



## NASHPA COMPRESSION FACILITY PROJECT



Tender Enquiry No.: PROC/FC/CB/PROJ/NASHPA-3268/2018

### PRE-BID CLARIFICATION # 10

One of the bidder has asked following queries, OGDCL/ENAR responses are as follows:

Sr. No.	Clarification By Bidder	OGDCL / ENAR Response
1	<p><b>ITB Reference</b> Volume-IIA (process) 04. Datasheets 0193-DS-1701-0 (Data Sheet For Front End Compressors) Page 9</p> <p>Cylinder coolant temperature</p> <p><b>Query</b> As per ITB Compressor cylinder coolant temperature monitoring is required whereas as per Vendor i.e. Ariel's design, all the cylinders are Air Cooled type and no coolant is required, hence, no temperature monitoring shall be required. Kindly confirm concurrence.</p>	<p>This shall be reviewed and confirmed during Detail Engineering.</p>
2	<p><b>ITB Reference</b> Volume-IIA (process) 04. Datasheets 0193-DS-1701-0 (Data Sheet For Front End Compressors) Page 8 Note13</p> <p>Special tools such as laser alignment tool, temperature guns, vibrometer, tachometer etc shall be provided.</p> <p><b>Query</b> Please confirm minimum quantities of required special tools for each compressor or all compressors.</p>	<p>Quantities must be estimated by the bidder for safe and reliable operation/maintenance requirements. The quantities must be mentioned explicitly in the bid proposal.</p>
3	<p><b>ITB Reference</b> Volume-IIA (process) 04. Datasheets 0193-DS-1701-0 (Data Sheet For Front End Compressors) Page 7 Clause 7.31</p> <p>Volume-iib (mechanical) Piping Specifications NGP-000-PIP-15.03-0001-00-02-PPiping Material Specification Page14, Page30</p> <p>All the flanges from CL 600# shall be RTJ with surface finish RA 1.6 µm as per ASME B16.48.</p> <p>ASME B16.5, Class 600 Raised Face, ASTM A 105</p> <p><b>Query</b> As per ITB Compressor Data Sheet, RTJ type 600 rating flanges are required whereas RF type flanges are indicated in piping specification. Kindly clarify the requirements.</p> <p>Furthermore, please note Vendor i.e. Ariel only provide FF type face Flange with Cylinder.</p>	<p>Bidder to consider Raised Face for 600# Flange facing.</p> <p>Furthermore, vendor related queries shall be facilitated during detail engineering phase.</p>

4	<p><b>ITB Reference</b>  Volume-IIA (process)  04. Datasheets  0193-DS-1701-0 (Data Sheet For Front End Compressors)  Page 7  Note 1</p> <p>Volume-IIA (process)  03. P&amp;IDs  0193-PB-2102-0 SHEET 1 OF 2 (Typical P&amp;ID For Front End Compressors)  Note 8</p> <p>Vendor shall provide inlet ESDV of 900# flange rating.</p> <p>Compressor inlet ESDV &amp; PCV shall be 600# rating.</p> <p><b>Query</b>  As per ITB Compressor Data Sheet, Unit ESDV flange rating is 900# whereas P&amp;ID shows 600 rating of Flanges for Inlet ESDV and PCV. Kindly clarify the requirements.</p> <p>Furthermore, please note that according to ASME B16.5, flange rating for ESDV &amp; PCV shall be 600#.</p>	Compressor inlet ESDV & PCV shall be 600# rating.
5	<p><b>ITB Reference</b>  Volume-IIA (process)  04. Datasheets  0193-DS-1701-0 (Data Sheet For Front End Compressors)  Page 10  Clause: Other</p> <p>Cooler coolant level</p> <p><b>Query</b>  We understand that requirements are relating to monitoring of engine expansion tank level which shall be placed on the top of air cooler, please confirm.</p>	This shall be reviewed and confirmed during Detail Engineering.
6	<p><b>ITB Reference</b>  Volume-IIB (Mechanical)  Mechanical Specifications  14-0193-STA-001-0 (Specification for Steel Structure)  Page 27  Clause 9.1 c</p> <p>Test Certificates, certificate type shall be to DIN 50049 3.1B for structural steel and bolts.</p> <p><b>Query</b>  DIN 50049 has been replaced by EN10204, therefore, updated standard certification shall be provided. Please confirm</p>	Bidder understanding is correct.
7	<p><b>ITB Reference</b>  Volume-IIA (process)  04. Datasheets  0193-DS-1701-0 (Data Sheet For Front End Compressors)  Page 4  Note 6 &amp; 7</p> <p>The maximum gas temperature at inter stage cooler and final stage cooler shall be 130°F and 150°F respectively</p> <p><b>Query</b>  Ambient temperature is 115°F and the temperature setting for inter stage cooler is 130°F. we understand and propose based on industry practice that inter cooler temperature setting should also be 150°F, same as after cooler temperature which will not influence for compressor performance.</p>	Bidder shall follow air coolers' discharged temperature as mentioned in datasheet. However, this shall be further reviewed and confirmed during Detail Engineering.

8	<p><b>ITB Reference</b>  Volume-IIB (Mechanical)  Mechanical Specifications  14-0193-GS-001-0 (General Specification for Painting)  Page 25  Clause 8.2.2</p> <p>Color  As per OGDCL's general specification.</p> <p><b>Query</b>  Please provide corresponding specification for color.</p>	<p>For clause 8.2.2 regarding color, please consider the following coding:  Fire water piping shall be painted solid red in a suitable weather resistant paint available in Pakistan.  Pipe work shall generally be painted silver and Color coding of pipe work shall be as per the Piping Service Designations. Each pipe shall be color coded with three painted bands (with the exception of Fire Water piping) identifying</p> <p>1- Product Medium  2- ANSI Piping Class  3- Piping Material</p> <p>Color coding shall be prepared by Supplier and agreed by OGDCL/Engineering Consultant from the appropriate range of suitable paints available in Pakistan.</p>
9	<p><b>ITB Reference</b>  Volume-IIB (Mechanical)  Piping Specifications</p> <p>NGP-000-PIP-15.03-0001-00-02-Piping Material Specification  Page 6  Clause 2.2</p> <p>Project Specification  Piping Design Basis NGP-000-PIP-15.05-0001-00  Specification for Stress Analysis NGP-000-PIP-15.03-0002-00  Specification for Carbon and Stainless Steel Pipes NGP-000-PIP-15.03-0008-00  Specification for Carbon and Stainless Steel Fittings NGP-000-PIP-15.03-0009-00  Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00  Specification for Stud Bolts and Nuts NGP-000-PIP-15.03-0007-00  Specification for Gaskets NGP-000-PIP-15.03-0006-00  Specification for Steel Flanges NGP-000-PIP-15.03-0011-00  Specification for Induction Bends NGP-000-PIP-15.03-0016-00  Data Sheet for Gate, Globe and Check Valves NGP-000-PIP-15.17-0001-00  Data Sheet for Ball Valves NGP-000-PIP-15.17-0002-00  Data Sheet for Induction Bends NGP-000-PIP-15.17-0006-00  Specification for Coating and Painting NGP-000-PAI-15.03-0001-00</p> <p><b>Query</b>  Listed project specifications are missing in ITB, we consider these specification are very critical for package design and commercial quotation, please provide the same.</p> <p>If these spec. are not applicable for this project, please clarify.</p>	<p>The required specifications are attached with clarifications.</p>
10	<p><b>ITB Reference</b>  Bid Price Schedule Summary  Price Break Up No. 5 Engineering is divided into 7 parts:  5.1 Verification &amp; Validation of FEED Document  5.2 Detailed Engineering  5.3 Construction, Installation, Fabrication, Pre-Commissioning Engineering  5.4 Civil Works, Erection and Construction  5.5 Plant Electrical Lighting  5.6 Plant Instrument Work  5.7 Plant Mechanical Work</p> <p><b>Query</b>  We understand that the detailed break up sr. no. 5.4, 5.5, 5.6, and 5.7 shall be the breakup of site execution work, not engineering work.</p>	<p>It is clear mentioned that from 5.3 "Construction, Installation, Fabrication, Pre-Commissioning Engineering" are related to site execution works. Bidder may do renumbering the heads accordingly.</p>

**ITB Reference**

Appendix-L Progress Payment, Overall Weight Factors

A	Construction	80.00
o	Civil	25.00
o	Mechanical	50.00
o	Electrical	10.00
o	Instrumentation	15.00
B	Pre-commissioning, Commissioning, Startup, Training and Testing	20.00
TOTAL:		100.00

**Query**

We understand that in the Bid Price Schedule, the respective disciplines are to be quoted separately on lump sum basis and it shall be paid as per milestones of Appendix-L so the overall weight factors shall not be applicable.

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Bidder understanding is not correct.

Clause 24.3 (b), point # 5 (page 35 of 73) of Section-IV Conditions of Contract shall now be read as:

"5. Thirty Percent (30%) of the LC amount shall be paid by OGDCL to Contractor for completion of Construction, Fabrication, Installation, Erection, Hook-up and Pre-Commissioning.

Payment for Construction, Fabrication, Installation, Erection, Hook-up and pre-commissioning shall be made on actual progress achieved.

The OGDCL shall make progress payments to the Contractor on monthly basis in accordance with the valuation of Work done as determined according to the weight factors for the respective items.

For determining the percent progress of a specific Work unit each specific Work unit shall be divided into Work steps/ activities and each of this step/ activity shall be given an appropriate weight factor as mentioned in Appendix-L1 ("sample" for Bidder's understanding for activity breakups and it must be made specific to Nashpa Compression Project lumpsum works activities and logical weightages distributions). The overall weight factors of various components of Works Contract are presented in Appendix – L. Activities under each component of Works Contract and their weight factors alongwith their basis shall be submitted by the Bidder with the technical bid proposal for the approval of the OGDCL.

The Contractor shall submit at Site a daily Work report in four copies, specifying the quantities of each category of Work on standard format to be designed by CONTRACTOR and agreed by OGDCL. OGDCL's representative shall verify these quantities and sign the Work report returning a copy of the same to the Contractor on daily basis. Monthly Work valuation shall be done on the basis of the quantities verified by the OGDCL's Site representative on daily Work reports.

For determining the value of Work for payment the Contractor shall measure and determine the monthly progress of actual Work done in accordance with the Contract. The OGDCL's representative shall ascertain the progress reported by the Contractor and accordingly issue a Work certificate. If measurement of any part of the Work is required, the OGDCL representative shall issue a notice to the Contractor who shall forthwith assist the OGDCL's representative or his nominee in making such measurements and shall furnish all particulars required. The measurement determined by the OGDCL's representative or his nominee shall be taken to be the final measurement of the Work, for valuation purpose.

Ten Percent (10%) of the LC amount shall be paid by OGDCL to Contractor for project management control, administration and general services (including inspection) Payment for project management control, administration and general services (including inspection) shall be paid after completion of project management work."

in view of above, the revised Appendix-L is attached for your working.

# **DATA SHEETS AND SPECIFICATIONS**



# NASHPA Gas Processing and LPG Recovery Plant

PROC-FC-CB/NASHPA/PROJ-1247 /2015

PROJECT NO.: NASHPA 1247



DOCUMENT NO.:  
NGP-000-PIP-15.03-0009-00

SPECIFICATION

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## Specification for Carbon and Stainless Steel Fittings

### REVISION DETAILS

REV	DATE	DESCRIPTION	PRPD	CHKD	REVD	APPD
00	09/05/2016	Approved for Use	Lan Houdong	Wang Shaobo	Liu Zijian	Xu Feng
C	21/03/2016	Issued for Approval	Lan Houdong	Wang Shaobo	Liu Zijian	Xu Feng
B	25/01/2016	Issued for Review	Lan Houdong	Wang Shaobo	Liu Zijian	Xu Feng
A	10/01/2016	Internal Discipline Check	Lan Houdong	Wang Shaobo	Liu Zijian	Xu Feng



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**REVISION HISTORY**

REV.	DATE	REVISION DESCRIPTION
A	10/01/2016	Internal Discipline Check
B	25/01/2016	Issued for Review
C	21/03/2016	Issued for Approval
00	09/05/2016	Approved for Use



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## 1.0 GENERAL

### 1.1 Introduction

OIL & GAS Development Company Ltd. (OGDCL) is operating NASHPA Oil & Gas fields in Khyber Pakhtunkhwa of Islamic Republic of Pakistan. OGDCL intends to install LPG Recovery Plant, Compressors & Allied Facilities at this field.

### 1.2 Scope

This specification covers the minimum technical requirement for design, manufacture, supply, inspection, testing and commissioning of Carbon and Stainless Steel Fittings to be used in NASHPA Gas Processing and LPG Recovery Plant PROC-FC-CB/NASHPA/PROJ-1247 /2015.

### 1.3 Definitions

Within this document the following definitions apply:

<b>Project</b>	NASHPA Gas Processing and LPG Recovery Plant PROC-FC-CB/NASHPA/PROJ-1247 /2015
<b>Company/Owner</b>	Oil & Gas Development Company Ltd.(OGDCL)
<b>Consultant</b>	Zishan Engineers (Pvt.) Ltd.
<b>Contractor</b>	Hong Kong Huihua Global Technology Limited Wholly owned Subsidiary of China OIL HBP Science and Technology Corporation Ltd.
<b>Manufacturer/Supplier/Vendor</b>	Party(ies), which manufactures and/or supplies material, equipment and service to perform the duties as specified by CONTRACTOR in the scope of supply
<b>Shall</b>	Indicates a mandatory requirement
<b>Should</b>	Indicates a strong recommendation to comply with the requirement of this document



### 1.4 Errors or Omissions

1.4.1 The review and comment by COMPANY/CONSULTANT/CONTRACTOR of any VENDOR's drawings, procedures or documents shall only indicate acceptance of general requirements and shall not relieve VENDOR of its obligations to comply with the requirements of this specification and other related parts of the Contract Documents.

1.4.2 Any errors or omissions noted by VENDOR in this Specification shall be immediately brought to the attention of COMPANY/CONSULTANT/CONTRACTOR.

### 1.5 Deviations



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All deviations to this Specification, other related specifications or attachments shall be brought to the knowledge of COMPANY/CONTRACTOR as a section in the bid. All deviations made during the procurement, design, manufacturing, testing and inspection shall be with written approval of COMPANY/CONTRACTOR prior to execution of Work. Such deviations shall be shown in the documentation prepared by VENDOR

### 1.6 Conflicting Requirement

In the event of any conflict, inconsistency or ambiguity between VENDOR's scope of work, this Specification, National Codes and Standards, and referenced in the Project Specification or any other documents, VENDOR shall refer to COMPANY/CONTRACTOR whose decision shall prevail.

### 1.7 Reporting Procedure

1.7.1 A reporting and documentation system shall be agreed between VENDOR and COMPANY/CONSULTANT/CONTRACTOR for the status of procurement, design, manufacturing, inspection, testing and shipment of the equipment/material to be supplied under this specification. VENDOR shall provide reports and summaries for production performance and testing operations in conformance with a manufacturing schedule approved by COMPANY.

1.7.2 Daily, weekly, monthly and run summaries of all major aspects of the production process shall be provided as reports to COMPANY/CONSULTANT/CONTRACTOR.

#### 1.7.3 Third Party Inspection

In addition to the inspection and witnessing of tests by the inspectors to be appointed by the COMPANY during the manufacturing and shipment of the equipment/material, COMPANY may appoint a third party or its own inspector for witnessing of the inspection and tests to be carried out at VENDOR's facility under this specification.

### 1.8 Unit Responsibility

VENDOR shall be responsible for the complete design, manufacture, supply, fabrication, construction, installation/erection, inspection and testing of Carbon and Stainless Steel Fittings, including full compliance with all applicable design codes and standards, including those listed in Section 2.0 of this document and the requirements of the certifying authority, if applicable. VENDOR shall handle and expedite drawings and data, and supervise and coordinate all inspection and testing.

VENDOR shall guarantee that all material and parts included in construction of the specified Carbon and Stainless Steel Fittings shall be new, unused and of the required/ specified grade.

### 1.9 Documentation

1.9.1 Documents, calculation sheets, drawings, etc., to be submitted to the COMPANY/CONTRACTOR shall be in English Language.

1.9.2 Unless otherwise specified, the metric units shall be used in documents and drawings, except that pipe sizes, flange sizes and bolts/nuts shall be indicated in inches.

1.9.3 The form of drawings and documents may be as per the CONTRACTOR/VENDOR's Standards. However, the format of the data sheet should be submitted to COMPANY by VENDOR for approval.



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1.9.4 Variations from or additions to this specification shall be called to the attention of the COMPANY and approved in writing by the COMPANY prior to starting fabrication.

1.9.5 Information for installation, operating, maintenance or inspection purposes shall be submitted to COMPANY.

## 2.0 CODES AND STANDARDS

### 2.1 Codes, Standards and Regulations

The Carbon and Stainless Steel Fittings shall be designed, manufactured and tested in accordance with the requirements of this specification, other referenced Project Specifications and the Latest Editions of following Codes, Standards and Statutory Regulations (where applicable):

ANSI B31.3	Process Piping
ASME B1.20.1	Pipe Threads, General Purpose(Inch)
ASME B16.9	Factory-Made Wrought Buttwelding Ding Fittings
ASME B16.11	Forged Fittings, Socket-Welding and Threaded
ASME B16.25	Butt welding Ends
MSS SP-95	Swage(d) Nipples and Bull Plugs
MSS SP-97	Forged Carbon Steel Branch Outlet Fittings-Socket Welding, Threaded and Buttwelding Ends

2.2 In addition to the requirements of this General Specification, all requirements of the governing Statutory Authority, i.e., in the country and/or its subdivision where Carbon and Stainless Steel Fittings are to be installed, shall be met.

### 2.3 Project Specification

Piping Material Specification	NGP-000-PIP-15.03-0001-00
Specification for Coating and Painting	NGP-000-PAI-15.03-0001-00
Specifications for Export Packing and Crating	NGP-000-COM-15.05-0002-00

## 3.0 ENVIRONMENTAL DESIGN CRITERIA

### 3.1 Area Classification

The area classification for Carbon and Stainless Steel Fittings will be as indicated in Material take-off.

### 3.2 Environmental Data

Environmental conditions for Carbon and Stainless Steel Fittings covered by this specification shall be in accordance with Specification 'Environmental Conditions' (NGP-000-COM-15.05-0001-00).



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## 4.0 DESIGN

4.1 Each condition of fittings shall be furnished in accordance with the following:

Butt Weld Ends -ASME B16.25

Socket Weld Ends-ASME B16.11

Threaded Ends-taper-threaded -ASME B1.20.1

4.2 Weld repair of any parent fitting material is not permitted.

4.3 Branch reinforcing fittings (i.e. sockolets, weldolets etc.) shall be designed in accordance with the requirements of ASME B31.3. Vendor shall submit drawings during bid stage.

4.4 Butt weld elbows shall be long radius type (radius =1.5 nominal pipe size) unless otherwise specified.

4.5 For reducing butt welded end fittings specified with two schedules in the Inquiry/Purchase description, the first schedule refers to the larger end or run pipe, the second schedule refers to the smaller end or branch pipe.

4.6 For reducing butt welded end fittings having different wall thickness at each end, the greater one shall be employed & ends shall be matched to suit the respective thickness.

## 5.0 MATERIALS

### 5.1 Carbon Steel Fittings

Steel used in the manufacture of fittings to this specification shall be fully killed and made by the Open-hearth, Electric-furnace or Basic-oxygen processes.

The chemical composition of each heat of steel shall be determined by the Manufacturer, and shall have maximum carbon content 0.30%, and maximum sulphur content 0.04%. and 0.30% and 0.058% for High temperature carbon steel.

The carbon equivalent shall not exceed 0.43% as determined by the following formula:

$$C.E. = C + \frac{Mn}{6} + \frac{Cr}{5} + \frac{Mo}{5} + \frac{V}{15} + Cu + Ni$$

### 5.2 Stainless Steel Fittings

The Steel used in manufacturing of fittings to this specification shall be melted by one of the process Electric Furnace or Vacuum furnace.

The Chemical composition shall be determined by the manufacturer and shall have Maximum Carbon content 0.08% and sulphur 0.03%.

5.3 Fittings shall have a maximum hardness of 235 BHN (HRC 22), shall not have more than 1.0% nickel content and shall not include hardenable steel such as AISI – 4140.



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## 6.0 HEAT TREATMENT

All Carbon steel and Stainless steel Fittings shall be furnished in the heat treated condition

## 7.0 DIMENSIONS

7.1 Dimensions of butt welded fittings shall be in accordance with ASME B16.9, Forged threaded or socket welded fittings shall be in accordance with ASME B16.11, other fittings dimensions shall comply with MSS SP-95, MSS SP-97 as applicable.

7.2 In all cases fittings shall be suitable for butt-welding into the adjacent pipe work with the internal diameter of ends and outlets matching that of the pipe.

## 8.0 TRANSITION PIECES

Where pipes of different material grades, or of different wall thickness (or both) are to be jointed, and where the miss-match of wall thickness cannot be rectified by grinding in accordance with the tolerances of ANSI B31.3, then a transition piece shall be used.

The transition piece shall have a length of at least 2 pipe diameters and shall have minimum specified yield strength equivalent to the thinner of the two pipes to be joined. The ends of the transition pieces shall be machined to suit the respective pipe wall thickness.

## 9.0 TESTING, INSPECTION AND REJECTION

9.1 All CONTRACTOR/SUPPLIER facilities, materials and fabrication work shall be subject to inspection by the COMPANY.

9.2 The CONTRACTOR/SUPPLIER shall afford the COMPANY's representative all reasonable facilities necessary to satisfy him the material is being produced and furnished in accordance with the specification.

9.3 Fittings supplied shall be examined visually. The surfaces of fittings shall be free from surface discontinuities more than 5% of specified wall thickness, finish scale and mechanical marks. General appearance, workmanship and fit-up shall be acceptable in accordance with ASME B31.3. Dimensions of the fitting shall be checked against ASME B16.9 or approved CONTRACTOR/SUPPLIER'S drawing.

9.4 Fittings containing defects originating with the CONTRACTOR/SUPPLIER design, materials, or workmanship or which are not in complete compliance with the requirement of the purchased order and referenced documents will be subject to rejection.

9.5 Inspection and acceptance of the fittings by the COMPANY does not relieve the CONTRACTOR/SUPPLIER of the responsibility to comply with the requirements of this specification and the purchase order.

9.6 The fittings CONTRACTOR / SUPPLIER shall perform all testing and examination required by the referenced standards and the purchase order.

9.7 Impact testing, when required, shall meet the requirements of ASME B31.3

## 10.0 ENGINEERING DATA REQUIREMENTS



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**10.1** All records indicated herein shall be fully identified with the specific materials they represent. All records shall be available for examination by the COMPANY.

**10.2** All required engineering data shall be in English.

**10.3** Welding Procedure Specification (WPS) and Procedure Qualification Records (PQR), if applicable, shall be in accordance with the ASME Boiler Vessel Code, Section IX. Individual WPSs and PQRs shall be available for examination by COMPANY'S request.

**10.4** When requested by COMPANY, CONTRACTOR / SUPPLIER shall furnish Material Test Reports ( MTR) that show actual results of chemical analyses, mechanical tests, impact test results (if applicable) , and the heat treatment in compliance with the referenced material specification. The test report shall be traceable to each production lot. These documents shall be identified with the Company' purchase order number and shall be signed by the CONTRACTOR / SUPPLIER'S authorized agent.

**10.5** The CONTRACTOR / SUPPLIER shall provide a certification of compliance with ASME B16.9, and the relevant ASTM standards and with the requirements of this specification.

## **11.0 PRODUCT MARKING, COATING AND PACKING**

**11.1** Each fitting shall have prescribed information stamped or otherwise suitably marked. The prescribed information for fittings shall be at least:

- § Manufacturer's name or trademark.
- § Schedule No.
- § Nominal Wall Thickness.
- § Size, Class, grade, Length.
- § Fitting designation.
- § Heat No.

**11.2** Fittings shall be supplied with a protective coating that does not hide marking or surface defects. This temporary coating combined with appropriate packing, must protect against corrosion during Ocean shipment. The coating shall be hard and dry. It can be either a clear coating or a thin opaque coating. Except for clear coating, the maximum dry film thickness shall be 0.076 mm. The fitting's normal stamped markings must be readable.

**11.3** The welding ends shall be coated with an Aluminum-flake weld able primer or a coating that is easily strippable and does not leave a residue that interferes with welding. The maximum dry film thickness of a weld able coating shall not exceed 0.050 mm. A welding end strippable coating is allowed to be any thickness. Example of strippable coatings include high build vinyl, urethane, PVC or strippable tape applied before coating.

**11.4** A fitting must be protected from mechanical damage. Welding ends must be protected with suitable wood, plastic or metal covers. Fittings must be packed in steel-banded wooden crates or secured to skids.

**11.5** The Packing of the Fittings shall also meet the packing requirements as detailed in the Specifications for Export Packing and Crating. (NGP-000-COM-15.05-0002-00).



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SPECIFICATION

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## Specification for Ball, Gate, Globe and Check Valves

### REVISION DETAILS

REV	DATE	DESCRIPTION	PRPD	CHKD	REVD	APPD
			<i>Zhang Lei</i>	<i>Wang Jing</i>	<i>Liu Zijian</i>	<i>xufeng</i>
00	06/05/2016	Approved for Use	Zhang Lei	Wang Jing	Liu Zijian	Xu Feng
C	21/03/2016	Issued for Approval	Zhang Lei	Wang Jing	Liu Zijian	Xu Feng
B	25/01/2016	Issued for Review	Zhang Lei	Wang Jing	Liu Zijian	Xu Feng
A	13/01/2016	Internal Discipline Check	Zhang Lei	Wang Jing	Liu Zijian	Xu Feng



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DOC. NO.            NGP-000-PIP-15.03-0010-00

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**REVISION HISTORY**

REV.	DATE	REVISION DESCRIPTION
A	13/01/2016	Internal Discipline Check
B	25/01/2016	Issued for Review
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00	06/05/2016	Approved for Use





NASHPA Gas Processing and LPG Recovery Plant  
PROC-FC-CB/NASHPA/PROJ-1247 /2015

DOC. NO.                      NGP-000-PIP-15.03-0010-00

DESCRIPTION                Specification for Ball, Gate, Globe and Check Valves

REVISION                    00

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## 1.0 GENERAL

### 1.1 Introduction

OIL & GAS Development Company Ltd. (OGDCL) is operating NASHPA Oil & Gas fields in Khyber Pakhtunkhwa of Islamic Republic of Pakistan. OGDCL intends to install LPG Recovery Plant, Compressors & Allied Facilities at this field.

### 1.2 Scope

This specification covers the minimum technical requirement for design, manufacture, supply, inspection, testing and commissioning of Gate, Globe, Ball and Check Valves to be used in NASHPA Gas Processing and LPG Recovery Plant PROC-FC-CB/NASHPA/PROJ-1247 /2015.

### 1.3 Definitions

Within this document the following definitions apply:

<b>Project</b>	NASHPA Gas Processing and LPG Recovery Plant PROC-FC-CB/NASHPA/PROJ-1247 /2015
<b>Company/Owner</b>	Oil & Gas Development Company Ltd.(OGDCL)
<b>Consultant</b>	Zishan Engineers (Pvt.) Ltd.
<b>Contractor</b>	Hong Kong Huihua Global Technology Limited Wholly owned Subsidiary of China OIL HBP Science and Technology Corporation Ltd.
<b>Manufacturer/Supplier/Vendor</b>	Party(ies), which manufactures and/or supplies material, equipment and service to perform the duties as specified by CONTRACTOR in the scope of supply
<b>Shall</b>	Indicates a mandatory requirement
<b>Should</b>	Indicates a strong recommendation to comply with the requirement of this document



### 1.4 Errors or Omissions

1.4.1 The review and comment by COMPANY/CONSULTANT/CONTRACTOR of any VENDOR's drawings, procedures or documents shall only indicate acceptance of general requirements and shall not relieve VENDOR of its obligations to comply with the requirements of this specification and other related parts of the Contract Documents.

1.4.2 Any errors or omissions noted by VENDOR in this Specification shall be immediately brought to the attention of COMPANY/CONSULTANT/CONTRACTOR.

### 1.5 Deviations



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All deviations to this Specification, other related specifications or attachments shall be brought to the knowledge of COMPANY/CONTRACTOR as a section in the bid. All deviations made during the procurement, design, manufacturing, testing and inspection shall be with written approval of COMPANY/CONTRACTOR prior to execution of Work. Such deviations shall be shown in the documentation prepared by VENDOR

### 1.6 Conflicting Requirement

In the event of any conflict, inconsistency or ambiguity between VENDOR's scope of work, this Specification, National Codes and Standards, and referenced in the Project Specification or any other documents, VENDOR shall refer to COMPANY/CONTRACTOR whose decision shall prevail.

### 1.7 Reporting Procedure

1.7.1 A reporting and documentation system shall be agreed between VENDOR and COMPANY/CONSULTANT/CONTRACTOR for the status of procurement, design, manufacturing, inspection, testing and shipment of the equipment/material to be supplied under this specification. VENDOR shall provide reports and summaries for production performance and testing operations in conformance with a manufacturing schedule approved by COMPANY.

1.7.2 Daily, weekly, monthly and run summaries of all major aspects of the production process shall be provided as reports to COMPANY/CONSULTANT/CONTRACTOR.

#### 1.7.3 Third Party Inspection

In addition to the inspection and witnessing of tests by the inspectors to be appointed by the COMPANY during the manufacturing and shipment of the equipment/material, COMPANY may appoint a third party or its own inspector for witnessing of the inspection and tests to be carried out at VENDOR's facility under this specification.

### 1.8 Unit Responsibility

VENDOR shall be responsible for the complete design, manufacture, supply, fabrication, construction, installation/erection, inspection and testing of the Gate, Globe, Ball and Check Valves, including full compliance with all applicable design codes and standards, including those listed in Section 2.0 of this document and the requirements of the certifying authority, if applicable. VENDOR shall handle and expedite drawings and data, and supervise and coordinate all inspection and testing.

VENDOR shall guarantee that all material and parts included in construction of the specified Gate, Globe, Ball and Check Valves shall be new, unused and of the required/ specified grade.

### 1.9 Documentation

1.9.1 Documents, calculation sheets, drawings, etc., to be submitted to the COMPANY/CONTRACTOR shall be in English Language.

1.9.2 Unless otherwise specified, the metric units shall be used in documents and drawings, except that pipe sizes, flange sizes and bolts/nuts shall be indicated in inches.

1.9.3 The form of drawings and documents may be as per the CONTRACTOR/VENDOR's Standards. However, the format of the data sheet will be submitted to COMPANY for approval.



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1.9.4 Variations from or additions to this specification shall be called to the attention of the COMPANY and approved in writing by the COMPANY prior to starting fabrication.

1.9.5 Information for installation, operating, maintenance or inspection purposes shall be submitted to COMPANY.

## 2.0 CODES AND STANDARDS

### 2.1 Codes, Standards and Regulations

The Valves shall be designed, manufactured and tested in accordance with the requirements of this specification, other referenced Project Specifications and the Latest Editions of following Codes, Standards and Statutory Regulations (where applicable):

#### ANSI

ANSI B 31.3 Process Piping

ANSI B 16.5 Pipe Flanges and Flanged Fittings

ANSI B 16.20 Metallic Gaskets for Pipe Flanges – Ring-Joint, Spiral-Wound

ANSI B 16.21 Non-metallic Gaskets for Pipe Flanges

ANSI B 18.2.1 Stud Bolts

ANSI B 18.2.2 Heavy Nuts

ANSI B 16.34 Valves-Flanged, Threaded and Welding End

ANSI B 16.10 Face to Face and End to End Dimensions of Valves

ANSI B 16.25 Butt welding ends

#### API

API6D  
/ISO14313 Specification for Pipeline Valves

API RP 520 Sizing and Selection of Pressure Relieving Devices in Refineries

API 598 Valve Inspection and Testing

API 600 Steel Gate Valves. Flanged and Butt-welding Ends, Bolted Bonnets



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API 601	Metallic Gaskets
API 602	Gate, globe, and check valves for sizes DN100 (NPS 4) and smaller for the petroleum and natural gas industries
API 607	Fire Test for Quarter-turn Valves and Valves Equipped with Nonmetallic Seats
API 598	Valve Inspection and Testing
ISO	
ISO 15761	Steel gate, globe, and check valves for sizes DN100 and smaller, for the petroleum and natural gas industries
ISO 9001	Quality Management System
ISO 9004	Managing For the Sustained Success of an Organization - A Quality Management Approach
<b>MSS</b>	
SP-44	Steel Pipeline Flanges- General Standard Practice
<b>BS</b>	
<b>BS 6364</b>	<b>Specification for Valves for cryogenic service</b>



**2.2** In addition to the requirements of this General Specification, all requirements of the governing Statutory Authority, i.e., in the country and/or its subdivision where Gate, Globe, Ball and Check Valves are to be installed, shall be met.

### 2.3 Project Specification

NGP-000-PIP-15.17-0001-00	Data Sheet for Gate, Globe and Check
NGP-000-PIP-15.17-0002-00	Data Sheet for Ball Valves
NGP-000-PAI-15.03-0001-00	Specification for Coating and Painting
NGP-000-PIP-15.03-0001-00	Piping Material Specification
NGP-000-INS-15.03-0009-00	Specification for Pneumatic Actuators

## 3.0 ENVIRONMENTAL DESIGN CRITERIA



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### 3.1 General

The design life of the Valves shall be 25 years minimum. Unless otherwise stated on the data sheets the Ball, Gate, Globe and Check Valves will be located in an open exposed area.

### 3.2 Area Classification

The area classification for the Ball, Gate, Globe and Check Valves will be as indicated in datasheets.

### 3.3 Environmental Data

Environmental conditions for the valves covered by this specification shall be in accordance with Specification NGP-000-COM-15.05-0001-00-Environmental Conditions.

## 4.0 SCOPE OF SUPPLY

The CONTRACTOR / SUPPLIER scope of work shall include, among others, the following items of work:

- a) All valves shall comply with the requirements of ANSI B16.10.
- b) Valves shall be made in accordance with API STD 6D, Specification for Gate, Globe, Ball and Check Valves latest edition and with the requirements of this specification.
- c) Valve size, type, and rating, material connection type and, where possible, dimensions for operating mechanisms will be specified on the Purchase order.
- d) Where indicated on the specifications/data sheets, valves shall be actuated.
- e) Both actuators and valves in this specification will be assembled as one unit and tested together at the valve factory and witnessed by COMPANY.

## 5.0 GENERAL SERVICE CONDITIONS

5.0 Fluid handled: Natural Gas

5.1 Valves may be installed:

- Underground with dirt cover over the pipe.
- Underground in covered sump.
- Above ground unsheltered.

5.2 Valve stem may be positioned:

- Vertically
- Horizontally

## 6.0 MATERIAL

6.1 Bodies, including end flanges and welding ends, bonnets and covers of valves shall be made of materials conforming to the specifications listed in API STD 6D, and as further specified in this specification.



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**6.2** Material selected for welding ends shall have a guaranteed minimum yield strength of not greater than 36,000 psi (Grade B).

**6.3** Material selected for welding shall have a carbon content of 0.20% maximum, 0.02% sulphur maximum and maximum carbon equivalent of 0.43% as determined by the formula:

$$C.E. = C + \frac{Mn}{6} + \frac{Cr + Mo + V}{5} + \frac{Cu + Ni}{15}$$

**6.4** Steel castings used for valves bodies shall be of X-ray quality, Class 2, as specified in ASTM Specification E71 'Industrial Radiographic Standards for Steel Casting'.

**6.5** The use of asbestos material in any form is not permitted.

**6.6** No bushings shall be used.

## 7.0 DESIGN AND CONSTRUCTION

### 7.1 General

The VENDOR assumes the obligation of selecting the station ball valves and their materials in accordance with good practice, the latest technological developments and available experience, allowing for economic aspects.

The VENDOR shall have suitable qualification and adequate experience in the field of shut-off valve manufacture.

The VENDOR shall bear sole responsibility for ensuring that the details of the valve, required for correct design and rating of the actuators, is submitted directly to the actuator Subcontractor. All coordination work required for this shall be performed by the VENDOR at his own responsibility.

The VENDOR shall bear sole responsibility for ensuring that design, materials, fabrication and inspection/testing comply with all requirements of this Specification, as well as all relevant legislation, codes, standards and regulations.

The Vendor shall be responsible for the design and workmanship of the product and the COMPANY 's approval will not absolve the vendor of this responsibility.

Changes, such as design concessions or deviations from the requirements of this Specification, shall always be submitted to the COMPANY in writing for approval.

The requirements contained in ANSI B16.34, in respect of mechanical properties of the base materials and their fabrication welds shall be met and certified by means of an acceptance test certificate.

**7.2** The design and construction of valves shall comply with the requirements of the latest editions of API Standard 6D, ANSI B16.10 and this specification.

**7.3** Gate Valves shall comply to API Std. 602 /API Std. 600.

**7.4** Globe Valves shall comply to API Std. 602/ASME B16.34( $\leq 1-1/2$ " shall comply to ISO 15761).

**7.5** Check Valves shall comply to API Std. 602/ASME B16.34( $\leq 1-1/2$ " shall comply to ISO 15761)..

**7.6** Ball Valves shall comply to API 6D .



- 7.7** Ball valves greater than 8" size shall be pinion supported.
- 7.8** Valves fabricated by welding are not applicable. Valve specified shall be made of cast or forged steel construction with integral flanges. Flanged end valves with welded on flanges are not permitted.
- 7.9** All valves hand wheels, including those on gear operators, shall be permanently marked "Open" or "Close" with arrow indicating the direction of rotation.
- 7.10** The maximum force required at the hand-wheel or wrench or apply the breakaway torque or thrust shall not exceed 360N(80 lbf).
- 7.11** VENDOR shall state which valves need to be fitted with gear operator to comply with the foregoing requirements. Gear operators shall be heavy duty and shall be totally enclosed weatherproof type packed with a suitable lubricant, and fitted with a grease nipple. Gearbox shall be lubricated for life.
- 7.12** Gear operators shall be supplied complete with hand wheels, position indicators and associated installation hardware.
- 7.13** Gear operators for manual valves shall be VENDOR's standard.
- 7.14** The valve closing direction in all cases shall be clockwise.
- 7.15** All valves shall be operated manual or with the actuator according to respective P&ID.
- 7.16** Welding ends shall be beveled for welding to pipe or fittings in accordance with ANSI B31.3, unless otherwise specified, and shall be bored to the inside diameters as specified in the purchase order.
- 7.17** Due consideration of difference in SMYS shall be taken when calculating wall thickness at welding ends.
- 7.18** Flanged valve dimensions shall be in accordance with ANSI B16.5 'Steel Pipe Flanges and Flanged Fittings' for sizes 2(inch) to 24 (inch) excluding 22 (inch) size, and in accordance with MSS-SP44 for 22 (inch) and 26 (inch) and above.
- 7.19** Valve operating mechanisms shall be fitted with suitable locking device.
- 7.20** Valves shall be fitted with renewable seats. Welding end Ball valves shall have body configurations which allow complete maintenance of the valve without its removal from the line. Top entry design shall be utilized to meet this requirements. Ball valves shall also be fire safe to appropriate API or BS code.
- 7.21** All welding shall be in accordance with the requirements of ANSI Boiler and Pressure Vessel Code, latest edition, sections VIII & IX.
- 7.22** The face to face dimensions of flanged valves shall conform to ASME B16.10 and the flanges on steel flanged valves shall conform to ASME B16.5.
- 7.23** Reduced ports in ball valves shall be limited to one line size smaller than body size.

**7.24** The stem extension should be considered for the low temperature valves.

The extension stem should be sure that the operation mechanism and the seal will not be frozen and frosted, and avoid mechanical obstacle of the valve operation mechanism in the special environment condition.

The low temperature valves should be meet the requirement of BS 6364







### 7.25 Valve Operation

Valves shall be gear operated in accordance with the following table:

	150#	300#	600#	900#
GATE	NPS ≥ 16"	NPS ≥ 12"	NPS ≥ 8"	NPS ≥ 8"
GLOBE	NPS ≥ 10"	NPS ≥ 10"	NPS ≥ 8"	NPS ≥ 6"
BALL	NPS ≥ 6"	NPS ≥ 6"	NPS ≥ 4"	NPS ≥ 4"

### 8.0 SPARE PARTS

The CONTRACTOR / SUPPLIER shall submit a priced list of recommended two years spare parts with his commercial bid. This list shall include original manufacturer and local representative name, address and phone number for each item.

### 9.0 TESTING

- 9.1 All valves size 6" and above shall be subjected to a shell hydrostatic pressure test in accordance with API 598 requirements. Three certified copies of this chart shall be supplied to the purchaser.
- 9.2 Hydrostatic seat tests shall be carried out as required by API 598 for Ball, Gate, Globe and Check Valves, while the test pressure is on each side of the valve, it shall be operated at least twice to demonstrate satisfactory mechanical operation as well as continued tightness after operation under differential pressure conditions.
- 9.3 Valves shall be subjected to air seat tests in accordance with API STD 6D requirements.
- 9.4 The valve manufacturer shall give sufficient advance notice satisfactory to the purchaser of the time and place at which testing is to be performed.

### 10.0 INSPECTION

- 10.1 All welds shall be 100% radiographed to meet the acceptance standards of ANSI Boiler and Pressure Vessel Code, Latest Edition, Section VIII.
- 10.2 Where X-ray quality steel casting are specified, records of test shall be furnished to the purchaser.

### 11.0 DATA AND DRAWINGS

The manufacturer shall provide the following information:

Outline dimensions and mechanical details for the valve.

Number of complete revolutions of hand wheel or other operating device to close or open the valve.

The maximum permissible torque and the rated torque required to close or open the valve at the maximum pressure differential.



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Actual time to fully open or close the valve.

Head loss curve and data for the valve.

Priced list of special tools.

Priced list of spare parts for two years operation

## 12.0 MARKING

Each valve shall be marked in accordance with API 6D requirements and as may be further specified in the purchase order.



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SPECIFICATION

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## Specification for Steel Flanges

### REVISION DETAILS

REV	DATE	DESCRIPTION	PRPD	CHKD	REVD	APPD
			<i>Lan Houdong</i>	<i>Wang Shaobo</i>	<i>Liu Zijian</i>	<i>Xu Feng</i>
00	09/05/2016	Approved for Use	Lan Houdong	Wang Shaobo	Liu Zijian	Xu Feng
C	21/03/2016	Issued for Approval	Lan Houdong	Wang Shaobo	Liu Zijian	Xu Feng
B	25/01/2016	Issued for Review	Lan Houdong	Wang Shaobo	Liu Zijian	Xu Feng
A	15/01/2016	Internal Discipline Check	Lan Houdong	Wang Shaobo	Liu Zijian	Xu Feng



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### REVISION HISTORY

REV.	DATE	REVISION DESCRIPTION
A	15/01/2015	Internal Discipline Check
B	25/01/2016	Issued for Review
C	21/03/2016	Issued for Approval
00	09/05/2016	Approved for Use



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## 1.0 GENERAL

### 1.1 Introduction

OIL & GAS Development Company Ltd. (OGDCL) is operating NASHPA Oil & Gas fields in Khyber Pakhtunkhwa of Islamic Republic of Pakistan. OGDCL intends to install LPG Recovery Plant, Compressors & Allied Facilities at this field.

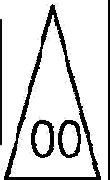
### 1.2 Scope

This specification covers the minimum technical requirement for design, manufacture, supply, inspection, testing and commissioning of Steel Flanges to be used in NASHPA Gas Processing and LPG Recovery Plant PROC-FC-CB/NASHPA/PROJ-1247 /2015.

### 1.3 Definitions

Within this document the following definitions apply:

<b>Project</b>	NASHPA Gas Processing and LPG Recovery Plant PROC-FC-CB/NASHPA/PROJ-1247 /2015
<b>Company/Owner</b>	Oil & Gas Development Company Ltd.(OGDCL)
<b>Consultant</b>	Zishan Engineers (Pvt.) Ltd.
<b>Contractor</b>	Hong Kong Huihua Global Technology Limited Wholly owned Subsidiary of China OIL HBP Science and Technology Corporation Ltd.
<b>Manufacturer/Supplier/Vendor</b>	Party(ies), which manufactures and/or supplies material, equipment and service to perform the duties as specified by CONTRACTOR in the scope of supply
<b>Shall</b>	Indicates a mandatory requirement
<b>Should</b>	Indicates a strong recommendation to comply with the requirement of this document



### 1.4 Errors or Omissions

1.4.1 The review and comment by COMPANY/CONSULTANT/CONTRACTOR of any VENDOR's drawings, procedures or documents shall only indicate acceptance of general requirements and shall not relieve VENDOR of its obligations to comply with the requirements of this specification and other related parts of the Contract Documents.

1.4.2 Any errors or omissions noted by VENDOR in this Specification shall be immediately brought to the attention of COMPANY/CONSULTANT/CONTRACTOR.

### 1.5 Deviations



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All deviations to this Specification, other related specifications or attachments shall be brought to the knowledge of COMPANY/CONTRACTOR as a section in the bid. All deviations made during the procurement, design, manufacturing, testing and inspection shall be with written approval of COMPANY/CONTRACTOR prior to execution of Work. Such deviations shall be shown in the documentation prepared by VENDOR

### 1.6 Conflicting Requirement

In the event of any conflict, inconsistency or ambiguity between VENDOR's scope of work, this Specification, National Codes and Standards, and referenced in the Project Specification or any other documents, VENDOR shall refer to COMPANY/CONTRACTOR whose decision shall prevail.

### 1.7 Reporting Procedure

1.7.1 A reporting and documentation system shall be agreed between VENDOR and COMPANY/CONSULTANT/CONTRACTOR for the status of procurement, design, manufacturing, inspection, testing and shipment of the equipment/material to be supplied under this specification. VENDOR shall provide reports and summaries for production performance and testing operations in conformance with a manufacturing schedule approved by COMPANY.

1.7.2 Daily, weekly, monthly and run summaries of all major aspects of the production process shall be provided as reports to COMPANY/CONSULTANT/CONTRACTOR.

#### 1.7.3 Third Party Inspection

In addition to the inspection and witnessing of tests by the inspectors to be appointed by the COMPANY during the manufacturing and shipment of the equipment/material, COMPANY may appoint a third party or its own inspector for witnessing of the inspection and tests to be carried out at VENDOR's facility under this specification.

### 1.8 Unit Responsibility

VENDOR shall be responsible for the complete design, manufacture, supply, fabrication, construction, installation/erection, inspection and testing of Steel Flanges, including full compliance with all applicable design codes and standards, including those listed in Section 2.0 of this document and the requirements of the certifying authority, if applicable. VENDOR shall handle and expedite drawings and data, and supervise and coordinate all inspection and testing.

VENDOR shall guarantee that all material and parts included in construction of the specified Steel Flanges shall be new, unused and of the required/ specified grade.

### 1.9 Documentation

1.9.1 Documents, calculation sheets, drawings, etc., to be submitted to the COMPANY/CONTRACTOR shall be in English Language.

1.9.2 Unless otherwise specified, the metric units shall be used in documents and drawings, except that pipe sizes, flange sizes and bolts/nuts shall be indicated in inches.

1.9.3 The form of drawings and documents may be as per the CONTRACTOR/VENDOR's Standards. However, the format of the data sheet should be submitted to COMPANY by VENDOR for approval.



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1.9.4 Variations from or additions to this specification shall be called to the attention of the COMPANY and approved in writing by the COMPANY prior to starting fabrication.

1.9.5 Information for installation, operating, maintenance or inspection purposes shall be submitted to COMPANY.

## 2.0 CODES AND STANDARDS

### 2.1 Codes, Standards and Regulations

Steel Flanges shall be designed, manufactured and tested in accordance with the requirements of this specification, other referenced Project Specifications and the Latest Editions of following Codes, Standards and Statutory Regulations (where applicable):

ASME B 16.48	Line Blanks
ASME B 16.5	Pipe Flanges and Flanged Fittings
ASME B 16.47	Large Diameter Steel Flanges
ASTM A105	Standard Specification for Carbon Steel Forgings for Piping Applications

2.2 In addition to the requirements of this General Specification, all requirements of the governing Statutory Authority, i.e., in the country and/or its subdivision where Steel Flanges are to be installed, shall be met.

### 2.3 Project Specification

Piping Material Specification	NGP-000-PIP-15.03-0001-00
Specification for Coating and Painting	NGP-000-PAI-15.03-0001-00

## 3.0 ENVIRONMENTAL DESIGN CRITERIA

### 3.1 Area Classification

The area classification for Steel Flanges will be as indicated in Material take-off.

### 3.2 Environmental Data

Environmental conditions for Steel Flanges covered by this specification shall be in accordance with Specification 'Environmental Conditions'(NGP-000-COM-15.05-0001-00).

## 4.0 GENERAL REQUIREMENTS

Welding neck/slip-on flanges covered by this specification shall be in the range of nominal sizes as follows:

- n Welding neck/slip-on flanges (2" to 24") incl. as per ASME B 16.5.
- n Welding neck flanges (26" and above) as per ASME B 16.47 Series A.
- n Blind flanges (2" to 24") incl. as per ASME B 16.48.
- n Blind flanges (26" and above) incl. as per Manufacturer's Standard.





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## 5.0 TEMPERATURE AND PRESSURE RATINGS

Class	Operating Pressure	Test Pressure
150	19.65 barg	29.50 barg
300	51.0 barg	76.5 barg
400	68.2 barg	102.3 barg
600	102.0 barg	153.0 barg

## 6.0 FLANGE FACINGS

Flanges shall be provided with Raised Faced (RF) unless otherwise specified in the Purchase Order.

Ring Type Joint (RTJ) flanges will be provided for Rating 900# or above.

## 7.0 MATERIAL

7.1 The steel used shall be suitable welding quality carbon steel, low grade as per

ASTM A105/ MSS-SP-44, ASTM A350-LF2, ASTM A694 F52.

The steel shall be of such quality as to properly respond to the intended heat treatment, and shall be fully killed. Steel shall be made by the open hearth, basic oxygen, or electric furnace processes, and shall be suitable for field welding to other project fittings, flanges and pipe.

7.2 Chemical composition of the steel, as determined by ladle analysis, shall conform with the following:

Carbon 0.20% Max.

Sulphur 0.02% Max.

7.3 The Carbon equivalent shall be determined by formula:

$$\text{C.E.} = \frac{\text{C}}{6} + \frac{\text{Mn}}{6} + \frac{\text{Cr} + \text{Mo} + \text{V}}{5} + \frac{\text{Cu} + \text{Ni}}{15}$$

and shall not exceed a value of 0.42% on check analysis.

7.4 The material of stainless steel flange as per ASTM A182 F-304.

## 8.0 TENSILE PROPERTIES

In order to provide satisfactory transitions of flange hubs to adjacent pipe-work, materials of sufficiently high yield strength shall be selected.



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## 9.0 HEAT TREATMENT

All flanges shall be furnished in the heat treated condition.

Details of the heat treatment employed shall be reported on the manufacturers material test certificates.

Steel Flanges shall have a maximum hardness of 235 BHN (HRC 22), shall not have more than 1.0% nickel content and shall not include hardenable steel such as AISI – 4140.

## 10.0 DIMENSIONS

**10.1** All flange dimensions shall be in accordance with the requirements of the relevant standards.

**10.2** All flanges furnished to this specification shall be supplied with hub inside diameter uniformly bored to suit dimensions of matching pipe and shall not exceed  $1.5 \times t$ , where  $t$  is the run pipe thickness at the bevel of welding ends.

## 11.0 INSPECTION, NON-DESTRUCTIVE TESTING, REPAIR OF DEFECTS

**11.1** Flanges shall be examined internally and externally for surface defects.

**11.2** Repair by welding of injurious defects shall not be permitted after final heat treatment.

**11.3** All flanges shall be subject to inspection at CONTRACTOR/SUPPLIER's works by the Purchaser or his representative.

## 12.0 MARKING

Marking shall be in accordance with the requirements of the relevant specifications and as may be further specified in the purchase order.

## 13.0 CERTIFICATION

The CONTRACTOR/SUPPLIER shall furnish test certificates covering all tests carried out and shall certify compliance with relevant specifications.



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SPECIFICATION

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## Specification for Induction Bends

### REVISION DETAILS

			<i>HuangChao</i>	<i>Shao Mingyu</i>	<i>Zhang Liqiang</i>	<i>Kongxia</i>
00	07/07/2016	Approved for Design	Huang Chao	Shao Mingyu	Zhang Liqiang	Kong Xia
C	23/05/2016	Issued for Approval	Huang Chao	Shao Mingyu	Zhang Liqiang	Kong Xia
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REV	DATE	DESCRIPTION	PRPD	CHKD	REVD	APPD



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## 1.0 GENERAL

### 1.1 Introduction

OIL & GAS Development Company Ltd. (OGDCL) is operating NASHPA Oil & Gas fields in Khyber Pakhtunkhwa of Islamic Republic of Pakistan. OGDCL intends to install LPG Recovery Plant, Compressors & Allied Facilities at this field.

### 1.2 Scope

This specification covers the minimum technical requirement for design, manufacture, supply, inspection, testing and commissioning of induction bends for flow lines and trunk line to be used in NASHPA Gas Processing and LPG Recovery Plant PROC-FC-CB/NASHPA/PROJ-1247 /2015.

The terms shall be as follows.

Arc	Curved portion of a bend
Bend angle	Amount of directional change through the bend
Bend radius	Distance from the centre of the curvature to the centreline axis of the bend pipe
Extrados	Outer curved section of the bend arc
Intrados	Inner curved section of the bend arc
Mother pipe	Straight section of pipe from which an induction bend is made
Tangent	Straight section at the end of induction bend
Wall thinning	Amount of reduction from the original wall thickness of the pipe to the wall thickness in the extrados after bending

The basic parameters shall be as follows.

Flow line		
Design Pressure		1580psig
Design Temperature		200°F
Linear Section	Diameter	8inch
	Wall Thickness	12.70mm
	Pipe Grade	API 5L X52
	Pipe Type	SMLS
Induction bend	Diameter	8inch
	Wall Thickness	12.70mm



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	Radius	5D (40inch)
	Pipe Grade	API 5L X52
	Pipe Type	SMLS
Trunk line		
	Design Pressure	1340psig
	Design Temperature	200°F
Linear Section	Diameter	8inch
	Wall Thickness	10.31mm
	Pipe Grade	API 5L X52
	Pipe Type	SMLS
Induction bend	Diameter	8inch
	Wall Thickness	11.13mm
	Radius	5D (40inch)
	Pipe Grade	API 5L X52
	Pipe Type	SMLS

### 1.3 Definitions

Within this document the following definitions apply:

<b>Project</b>	NASHPA Gas Processing and LPG Recovery Plant PROC-FC-CB/NASHPA/PROJ-1247 /2015
<b>Company/Owner</b>	Oil & Gas Development Company Ltd.(OGDCL)
<b>Consultant</b>	Zishan Engineers (Pvt.) Ltd.
<b>Contractor</b>	Hong Kong Huihua Global Technology Limited Wholly owned Subsidiary of China OIL HBP Science and Technology Corporation Ltd.
<b>Manufacturer/Supplier/Vendor</b>	Party(ies), which manufactures and/or supplies material, equipment and service to perform the duties as specified by CONTRACTOR in the scope of supply
<b>Shall</b>	Indicates a mandatory requirement
<b>Should</b>	Indicates a strong recommendation to comply with the requirement of this document



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#### 1.4 Errors or Omissions

- 1.4.1 The review and comment by COMPANY/CONSULTANT/CONTRACTOR of any VENDOR's drawings, procedures or documents shall only indicate acceptance of general requirements and shall not relieve VENDOR of its obligations to comply with the requirements of this specification and other related parts of the Contract Documents.
- 1.4.2 Any errors or omissions noted by VENDOR in this Specification shall be immediately brought to the attention of COMPANY/CONSULTANT/CONTRACTOR.

#### 1.5 Deviations

All deviations to this Specification, other related specifications or attachments shall be brought to the knowledge of COMPANY/CONTRACTOR as a section in the bid. All deviations made during the procurement, design, manufacturing, testing and inspection shall be with written approval of COMPANY/CONTRACTOR prior to execution of Work. Such deviations shall be shown in the documentation prepared by VENDOR.

#### 1.6 Conflicting Requirement

In the event of any conflict, inconsistency or ambiguity between VENDOR's scope of work, this Specification, National Codes and Standards, and referenced in the Project Specification or any other documents, VENDOR shall refer to COMPANY/CONTRACTOR whose decision shall prevail.

#### 1.7 Reporting Procedure

1.7.1 A reporting and documentation system shall be agreed between VENDOR and COMPANY/CONSULTANT/CONTRACTOR for the status of procurement, design, manufacturing, inspection, testing and shipment of the equipment/material to be supplied under this specification. VENDOR shall provide reports and summaries for production performance and testing operations in conformance with a manufacturing schedule approved by COMPANY.

1.7.2 Daily, weekly, monthly and run summaries of all major aspects of the production process shall be provided as reports to COMPANY/CONSULTANT/CONTRACTOR.

1.7.3 Third Party Inspection

In addition to the inspection and witnessing of tests by the inspectors to be appointed by the COMPANY during the manufacturing and shipment of the equipment/material, COMPANY may appoint a third party or its own inspector for witnessing of the inspection and tests to be carried out at VENDOR's facility under this specification.

#### 1.8 Unit Responsibility

VENDOR shall be responsible for the complete design, manufacture, supply, fabrication, construction, installation/erection, inspection and testing of induction bends, including full compliance with all applicable design codes and standards, including those listed in Section 2.0 of this document and the requirements of the certifying authority, if applicable. VENDOR shall handle and expedite drawings and data, and supervise and coordinate all inspection and testing.





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VENDOR shall guarantee that all material and parts included in construction of the specified induction bends shall be new, unused and the mother pipe shall be of the required/ specified grade.

### 1.9 Documentation

- 1.9.1 Documents, calculation sheets, drawings, etc., to be submitted to the COMPANY/CONTRACTOR shall be in English Language.
- 1.9.2 Unless otherwise specified, the metric units shall be used in documents and drawings, except that pipe sizes and induction bend sizes shall be indicated in inches.
- 1.9.3 The form of drawings and documents may be as per the CONTRACTOR/VENDOR's Standards. However, the format of the data sheet should be submitted to COMPANY by VENDOR for approval.
- 1.9.4 Variations from or additions to this specification shall be called to the attention of the COMPANY and approved in writing by the COMPANY prior to starting fabrication.
- 1.9.5 Information for installation, operating, maintenance or inspection purposes shall be submitted to COMPANY.

## 2.0 CODES AND STANDARDS

### 2.1 Codes, Standards and Regulations

Induction bends shall be designed, manufactured and tested in accordance with the requirements of this specification, other referenced Project Specifications and the Latest Editions of following Codes, Standards and Statutory Regulations (where applicable):

API 5L	Specification for Line Pipe
ASME B36.10	Welded and Seamless Wrought Steel Pipe
ASME B31.8	Gas Transmission and Distribution Piping Systems
ASME SECTION II	Part 'C' Material Specifications –Welding Rods, Electrodes and Filler Metals
ASME SECTION V	Non Destructive Examination
ASME SECTION IX	Qualification Standard for Welding and Brazing Procedure
ISO 15590-1	Petroleum and Natural Gas Industry-Induction Bends, Fittings and Flanges for Pipeline Transportation Systems-Part 1: Induction Bends
ISO 9001	Quality Systems Model for Quality Assurance in Design, Development, Production, Installation and Service
EN 10204	Metallic Products-Types of Inspection Documents
ASTM A370	Standard Test Methods and Definitions for Mechanical Testing Steel Products



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ASTM E112	Standard Test Methods for Determining Average Grain Size
ASTM E340	Standard Test Methods for Macroetching Metals and Alloys

2.2 In addition to the requirements of this General Specification, all requirements of the governing Statutory Authority, i.e., in the country and/or its subdivision where induction bends are to be installed, shall be met.

### 2.3 Project Specification

Piping Material Specification	NGP-000-PIP-15.03-0001-00
Specification for Carbon and Stainless steel Pipes	NGP-000-PIP-15.03-0008-00

## 3.0 ENVIRONMENTAL DESIGN CRITERIA

### 3.1 Area Classification

The area classification for induction bends will be as indicated in Data Sheet for Induction Bends (NGP-000-PIP-15.17-0006-01).

### 3.2 Environmental Data

Environmental conditions for induction bends covered by this specification shall be in accordance with Specification 'Environmental Conditions' (NGP-000-COM-15.05-0001-00).

## 4.0 PROJECT REQUIREMENTS

### 4.1 general requirements

This specification defines the minimum requirements for the induction bends to be fabricated from Carbon Steel Seamless line pipes. Other requirements for induction bends which are not mentioned in this specification shall be fully in according with ISO 15590-1.

Steel grade, nominal wall thickness and angles of bends (after forming) shall be as specified in the MR for Induction Bends(NGP-000-PIP-10.57-0011-01).

Bend manufacturer shall send the bending procedure for CONTRACTOR approval prior commencing bending process.

Bend steel grade shall be same as the adjoining pipe.

Induction bends shall be provided with straight tangents parts of 300mm minimum at each of ends. The radius of induction bends shall be 5D.

The wall thickness of the bend extrados shall be at least  $t_{min}$ .

The wall thickness of the bend intrados shall be at least  $t_{min} \times \frac{2R-r}{2(R-r)}$ .



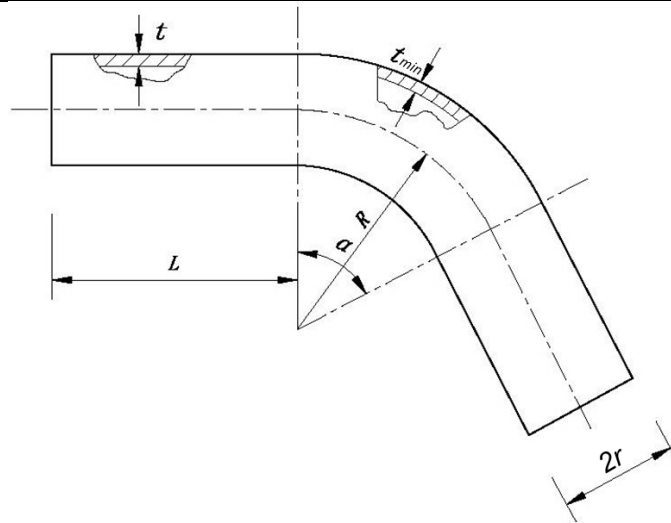


Figure1 the basic parameters of bend

R: Bend centerline radius

r: Mean radius of the mother pipe

L: The straight tangent parts at the bends ends

t : Wall thickness of mother pipe

$t_{min}$ : Minimum wall thickness required for the straight pipe adjacent to the bend,  $t_{min}=11.13\text{mm}$  for flow lines and trunk line in this project

#### 4.2 Design Conditions

- Pipeline diameter: 219mm (8")
- Design Temperature: 200°F
- Design Pressure for trunk line: 1340psig
- Design Pressure for flow line: 1580psig

#### 4.3 Basic Parameters of Bends

The figure1 show the basic parameters for bend; all the parameters shall meet the requirements of table 1.

Table 1 Basic parameters for induction bend

Location	D(mm)	Mother Pipe Grade	Mother Pipe Type	Radius	Tangent lengths L(mm)	Wall thickness of mother pipe t(mm)
Trunk line	219	X52	SMLS	5D	300	11.13
Flow line	219	X52	SMLS	5D	300	12.70

## 5.0 MPS AND MPS QUALIFICATION

### 5.1 Manufacturing Procedure Specification

The induction bends shall be manufactured using a comprehensive quality system. Therefore, VENDOR shall operate a quality management system in compliance with requirements of ISO 9001 which shall be approved and



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regularly supervised by competent authorities. VENDOR shall present documentation to COMPANY to demonstrate that an approved quality system is in use.

VENDOR shall submit a manufacturing procedure, a quality plan and a detailed Inspection and Test Plan (ITP) before start of production for approval by COMPANY and/or Consultant.

Prior to fabrication of the bends, all procedures for testing shall also be subject to the approval of the COMPANY and/or Consultant.

The following shall also be submitted for COMPANY/CONTRACTOR review as part of manufacturing procedure specification (MPS):

- Inspection procedures for all destructive / non-destructive testing as per requirements of this specification, both during qualification and production.
- Inspection test plan (ITP) covering all destructive / non-destructive testing as per requirements of this specification, both during qualification and production.
- Detailed production schedule.

## 5.2 MPS Qualification

Bend manufacture shall be carried out in accordance with an MPS which shall be qualified in accordance with Clause 8.3 in ISO 15590-1 before commencement of production.

A test bend with a sufficient arc length to allow extraction of the necessary test specimens shall be manufactured in accordance with each preliminary MPS. The inspection and testing of the test bend shall include tangents and transition zones if included in the produced bends.

## 6.0 MANUFACTURING

### 6.1 Mother pipe

#### 6.1.1 General

The mother pipe shall comply with the requirements of the Specification for Carbon and Stainless steel Pipes, doc.no. NGP-000-PIP-15.03-0008-00.

The wall thickness of the mother pipe shall have adequate allowance for wall thinning at the extrados due to induction bending. The wall thickness of the mother pipe to be used for induction bends is calculated in Section 4.

#### 6.1.2 Information on the Mother pipe

If the mother pipe is supplied by the purchaser, the following information on the mother pipe shall be provided to the VENDOR:

- Purchasing specification;
- Pipe diameter, inside or outside;
- Pipe wall thickness, nominal or minimum;
- Pipe lengths;
- Pipe manufacturer;
- Inspection documents with complete chemical composition, mechanical properties, results of NDT and dimensions.

### 6.2 Production Bending

Induction bending shall be carried out in accordance with a qualified MPS as specified in Annex A of ISO 15590-1

Any interruption of the bend forming operation shall not be permitted and shall result in the rejection of the bend.





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										CE <sub>IW</sub>	CE <sub>Pcm</sub>
API X52	0.24	0.45	1.40	0.025	0.015	0.10	0.05	0.04	a, b, c	0.43	0.25

Note:

a Nb + V + Ti ≤ 0.15%.

b Unless other agreed, Cu ≤ 0.5%; Ni ≤ 0.30%; Cr ≤ 0.30% and Mo ≤ 0.15%.

c Unless other agreed, no intentional addition of B is permitted and residual B ≤ 0.001%.

## 7.2 Strength Limitations

All the tests shall meet the following strength limitations:

Yield strength ( $R_{t0.5}$ ) at ambient temperature shall be at the range 360~530MPa;

Tensile strength ( $R_m$ ) at ambient temperature shall be at the range 460~760 MPa.

## 8.0 MARKING

8.1 All Marking Shall be in English.

8.2 Both ends of each pipe length shall be externally hard die stamped as listed in Section 12 in ISO 15590-1.

8.3 Marking shall be stenciled on the inside of the pipe within 200mm of the beveled ends.

## 9.0 ENGINEERING DATA REQUIREMENTS

### 9.1 General

9.1.2 If Engineering data beyond those listed in this Practice are required, a statement of those requirements shall be included in the request for quotation and/or the purchase order.

9.1.3 All required engineering data shall be in English.

### 9.2 Certificate

CONTRACTOR / SUPPLIER shall be liable to provide certificates of the manufacture induction bends. This certificate in addition to the information required by EN 10204, the certification shall state whether or not the material was hydraulically tested. In case of nondestructively tested, the certificate shall so state.

## 10.0 SHIPPING AND HANDLING

10.1 Induction bends shall be prepared for shipment in a manner that damages or atmospheric corrosion of internal or external surfaces is avoided during storage and transport.

10.2 The ends of induction bends shall be protected with wood, plastic, or metal covers. These covers shall protect the ends and prevent dirt and other foreign matter from entering the interior. Butt welding bevels are protected with metal covers, a layer of nonmetallic material shall also be provided between the butt-welding bevel and the metal cover. Tape shall not be used as the sole covering method.

10.3 The Packing of the induction bends shall also meet the packing requirements as detailed in specification for Export Crating and Packing.



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DESIGN BASIS

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## Piping Design Basis

### REVISION DETAILS

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			<i>Wu Yuyan</i>	<i>Wang Shaobo</i>	<i>Liu Zijian</i>	<i>Xu Feng</i>
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## 1.0 GENERAL

### 1.1 Introduction

OIL & GAS Development Company Ltd. (OGDCL) is operating NASHPA Oil & Gas fields in Khyber Pakhtunkhwa of Islamic Republic of Pakistan. OGDCL intends to install LPG Recovery Plant, Compressors & Allied Facilities at this field.

### 1.2 Scope

The purpose of this document is to define the basis for the process design of the project "NASHPA Gas Processing and LPG Recovery Plant PROC-FC-CB/NASHPA/PROJ-1247 /2015".

## 2.0 DEFINITIONS

Within this document the following definitions apply:

<b>Project</b>	NASHPA Gas Processing and LPG Recovery Plant PROC-FC-CB/NASHPA/PROJ-1247 /2015
<b>Company/Owner</b>	Oil & Gas Development Company Ltd.(OGDCL)
<b>Consultant</b>	Zishan Engineers (Pvt.) Ltd.
<b>Contractor</b>	Hong Kong Huihua Global Technology Limited Wholly owned Subsidiary of China OIL HBP Science and Technology Corporation Ltd.
<b>Manufacturer/Supplier/Vendor</b>	Party(ies), which manufactures and/or supplies material, equipment and service to perform the duties as specified by CONTRACTOR in the scope of supply
<b>Shall</b>	Indicates a mandatory requirement
<b>Should</b>	Indicates a strong recommendation to comply with the requirement of this document

## 3.0 REFERENCES

### 3.1 Codes and Standards

The applicable & latest version standards and codes listed below but not limited following will be used for the design of this project.

ANSI B1.1	Unified inch screw threads
ASME B16.9	Factory-Made Wrought Butt-Welding Fittings
ASME B1.20.1	Pipe threads - General purpose(inch)
ASME B16.10	Face to face and end to end dimensions of valves
ASME B16.11	Forged steel fittings, socket welding and threaded



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ASME B16.20	Metallic Gaskets for Pipe Flanges-Ring-Joint, Spiral-Would, and Jacketed
ASME B16.25	Butt welded ends for pipes, valves, flanges and fittings
ASME B16.34	Valves-Flanged, Threaded and Butt Welding End
ASME B16.47	Large diameter steel flanges
ASME B31.3	Process piping
ASME B31.8	Gas Transmission and Distribution Piping System
ASME B36.10M	Welded and seamless wrought steel pipes
ASME B36.19M	Stainless steel pipe
API 5L	Specification for Line Pipe
API 6FA	Specification for Fire Test for Valves
API 598	Valve Inspection and Testing
API RP 1104	Welding of pipelines and related facilities
API STD 600	Steel Gate Valves - Flanged and Butt-welding Ends, Bolted Bonnets
ISO 15761	Steel gate, globe and check valves for sizes DN 100 and smaller, for the petroleum and natural gas industries
API 607	Fire Test for Quarter-Turn Valves and valves equipped with non metallic seats
BS 1873	Steel globe, globe, stop and check valves
EN10204	Metallic Products - Types of Inspection Documents
ISO 10434	Bolted bonnet steel gate valves for the petroleum, petrochemical and allied industries
ISO 10497	Testing of valves. Fire type-testing requirements
MSS-SP-97	Integrally Reinforced Forged Branch Outlet Fittings–Socket Welding, Threaded, and Butt welding Ends
MSS SP 6	Standard finishes for contact faces of pipes flanges
MSS SP 25	Standard Marking System for Valves, Fitting, Flange and Union
MSS SP 44	Steel pipe flanges
MSS SP 54	Quality Standards for Steel Casting and Forgings for Valves, and Fittings and Other Piping Component - Radiographic Inspection Method.
MSS SP 75	Specification for High Test Wrought Welding Fittings

### 3.2 Project Specifications, Procedures and drawings

Particular reference is made to the following project specifications:



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Piping Material Specification	NGP-000-PIP-15.03-0001-00
Specification for Stress Analysis	NGP-000-PIP-15.03-0002-00
General Design Rules for Piping	NGP-000-PIP-15.03-0003-00
Specification for Insulation	NGP-000-PIP-15.03-0004-00
Specification for Fabrication / Installation of Equipment & Piping	NGP-000-PIP-15.03-0005-00
Specification for Gaskets	NGP-000-PIP-15.03-0006-00
Specification for Stud Bolts and Nuts	NGP-000-PIP-15.03-0007-00
Specification for Carbon and Stainless Steel Pipes	NGP-000-PIP-15.03-0008-00
Specification for Carbon and Stainless Steel Fittings	NGP-000-PIP-15.03-0009-00
Specification for Ball, Gate, Globe and Check Valves	NGP-000-PIP-15.03-0010-00
Specification for Steel Flanges	NGP-000-PIP-15.03-0011-00
Specification for Pressure Safety Valves	NGP-000-PIP-15.03-0012-00
Specification for Skid Mounted Packages	NGP-000-PIP-15.03-0013-00
Specification for Induction Bends	NGP-000-PIP-15.03-0016-01
Specification for Pipe Support	NGP-000-PIP-15.03-0014-00
Specification for Coating and Painting	NGP-000-PAI-15.03-0002-00

### 3.3 Units of Measurement

In general the SI (metric) units shall be used for all quantities and parameters concerning piping design, unless otherwise specified in any project specification. Commonly used units are:

Pipe diameter: inch

Dimensions: millimetre (mm)

Elevations and coordinates: millimetre (mm) or metre (1 m = 1000 mm)

Mass: kilogram (kg) or ton (1 ton = 1000 kg)

Force: Newton (N) or kilonewton (1 kN = 1000 N)

Moment: Newton metre (Nm) or kilonewton metre (1 kNm = 1000Nm)

Pressure: Bar

Stress: bar (1 bar =  $10^5$  Pa) or megapascal (1 MPa =  $10^6$ Pa)



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Temperature: degree Fahrenheit (°F)

## 4.0 DESIGN AND LAYOUT

The piping material selection and layout of the project shall be done with the aim of achieving the desired intent of the project in an efficient and planned manner. The layout shall meet the project requirements and comply with the applicable codes, standards and safety norms.

The piping design shall comply with the requirements of: General Design Rules for Piping  
NGP-000-PIP-15.03-0003-00

## 5.0 PIPING FLEXIBILITY AND SUPPORTS

### 5.1 Piping Flexibility and Stress Analysis Extent

The piping system shall be designed to have adequate flexibility. Line required to be stress analyzed shall be identified based on the stress analysis criteria which are mentioned in specification for stress analysis  
NGP-000-PIP-15.03-0002-00

The analysis shall be performed to ensure that:

- Excessive pipe movements are avoided
- There is no failure of pipe from over-stress
- Loads on supports are determined for the appropriate design of supports
- Forces and moments on the connected equipment nozzles are within the allowable limits.

The required flexibility of the piping shall be achieved by provision of appropriate restraints (e.g. anchors, stops and guides supports), spring supports, expansion loops and bends. Use of bellows for achieving flexibility shall be avoided to the extent possible.

The software package Caesar II shall be used for the computer analysis of piping systems. The analysis shall be documented in the form of reports and issued as a part of project documentation.

### 5.2 Pipe Supports

All piping shall be adequately supported so as to prevent undue vibration, deflection, stress and leakage at joints in the piping as well as at the connected equipment. The supporting of stress critical lines shall be done based on the analysis recommendations.



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Pipe support spans and general requirements to pipe support design are given in the Specification for Pipe Support NGP-000-PIP-15.03-0014-00

All pipe supports used in this PROJECT are standardized, aiming the minimization of support types, the detailed design of piping supports is also given in the Specification for Pipe Support NGP-000-PIP-15.03-0014-00

## 6.0 TIE-INS

Whenever new piping has to be connected to existing pipe work, the tie-in locations shall be verified for most optimum locations. The following aspects shall be considered for the engineering of the tie-ins:

- The tie-ins connections with existing piping systems shall be as per the process requirements indicated on the P&ID's.
- The tie-in points referred from Tie-in schedule shall be determined considering the constructability, schedule, sequencing, hot tap/shutdown requirements, etc.
- Tie-ins shall preferably be taken at flanges & plant battery limit to minimise the shutdown time.
- Tie-in valves, where necessary to meet the project programme, shall be included.
- Tie in drawings/sketches shall be prepared to clearly indicate the type & locations of the tie-ins. The tie-in schedule shall be prepared to list all the tie-ins.

## 7.0 THE 3D MODEL AND DRAWINGS

The model and the major drawings to be produced are as described below.

### 7.1 3D Model

The plant layout shall be developed using a three-dimensional computer generated model.

Permitted design software is AVEVA PDMS.

The model shall consist of piping, equipment and structures. Proper coordination shall be ensured so that the model is clash-free.

Clash checking shall be done at the time when no designers are working with the model, the said checking shall be daily based.

The model shall be reviewed internally on a regular basis for compliance with design requirements, as well as, for clearances, access, constructability, maintainability and safe operability.



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## 7.2 Piping General Arrangement Drawings

The Piping General Arrangement (GA) drawings shall show the layout of all pipe work and instruments, equipment, structures, etc. All items shall be in their true relative position on site. The layout shall be in the form of a plan view. Elevations and details may be produced if required in order to clarify complex piping. A key plan highlighting the area covered by the drawing shall be included in the layout.

Piping GA drawings shall include the following information as a minimum.

- All equipment with equipment number, location and nozzle positions
- All pipe-work (including designation as in P&ID and location).
- Equipment foundation outline.
- All special items, All in-line and on-line instrumentation with tag numbers.
- Main steel and concrete structures, stairway, platforms, pipe racks and pipe sleepers.
- Pipe support.
- Plant North with True North.
- Valve type, flow direction.
- Plan views shall be limited by match line. (coordinated line; continuous line).
- Separate GA drawings for underground piping system.

Piping GA drawings shall be prepared by extracting from the 3D model and incorporating the necessary annotations and other details.

Piping GA shall be defined in such a way that no piping is hidden and locations are clearly identifiable.

Finished Ground Level shall be marked in all Areas of Plant.

The dimensioning and annotation for all distances from the pipe to the nearest major axis of equipment, AG/UG limited point and adjacent main pipes shall be show.

Additional section marks shall be shown on the Piping GA drawings, to identify and produce the necessary Section Drawings, showing multi-level piping layout relationship and piping arrangement.



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On the Section type drawings the use of dimensions are permitted only in exceptional cases, the proper elevation marks shall be used. All the major equipment axis and flanges outlets shall have proper elevation marks.

Piping GA Drawings shall be provided for all major elevation of the layout. Basically at grade level, showing the above equipment/foundations in dashed outline, next only level up, normally at the first vessel's service platform elevation, then one level higher, f.e. at the PSV service platform elevation.

All the below major equipment shall be show in dashed outline.

Major equipment's nozzles shall be shown as well, with disregard of the current Piping GA elevation selected, using the same dashed outline.

All the equipment on Piping GA Drawing shall have a central axis, and the equipment's foundation axis as well. The elevation mark of centerline of the vessel type equipment shall be shown in the Section drawing if applicable.

### 7.3 Piping Isometric Drawings

Isometric drawings shall be produced for all the lines.

Piping isometric drawings shall include the following information as a minimum.

- Connected equipment number and nozzle number.
- Configuration of complete line from starting to end as defined by the line number.
- Dimensions, Elevations and Coordinates shall be marked as required.
- Line number, direction of flow and slope wherever applicable.
- All in-line and on-line instrumentation with tag numbers.
- Pipe support codes as per pipe support standard.
- Tie-in details and demolition scope as applicable.
- Bill of materials for the complete line as per P&ID
- Piping Special item tag number.
- Data table (Design and Operating Temperature and Pressure Conditions, Insulation, Test Pressure, NDT, PWHT)





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Isometric drawings shall be prepared by extracting from the 3D model after the lines are fully checked and locked in the model.

## 8.0 MATERIAL SPECIFICATIONS AND REQUISITIONS

### 8.1 Piping Material Specifications

The piping material specifications (PMS) shall be prepared as a project specification. The PMS shall contain various pipe classes as per process requirements. The pipe classes are based on a particular set of operating and design conditions and service fluids that are specified by Process.

Each pipe class shall specify the following items and details:

- Pressure and temperature design limits
- Material specifications of different items
- Design Code of Pipe
- Pipe wall thickness values
- Corrosion Allowance
- Size range of Pipe to be used
- Type and size range of fittings and flanges to be used
- Type and size range of valves to be used
- Type of gaskets/ Fasteners to be used
- Branch connection details
- PWHT requirement
- Service (Fluid) table

### 8.2 Purchase Specifications

All piping items shall be procured in compliance with the Purchase Specifications (PS). The Material requisition describes the specific requirements of each type of piping item, e.g.:



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- Design requirements
- Specific material and manufacturing requirements
- Testing and inspection requirements, in addition to general requirements given in dedicated applicable PROJECT Specification (for pipes, flanges, fittings, gaskets, bolting, valves, etc.)

### 8.3 Material Take-off

#### 8.3.1 Material Take-off

The material take-off (MTO) shall be done to determine the piping material quantities to be procured.

MTO for piping, insulation shall be provided.

#### 8.3.2 Pipe and Pipe Components (including valves and fittings)

Pipe and Pipe components (including valves and fittings) shall be extracted from 3D model.

Pipe sizes shall be in inches. Quantity shall be in metres for pipes and numbers for items other than pipes

#### 8.3.3 Special Parts

Special items shall be included as a part of MTO.

## 9.0 INSULATION , PAINTING & COATING

### 9.1 Insulation

Insulation shall be provided on piping and equipment as per the requirements of the P&IDs and the Line List. Based on the process requirements, insulation may be required for one or more of the following applications:

- Personal protection (prevention of injury to personnel)
- Heat conservation
- Cold services insulation
- The piping isometric drawings shall indicate the insulation and its extent.
- The insulating materials and installation methods shall be in accordance with Specification for insulation

### 9.2 Painting & Coating



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Pipe work shall be externally painted/coated for corrosion protection Piping shall be painted in accordance with Specification for coating and painting of piping and equipment.

## 10.0 CONSTRUCTION PROCEDURE FOR PIPING

The detail requirements for shop and field piping fabrication, erection, examination testing and recording of reports issued during these activities for the project shall be in accordance with NGP-000-PIP-15.03-0005-00 Specification for Fabrication / Installation of Equipment & Piping



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DATA SHEET

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## Data Sheet for Gate, Globe and Check Valves

### REVISION DETAILS

REV	DATE	DESCRIPTION	PRPD	CHKD	REVD	APPD
00	18/07/2016	Approved for Design	Lan Houdong	Wang Shaobo	Wang Jing	Xu Feng
C	13/06/2016	Issued for Approval	Lan Houdong	Wang Shaobo	Wang Jing	Xu Feng
B	29/03/2016	Issued for Review	Lan Houdong	Wang Shaobo	Wang Jing	Xu Feng
A	10/01/2016	Internal Discipline Check	Lan Houdong	Wang Shaobo	Wang Jing	Xu Feng



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**REVISION HISTORY**

REV.	DATE	REVISION DESCRIPTION
A	10/01/2016	Internal Discipline Check
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C	13/06/2016	Issued for Approval
00	18/07/2016	Approved for Design



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### 1. Gate Valves 1/2"~1-1/2"- VG-101-A1

	PIPE CLASS	A1	Rating class	Class 800	CA=1.6mm
general	Tag Number	VG-101-A1			
	Size Range	Inch	1/2"~1-1/2"		
	Design Pressure(PSIG) (max)	270			
	Design Temperature (°F)(min/max)	150/170			
	Service/Service code	Fuel Oil/ Hot Oil/ Stabilized Condensate/ Glycol/ Treated Gas(Sales Gas, LPG)/ Fire Water (A/G)			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ISO 15761			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Socket Weld			
	End to End Dimension	Mfr. Std.			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Solid Wedge, replaceable seats.			
Material	Body	ASTM A105N			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ISO 15761			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

**Notes:**

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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## 2. Gate Valves 1/2"~1-1/2"- VG-101-A2

	PIPE CLASS	A2	Rating class	Class 800	CA=3.0mm
general	Tag Number	VG-101-A2			
	Size Range	Inch	1/2"~1-1/2"		
	Design Pressure(PSIG) (max)	270			
	Design Temperature (°F )(min/max)	150/500			
	Service/Service code	Raw Gas/ Fuel Gas/ Open Drain/ Vents / Closed Drain			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ISO 15761			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Socket Weld			
	End to End Dimension	Mfr. Std.			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Solid Wedge, replaceable seats.			
Material	Body	ASTM A105N			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ISO 15761			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

### Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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### 3. Gate Valves 1/2"~1-1/2"- VG-101-B1

	PIPE CLASS	B1	Rating class	Class 800	CA=1.6mm
general	Tag Number	VG-101-B1			
	Size Range	Inch	1/2"~1-1/2"		
	Design Pressure(PSIG) (max)	600			
	Design Temperature (°F )(min/max)	35/650			
	Service/Service code	Fuel Oil/ Hot Oil/ Stabilized Condensate/ Glycol/ Treated Gas( Sales Gas).			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ISO 15761			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Socket Weld			
	End to End Dimension	Mfr. Std.			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Solid Wedge, replaceable seats.			
Material	Body	ASTM A105N			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ISO 15761			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

**Notes:**

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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#### 4. Gate Valves 1/2"~1-1/2"- VG-101-B2

	PIPE CLASS	B2	Rating class	Class 800	CA=3.0mm
general	Tag Number	VG-101-B2			
	Size Range	Inch	1/2"~1-1/2"		
	Design Pressure(PSIG) (max)	600			
	Design Temperature (°F )(min/max)	200/200			
	Service/Service code	Raw Gas/ Fuel Gas/ Open Drain/ Vents / Closed Drain			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ISO 15761			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Socket Weld			
	End to End Dimension	Mfr. Std.			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Solid Wedge, replaceable seats.			
Material	Body	ASTM A105N			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ISO 15761			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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### 5. Gate Valves 1/2"~1-1/2"- VG-101-A8

	PIPE CLASS	A8	Rating class	Class 800	CA=4.5mm
general	Tag Number	VG-101-A8			
	Size Range	Inch	1/2"~1-1/2"		
	Design Pressure(PSIG) (max)	270			
	Design Temperature (°F )(min/max)	200/200			
	Service/Service code	Produce Water			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ISO 15761			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Socket Weld			
	End to End Dimension	Mfr. Std.			
	Operation	Handwheel Operated			
	Lock Device	Yes			
Material	Others	Anti-static, stem protector, Solid Wedge, replaceable seats.			
	Body	ASTM A105N			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
Others	Packing	Mfr. Std.			
	Test Standard	API 598/ ISO 15761			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00				

**Notes:**

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.





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## 6. Gate Valves 1/2"~1-1/2"- VG-102-A4

	PIPE CLASS	A4	Rating class	Class 800	CA=1.6mm
general	Tag Number	VG-102-A4			
	Size Range	Inch	1/2"~1-1/2"		
	Design Pressure(PSIG) (max)	270			
	Design Temperature (°F )(min/max)	-50/200			
	Service/Service code	Utility, Instrument& Plant Air			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ISO 15761			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Threaded			
	End to End Dimension	Mfr. Std.			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Solid Wedge, replaceable seats.			
Material	Body	ASTM A105N			
	Seat	Hard Faced 13% Cr. S.S.			
	Stem	13% Cr. S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ISO 15761			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

### Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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## 7. Gate Valves 1/2"~1-1/2"- VG-103-A6

	PIPE CLASS	A6	Rating class	Class 800	CA=0mm
general	Tag Number	VG-103-A6			
	Size Range	Inch	1/2"~1-1/2"		
	Design Pressure(PSIG) (max)	270			
	Design Temperature (°F )(min/max)	-180/150			
	Service/Service code	Liquified Gas Under -100 °C			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ISO 15761			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Socket Weld			
	End to End Dimension	Mfr. Std.			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Solid Wedge, replaceable seats.			
Material	Body	Type 316 S.S.			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ISO 15761			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

### Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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### 8. Gate Valves 1/2"~1-1/2"- VG-103-B6

	PIPE CLASS	B6	Rating class	Class 800	CA=0mm
general	Tag Number	VG-103-B6			
	Size Range	Inch	1/2"~1-1/2"		
	Design Pressure(PSIG) (max)	600			
	Design Temperature (°F )(min/max)	-120/-70			
	Service/Service code	Liquified Gas Under -100 °C			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ISO 15761			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Socket Weld			
	End to End Dimension	Mfr. Std.			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Solid Wedge, replaceable seats.			
Material	Body	Type 316 S.S.			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ISO 15761			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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### 9. Gate Valves 1/2"~1-1/2"- VG-104-A3

	PIPE CLASS	A3	Rating class	Class 800	CA=3.0mm
general	Tag Number	VG-104-A3			
	Size Range	Inch	1/2"~1-1/2"		
	Design Pressure(PSIG) (max)	270			
	Design Temperature (°F )(min/max)	-50/-50			
	Service/Service code	Flare/ Vent/ Process Gas/ Glycol(Cold Service)/ Process Liquid			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ISO 15761			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Socket Weld			
	End to End Dimension	Mfr. Std.			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Solid Wedge, replaceable seats.			
Material	Body	ASTM A350 LF2			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ISO 15761			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**10. Gate Valves 1/2"~1-1/2"- VG-104-B3**

	PIPE CLASS	B3	Rating class	Class 800	CA=3.0mm
general	Tag Number	VG-104-B3			
	Size Range	Inch	1/2"~1-1/2"		
	Design Pressure(PSIG) (max)	600			
	Design Temperature (°F )(min/max)	-50/265			
	Service/Service code	Flare/ Vent/ Process Gas/ Glycol(Cold Service)/ Process Liquid			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ISO 15761			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Socket Weld			
	End to End Dimension	Mfr. Std.			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Solid Wedge, replaceable seats.			
Material	Body	ASTM A350 LF2			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ISO 15761			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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### 11. Gate Valves 1/2"~1-1/2"- VG-121-D1

	PIPE CLASS	D1	Rating class	Class 1500	CA=1.6mm
general	Tag Number		VG-121-D1		
	Size Range		Inch	1/2"~1-1/2"	
	Design Pressure(PSIG) (max)		1340		
	Design Temperature (°F)(min/max)		150/150		
	Service/Service code		Fuel Oil/ Hot Oil/ Stabilized Condensate/ Glycol/ Treated Gas/ Sales Gas/ LPG		
	Fluid composition		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		ISO 15761		
	Body		OS&Y, bolted bonnet, bolted gland		
	End Connection		Socket Weld		
	End to End Dimension		Mfr. Std.		
	Operation		Handwheel Operated		
	Lock Device		Yes		
Material	Others		Anti-static, stem protector, Solid Wedge, replaceable seats.		
	Body		ASTM A105N		
	Seat		Hard Faced Type 316 S.S.		
	Stem		Type 316 S.S.		
	Bolting		Hot Dip Galvanized plated		
Others	Packing		Mfr. Std.		
	Test Standard		API 598/ ISO 15761		
	Certification		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location		Above-ground/outdoor		
Marking		As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

**Notes:**

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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## 12. Gate Valves 1/2"~1-1/2"- VG-121-D2

	PIPE CLASS	D2	Rating class	Class 1500	CA=3.0mm
general	Tag Number		VG-121-D2		
	Size Range		Inch	1/2"~1-1/2"	
	Design Pressure(PSIG) (max)		1340		
	Design Temperature (°F )(min/max)		150/650		
	Service/Service code		Raw Gas/ Fuel Gas/ Open Drain/ Vents/ Closed Drain		
	Fluid composition		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		ISO 15761		
	Body		OS&Y, bolted bonnet, bolted gland		
	End Connection		Socket Weld		
	End to End Dimension		Mfr. Std.		
	Operation		Handwheel Operated		
	Lock Device		Yes		
Others		Anti-static, stem protector, Solid Wedge, replaceable seats.			
Material	Body		ASTM A105N		
	Seat		Hard Faced Type 316 S.S.		
	Stem		Type 316 S.S.		
	Bolting		Hot Dip Galvanized plated		
	Packing		Mfr. Std.		
Others	Test Standard		API 598/ ISO 15761		
	Certification		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location		Above-ground/outdoor		
	Marking		As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00		

### Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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### 13. Gate Valves 1/2"~1-1/2"- VG-121-E1

	PIPE CLASS	E1	Rating class	Class 1500	CA=1.6mm
general	Tag Number	VG-121-E1			
	Size Range	Inch	1/2"~1-1/2"		
	Design Pressure(PSIG) (max)	1580			
	Design Temperature (°F)(min/max)	-20/150			
	Service/Service code	Fuel Oil/ Hot Oil/ Stabilized Condensate/ Glycol/ Treated Gas/ Sales Gas/ LPG			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ISO 15761			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Socket Weld			
	End to End Dimension	Mfr. Std.			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Solid Wedge, replaceable seats.			
Material	Body	ASTM A105N			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ISO 15761			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

**Notes:**

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.





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#### 14. Gate Valves 1/2"~1-1/2"- VG-121-E2

	PIPE CLASS	E2	Rating class	Class 1500	CA=3.0mm
general	Tag Number		VG-121-E2		
	Size Range		Inch	1/2"~1-1/2"	
	Design Pressure(PSIG) (max)		1580		
	Design Temperature (°F )(min/max)		200/650		
	Service/Service code		Raw Gas/ Fuel Gas/ Open Drain/ Vents/ Closed Drain		
	Fluid composition		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		ISO 15761		
	Body		OS&Y, bolted bonnet, bolted gland		
	End Connection		Socket Weld		
	End to End Dimension		Mfr. Std.		
	Operation		Handwheel Operated		
	Lock Device		Yes		
Others		Anti-static, stem protector, Solid Wedge, replaceable seats.			
Material	Body		ASTM A105N		
	Seat		Hard Faced Type 316 S.S.		
	Stem		Type 316 S.S.		
	Bolting		Hot Dip Galvanized plated		
	Packing		Mfr. Std.		
Others	Test Standard		API 598/ ISO 15761		
	Certification		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location		Above-ground/outdoor		
	Marking		As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00		

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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### 15. Gate Valves 1/2"~1-1/2"- VG-121-D9

	PIPE CLASS	D9	Rating class	Class 1500	CA=4.5mm
general	Tag Number		VG-121-D9		
	Size Range		Inch	1/2"~1-1/2"	
	Design Pressure(PSIG) (max)		1340		
	Design Temperature (°F )(min/max)		200/200		
	Service/Service code		Produce Water		
	Fluid composition		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		ISO 15761		
	Body		OS&Y, bolted bonnet, bolted gland		
	End Connection		Socket Weld		
	End to End Dimension		Mfr. Std.		
	Operation		Handwheel Operated		
	Lock Device		Yes		
Material	Others		Anti-static, stem protector, Solid Wedge, replaceable seats.		
	Body		ASTM A105N		
	Seat		Hard Faced Type 316 S.S.		
	Stem		Type 316 S.S.		
	Bolting		Hot Dip Galvanized plated		
Others	Packing		Mfr. Std.		
	Test Standard		API 598/ ISO 15761		
	Certification		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location		Above-ground/outdoor		
Marking		As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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### 16. Gate Valves 1/2"~1-1/2"- VG-123-D6

	PIPE CLASS	D6	Rating class	Class 1500	CA=0mm
general	Tag Number		VG-123-D6		
	Size Range		Inch	1/2"~1-1/2"	
	Design Pressure(PSIG) (max)		1340		
	Design Temperature (°F )(min/max)		-120/150		
	Service/Service code		Liquified Gas Under -100 °C		
	Fluid composition		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		ISO 15761		
	Body		OS&Y, bolted bonnet, bolted gland		
	End Connection		Socket Weld		
	End to End Dimension		Mfr. Std.		
	Operation		Handwheel Operated		
	Lock Device		Yes		
Others		Anti-static, stem protector, Solid Wedge, replaceable seats.			
Material	Body		Type 316 S.S.		
	Seat		Hard Faced Type 316 S.S.		
	Stem		Type 316 S.S.		
	Packing		Mfr. Std.		
Others	Test Standard		API 598/ ISO 15761		
	Certification		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location		Above-ground/outdoor		
	Marking		As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00		

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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### 17. Gate Valves 1/2"~1-1/2"- VG-123-E6

	PIPE CLASS	E6	Rating class	Class 1500	CA=0mm
general	Tag Number	VG-123-E6			
	Size Range	Inch	1/2"~1-1/2"		
	Design Pressure(PSIG) (max)	1580			
	Design Temperature (°F )(min/max)	200/200			
	Service/Service code	Liquified Gas Under -100 °C			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ISO 15761			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Socket Weld			
	End to End Dimension	Mfr. Std.			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Solid Wedge, replaceable seats.			
Material	Body	Type 316 S.S.			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ISO 15761			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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### 18. Gate Valves 1/2"~1-1/2"- VG-124-D3

	PIPE CLASS	D3	Rating class	Class 1500	CA=3.0mm
general	Tag Number		VG-124-D3		
	Size Range	Inch	1/2"~1-1/2"		
	Design Pressure(PSIG)	(max)	1340		
	Design Temperature (°F)	(min/max)	-50/265		
	Service/Service code	Flare/ Vent/ Process Gas/ Glycol(Cold Service)/ Process Liquid			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard		ISO 15761		
	Body		OS&Y, bolted bonnet, bolted gland		
	End Connection		Socket Weld		
	End to End Dimension		Mfr. Std.		
	Operation		Handwheel Operated		
	Lock Device		Yes		
Material	Others		Anti-static, stem protector, Solid Wedge, replaceable seats.		
	Body		ASTM A350 LF2		
	Seat		Hard Faced Type 316 S.S.		
	Stem		Type 316 S.S.		
	Bolting		Hot Dip Galvanized plated		
Others	Packing		Mfr. Std.		
	Test Standard		API 598/ ISO 15761		
	Certification		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location		Above-ground/outdoor		
Marking		As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

**Notes:**

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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### 19. Gate Valves 1/2"~1-1/2"- VG-124-E3

	PIPE CLASS	E3	Rating class	Class 1500	CA=3.0mm
general	Tag Number	VG-124-E3			
	Size Range	Inch	1/2"~1-1/2"		
	Design Pressure(PSIG) (max)	1580			
	Design Temperature (°F )(min/max)	-50/265			
	Service/Service code	Flare/ Vent/ Process Gas/ Glycol(Cold Service)/ Process Liquid			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ISO 15761			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Socket Weld			
	End to End Dimension	Mfr. Std.			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Solid Wedge, replaceable seats.			
Material	Body	ASTM A350 LF2			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ISO 15761			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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## 20. Gate Valves 1/2"~1-1/2"- VG-125-D8

	PIPE CLASS	D8	Rating class	Class 1500	CA=3.0mm
general	Tag Number		VG-125-D8		
	Size Range		Inch	1/2"~1-1/2"	
	Design Pressure(PSIG) (max)		1340		
	Design Temperature (°F )(min/max)		200/200		
	Service/Service code		Flow Lines		
	Fluid composition		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		ISO 15761		
	Body		OS&Y, bolted bonnet, bolted gland		
	End Connection		Socket Weld		
	End to End Dimension		Mfr. Std.		
	Operation		Handwheel Operated		
	Lock Device		Yes		
Material	Others		Anti-static, stem protector, Solid Wedge, replaceable seats.		
	Body		ASTM A105N		
	Seat		A105N + Stellite Gr.6		
	Stem		ASTM A182 F6.		
	Bolting		Hot Dip Galvanized plated		
Others	Packing		Mfr. Std.		
	Test Standard		API 598/ ISO 15761		
	Certification		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location		Above-ground/outdoor		
Marking		As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

### Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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## 21. Gate Valves 1/2"~1-1/2"- VG-125-E8

	PIPE CLASS	E8	Rating class	Class 1500	CA=3.0mm
general	Tag Number	VG-125-E8			
	Size Range	Inch	1/2"~1-1/2"		
	Design Pressure(PSIG) (max)	1580			
	Design Temperature (°F )(min/max)	200/200			
	Service/Service code	Flow Lines			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ISO 15761			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Socket Weld			
	End to End Dimension	Mfr. Std.			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Solid Wedge, replaceable seats.			
Material	Body	ASTM A105N			
	Seat	A105N + Stellite Gr.6			
	Stem	ASTM A182 F6.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ISO 15761			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

### Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.





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**22. Gate Valves 2" - VG-201-A1**

	PIPE CLASS	A1	Rating class	Class 150	CA=1.6mm
general	Tag Number	VG-201-A1			
	Size Range	Inch	2"		
	Design Pressure(PSIG)	(max)	270		
	Design Temperature (°F)	(min/max)	150/170		
	Service/Service code	Fuel Oil/ Hot Oil/ Stabilized Condensate/ Glycol/ Treated Gas(Sales Gas, LPG)/ Fire Water (A/G)			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 600			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Flexible Wedge, replaceable seats.			
Material	Body	ASTM A216 Gr. WCB			
	Seat	Hard Faced 13% Cr. S.S.			
	Stem	13% Cr. S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ API 600			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			



Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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### 23. Gate Valves 3"~14" - VG-201-A1

	PIPE CLASS	A1	Rating class	Class 150	CA=1.6mm
general	Tag Number	VG-201-A1			
	Size Range	Inch	3"~14"		
	Design Pressure(PSIG) (max)	270			
	Design Temperature (°F)(min/max)	150/170			
	Service/Service code	Fuel Oil/ Hot Oil/ Stabilized Condensate/ Glycol/ Treated Gas(Sales Gas, LPG)/ Fire Water (A/G)			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 600			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Handwheel Operated			
	Lock Device	Yes			
Material	Others	Anti-static, stem protector, Flexible Wedge, replaceable seats.			
	Body	ASTM A216 Gr. WCB			
	Seat	Hard Faced 13% Cr. S.S.			
	Stem	13% Cr. S.S.			
	Bolting	Hot Dip Galvanized plated			
Others	Packing	Mfr. Std.			
	Test Standard	API 598/ API 600			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00				

Notes:

- This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
- A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
- Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
- All valves not less than 8" should be supplied with support.





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#### 24. Gate Valves 16"~24" - VG-201-A1

	PIPE CLASS	A1	Rating class	Class 150	CA=1.6mm
general	Tag Number	VG-201-A1			
	Size Range	Inch	16"~24"		
	Design Pressure(PSIG) (max)	270			
	Design Temperature (°F)(min/max)	150/170			
	Service/Service code	Fuel Oil/ Hot Oil/ Stabilized Condensate/ Glycol/ Treated Gas(Sales Gas, LPG)/ Fire Water (A/G)			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 600			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Gear Operation			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Flexible Wedge, replaceable seats.			
Material	Body	ASTM A216 Gr. WCB			
	Seat	Hard Faced 13% Cr. S.S.			
	Stem	13% Cr. S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ API 600			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**25. Gate Valves 2" - VG-201-A4**

	PIPE CLASS	A4	Rating class	Class 150	CA=1.6mm
general	Tag Number	VG-201-A4			
	Size Range	Inch	2"		
	Design Pressure(PSIG) (max)	270			
	Design Temperature (°F )(min/max)	-50/200			
	Service/Service code	Utility, Instrument& Plant Air			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 600			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Flexible Wedge, replaceable seats.			
Material	Body	ASTM A216 Gr. WCB			
	Seat	Hard Faced 13% Cr. S.S.			
	Stem	13% Cr. S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ API 600			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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## 26. Gate Valves 3"~4" - VG-201-A4

	PIPE CLASS	A4	Rating class	Class 150	CA=1.6mm
general	Tag Number	VG-201-A4			
	Size Range	Inch	3"~4"		
	Design Pressure(PSIG) (max)	270			
	Design Temperature (°F )(min/max)	-50/200			
	Service/Service code	Utility, Instrument& Plant Air			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 600			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Flexible Wedge, replaceable seats.			
Material	Body	ASTM A216 Gr. WCB			
	Seat	Hard Faced 13% Cr. S.S.			
	Stem	13% Cr. S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ API 600			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

### Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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## 27. Gate Valves 2" - VG-202-A2

	PIPE CLASS	A2	Rating class	Class 150	CA=3.0mm
general	Tag Number	VG-202-A2			
	Size Range	Inch	2"		
	Design Pressure(PSIG) (max)	270			
	Design Temperature (°F )(min/max)	150/500			
	Service/Service code	Raw Gas/ Fuel Gas/ Open Drain/ Vents / Closed Drain			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 600			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Flexible Wedge, replaceable seats.			
Material	Body	ASTM A216 Gr. WCB			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ API 600			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

### Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**28. Gate Valves 3”~14” - VG-202-A2**

	PIPE CLASS	A2	Rating class	Class 150	CA=3.0mm
general	Tag Number	VG-202-A2			
	Size Range	Inch	3”~14”		
	Design Pressure(PSIG) (max)	270			
	Design Temperature (°F )(min/max)	150/500			
	Service/Service code	Raw Gas/ Fuel Gas/ Open Drain/ Vents / Closed Drain			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 600			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Flexible Wedge, replaceable seats.			
Material	Body	ASTM A216 Gr. WCB			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ API 600			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves  
NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
4. All valves not less than 8” should be supplied with support.



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**29. Gate Valves 16”~24” - VG-202-A2**

	PIPE CLASS	A2	Rating class	Class 150	CA=3.0mm
general	Tag Number	VG-202-A2			
	Size Range	Inch	16”~24”		
	Design Pressure(PSIG) (max)	270			
	Design Temperature (°F )(min/max)	150/500			
	Service/Service code	Raw Gas/ Fuel Gas/ Open Drain/ Vents / Closed Drain			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 600			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Gear Operation			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Flexible Wedge, replaceable seats.			
Material	Body	ASTM A216 Gr. WCB			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ API 600			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves  
NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
4. All valves not less than 8” should be supplied with support.





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### 30. Gate Valves 2" - VG-202-A8

	PIPE CLASS	A8	Rating class	Class 150	CA=4.5mm
general	Tag Number	VG-202-A8			
	Size Range	Inch	2"		
	Design Pressure(PSIG) (max)	270			
	Design Temperature (°F )(min/max)	200/200			
	Service/Service code	Produce Water			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 600			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Flexible Wedge, replaceable seats.			
Material	Body	ASTM A216 Gr. WCB			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ API 600			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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### 31. Gate Valves 3"~14" - VG-202-A8

	PIPE CLASS	A8	Rating class	Class 150	CA=4.5mm
general	Tag Number	VG-202-A8			
	Size Range	Inch	3"~14"		
	Design Pressure(PSIG) (max)	270			
	Design Temperature (°F )(min/max)	200/200			
	Service/Service code	Produce Water			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 600			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Flexible Wedge, replaceable seats.			
Material	Body	ASTM A216 Gr. WCB			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ API 600			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves  
NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
4. All valves not less than 8" should be supplied with support.



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### 32. Gate Valves 16"~24" - VG-202-A8

	PIPE CLASS	A8	Rating class	Class 150	CA=4.5mm
general	Tag Number	VG-202-A8			
	Size Range	Inch	16"~24"		
	Design Pressure(PSIG) (max)	270			
	Design Temperature (°F )(min/max)	200/200			
	Service/Service code	Produce Water			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 600			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Gear Operation			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Flexible Wedge, replaceable seats.			
Material	Body	ASTM A216 Gr. WCB			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ API 600			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves  
NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
4. All valves not less than 8" should be supplied with support.



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### 33. Gate Valves 2" - VG-203-A6

	PIPE CLASS	A6	Rating class	Class 150	CA=0mm
general	Tag Number	VG-203-A6			
	Size Range	Inch	2"		
	Design Pressure(PSIG) (max)	270			
	Design Temperature (°F )(min/max)	-180/150			
	Service/Service code	Liquified Gas Under -100 °C			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 600			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Flexible Wedge, replaceable seats.			
Material	Body	Type 316 S.S.			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ API 600			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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### 34. Gate Valves 3"~14" - VG-203-A6

	PIPE CLASS	A6	Rating class	Class 150	CA=0mm
general	Tag Number	VG-203-A6			
	Size Range	Inch	3"~14"		
	Design Pressure(PSIG) (max)	270			
	Design Temperature (°F )(min/max)	-180/150			
	Service/Service code	Liquified Gas Under -100 °C			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 600			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Flexible Wedge, replaceable seats.			
Material	Body	Type 316 S.S.			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ API 600			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves  
NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
4. All valves not less than 8" should be supplied with support.



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### 35. Gate Valves 16"~24" - VG-203-A6

	PIPE CLASS	A6	Rating class	Class 150	CA=0mm
general	Tag Number	VG-203-A6			
	Size Range	Inch	16"~24"		
	Design Pressure(PSIG) (max)	270			
	Design Temperature (°F )(min/max)	-180/150			
	Service/Service code	Liquified Gas Under -100 °C			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 600			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Gear Operation			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Flexible Wedge, replaceable seats.			
Material	Body	Type 316 S.S.			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ API 600			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

- This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
- A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
- Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
- All valves not less than 8" should be supplied with support.



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### 36. Gate Valves 2" - VG-204-A3

	PIPE CLASS	A3	Rating class	Class 150	CA=3.0mm
general	Tag Number	VG-204-A3			
	Size Range	Inch	2"		
	Design Pressure(PSIG) (max)	270			
	Design Temperature (°F )(min/max)	-50/-50			
	Service/Service code	Flare/ Vent/ Process Gas/ Glycol(Cold Service)/ Process Liquid			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 600			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Flexible Wedge, replaceable seats.			
Material	Body	ASTM A352 Gr. LCC			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ API 600			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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### 37. Gate Valves 3"~14" - VG-204-A3

	PIPE CLASS	A3	Rating class	Class 150	CA=3.0mm
general	Tag Number	VG-204-A3			
	Size Range	Inch	3"~14"		
	Design Pressure(PSIG) (max)	270			
	Design Temperature (°F )(min/max)	-50/-50			
	Service/Service code	Flare/ Vent/ Process Gas/ Glycol(Cold Service)/ Process Liquid			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 600			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Flexible Wedge, replaceable seats.			
Material	Body	ASTM A352 Gr. LCC			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ API 600			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves  
NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
4. All valves not less than 8" should be supplied with support.





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### 38. Gate Valves 16"~24" - VG-204-A3

	PIPE CLASS	A3	Rating class	Class 150	CA=3.0mm
general	Tag Number	VG-204-A3			
	Size Range	Inch	16"~24"		
	Design Pressure(PSIG) (max)	270			
	Design Temperature (°F )(min/max)	-50/-50			
	Service/Service code	Flare/ Vent/ Process Gas/ Glycol(Cold Service)/ Process Liquid			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 600			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Gear Operation			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Flexible Wedge, replaceable seats.			
Material	Body	ASTM A352 Gr. LCC			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ API 600			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves  
NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
4. All valves not less than 8" should be supplied with support.



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### 39. Gate Valves 4" ~12" - VG-201-A7

	PIPE CLASS	A7	Rating class	Class 150	N/A
general	Tag Number	VG-201-A7			
	Size Range	inch	4" ~12"		
	Design Pressure(PSIG) (max)	270			
	Design Temperature (OF )(min/max)	-20/100			
	Service/Service code	Fire Water(UG)/ Produce Water(U/G)			
	Fluid composition	As per Specification for Water Treatment Package NGP-001-PCS-15.03-4001-00			
design	Design Standard	API 600			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Flexible Wedge, replaceable seats.			
Material	Body	ASTM A216 Gr. WCB			
	Seat	Hard Faced 13% Cr. S.S.			
	Stem	13% Cr. S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ API 600			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Under-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves  
NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
4. All valves not less than 8" should be supplied with support.



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**40. Gate Valves 1”~3” VG-102-A7**

	PIPE CLASS	A7	Rating class	Class 800	N/A
general	Tag Number	VG-102-A7			
	Size Range	inch	1”~3”		
	Design Pressure(PSIG) (max)	270			
	Design Temperature (0F )(min/max)	-20/100			
	Service/Service code	Fire Water(UG)/ Produce Water(U/G)			
	Fluid composition	As per Specification for Water Treatment Package NGP-001-PCS-15.03-4001-00			
design	Design Standard	API 600			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Threaded			
	Face to Face Dimension	ASME B16.10			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, solid wedge, replaceable seats.			
Material	Body	ASTM A216 Gr. WCB			
	Seat	Hard Faced 13% Cr. S.S.			
	Stem	13% Cr. S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ API 600			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Under-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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#### 41. Gate Valves 2" - VG-211-B1

	PIPE CLASS	B1	Rating class	Class 300	CA=1.6mm
general	Tag Number	VG-211-B1			
	Size Range	Inch	2"		
	Design Pressure(PSIG) (max)	600			
	Design Temperature (°F)(min/max)	35/650			
	Service/Service code	Fuel Oil/ Hot Oil/ Stabilized Condensate/ Glycol/ Treated Gas( Sales Gas).			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 600			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Flexible Wedge, replaceable seats.			
Material	Body	ASTM A216 Gr. WCB			
	Seat	Hard Faced 13% Cr. S.S.			
	Stem	13% Cr. S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ API 600			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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#### 42. Gate Valves 3"~10" - VG-211-B1

	PIPE CLASS	B1	Rating class	Class 300	CA=1.6mm
general	Tag Number	VG-211-B1			
	Size Range	Inch	3"~10"		
	Design Pressure(PSIG) (max)	600			
	Design Temperature (°F)(min/max)	35/650			
	Service/Service code	Fuel Oil/ Hot Oil/ Stabilized Condensate/ Glycol/ Treated Gas( Sales Gas).			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 600			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Flexible Wedge, replaceable seats.			
Material	Body	ASTM A216 Gr. WCB			
	Seat	Hard Faced 13% Cr. S.S.			
	Stem	13% Cr. S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ API 600			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves  
NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
4. All valves not less than 8" should be supplied with support.



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### 43. Gate Valves 12"~24" - VG-211-B1

	PIPE CLASS	B1	Rating class	Class 300	CA=1.6mm
general	Tag Number	VG-211-B1			
	Size Range	Inch	12"~24"		
	Design Pressure(PSIG) (max)	600			
	Design Temperature (°F)(min/max)	35/650			
	Service/Service code	Fuel Oil/ Hot Oil/ Stabilized Condensate/ Glycol/ Treated Gas( Sales Gas).			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 600			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Gear Operation			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Flexible Wedge, replaceable seats.			
Material	Body	ASTM A216 Gr. WCB			
	Seat	Hard Faced 13% Cr. S.S.			
	Stem	13% Cr. S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ API 600			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves  
NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
4. All valves not less than 8" should be supplied with support.



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#### 44. Gate Valves 2" - VG-212-B2

	PIPE CLASS	B2	Rating class	Class 300	CA=3.0mm
general	Tag Number	VG-212-B2			
	Size Range	Inch	2"		
	Design Pressure(PSIG) (max)	600			
	Design Temperature (°F )(min/max)	200/200			
	Service/Service code	Raw Gas/ Fuel Gas/ Open Drain/ Vents / Closed Drain			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 600			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Flexible Wedge, replaceable seats.			
Material	Body	ASTM A216 Gr. WCB			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ API 600			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**45. Gate Valves 3"~10" - VG-212-B2**

	PIPE CLASS	B2	Rating class	Class 300	CA=3.0mm
general	Tag Number	VG-212-B2			
	Size Range	Inch	3"~10"		
	Design Pressure(PSIG) (max)	600			
	Design Temperature (°F )(min/max)	-200/200			
	Service/Service code	Raw Gas/ Fuel Gas/ Open Drain/ Vents / Closed Drain			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 600			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Flexible Wedge, replaceable seats.			
Material	Body	ASTM A216 Gr. WCB			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ API 600			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves  
NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
4. All valves not less than 8" should be supplied with support.





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#### 46. Gate Valves 12"~24" - VG-212-B2

	PIPE CLASS	B2	Rating class	Class 300	CA=3.0mm
general	Tag Number	VG-212-B2			
	Size Range	Inch	12"~24"		
	Design Pressure(PSIG) (max)	600			
	Design Temperature (°F)(min/max)	200/200			
	Service/Service code	Raw Gas/ Fuel Gas/ Open Drain/ Vents / Closed Drain			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 600			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Gear Operation			
	Lock Device	Yes			
Material	Others	Anti-static, stem protector, Flexible Wedge, replaceable seats.			
	Body	ASTM A216 Gr. WCB			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
Others	Packing	Mfr. Std.			
	Test Standard	API 598/ API 600			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00				

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves  
NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
4. All valves not less than 8" should be supplied with support.



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#### 47. Gate Valves 2" - VG-213-B6

	PIPE CLASS	B6	Rating class	Class 300	CA=0mm
general	Tag Number	VG-213-B6			
	Size Range	Inch	2"		
	Design Pressure(PSIG) (max)	600			
	Design Temperature (°F )(min/max)	-120/-70			
	Service/Service code	Liquified Gas Under -100 °C			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 600			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Flexible Wedge, replaceable seats.			
Material	Body	Type 316 S.S.			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ API 600			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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#### 48. Gate Valves 3"~10" - VG-213-B6

	PIPE CLASS	B6	Rating class	Class 300	CA=0mm
general	Tag Number	VG-213-B6			
	Size Range	Inch	3"~10"		
	Design Pressure(PSIG) (max)	600			
	Design Temperature (°F )(min/max)	-120/-70			
	Service/Service code	Liquified Gas Under -100 °C			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 600			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Flexible Wedge, replaceable seats.			
Material	Body	Type 316 S.S.			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ API 600			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves  
NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
4. All valves not less than 8" should be supplied with support.



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**49. Gate Valves 12"~24" - VG-213-B6**

	PIPE CLASS	B6	Rating class	Class 300	CA=0mm
general	Tag Number	VG-213-B6			
	Size Range	Inch	12"~24"		
	Design Pressure(PSIG) (max)	600			
	Design Temperature (°F )(min/max)	-120/-70			
	Service/Service code	Liquified Gas Under -100 °C			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 600			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Gear Operation			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Flexible Wedge, replaceable seats.			
Material	Body	Type 316 S.S.			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ API 600			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves  
NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
4. All valves not less than 8" should be supplied with support.



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### 50. Gate Valves 2" - VG-214-B3

	PIPE CLASS	B3	Rating class	Class 300	CA=3.0mm
general	Tag Number	VG-214-B3			
	Size Range	Inch	2"		
	Design Pressure(PSIG) (max)	600			
	Design Temperature (°F )(min/max)	-50/265			
	Service/Service code	Flare/ Vent/ Process Gas/ Glycol(Cold Service)/ Process Liquid			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 600			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Flexible Wedge, replaceable seats			
Material	Body	ASTM A352 Gr. LCC			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ API 600			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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### 51. Gate Valves 3"~10" - VG-214-B3

	PIPE CLASS	B3	Rating class	Class 300	CA=3.0mm
general	Tag Number	VG-214-B3			
	Size Range	Inch	3"~10"		
	Design Pressure(PSIG) (max)	600			
	Design Temperature (°F)(min/max)	-50/265			
	Service/Service code	Flare/ Vent/ Process Gas/ Glycol(Cold Service)/ Process Liquid			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 600			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Flexible Wedge, replaceable seats.			
Material	Body	ASTM A352 Gr. LCC			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ API 600			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves  
NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
4. All valves not less than 8" should be supplied with support.



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## 52. Gate Valves 12"~24" - VG-214-B3

	PIPE CLASS	B3	Rating class	Class 300	CA=3.0mm
general	Tag Number	VG-214-B3			
	Size Range	Inch	12"~24"		
	Design Pressure(PSIG) (max)	600			
	Design Temperature (°F)(min/max)	-50/265			
	Service/Service code	Flare/ Vent/ Process Gas/ Glycol(Cold Service)/ Process Liquid			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 600			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Gear Operation			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Flexible Wedge, replaceable seats.			
Material	Body	ASTM A352 Gr. LCC			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ API 600			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

### Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves  
NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
4. All valves not less than 8" should be supplied with support.



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### 53. Gate Valves 2" - VG-221-D1

	PIPE CLASS	D1	Rating class	Class 600	CA=1.6mm
general	Tag Number		VG-221-D1		
	Size Range		Inch	2"	
	Design Pressure(PSIG) (max)		1340		
	Design Temperature (°F)(min/max)		150/150		
	Service/Service code		Fuel Oil/ Hot Oil/ Stabilized Condensate/ Glycol/ Treated Gas/ Sales Gas/ LPG		
	Fluid composition		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		API 600		
	Body		OS&Y, bolted bonnet, bolted gland		
	End Connection		Flange, RF to ASME B16.5		
	Face to Face Dimension		ASME B16.10		
	Operation		Handwheel Operated		
	Lock Device		Yes		
Others		Anti-static, stem protector, Flexible Wedge, replaceable seats			
Material	Body		ASTM A216 Gr. WCB		
	Seat		Hard Faced 13% Cr. S.S.		
	Stem		13% Cr. S.S.		
	Bolting		Hot Dip Galvanized plated		
	Packing		Mfr. Std.		
Others	Test Standard		API 598/ API 600		
	Certification		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location		Above-ground/outdoor		
	Marking		As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00		

**Notes:**

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.





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#### 54. Gate Valves 3"~6" - VG-221-D1

	PIPE CLASS	D1	Rating class	Class 600	CA=1.6mm
general	Tag Number		VG-221-D1		
	Size Range		Inch	3"~6"	
	Design Pressure(PSIG) (max)		1340		
	Design Temperature (°F)(min/max)		150/150		
	Service/Service code		Fuel Oil/ Hot Oil/ Stabilized Condensate/ Glycol/ Treated Gas/ Sales Gas/ LPG		
	Fluid composition		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		API 600		
	Body		OS&Y, bolted bonnet, bolted gland		
	End Connection		Flange, RF to ASME B16.5		
	Face to Face Dimension		ASME B16.10		
	Operation		Handwheel Operated		
	Lock Device		Yes		
Others		Anti-static, stem protector, Flexible Wedge, replaceable seats.			
Material	Body		ASTM A216 Gr. WCB		
	Seat		Hard Faced 13% Cr. S.S.		
	Stem		13% Cr. S.S.		
	Bolting		Hot Dip Galvanized plated		
	Packing		Mfr. Std.		
Others	Test Standard		API 598/ API 600		
	Certification		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location		Above-ground/outdoor		
	Marking		As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00		

**Notes:**

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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### 55. Gate Valves 8"~24" - VG-221-D1

	PIPE CLASS	D1	Rating class	Class 600	CA=1.6mm
general	Tag Number		VG-221-D1		
	Size Range		Inch	8"~24"	
	Design Pressure(PSIG) (max)		1340		
	Design Temperature (°F)(min/max)		150/150		
	Service/Service code		Fuel Oil/ Hot Oil/ Stabilized Condensate/ Glycol/ Treated Gas/ Sales Gas/ LPG		
	Fluid composition		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		API 600		
	Body		OS&Y, bolted bonnet, bolted gland		
	End Connection		Flange, RF to ASME B16.5		
	Face to Face Dimension		ASME B16.10		
	Operation		Gear Operation		
	Lock Device		Yes		
Others		Anti-static, stem protector, Flexible Wedge, replaceable seats.			
Material	Body		ASTM A216 Gr. WCB		
	Seat		Hard Faced 13% Cr. S.S.		
	Stem		13% Cr. S.S.		
	Bolting		Hot Dip Galvanized plated		
	Packing		Mfr. Std.		
Others	Test Standard		API 598/ API 600		
	Certification		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location		Above-ground/outdoor		
	Marking		As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00		

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves  
NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
4. All valves not less than 8" should be supplied with support.



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**56. Gate Valves 2" - VG-222-D2**

	PIPE CLASS	D2	Rating class	Class 600	CA=3.0mm
general	Tag Number		VG-222-D2		
	Size Range	Inch	2"		
	Design Pressure(PSIG)	(max)	1340		
	Design Temperature (°F)	(min/max)	150/650		
	Service/Service code	Raw Gas/ Fuel Gas/ Open Drain/ Vents/ Closed Drain			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard		API 600		
	Body		OS&Y, bolted bonnet, bolted gland		
	End Connection		Flange, RF to ASME B16.5		
	Face to Face Dimension		ASME B16.10		
	Operation		Handwheel Operated		
	Lock Device		Yes		
	Others		Anti-static, stem protector, Flexible Wedge, replaceable seats		
Material	Body		ASTM A216 Gr. WCB		
	Seat		Hard Faced Type 316 S.S.		
	Stem		Type 316 S.S.		
	Bolting		Hot Dip Galvanized plated		
	Packing		Mfr. Std.		
Others	Test Standard		API 598/ API 600		
	Certification		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location		Above-ground/outdoor		
	Marking		As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00		

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**57. Gate Valves 3”~6” - VG-222-D2**

	PIPE CLASS	D2	Rating class	Class 600	CA=3.0mm
general	Tag Number		VG-222-D2		
	Size Range	Inch	3”~6”		
	Design Pressure(PSIG)	(max)	1340		
	Design Temperature (°F)	(min/max)	150/650		
	Service/Service code	Raw Gas/ Fuel Gas/ Open Drain/ Vents/ Closed Drain			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard		API 600		
	Body		OS&Y, bolted bonnet, bolted gland		
	End Connection		Flange, RF to ASME B16.5		
	Face to Face Dimension		ASME B16.10		
	Operation		Handwheel Operated		
	Lock Device		Yes		
Material	Others		Anti-static, stem protector, Flexible Wedge, replaceable seats.		
	Body		ASTM A216 Gr. WCB		
	Seat		Hard Faced Type 316 S.S.		
	Stem		Type 316 S.S.		
	Bolting		Hot Dip Galvanized plated		
Others	Packing		Mfr. Std.		
	Test Standard		API 598/ API 600		
	Certification		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location		Above-ground/outdoor		
Marking		As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**58. Gate Valves 8”~24” - VG-222-D2**

	PIPE CLASS	D2	Rating class	Class 600	CA=3.0mm
general	Tag Number		VG-222-D2		
	Size Range		Inch	8”~24”	
	Design Pressure(PSIG) (max)		1340		
	Design Temperature (°F )(min/max)		150/650		
	Service/Service code		Raw Gas/ Fuel Gas/ Open Drain/ Vents/ Closed Drain		
	Fluid composition		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		API 600		
	Body		OS&Y, bolted bonnet, bolted gland		
	End Connection		Flange, RF to ASME B16.5		
	Face to Face Dimension		ASME B16.10		
	Operation		Gear Operation		
	Lock Device		Yes		
Others		Anti-static, stem protector, Flexible Wedge, replaceable seats.			
Material	Body		ASTM A216 Gr. WCB		
	Seat		Hard Faced Type 316 S.S.		
	Stem		Type 316 S.S.		
	Bolting		Hot Dip Galvanized plated		
	Packing		Mfr. Std.		
Others	Test Standard		API 598/ API 600		
	Certification		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location		Above-ground/outdoor		
	Marking		As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00		

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves  
NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
4. All valves not less than 8” should be supplied with support.



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**59. Gate Valves 2" - VG-222-D9**

	PIPE CLASS	D9	Rating class	Class 600	CA=4.5mm
general	Tag Number		VG-222-D9		
	Size Range	Inch	2"		
	Design Pressure(PSIG)	(max)	1340		
	Design Temperature (°F)	(min/max)	200/200		
	Service/Service code	Produce Water			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard		API 600		
	Body		OS&Y, bolted bonnet, bolted gland		
	End Connection		Flange, RF to ASME B16.5		
	Face to Face Dimension		ASME B16.10		
	Operation		Handwheel Operated		
	Lock Device		Yes		
	Others		Anti-static, stem protector, Flexible Wedge, replaceable seats		
Material	Body		ASTM A216 Gr. WCB		
	Seat		Hard Faced Type 316 S.S.		
	Stem		Type 316 S.S.		
	Bolting		Hot Dip Galvanized plated		
	Packing		Mfr. Std.		
Others	Test Standard		API 598/ API 600		
	Certification		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location		Above-ground/outdoor		
	Marking		As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00		

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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### 60. Gate Valves 3"~6" - VG-222-D9

	PIPE CLASS	D9	Rating class	Class 600	CA=4.5mm
general	Tag Number		VG-222-D9		
	Size Range	Inch	3"~6"		
	Design Pressure(PSIG)	(max)	1340		
	Design Temperature (°F)	(min/max)	200/200		
	Service/Service code	Produce Water			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard		API 600		
	Body		OS&Y, bolted bonnet, bolted gland		
	End Connection		Flange, RF to ASME B16.5		
	Face to Face Dimension		ASME B16.10		
	Operation		Handwheel Operated		
	Lock Device		Yes		
Material	Others		Anti-static, stem protector, Flexible Wedge, replaceable seats.		
	Body		ASTM A216 Gr. WCB		
	Seat		Hard Faced Type 316 S.S.		
	Stem		Type 316 S.S.		
	Bolting		Hot Dip Galvanized plated		
Others	Packing		Mfr. Std.		
	Test Standard		API 598/ API 600		
	Certification		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location		Above-ground/outdoor		
Marking		As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

**Notes:**

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**61. Gate Valves 8”~24” - VG-222-D9**

	PIPE CLASS	D9	Rating class	Class 600	CA=4.5mm
general	Tag Number	VG-222-D9			
	Size Range	Inch	8”~24”		
	Design Pressure(PSIG) (max)	1340			
	Design Temperature (°F )(min/max)	200/200			
	Service/Service code	Produce Water			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 600			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Gear Operation			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Flexible Wedge, replaceable seats.			
Material	Body	ASTM A216 Gr. WCB			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ API 600			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves  
NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
4. All valves not less than 8” should be supplied with support.





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## 62. Gate Valves 2" - VG-223-D6

	PIPE CLASS	D6	Rating class	Class 600	CA=0mm
general	Tag Number	VG-223-D6			
	Size Range	Inch	2"		
	Design Pressure(PSIG) (max)	1340			
	Design Temperature (°F )(min/max)	-120/150			
	Service/Service code	Liquified Gas Under -100 °C			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 600			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Flexible Wedge, replaceable seats			
Material	Body	Type 316 S.S.			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ API 600			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

### Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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### 63. Gate Valves 3"~6" - VG-223-D6

	PIPE CLASS	D6	Rating class	Class 600	CA=0mm
general	Tag Number	VG-223-D6			
	Size Range	Inch	3"~6"		
	Design Pressure(PSIG) (max)	1340			
	Design Temperature (°F )(min/max)	-120/150			
	Service/Service code	Liquified Gas Under -100 °C			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 600			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Flexible Wedge, replaceable seats.			
Material	Body	Type 316 S.S.			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ API 600			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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#### 64. Gate Valves 8"~24" - VG-223-D6

	PIPE CLASS	D6	Rating class	Class 600	CA=0mm
general	Tag Number	VG-223-D6			
	Size Range	Inch	8"~24"		
	Design Pressure(PSIG) (max)	1340			
	Design Temperature (°F )(min/max)	-120/150			
	Service/Service code	Liquified Gas Under -100 °C			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 600			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Gear Operation			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Flexible Wedge, replaceable seats.			
Material	Body	Type 316 S.S.			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ API 600			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves  
NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
4. All valves not less than 8" should be supplied with support.



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**65. Gate Valves 2" - VG-224-D3**

	PIPE CLASS	D3	Rating class	Class 600	CA=3.0mm
general	Tag Number		VG-224-D3		
	Size Range	Inch	2"		
	Design Pressure(PSIG)	(max)	1340		
	Design Temperature (°F)	(min/max)	-50/265		
	Service/Service code	Flare/ Vent/ Process Gas/ Glycol(Cold Service)/ Process Liquid			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard		API 600		
	Body		OS&Y, bolted bonnet, bolted gland		
	End Connection		Flange, RF to ASME B16.5		
	Face to Face Dimension		ASME B16.10		
	Operation		Handwheel Operated		
	Lock Device		Yes		
	Others		Anti-static, stem protector, Flexible Wedge, replaceable seats		
Material	Body		ASTM A352 Gr. LCC		
	Seat		Hard Faced Type 316 S.S.		
	Stem		Type 316 S.S.		
	Bolting		Hot Dip Galvanized plated		
	Packing		Mfr. Std.		
Others	Test Standard		API 598/ API 600		
	Certification		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location		Above-ground/outdoor		
	Marking		As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00		

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**66. Gate Valves 3”~6” - VG-224-D3**

	PIPE CLASS	D3	Rating class	Class 600	CA=3.0mm
general	Tag Number	VG-224-D3			
	Size Range	Inch	3”~6”		
	Design Pressure(PSIG) (max)	1340			
	Design Temperature (°F )(min/max)	-50/265			
	Service/Service code	Flare/ Vent/ Process Gas/ Glycol(Cold Service)/ Process Liquid			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 600			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Flexible Wedge, replaceable seats.			
Material	Body	ASTM A352 Gr. LCC			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ API 600			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**67. Gate Valves 8”~24” - VG-224-D3**

	PIPE CLASS	D3	Rating class	Class 600	CA=3.0mm
general	Tag Number	VG-224-D3			
	Size Range	Inch	8”~24”		
	Design Pressure(PSIG) (max)	1340			
	Design Temperature (°F)(min/max)	-50/265			
	Service/Service code	Flare/ Vent/ Process Gas/ Glycol(Cold Service)/ Process Liquid			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 600			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Gear Operation			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Flexible Wedge, replaceable seats.			
Material	Body	ASTM A352 Gr. LCC			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ API 600			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves  
NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
4. All valves not less than 8” should be supplied with support.



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### 68. Gate Valves 2" - VG-231-E1

	PIPE CLASS	E1	Rating class	Class 900	CA=1.6mm
general	Tag Number	VG-231-E1			
	Size Range	Inch	2"		
	Design Pressure(PSIG) (max)	1580			
	Design Temperature (°F)(min/max)	-20/150			
	Service/Service code	Fuel Oil/ Hot Oil/ Stabilized Condensate/ Glycol/ Treated Gas/ Sales Gas/ LPG			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 600			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Flange, RTJ to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Flexible Wedge, replaceable seats			
Material	Body	ASTM A216 Gr. WCB			
	Seat	Hard Faced 13% Cr. S.S.			
	Stem	13% Cr. S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ API 600			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

**Notes:**

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**69. Gate Valves 3”~6” - VG-231-E1**

	PIPE CLASS	E1	Rating class	Class 900	CA=1.6mm
general	Tag Number	VG-231-E1			
	Size Range	Inch	3”~6”		
	Design Pressure(PSIG) (max)	1580			
	Design Temperature (°F)(min/max)	-20/150			
	Service/Service code	Fuel Oil/ Hot Oil/ Stabilized Condensate/ Glycol/ Treated Gas/ Sales Gas/ LPG			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 600			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Flange, RTJ to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Flexible Wedge, replaceable seats.			
Material	Body	ASTM A216 Gr. WCB			
	Seat	Hard Faced 13% Cr. S.S.			
	Stem	13% Cr. S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ API 600			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.





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### 70. Gate Valves 8"~24" - VG-231-E1

	PIPE CLASS	E1	Rating class	Class 900	CA=1.6mm
general	Tag Number	VG-231-E1			
	Size Range	Inch	8"~24"		
	Design Pressure(PSIG) (max)	1580			
	Design Temperature (°F)(min/max)	-20/150			
	Service/Service code	Fuel Oil/ Hot Oil/ Stabilized Condensate/ Glycol/ Treated Gas/ Sales Gas/ LPG			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 600			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Flange, RTJ to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Gear Operation			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Flexible Wedge, replaceable seats.			
Material	Body	ASTM A216 Gr. WCB			
	Seat	Hard Faced 13% Cr. S.S.			
	Stem	13% Cr. S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ API 600			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves  
NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
4. All valves not less than 8" should be supplied with support.



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**71. Gate Valves 2" - VG-232-E2**

	PIPE CLASS	E2	Rating class	Class 900	CA=3.0mm
general	Tag Number	VG-232-E2			
	Size Range	Inch	2"		
	Design Pressure(PSIG) (max)	1580			
	Design Temperature (°F )(min/max)	200/650			
	Service/Service code	Raw Gas/ Fuel Gas/ Open Drain/ Vents/ Closed Drain			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 600			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Flange, RTJ to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Flexible Wedge, replaceable seats			
Material	Body	ASTM A216 Gr. WCB			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ API 600			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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## 72. Gate Valves 3"~6" - VG-232-E2

	PIPE CLASS	E2	Rating class	Class 900	CA=3.0mm
general	Tag Number	VG-232-E2			
	Size Range	Inch	3"~6"		
	Design Pressure(PSIG) (max)	1580			
	Design Temperature (°F )(min/max)	200/650			
	Service/Service code	Raw Gas/ Fuel Gas/ Open Drain/ Vents/ Closed Drain			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 600			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Flange, RTJ to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Flexible Wedge, replaceable seats.			
Material	Body	ASTM A216 Gr. WCB			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ API 600			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

### Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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### 73. Gate Valves 8"~24" - VG-232-E2

	PIPE CLASS	E2	Rating class	Class 900	CA=3.0mm
general	Tag Number	VG-232-E2			
	Size Range	Inch	8"~24"		
	Design Pressure(PSIG) (max)	1580			
	Design Temperature (°F)(min/max)	200/650			
	Service/Service code	Raw Gas/ Fuel Gas/ Open Drain/ Vents/ Closed Drain			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 600			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Flange, RTJ to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Gear Operation			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Flexible Wedge, replaceable seats.			
Material	Body	ASTM A216 Gr. WCB			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ API 600			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves  
NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
4. All valves not less than 8" should be supplied with support.



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#### 74. Gate Valves 2" - VG-233-E6

	PIPE CLASS	E6	Rating class	Class 900	CA=0mm
general	Tag Number	VG-233-E6			
	Size Range	Inch	2"		
	Design Pressure(PSIG) (max)	1580			
	Design Temperature (°F )(min/max)	200/200			
	Service/Service code	Liquified Gas Under -100 °C			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 600			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Flange, RTJ to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Flexible Wedge, replaceable seats			
Material	Body	Type 316 S.S.			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ API 600			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**75. Gate Valves 3”~6” - VG-233-E6**

	PIPE CLASS	E6	Rating class	Class 900	CA=0mm
general	Tag Number	VG-233-E6			
	Size Range	Inch	3”~6”		
	Design Pressure(PSIG) (max)	1580			
	Design Temperature (°F )(min/max)	200/200			
	Service/Service code	Liquified Gas Under -100 °C			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 600			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Flange, RTJ to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Flexible Wedge, replaceable seats.			
Material	Body	Type 316 S.S.			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ API 600			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**76. Gate Valves 8"~24" - VG-233-E6**

	PIPE CLASS	E6	Rating class	Class 900	CA=0mm
general	Tag Number	VG-233-E6			
	Size Range	Inch	8"~24"		
	Design Pressure(PSIG) (max)	1580			
	Design Temperature (°F )(min/max)	200/200			
	Service/Service code	Liquified Gas Under -100 °C			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 600			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Flange, RTJ to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Gear Operation			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Flexible Wedge, replaceable seats.			
Material	Body	Type 316 S.S.			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ API 600			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
4. All valves not less than 8" should be supplied with support.



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**77. Gate Valves 2" - VG-234-E3**

	PIPE CLASS	E3	Rating class	Class 900	CA=3.0mm
general	Tag Number	VG-234-E3			
	Size Range	Inch	2"		
	Design Pressure(PSIG) (max)	1580			
	Design Temperature (°F )(min/max)	-50/265			
	Service/Service code	Flare/ Vent/ Process Gas/ Glycol(Cold Service)/ Process Liquid			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 600			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Flange, RTJ to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Flexible Wedge, replaceable seats			
Material	Body	ASTM A352 Gr. LCC			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ API 600			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.





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**78. Gate Valves 3”~6” - VG-234-E3**

	PIPE CLASS	E3	Rating class	Class 900	CA=3.0mm
general	Tag Number	VG-234-E3			
	Size Range	Inch	3”~6”		
	Design Pressure(PSIG) (max)	1580			
	Design Temperature (°F )(min/max)	-50/265			
	Service/Service code	Flare/ Vent/ Process Gas/ Glycol(Cold Service)/ Process Liquid			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 600			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Flange, RTJ to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Flexible Wedge, replaceable seats.			
Material	Body	ASTM A352 Gr. LCC			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ API 600			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**79. Gate Valves 8”~24” - VG-234-E3**

	PIPE CLASS	E3	Rating class	Class 900	CA=3.0mm
general	Tag Number	VG-234-E3			
	Size Range	Inch	8”~24”		
	Design Pressure(PSIG) (max)	1580			
	Design Temperature (°F )(min/max)	-50/265			
	Service/Service code	Flare/ Vent/ Process Gas/ Glycol(Cold Service)/ Process Liquid			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 600			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Flange, RTJ to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Gear Operation			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Flexible Wedge, replaceable seats.			
Material	Body	ASTM A352 Gr. LCC			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ API 600			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves  
NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
4. All valves not less than 8” should be supplied with support.



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### 80. Gate Valves 3/4" – PT/PDT-A1

	PIPE CLASS	A1	Rating class	Class 150	CA=1.6mm
general	Tag Number	PT/PDT -A1			
	Size Range	Inch	3/4"		
	Design Pressure(PSIG) (max)	270			
	Design Temperature (°F )(min/max)	150/170			
	Service/Service code	Fuel Oil/ Hot Oil/ Stabilized Condensate/ Glycol/ Treated Gas(Sales Gas, LPG)/ Fire Water (A/G)			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ISO 15761			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Flange, RF to ASME B16.5			
	End to End Dimension	Mfr. Std.			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Solid Wedge, replaceable seats.			
Material	Body	ASTM A105N			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ISO 15761			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

**Notes:**

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**81. Gate Valves 3/4"- PT/PDT-B1**

	PIPE CLASS	B1	Rating class	Class 300	CA=1.6mm
general	Tag Number	PT/PDT-B1			
	Size Range	Inch	3/4"		
	Design Pressure(PSIG) (max)	600			
	Design Temperature (°F )(min/max)	35/650			
	Service/Service code	Fuel Oil/ Hot Oil/ Stabilized Condensate/ Glycol/ Treated Gas(Sales Gas).			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ISO 15761			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Flange, RF to ASME B16.5			
	End to End Dimension	Mfr. Std.			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Solid Wedge, replaceable seats.			
Material	Body	ASTM A105N			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ISO 15761			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**82. Gate Valves 3/4"- PT/PDT-D1**

PIPE CLASS	D1	Rating class	Class 600	CA=1.6mm
general	Tag Number	PT/PDT-D1		
	Size Range	Inch	3/4"	
	Design Pressure(PSIG) (max)	1340		
	Design Temperature (°F )(min/max)	150/150		
	Service/Service code	Fuel Oil/ Hot Oil/ Stabilized Condensate/ Glycol/ Treated Gas/ Sales Gas/ LPG		
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard	ISO 15761		
	Body	OS&Y, bolted bonnet, bolted gland		
	End Connection	Flange, RF to ASME B16.5		
	End to End Dimension	Mfr. Std.		
	Operation	Handwheel Operated		
	Lock Device	Yes		
Material	Others	Anti-static, stem protector, Solid Wedge, replaceable seats.		
	Body	ASTM A105N		
	Seat	Hard Faced Type 316 S.S.		
	Stem	Type 316 S.S.		
	Bolting	Hot Dip Galvanized plated		
Others	Packing	Mfr. Std.		
	Test Standard	API 598/ ISO 15761		
	Certification	EN 10204 3.1		
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location	Above-ground/outdoor		
Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**83. Gate Valves 3/4"- PT/PDT-E1**

	PIPE CLASS	E1	Rating class	Class 900	CA=1.6mm
general	Tag Number	PT/PDT-E1			
	Size Range	Inch	3/4"		
	Design Pressure(PSIG) (max)	1580			
	Design Temperature (°F) (min/max)	-20/150			
	Service/Service code	Fuel Oil/ Hot Oil/ Stabilized Condensate/ Glycol/ Treated Gas/ Sales Gas/ LPG			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ISO 15761			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Flange, RTJ to ASME B16.5			
	End to End Dimension	Mfr. Std.			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Solid Wedge, replaceable seats.			
Material	Body	ASTM A105N			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ISO 15761			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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#### 84. Gate Valves 3/4"- PT/PDT-A2

	PIPE CLASS	A2	Rating class	Class 150	CA=3.0mm
general	Tag Number	PT/PDT-A2			
	Size Range	Inch	3/4"		
	Design Pressure(PSIG) (max)	270			
	Design Temperature (°F )(min/max)	150/500			
	Service/Service code	Raw Gas/ Fuel Gas/ Open Drain/ Vents / Closed Drain			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ISO 15761			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Flange, RF to ASME B16.5			
	End to End Dimension	Mfr. Std.			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Solid Wedge, replaceable seats.			
Material	Body	ASTM A105N			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ISO 15761			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

**Notes:**

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**85. Gate Valves 3/4"- PT/PDT -A4**

	PIPE CLASS	A4	Rating class	Class 150	CA=1.6mm
general	Tag Number	PT/PDT -A4			
	Size Range	Inch	3/4"		
	Design Pressure(PSIG) (max)	270			
	Design Temperature (°F )(min/max)	-50/200			
	Service/Service code	Utility, Instrument& Plant Air			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ISO 15761			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Flange, RF to ASME B16.5			
	End to End Dimension	Mfr. Std.			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Solid Wedge, replaceable seats.			
Material	Body	ASTM A105N			
	Seat	Hard Faced 13% Cr. S.S.			
	Stem	13% Cr. S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ISO 15761			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.





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**86. Gate Valves 3/4"- PT/PDT -A6**

	PIPE CLASS	A6	Rating class	Class 150	CA=0mm
general	Tag Number	PT/PDT -A6			
	Size Range	Inch	3/4"		
	Design Pressure(PSIG) (max)	270			
	Design Temperature (°F )(min/max)	-180/150			
	Service/Service code	Liquified Gas Under -100 °C			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ISO 15761			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Flange, RF to ASME B16.5			
	End to End Dimension	Mfr. Std.			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Solid Wedge, replaceable seats.			
Material	Body	Type 316 S.S.			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ISO 15761			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**87. Gate Valves 3/4"- PT/PDT-B2**

	PIPE CLASS	B2	Rating class	Class 300	CA=3.0mm
general	Tag Number	PT/PDT-B2			
	Size Range	Inch	3/4"		
	Design Pressure(PSIG) (max)	600			
	Design Temperature (°F )(min/max)	200/200			
	Service/Service code	Raw Gas/ Fuel Gas/ Open Drain/ Vents / Closed Drain			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ISO 15761			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Flange, RF to ASME B16.5			
	End to End Dimension	Mfr. Std.			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Solid Wedge, replaceable seats.			
Material	Body	ASTM A105N			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ISO 15761			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**88. Gate Valves 3/4"- PT/PDT -B6**

	PIPE CLASS	B6	Rating class	Class 300	CA=0mm
general	Tag Number	PT/PDT -B6			
	Size Range	Inch	3/4"		
	Design Pressure(PSIG) (max)	600			
	Design Temperature (°F )(min/max)	-120/-70			
	Service/Service code	Liquified Gas Under -100 °C			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ISO 15761			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Flange, RF to ASME B16.5			
	End to End Dimension	Mfr. Std.			
	Operation	Handwheel Operated			
	Lock Device	Yes			
Material	Others	Anti-static, stem protector, Solid Wedge, replaceable seats.			
	Body	Type 316 S.S.			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
Others	Packing	Mfr. Std.			
	Test Standard	API 598/ ISO 15761			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00				

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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### 89. Gate Valves 3/4"- PT/PDT-D2

	PIPE CLASS	D2	Rating class	Class 600	CA=3.0mm
general	Tag Number		PT/PDT-D2		
	Size Range Inch		3/4"		
	Design Pressure(PSIG) (max)		1340		
	Design Temperature (°F )(min/max)		150/650		
	Service/Service code		Raw Gas/ Fuel Gas/ Open Drain/ Vents/ Closed Drain		
	Fluid composition		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		ISO 15761		
	Body		OS&Y, bolted bonnet, bolted gland		
	End Connection		Flange, RF to ASME B16.5		
	End to End Dimension		Mfr. Std.		
	Operation		Handwheel Operated		
	Lock Device		Yes		
Others		Anti-static, stem protector, Solid Wedge, replaceable seats.			
Material	Body		ASTM A105N		
	Seat		Hard Faced Type 316 S.S.		
	Stem		Type 316 S.S.		
	Bolting		Hot Dip Galvanized plated		
	Packing		Mfr. Std.		
Others	Test Standard		API 598/ ISO 15761		
	Certification		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location		Above-ground/outdoor		
	Marking		As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00		

**Notes:**

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**90. Gate Valves 3/4"- PT/PDT -D6**

	PIPE CLASS	D6	Rating class	Class 600	CA=0mm
general	Tag Number	PT/PDT -D6			
	Size Range	Inch	3/4"		
	Design Pressure(PSIG) (max)	1340			
	Design Temperature (°F )(min/max)	-120/150			
	Service/Service code	Liquified Gas Under -100 °C			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ISO 15761			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Flange, RF to ASME B16.5			
	End to End Dimension	Mfr. Std.			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Solid Wedge, replaceable seats.			
Material	Body	Type 316 S.S.			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ISO 15761			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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### 91. Gate Valves 3/4"- PT/PDT-E2

	PIPE CLASS	E2	Rating class	Class 900	CA=3.0mm
general	Tag Number	PT/PDT-E2			
	Size Range	Inch	3/4"		
	Design Pressure(PSIG) (max)	1580			
	Design Temperature (°F )(min/max)	200/650			
	Service/Service code	Raw Gas/ Fuel Gas/ Open Drain/ Vents/ Closed Drain			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ISO 15761			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Flange, RTJ to ASME B16.5			
	End to End Dimension	Mfr. Std.			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Solid Wedge, replaceable seats.			
Material	Body	ASTM A105N			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ISO 15761			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

**Notes:**

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**92. Gate Valves 3/4"- PT/PDT -E6**

	PIPE CLASS	E6	Rating class	Class 900	CA=0mm
general	Tag Number	PT/PDT -E6			
	Size Range	Inch	3/4"		
	Design Pressure(PSIG) (max)	1580			
	Design Temperature (°F )(min/max)	200/200			
	Service/Service code	Liquified Gas Under -100 °C			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ISO 15761			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Flange, RTJ to ASME B16.5			
	End to End Dimension	Mfr. Std.			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Solid Wedge, replaceable seats.			
Material	Body	Type 316 S.S.			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ISO 15761			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**93. Gate Valves 3/4" – PT/PDT-A8**

	PIPE CLASS	A8	Rating class	Class 150	CA=4.5mm
general	Tag Number	PT/PDT-A8			
	Size Range	Inch	3/4"		
	Design Pressure(PSIG) (max)	270			
	Design Temperature (°F )(min/max)	200/200			
	Service/Service code	Produce Water			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ISO 15761			
	Body	OS&Y, bolted bonnet, bolted gland			
	End Connection	Flange, RF to ASME B16.5			
	End to End Dimension	Mfr. Std.			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Solid Wedge, replaceable seats.			
Material	Body	ASTM A105N			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ISO 15761			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			



Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.





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**94. Globe Valves 1/2"~1-1/2"- VGL-101-A1**

	PIPE CLASS	A1	Rating class	Class 800	CA=1.6mm
general	Tag Number	VGL-101-A1			
	Size Range	Inch	1/2"~1-1/2"		
	Design Pressure(PSIG) (max)	270			
	Design Temperature (°F)(min/max)	150/170			
	Service/Service code	Fuel Oil/ Hot Oil/ Stabilized Condensate/ Glycol/ Treated Gas(Sales Gas, LPG)/ Fire Water (A/G)			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ISO 15761			
	Body	OS&Y, bolted bonnet, Rising Stem			
	End Connection	Socket Weld			
	End to End Dimension	Mfr. Std.			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Straight Pattern.			
Material	Body	ASTM A105N			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ISO 15761			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			



Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**95. Globe Valves 1/2"~1-1/2"- VGL-101-A2**

	PIPE CLASS	A2	Rating class	Class 800	CA=3.0mm
general	Tag Number	VGL-101-A2			
	Size Range	Inch	1/2"~1-1/2"		
	Design Pressure(PSIG) (max)	270			
	Design Temperature (°F )(min/max)	150/500			
	Service/Service code	Raw Gas/ Fuel Gas/ Open Drain/ Vents / Closed Drain			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ISO 15761			
	Body	OS&Y, bolted bonnet, Rising Stem			
	End Connection	Socket Weld			
	End to End Dimension	Mfr. Std.			
	Operation	Handwheel Operated			
	Lock Device	Yes			
Material	Others	Anti-static, stem protector, Straight Pattern.			
	Body	ASTM A105N			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
Others	Packing	Mfr. Std.			
	Test Standard	API 598/ ISO 15761			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00				

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**96. Globe Valves 1/2"~1-1/2"- VGL-101-B1**

	PIPE CLASS	B1	Rating class	Class 800	CA=1.6mm
general	Tag Number	VGL-101-B1			
	Size Range	Inch	1/2"~1-1/2"		
	Design Pressure(PSIG) (max)	600			
	Design Temperature (°F)(min/max)	35/650			
	Service/Service code	Fuel Oil/ Hot Oil/ Stabilized Condensate/ Glycol/ Treated Gas( Sales Gas).			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ISO 15761			
	Body	OS&Y, bolted bonnet, Rising Stem			
	End Connection	Socket Weld			
	End to End Dimension	Mfr. Std.			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Straight Pattern.			
Material	Body	ASTM A105N			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ISO 15761			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**97. Globe Valves 1/2"~1-1/2"- VGL-101-B2**

	PIPE CLASS	B2	Rating class	Class 800	CA=3.0mm
general	Tag Number	VGL-101-B2			
	Size Range	Inch	1/2"~1-1/2"		
	Design Pressure(PSIG) (max)	600			
	Design Temperature (°F )(min/max)	200/200			
	Service/Service code	Raw Gas/ Fuel Gas/ Open Drain/ Vents / Closed Drain			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ISO 15761			
	Body	OS&Y, bolted bonnet, Rising Stem			
	End Connection	Socket Weld			
	End to End Dimension	Mfr. Std.			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Straight Pattern.			
Material	Body	ASTM A105N			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ISO 15761			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**98. Globe Valves 1/2"~1-1/2"- VGL-101-A8**

	PIPE CLASS	A8	Rating class	Class 800	CA=4.5mm
general	Tag Number	VGL-101-A8			
	Size Range	Inch	1/2"~1-1/2"		
	Design Pressure(PSIG) (max)	270			
	Design Temperature (°F )(min/max)	200/200			
	Service/Service code	Produce Water			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ISO 15761			
	Body	OS&Y, bolted bonnet, Rising Stem			
	End Connection	Socket Weld			
	End to End Dimension	Mfr. Std.			
	Operation	Handwheel Operated			
	Lock Device	Yes			
Material	Others	Anti-static, stem protector, Straight Pattern.			
	Body	ASTM A105N			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
Others	Packing	Mfr. Std.			
	Test Standard	API 598/ ISO 15761			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00				

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**99. Globe Valves 1/2"~1-1/2"- VGL-102-A4**

	PIPE CLASS	A4	Rating class	Class 800	CA=1.6mm
general	Tag Number	VGL-102-A4			
	Size Range	Inch	1/2"~1-1/2"		
	Design Pressure(PSIG) (max)	270			
	Design Temperature (°F )(min/max)	-50/200			
	Service/Service code	Utility, Instrument& Plant Air			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ISO 15761			
	Body	OS&Y, bolted bonnet, Rising Stem			
	End Connection	Threaded			
	End to End Dimension	Mfr. Std.			
	Operation	Handwheel Operated			
	Lock Device	Yes			
Material	Others	Anti-static, stem protector, Straight Pattern, plug type disc .			
	Body	ASTM A105N			
	Seat	Hard Faced 13% Cr. S.S.			
	Stem	13% Cr. S.S.			
	Bolting	Hot Dip Galvanized plated			
Others	Packing	Mfr. Std.			
	Test Standard	API 598/ ISO 15761			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00				

**Notes:**

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**100. Globe Valves 1/2"~1-1/2"- VGL-103-A3**

	PIPE CLASS	A3	Rating class	Class 800	CA=3.0mm
general	Tag Number	VGL-103-A3			
	Size Range	Inch	1/2"~1-1/2"		
	Design Pressure(PSIG) (max)	270			
	Design Temperature (°F )(min/max)	-50/-50			
	Service/Service code	Flare/ Vent/ Process Gas/ Glycol(Cold Service)/ Process Liquid			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ISO 15761			
	Body	OS&Y, bolted bonnet, Rising Stem			
	End Connection	Socket Weld			
	End to End Dimension	Mfr. Std.			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Straight Pattern.			
Material	Body	ASTM A350 LF2			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ISO 15761			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**101. Globe Valves 1/2"~1-1/2"- VGL-103-B3**

	PIPE CLASS	B3	Rating class	Class 800	CA=3.0mm
general	Tag Number	VGL-103-B3			
	Size Range	Inch	1/2"~1-1/2"		
	Design Pressure(PSIG) (max)	600			
	Design Temperature (°F )(min/max)	-50/265			
	Service/Service code	Flare/ Vent/ Process Gas/ Glycol(Cold Service)/ Process Liquid			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ISO 15761			
	Body	OS&Y, bolted bonnet, Rising Stem			
	End Connection	Socket Weld			
	End to End Dimension	Mfr. Std.			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Straight Pattern.			
Material	Body	ASTM A350 LF2			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ISO 15761			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.





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**102. Globe Valves 1/2"~1-1/2"- VGL-104-A6**

	PIPE CLASS	A6	Rating class	Class 800	CA=0mm
general	Tag Number	VGL-104-A6			
	Size Range	Inch	1/2"~1-1/2"		
	Design Pressure(PSIG) (max)	270			
	Design Temperature (°F )(min/max)	-180/150			
	Service/Service code	Liquified Gas Under -100 °C			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ISO 15761			
	Body	OS&Y, bolted bonnet, Rising Stem			
	End Connection	Socket Weld			
	End to End Dimension	Mfr. Std.			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Straight Pattern.			
Material	Body	Type 316 S.S.			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ISO 15761			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**103. Globe Valves 1/2"~1-1/2"- VGL-104-B6**

	PIPE CLASS	B6	Rating class	Class 800	CA=0mm
general	Tag Number	VGL-104-B6			
	Size Range	Inch	1/2"~1-1/2"		
	Design Pressure(PSIG) (max)	600			
	Design Temperature (°F )(min/max)	-120/-70			
	Service/Service code	Liquified Gas Under -100 °C			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ISO 15761			
	Body	OS&Y, bolted bonnet, Rising Stem			
	End Connection	Socket Weld			
	End to End Dimension	Mfr. Std.			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Straight Pattern.			
Material	Body	Type 316 S.S.			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ISO 15761			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**104. Globe Valves 1/2"~1-1/2"- VGL-121-D1**

	PIPE CLASS	D1	Rating class	Class 1500	CA=1.6mm
general	Tag Number		VGL-121-D1		
	Size Range Inch		1/2"~1-1/2"		
	Design Pressure(PSIG) (max)		1340		
	Design Temperature (°F )(min/max)		150/150		
	Service/Service code		Fuel Oil/ Hot Oil/ Stabilized Condensate/ Glycol/ Treated Gas/ Sales Gas/ LPG		
	Fluid composition		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		ISO 15761		
	Body		OS&Y, bolted bonnet, Rising Stem		
	End Connection		Socket Weld		
	End to End Dimension		Mfr. Std.		
	Operation		Handwheel Operated		
	Lock Device		Yes		
	Others		Anti-static, stem protector, Straight Pattern.		
Material	Body		ASTM A105N		
	Seat		Hard Faced Type 316 S.S.		
	Stem		Type 316 S.S.		
	Bolting		Hot Dip Galvanized plated		
	Packing		Mfr. Std.		
Others	Test Standard		API 598/ ISO 15761		
	Certification		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location		Above-ground/outdoor		
	Marking		As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00		

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**105. Globe Valves 1/2"~1-1/2"- VGL-121-D2**

	PIPE CLASS	D2	Rating class	Class 1500	CA=3.0mm
general	Tag Number		VGL-121-D2		
	Size Range		Inch	1/2"~1-1/2"	
	Design Pressure(PSIG) (max)		1340		
	Design Temperature (°F )(min/max)		150/650		
	Service/Service code		Raw Gas/ Fuel Gas/ Open Drain/ Vents/ Closed Drain		
	Fluid composition		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		ISO 15761		
	Body		OS&Y, bolted bonnet, Rising Stem		
	End Connection		Socket Weld		
	End to End Dimension		Mfr. Std.		
	Operation		Handwheel Operated		
	Lock Device		Yes		
Material	Others		Anti-static, stem protector, Straight Pattern.		
	Body		ASTM A105N		
	Seat		Hard Faced Type 316 S.S.		
	Stem		Type 316 S.S.		
	Bolting		Hot Dip Galvanized plated		
Others	Packing		Mfr. Std.		
	Test Standard		API 598/ ISO 15761		
	Certification		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location		Above-ground/outdoor		
Marking		As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**106. Globe Valves 1/2"~1-1/2"- VGL-121-E1**

	PIPE CLASS	E1	Rating class	Class 1500	CA=1.6mm
general	Tag Number		VGL-121-E1		
	Size Range Inch		1/2"~1-1/2"		
	Design Pressure(PSIG) (max)		1580		
	Design Temperature (°F)(min/max)		-20/150		
	Service/Service code		Fuel Oil/ Hot Oil/ Stabilized Condensate/ Glycol/ Treated Gas/ Sales Gas/ LPG		
	Fluid composition		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		ISO 15761		
	Body		OS&Y, bolted bonnet, Rising Stem		
	End Connection		Socket Weld		
	End to End Dimension		Mfr. Std.		
	Operation		Handwheel Operated		
	Lock Device		Yes		
	Others		Anti-static, stem protector, Straight Pattern.		
Material	Body		ASTM A105N		
	Seat		Hard Faced Type 316 S.S.		
	Stem		Type 316 S.S.		
	Bolting		Hot Dip Galvanized plated		
	Packing		Mfr. Std.		
Others	Test Standard		API 598/ ISO 15761		
	Certification		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location		Above-ground/outdoor		
	Marking		As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00		

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**107. Globe Valves 1/2"~1-1/2"- VGL-121-E2**

	PIPE CLASS	E2	Rating class	Class 1500	CA=3.0mm
general	Tag Number	VGL-121-E2			
	Size Range	Inch	1/2"~1-1/2"		
	Design Pressure(PSIG) (max)	1580			
	Design Temperature (°F )(min/max)	200/650			
	Service/Service code	Raw Gas/ Fuel Gas/ Open Drain/ Vents/ Closed Drain			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ISO 15761			
	Body	OS&Y, bolted bonnet, Rising Stem			
	End Connection	Socket Weld			
	End to End Dimension	Mfr. Std.			
	Operation	Handwheel Operated			
	Lock Device	Yes			
Material	Others	Anti-static, stem protector, Straight Pattern.			
	Body	ASTM A105N			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
Others	Packing	Mfr. Std.			
	Test Standard	API 598/ ISO 15761			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00				

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**108. Globe Valves 1/2"~1-1/2"- VGL-121-D9**

	PIPE CLASS	D9	Rating class	Class 1500	CA=4.5mm
general	Tag Number	VGL-121-D9			
	Size Range	Inch	1/2"~1-1/2"		
	Design Pressure(PSIG) (max)	1340			
	Design Temperature (°F )(min/max)	200/200			
	Service/Service code	Produce Water			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ISO 15761			
	Body	OS&Y, bolted bonnet, Rising Stem			
	End Connection	Socket Weld			
	End to End Dimension	Mfr. Std.			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Straight Pattern.			
Material	Body	ASTM A105N			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ISO 15761			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**109. Globe Valves 1/2"~1-1/2"- VGL-123-D8**

	PIPE CLASS	D8	Rating class	Class 1500	CA=3.0mm
general	Tag Number		VGL-123-D8		
	Size Range		Inch	1/2"~1-1/2"	
	Design Pressure(PSIG) (max)		1340		
	Design Temperature (°F )(min/max)		200/200		
	Service/Service code		Flow Lines		
	Fluid composition		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		ISO 15761		
	Body		OS&Y, bolted bonnet, Rising Stem		
	End Connection		Socket Weld		
	End to End Dimension		Mfr. Std.		
	Operation		Handwheel Operated		
	Lock Device		Yes		
	Others		Anti-static, stem protector, Straight Pattern, plug type disc.		
Material	Body		ASTM A216 Gr. WCB		
	Seat		A105N + Stellite Gr.6		
	Stem		ASTM A182 F6.		
	Bolting		Hot Dip Galvanized plated		
	Packing		Mfr. Std.		
Others	Test Standard		API 598/ ISO 15761		
	Certification		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location		Above-ground/outdoor		
	Marking		As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00		

**Notes:**

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.





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**110. Globe Valves 1/2"~1-1/2"- VGL-123-E8**

	PIPE CLASS	E8	Rating class	Class 1500	CA=3.0mm
general	Tag Number	VGL-123-E8			
	Size Range	Inch	1/2"~1-1/2"		
	Design Pressure(PSIG) (max)	1580			
	Design Temperature (°F )(min/max)	200/200			
	Service/Service code	Flow Lines			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ISO 15761			
	Body	OS&Y, bolted bonnet, Rising Stem			
	End Connection	Socket Weld			
	End to End Dimension	Mfr. Std.			
	Operation	Handwheel Operated			
	Lock Device	Yes			
Material	Others	Anti-static, stem protector, Straight Pattern, plug type disc.			
	Body	ASTM A216 Gr. WCB			
	Seat	A105N + Stellite Gr.6			
	Stem	ASTM A 182 F6.			
	Bolting	Hot Dip Galvanized plated			
Others	Packing	Mfr. Std.			
	Test Standard	API 598/ ISO 15761			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00				

**Notes:**

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**111. Globe Valves 1/2"~1-1/2"- VGL-124-D3**

	PIPE CLASS	D3	Rating class	Class 1500	CA=3.0mm
general	Tag Number	VGL-124-D3			
	Size Range	Inch	1/2"~1-1/2"		
	Design Pressure(PSIG) (max)	1340			
	Design Temperature (°F )(min/max)	-50/265			
	Service/Service code	Flare/ Vent/ Process Gas/ Glycol(Cold Service)/ Process Liquid			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ISO 15761			
	Body	OS&Y, bolted bonnet, Rising Stem			
	End Connection	Socket Weld			
	End to End Dimension	Mfr. Std.			
	Operation	Handwheel Operated			
	Lock Device	Yes			
Material	Others	Anti-static, stem protector, Straight Pattern.			
	Body	ASTM A350 LF2			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
Others	Packing	Mfr. Std.			
	Test Standard	API 598/ ISO 15761			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00				

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**112. Globe Valves 1/2"~1-1/2"- VGL-124-E3**

	PIPE CLASS	E3	Rating class	Class 1500	CA=3.0mm
general	Tag Number	VGL-124-E3			
	Size Range	Inch	1/2"~1-1/2"		
	Design Pressure(PSIG) (max)	1580			
	Design Temperature (°F )(min/max)	-50/265			
	Service/Service code	Flare/ Vent/ Process Gas/ Glycol(Cold Service)/ Process Liquid			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ISO 15761			
	Body	OS&Y, bolted bonnet, Rising Stem			
	End Connection	Socket Weld			
	End to End Dimension	Mfr. Std.			
	Operation	Handwheel Operated			
	Lock Device	Yes			
Material	Others	Anti-static, stem protector, Straight Pattern.			
	Body	ASTM A350 LF2			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
Others	Packing	Mfr. Std.			
	Test Standard	API 598/ ISO 15761			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00				

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**113. Globe Valves 1/2"~1-1/2"- VGL-125-D6**

	PIPE CLASS	D6	Rating class	Class 1500	CA=0mm
general	Tag Number		VGL-125-D6		
	Size Range	Inch	1/2"~1-1/2"		
	Design Pressure(PSIG) (max)	1340			
	Design Temperature (°F )(min/max)	-120/150			
	Service/Service code	Liquified Gas Under -100 °C			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard		ISO 15761		
	Body		OS&Y, bolted bonnet, Rising Stem		
	End Connection		Socket Weld		
	End to End Dimension		Mfr. Std.		
	Operation		Handwheel Operated		
	Lock Device		Yes		
Material	Others		Anti-static, stem protector, Straight Pattern.		
	Body	Type 316 S.S.			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
Others	Packing	Mfr. Std.			
	Test Standard	API 598/ ISO 15761			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00				

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**114. Globe Valves 1/2"~1-1/2"- VGL-125-E6**

	PIPE CLASS	E6	Rating class	Class 1500	CA=0mm
general	Tag Number	VGL-125-E6			
	Size Range	Inch	1/2"~1-1/2"		
	Design Pressure(PSIG) (max)	1580			
	Design Temperature (°F )(min/max)	200/200			
	Service/Service code	Liquified Gas Under -100 °C			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ISO 15761			
	Body	OS&Y, bolted bonnet, Rising Stem			
	End Connection	Socket Weld			
	End to End Dimension	Mfr. Std.			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Straight Pattern.			
Material	Body	Type 316 S.S.			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ISO 15761			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**115. Globe Valves 2”~8”- VGL-201-A1**

	PIPE CLASS	A1	Rating class	Class 150	CA=1.6mm
general	Tag Number	VGL-201-A1			
	Size Range	Inch	2”~8”		
	Design Pressure(PSIG) (max)	270			
	Design Temperature (°F )(min/max)	150/170			
	Service/Service code	Fuel Oil/ Hot Oil/ Stabilized Condensate/ Glycol/ Treated Gas(Sales Gas, LPG)/ Fire Water (A/G)			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ASME B16.34			
	Body	OS&Y, bolted bonnet, Rising Stem			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Straight Pattern, plug type disc, replaceable seats.			
Material	Body	ASTM A216 Gr. WCB			
	Seat	Hard Faced 13% Cr. S.S.			
	Stem	13% Cr. S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ASME B16.34			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			



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Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
5. All valves not less than 8" should be supplied with support.



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**116. Globe Valves 10"~24"- VGL-201-A1**

	PIPE CLASS	A1	Rating class	Class 150	CA=1.6mm
general	Tag Number	VGL-201-A1			
	Size Range	Inch	10"~24"		
	Design Pressure(PSIG) (max)	270			
	Design Temperature (°F)(min/max)	150/170			
	Service/Service code	Fuel Oil/ Hot Oil/ Stabilized Condensate/ Glycol/ Treated Gas(Sales Gas, LPG)/ Fire Water (A/G)			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ASME B16.34			
	Body	OS&Y, bolted bonnet, Rising Stem			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Gear Operation			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Straight Pattern, plug type disc, replaceable seats.			
Material	Body	ASTM A216 Gr. WCB			
	Seat	Hard Faced 13% Cr. S.S.			
	Stem	13% Cr. S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ASME B16.34			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			





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Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
5. All valves not less than 8" should be supplied with support.



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**117. Globe Valves 2”~4”- VGL-201-A4**

	PIPE CLASS	A4	Rating class	Class 150	CA=1.6mm
general	Tag Number	VGL-201-A4			
	Size Range	Inch	2”~4”		
	Design Pressure(PSIG) (max)	270			
	Design Temperature (°F )(min/max)	-50/200			
	Service/Service code	Utility, Instrument& Plant Air			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ASME B16.34			
	Body	OS&Y, bolted bonnet, Rising Stem			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Straight Pattern, plug type disc, replaceable seats.			
Material	Body	ASTM A216 Gr. WCB			
	Seat	Hard Faced 13% Cr. S.S.			
	Stem	13% Cr. S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ASME B16.34			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**118. Globe Valves 2”~8”- VGL-202-A2**

	PIPE CLASS	A2	Rating class	Class 150	CA=3.0mm
general	Tag Number	VGL-202-A2			
	Size Range	Inch	2”~8”		
	Design Pressure(PSIG) (max)	270			
	Design Temperature (°F )(min/max)	150/500			
	Service/Service code	Raw Gas/ Fuel Gas/ Open Drain/ Vents / Closed Drain			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ASME B16.34			
	Body	OS&Y, bolted bonnet, Rising Stem			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Straight Pattern, replaceable seats.			
Material	Body	ASTM A216 Gr. WCB			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ASME B16.34			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
5. All valves not less than 8” should be supplied with support.



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**119. Globe Valves 10”~24”- VGL-202-A2**

	PIPE CLASS	A2	Rating class	Class 150	CA=3.0mm
general	Tag Number	VGL-202-A2			
	Size Range	Inch	10”~24”		
	Design Pressure(PSIG) (max)	270			
	Design Temperature (°F )(min/max)	150/500			
	Service/Service code	Raw Gas/ Fuel Gas/ Open Drain/ Vents / Closed Drain			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ASME B16.34			
	Body	OS&Y, bolted bonnet, Rising Stem			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Gear Operation			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Straight Pattern, replaceable seats.			
Material	Body	ASTM A216 Gr. WCB			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ASME B16.34			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
5. All valves not less than 8” should be supplied with support.



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**120. Globe Valves 2”~8”- VGL-202-A8**

	PIPE CLASS	A8	Rating class	Class 150	CA=4.5mm
general	Tag Number	VGL-202-A8			
	Size Range	Inch	2”~8”		
	Design Pressure(PSIG) (max)	270			
	Design Temperature (°F )(min/max)	200/200			
	Service/Service code	Produce Water			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ASME B16.34			
	Body	OS&Y, bolted bonnet, Rising Stem			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Straight Pattern, replaceable seats.			
Material	Body	ASTM A216 Gr. WCB			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ASME B16.34			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

- This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
- A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
- Valves shall be supplied with arrow direction marked on valve body.
- Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
- All valves not less than 8” should be supplied with support.



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**121. Globe Valves 10”~24”- VGL-202-A8**

	PIPE CLASS	A8	Rating class	Class 150	CA=4.5mm
general	Tag Number	VGL-202-A8			
	Size Range	Inch	10”~24”		
	Design Pressure(PSIG) (max)	270			
	Design Temperature (°F )(min/max)	200/200			
	Service/Service code	Produce Water			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ASME B16.34			
	Body	OS&Y, bolted bonnet, Rising Stem			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Gear Operation			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Straight Pattern, replaceable seats.			
Material	Body	ASTM A216 Gr. WCB			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ASME B16.34			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
5. All valves not less than 8” should be supplied with support.



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**122. Globe Valves 2”~8”- VGL-204-A3**

	PIPE CLASS	A3	Rating class	Class 150	CA=3.0mm
general	Tag Number	VGL-204-A3			
	Size Range	Inch	2”~8”		
	Design Pressure(PSIG) (max)	270			
	Design Temperature (°F )(min/max)	-50/-50			
	Service/Service code	Flare/ Vent/ Process Gas/ Glycol(Cold Service)/ Process Liquid			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ASME B16.34			
	Body	OS&Y, bolted bonnet, Rising Stem			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Straight Pattern, replaceable seats.			
Material	Body	ASTM A352 Gr. LCC			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ASME B16.34			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
5. All valves not less than 8” should be supplied with support.



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**123. Globe Valves 10”~24”- VGL-204-A3**

	PIPE CLASS	A3	Rating class	Class 150	CA=3.0mm
general	Tag Number	VGL-204-A3			
	Size Range	Inch	10”~24”		
	Design Pressure(PSIG) (max)	270			
	Design Temperature (°F )(min/max)	-50/-50			
	Service/Service code	Flare/ Vent/ Process Gas/ Glycol(Cold Service)/ Process Liquid			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ASME B16.34			
	Body	OS&Y, bolted bonnet, Rising Stem			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Gear Operation			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Straight Pattern, replaceable seats.			
Material	Body	ASTM A352 Gr. LCC			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ASME B16.34			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
5. All valves not less than 8” should be supplied with support.





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**124. Globe Valves 2”~8”- VGL-205-A6**

	PIPE CLASS	A6	Rating class	Class 150	CA=0mm
general	Tag Number	VGL-205-A6			
	Size Range	Inch	2”~8”		
	Design Pressure(PSIG) (max)	270			
	Design Temperature (°F )(min/max)	-180/150			
	Service/Service code	Liquified Gas Under -100 °C			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ASME B16.34			
	Body	OS&Y, bolted bonnet, Rising Stem			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Straight Pattern, replaceable seats.			
Material	Body	Type 316 S.S.			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ASME B16.34			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
5. All valves not less than 8” should be supplied with support.



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**125. Globe Valves 10”~24”- VGL-205-A6**

	PIPE CLASS	A6	Rating class	Class 150	CA=0mm
general	Tag Number	VGL-204-A6			
	Size Range	Inch	10”~24”		
	Design Pressure(PSIG) (max)	270			
	Design Temperature (°F )(min/max)	-180/150			
	Service/Service code	Liquified Gas Under -100 °C			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ASME B16.34			
	Body	OS&Y, bolted bonnet, Rising Stem			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Gear Operation			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Straight Pattern, replaceable seats.			
Material	Body	Type 316 S.S.			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ASME B16.34			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
5. All valves not less than 8” should be supplied with support.



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**126. Globe Valves 2”~8”- VGL-211-B1**

	PIPE CLASS	B1	Rating class	Class 300	CA=1.6mm
general	Tag Number	VGL-211-B1			
	Size Range	Inch	2”~8”		
	Design Pressure(PSIG) (max)	600			
	Design Temperature (°F )(min/max)	35/650			
	Service/Service code	Fuel Oil/ Hot Oil/ Stabilized Condensate/ Glycol/ Treated Gas( Sales Gas).			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ASME B16.34			
	Body	OS&Y, bolted bonnet, Rising Stem			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Straight Pattern, plug type disc, replaceable seats.			
Material	Body	ASTM A216 Gr. WCB			
	Seat	Hard Faced 13% Cr. S.S.			
	Stem	13% Cr. S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ASME B16.34			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			



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Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
5. All valves not less than 8" should be supplied with support.



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**127. Globe Valves 10"~24"- VGL-211-B1**

	PIPE CLASS	B1	Rating class	Class 300	CA=1.6mm
general	Tag Number	VGL-211-B1			
	Size Range	Inch	10"~24"		
	Design Pressure(PSIG) (max)	600			
	Design Temperature (°F )(min/max)	35/650			
	Service/Service code	Fuel Oil/ Hot Oil/ Stabilized Condensate/ Glycol/ Treated Gas( Sales Gas).			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ASME B16.34			
	Body	OS&Y, bolted bonnet, Rising Stem			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Gear Operation			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Straight Pattern, plug type disc, replaceable seats.			
Material	Body	ASTM A216 Gr. WCB			
	Seat	Hard Faced 13% Cr. S.S.			
	Stem	13% Cr. S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ASME B16.34			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			



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Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
5. All valves not less than 8" should be supplied with support.



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**128. Globe Valves 2”~8”- VGL-212-B2**

	PIPE CLASS	B2	Rating class	Class 300	CA=3.0mm
general	Tag Number	VGL-212-B2			
	Size Range	Inch	2”~8”		
	Design Pressure(PSIG) (max)	600			
	Design Temperature (°F )(min/max)	200/200			
	Service/Service code	Raw Gas/ Fuel Gas/ Open Drain/ Vents / Closed Drain			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ASME B16.34			
	Body	OS&Y, bolted bonnet, Rising Stem			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Straight Pattern, replaceable seats.			
Material	Body	ASTM A216 Gr. WCB			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ASME B16.34			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
5. All valves not less than 8” should be supplied with support.



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**129. Globe Valves 10"~24"- VGL-212-B2**

	PIPE CLASS	B2	Rating class	Class 300	CA=3.0mm
general	Tag Number	VGL-212-B2			
	Size Range	Inch	10"~24"		
	Design Pressure(PSIG) (max)	600			
	Design Temperature (°F )(min/max)	200/200			
	Service/Service code	Raw Gas/ Fuel Gas/ Open Drain/ Vents / Closed Drain			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ASME B16.34			
	Body	OS&Y, bolted bonnet, Rising Stem			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Gear Operation			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Straight Pattern, replaceable seats.			
Material	Body	ASTM A216 Gr. WCB			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ASME B16.34			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
5. All valves not less than 8" should be supplied with support.





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**130. Globe Valves 2”~8”- VGL-214-B3**

	PIPE CLASS	B3	Rating class	Class 300	CA=3.0mm
general	Tag Number	VGL-214-B3			
	Size Range	Inch	2”~8”		
	Design Pressure(PSIG) (max)	600			
	Design Temperature (°F )(min/max)	-50/265			
	Service/Service code	Flare/ Vent/ Process Gas/ Glycol(Cold Service)/ Process Liquid			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ASME B16.34			
	Body	OS&Y, bolted bonnet, Rising Stem			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Straight Pattern, replaceable seats.			
Material	Body	ASTM A352 Gr. LCC			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ASME B16.34			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
5. All valves not less than 8” should be supplied with support.



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**131. Globe Valves 10"~24"- VGL-214-B3**

	PIPE CLASS	B3	Rating class	Class 300	CA=3.0mm
general	Tag Number	VGL-214-B3			
	Size Range	Inch	10"~24"		
	Design Pressure(PSIG) (max)	600			
	Design Temperature (°F)(min/max)	-50/265			
	Service/Service code	Flare/ Vent/ Process Gas/ Glycol(Cold Service)/ Process Liquid			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ASME B16.34			
	Body	OS&Y, bolted bonnet, Rising Stem			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Gear Operation			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Straight Pattern, replaceable seats.			
Material	Body	ASTM A352 Gr. LCC			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ASME B16.34			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
5. All valves not less than 8" should be supplied with support.



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**132. Globe Valves 2”~8”- VGL-215-B6**

	PIPE CLASS	B6	Rating class	Class 300	CA=0mm
general	Tag Number	VGL-215-B6			
	Size Range	Inch	2”~8”		
	Design Pressure(PSIG) (max)	600			
	Design Temperature (°F )(min/max)	-120/-70			
	Service/Service code	Liquified Gas Under -100 °C			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ASME B16.34			
	Body	OS&Y, bolted bonnet, Rising Stem			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Straight Pattern, replaceable seats.			
Material	Body	Type 316 S.S.			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ASME B16.34			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
5. All valves not less than 8” should be supplied with support.



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**133. Globe Valves 10"~24"- VGL-215-B6**

	PIPE CLASS	B6	Rating class	Class 300	CA=0mm
general	Tag Number	VGL-215-B6			
	Size Range	Inch	10"~24"		
	Design Pressure(PSIG) (max)	600			
	Design Temperature (°F )(min/max)	-120/-70			
	Service/Service code	Liquified Gas Under -100 °C			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ASME B16.34			
	Body	OS&Y, bolted bonnet, Rising Stem			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Gear Operation			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Straight Pattern, replaceable seats.			
Material	Body	Type 316 S.S.			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ASME B16.34			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
5. All valves not less than 8" should be supplied with support.



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**134. Globe Valves 2”~6”- VGL-221-D1**

	PIPE CLASS	D1	Rating class	Class 600	CA=1.6mm
general	Tag Number		VGL-221-D1		
	Size Range	Inch	2”~6”		
	Design Pressure(PSIG)	(max)	1340		
	Design Temperature (°F)	(min/max)	150/150		
	Service/Service code	Fuel Oil/ Hot Oil/ Stabilized Condensate/ Glycol/ Treated Gas/ Sales Gas/ LPG			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard		ASME B16.34		
	Body		OS&Y, bolted bonnet, Rising Stem		
	End Connection		Flange, RF to ASME B16.5		
	Face to Face Dimension		ASME B16.10		
	Operation		Handwheel Operated		
	Lock Device		Yes		
	Others		Anti-static, stem protector, Straight Pattern, plug type disc, replaceable seats.		
Material	Body		ASTM A216 Gr. WCB		
	Seat		Hard Faced 13% Cr. S.S.		
	Stem		13% Cr. S.S.		
	Bolting		Hot Dip Galvanized plated		
	Packing		Mfr. Std.		
Others	Test Standard		API 598/ ASME B16.34		
	Certification		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location		Above-ground/outdoor		
	Marking		As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00		



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Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**135. Globe Valves 8"~24"- VGL-221-D1**

PIPE CLASS	D1	Rating class	Class 600	CA=1.6mm
general	Tag Number	VGL-221-D1		
	Size Range	Inch	8"~24"	
	Design Pressure(PSIG) (max)	1340		
	Design Temperature (°F)(min/max)	150/150		
	Service/Service code	Fuel Oil/ Hot Oil/ Stabilized Condensate/ Glycol/ Treated Gas/ Sales Gas/ LPG		
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard	ASME B16.34		
	Body	OS&Y, bolted bonnet, Rising Stem		
	End Connection	Flange, RF to ASME B16.5		
	Face to Face Dimension	ASME B16.10		
	Operation	Gear Operation		
	Lock Device	Yes		
Others	Anti-static, stem protector, Straight Pattern, plug type disc, replaceable seats.			
Material	Body	ASTM A216 Gr. WCB		
	Seat	Hard Faced 13% Cr. S.S.		
	Stem	13% Cr. S.S.		
	Bolting	Hot Dip Galvanized plated		
	Packing	Mfr. Std.		
Others	Test Standard	API 598/ ASME B16.34		
	Certification	EN 10204 3.1		
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location	Above-ground/outdoor		
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00		



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Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
5. All valves not less than 8" should be supplied with support.





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**136. Globe Valves 2”~6”- VGL-222-D2**

	PIPE CLASS	D2	Rating class	Class 600	CA=3.0mm
general	Tag Number		VGL-222-D2		
	Size Range	Inch	2”~6”		
	Design Pressure(PSIG)	(max)	1340		
	Design Temperature (°F)	(min/max)	150/650		
	Service/Service code	Raw Gas/ Fuel Gas/ Open Drain/ Vents/ Closed Drain			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard		ASME B16.34		
	Body		OS&Y, bolted bonnet, Rising Stem		
	End Connection		Flange, RF to ASME B16.5		
	Face to Face Dimension		ASME B16.10		
	Operation		Handwheel Operated		
	Lock Device		Yes		
	Others		Anti-static, stem protector, Straight Pattern, replaceable seats.		
Material	Body		ASTM A216 Gr. WCB		
	Seat		Hard Faced Type 316 S.S.		
	Stem		Type 316 S.S.		
	Bolting		Hot Dip Galvanized plated		
	Packing		Mfr. Std.		
Others	Test Standard		API 598/ ASME B16.34		
	Certification		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location		Above-ground/outdoor		
	Marking		As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00		

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**137. Globe Valves 8”~24”- VGL-222-D2**

	PIPE CLASS	D2	Rating class	Class 600	CA=3.0mm
general	Tag Number		VGL-222-D2		
	Size Range	Inch	8”~24”		
	Design Pressure(PSIG)	(max)	1340		
	Design Temperature (°F)	(min/max)	150/650		
	Service/Service code	Raw Gas/ Fuel Gas/ Open Drain/ Vents/ Closed Drain			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ASME B16.34			
	Body	OS&Y, bolted bonnet, Rising Stem			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Gear Operation			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Straight Pattern, replaceable seats.			
Material	Body	ASTM A216 Gr. WCB			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ASME B16.34			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
5. All valves not less than 8” should be supplied with support.



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**138. Globe Valves 2”~6”- VGL-222-D9**

	PIPE CLASS	D9	Rating class	Class 600	CA=4.5mm
general	Tag Number	VGL-222-D9			
	Size Range	Inch	2”~6”		
	Design Pressure(PSIG) (max)	1340			
	Design Temperature (°F )(min/max)	200/200			
	Service/Service code	Produce Water			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ASME B16.34			
	Body	OS&Y, bolted bonnet, Rising Stem			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Straight Pattern, replaceable seats.			
Material	Body	ASTM A216 Gr. WCB			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ASME B16.34			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**139. Globe Valves 8”~24”- VGL-222-D9**

	PIPE CLASS	D9	Rating class	Class 600	CA=4.5mm
general	Tag Number	VGL-222-D9			
	Size Range	Inch	8”~24”		
	Design Pressure(PSIG) (max)	1340			
	Design Temperature (°F )(min/max)	200/200			
	Service/Service code	Produce Water			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ASME B16.34			
	Body	OS&Y, bolted bonnet, Rising Stem			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Gear Operation			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Straight Pattern, replaceable seats.			
Material	Body	ASTM A216 Gr. WCB			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ASME B16.34			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
5. All valves not less than 8” should be supplied with support.



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**140. Globe Valves 2”~6”- VGL-224-D3**

	PIPE CLASS	D3	Rating class	Class 600	CA=3.0mm
general	Tag Number	VGL-224-D3			
	Size Range	Inch	2”~6”		
	Design Pressure(PSIG) (max)	1340			
	Design Temperature (°F )(min/max)	-50/265			
	Service/Service code	Flare/ Vent/ Process Gas/ Glycol(Cold Service)/ Process Liquid			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ASME B16.34			
	Body	OS&Y, bolted bonnet, Rising Stem			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Straight Pattern, replaceable seats.			
Material	Body	ASTM A352 Gr. LCC			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ASME B16.34			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**141. Globe Valves 8”~24”- VGL-224-D3**

	PIPE CLASS	D3	Rating class	Class 600	CA=3.0mm
general	Tag Number	VGL-224-D3			
	Size Range	Inch	8”~24”		
	Design Pressure(PSIG) (max)	1340			
	Design Temperature (°F )(min/max)	-50/265			
	Service/Service code	Flare/ Vent/ Process Gas/ Glycol(Cold Service)/ Process Liquid			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ASME B16.34			
	Body	OS&Y, bolted bonnet, Rising Stem			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Gear Operation			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Straight Pattern, replaceable seats.			
Material	Body	ASTM A352 Gr. LCC			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ASME B16.34			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
5. All valves not less than 8” should be supplied with support.



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**142. Globe Valves 2”~4”- VGL-225-D8**

	PIPE CLASS	D8	Rating class	Class 600	CA=3.0mm
general	Tag Number	VGL-225-D8			
	Size Range	Inch	2”~4”		
	Design Pressure(PSIG) (max)	1340			
	Design Temperature (°F )(min/max)	200/200			
	Service/Service code	Flow Lines			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ASME B16.34			
	Body	OS&Y, bolted bonnet, Rising Stem			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Straight Pattern, plug type disc, replaceable seats.			
Material	Body	ASTM A 216 Gr. WCB			
	Seat	A105N + Stellite Gr.6			
	Stem	ASTM A182 F6			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ASME B16.34			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**143. Globe Valves 6”~24”- VGL-225-D8**

	PIPE CLASS	D8	Rating class	Class 600	CA=3.0mm
general	Tag Number	VGL-225-D8			
	Size Range	Inch	6”~24”		
	Design Pressure(PSIG) (max)	1340			
	Design Temperature (°F )(min/max)	200/200			
	Service/Service code	Flow Lines			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ASME B16.34			
	Body	OS&Y, bolted bonnet, Rising Stem			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Gear Operation			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Straight Pattern, plug type disc, replaceable seats.			
Material	Body	ASTM A 216 Gr. WCB			
	Seat	A105N + Stellite Gr.6			
	Stem	ASTM A182 F6			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ASME B16.34			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
5. All valves not less than 8” should be supplied with support.





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**144. Globe Valves 2”~6”- VGL-226-D6**

	PIPE CLASS	D6	Rating class	Class 600	CA=0mm
general	Tag Number	VGL-226-D6			
	Size Range	Inch	2”~6”		
	Design Pressure(PSIG) (max)	1340			
	Design Temperature (°F )(min/max)	-120/150			
	Service/Service code	Liquified Gas Under -100 °C			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ASME B16.34			
	Body	OS&Y, bolted bonnet, Rising Stem			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Straight Pattern, replaceable seats.			
Material	Body	Type 316 S.S.			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ASME B16.34			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**145. Globe Valves 8”~24”- VGL-226-D6**

	PIPE CLASS	D6	Rating class	Class 600	CA=0mm
general	Tag Number	VGL-226-D6			
	Size Range	Inch	8”~24”		
	Design Pressure(PSIG) (max)	1340			
	Design Temperature (°F )(min/max)	-120/150			
	Service/Service code	Liquified Gas Under -100 °C			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ASME B16.34			
	Body	OS&Y, bolted bonnet, Rising Stem			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Gear Operation			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Straight Pattern, replaceable seats.			
Material	Body	Type 316 S.S.			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ASME B16.34			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
5. All valves not less than 8” should be supplied with support.



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**146. Globe Valves 2”~4”- VGL-231-E1**

	PIPE CLASS	E1	Rating class	Class 900	CA=1.6mm
general	Tag Number	VGL-231-E1			
	Size Range	Inch	2”~4”		
	Design Pressure(PSIG) (max)	1580			
	Design Temperature (°F )(min/max)	-20/150			
	Service/Service code	Fuel Oil/ Hot Oil/ Stabilized Condensate/ Glycol/ Treated Gas/ Sales Gas/ LPG			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ASME B16.34			
	Body	OS&Y, bolted bonnet, Rising Stem			
	End Connection	Flange, RTJ to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Straight Pattern, plug type disc, replaceable seats.			
Material	Body	ASTM A216 Gr. WCB			
	Seat	Hard Faced 13% Cr. S.S.			
	Stem	13% Cr. S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ASME B16.34			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			



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Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**147. Globe Valves 6"~24"- VGL-231-E1**

	PIPE CLASS	E1	Rating class	Class 900	CA=1.6mm
general	Tag Number	VGL-231-E1			
	Size Range	Inch	6"~24"		
	Design Pressure(PSIG) (max)	1580			
	Design Temperature (°F)(min/max)	-20/150			
	Service/Service code	Fuel Oil/ Hot Oil/ Stabilized Condensate/ Glycol/ Treated Gas/ Sales Gas/ LPG			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ASME B16.34			
	Body	OS&Y, bolted bonnet, Rising Stem			
	End Connection	Flange, RTJ to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Gear Operation			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Straight Pattern, plug type disc, replaceable seats.			
Material	Body	ASTM A216 Gr. WCB			
	Seat	Hard Faced 13% Cr. S.S.			
	Stem	13% Cr. S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ASME B16.34			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			



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Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves  
NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
5. All valves not less than 8" should be supplied with support.



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**148. Globe Valves 2”~4”- VGL-232-E2**

	PIPE CLASS	E2	Rating class	Class 900	CA=3.0mm
general	Tag Number	VGL-232-E2			
	Size Range	Inch	2”~4”		
	Design Pressure(PSIG) (max)	1580			
	Design Temperature (°F )(min/max)	200/650			
	Service/Service code	Raw Gas/ Fuel Gas/ Open Drain/ Vents/ Closed Drain			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ASME B16.34			
	Body	OS&Y, bolted bonnet, Rising Stem			
	End Connection	Flange, RTJ to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Straight Pattern, replaceable seats.			
Material	Body	ASTM A216 Gr. WCB			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ASME B16.34			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**149. Globe Valves 6”~24”- VGL-232-E2**

	PIPE CLASS	E2	Rating class	Class 900	CA=3.0mm
general	Tag Number	VGL-232-E2			
	Size Range	Inch	6”~24”		
	Design Pressure(PSIG) (max)	1580			
	Design Temperature (°F )(min/max)	200/650			
	Service/Service code	Raw Gas/ Fuel Gas/ Open Drain/ Vents/ Closed Drain			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ASME B16.34			
	Body	OS&Y, bolted bonnet, Rising Stem			
	End Connection	Flange, RTJ to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Gear Operation			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Straight Pattern, replaceable seats.			
Material	Body	ASTM A216 Gr. WCB			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ASME B16.34			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
5. All valves not less than 8” should be supplied with support.





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**150. Globe Valves 2”~4”- VGL-234-E8**

	PIPE CLASS	E8	Rating class	Class 900	CA=3.0mm
general	Tag Number	VGL-234-E8			
	Size Range	Inch	2”~4”		
	Design Pressure(PSIG) (max)	1580			
	Design Temperature (°F )(min/max)	200/200			
	Service/Service code	Flow Lines			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ASME B16.34			
	Body	OS&Y, bolted bonnet, Rising Stem			
	End Connection	Flange, RTJ to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Straight Pattern, plug type disc, replaceable seats.			
Material	Body	ASTM A 216 Gr. WCB			
	Seat	A105N + Stellite Gr.6			
	Stem	ASTM A182 F6			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ASME B16.34			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**151. Globe Valves 6”~24”- VGL-234-E8**

	PIPE CLASS	E8	Rating class	Class 900	CA=3.0mm
general	Tag Number	VGL-234-E8			
	Size Range	Inch	6”~24”		
	Design Pressure(PSIG) (max)	1580			
	Design Temperature (°F )(min/max)	200/200			
	Service/Service code	Flow Lines			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ASME B16.34			
	Body	OS&Y, bolted bonnet, Rising Stem			
	End Connection	Flange, RTJ to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Gear Operation			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Straight Pattern, plug type disc, replaceable seats.			
Material	Body	ASTM A 216 Gr. WCB			
	Seat	A105N + Stellite Gr.6			
	Stem	ASTM A182 F6			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ASME B16.34			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
5. All valves not less than 8” should be supplied with support.



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**152. Globe Valves 2”~4”- VGL-235-E3**

	PIPE CLASS	E3	Rating class	Class 900	CA=3.0mm
general	Tag Number	VGL-234-E3			
	Size Range	Inch	2”~4”		
	Design Pressure(PSIG) (max)	1580			
	Design Temperature (°F )(min/max)	-50/265			
	Service/Service code	Flare/ Vent/ Process Gas/ Glycol(Cold Service)/ Process Liquid			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ASME B16.34			
	Body	OS&Y, bolted bonnet, Rising Stem			
	End Connection	Flange, RTJ to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Straight Pattern, replaceable seats.			
Material	Body	ASTM A352 Gr. LCC			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ASME B16.34			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**153. Globe Valves 6”~24”- VGL-235-E3**

	PIPE CLASS	E3	Rating class	Class 900	CA=3.0mm
general	Tag Number	VGL-235-E3			
	Size Range	Inch	6”~24”		
	Design Pressure(PSIG) (max)	1580			
	Design Temperature (°F )(min/max)	-50/265			
	Service/Service code	Flare/ Vent/ Process Gas/ Glycol(Cold Service)/ Process Liquid			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ASME B16.34			
	Body	OS&Y, bolted bonnet, Rising Stem			
	End Connection	Flange, RTJ to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Gear Operation			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Straight Pattern, replaceable seats.			
Material	Body	ASTM A352 Gr. LCC			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Bolting	Hot Dip Galvanized plated			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ASME B16.34			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
5. All valves not less than 8” should be supplied with support.



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**154. Globe Valves 2”~4”- VGL-236-E6**

	PIPE CLASS	E6	Rating class	Class 900	CA=0mm
general	Tag Number	VGL-236-E6			
	Size Range	Inch	2”~4”		
	Design Pressure(PSIG) (max)	1580			
	Design Temperature (°F )(min/max)	200/200			
	Service/Service code	Liquified Gas Under -100 °C			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ASME B16.34			
	Body	OS&Y, bolted bonnet, Rising Stem			
	End Connection	Flange, RTJ to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Handwheel Operated			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Straight Pattern, plug type disc, replaceable seats.			
Material	Body	Type 316 S.S.			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ASME B16.34			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**155. Globe Valves 6"~24"- VGL-236-E6**

	PIPE CLASS	E6	Rating class	Class 900	CA=0mm
general	Tag Number	VGL-236-E6			
	Size Range	Inch	6"~24"		
	Design Pressure(PSIG) (max)	1580			
	Design Temperature (°F )(min/max)	200/200			
	Service/Service code	Liquified Gas Under -100 °C			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ASME B16.34			
	Body	OS&Y, bolted bonnet, Rising Stem			
	End Connection	Flange, RTJ to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Operation	Gear Operation			
	Lock Device	Yes			
	Others	Anti-static, stem protector, Straight Pattern, plug type disc, replaceable seats.			
Material	Body	Type 316 S.S.			
	Seat	Hard Faced Type 316 S.S.			
	Stem	Type 316 S.S.			
	Packing	Mfr. Std.			
Others	Test Standard	API 598/ ASME B16.34			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
5. All valves not less than 8" should be supplied with support.



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**156. Check Valves 1/2"~1-1/2"- VC-101-A1**

	PIPE CLASS	A1	Rating class	Class 800	CA=1.6mm
general	Tag Number		VC-101-A1		
	Size Range Inch		1/2"~1-1/2"		
	Design Pressure(PSIG) (max)		270		
	Design Temperature (°F )(min/max)		150/170		
	Service/Service code		Fuel Oil/ Hot Oil/ Stabilized Condensate/ Glycol/ Treated Gas(Sales Gas, LPG)/ Fire Water (A/G)		
	Fluid composition		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		ISO 15761		
	Valve Type		Swing Check		
	Body		Bolted bonnet		
	End Connection		Socket Weld		
	End to End Dimension		Mfr. Std.		
	Others		Anti-static, anti-blow-out stem		
Material	Body		ASTM A105N		
	Seat		Hard Faced Type 316 S.S.		
	Pin		Type 316 S.S.		
	Bolting		Hot Dip Galvanized plated		
	Seal		Mfr. Std.		
Others	Test Standard		API 598/ ISO 15761		
	Certification		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location		Above-ground/outdoor		
	Marking		As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00		

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**157. Check Valves 1/2"~1-1/2"- VC-101-A2**

	PIPE CLASS	A2	Rating class	Class 800	CA=3.0mm
general	Tag Number		VC-101-A2		
	Size Range	Inch	1/2"~1-1/2"		
	Design Pressure(PSIG)	(max)	270		
	Design Temperature (°F)	(min/max)	150/500		
	Service/Service code	Raw Gas/ Fuel Gas/ Open Drain/ Vents / Closed Drain			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard		ISO 15761		
	Valve Type		Swing Check		
	Body		Bolted bonnet		
	End Connection		Socket Weld		
	End to End Dimension		Mfr. Std.		
	Others		Anti-static, anti-blow-out stem		
Material	Body		ASTM A105N		
	Seat		Hard Faced Type 316 S.S.		
	Pin		Type 316 S.S.		
	Bolting		Hot Dip Galvanized plated		
	Seal		Mfr. Std.		
Others	Test Standard		API 598/ ISO 15761		
	Certification		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location		Above-ground/outdoor		
	Marking		As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00		

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.





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**158. Check Valves 1/2"~1-1/2"- VC-101-B1**

	PIPE CLASS	B1	Rating class	Class 800	CA=1.6mm
general	Tag Number		VC-101-B1		
	Size Range Inch		1/2"~1-1/2"		
	Design Pressure(PSIG) (max)		600		
	Design Temperature (°F )(min/max)		35/650		
	Service/Service code		Fuel Oil/ Hot Oil/ Stabilized Condensate/ Glycol/ Treated Gas( Sales Gas).		
	Fluid composition		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		ISO 15761		
	Valve Type		Swing Check		
	Body		Bolted bonnet		
	End Connection		Socket Weld		
	End to End Dimension		Mfr. Std.		
	Others		Anti-static, anti-blow-out stem		
Material	Body		ASTM A105N		
	Seat		Hard Faced Type 316 S.S.		
	Pin		Type 316 S.S.		
	Bolting		Hot Dip Galvanized plated		
	Seal		Mfr. Std.		
Others	Test Standard		API 598/ ISO 15761		
	Certification		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location		Above-ground/outdoor		
	Marking		As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00		

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**159. Check Valves 1/2"~1-1/2"- VC-101-B2**

	PIPE CLASS	B2	Rating class	Class 800	CA=3.0mm
general	Tag Number		VC-101-B2		
	Size Range	Inch	1/2"~1-1/2"		
	Design Pressure(PSIG)	(max)	600		
	Design Temperature (°F)	(min/max)	200/200		
	Service/Service code	Raw Gas/ Fuel Gas/ Open Drain/ Vents / Closed Drain			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard		ISO 15761		
	Valve Type		Swing Check		
	Body		Bolted bonnet		
	End Connection		Socket Weld		
	End to End Dimension		Mfr. Std.		
	Others		Anti-static, anti-blow-out stem		
Material	Body		ASTM A105N		
	Seat		Hard Faced Type 316 S.S.		
	Pin		Type 316 S.S.		
	Bolting		Hot Dip Galvanized plated		
	Seal		Mfr. Std.		
Others	Test Standard		API 598/ ISO 15761		
	Certification		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location		Above-ground/outdoor		
	Marking		As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00		

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**160. Check Valves 1/2"~1-1/2"- VC-101-A8**

	PIPE CLASS	A8	Rating class	Class 800	CA=4.5mm
general	Tag Number		VC-101-A8		
	Size Range	Inch	1/2"~1-1/2"		
	Design Pressure(PSIG)	(max)	270		
	Design Temperature (°F)	(min/max)	200/200		
	Service/Service code	Produce Water			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard		ISO 15761		
	Valve Type		Swing Check		
	Body		Bolted bonnet		
	End Connection		Socket Weld		
	End to End Dimension		Mfr. Std.		
	Others		Anti-static, anti-blow-out stem		
Material	Body		ASTM A105N		
	Seat		Hard Faced Type 316 S.S.		
	Pin		Type 316 S.S.		
	Bolting		Hot Dip Galvanized plated		
	Seal		Mfr. Std.		
Others	Test Standard		API 598/ ISO 15761		
	Certification		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location		Above-ground/outdoor		
	Marking		As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00		

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**161. Check Valves 1/2"~1-1/2"- VC-102-A4**

PIPE CLASS	A4	Rating class	Class 800	CA=1.6mm
general	Tag Number	VC-102-A4		
	Size Range	Inch	1/2"~1-1/2"	
	Design Pressure(PSIG) (max)	270		
	Design Temperature (°F )(min/max)	-50/200		
	Service/Service code	Utility, Instrument& Plant Air		
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard	ISO 15761		
	Valve Type	Piston Check		
	Body	Bolted bonnet		
	End Connection	Threaded		
	End to End Dimension	Mfr. Std.		
	Others	Anti-static, anti-blow-out stem, renewable seat		
Material	Body	ASTM A105N		
	Seat	Hard Faced 13% Cr. S.S.		
	Piston	13% Cr. S.S.		
	Bolting	Hot Dip Galvanized plated		
	Seal	Mfr. Std.		
Others	Test Standard	API 598/ ISO 15761		
	Certification	EN 10204 3.1		
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location	Above-ground/outdoor		
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00		

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
5. Valves shall be installed in horizontal pipe.



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**162. Check Valves 1/2"~1-1/2"- VC-103-A6**

	PIPE CLASS	A6	Rating class	Class 800	CA=0mm
general	Tag Number		VC-103-A6		
	Size Range Inch		1/2"~1-1/2"		
	Design Pressure(PSIG) (max)		270		
	Design Temperature (°F )(min/max)		-180/150		
	Service/Service code		Liquified Gas Under -100 °C		
	Fluid composition		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		ISO 15761		
	Valve Type		Swing Check		
	Body		Bolted bonnet		
	End Connection		Socket Weld		
	End to End Dimension		Mfr. Std.		
	Others		Anti-static, anti-blow-out stem		
Material	Body		Type 316 S.S.		
	Seat		Hard Faced Type 316 S.S.		
	Pin		Type 316 S.S.		
	Seal		Mfr. Std.		
Others	Test Standard		API 598/ ISO 15761		
	Certification		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location		Above-ground/outdoor		
	Marking		As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00		

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**163. Check Valves 1/2"~1-1/2"- VC-103-B6**

PIPE CLASS	B6	Rating class	Class 800	CA=0mm
general	Tag Number	VC-103-B6		
	Size Range	Inch	1/2"~1-1/2"	
	Design Pressure(PSIG) (max)	600		
	Design Temperature (°F )(min/max)	-120/-70		
	Service/Service code	Liquified Gas Under -100 °C		
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard	ISO 15761		
	Valve Type	Swing Check		
	Body	Bolted bonnet		
	End Connection	Socket Weld		
	End to End Dimension	Mfr. Std.		
	Others	Anti-static, anti-blow-out stem		
Material	Body	Type 316 S.S.		
	Seat	Hard Faced Type 316 S.S.		
	Pin	Type 316 S.S.		
	Seal	Mfr. Std.		
Others	Test Standard	API 598/ ISO 15761		
	Certification	EN 10204 3.1		
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location	Above-ground/outdoor		
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00		

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**164. Check Valves 1/2"~1-1/2"- VC-104-A3**

	PIPE CLASS	A3	Rating class	Class 800	CA=3.0mm
general	Tag Number		VC-104-A3		
	Size Range Inch		1/2"~1-1/2"		
	Design Pressure(PSIG) (max)		270		
	Design Temperature (°F )(min/max)		-50/-50		
	Service/Service code		Flare/ Vent/ Process Gas/ Glycol(Cold Service)/ Process Liquid		
	Fluid composition		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		ISO 15761		
	Valve Type		Swing Check		
	Body		Bolted bonnet		
	End Connection		Socket Weld		
	End to End Dimension		Mfr. Std.		
	Others		Anti-static, anti-blow-out stem		
Material	Body		ASTM A350 LF2		
	Seat		Hard Faced Type 316 S.S.		
	Pin		Type 316 S.S.		
	Bolting		Hot Dip Galvanized plated		
	Seal		Mfr. Std.		
Others	Test Standard		API 598/ ISO 15761		
	Certification		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location		Above-ground/outdoor		
	Marking		As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00		

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**165. Check Valves 1/2"~1-1/2"- VC-104-B3**

	PIPE CLASS	B3	Rating class	Class 800	CA=3.0mm
general	Tag Number		VC-104-B3		
	Size Range	Inch	1/2"~1-1/2"		
	Design Pressure(PSIG)	(max)	600		
	Design Temperature (°F)	(min/max)	-50/265		
	Service/Service code	Flare/ Vent/ Process Gas/ Glycol(Cold Service)/ Process Liquid			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard		ISO 15761		
	Valve Type		Swing Check		
	Body		Bolted bonnet		
	End Connection		Socket Weld		
	End to End Dimension		Mfr. Std.		
	Others		Anti-static, anti-blow-out stem		
Material	Body		ASTM A350 LF2		
	Seat		Hard Faced Type 316 S.S.		
	Pin		Type 316 S.S.		
	Bolting		Hot Dip Galvanized plated		
	Seal		Mfr. Std.		
Others	Test Standard		API 598/ ISO 15761		
	Certification		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location		Above-ground/outdoor		
	Marking		As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00		

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.





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**166. Check Valves 1/2"~1-1/2"- VC-121-D1**

	PIPE CLASS	D1	Rating class	Class 1500	CA=1.6mm
general	Tag Number		VC-121-D1		
	Size Range	Inch	1/2"~1-1/2"		
	Design Pressure(PSIG)	(max)	1340		
	Design Temperature (°F)	(min/max)	150/150		
	Service/Service code	Fuel Oil/ Hot Oil/ Stabilized Condensate/ Glycol/ Treated Gas/ Sales Gas/ LPG			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard		ISO 15761		
	Valve Type		Swing Check		
	Body		Bolted bonnet		
	End Connection		Socket Weld		
	End to End Dimension		Mfr. Std.		
	Others		Anti-static, anti-blow-out stem		
Material	Body		ASTM A105N		
	Seat		Hard Faced Type 316 S.S.		
	Pin		Type 316 S.S.		
	Bolting		Hot Dip Galvanized plated		
	Seal		Mfr. Std.		
Others	Test Standard		API 598/ ISO 15761		
	Certification		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location		Above-ground/outdoor		
	Marking		As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00		

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**167. Check Valves 1/2"~1-1/2"- VC-121-D2**

	PIPE CLASS	D2	Rating class	Class 1500	CA=3.0mm
general	Tag Number		VC-121-D2		
	Size Range	Inch	1/2"~1-1/2"		
	Design Pressure(PSIG)	(max)	1340		
	Design Temperature (°F)	(min/max)	150/650		
	Service/Service code	Raw Gas/ Fuel Gas/ Open Drain/ Vents/ Closed Drain			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard		ISO 15761		
	Valve Type		Swing Check		
	Body		Bolted bonnet		
	End Connection		Socket Weld		
	End to End Dimension		Mfr. Std.		
	Others		Anti-static, anti-blow-out stem		
Material	Body		ASTM A105N		
	Seat		Hard Faced Type 316 S.S.		
	Pin		Type 316 S.S.		
	Bolting		Hot Dip Galvanized plated		
	Seal		Mfr. Std.		
Others	Test Standard		API 598/ ISO 15761		
	Certification		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location		Above-ground/outdoor		
	Marking		As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00		

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**168. Check Valves 1/2"~1-1/2"- VC-121-E1**

	PIPE CLASS	E1	Rating class	Class 1500	CA=1.6mm
general	Tag Number		VC-121-E1		
	Size Range Inch		1/2"~1-1/2"		
	Design Pressure(PSIG) (max)		1580		
	Design Temperature (°F )(min/max)		-20/150		
	Service/Service code		Fuel Oil/ Hot Oil/ Stabilized Condensate/ Glycol/ Treated Gas/ Sales Gas/ LPG		
	Fluid composition		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		ISO 15761		
	Valve Type		Swing Check		
	Body		Bolted bonnet		
	End Connection		Socket Weld		
	End to End Dimension		Mfr. Std.		
	Others		Anti-static, anti-blow-out stem		
Material	Body		ASTM A105N		
	Seat		Hard Faced Type 316 S.S.		
	Pin		Type 316 S.S.		
	Bolting		Hot Dip Galvanized plated		
	Seal		Mfr. Std.		
Others	Test Standard		API 598/ ISO 15761		
	Certification		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location		Above-ground/outdoor		
	Marking		As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00		

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**169. Check Valves 1/2"~1-1/2"- VC-121-E2**

	PIPE CLASS	E2	Rating class	Class 1500	CA=3.0mm
general	Tag Number		VC-121-E2		
	Size Range	Inch	1/2"~1-1/2"		
	Design Pressure(PSIG)	(max)	1580		
	Design Temperature (°F)	(min/max)	200/650		
	Service/Service code	Raw Gas/ Fuel Gas/ Open Drain/ Vents/ Closed Drain			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard		ISO 15761		
	Valve Type		Swing Check		
	Body		Bolted bonnet		
	End Connection		Socket Weld		
	End to End Dimension		Mfr. Std.		
	Others		Anti-static, anti-blow-out stem		
Material	Body		ASTM A105N		
	Seat		Hard Faced Type 316 S.S.		
	Pin		Type 316 S.S.		
	Bolting		Hot Dip Galvanized plated		
	Seal		Mfr. Std.		
Others	Test Standard		API 598/ ISO 15761		
	Certification		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location		Above-ground/outdoor		
	Marking		As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00		

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**170. Check Valves 1/2"~1-1/2"- VC-121-D9**

	PIPE CLASS	D9	Rating class	Class 1500	CA=4.5mm
general	Tag Number		VC-121-D9		
	Size Range	Inch	1/2"~1-1/2"		
	Design Pressure(PSIG)	(max)	1340		
	Design Temperature (°F)	(min/max)	200/200		
	Service/Service code	Produce Water			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard		ISO 15761		
	Valve Type		Swing Check		
	Body		Bolted bonnet		
	End Connection		Socket Weld		
	End to End Dimension		Mfr. Std.		
	Others		Anti-static, anti-blow-out stem		
Material	Body		ASTM A105N		
	Seat		Hard Faced Type 316 S.S.		
	Pin		Type 316 S.S.		
	Bolting		Hot Dip Galvanized plated		
	Seal		Mfr. Std.		
Others	Test Standard		API 598/ ISO 15761		
	Certification		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location		Above-ground/outdoor		
	Marking		As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00		

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**171. Check Valves 1/2"~1-1/2"- VC-123-D6**

	PIPE CLASS	D6	Rating class	Class 1500	CA=0mm
general	Tag Number		VC-123-D6		
	Size Range	Inch	1/2"~1-1/2"		
	Design Pressure(PSIG)	(max)	1340		
	Design Temperature (°F)	(min/max)	-120/150		
	Service/Service code	Liquified Gas Under -100 °C			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard		ISO 15761		
	Valve Type		Swing Check		
	Body		Bolted bonnet		
	End Connection		Socket Weld		
	End to End Dimension		Mfr. Std.		
	Others		Anti-static, anti-blow-out stem		
Material	Body		Type 316 S.S.		
	Seat		Hard Faced Type 316 S.S.		
	Pin		Type 316 S.S.		
	Seal		Mfr. Std.		
Others	Test Standard		API 598/ ISO 15761		
	Certification		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location		Above-ground/outdoor		
	Marking		As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00		

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**172. Check Valves 1/2"~1-1/2"- VC-123-E6**

	PIPE CLASS	E6	Rating class	Class 1500	CA=0mm
general	Tag Number		VC-123-E6		
	Size Range	Inch	1/2"~1-1/2"		
	Design Pressure(PSIG)	(max)	1580		
	Design Temperature (°F)	(min/max)	200/200		
	Service/Service code	Liquified Gas Under -100 °C			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard		ISO 15761		
	Valve Type		Swing Check		
	Body		Bolted bonnet		
	End Connection		Socket Weld		
	End to End Dimension		Mfr. Std.		
	Others		Anti-static, anti-blow-out stem		
Material	Body		Type 316 S.S.		
	Seat		Hard Faced Type 316 S.S.		
	Pin		Type 316 S.S.		
	Seal		Mfr. Std.		
Others	Test Standard		API 598/ ISO 15761		
	Certification		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location		Above-ground/outdoor		
	Marking		As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00		

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**173. Check Valves 1/2"~1-1/2"- VC-124-D3**

	PIPE CLASS	D3	Rating class	Class 1500	CA=3.0mm
general	Tag Number		VC-124-D3		
	Size Range	Inch	1/2"~1-1/2"		
	Design Pressure(PSIG)	(max)	1340		
	Design Temperature (°F)	(min/max)	-50/265		
	Service/Service code	Flare/ Vent/ Process Gas/ Glycol(Cold Service)/ Process Liquid			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard		ISO 15761		
	Valve Type		Swing Check		
	Body		Bolted bonnet		
	End Connection		Socket Weld		
	End to End Dimension		Mfr. Std.		
	Others		Anti-static, anti-blow-out stem		
Material	Body		ASTM A350 LF2		
	Seat		Hard Faced Type 316 S.S.		
	Pin		Type 316 S.S.		
	Bolting		Hot Dip Galvanized plated		
	Seal		Mfr. Std.		
Others	Test Standard		API 598/ ISO 15761		
	Certification		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location		Above-ground/outdoor		
	Marking		As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00		

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.





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**174. Check Valves 1/2"~1-1/2"- VC-124-E3**

	PIPE CLASS	E3	Rating class	Class 1500	CA=3.0mm
general	Tag Number		VC-124-E3		
	Size Range	Inch	1/2"~1-1/2"		
	Design Pressure(PSIG)	(max)	1580		
	Design Temperature (°F)	(min/max)	-50/265		
	Service/Service code	Flare/ Vent/ Process Gas/ Glycol(Cold Service)/ Process Liquid			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard		ISO 15761		
	Valve Type		Swing Check		
	Body		Bolted bonnet		
	End Connection		Socket Weld		
	End to End Dimension		Mfr. Std.		
	Others		Anti-static, anti-blow-out stem		
Material	Body		ASTM A350 LF2		
	Seat		Hard Faced Type 316 S.S.		
	Pin		Type 316 S.S.		
	Bolting		Hot Dip Galvanized plated		
	Seal		Mfr. Std.		
Others	Test Standard		API 598/ ISO 15761		
	Certification		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location		Above-ground/outdoor		
	Marking		As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00		

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**175. Check Valves 2"~24"- VC-201-A1**

	PIPE CLASS	A1	Rating class	Class 150	CA=1.6mm
general	Tag Number		VC-201-A1		
	Size Range		Inch	2"~24"	
	Design Pressure(PSIG) (max)		270		
	Design Temperature (°F )(min/max)		150/170		
	Service/Service code		Fuel Oil/ Hot Oil/ Stabilized Condensate/ Glycol/ Treated Gas(Sales Gas, LPG)/ Fire Water (A/G)		
	Fluid composition		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		ASME B16.34		
	Valve Type		Swing Check		
	Body		Bolted bonnet		
	End Connection		Flange, RF to ASME B16.5		
	Face to Face Dimension		ASME B16.10		
	Others		Anti-static, anti-blow-out stem, replaceable seats		
Material	Body		ASTM A216 Gr. WCB		
	Seat		Hard Faced 13% Cr. S.S.		
	Pin		13% Cr. S.S.		
	Disc		Type 316 S.S.		
	Bolting		Hot Dip Galvanized plated		
	Seal		Mfr. Std.		
Others	Test Standard		API 598/ ASME B16.34		
	Certification		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location		Above-ground/outdoor		
	Marking		As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00		

Notes:

- This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
- A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
- Valves shall be supplied with arrow direction marked on valve body.
- Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
- All valves not less than 8" should be supplied with support.



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**176. Check Valves 2"~4"- VC-201-A4**

	PIPE CLASS	A4	Rating class	Class 150	CA=1.6mm
general	Tag Number		VC-201-A4		
	Size Range		Inch	2"~4"	
	Design Pressure(PSIG) (max)		270		
	Design Temperature (°F)(min/max)		-50/200		
	Service/Service code		Utility, Instrument& Plant Air		
	Fluid composition		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		ASME B16.34		
	Valve Type		Swing Check		
	Body		Bolted bonnet		
	End Connection		Flange, RF to ASME B16.5		
	Face to Face Dimension		ASME B16.10		
	Others		Anti-static, anti-blow-out stem, replaceable seats		
Material	Body		ASTM A216 Gr. WCB		
	Seat		Hard Faced 13% Cr. S.S.		
	Pin		13% Cr. S.S.		
	Disc		Type 316 S.S.		
	Bolting		Hot Dip Galvanized plated		
	Seal		Mfr. Std.		
Others	Test Standard		API 598/ ASME B16.34		
	Certification		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location		Above-ground/outdoor		
	Marking		As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00		

Notes:

1. This data sheet shall be read in conjunction with Specification for Gate, Globe and Check Valves 8015-0151-CPPB-00-000-PI-SP-00002
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**177. Check Valves 2"~24"- VC-202-A2**

PIPE CLASS	A2	Rating class	Class 150	CA=3.0mm	
general	Tag Number		VC-202-A2		
	Size Range		Inch	2"~24"	
	Design Pressure(PSIG) (max)		270		
	Design Temperature (°F )(min/max)		150/500		
	Service/Service code		Raw Gas/ Fuel Gas/ Open Drain/ Vents / Closed Drain		
	Fluid composition		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		ASME B16.34		
	Valve Type		Piston Check		
	Body		Bolted bonnet		
	End Connection		Flange, RF to ASME B16.5		
	Face to Face Dimension		ASME B16.10		
	Others		Anti-static, anti-blow-out stem, non-slam, replaceable seats		
Material	Body		ASTM A216 Gr. WCB		
	Seat		Hard Faced Type 316 S.S.		
	Piston		Type 316 S.S.		
	Bolting		Hot Dip Galvanized plated		
	Seal		Mfr. Std.		
Others	Test Standard		API 598/ ASME B16.34		
	Certification		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location		Above-ground/outdoor		
	Marking		As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00		

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
5. All valves not less than 8" should be supplied with support.
6. Valves shall be installed in horizontal pipe.



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**178. Check Valves 2"~24"- VC-202-A8**

	PIPE CLASS	A8	Rating class	Class 150	CA=4.5mm
general	Tag Number		VC-202-A8		
	Size Range		Inch	2"~24"	
	Design Pressure(PSIG) (max)		270		
	Design Temperature (°F )(min/max)		200/200		
	Service/Service code		Produce Water		
	Fluid composition		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		ASME B16.34		
	Valve Type		Piston Check		
	Body		Bolted bonnet		
	End Connection		Flange, RF to ASME B16.5		
	Face to Face Dimension		ASME B16.10		
	Others		Anti-static, anti-blow-out stem, non-slam, replaceable seats		
Material	Body		ASTM A216 Gr. WCB		
	Seat		Hard Faced Type 316 S.S.		
	Piston		Type 316 S.S.		
	Bolting		Hot Dip Galvanized plated		
	Seal		Mfr. Std.		
Others	Test Standard		API 598/ ASME B16.34		
	Certification		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location		Above-ground/outdoor		
	Marking		As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00		

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
5. All valves not less than 8" should be supplied with support.
6. Valves shall be installed in horizontal pipe.



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**179. Check Valves 2"~24"- VC-205-A6**

	PIPE CLASS	A6	Rating class	Class 150	CA=0mm
general	Tag Number		VC-205-A6		
	Size Range		Inch	2"~24"	
	Design Pressure(PSIG) (max)		270		
	Design Temperature (°F )(min/max)		-180/150		
	Service/Service code		Liquified Gas Under -100 °C		
	Fluid composition		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		ASME B16.34		
	Valve Type		Swing Check		
	Body		Bolted bonnet		
	End Connection		Flange, RF to ASME B16.5		
	Face to Face Dimension		ASME B16.10		
	Others		Anti-static, anti-blow-out stem, replaceable seats		
Material	Body		Type 316 S.S.		
	Seat		Hard Faced Type 316 S.S.		
	Pin		Type 316 S.S.		
	Disc		Type 316 S.S.		
	Seal		Mfr. Std.		
Others	Test Standard		API 598/ ASME B16.34		
	Certification		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location		Above-ground/outdoor		
	Marking		As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00		

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
5. All valves not less than 8" should be supplied with support.



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**180. Check Valves 2"~24"- VC-206-A3**

	PIPE CLASS	A3	Rating class	Class 150	CA=3.0mm
general	Tag Number		VC-206-A3		
	Size Range		Inch	2"~24"	
	Design Pressure(PSIG) (max)		270		
	Design Temperature (°F )(min/max)		-50/-50		
	Service/Service code		Flare/ Vent/ Process Gas/ Glycol(Cold Service)/ Process Liquid		
	Fluid composition		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		ASME B16.34		
	Valve Type		Piston Check		
	Body		Bolted bonnet		
	End Connection		Flange, RF to ASME B16.5		
	Face to Face Dimension		ASME B16.10		
	Others		Anti-static, anti-blow-out stem, non-slam, replaceable seats		
Material	Body		ASTM A352 Gr. LCC		
	Seat		Hard Faced Type 316 S.S.		
	Piston		Type 316 S.S.		
	Bolting		Hot Dip Galvanized plated		
	Seal		Mfr. Std.		
Others	Test Standard		API 598/ ASME B16.34		
	Certification		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location		Above-ground/outdoor		
	Marking		As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00		

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
5. All valves not less than 8" should be supplied with support.
6. Valves shall be installed in horizontal pipe.



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**181. Check Valves 2"~24"- VC-211-B1**

	PIPE CLASS	B1	Rating class	Class 300	CA=1.6mm
general	Tag Number		VC-211-B1		
	Size Range		Inch	2"~24"	
	Design Pressure(PSIG) (max)		600		
	Design Temperature (°F )(min/max)		35/650		
	Service/Service code		Fuel Oil/ Hot Oil/ Stabilized Condensate/ Glycol/ Treated Gas( Sales Gas).		
	Fluid composition		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		ASME B16.34		
	Valve Type		Swing Check		
	Body		Bolted bonnet		
	End Connection		Flange, RF to ASME B16.5		
	Face to Face Dimension		ASME B16.10		
	Others		Anti-static, anti-blow-out stem, replaceable seats		
Material	Body		ASTM A216 Gr. WCB		
	Seat		Hard Faced 13% Cr. S.S.		
	Pin		13% Cr. S.S.		
	Disc		Type 316 S.S.		
	Bolting		Hot Dip Galvanized plated		
	Seal		Mfr. Std.		
Others	Test Standard		API 598/ ASME B16.34		
	Certification		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location		Above-ground/outdoor		
	Marking		As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00		

Notes:

- This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
- A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
- Valves shall be supplied with arrow direction marked on valve body.
- Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
- All valves not less than 8" should be supplied with support.





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**182. Check Valves 2"~24"- VC-217-B1**



	PIPE CLASS	B1	Rating class	Class 300	CA=1.6mm
general	Tag Number	VC-217-B1			
	Size Range	Inch	2"~24"		
	Design Pressure(PSIG) (max)	600			
	Design Temperature (°F)(min/max)	35/650			
	Service/Service code	Fuel Oil/ Hot Oil/ Stabilized Condensate/ Glycol/ Treated Gas( Sales Gas).			
	Fluid composition	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	ASME B16.34			
	Valve Type	Piston Check			
	Body	Bolted bonnet			
	End Connection	Flange, RF to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Others	Anti-static, anti-blow-out stem, replaceable seats			
Material	Body	ASTM A216 Gr. WCB			
	Seat	Hard Faced 13% Cr. S.S.			
	Piston	13% Cr. S.S.			
	Bolting	Hot Dip Galvanized plated			
	Seal	Mfr. Std.			
Others	Test Standard	API 598/ ASME B16.34			
	Certification	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location	Above-ground/outdoor			
	Marking	As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00			

**Notes:**

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
5. All valves not less than 8" should be supplied with support.
6. Valves shall be installed in horizontal pipe.



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**183. Check Valves 2"~24"- VC-212-B2**

	PIPE CLASS	B2	Rating class	Class 300	CA=3.0mm
general	Tag Number		VC-212-B2		
	Size Range		Inch	2"~24"	
	Design Pressure(PSIG) (max)		600		
	Design Temperature (°F )(min/max)		200/200		
	Service/Service code		Raw Gas/ Fuel Gas/ Open Drain/ Vents / Closed Drain		
	Fluid composition		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		ASME B16.34		
	Valve Type		Piston Check		
	Body		Bolted bonnet		
	End Connection		Flange, RF to ASME B16.5		
	Face to Face Dimension		ASME B16.10		
	Others		Anti-static, anti-blow-out stem, non-slam, replaceable seats		
Material	Body		ASTM A216 Gr. WCB		
	Seat		Hard Faced Type 316 S.S.		
	Piston		Type 316 S.S.		
	Bolting		Hot Dip Galvanized plated		
	Seal		Mfr. Std.		
Others	Test Standard		API 598/ ASME B16.34		
	Certification		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location		Above-ground/outdoor		
	Marking		As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00		

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
5. All valves not less than 8" should be supplied with support.
6. Valves shall be installed in horizontal pipe.



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**184. Check Valves 2"~24"- VC-215-B6**

	PIPE CLASS	B6	Rating class	Class 300	CA=0mm
general	Tag Number		VC-215-B6		
	Size Range		Inch	2"~24"	
	Design Pressure(PSIG) (max)		600		
	Design Temperature (°F )(min/max)		-120/-70		
	Service/Service code		Liquified Gas Under -100 °C		
	Fluid composition		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		ASME B16.34		
	Valve Type		Swing Check		
	Body		Bolted bonnet		
	End Connection		Flange, RF to ASME B16.5		
	Face to Face Dimension		ASME B16.10		
	Others		Anti-static, anti-blow-out stem, replaceable seats		
Material	Body		Type 316 S.S.		
	Seat		Hard Faced Type 316 S.S.		
	Pin		Type 316 S.S.		
	Disc		Type 316 S.S.		
	Seal		Mfr. Std.		
Others	Test Standard		API 598/ ASME B16.34		
	Certification		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location		Above-ground/outdoor		
	Marking		As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00		

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
5. All valves not less than 8" should be supplied with support.



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**185. Check Valves 2"~24"- VC-216-B3**

	PIPE CLASS	B3	Rating class	Class 300	CA=3.0mm
general	Tag Number		VC-216-B3		
	Size Range		Inch	2"~24"	
	Design Pressure(PSIG) (max)		600		
	Design Temperature (°F )(min/max)		-50/265		
	Service/Service code		Flare/ Vent/ Process Gas/ Glycol(Cold Service)/ Process Liquid		
	Fluid composition		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		ASME B16.34		
	Valve Type		Piston Check		
	Body		Bolted bonnet		
	End Connection		Flange, RF to ASME B16.5		
	Face to Face Dimension		ASME B16.10		
	Others		Anti-static, anti-blow-out stem, non-slam, replaceable seats		
Material	Body		ASTM A352 Gr. LCC		
	Seat		Hard Faced Type 316 S.S.		
	Piston		Type 316 S.S.		
	Bolting		Hot Dip Galvanized plated		
	Seal		Mfr. Std.		
Others	Test Standard		API 598/ ASME B16.34		
	Certification		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location		Above-ground/outdoor		
	Marking		As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00		

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
5. All valves not less than 8" should be supplied with support.
6. Valves shall be installed in horizontal pipe.



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**186. Check Valves 2"~24"- VC-221-D1**

	PIPE CLASS	D1	Rating class	Class 600	CA=1.6mm
general	Tag Number		VC-221-D1		
	Size Range		Inch	2"~24"	
	Design Pressure(PSIG) (max)		1340		
	Design Temperature (°F )(min/max)		150/150		
	Service/Service code		Fuel Oil/ Hot Oil/ Stabilized Condensate/ Glycol/ Treated Gas/ Sales Gas/ LPG		
	Fluid composition		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		ASME B16.34		
	Valve Type		Swing Check		
	Body		Bolted bonnet		
	End Connection		Flange, RF to ASME B16.5		
	Face to Face Dimension		ASME B16.10		
	Others		Anti-static, anti-blow-out stem, replaceable seats		
Material	Body		ASTM A216 Gr. WCB		
	Seat		Hard Faced 13% Cr. S.S.		
	Pin		13% Cr. S.S.		
	Disc		Type 316 S.S.		
	Bolting		Hot Dip Galvanized plated		
	Seal		Mfr. Std.		
Others	Test Standard		API 598/ ASME B16.34		
	Certification		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location		Above-ground/outdoor		
	Marking		As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00		

Notes:

- This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
- A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
- Valves shall be supplied with arrow direction marked on valve body.
- Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
- All valves not less than 8" should be supplied with support.



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**187. Check Valves 2"~24"- VC-222-D2**

	PIPE CLASS	D2	Rating class	Class 600	CA=3.0mm
general	Tag Number		VC-222-D2		
	Size Range		Inch	2"~24"	
	Design Pressure(PSIG) (max)		1340		
	Design Temperature (°F )(min/max)		150/650		
	Service/Service code		Raw Gas/ Fuel Gas/ Open Drain/ Vents/ Closed Drain		
	Fluid composition		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		ASME B16.34		
	Valve Type		Piston Check		
	Body		Bolted bonnet		
	End Connection		Flange, RF to ASME B16.5		
	Face to Face Dimension		ASME B16.10		
	Others		Anti-static, anti-blow-out stem, non-slam, replaceable seats		
Material	Body		ASTM A216 Gr. WCB		
	Seat		Hard Faced Type 316 S.S.		
	Piston		Type 316 S.S.		
	Bolting		Hot Dip Galvanized plated		
	Seal		Mfr. Std.		
Others	Test Standard		API 598/ ASME B16.34		
	Certification		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location		Above-ground/outdoor		
	Marking		As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00		

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
5. All valves not less than 8" should be supplied with support.
6. Valves shall be installed in horizontal pipe.



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**188. Check Valves 2"~24"- VC-222-D9**

	PIPE CLASS	D9	Rating class	Class 600	CA=4.5mm
general	Tag Number		VC-222-D9		
	Size Range		Inch	2"~24"	
	Design Pressure(PSIG) (max)		1340		
	Design Temperature (°F )(min/max)		200/200		
	Service/Service code		Produce Water		
	Fluid composition		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		ASME B16.34		
	Valve Type		Piston Check		
	Body		Bolted bonnet		
	End Connection		Flange, RF to ASME B16.5		
	Face to Face Dimension		ASME B16.10		
	Others		Anti-static, anti-blow-out stem, non-slam,replaceable seats		
Material	Body		ASTM A216 Gr. WCB		
	Seat		Hard Faced Type 316 S.S.		
	Piston		Type 316 S.S.		
	Bolting		Hot Dip Galvanized plated		
	Seal		Mfr. Std.		
Others	Test Standard		API 598/ ASME B16.34		
	Certification		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location		Above-ground/outdoor		
	Marking		As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00		

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
5. All valves not less than 8" should be supplied with support.
6. Valves shall be installed in horizontal pipe.



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**189. Check Valves 2"~24"- VC-225-D6**

	PIPE CLASS	D6	Rating class	Class 600	CA=0mm
general	Tag Number		VC-225-D6		
	Size Range		Inch	2"~24"	
	Design Pressure(PSIG) (max)		1340		
	Design Temperature (°F )(min/max)		-120/150		
	Service/Service code		Liquified Gas Under -100 °C		
	Fluid composition		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		ASME B16.34		
	Valve Type		Swing Check		
	Body		Bolted bonnet		
	End Connection		Flange, RF to ASME B16.5		
	Face to Face Dimension		ASME B16.10		
	Others		Anti-static, anti-blow-out stem, replaceable seats		
Material	Body		Type 316 S.S.		
	Seat		Hard Faced Type 316 S.S.		
	Pin		Type 316 S.S.		
	Disc		Type 316 S.S.		
	Seal		Mfr. Std.		
Others	Test Standard		API 598/ ASME B16.34		
	Certification		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location		Above-ground/outdoor		
	Marking		As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00		

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
5. All valves not less than 8" should be supplied with support.





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**190. Check Valves 2"~24"- VC-226-D3**

	PIPE CLASS	D3	Rating class	Class 600	CA=3.0mm
general	Tag Number		VC-226-D3		
	Size Range		Inch	2"~24"	
	Design Pressure(PSIG) (max)		1340		
	Design Temperature (°F )(min/max)		-50/265		
	Service/Service code		Flare/ Vent/ Process Gas/ Glycol(Cold Service)/ Process Liquid		
	Fluid composition		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		ASME B16.34		
	Valve Type		Piston Check		
	Body		Bolted bonnet		
	End Connection		Flange, RF to ASME B16.5		
	Face to Face Dimension		ASME B16.10		
	Others		Anti-static, anti-blow-out stem, non-slam, replaceable seats		
Material	Body		ASTM A352 Gr. LCC		
	Seat		Hard Faced Type 316 S.S.		
	Piston		Type 316 S.S.		
	Bolting		Hot Dip Galvanized plated		
	Seal		Mfr. Std.		
Others	Test Standard		API 598/ ASME B16.34		
	Certification		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location		Above-ground/outdoor		
	Marking		As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00		

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
5. All valves not less than 8" should be supplied with support.
6. Valves shall be installed in horizontal pipe.



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**191. Check Valves 2"~24"- VC-227-D8**

	PIPE CLASS	D8	Rating class	Class 600	CA=3.0mm
general	Tag Number		VC-227-D8		
	Size Range		Inch	2"~24"	
	Design Pressure(PSIG) (max)		1340		
	Design Temperature (°F )(min/max)		200/200		
	Service/Service code		Flow Lines		
	Fluid composition		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		ASME B16.34		
	Valve Type		Swing Check		
	Body		Bolted bonnet		
	End Connection		Flange, RF to ASME B16.5		
	Face to Face Dimension		ASME B16.10		
	Others		Anti-static, anti-blow-out stem, fire safe seats, replaceable seats		
Material	Body		ASTM A216 Gr. WCB.		
	Seat		A105N + Stellite Gr.6		
	Pin		13% Cr. S.S		
	Disc		A216 WCB + A182 F6		
	Bolting		Hot Dip Galvanized plated		
	Seal		Mfr. Std.		
Others	Test Standard		API 598/ ASME B16.34		
	Certification		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location		Above-ground/outdoor		
	Marking		As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00		

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
5. All valves not less than 8" should be supplied with support.



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**192. Check Valves 2"~24"- VC-228-D6**

	PIPE CLASS	D6	Rating class	Class 600	CA=0mm
general	Tag Number		VC-228-D8		
	Size Range		Inch	2"~24"	
	Design Pressure(PSIG) (max)		1340		
	Design Temperature (°F )(min/max)		-120/150		
	Service/Service code		Liquified Gas Under -100 °C		
	Fluid composition		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		ASME B16.34		
	Valve Type		Piston Check		
	Body		Bolted bonnet		
	End Connection		Flange, RF to ASME B16.5		
	Face to Face Dimension		ASME B16.10		
	Others		Anti-static, anti-blow-out stem, replaceable seats		
Material	Body		Type 316 S.S.		
	Seat		Hard Faced Type 316 S.S.		
	Piston		Type 316 S.S.		
	Bolting		Hot Dip Galvanized plated		
	Seal		Mfr. Std.		
Others	Test Standard		API 598/ ASME B16.34		
	Certification		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location		Above-ground/outdoor		
	Marking		As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00		

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
5. All valves not less than 8" should be supplied with support.
6. Valves shall be installed in horizontal pipe.



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**193. Check Valves 2"~24"- VC-231-E1**

	PIPE CLASS	E1	Rating class	Class 900	CA=1.6mm
general	Tag Number		VC-231-E1		
	Size Range		Inch	2"~24"	
	Design Pressure(PSIG) (max)		1580		
	Design Temperature (°F )(min/max)		-20/150		
	Service/Service code		Fuel Oil/ Hot Oil/ Stabilized Condensate/ Glycol/ Treated Gas/ Sales Gas/ LPG		
	Fluid composition		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		ASME B16.34		
	Valve Type		Swing Check		
	Body		Bolted bonnet		
	End Connection		Flange, RTJ to ASME B16.5		
	Face to Face Dimension		ASME B16.10		
	Others		Anti-static, anti-blow-out stem, replaceable seats		
Material	Body		ASTM A216 Gr. WCB		
	Seat		Hard Faced 13% Cr. S.S.		
	Pin		13% Cr. S.S.		
	Disc		Type 316 S.S.		
	Bolting		Hot Dip Galvanized plated		
	Seal		Mfr. Std.		
Others	Test Standard		API 598/ ASME B16.34		
	Certification		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location		Above-ground/outdoor		
	Marking		As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00		

Notes:

- This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
- A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
- Valves shall be supplied with arrow direction marked on valve body.
- Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
- All valves not less than 8" should be supplied with support.



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**194. Check Valves 2"~24"- VC-232-E2**

	PIPE CLASS	E2	Rating class	Class 900	CA=3.0mm
general	Tag Number		VC-232-E2		
	Size Range		Inch	2"~24"	
	Design Pressure(PSIG) (max)		1580		
	Design Temperature (°F )(min/max)		200/650		
	Service/Service code		Raw Gas/ Fuel Gas/ Open Drain/ Vents/ Closed Drain		
	Fluid composition		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		ASME B16.34		
	Valve Type		Piston Check		
	Body		Bolted bonnet		
	End Connection		Flange, RTJ to ASME B16.5		
	Face to Face Dimension		ASME B16.10		
	Others		Anti-static, anti-blow-out stem, non-slam,replaceable seats		
Material	Body		ASTM A216 Gr. WCB		
	Seat		Hard Faced Type 316 S.S.		
	Piston		Type 316 S.S.		
	Bolting		Hot Dip Galvanized plated		
	Seal		Mfr. Std.		
Others	Test Standard		API 598/ ASME B16.34		
	Certification		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location		Above-ground/outdoor		
	Marking		As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00		

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
5. All valves not less than 8" should be supplied with support.
6. Valves shall be installed in horizontal pipe.



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**195. Check Valves 2"~24"- VC-235-E6**

	PIPE CLASS	E6	Rating class	Class 900	CA=0mm
general	Tag Number		VC-235-E6		
	Size Range		Inch	2"~24"	
	Design Pressure(PSIG) (max)		1580		
	Design Temperature (°F )(min/max)		200/200		
	Service/Service code		Liquified Gas Under -100 °C		
	Fluid composition		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		ASME B16.34		
	Valve Type		Swing Check		
	Body		Bolted bonnet		
	End Connection		Flange, RTJ to ASME B16.5		
	Face to Face Dimension		ASME B16.10		
	Others		Anti-static, anti-blow-out stem, replaceable seats		
Material	Body		Type 316 S.S.		
	Seat		Hard Faced Type 316 S.S.		
	Pin		Type 316 S.S.		
	Disc		Type 316 S.S.		
	Seal		Mfr. Std.		
Others	Test Standard		API 598/ ASME B16.34		
	Certification		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location		Above-ground/outdoor		
	Marking		As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00		

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
5. All valves not less than 8" should be supplied with support.



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**196. Check Valves 2"~24"- VC-236-E8**

	PIPE CLASS	E8	Rating class	Class 900	CA=3.0mm
general	Tag Number		VC-236-E8		
	Size Range		Inch	2"~24"	
	Design Pressure(PSIG) (max)		1580		
	Design Temperature (°F )(min/max)		200/200		
	Service/Service code		Flow Lines		
	Fluid composition		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		ASME B16.34		
	Valve Type		Swing Check		
	Body		Bolted bonnet		
	End Connection		Flange, RTJ to ASME B16.5		
	Face to Face Dimension		ASME B16.10		
	Others		Anti-static, anti-blow-out stem, fire safe seats, replaceable seats		
Material	Body		ASTM A216 Gr. WCB.		
	Seat		Hard face A105N + Stellite Gr.6		
	Pin		13% Cr. S.S		
	Disc		A216 WCB + A182 F6		
	Bolting		Hot Dip Galvanized plated		
	Seal		Mfr. Std.		
Others	Test Standard		API 598/ ASME B16.34		
	Certification		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location		Above-ground/outdoor		
	Marking		As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00		

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
5. All valves not less than 8" should be supplied with support.



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**197. Check Valves 2"~24"- VC-237-E3**

PIPE CLASS	E3	Rating class	Class 900	CA=3.0mm	
general	Tag Number		VC-237-E3		
	Size Range		Inch	2"~24"	
	Design Pressure(PSIG) (max)		1580		
	Design Temperature (°F )(min/max)		-50/265		
	Service/Service code		Flare/ Vent/ Process Gas/ Glycol(Cold Service)/ Process Liquid		
	Fluid composition		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		ASME B16.34		
	Valve Type		Piston Check		
	Body		Bolted bonnet		
	End Connection		Flange, RTJ to ASME B16.5		
	Face to Face Dimension		ASME B16.10		
	Others		Anti-static, anti-blow-out stem, non-slam, replaceable seats		
Material	Body		ASTM A352 Gr. LCC		
	Seat		Hard Faced Type 316 S.S.		
	Piston		Type 316 S.S.		
	Bolting		Hot Dip Galvanized plated		
	Seal		Mfr. Std.		
Others	Test Standard		API 598/ ASME B16.34		
	Certification		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location		Above-ground/outdoor		
	Marking		As per Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00		

Notes:

1. This data sheet shall be read in conjunction with Specification for Ball, Gate, Globe and Check Valves NGP-000-PIP-15.03-0010-00.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall be supplied with arrow direction marked on valve body.
4. Vendor shall certify suitability of material mentioned in the datasheet for the intended service condition specified.
5. All valves not less than 8" should be supplied with support.
6. Valves shall be installed in horizontal pipe.





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DATA SHEET

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## Data Sheet for Ball Valves

### REVISION DETAILS

REV	DATE	DESCRIPTION	PRPD	CHKD	REVD	APPD
			<i>Wu Yuyan</i>	<i>Wang Shaobo</i>	<i>Liu Zijian</i>	<i>Xu Feng</i>
00	08/07/2016	Approved for Design	Wu Yuyan	Wang Shaobo	Liu Zijian	Xu Feng
C	14/06/2016	Issued for Approval	Wu Yuyan	Wang Shaobo	Liu Zijian	Xu Feng
B	29/03/2016	Issued for Review	Wu Yuyan	Wang Shaobo	Liu Zijian	Xu Feng
A	14/01/2016	Internal Discipline Check	Wu Yuyan	Wang Shaobo	Liu Zijian	Xu Feng



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**REVISION HISTORY**

REV.	DATE	REVISION DESCRIPTION
A	14/01/2016	Internal Discipline Check
B	29/03/2016	Issued for Review
C	14/06/2016	Issued for Approval
00	08/07/2016	Approved for Design



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**1. BALL VALVES 1/2"~1-1/2" - VB-101-A1**

	PIPE CLASS	A1	Rating class	Class 150	CA=1.6mm
general	Tag Number	VB-101-A1			
	Size Range (Inch)	1/2"~1-1/2"			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	270			
	Design Temperature (°F)(min/max)	150/170			
	Service/Service code	Fuel Oil/ Hot Oil/ Inert Gas/ Stabilized Condensate/ Glycol/ Treated Gas(Sales Gas, LPG), Fire Water (A/G)			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Floating ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	Flanged Raised Face to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Lever Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	ASTM A105N			
	Ball	Type 316SS			
	Stem	Type 316SS			
	Seat	Filled Teflon			
	Seal	Filled Teflon			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	Zinc coating for Body bolt/nut	Hot Dip Galvanized Plated			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			



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Valve location and function	Above-ground/outdoor/block
Marking	As per Specification for Specification for Ball, Gate, Globe and Check Valves NGP-00-PIP-15.03-0010-00
Actuator	N/A
Support	No
Locking device	Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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## 2. BALL VALVES 1/2"~1-1/2" - VB-101-A2

	PIPE CLASS	A2	Rating class	Class 150	CA=3.0mm
general	Tag Number	VB-101-A2			
	Size Range (Inch)	1/2"~1-1/2"			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	270			
	Design Temperature (°F)(min/max)	150/350			
	Service/Service code	Raw Gas/ Fuel Gas/ Open Drain/ Vents / Closed Drain			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Floating ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	Flanged Raised Face to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Lever Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	ASTM A105N			
	Ball	Type 316SS			
	Stem	Type 316SS			
	Seat	Filled Teflon			
	Seal	Filled Teflon			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	Zinc coating for Body bolt/nut	Hot Dip Galvanized Plated			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location and function	Above-ground/outdoor/block			





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Actuator

N/A

Support

No

Locking device

Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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### 3. BALL VALVES 1/2"~1-1/2" - VB-101-A8

	PIPE CLASS	A8	Rating class	Class 150	CA=4.5mm
general	Tag Number	VB-101-A8			
	Size Range (Inch)	1/2"~1-1/2"			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	250			
	Design Temperature (°F)(min/max)	200/200			
	Service/Service code	Produce Water			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Floating ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	Flanged Raised Face to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Lever Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	ASTM A105N			
	Ball	Type 316SS			
	Stem	Type 316SS			
	Seat	Filled Teflon			
	Seal	Filled Teflon			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	Zinc coating for Body bolt/nut	Hot Dip Galvanized Plated			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location and function	Above-ground/outdoor/block			



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Actuator

N/A

Support

No

Locking device

Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**4. BALL VALVES 1/2"~1-1/2" - VB-102-A3**

	PIPE CLASS	A3	Rating class	Class 150	CA=3.0mm
general	Tag Number	VB-102-A3			
	Size Range (Inch)	1/2"~1-1/2"			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	270			
	Design Temperature (°F)(min/max)	-50/-50			
	Service/Service code	Flare/ Vent/ Process Gas/ Glycol(Cold Service)/ Process Liquid			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Floating ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	Flanged Raised Face to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Lever Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	ASTM A 350 LF2.			
	Ball	Type 316SS			
	Stem	Type 316SS			
	Seat	Filled Teflon			
	Seal	Filled Teflon			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	Zinc coating for Body bolt/nut	Hot Dip Galvanized Plated			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			



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Valve location and function	Above-ground/outdoor/block
Marking	As per Specification for Specification for Ball, Gate, Globe and Check Valves NGP-00-PIP-15.03-0010-00
Actuator	N/A
Support	No
Locking device	Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**5. BALL VALVES 1/2"~1-1/2" - VB-103-A4**

	PIPE CLASS	A4	Rating class	Class 800	CA=1.6mm
general	Tag Number	VB-103-A4			
	Size Range (Inch)	1/2"~1-1/2"			
	Valve Type	Full Port			
	Design Pressure(PSIG) (max)	270			
	Design Temperature (°F)(min/max)	-20/200			
	Service/Service code	Utility, Instrument& Plant Air			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Floating ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	Threaded			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Lever Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	ASTM A105N			
	Ball	Type 316SS			
	Stem	13% Cr. S.S.			
	Seat	Filled Teflon			
	Seal	Filled Teflon			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	Zinc coating for Body bolt/nut	Hot Dip Galvanized Plated			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location and function	Above-ground/outdoor/block			



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Actuator

N/A

Support

No

Locking device

Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**6. BALL VALVES 1/2"~1-1/2" - VB-106-B1**

	PIPE CLASS	B1	Rating class	Class 300	CA=1.6mm
general	Tag Number	VB-106-B1			
	Size Range (Inch)	1/2"~1-1/2"			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	600			
	Design Temperature (°F)(min/max)	35/350			
	Service/Service code	Fuel Oil/ Hot Oil/ Inert Gas/ Stabilized Condensate/ Glycol/ Treated Gas(Sales Gas, LPG).			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Floating ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	Flanged Raised Face to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Lever Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	ASTM A105N			
	Ball	Type 316SS			
	Stem	Type 316SS			
	Seat	Filled Teflon			
	Seal	Filled Teflon			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	Zinc coating for Body bolt/nut	Hot Dip Galvanized Plated			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			





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Valve location and function	Above-ground/outdoor/block
Marking	As per Specification for Specification for Ball, Gate, Globe and Check Valves NGP-00-PIP-15.03-0010-00
Actuator	N/A
Support	No
Locking device	Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**7. BALL VALVES 1/2"~1-1/2" - VB-106-B2**

	PIPE CLASS	B2	Rating class	Class 300	CA=3.0mm
general	Tag Number	VB-106-B2			
	Size Range (Inch)	1/2"~1-1/2"			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	600			
	Design Temperature (°F)(min/max)	200/200			
	Service/Service code	Raw Gas/ Fuel Gas/ Open Drain/ Vents / Closed Drain			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Floating ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	Flanged Raised Face to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Lever Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	ASTM A105N			
	Ball	Type 316SS			
	Stem	Type 316SS			
	Seat	Filled Teflon			
	Seal	Filled Teflon			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	Zinc coating for Body bolt/nut	Hot Dip Galvanized Plated			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location and function	Above-ground/outdoor/block			



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Actuator

N/A

Support

No

Locking device

Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**8. BALL VALVES 1/2"~1-1/2" - VB-107-B3**

	PIPE CLASS	B3	Rating class	Class 300	CA=3.0mm
general	Tag Number	VB-107-B3			
	Size Range (Inch)	1/2"~1-1/2"			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	600			
	Design Temperature (°F)(min/max)	-50/265			
	Service/Service code	Flare/ Vent/ Process Gas/ Glycol(Cold Service)/ Process Liquid			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Floating ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	Flanged Raised Face to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Lever Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	ASTM A 350 LF2.			
	Ball	Type 316SS			
	Stem	Type 316SS			
	Seat	Filled Teflon			
	Seal	Filled Teflon			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	Zinc coating for Body bolt/nut	Hot Dip Galvanized Plated			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			



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Valve location and function	Above-ground/outdoor/block
Marking	As per Specification for Specification for Ball, Gate, Globe and Check Valves NGP-00-PIP-15.03-0010-00
Actuator	N/A
Support	No
Locking device	Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**9. BALL VALVES 1/2"~1-1/2" - VB-109-A6**

	PIPE CLASS	A6	Rating class	Class 150	CA=0mm
general	Tag Number	VB-109-A6			
	Size Range (Inch)	1/2"~1-1/2"			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	270			
	Design Temperature (°F)(min/max)	-180/150			
	Service/Service code	Liquified Gas Under -100 °C			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Floating ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	Flanged Raised Face to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Lever Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	Type 316SS			
	Ball	Type 316SS			
	Stem	Type 316SS			
	Seat	Mfr. Std.			
	Seat	Mfr. Std.			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location and function	Above-ground/outdoor/block			
	Marking	As per Specification for Specification for Ball, Gate, Globe			



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		and Check Valves NGP-00-PIP-15.03-0010-00
Actuator		N/A
Support		No
Locking device		Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**10. BALL VALVES 1/2"~1-1/2" - VB-110-B6**

	PIPE CLASS	B6	Rating class	Class 300	CA=0mm
general	Tag Number	VB-110-B6			
	Size Range (Inch)	1/2"~1-1/2"			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	600			
	Design Temperature (°F)(min/max)	-120/-70			
	Service/Service code	Liquified Gas Under -100 °C			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Floating ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	Flanged Raised Face to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Lever Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	Type 316SS			
	Ball	Type 316SS			
	Stem	Type 316SS			
	Seat	Mfr. Std.			
	Seat	Mfr. Std.			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location and function	Above-ground/outdoor/block			
	Marking	As per Specification for Specification for Ball, Gate, Globe			





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		and Check Valves NGP-00-PIP-15.03-0010-00
Actuator		N/A
Support		No
Locking device		Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**11. BALL VALVES 1/2"~1-1/2" - VB-121-D1**

	PIPE CLASS	D1	Rating class	Class 600	CA=1.6mm
general	Tag Number		VB-121-D1		
	Size Range (Inch)		1/2"~1-1/2"		
	Valve Type		Reduced Port		
	Design Pressure(PSIG) (max)		1340		
	Design Temperature (°F)(min/max)		150/150		
	Service/Service code		Fuel Oil/ Hot Oil/ Inert Gas/ Stabilized Condensate/ Glycol/ Treated Gas/ Sales Gas/ LPG		
	Service Component		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		API 6D		
	Body		Side entry, Split body, Bolted Body		
	Ball		Floating ball		
	Seat		Soft Seated, Replaceable Seats		
	End Connection		Flanged Raised Face to ASME B16.5		
	Face to Face Dimension		ASME B16.10		
	Leakage Class		Rate A		
	Operation		Lever Operated		
	Fire Safe requirements(Design & Certificate)		API 607/API 6FA		
	Others		anti-static, anti-blow-out stem		
material (Note-4)	Body & Cover		ASTM A105N		
	Ball		Type 316SS		
	Stem		Type 316SS		
	Seat		Filled Teflon		
	Seal		Filled Teflon		
others	Test Standard		API 6D/ISO 5208/API 598		
	CERTIFICATION		EN 10204 3.1		
	Zinc coating for Body bolt/nut		Hot Dip Galvanized Plated		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		



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Valve location and function	Above-ground/outdoor/block
Marking	As per Specification for Specification for Ball, Gate, Globe and Check Valves NGP-00-PIP-15.03-0010-00
Actuator	N/A
Support	No
Locking device	Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**12. BALL VALVES 1/2"~1-1/2" - VB-121-D2**

	PIPE CLASS	D2	Rating class	Class 600	CA=3.0mm
general	Tag Number		VB-121-D2		
	Size Range (Inch)		1/2"~1-1/2"		
	Valve Type		Reduced Port		
	Design Pressure(PSIG) (max)		1340		
	Design Temperature (°F)(min/max)		150/350		
	Service/Service code		Raw Gas/ Fuel Gas/ Open Drain/ Vents/ Closed Drain		
	Service Component		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		API 6D		
	Body		Side entry, Split body, Bolted Body		
	Ball		Floating ball		
	Seat		Soft Seated, Replaceable Seats		
	End Connection		Flanged Raised Face to ASME B16.5		
	Face to Face Dimension		ASME B16.10		
	Leakage Class		Rate A		
	Operation		Lever Operated		
	Fire Safe requirements(Design & Certificate)		API 607/API 6FA		
	Others		anti-static, anti-blow-out stem		
material (Note-4)	Body & Cover		ASTM A105N		
	Ball		Type 316SS		
	Stem		Type 316SS		
	Seat		Filled Teflon		
	Seal		Filled Teflon		
others	Test Standard		API 6D/ISO 5208/API 598		
	CERTIFICATION		EN 10204 3.1		
	Zinc coating for Body bolt/nut		Hot Dip Galvanized Plated		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location and function		Above-ground/outdoor/block		



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Marking

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Actuator

N/A

Support

No

Locking device

Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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### 13. BALL VALVES 1/2"~1-1/2" - VB-121-D9

	PIPE CLASS	D9	Rating class	Class 600	CA=4.5mm
general	Tag Number	VB-121-D9			
	Size Range (Inch)	1/2"~1-1/2"			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	1340			
	Design Temperature (°F)(min/max)	200/200			
	Service/Service code	Produce Water			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Floating ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	Flanged Raised Face to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Lever Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	ASTM A105N			
	Ball	Type 316SS			
	Stem	Type 316SS			
	Seat	Filled Teflon			
	Seal	Filled Teflon			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	Zinc coating for Body bolt/nut	Hot Dip Galvanized Plated			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location and function	Above-ground/outdoor/block			



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Actuator

N/A

Support

No

Locking device

Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**14. BALL VALVES 1/2"~1-1/2" - VB-122-D3**

	PIPE CLASS	D3	Rating class	Class 600	CA=3.0mm
general	Tag Number	VB-122-D3			
	Size Range (Inch)	1/2"~1-1/2"			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	1340			
	Design Temperature (°F)(min/max)	-50/265			
	Service/Service code	Flare/ Vent/ Process Gas/ Glycol(Cold Service)/ Process Liquid			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Floating ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	Flanged Raised Face to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Lever Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	ASTM A 350 LF2.			
	Ball	Type 316SS			
	Stem	Type 316SS			
	Seat	Filled Teflon			
	Seal	Filled Teflon			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	Zinc coating for Body bolt/nut	Hot Dip Galvanized Plated			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			





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Valve location and function	Above-ground/outdoor/block
Marking	As per Specification for Specification for Ball, Gate, Globe and Check Valves NGP-00-PIP-15.03-0010-00
Actuator	N/A
Support	No
Locking device	Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**15. BALL VALVES 1/2"~1-1/2" - VB-124-D8**

	PIPE CLASS	D8	Rating class	Class 600	CA=3.0mm
general	Tag Number	VB-124-D8			
	Size Range (Inch)	1/2"~1-1/2"			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	1340			
	Design Temperature (°F)(min/max)	200/200			
	Service/Service code	Flow Lines			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Floating ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	Flanged Raised Face to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Lever Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	ASTM A105N			
	Ball	A182 F6 Class2			
	Stem	13% Cr. S.S.			
	Seat	Filled Teflon			
	Seal	Filled Teflon			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	Zinc coating for Body bolt/nut	Hot Dip Galvanized Plated			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location and function	Above-ground/outdoor/block			



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Actuator

N/A

Support

No

Locking device

Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**16. BALL VALVES 1/2"~1-1/2" - VB-126-E1**

	PIPE CLASS	E1	Rating class	Class 900	CA=1.6mm
general	Tag Number	VB-126-E1			
	Size Range (Inch)	1/2"~1-1/2"			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	1580			
	Design Temperature (°F)(min/max)	-20/150			
	Service/Service code	Fuel Oil/ Hot Oil/ Inert Gas/ Stabilized Condensate/ Glycol/ Treated Gas/ Sales Gas/ LPG			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Floating ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	RTJ to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Lever Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	ASTM A105N			
	Ball	Type 316SS			
	Stem	Type 316SS			
	Seat	Filled Teflon			
	Seal	Filled Teflon			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	Zinc coating for Body bolt/nut	Hot Dip Galvanized Plated			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			



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Valve location and function	Above-ground/outdoor/block
Marking	As per Specification for Specification for Ball, Gate, Globe and Check Valves NGP-00-PIP-15.03-0010-00
Actuator	N/A
Support	No
Locking device	Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**17. BALL VALVES 1/2"~1-1/2" - VB-126-E2**

	PIPE CLASS	E2	Rating class	Class 900	CA=3.0mm
general	Tag Number	VB-126-E2			
	Size Range (Inch)	1/2"~1-1/2"			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	1580			
	Design Temperature (°F)(min/max)	200/350			
	Service/Service code	Raw Gas/ Fuel Gas/ Open Drain/ Vents/ Closed Drain			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Floating ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	RTJ to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Lever Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	ASTM A105N			
	Ball	Type 316SS			
	Stem	Type 316SS			
	Seat	Filled Teflon			
	Seal	Filled Teflon			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	Zinc coating for Body bolt/nut	Hot Dip Galvanized Plated			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location and function	Above-ground/outdoor/block			



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Actuator

N/A

Support

No

Locking device

Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**18. BALL VALVES 1/2"~1-1/2" - VB-127-E3**

	PIPE CLASS	E3	Rating class	Class 900	CA=3.0mm
general	Tag Number	VB-127-E3			
	Size Range (Inch)	1/2"~1-1/2"			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	1580			
	Design Temperature (°F)(min/max)	-50/265			
	Service/Service code	Flare/ Vent/ Process Gas/ Glycol(Cold Service)/ Process Liquid			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Floating ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	RTJ to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Lever Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	ASTM A 350 LF2.			
	Ball	Type 316SS			
	Stem	Type 316SS			
	Seat	Filled Teflon			
	Seal	Filled Teflon			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	Zinc coating for Body bolt/nut	Hot Dip Galvanized Plated			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			





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Valve location and function	Above-ground/outdoor/block
Marking	As per Specification for Specification for Ball, Gate, Globe and Check Valves NGP-00-PIP-15.03-0010-00
Actuator	N/A
Support	No
Locking device	Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**19. BALL VALVES 1/2"~1-1/2" - VB-128-E8**

	PIPE CLASS	E8	Rating class	Class 900	CA=3.0mm
general	Tag Number	VB-128-E8			
	Size Range (Inch)	1/2"~1-1/2"			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	1580			
	Design Temperature (°F)(min/max)	200/200			
	Service/Service code	Flow Lines			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Floating ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	RTJ to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Lever Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	ASTM A105N			
	Ball	A182 F6 Class2			
	Stem	13% Cr. S.S.			
	Seat	Filled Teflon			
	Seal	Filled Teflon			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	Zinc coating for Body bolt/nut	Hot Dip Galvanized Plated			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location and function	Above-ground/outdoor/block			



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Marking

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Actuator

N/A

Support

No

Locking device

Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**20. BALL VALVES 1/2"~1-1/2" - VB-130-D6**

	PIPE CLASS	D6	Rating class	Class 600	CA=0mm
general	Tag Number		VB-130-D6		
	Size Range (Inch)		1/2"~1-1/2"		
	Valve Type		Reduced Port		
	Design Pressure(PSIG) (max)		1340		
	Design Temperature (°F)(min/max)		-120/150		
	Service/Service code		Liquified Gas Under -100 °C		
	Service Component		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		API 6D		
	Body		Side entry, Split body, Bolted Body		
	Ball		Floating ball		
	Seat		Soft Seated, Replaceable Seats		
	End Connection		Flanged Raised Face to ASME B16.5		
	Face to Face Dimension		ASME B16.10		
	Leakage Class		Rate A		
	Operation		Lever Operated		
	Fire Safe requirements(Design & Certificate)		API 607/API 6FA		
	Others		anti-static, anti-blow-out stem		
material (Note-4)	Body & Cover		Type 316SS		
	Ball		Type 316SS		
	Stem		Type 316SS		
	Seat		Mfr. Std.		
	Seat		Mfr. Std.		
others	Test Standard		API 6D/ISO 5208/API 598		
	CERTIFICATION		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location and function		Above-ground/outdoor/block		
	Marking		As per Specification for Specification for Ball, Gate, Globe		



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		and Check Valves NGP-00-PIP-15.03-0010-00
Actuator		N/A
Support		No
Locking device		Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**21. BALL VALVES 1/2"~1-1/2" - VB-131-E6**

	PIPE CLASS	E6	Rating class	Class 900	CA=0mm
general	Tag Number		VB-131-E6		
	Size Range (Inch)		1/2"~1-1/2"		
	Valve Type		Reduced Port		
	Design Pressure(PSIG) (max)		1580		
	Design Temperature (°F)(min/max)		200/200		
	Service/Service code		Liquified Gas Under -100 °C		
	Service Component		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		API 6D		
	Body		Side entry, Split body, Bolted Body		
	Ball		Floating ball		
	Seat		Soft Seated, Replaceable Seats		
	End Connection		Flanged Raised Face to ASME B16.5		
	Face to Face Dimension		ASME B16.10		
	Leakage Class		Rate A		
	Operation		Lever Operated		
	Fire Safe requirements(Design & Certificate)		API 607/API 6FA		
	Others		anti-static, anti-blow-out stem		
material (Note-4)	Body & Cover		Type 316SS		
	Ball		Type 316SS		
	Stem		Type 316SS		
	Seat		Mfr. Std.		
	Seat		Mfr. Std.		
others	Test Standard		API 6D/ISO 5208/API 598		
	CERTIFICATION		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location and function		Above-ground/outdoor/block		
	Marking		As per Specification for Specification for Ball, Gate, Globe		



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		and Check Valves NGP-00-PIP-15.03-0010-00
Actuator		N/A
Support		No
Locking device		Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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## 22. BALL VALVES 2"~4"- VB-201-A1

	PIPE CLASS	A1	Rating class	Class 150	CA=1.6mm
general	Tag Number	VB-201-A1			
	Size Range (Inch)	2"~4"			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	270			
	Design Temperature (°F)(min/max)	150/170			
	Service/Service code	Fuel Oil/ Hot Oil/ Inert Gas/ Stabilized Condensate/ Glycol/ Treated Gas(Sales Gas, LPG), Fire Water (A/G)			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Floating ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	Flanged Raised Face to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Lever Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	ASTM A216 Gr WCB			
	Ball	A105N Chrome Plated Steel			
	Stem	13% Cr. S.S.			
	Seat	Filled TFE			
	Seal	Filled TFE			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	Zinc coating for Body bolt/nut	Hot Dip Galvanized Plated			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			





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Valve location and function	Above-ground/outdoor/block
Marking	As per Specification for Specification for Ball, Gate, Globe and Check Valves NGP-00-PIP-15.03-0010-00
Actuator	N/A
Support	No
Locking device	Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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### 23. BALL VALVES 6"- VB-201-A1

	PIPE CLASS	A1	Rating class	Class 150	CA=1.6mm
general	Tag Number	VB-201-A1			
	Size Range (Inch)	6"			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	270			
	Design Temperature (°F)(min/max)	150/170			
	Service/Service code	Fuel Oil/ Hot Oil/ Inert Gas/ Stabilized Condensate/ Glycol/ Treated Gas(Sales Gas, LPG), Fire Water (A/G)			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Trunnion Mounted ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	Flanged Raised Face to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Bevel Gear Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	DBB DESIGN, Secondary Sealant Injection for Seat and Stem Seals, anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	ASTM A216 Gr WCB			
	Ball	A105N Chrome Plated Steel			
	Stem	13% Cr. S.S.			
	Seat	Filled TFE			
	Seal	Filled TFE			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	Zinc coating for Body bolt/nut	Hot Dip Galvanized Plated			
	External painting and Colour coding	As per Specification for Coating and Painting			



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	Valve location and function	Above-ground/outdoor/block
	Marking	As per Specification for Specification for Ball, Gate, Globe and Check Valves NGP-00-PIP-15.03-0010-00
	Actuator	N/A
	Support	No
	Locking device	Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**24. BALL VALVES 8”~24”- VB-201-A1**

	PIPE CLASS	A1	Rating class	Class 150	CA=1.6mm
general	Tag Number	VB-201-A1			
	Size Range (Inch)	8”~24”			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	270			
	Design Temperature (°F)(min/max)	150/170			
	Service/Service code	Fuel Oil/ Hot Oil/ Inert Gas/ Stabilized Condensate/ Glycol/ Treated Gas(Sales Gas, LPG), Fire Water (A/G)			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Trunnion Mounted ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	Flanged Raised Face to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Bevel Gear Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	DBB DESIGN, Secondary Sealant Injection for Seat and Stem Seals, anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	ASTM A216 Gr WCB			
	Ball	A105N Chrome Plated Steel			
	Stem	13% Cr. S.S.			
	Seat	Filled TFE			
	Seal	Filled TFE			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	Zinc coating for Body bolt/nut	Hot Dip Galvanized Plated			
	External painting and Colour coding	As per Specification for Coating and Painting			



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		NGP-000-PAI-15.03-0001-00
	Valve location and function	Above-ground/outdoor/block
	Marking	As per Specification for Specification for Ball, Gate, Globe and Check Valves NGP-00-PIP-15.03-0010-00
	Actuator	N/A
	Support	Yes
	Locking device	Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**25. BALL VALVES 2"~4"- VB-202-A2**

	PIPE CLASS	A2	Rating class	Class 150	CA=3.0mm
general	Tag Number	VB-202-A2			
	Size Range (Inch)	2"~4"			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	270			
	Design Temperature (°F)(min/max)	150/350			
	Service/Service code	Raw Gas/ Fuel Gas/ Open Drain/ Vents / Closed Drain			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Floating ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	Flanged Raised Face to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Lever Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	ASTM A216 Gr WCB			
	Ball	Type 316 S.S.			
	Stem	Type 316 S.S.			
	Seat	Filled TFE			
	Seal	Filled TFE			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	Zinc coating for Body bolt/nut	Hot Dip Galvanized Plated			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location and function	Above-ground/outdoor/block			



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Marking

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Actuator

N/A

Support

No

Locking device

Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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## 26. BALL VALVES 6"- VB-202-A2

	PIPE CLASS	A2	Rating class	Class 150	CA=3.0mm
general	Tag Number	VB-202-A2			
	Size Range (Inch)	6"			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	270			
	Design Temperature (°F)(min/max)	150/350			
	Service/Service code	Raw Gas/ Fuel Gas/ Open Drain/ Vents / Closed Drain			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Trunnion Mounted ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	Flanged Raised Face to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Bevel Gear Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	DBB DESIGN, Secondary Sealant Injection for Seat and Stem Seals, anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	ASTM A216 Gr WCB			
	Ball	Type 316 S.S.			
	Stem	Type 316 S.S.			
	Seat	Filled TFE			
	Seal	Filled TFE			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	Zinc coating for Body bolt/nut	Hot Dip Galvanized Plated			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			





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Valve location and function	Above-ground/outdoor/block
Marking	As per Specification for Specification for Ball, Gate, Globe and Check Valves NGP-00-PIP-15.03-0010-00
Actuator	N/A
Support	No
Locking device	Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**27. BALL VALVES 8”~24”- VB-202-A2**

	PIPE CLASS	A2	Rating class	Class 150	CA=3.0mm
general	Tag Number	VB-202-A2			
	Size Range (Inch)	8”~24”			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	270			
	Design Temperature (°F)(min/max)	150/350			
	Service/Service code	Raw Gas/ Fuel Gas/ Open Drain/ Vents / Closed Drain			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Trunnion Mounted ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	Flanged Raised Face to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Bevel Gear Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	DBB DESIGN, Secondary Sealant Injection for Seat and Stem Seals, anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	ASTM A216 Gr WCB			
	Ball	Type 316 S.S.			
	Stem	Type 316 S.S.			
	Seat	Filled TFE			
	Seal	Filled TFE			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	Zinc coating for Body bolt/nut	Hot Dip Galvanized Plated			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			



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Valve location and function	Above-ground/outdoor/block
Marking	As per Specification for Specification for Ball, Gate, Globe and Check Valves NGP-00-PIP-15.03-0010-00
Actuator	N/A
Support	Yes
Locking device	Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**28. BALL VALVES 2"~4"- VB-202-A8**

	PIPE CLASS	A8	Rating class	Class 150	CA=3.0mm
general	Tag Number	VB-202-A8			
	Size Range (Inch)	2"~4"			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	250			
	Design Temperature (°F)(min/max)	200/200			
	Service/Service code	Produce Water			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Floating ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	Flanged Raised Face to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Lever Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	ASTM A216 Gr WCB			
	Ball	Type 316 S.S.			
	Stem	Type 316 S.S.			
	Seat	Filled TFE			
	Seal	Filled TFE			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	Zinc coating for Body bolt/nut	Hot Dip Galvanized Plated			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location and function	Above-ground/outdoor/block			



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Marking

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Actuator

N/A

Support

No

Locking device

Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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## 29. BALL VALVES 6"- VB-202-A8

	PIPE CLASS	A8	Rating class	Class 150	CA=4.5mm
general	Tag Number	VB-202-A8			
	Size Range (Inch)	6"			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	250			
	Design Temperature (°F)(min/max)	200/200			
	Service/Service code	Produce Water			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Trunnion Mounted ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	Flanged Raised Face to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Bevel Gear Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	DBB DESIGN, Secondary Sealant Injection for Seat and Stem Seals, anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	ASTM A216 Gr WCB			
	Ball	Type 316 S.S.			
	Stem	Type 316 S.S.			
	Seat	Filled TFE			
	Seal	Filled TFE			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	Zinc coating for Body bolt/nut	Hot Dip Galvanized Plated			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			



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Valve location and function	Above-ground/outdoor/block
Marking	As per Specification for Specification for Ball, Gate, Globe and Check Valves NGP-00-PIP-15.03-0010-00
Actuator	N/A
Support	No
Locking device	Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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### 30. BALL VALVES 8"~24"- VB-202-A8

	PIPE CLASS	A8	Rating class	Class 150	CA=4.5mm
general	Tag Number	VB-202-A8			
	Size Range (Inch)	8"~24"			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	250			
	Design Temperature (°F)(min/max)	200/200			
	Service/Service code	Produce Water			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Trunnion Mounted ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	Flanged Raised Face to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Bevel Gear Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	DBB DESIGN, Secondary Sealant Injection for Seat and Stem Seals, anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	ASTM A216 Gr WCB			
	Ball	Type 316 S.S.			
	Stem	Type 316 S.S.			
	Seat	Filled TFE			
	Seal	Filled TFE			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	Zinc coating for Body bolt/nut	Hot Dip Galvanized Plated			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			





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Valve location and function	Above-ground/outdoor/block
Marking	As per Specification for Specification for Ball, Gate, Globe and Check Valves NGP-00-PIP-15.03-0010-00
Actuator	N/A
Support	Yes
Locking device	Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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### 31. BALL VALVES 2"~4"- VB-203-A4

	PIPE CLASS	A4	Rating class	Class 150	CA=1.6mm
general	Tag Number	VB-203-A4			
	Size Range (Inch)	2"~4"			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	270			
	Design Temperature (°F)(min/max)	-20/200			
	Service/Service code	Utility, Instrument& Plant Air			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Floating ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	Flanged Raised Face to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Lever Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	ASTM A216 Gr WCB			
	Ball	Type 316 S.S.Nickel Plated			
	Stem	13% Cr. S.S.Nickel Plated			
	Seat	Filled TFE			
	Seal	Filled TFE			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	Zinc coating for Body bolt/nut	Hot Dip Galvanized Plated			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location and function	Above-ground/outdoor/block			



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Marking

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Actuator

N/A

Support

No

Locking device

Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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### 32. BALL VALVES 6"- VB-203-A4

	PIPE CLASS	A4	Rating class	Class 150	CA=1.6mm
general	Tag Number	VB-203-A4			
	Size Range (Inch)	6"			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	270			
	Design Temperature (°F)(min/max)	-20/200			
	Service/Service code	Utility, Instrument& Plant Air			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Trunnion Mounted ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	Flanged Raised Face to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Bevel Gear Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	DBB DESIGN, Secondary Sealant Injection for Seat and Stem Seals, anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	ASTM A216 Gr WCB			
	Ball	Type 316 S.S.Nickel Plated			
	Stem	13% Cr. S.S.Nickel Plated			
	Seat	Filled TFE			
	Seal	Filled TFE			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	Zinc coating for Body bolt/nut	Hot Dip Galvanized Plated			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			



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Valve location and function	Above-ground/outdoor/block
Marking	As per Specification for Specification for Ball, Gate, Globe and Check Valves NGP-00-PIP-15.03-0010-00
Actuator	N/A
Support	No
Locking device	Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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### 33. BALL VALVES 2"~4"- VB-206-A6

	PIPE CLASS	A6	Rating class	Class 150	CA=0mm
general	Tag Number	VB-206-A6			
	Size Range (Inch)	2"~4"			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	270			
	Design Temperature (°F)(min/max)	-180/150			
	Service/Service code	Liquified Gas Under -100 °C			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Floating ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	Flanged Raised Face to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Lever Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	Type 316 S.S.			
	Ball	Type 316 S.S.			
	Stem	Type 316 S.S.			
	Seat	Filled TFE			
	Seal	Filled TFE			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location and function	Above-ground/outdoor/block			
	Marking	As per Specification for Specification for Ball, Gate, Globe			



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		and Check Valves NGP-00-PIP-15.03-0010-00
Actuator		N/A
Support		No
Locking device		Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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### 34. BALL VALVES 6"- VB-206-A6

	PIPE CLASS	A6	Rating class	Class 150	CA=0mm
general	Tag Number	VB-206-A6			
	Size Range (Inch)	6"			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	270			
	Design Temperature (°F)(min/max)	-180/150			
	Service/Service code	Liquified Gas Under -100 °C			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Trunnion Mounted ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	Flanged Raised Face to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Bevel Gear Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	DBB DESIGN, Secondary Sealant Injection for Seat and Stem Seals, anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	Type 316 S.S.			
	Ball	Type 316 S.S.			
	Stem	Type 316 S.S.			
	Seat	Filled TFE			
	Seal	Filled TFE			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location and function	Above-ground/outdoor/block			





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Actuator

N/A

Support

No

Locking device

Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**35. BALL VALVES 8”~24”- VB-206-A6**

	PIPE CLASS	A6	Rating class	Class 150	CA=0mm
general	Tag Number	VB-206-A6			
	Size Range (Inch)	8”~24”			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	270			
	Design Temperature (°F)(min/max)	-180/150			
	Service/Service code	Liquified Gas Under -100 °C			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Trunnion Mounted ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	Flanged Raised Face to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Bevel Gear Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	DBB DESIGN, Secondary Sealant Injection for Seat and Stem Seals, anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	Type 316 S.S.			
	Ball	Type 316 S.S.			
	Stem	Type 316 S.S.			
	Seat	Filled TFE			
	Seal	Filled TFE			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location and function	Above-ground/outdoor/block			



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Actuator

N/A

Support

Yes

Locking device

Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**36. BALL VALVES 2"~4"- VB-208-A3**

	PIPE CLASS	A3	Rating class	Class 150	CA=3.0mm
general	Tag Number	VB-208-A3			
	Size Range (Inch)	2"~4"			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	270			
	Design Temperature (°F)(min/max)	-50/-50			
	Service/Service code	Flare/ Vent/ Process Gas/ Glycol(Cold Service)/ Process Liquid			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Floating ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	Flanged Raised Face to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Lever Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	ASTM A352 Gr LCC			
	Ball	Type 316 S.S.			
	Stem	Type 316 S.S.			
	Seat	Filled TFE			
	Seal	Filled TFE			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	Zinc coating for Body bolt/nut	Hot Dip Galvanized Plated			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			



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Valve location and function	Above-ground/outdoor/block
Marking	As per Specification for Specification for Ball, Gate, Globe and Check Valves NGP-00-PIP-15.03-0010-00
Actuator	N/A
Support	No
Locking device	Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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### 37. BALL VALVES 6"- VB-208-A3

	PIPE CLASS	A3	Rating class	Class 150	CA=3.0mm
general	Tag Number	VB-208-A3			
	Size Range (Inch)	6"			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	270			
	Design Temperature (°F)(min/max)	-50/-50			
	Service/Service code	Flare/ Vent/ Process Gas/ Glycol(Cold Service)/ Process Liquid			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Trunnion Mounted ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	Flanged Raised Face to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Bevel Gear Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	DBB DESIGN, Secondary Sealant Injection for Seat and Stem Seals, anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	ASTM A352 Gr LCC			
	Ball	Type 316 S.S.			
	Stem	Type 316 S.S.			
	Seat	Filled TFE			
	Seal	Filled TFE			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	Zinc coating for Body bolt/nut	Hot Dip Galvanized Plated			
	External painting and Colour coding	As per Specification for Coating and Painting			



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Valve location and function	Above-ground/outdoor/block
Marking	As per Specification for Specification for Ball, Gate, Globe and Check Valves NGP-00-PIP-15.03-0010-00
Actuator	N/A
Support	No
Locking device	Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**38. BALL VALVES 8”~24”- VB-208-A3**

	PIPE CLASS	A3	Rating class	Class 150	CA=3.0mm
general	Tag Number	VB-208-A3			
	Size Range (Inch)	8”~24”			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	270			
	Design Temperature (°F)(min/max)	-50/-50			
	Service/Service code	Flare/ Vent/ Process Gas/ Glycol(Cold Service)/ Process Liquid			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Trunnion Mounted ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	Flanged Raised Face to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Bevel Gear Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	DBB DESIGN, Secondary Sealant Injection for Seat and Stem Seals, anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	ASTM A352 Gr LCC			
	Ball	Type 316 S.S.			
	Stem	Type 316 S.S.			
	Seat	Filled TFE			
	Seal	Filled TFE			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	Zinc coating for Body bolt/nut	Hot Dip Galvanized Plated			
	External painting and Colour coding	As per Specification for Coating and Painting			





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	Valve location and function	Above-ground/outdoor/block
	Marking	As per Specification for Specification for Ball, Gate, Globe and Check Valves NGP-00-PIP-15.03-0010-00
	Actuator	N/A
	Support	Yes
	Locking device	Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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### 39. BALL VALVES 2"~4"- VB-211-B1

	PIPE CLASS	B1	Rating class	Class 300	CA=1.6mm
general	Tag Number	VB-211-B1			
	Size Range (Inch)	2"~4"			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	600			
	Design Temperature (°F)(min/max)	35/350			
	Service/Service code	Fuel Oil/ Hot Oil/ Inert Gas/ Stabilized Condensate/ Glycol/ Treated Gas(Sales Gas, LPG).			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Floating ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	Flanged Raised Face to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Lever Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	ASTM A216 Gr WCB			
	Ball	A105N Chrome Plated Steel			
	Stem	13% Cr. S.S.			
	Seat	Filled TFE			
	Seal	Filled TFE			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	Zinc coating for Body bolt/nut	Hot Dip Galvanized Plated			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			



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Valve location and function	Above-ground/outdoor/block
Marking	As per Specification for Specification for Ball, Gate, Globe and Check Valves NGP-00-PIP-15.03-0010-00
Actuator	N/A
Support	No
Locking device	Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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#### 40. BALL VALVES 6"- VB-211-B1

	PIPE CLASS	B1	Rating class	Class 300	CA=1.6mm
general	Tag Number	VB-211-B1			
	Size Range (Inch)	6"			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	600			
	Design Temperature (°F)(min/max)	35/350			
	Service/Service code	Fuel Oil/ Hot Oil/ Inert Gas/ Stabilized Condensate/ Glycol/ Treated Gas(Sales Gas, LPG).			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Trunnion Mounted ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	Flanged Raised Face to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Bevel Gear Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	DBB DESIGN, Secondary Sealant Injection for Seat and Stem Seals, anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	ASTM A216 Gr WCB			
	Ball	A105N Chrome Plated Steel			
	Stem	13% Cr. S.S.			
	Seat	Filled TFE			
	Seal	Filled TFE			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	Zinc coating for Body bolt/nut	Hot Dip Galvanized Plated			
	External painting and Colour coding	As per Specification for Coating and Painting			



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		NGP-000-PAI-15.03-0001-00
	Valve location and function	Above-ground/outdoor/block
	Marking	As per Specification for Specification for Ball, Gate, Globe and Check Valves NGP-00-PIP-15.03-0010-00
	Actuator	N/A
	Support	No
	Locking device	Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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#### 41. BALL VALVES 8"~24"- VB-211-B1

	PIPE CLASS	B1	Rating class	Class 300	CA=1.6mm
general	Tag Number	VB-211-B1			
	Size Range (Inch)	8"~24"			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	600			
	Design Temperature (°F)(min/max)	35/350			
	Service/Service code	Fuel Oil/ Hot Oil/ Inert Gas/ Stabilized Condensate/ Glycol/ Treated Gas(Sales Gas, LPG).			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Trunnion Mounted ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	Flanged Raised Face to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Bevel Gear Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	DBB DESIGN, Secondary Sealant Injection for Seat and Stem Seals, anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	ASTM A216 Gr WCB			
	Ball	A105N Chrome Plated Steel			
	Stem	13% Cr. S.S.			
	Seat	Filled TFE			
	Seal	Filled TFE			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	Zinc coating for Body bolt/nut	Hot Dip Galvanized Plated			
	External painting and Colour coding	As per Specification for Coating and Painting			



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		NGP-000-PAI-15.03-0001-00
	Valve location and function	Above-ground/outdoor/block
	Marking	As per Specification for Specification for Ball, Gate, Globe and Check Valves NGP-00-PIP-15.03-0010-00
	Actuator	N/A
	Support	Yes
	Locking device	Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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#### 42. BALL VALVES 2"~4"- VB-212-B2

	PIPE CLASS	B2	Rating class	Class 300	CA=3.0mm
general	Tag Number	VB-212-B2			
	Size Range (Inch)	2"~4"			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	600			
	Design Temperature (°F)(min/max)	200/200			
	Service/Service code	Raw Gas/ Fuel Gas/ Open Drain/ Vents / Closed Drain			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Floating ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	Flanged Raised Face to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Lever Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	ASTM A216 Gr WCB			
	Ball	Type 316 S.S.			
	Stem	Type 316 S.S.			
	Seat	Filled TFE			
	Seal	Filled TFE			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	Zinc coating for Body bolt/nut	Hot Dip Galvanized Plated			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location and function	Above-ground/outdoor/block			





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Actuator

N/A

Support

No

Locking device

Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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### 43. BALL VALVES 6"- VB-212-B2

	PIPE CLASS	B2	Rating class	Class 300	CA=3.0mm
general	Tag Number	VB-212-B2			
	Size Range (Inch)	6"			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	600			
	Design Temperature (°F)(min/max)	200/200			
	Service/Service code	Raw Gas/ Fuel Gas/ Open Drain/ Vents / Closed Drain			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Trunnion Mounted ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	Flanged Raised Face to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Bevel Gear Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	DBB DESIGN, Secondary Sealant Injection for Seat and Stem Seals, anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	ASTM A216 Gr WCB			
	Ball	Type 316 S.S.			
	Stem	Type 316 S.S.			
	Seat	Filled TFE			
	Seal	Filled TFE			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	Zinc coating for Body bolt/nut	Hot Dip Galvanized Plated			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			



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Valve location and function	Above-ground/outdoor/block
Marking	As per Specification for Specification for Ball, Gate, Globe and Check Valves NGP-00-PIP-15.03-0010-00
Actuator	N/A
Support	No
Locking device	Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**44. BALL VALVES 8"~24"- VB-212-B2**

	PIPE CLASS	B2	Rating class	Class 300	CA=3.0mm
general	Tag Number	VB-212-B2			
	Size Range (Inch)	8"~24"			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	600			
	Design Temperature (°F)(min/max)	200/200			
	Service/Service code	Raw Gas/ Fuel Gas/ Open Drain/ Vents / Closed Drain			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Trunnion Mounted ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	Flanged Raised Face to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Bevel Gear Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	DBB DESIGN, Secondary Sealant Injection for Seat and Stem Seals, anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	ASTM A216 Gr WCB			
	Ball	Type 316 S.S.			
	Stem	Type 316 S.S.			
	Seat	Filled TFE			
	Seal	Filled TFE			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	Zinc coating for Body bolt/nut	Hot Dip Galvanized Plated			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			



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Valve location and function	Above-ground/outdoor/block
Marking	As per Specification for Specification for Ball, Gate, Globe and Check Valves NGP-00-PIP-15.03-0010-00
Actuator	N/A
Support	Yes
Locking device	Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**45. BALL VALVES 2"~4"- VB-216-B6**

	PIPE CLASS	B6	Rating class	Class 300	CA=0mm
general	Tag Number	VB-216-B6			
	Size Range (Inch)	2"~4"			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	600			
	Design Temperature (°F)(min/max)	-120/-70			
	Service/Service code	Liquified Gas Under -100 °C			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Floating ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	Flanged Raised Face to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Lever Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	Type 316 S.S.			
	Ball	Type 316 S.S.			
	Stem	Type 316 S.S.			
	Seat	Filled TFE			
	Seal	Filled TFE			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location and function	Above-ground/outdoor/block			
	Marking	As per Specification for Specification for Ball, Gate, Globe			



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		and Check Valves NGP-00-PIP-15.03-0010-00
Actuator		N/A
Support		No
Locking device		Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**46. BALL VALVES 6"- VB-216-B6**

	PIPE CLASS	B6	Rating class	Class 300	CA=0mm
general	Tag Number		VB-216-B6		
	Size Range (Inch)		6"		
	Valve Type		Reduced Port		
	Design Pressure(PSIG) (max)		600		
	Design Temperature (°F)(min/max)		-120/-70		
	Service/Service code		Liquified Gas Under -100 °C		
	Service Component		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		API 6D		
	Body		Side entry, Split body, Bolted Body		
	Ball		Trunnion Mounted ball		
	Seat		Soft Seated, Replaceable Seats		
	End Connection		Flanged Raised Face to ASME B16.5		
	Face to Face Dimension		ASME B16.10		
	Leakage Class		Rate A		
	Operation		Bevel Gear Operated		
	Fire Safe requirements(Design & Certificate)		API 607/API 6FA		
	Others		DBB DESIGN, Secondary Sealant Injection for Seat and Stem Seals, anti-static, anti-blow-out stem		
material (Note-4)	Body & Cover		Type 316 S.S.		
	Ball		Type 316 S.S.		
	Stem		Type 316 S.S.		
	Seat		Filled TFE		
	Seal		Filled TFE		
others	Test Standard		API 6D/ISO 5208/API 598		
	CERTIFICATION		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location and function		Above-ground/outdoor/block		





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Marking

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Actuator

N/A

Support

No

Locking device

Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**47. BALL VALVES 8"~24"- VB-216-B6**

	PIPE CLASS	B6	Rating class	Class 300	CA=0mm
general	Tag Number	VB-216-B6			
	Size Range (Inch)	8"~24"			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	600			
	Design Temperature (°F)(min/max)	-120/-70			
	Service/Service code	Liquified Gas Under -100 °C			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Trunnion Mounted ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	Flanged Raised Face to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Bevel Gear Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	DBB DESIGN, Secondary Sealant Injection for Seat and Stem Seals, anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	Type 316 S.S.			
	Ball	Type 316 S.S.			
	Stem	Type 316 S.S.			
	Seat	Filled TFE			
	Seal	Filled TFE			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location and function	Above-ground/outdoor/block			



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Marking

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Actuator

N/A

Support

Yes

Locking device

Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**48. Ball Valves 2"~4"- VB-218-B3**

	PIPE CLASS	B3	Rating class	Class 300	CA=3.0mm
general	Tag Number	VB-218-B3			
	Size Range (Inch)	2"~4"			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	600			
	Design Temperature (°F)(min/max)	-50/265			
	Service/Service code	Flare/ Vent/ Process Gas/ Glycol(Cold Service)/ Process Liquid			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Floating ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	Flanged Raised Face to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Lever Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	ASTM A352 Gr LCC			
	Ball	Type 316 S.S.			
	Stem	Type 316 S.S.			
	Seat	Filled TFE			
	Seal	Filled TFE			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	Zinc coating for Body bolt/nut	Hot Dip Galvanized Plated			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			



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Valve location and function	Above-ground/outdoor/block
Marking	As per Specification for Specification for Ball, Gate, Globe and Check Valves NGP-00-PIP-15.03-0010-00
Actuator	N/A
Support	No
Locking device	Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**49. Ball Valves 6"- VB-218-B3**

	PIPE CLASS	B3	Rating class	Class 300	CA=3.0mm
general	Tag Number	VB-218-B3			
	Size Range (Inch)	6"			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	600			
	Design Temperature (°F)(min/max)	-50/265			
	Service/Service code	Flare/ Vent/ Process Gas/ Glycol(Cold Service)/ Process Liquid			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Trunnion Mounted ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	Flanged Raised Face to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Bevel Gear Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	DBB DESIGN, Secondary Sealant Injection for Seat and Stem Seals, anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	ASTM A352 Gr LCC			
	Ball	Type 316 S.S.			
	Stem	Type 316 S.S.			
	Seat	Filled TFE			
	Seal	Filled TFE			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	Zinc coating for Body bolt/nut	Hot Dip Galvanized Plated			
	External painting and Colour coding	As per Specification for Coating and Painting			



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Valve location and function	Above-ground/outdoor/block
Marking	As per Specification for Specification for Ball, Gate, Globe and Check Valves NGP-00-PIP-15.03-0010-00
Actuator	N/A
Support	No
Locking device	Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**50. Ball Valves 8”~24”- VB-218-B3**

	PIPE CLASS	B3	Rating class	Class 300	CA=3.0mm
general	Tag Number	VB-218-B3			
	Size Range (Inch)	8”~24”			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	600			
	Design Temperature (°F)(min/max)	-50/265			
	Service/Service code	Flare/ Vent/ Process Gas/ Glycol(Cold Service)/ Process Liquid			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Trunnion Mounted ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	Flanged Raised Face to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Bevel Gear Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	DBB DESIGN, Secondary Sealant Injection for Seat and Stem Seals, anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	ASTM A352 Gr LCC			
	Ball	Type 316 S.S.			
	Stem	Type 316 S.S.			
	Seat	Filled TFE			
	Seal	Filled TFE			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	Zinc coating for Body bolt/nut	Hot Dip Galvanized Plated			
	External painting and Colour coding	As per Specification for Coating and Painting			





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	Valve location and function	Above-ground/outdoor/block
	Marking	As per Specification for Specification for Ball, Gate, Globe and Check Valves NGP-00-PIP-15.03-0010-00
	Actuator	N/A
	Support	Yes
	Locking device	Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**51. Ball Valves 2"~3"- VB-221-D1**

	PIPE CLASS	D1	Rating class	Class 600	CA=1.6mm
general	Tag Number		VB-221-D1		
	Size Range (Inch)		2"~3"		
	Valve Type		Reduced Port		
	Design Pressure(PSIG) (max)		1340		
	Design Temperature (°F)(min/max)		150/150		
	Service/Service code		Fuel Oil/ Hot Oil/ Inert Gas/ Stabilized Condensate/ Glycol/ Treated Gas/ Sales Gas/ LPG		
	Service Component		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		API 6D		
	Body		Side entry, Split body, Bolted Body		
	Ball		Floating ball		
	Seat		Soft Seated, Replaceable Seats		
	End Connection		Flanged Raised Face to ASME B16.5		
	Face to Face Dimension		ASME B16.10		
	Leakage Class		Rate A		
	Operation		Lever Operated		
	Fire Safe requirements(Design & Certificate)		API 607/API 6FA		
	Others		anti-static, anti-blow-out stem		
material (Note-4)	Body & Cover		ASTM A216 Gr WCB		
	Ball		A105N Chrome Plated Steel		
	Stem		13% Cr. S.S.		
	Seat		Filled TFE		
	Seal		Filled TFE		
others	Test Standard		API 6D/ISO 5208/API 598		
	CERTIFICATION		EN 10204 3.1		
	Zinc coating for Body bolt/nut		Hot Dip Galvanized Plated		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		



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Valve location and function	Above-ground/outdoor/block
Marking	As per Specification for Specification for Ball, Gate, Globe and Check Valves NGP-00-PIP-15.03-0010-00
Actuator	N/A
Support	No
Locking device	Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**52. Ball Valves 4"- VB-221-D1**

	PIPE CLASS	D1	Rating class	Class 600	CA=1.6mm
general	Tag Number		VB-221-D1		
	Size Range (Inch)		4"		
	Valve Type		Reduced Port		
	Design Pressure(PSIG) (max)		1340		
	Design Temperature (°F)(min/max)		150/150		
	Service/Service code		Fuel Oil/ Hot Oil/ Inert Gas/ Stabilized Condensate/ Glycol/ Treated Gas/ Sales Gas/ LPG		
	Service Component		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		API 6D		
	Body		Side entry, Split body, Bolted Body		
	Ball		Floating ball		
	Seat		Soft Seated, Replaceable Seats		
	End Connection		Flanged Raised Face to ASME B16.5		
	Face to Face Dimension		ASME B16.10		
	Leakage Class		Rate A		
	Operation		Bevel Gear Operated		
	Fire Safe requirements(Design & Certificate)		API 607/API 6FA		
	Others		anti-static, anti-blow-out stem		
material (Note-4)	Body & Cover		ASTM A216 Gr WCB		
	Ball		A105N Chrome Plated Steel		
	Stem		13% Cr. S.S.		
	Seat		Filled TFE		
	Seal		Filled TFE		
others	Test Standard		API 6D/ISO 5208/API 598		
	CERTIFICATION		EN 10204 3.1		
	Zinc coating for Body bolt/nut		Hot Dip Galvanized Plated		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		



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Valve location and function	Above-ground/outdoor/block
Marking	As per Specification for Specification for Ball, Gate, Globe and Check Valves NGP-00-PIP-15.03-0010-00
Actuator	N/A
Support	No
Locking device	Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**53. Ball Valves 6"- VB-221-D1**

	PIPE CLASS	D1	Rating class	Class 600	CA=1.6mm
general	Tag Number		VB-221-D1		
	Size Range (Inch)		6"		
	Valve Type		Reduced Port		
	Design Pressure(PSIG) (max)		1340		
	Design Temperature (°F)(min/max)		150/150		
	Service/Service code		Fuel Oil/ Hot Oil/ Inert Gas/ Stabilized Condensate/ Glycol/ Treated Gas/ Sales Gas/ LPG		
	Service Component		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		API 6D		
	Body		Side entry, Split body, Bolted Body		
	Ball		Trunnion Mounted ball		
	Seat		Soft Seated, Replaceable Seats		
	End Connection		Flanged Raised Face to ASME B16.5		
	Face to Face Dimension		ASME B16.10		
	Leakage Class		Rate A		
	Operation		Bevel Gear Operated		
	Fire Safe requirements(Design & Certificate)		API 607/API 6FA		
	Others		DBB DESIGN, Secondary Sealant Injection for Seat and Stem Seals, anti-static, anti-blow-out stem		
material (Note-4)	Body & Cover		ASTM A216 Gr WCB		
	Ball		A105N Chrome Plated Steel		
	Stem		13% Cr. S.S.		
	Seat		Filled TFE		
	Seal		Filled TFE		
others	Test Standard		API 6D/ISO 5208/API 598		
	CERTIFICATION		EN 10204 3.1		
	Zinc coating for Body bolt/nut		Hot Dip Galvanized Plated		
	External painting and Colour coding		As per Specification for Coating and Painting		



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	Valve location and function	Above-ground/outdoor/block
	Marking	As per Specification for Specification for Ball, Gate, Globe and Check Valves NGP-00-PIP-15.03-0010-00
	Actuator	N/A
	Support	No
	Locking device	Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**54. Ball Valves 8”~24”- VB-221-D1**

	PIPE CLASS	D1	Rating class	Class 600	CA=1.6mm
general	Tag Number		VB-221-D1		
	Size Range (Inch)		8”~24”		
	Valve Type		Reduced Port		
	Design Pressure(PSIG) (max)		1340		
	Design Temperature (°F)(min/max)		150/150		
	Service/Service code		Fuel Oil/ Hot Oil/ Inert Gas/ Stabilized Condensate/ Glycol/ Treated Gas/ Sales Gas/ LPG		
	Service Component		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		API 6D		
	Body		Side entry, Split body, Bolted Body		
	Ball		Trunnion Mounted ball		
	Seat		Soft Seated, Replaceable Seats		
	End Connection		Flanged Raised Face to ASME B16.5		
	Face to Face Dimension		ASME B16.10		
	Leakage Class		Rate A		
	Operation		Bevel Gear Operated		
	Fire Safe requirements(Design & Certificate)		API 607/API 6FA		
	Others		DBB DESIGN, Secondary Sealant Injection for Seat and Stem Seals, anti-static, anti-blow-out stem		
material (Note-4)	Body & Cover		ASTM A216 Gr WCB		
	Ball		A105N Chrome Plated Steel		
	Stem		13% Cr. S.S.		
	Seat		Filled TFE		
	Seal		Filled TFE		
others	Test Standard		API 6D/ISO 5208/API 598		
	CERTIFICATION		EN 10204 3.1		
	Zinc coating for Body bolt/nut		Hot Dip Galvanized Plated		
	External painting and Colour coding		As per Specification for Coating and Painting		





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Valve location and function	Above-ground/outdoor/block
Marking	As per Specification for Specification for Ball, Gate, Globe and Check Valves NGP-00-PIP-15.03-0010-00
Actuator	N/A
Support	Yes
Locking device	Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**55. Ball Valves 2"~3"- VB-222-D2**

	PIPE CLASS	D2	Rating class	Class 600	CA=3.0mm
general	Tag Number		VB-222-D2		
	Size Range (Inch)		2"~3"		
	Valve Type		Reduced Port		
	Design Pressure(PSIG) (max)		1340		
	Design Temperature (°F)(min/max)		150/350		
	Service/Service code		Raw Gas/ Fuel Gas/ Open Drain/ Vents/ Closed Drain		
	Service Component		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		API 6D		
	Body		Side entry, Split body, Bolted Body		
	Ball		Floating ball		
	Seat		Soft Seated, Replaceable Seats		
	End Connection		Flanged Raised Face to ASME B16.5		
	Face to Face Dimension		ASME B16.10		
	Leakage Class		Rate A		
	Operation		Lever Operated		
	Fire Safe requirements(Design & Certificate)		API 607/API 6FA		
	Others		anti-static, anti-blow-out stem		
material (Note-4)	Body & Cover		ASTM A216 Gr WCB		
	Ball		Type 316 S.S.		
	Stem		Type 316 S.S.		
	Seat		Filled TFE		
	Seal		Filled TFE		
others	Test Standard		API 6D/ISO 5208/API 598		
	CERTIFICATION		EN 10204 3.1		
	Zinc coating for Body bolt/nut		Hot Dip Galvanized Plated		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location and function		Above-ground/outdoor/block		



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Actuator

N/A

Support

No

Locking device

Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**56. Ball Valves 4"- VB-222-D2**

	PIPE CLASS	D2	Rating class	Class 600	CA=3.0mm
general	Tag Number		VB-222-D2		
	Size Range (Inch)		4"		
	Valve Type		Reduced Port		
	Design Pressure(PSIG) (max)		1340		
	Design Temperature (°F)(min/max)		150/350		
	Service/Service code		Raw Gas/ Fuel Gas/ Open Drain/ Vents/ Closed Drain		
	Service Component		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		API 6D		
	Body		Side entry, Split body, Bolted Body		
	Ball		Floating ball		
	Seat		Soft Seated, Replaceable Seats		
	End Connection		Flanged Raised Face to ASME B16.5		
	Face to Face Dimension		ASME B16.10		
	Leakage Class		Rate A		
	Operation		Bevel Gear Operated		
	Fire Safe requirements(Design & Certificate)		API 607/API 6FA		
	Others		anti-static, anti-blow-out stem		
material (Note-4)	Body & Cover		ASTM A216 Gr WCB		
	Ball		Type 316 S.S.		
	Stem		Type 316 S.S.		
	Seat		Filled TFE		
	Seal		Filled TFE		
others	Test Standard		API 6D/ISO 5208/API 598		
	CERTIFICATION		EN 10204 3.1		
	Zinc coating for Body bolt/nut		Hot Dip Galvanized Plated		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location and function		Above-ground/outdoor/block		



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Actuator

N/A

Support

No

Locking device

Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**57. Ball Valves 6"- VB-222-D2**

	PIPE CLASS	D2	Rating class	Class 600	CA=3.0mm
general	Tag Number		VB-222-D2		
	Size Range (Inch)		6"		
	Valve Type		Reduced Port		
	Design Pressure(PSIG) (max)		1340		
	Design Temperature (°F)(min/max)		150/350		
	Service/Service code		Raw Gas/ Fuel Gas/ Open Drain/ Vents/ Closed Drain		
	Service Component		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		API 6D		
	Body		Side entry, Split body, Bolted Body		
	Ball		Trunnion Mounted ball		
	Seat		Soft Seated, Replaceable Seats		
	End Connection		Flanged Raised Face to ASME B16.5		
	Face to Face Dimension		ASME B16.10		
	Leakage Class		Rate A		
	Operation		Bevel Gear Operated		
	Fire Safe requirements(Design & Certificate)		API 607/API 6FA		
	Others		DBB DESIGN, Secondary Sealant Injection for Seat and Stem Seals, anti-static, anti-blow-out stem		
material (Note-4)	Body & Cover		ASTM A216 Gr WCB		
	Ball		Type 316 S.S.		
	Stem		Type 316 S.S.		
	Seat		Filled TFE		
	Seal		Filled TFE		
others	Test Standard		API 6D/ISO 5208/API 598		
	CERTIFICATION		EN 10204 3.1		
	Zinc coating for Body bolt/nut		Hot Dip Galvanized Plated		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		



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Valve location and function	Above-ground/outdoor/block
Marking	As per Specification for Specification for Ball, Gate, Globe and Check Valves NGP-00-PIP-15.03-0010-00
Actuator	N/A
Support	No
Locking device	Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**58. Ball Valves 8”~24”- VB-222-D2**

	PIPE CLASS	D2	Rating class	Class 600	CA=3.0mm
general	Tag Number		VB-222-D2		
	Size Range (Inch)		6”		
	Valve Type		Reduced Port		
	Design Pressure(PSIG) (max)		1340		
	Design Temperature (°F)(min/max)		150/350		
	Service/Service code		Raw Gas/ Fuel Gas/ Open Drain/ Vents/ Closed Drain		
	Service Component		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		API 6D		
	Body		Side entry, Split body, Bolted Body		
	Ball		Trunnion Mounted ball		
	Seat		Soft Seated, Replaceable Seats		
	End Connection		Flanged Raised Face to ASME B16.5		
	Face to Face Dimension		ASME B16.10		
	Leakage Class		Rate A		
	Operation		Bevel Gear Operated		
	Fire Safe requirements(Design & Certificate)		API 607/API 6FA		
	Others		DBB DESIGN, Secondary Sealant Injection for Seat and Stem Seals, anti-static, anti-blow-out stem		
material (Note-4)	Body & Cover		ASTM A216 Gr WCB		
	Ball		Type 316 S.S.		
	Stem		Type 316 S.S.		
	Seat		Filled TFE		
	Seal		Filled TFE		
others	Test Standard		API 6D/ISO 5208/API 598		
	CERTIFICATION		EN 10204 3.1		
	Zinc coating for Body bolt/nut		Hot Dip Galvanized Plated		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		





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Valve location and function	Above-ground/outdoor/block
Marking	As per Specification for Specification for Ball, Gate, Globe and Check Valves NGP-00-PIP-15.03-0010-00
Actuator	N/A
Support	Yes
Locking device	Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**59. Ball Valves 2"~3"- VB-222-D9**

	PIPE CLASS	D9	Rating class	Class 600	CA=4.5mm
general	Tag Number	VB-222-D9			
	Size Range (Inch)	2"~3"			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	1340			
	Design Temperature (°F)(min/max)	200/200			
	Service/Service code	Produce Water			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Floating ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	Flanged Raised Face to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Lever Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	ASTM A216 Gr WCB			
	Ball	Type 316 S.S.			
	Stem	Type 316 S.S.			
	Seat	Filled TFE			
	Seal	Filled TFE			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	Zinc coating for Body bolt/nut	Hot Dip Galvanized Plated			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location and function	Above-ground/outdoor/block			



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Marking

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Actuator

N/A

Support

No

Locking device

Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**60. Ball Valves 4"- VB-222-D9**

	PIPE CLASS	D9	Rating class	Class 600	CA=4.5mm
general	Tag Number		VB-222-D9		
	Size Range (Inch)		4"		
	Valve Type		Reduced Port		
	Design Pressure(PSIG) (max)		1340		
	Design Temperature (°F)(min/max)		200/200		
	Service/Service code		Produce Water		
	Service Component		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		API 6D		
	Body		Side entry, Split body, Bolted Body		
	Ball		Floating ball		
	Seat		Soft Seated, Replaceable Seats		
	End Connection		Flanged Raised Face to ASME B16.5		
	Face to Face Dimension		ASME B16.10		
	Leakage Class		Rate A		
	Operation		Bevel Gear Operated		
	Fire Safe requirements(Design & Certificate)		API 607/API 6FA		
	Others		anti-static, anti-blow-out stem		
material (Note-4)	Body & Cover		ASTM A216 Gr WCB		
	Ball		Type 316 S.S.		
	Stem		Type 316 S.S.		
	Seat		Filled TFE		
	Seal		Filled TFE		
others	Test Standard		API 6D/ISO 5208/API 598		
	CERTIFICATION		EN 10204 3.1		
	Zinc coating for Body bolt/nut		Hot Dip Galvanized Plated		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location and function		Above-ground/outdoor/block		



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Marking

As per Specification for Specification for Ball, Gate, Globe and Check Valves NGP-00-PIP-15.03-0010-00

Actuator

N/A

Support

No

Locking device

Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**61. Ball Valves 6"- VB-222-D9**

	PIPE CLASS	D9	Rating class	Class 600	CA=4.5mm
general	Tag Number		VB-222-D9		
	Size Range (Inch)		6"		
	Valve Type		Reduced Port		
	Design Pressure(PSIG) (max)		1340		
	Design Temperature (°F)(min/max)		200/200		
	Service/Service code		Produce Water		
	Service Component		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		API 6D		
	Body		Side entry, Split body, Bolted Body		
	Ball		Trunnion Mounted ball		
	Seat		Soft Seated, Replaceable Seats		
	End Connection		Flanged Raised Face to ASME B16.5		
	Face to Face Dimension		ASME B16.10		
	Leakage Class		Rate A		
	Operation		Bevel Gear Operated		
	Fire Safe requirements(Design & Certificate)		API 607/API 6FA		
	Others		DBB DESIGN, Secondary Sealant Injection for Seat and Stem Seals, anti-static, anti-blow-out stem		
material (Note-4)	Body & Cover		ASTM A216 Gr WCB		
	Ball		Type 316 S.S.		
	Stem		Type 316 S.S.		
	Seat		Filled TFE		
	Seal		Filled TFE		
others	Test Standard		API 6D/ISO 5208/API 598		
	CERTIFICATION		EN 10204 3.1		
	Zinc coating for Body bolt/nut		Hot Dip Galvanized Plated		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		



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Valve location and function	Above-ground/outdoor/block
Marking	As per Specification for Specification for Ball, Gate, Globe and Check Valves NGP-00-PIP-15.03-0010-00
Actuator	N/A
Support	No
Locking device	Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**62. Ball Valves 8”~24”- VB-222-D9**

	PIPE CLASS	D9	Rating class	Class 600	CA=4.5mm
general	Tag Number	VB-222-D9			
	Size Range (Inch)	6”			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	1340			
	Design Temperature (°F)(min/max)	200/200			
	Service/Service code	Produce Water			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Trunnion Mounted ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	Flanged Raised Face to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Bevel Gear Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	DBB DESIGN, Secondary Sealant Injection for Seat and Stem Seals, anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	ASTM A216 Gr WCB			
	Ball	Type 316 S.S.			
	Stem	Type 316 S.S.			
	Seat	Filled TFE			
	Seal	Filled TFE			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	Zinc coating for Body bolt/nut	Hot Dip Galvanized Plated			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			





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Valve location and function	Above-ground/outdoor/block
Marking	As per Specification for Specification for Ball, Gate, Globe and Check Valves NGP-00-PIP-15.03-0010-00
Actuator	N/A
Support	Yes
Locking device	Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**63. Ball Valves 2"~3"- VB-226-D6**

	PIPE CLASS	D6	Rating class	Class 600	CA=0mm
general	Tag Number	VB-226-D6			
	Size Range (Inch)	2"~3"			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	1340			
	Design Temperature (°F)(min/max)	-120/150			
	Service/Service code	Liquified Gas Under -100 °C			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Floating ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	Flanged Raised Face to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Lever Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	Type 316 S.S.			
	Ball	Type 316 S.S.			
	Stem	Type 316 S.S.			
	Seat	Filled TFE			
	Seal	Filled TFE			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location and function	Above-ground/outdoor/block			
	Marking	As per Specification for Specification for Ball, Gate, Globe			



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		and Check Valves NGP-00-PIP-15.03-0010-00
Actuator		N/A
Support		No
Locking device		Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**64. Ball Valves 4"- VB-226-D6**

	PIPE CLASS	D6	Rating class	Class 600	CA=0mm
general	Tag Number	VB-226-D6			
	Size Range (Inch)	4"			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	1340			
	Design Temperature (°F)(min/max)	-120/150			
	Service/Service code	Liquified Gas Under -100 °C			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Floating ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	Flanged Raised Face to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Bevel Gear Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	Type 316 S.S.			
	Ball	Type 316 S.S.			
	Stem	Type 316 S.S.			
	Seat	Filled TFE			
	Seal	Filled TFE			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location and function	Above-ground/outdoor/block			
	Marking	As per Specification for Specification for Ball, Gate, Globe			



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		and Check Valves NGP-00-PIP-15.03-0010-00
Actuator		N/A
Support		No
Locking device		Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**65. Ball Valves 6"- VB-226-D6**

	PIPE CLASS	D6	Rating class	Class 600	CA=0mm
general	Tag Number		VB-226-D6		
	Size Range (Inch)		6"		
	Valve Type		Reduced Port		
	Design Pressure(PSIG) (max)		1340		
	Design Temperature (°F)(min/max)		-120/150		
	Service/Service code		Liquified Gas Under -100 °C		
	Service Component		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		API 6D		
	Body		Side entry, Split body, Bolted Body		
	Ball		Trunnion Mounted ball		
	Seat		Soft Seated, Replaceable Seats		
	End Connection		Flanged Raised Face to ASME B16.5		
	Face to Face Dimension		ASME B16.10		
	Leakage Class		Rate A		
	Operation		Bevel Gear Operated		
	Fire Safe requirements(Design & Certificate)		API 607/API 6FA		
	Others		DBB DESIGN, Secondary Sealant Injection for Seat and Stem Seals, anti-static, anti-blow-out stem		
material (Note-4)	Body & Cover		Type 316 S.S.		
	Ball		Type 316 S.S.		
	Stem		Type 316 S.S.		
	Seat		Filled TFE		
	Seal		Filled TFE		
others	Test Standard		API 6D/ISO 5208/API 598		
	CERTIFICATION		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location and function		Above-ground/outdoor/block		



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Actuator

N/A

Support

No

Locking device

Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**66. Ball Valves 8”~24”- VB-226-D6**

	PIPE CLASS	D6	Rating class	Class 600	CA=0mm
general	Tag Number	VB-226-D6			
	Size Range (Inch)	8”~24”			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	1340			
	Design Temperature (°F)(min/max)	-120/150			
	Service/Service code	Liquified Gas Under -100 °C			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Trunnion Mounted ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	Flanged Raised Face to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Bevel Gear Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	DBB DESIGN, Secondary Sealant Injection for Seat and Stem Seals, anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	Type 316 S.S.			
	Ball	Type 316 S.S.			
	Stem	Type 316 S.S.			
	Seat	Filled TFE			
	Seal	Filled TFE			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location and function	Above-ground/outdoor/block			





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Marking

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Actuator

N/A

Support

Yes

Locking device

Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**67. Ball Valves 2"~3"- VB-228-D3**

	PIPE CLASS	D3	Rating class	Class 600	CA=3.0mm
general	Tag Number		VB-228-D3		
	Size Range (Inch)		2"~3"		
	Valve Type		Reduced Port		
	Design Pressure(PSIG) (max)		1340		
	Design Temperature (°F)(min/max)		-50/265		
	Service/Service code		Flare/ Vent/ Process Gas/ Glycol(Cold Service)/ Process Liquid		
	Service Component		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		API 6D		
	Body		Side entry, Split body, Bolted Body		
	Ball		Floating ball		
	Seat		Soft Seated, Replaceable Seats		
	End Connection		Flanged Raised Face to ASME B16.5		
	Face to Face Dimension		ASME B16.10		
	Leakage Class		Rate A		
	Operation		Lever Operated		
	Fire Safe requirements(Design & Certificate)		API 607/API 6FA		
	Others		anti-static, anti-blow-out stem		
material (Note-4)	Body & Cover		ASTM A352 Gr LCC		
	Ball		Type 316 S.S.		
	Stem		Type 316 S.S.		
	Seat		Filled TFE		
	Seal		Filled TFE		
others	Test Standard		API 6D/ISO 5208/API 598		
	CERTIFICATION		EN 10204 3.1		
	Zinc coating for Body bolt/nut		Hot Dip Galvanized Plated		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		



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Valve location and function	Above-ground/outdoor/block
Marking	As per Specification for Specification for Ball, Gate, Globe and Check Valves NGP-00-PIP-15.03-0010-00
Actuator	N/A
Support	No
Locking device	Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**68. Ball Valves 4"- VB-228-D3**

	PIPE CLASS	D3	Rating class	Class 600	CA=3.0mm
general	Tag Number		VB-228-D3		
	Size Range (Inch)		4"		
	Valve Type		Reduced Port		
	Design Pressure(PSIG) (max)		1340		
	Design Temperature (°F)(min/max)		-50/265		
	Service/Service code		Flare/ Vent/ Process Gas/ Glycol(Cold Service)/ Process Liquid		
	Service Component		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		API 6D		
	Body		Side entry, Split body, Bolted Body		
	Ball		Floating ball		
	Seat		Soft Seated, Replaceable Seats		
	End Connection		Flanged Raised Face to ASME B16.5		
	Face to Face Dimension		ASME B16.10		
	Leakage Class		Rate A		
	Operation		Bevel Gear Operated		
	Fire Safe requirements(Design & Certificate)		API 607/API 6FA		
	Others		anti-static, anti-blow-out stem		
material (Note-4)	Body & Cover		ASTM A352 Gr LCC		
	Ball		Type 316 S.S.		
	Stem		Type 316 S.S.		
	Seat		Filled TFE		
	Seal		Filled TFE		
others	Test Standard		API 6D/ISO 5208/API 598		
	CERTIFICATION		EN 10204 3.1		
	Zinc coating for Body bolt/nut		Hot Dip Galvanized Plated		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		



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Valve location and function	Above-ground/outdoor/block
Marking	As per Specification for Specification for Ball, Gate, Globe and Check Valves NGP-00-PIP-15.03-0010-00
Actuator	N/A
Support	No
Locking device	Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**69. Ball Valves 6"- VB-228-D3**

	PIPE CLASS	D3	Rating class	Class 600	CA=3.0mm
general	Tag Number		VB-228-D3		
	Size Range (Inch)		6"		
	Valve Type		Reduced Port		
	Design Pressure(PSIG) (max)		1340		
	Design Temperature (°F)(min/max)		-50/265		
	Service/Service code		Flare/ Vent/ Process Gas/ Glycol(Cold Service)/ Process Liquid		
	Service Component		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		API 6D		
	Body		Side entry, Split body, Bolted Body		
	Ball		Trunnion Mounted ball		
	Seat		Soft Seated, Replaceable Seats		
	End Connection		Flanged Raised Face to ASME B16.5		
	Face to Face Dimension		ASME B16.10		
	Leakage Class		Rate A		
	Operation		Bevel Gear Operated		
	Fire Safe requirements(Design & Certificate)		API 607/API 6FA		
	Others		DBB DESIGN, Secondary Sealant Injection for Seat and Stem Seals, anti-static, anti-blow-out stem		
material (Note-4)	Body & Cover		ASTM A352 Gr LCC		
	Ball		Type 316 S.S.		
	Stem		Type 316 S.S.		
	Seat		Filled TFE		
	Seal		Filled TFE		
others	Test Standard		API 6D/ISO 5208/API 598		
	CERTIFICATION		EN 10204 3.1		
	Zinc coating for Body bolt/nut		Hot Dip Galvanized Plated		
	External painting and Colour coding		As per Specification for Coating and Painting		



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Valve location and function	Above-ground/outdoor/block
Marking	As per Specification for Specification for Ball, Gate, Globe and Check Valves NGP-00-PIP-15.03-0010-00
Actuator	N/A
Support	No
Locking device	Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**70. Ball Valves 8”~24”- VB-228-D3**

	PIPE CLASS	D3	Rating class	Class 600	CA=3.0mm
general	Tag Number	VB-228-D3			
	Size Range (Inch)	8”~24”			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	1340			
	Design Temperature (°F)(min/max)	-50/265			
	Service/Service code	Flare/ Vent/ Process Gas/ Glycol(Cold Service)/ Process Liquid			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Trunnion Mounted ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	Flanged Raised Face to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Bevel Gear Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	DBB DESIGN, Secondary Sealant Injection for Seat and Stem Seals, anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	ASTM A352 Gr LCC			
	Ball	Type 316 S.S.			
	Stem	Type 316 S.S.			
	Seat	Filled TFE			
	Seal	Filled TFE			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	Zinc coating for Body bolt/nut	Hot Dip Galvanized Plated			
	External painting and Colour coding	As per Specification for Coating and Painting			





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		NGP-000-PAI-15.03-0001-00
	Valve location and function	Above-ground/outdoor/block
	Marking	As per Specification for Specification for Ball, Gate, Globe and Check Valves NGP-00-PIP-15.03-0010-00
	Actuator	N/A
	Support	Yes
	Locking device	Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**71. Ball Valves 2"~3"- VB-22A-D8**

	PIPE CLASS	D8	Rating class	Class 600	CA=3.0mm
general	Tag Number	VB-22A-D8			
	Size Range (Inch)	2"~3"			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	1340			
	Design Temperature (°F)(min/max)	200/200			
	Service/Service code	Flow Lines			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Floating ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	Flanged Raised Face to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Lever Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	ASTM A216 Gr WCB			
	Ball	A105/350LF-2 + 3 MIL ENP			
	Stem	ASTM A 182 F6			
	Seat	Viton AED			
	Seal	Viton AED			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	Zinc coating for Body bolt/nut	Hot Dip Galvanized Plated			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location and function	Above-ground/outdoor/block			



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Marking

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Actuator

N/A

Support

No

Locking device

Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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## 72. Ball Valves 4"- VB-22A-D8

	PIPE CLASS	D8	Rating class	Class 600	CA=3.0mm
general	Tag Number		VB-22A-D8		
	Size Range (Inch)		4"		
	Valve Type		Reduced Port		
	Design Pressure(PSIG) (max)		1340		
	Design Temperature (°F)(min/max)		200/200		
	Service/Service code		Flow Lines		
	Service Component		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		API 6D		
	Body		Side entry, Split body, Bolted Body		
	Ball		Floating ball		
	Seat		Soft Seated, Replaceable Seats		
	End Connection		Flanged Raised Face to ASME B16.5		
	Face to Face Dimension		ASME B16.10		
	Leakage Class		Rate A		
	Operation		Bevel Gear Operated		
	Fire Safe requirements(Design & Certificate)		API 607/API 6FA		
	Others		anti-static, anti-blow-out stem		
material (Note-4)	Body & Cover		ASTM A216 Gr WCB		
	Ball		A105/350LF-2 + 3 MIL ENP		
	Stem		ASTM A 182 F6		
	Seat		Viton AED		
	Seal		Viton AED		
others	Test Standard		API 6D/ISO 5208/API 598		
	CERTIFICATION		EN 10204 3.1		
	Zinc coating for Body bolt/nut		Hot Dip Galvanized Plated		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location and function		Above-ground/outdoor/block		



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Actuator

N/A

Support

No

Locking device

Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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### 73. Ball Valves 6"- VB-22A-D8

	PIPE CLASS	D8	Rating class	Class 600	CA=3.0mm
general	Tag Number		VB-22A-D8		
	Size Range (Inch)		6"		
	Valve Type		Reduced Port		
	Design Pressure(PSIG) (max)		1340		
	Design Temperature (°F)(min/max)		200/200		
	Service/Service code		Flow Lines		
	Service Component		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		API 6D		
	Body		Side entry, Split body, Bolted Body		
	Ball		Trunnion Mounted ball		
	Seat		Soft Seated, Replaceable Seats		
	End Connection		Flanged Raised Face to ASME B16.5		
	Face to Face Dimension		ASME B16.10		
	Leakage Class		Rate A		
	Operation		Bevel Gear Operated		
	Fire Safe requirements(Design & Certificate)		API 607/API 6FA		
	Others		DBB DESIGN, Secondary Sealant Injection for Seat and Stem Seals, anti-static, anti-blow-out stem		
material (Note-4)	Body & Cover		ASTM A216 Gr WCB		
	Ball		A105/350LF-2 + 3 MIL ENP		
	Stem		ASTM A 182 F6		
	Seat		Viton AED		
	Seal		Viton AED		
others	Test Standard		API 6D/ISO 5208/API 598		
	CERTIFICATION		EN 10204 3.1		
	Zinc coating for Body bolt/nut		Hot Dip Galvanized Plated		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		



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Valve location and function	Above-ground/outdoor/block
Marking	As per Specification for Specification for Ball, Gate, Globe and Check Valves NGP-00-PIP-15.03-0010-00
Actuator	N/A
Support	No
Locking device	Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**74. Ball Valves 8”~24”- VB-22A-D8**

	PIPE CLASS	D8	Rating class	Class 600	CA=3.0mm
general	Tag Number	VB-22A-D8			
	Size Range (Inch)	8”~24”			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	1340			
	Design Temperature (°F)(min/max)	200/200			
	Service/Service code	Flow Lines			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Trunnion Mounted ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	Flanged Raised Face to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Bevel Gear Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	DBB DESIGN, Secondary Sealant Injection for Seat and Stem Seals, anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	ASTM A216 Gr WCB			
	Ball	A105/350LF-2 + 3 MIL ENP			
	Stem	ASTM A 182 F6			
	Seat	Viton AED			
	Seal	Viton AED			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	Zinc coating for Body bolt/nut	Hot Dip Galvanized Plated			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			





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Valve location and function	Above-ground/outdoor/block
Marking	As per Specification for Specification for Ball, Gate, Globe and Check Valves NGP-00-PIP-15.03-0010-00
Actuator	N/A
Support	Yes
Locking device	Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**75. Ball Valves 2"~3"- VB-22B-D8**

	PIPE CLASS	D8	Rating class	Class 600	CA=3.0mm
general	Tag Number	VB-22B-D8			
	Size Range (Inch)	2"~3"			
	Valve Type	Full Port			
	Design Pressure(PSIG) (max)	1340			
	Design Temperature (°F)(min/max)	200/200			
	Service/Service code	Flow Lines			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Floating ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	Flanged Raised Face to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Lever Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	ASTM A216 Gr WCB			
	Ball	A105/350LF-2 + 3 MIL ENP			
	Stem	ASTM A 182 F6			
	Seat	Viton AED			
	Seal	Viton AED			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	Zinc coating for Body bolt/nut	Hot Dip Galvanized Plated			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location and function	Above-ground/outdoor/block			



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Actuator

N/A

Support

No

Locking device

Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**76. Ball Valves 4"- VB-22B-D8**

	PIPE CLASS	D8	Rating class	Class 600	CA=3.0mm
general	Tag Number	VB-22B-D8			
	Size Range (Inch)	4"			
	Valve Type	Full Port			
	Design Pressure(PSIG) (max)	1340			
	Design Temperature (°F)(min/max)	200/200			
	Service/Service code	Flow Lines			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Floating ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	Flanged Raised Face to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Bevel Gear Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	ASTM A216 Gr WCB			
	Ball	A105/350LF-2 + 3 MIL ENP			
	Stem	ASTM A 182 F6			
	Seat	Viton AED			
	Seal	Viton AED			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	Zinc coating for Body bolt/nut	Hot Dip Galvanized Plated			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location and function	Above-ground/outdoor/block			



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Actuator

N/A

Support

No

Locking device

Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**77. Ball Valves 6"- VB-22B-D8**

	PIPE CLASS	D8	Rating class	Class 600	CA=3.0mm
general	Tag Number		VB-22B-D8		
	Size Range (Inch)		6"		
	Valve Type		Full Port		
	Design Pressure(PSIG) (max)		1340		
	Design Temperature (°F)(min/max)		200/200		
	Service/Service code		Flow Lines		
	Service Component		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		API 6D		
	Body		Side entry, Split body, Bolted Body		
	Ball		Trunnion Mounted ball		
	Seat		Soft Seated, Replaceable Seats		
	End Connection		Flanged Raised Face to ASME B16.5		
	Face to Face Dimension		ASME B16.10		
	Leakage Class		Rate A		
	Operation		Bevel Gear Operated		
	Fire Safe requirements(Design & Certificate)		API 607/API 6FA		
	Others		DBB DESIGN, Secondary Sealant Injection for Seat and Stem Seals, anti-static, anti-blow-out stem		
material (Note-4)	Body & Cover		ASTM A216 Gr WCB		
	Ball		A105/350LF-2 + 3 MIL ENP		
	Stem		ASTM A 182 F6		
	Seat		Viton AED		
	Seal		Viton AED		
others	Test Standard		API 6D/ISO 5208/API 598		
	CERTIFICATION		EN 10204 3.1		
	Zinc coating for Body bolt/nut		Hot Dip Galvanized Plated		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		



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Valve location and function	Above-ground/outdoor/block
Marking	As per Specification for Specification for Ball, Gate, Globe and Check Valves NGP-00-PIP-15.03-0010-00
Actuator	N/A
Support	No
Locking device	Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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### 78. Ball Valves 8"~24"- VB-22B-D8

	PIPE CLASS	D8	Rating class	Class 600	CA=3.0mm
general	Tag Number		VB-22B-D8		
	Size Range (Inch)		8"~24"		
	Valve Type		Full Port		
	Design Pressure(PSIG) (max)		1340		
	Design Temperature (°F)(min/max)		200/200		
	Service/Service code		Flow Lines		
	Service Component		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		API 6D		
	Body		Side entry, Split body, Bolted Body		
	Ball		Trunnion Mounted ball		
	Seat		Soft Seated, Replaceable Seats		
	End Connection		Flanged Raised Face to ASME B16.5		
	Face to Face Dimension		ASME B16.10		
	Leakage Class		Rate A		
	Operation		Bevel Gear Operated		
	Fire Safe requirements(Design & Certificate)		API 607/API 6FA		
	Others		DBB DESIGN, Secondary Sealant Injection for Seat and Stem Seals, anti-static, anti-blow-out stem		
material (Note-4)	Body & Cover		ASTM A216 Gr WCB		
	Ball		A105/350LF-2 + 3 MIL ENP		
	Stem		ASTM A 182 F6		
	Seat		Viton AED		
	Seal		Viton AED		
others	Test Standard		API 6D/ISO 5208/API 598		
	CERTIFICATION		EN 10204 3.1		
	Zinc coating for Body bolt/nut		Hot Dip Galvanized Plated		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		





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Valve location and function	Above-ground/outdoor/block
Marking	As per Specification for Specification for Ball, Gate, Globe and Check Valves NGP-00-PIP-15.03-0010-00
Actuator	N/A
Support	Yes
Locking device	Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**79. Ball Valves 2"~3"- VB-231-E1**

	PIPE CLASS	E1	Rating class	Class 900	CA=1.6mm
general	Tag Number	VB-231-E1			
	Size Range (Inch)	2"~3"			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	1580			
	Design Temperature (°F)(min/max)	-20/150			
	Service/Service code	Fuel Oil/ Hot Oil/ Inert Gas/ Stabilized Condensate/ Glycol/ Treated Gas/ Sales Gas/ LPG			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Floating ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	RTJ to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Lever Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	ASTM A216 Gr WCB			
	Ball	A105N Chrome Plated Steel			
	Stem	13% Cr. S.S.			
	Seat	Filled TFE			
	Seal	Filled TFE			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	Zinc coating for Body bolt/nut	Hot Dip Galvanized Plated			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			



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Valve location and function	Above-ground/outdoor/block
Marking	As per Specification for Specification for Ball, Gate, Globe and Check Valves NGP-00-PIP-15.03-0010-00
Actuator	N/A
Support	No
Locking device	Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**80. Ball Valves 4"- VB-231-E1**

	PIPE CLASS	E1	Rating class	Class 900	CA=1.6mm
general	Tag Number		VB-231-E1		
	Size Range (Inch)		4"		
	Valve Type		Reduced Port		
	Design Pressure(PSIG) (max)		1580		
	Design Temperature (°F)(min/max)		-20/150		
	Service/Service code		Fuel Oil/ Hot Oil/ Inert Gas/ Stabilized Condensate/ Glycol/ Treated Gas/ Sales Gas/ LPG		
	Service Component		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		API 6D		
	Body		Side entry, Split body, Bolted Body		
	Ball		Floating ball		
	Seat		Soft Seated, Replaceable Seats		
	End Connection		RTJ to ASME B16.5		
	Face to Face Dimension		ASME B16.10		
	Leakage Class		Rate A		
	Operation		Bevel Gear Operated		
	Fire Safe requirements(Design & Certificate)		API 607/API 6FA		
	Others		anti-static, anti-blow-out stem		
material (Note-4)	Body & Cover		ASTM A216 Gr WCB		
	Ball		A105N Chrome Plated Steel		
	Stem		13% Cr. S.S.		
	Seat		Filled TFE		
	Seal		Filled TFE		
others	Test Standard		API 6D/ISO 5208/API 598		
	CERTIFICATION		EN 10204 3.1		
	Zinc coating for Body bolt/nut		Hot Dip Galvanized Plated		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		



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Valve location and function	Above-ground/outdoor/block
Marking	As per Specification for Specification for Ball, Gate, Globe and Check Valves NGP-00-PIP-15.03-0010-00
Actuator	N/A
Support	No
Locking device	Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**81. Ball Valves 6"- VB-231-E1**

	PIPE CLASS	E1	Rating class	Class 900	CA=1.6mm
general	Tag Number	VB-231-E1			
	Size Range (Inch)	6"			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	1580			
	Design Temperature (°F)(min/max)	-20/150			
	Service/Service code	Fuel Oil/ Hot Oil/ Inert Gas/ Stabilized Condensate/ Glycol/ Treated Gas/ Sales Gas/ LPG			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Trunnion Mounted ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	RTJ to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Bevel Gear Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	DBB DESIGN, Secondary Sealant Injection for Seat and Stem Seals, anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	ASTM A216 Gr WCB			
	Ball	A105N Chrome Plated Steel			
	Stem	13% Cr. S.S.			
	Seat	Filled TFE			
	Seal	Filled TFE			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	Zinc coating for Body bolt/nut	Hot Dip Galvanized Plated			
	External painting and Colour coding	As per Specification for Coating and Painting			



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		NGP-000-PAI-15.03-0001-00
	Valve location and function	Above-ground/outdoor/block
	Marking	As per Specification for Specification for Ball, Gate, Globe and Check Valves NGP-00-PIP-15.03-0010-00
	Actuator	N/A
	Support	No
	Locking device	Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**82. Ball Valves 8”~24”- VB-231-E1**

	PIPE CLASS	E1	Rating class	Class 900	CA=1.6mm
general	Tag Number	VB-231-E1			
	Size Range (Inch)	8”~24”			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	1580			
	Design Temperature (°F)(min/max)	-20/150			
	Service/Service code	Fuel Oil/ Hot Oil/ Inert Gas/ Stabilized Condensate/ Glycol/ Treated Gas/ Sales Gas/ LPG			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Trunnion Mounted ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	RTJ to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Bevel Gear Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	DBB DESIGN, Secondary Sealant Injection for Seat and Stem Seals, anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	ASTM A216 Gr WCB			
	Ball	A105N Chrome Plated Steel			
	Stem	13% Cr. S.S.			
	Seat	Filled TFE			
	Seal	Filled TFE			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	Zinc coating for Body bolt/nut	Hot Dip Galvanized Plated			
	External painting and Colour coding	As per Specification for Coating and Painting			





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Valve location and function	Above-ground/outdoor/block
Marking	As per Specification for Specification for Ball, Gate, Globe and Check Valves NGP-00-PIP-15.03-0010-00
Actuator	N/A
Support	Yes
Locking device	Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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### 83. Ball Valves 2"~3"- VB-232-E2

	PIPE CLASS	E2	Rating class	Class 900	CA=3.0mm
general	Tag Number	VB-232-E2			
	Size Range (Inch)	2"~3"			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	1580			
	Design Temperature (°F)(min/max)	200/350			
	Service/Service code	Raw Gas/ Fuel Gas/ Open Drain/ Vents/ Closed Drain			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Floating ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	RTJ to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Lever Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	ASTM A216 Gr WCB			
	Ball	Type 316 S.S.			
	Stem	Type 316 S.S.			
	Seat	Filled TFE			
	Seal	Filled TFE			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	Zinc coating for Body bolt/nut	Hot Dip Galvanized Plated			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location and function	Above-ground/outdoor/block			



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Marking

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Actuator

N/A

Support

No

Locking device

Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**84. Ball Valves 4"- VB-232-E2**

	PIPE CLASS	E2	Rating class	Class 900	CA=3.0mm
general	Tag Number		VB-232-E2		
	Size Range (Inch)		4"		
	Valve Type		Reduced Port		
	Design Pressure(PSIG) (max)		1580		
	Design Temperature (°F)(min/max)		200/350		
	Service/Service code		Raw Gas/ Fuel Gas/ Open Drain/ Vents/ Closed Drain		
	Service Component		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		API 6D		
	Body		Side entry, Split body, Bolted Body		
	Ball		Floating ball		
	Seat		Soft Seated, Replaceable Seats		
	End Connection		RTJ to ASME B16.5		
	Face to Face Dimension		ASME B16.10		
	Leakage Class		Rate A		
	Operation		Bevel Gear Operated		
	Fire Safe requirements(Design & Certificate)		API 607/API 6FA		
	Others		anti-static, anti-blow-out stem		
material (Note-4)	Body & Cover		ASTM A216 Gr WCB		
	Ball		Type 316 S.S.		
	Stem		Type 316 S.S.		
	Seat		Filled TFE		
	Seal		Filled TFE		
others	Test Standard		API 6D/ISO 5208/API 598		
	CERTIFICATION		EN 10204 3.1		
	Zinc coating for Body bolt/nut		Hot Dip Galvanized Plated		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location and function		Above-ground/outdoor/block		



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Marking

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Actuator

N/A

Support

No

Locking device

Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**85. Ball Valves 6"- VB-232-E2**

	PIPE CLASS	E2	Rating class	Class 900	CA=3.0mm
general	Tag Number		VB-232-E2		
	Size Range (Inch)		6"		
	Valve Type		Reduced Port		
	Design Pressure(PSIG) (max)		1580		
	Design Temperature (°F)(min/max)		200/350		
	Service/Service code		Raw Gas/ Fuel Gas/ Open Drain/ Vents/ Closed Drain		
	Service Component		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		API 6D		
	Body		Side entry, Split body, Bolted Body		
	Ball		Trunnion Mounted ball		
	Seat		Soft Seated, Replaceable Seats		
	End Connection		RTJ to ASME B16.5		
	Face to Face Dimension		ASME B16.10		
	Leakage Class		Rate A		
	Operation		Bevel Gear Operated		
	Fire Safe requirements(Design & Certificate)		API 607/API 6FA		
	Others		DBB DESIGN, Secondary Sealant Injection for Seat and Stem Seals, anti-static, anti-blow-out stem		
material (Note-4)	Body & Cover		ASTM A216 Gr WCB		
	Ball		Type 316 S.S.		
	Stem		Type 316 S.S.		
	Seat		Filled TFE		
	Seal		Filled TFE		
others	Test Standard		API 6D/ISO 5208/API 598		
	CERTIFICATION		EN 10204 3.1		
	Zinc coating for Body bolt/nut		Hot Dip Galvanized Plated		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		



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Valve location and function	Above-ground/outdoor/block
Marking	As per Specification for Specification for Ball, Gate, Globe and Check Valves NGP-00-PIP-15.03-0010-00
Actuator	N/A
Support	No
Locking device	Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**86. Ball Valves 8”~24”- VB-232-E2**

	PIPE CLASS	E2	Rating class	Class 900	CA=3.0mm
general	Tag Number		VB-232-E2		
	Size Range (Inch)		8”~24”		
	Valve Type		Reduced Port		
	Design Pressure(PSIG) (max)		1580		
	Design Temperature (°F)(min/max)		200/350		
	Service/Service code		Raw Gas/ Fuel Gas/ Open Drain/ Vents/ Closed Drain		
	Service Component		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		API 6D		
	Body		Side entry, Split body, Bolted Body		
	Ball		Trunnion Mounted ball		
	Seat		Soft Seated, Replaceable Seats		
	End Connection		RTJ to ASME B16.5		
	Face to Face Dimension		ASME B16.10		
	Leakage Class		Rate A		
	Operation		Bevel Gear Operated		
	Fire Safe requirements(Design & Certificate)		API 607/API 6FA		
	Others		DBB DESIGN, Secondary Sealant Injection for Seat and Stem Seals, anti-static, anti-blow-out stem		
material (Note-4)	Body & Cover		ASTM A216 Gr WCB		
	Ball		Type 316 S.S.		
	Stem		Type 316 S.S.		
	Seat		Filled TFE		
	Seal		Filled TFE		
others	Test Standard		API 6D/ISO 5208/API 598		
	CERTIFICATION		EN 10204 3.1		
	Zinc coating for Body bolt/nut		Hot Dip Galvanized Plated		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		





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Valve location and function	Above-ground/outdoor/block
Marking	As per Specification for Specification for Ball, Gate, Globe and Check Valves NGP-00-PIP-15.03-0010-00
Actuator	N/A
Support	Yes
Locking device	Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**87. Ball Valves 2"~3"- VB-236-E6**

	PIPE CLASS	E6	Rating class	Class 900	CA=0mm
general	Tag Number		VB-236-E6		
	Size Range (Inch)		2"~3"		
	Valve Type		Reduced Port		
	Design Pressure(PSIG) (max)		1580		
	Design Temperature (°F)(min/max)		200/200		
	Service/Service code		Liquified Gas Under -100 °C		
	Service Component		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		API 6D		
	Body		Side entry, Split body, Bolted Body		
	Ball		Floating ball		
	Seat		Soft Seated, Replaceable Seats		
	End Connection		RTJ to ASME B16.5		
	Face to Face Dimension		ASME B16.10		
	Leakage Class		Rate A		
	Operation		Lever Operated		
	Fire Safe requirements(Design & Certificate)		API 607/API 6FA		
	Others		anti-static, anti-blow-out stem		
material (Note-4)	Body & Cover		Type 316 S.S.		
	Ball		Type 316 S.S.		
	Stem		Type 316 S.S.		
	Seat		Filled TFE		
	Seal		Filled TFE		
others	Test Standard		API 6D/ISO 5208/API 598		
	CERTIFICATION		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location and function		Above-ground/outdoor/block		
	Marking		As per Specification for Specification for Ball, Gate, Globe		



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		and Check Valves NGP-00-PIP-15.03-0010-00
Actuator		N/A
Support		No
Locking device		Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**88. Ball Valves 4"- VB-236-E6**

	PIPE CLASS	E6	Rating class	Class 900	CA=0mm
general	Tag Number		VB-236-E6		
	Size Range (Inch)		4"		
	Valve Type		Reduced Port		
	Design Pressure(PSIG) (max)		1580		
	Design Temperature (°F)(min/max)		200/200		
	Service/Service code		Liquified Gas Under -100 °C		
	Service Component		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		API 6D		
	Body		Side entry, Split body, Bolted Body		
	Ball		Floating ball		
	Seat		Soft Seated, Replaceable Seats		
	End Connection		RTJ to ASME B16.5		
	Face to Face Dimension		ASME B16.10		
	Leakage Class		Rate A		
	Operation		Bevel Gear Operated		
	Fire Safe requirements(Design & Certificate)		API 607/API 6FA		
	Others		anti-static, anti-blow-out stem		
material (Note-4)	Body & Cover		Type 316 S.S.		
	Ball		Type 316 S.S.		
	Stem		Type 316 S.S.		
	Seat		Filled TFE		
	Seal		Filled TFE		
others	Test Standard		API 6D/ISO 5208/API 598		
	CERTIFICATION		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location and function		Above-ground/outdoor/block		
	Marking		As per Specification for Specification for Ball, Gate, Globe		



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		and Check Valves NGP-00-PIP-15.03-0010-00
Actuator		N/A
Support		No
Locking device		Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**89. Ball Valves 6"- VB-236-E6**

	PIPE CLASS	E6	Rating class	Class 900	CA=0mm
general	Tag Number		VB-236-E6		
	Size Range (Inch)		6"		
	Valve Type		Reduced Port		
	Design Pressure(PSIG) (max)		1580		
	Design Temperature (°F)(min/max)		200/200		
	Service/Service code		Liquified Gas Under -100 °C		
	Service Component		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		API 6D		
	Body		Side entry, Split body, Bolted Body		
	Ball		Trunnion Mounted ball		
	Seat		Soft Seated, Replaceable Seats		
	End Connection		RTJ to ASME B16.5		
	Face to Face Dimension		ASME B16.10		
	Leakage Class		Rate A		
	Operation		Bevel Gear Operated		
	Fire Safe requirements(Design & Certificate)		API 607/API 6FA		
	Others		DBB DESIGN, Secondary Sealant Injection for Seat and Stem Seals, anti-static, anti-blow-out stem		
material (Note-4)	Body & Cover		Type 316 S.S.		
	Ball		Type 316 S.S.		
	Stem		Type 316 S.S.		
	Seat		Filled TFE		
	Seal		Filled TFE		
others	Test Standard		API 6D/ISO 5208/API 598		
	CERTIFICATION		EN 10204 3.1		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location and function		Above-ground/outdoor/block		



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Marking

As per Specification for Specification for Ball, Gate, Globe and Check Valves NGP-00-PIP-15.03-0010-00

Actuator

N/A

Support

No

Locking device

Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**90. Ball Valves 8”~24”- VB-236-E6**

	PIPE CLASS	E6	Rating class	Class 900	CA=0mm
general	Tag Number	VB-236-E6			
	Size Range (Inch)	8”~24”			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	1580			
	Design Temperature (°F)(min/max)	200/200			
	Service/Service code	Liquified Gas Under -100 °C			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Trunnion Mounted ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	RTJ to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Bevel Gear Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	DBB DESIGN, Secondary Sealant Injection for Seat and Stem Seals, anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	Type 316 S.S.			
	Ball	Type 316 S.S.			
	Stem	Type 316 S.S.			
	Seat	Filled TFE			
	Seal	Filled TFE			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location and function	Above-ground/outdoor/block			





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Actuator

N/A

Support

Yes

Locking device

Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**91. Ball Valves 2”~3”- VB-238-E8**

	PIPE CLASS	E8	Rating class	Class 900	CA=3.0mm
general	Tag Number	VB-238-E8			
	Size Range (Inch)	2”~3”			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	1580			
	Design Temperature (°F)(min/max)	200/200			
	Service/Service code	Flow Lines			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Floating ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	RTJ to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Lever Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	ASTM A216 Gr WCB			
	Ball	A105/350LF-2 + 3 MIL ENP			
	Stem	ASTM A 182 F6			
	Seat	Viton AED			
	Seal	Viton AED			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	Zinc coating for Body bolt/nut	Hot Dip Galvanized Plated			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location and function	Above-ground/outdoor/block			



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Actuator

N/A

Support

No

Locking device

Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**92. Ball Valves 4"- VB-238-E8**

	PIPE CLASS	E8	Rating class	Class 900	CA=3.0mm
general	Tag Number	VB-238-E8			
	Size Range (Inch)	4"			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	1580			
	Design Temperature (°F)(min/max)	200/200			
	Service/Service code	Flow Lines			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Floating ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	RTJ to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Bevel Gear Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	ASTM A216 Gr WCB			
	Ball	A105/350LF-2 + 3 MIL ENP			
	Stem	ASTM A 182 F6			
	Seat	Viton AED			
	Seal	Viton AED			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	Zinc coating for Body bolt/nut	Hot Dip Galvanized Plated			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location and function	Above-ground/outdoor/block			



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Actuator

N/A

Support

No

Locking device

Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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### 93. Ball Valves 6"- VB-238-E8

	PIPE CLASS	E8	Rating class	Class 900	CA=3.0mm
general	Tag Number	VB-238-E8			
	Size Range (Inch)	6"			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	1580			
	Design Temperature (°F)(min/max)	200/200			
	Service/Service code	Flow Lines			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Trunnion Mounted ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	RTJ to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Bevel Gear Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	DBB DESIGN, Secondary Sealant Injection for Seat and Stem Seals, anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	ASTM A216 Gr WCB			
	Ball	A105/350LF-2 + 3 MIL ENP			
	Stem	ASTM A 182 F6			
	Seat	Viton AED			
	Seal	Viton AED			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	Zinc coating for Body bolt/nut	Hot Dip Galvanized Plated			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			



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Valve location and function	Above-ground/outdoor/block
Marking	As per Specification for Specification for Ball, Gate, Globe and Check Valves NGP-00-PIP-15.03-0010-00
Actuator	N/A
Support	No
Locking device	Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**94. Ball Valves 8”~24”- VB-238-E8**

	PIPE CLASS	E8	Rating class	Class 900	CA=3.0mm
general	Tag Number	VB-238-E8			
	Size Range (Inch)	8”~24”			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	1580			
	Design Temperature (°F)(min/max)	200/200			
	Service/Service code	Flow Lines			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Trunnion Mounted ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	RTJ to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Bevel Gear Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	DBB DESIGN, Secondary Sealant Injection for Seat and Stem Seals, anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	ASTM A216 Gr WCB			
	Ball	A105/350LF-2 + 3 MIL ENP			
	Stem	ASTM A 182 F6			
	Seat	Viton AED			
	Seal	Viton AED			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	Zinc coating for Body bolt/nut	Hot Dip Galvanized Plated			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			





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Valve location and function	Above-ground/outdoor/block
Marking	As per Specification for Specification for Ball, Gate, Globe and Check Valves NGP-00-PIP-15.03-0010-00
Actuator	N/A
Support	Yes
Locking device	Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**95. Ball Valves 2"~3"- VB-239-E8**

	PIPE CLASS	E8	Rating class	Class 900	CA=3.0mm
general	Tag Number	VB-239-E8			
	Size Range (Inch)	2"~3"			
	Valve Type	Full Port			
	Design Pressure(PSIG) (max)	1580			
	Design Temperature (°F)(min/max)	200/200			
	Service/Service code	Flow Lines			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Floating ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	RTJ to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Lever Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	ASTM A216 Gr WCB			
	Ball	A105/350LF-2 + 3 MIL ENP			
	Stem	ASTM A 182 F6			
	Seat	Viton AED			
	Seal	Viton AED			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	Zinc coating for Body bolt/nut	Hot Dip Galvanized Plated			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			
	Valve location and function	Above-ground/outdoor/block			



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Marking

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Actuator

N/A

Support

No

Locking device

Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**96. Ball Valves 4"- VB-239-E8**

	PIPE CLASS	E8	Rating class	Class 900	CA=3.0mm
general	Tag Number		VB-239-E8		
	Size Range (Inch)		4"		
	Valve Type		Full Port		
	Design Pressure(PSIG) (max)		1580		
	Design Temperature (°F)(min/max)		200/200		
	Service/Service code		Flow Lines		
	Service Component		As per Process Simulation Report NGP-001-PCS-15.00-0002-00		
design	Design Standard		API 6D		
	Body		Side entry, Split body, Bolted Body		
	Ball		Floating ball		
	Seat		Soft Seated, Replaceable Seats		
	End Connection		RTJ to ASME B16.5		
	Face to Face Dimension		ASME B16.10		
	Leakage Class		Rate A		
	Operation		Bevel Gear Operated		
	Fire Safe requirements(Design & Certificate)		API 607/API 6FA		
	Others		anti-static, anti-blow-out stem		
material (Note-4)	Body & Cover		ASTM A216 Gr WCB		
	Ball		A105/350LF-2 + 3 MIL ENP		
	Stem		ASTM A 182 F6		
	Seat		Viton AED		
	Seal		Viton AED		
others	Test Standard		API 6D/ISO 5208/API 598		
	CERTIFICATION		EN 10204 3.1		
	Zinc coating for Body bolt/nut		Hot Dip Galvanized Plated		
	External painting and Colour coding		As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00		
	Valve location and function		Above-ground/outdoor/block		



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Marking

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Actuator

N/A

Support

No

Locking device

Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**97. Ball Valves 6"- VB-239-E8**

	PIPE CLASS	E8	Rating class	Class 900	CA=3.0mm
general	Tag Number	VB-239-E8			
	Size Range (Inch)	6"			
	Valve Type	Full Port			
	Design Pressure(PSIG) (max)	1580			
	Design Temperature (°F)(min/max)	200/200			
	Service/Service code	Flow Lines			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Trunnion Mounted ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	RTJ to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Bevel Gear Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	DBB DESIGN, Secondary Sealant Injection for Seat and Stem Seals, anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	ASTM A216 Gr WCB			
	Ball	A105/350LF-2 + 3 MIL ENP			
	Stem	ASTM A 182 F6			
	Seat	Viton AED			
	Seal	Viton AED			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	Zinc coating for Body bolt/nut	Hot Dip Galvanized Plated			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			



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DESCRIPTION Data Sheet for Ball Valves

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Valve location and function	Above-ground/outdoor/block
Marking	As per Specification for Specification for Ball, Gate, Globe and Check Valves NGP-00-PIP-15.03-0010-00
Actuator	N/A
Support	No
Locking device	Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**98. Ball Valves 8”~24”- VB-239-E8**

	PIPE CLASS	E8	Rating class	Class 900	CA=3.0mm
general	Tag Number	VB-239-E8			
	Size Range (Inch)	8”~24”			
	Valve Type	Full Port			
	Design Pressure(PSIG) (max)	1580			
	Design Temperature (°F)(min/max)	200/200			
	Service/Service code	Flow Lines			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Trunnion Mounted ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	RTJ to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Bevel Gear Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	DBB DESIGN, Secondary Sealant Injection for Seat and Stem Seals, anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	ASTM A216 Gr WCB			
	Ball	A105/350LF-2 + 3 MIL ENP			
	Stem	ASTM A 182 F6			
	Seat	Viton AED			
	Seal	Viton AED			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	Zinc coating for Body bolt/nut	Hot Dip Galvanized Plated			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			





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Valve location and function	Above-ground/outdoor/block
Marking	As per Specification for Specification for Ball, Gate, Globe and Check Valves NGP-00-PIP-15.03-0010-00
Actuator	N/A
Support	Yes
Locking device	Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**99. Ball Valves 2"~3"- VB-23A-E3**

	PIPE CLASS	E3	Rating class	Class 900	CA=3.0mm
general	Tag Number	VB-23A-E3			
	Size Range (Inch)	2"~3"			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	1580			
	Design Temperature (°F)(min/max)	-50/265			
	Service/Service code	Flare/ Vent/ Process Gas/ Glycol(Cold Service)/ Process Liquid			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Floating ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	RTJ to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Lever Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	ASTM A352 Gr LCC			
	Ball	Type 316 S.S.			
	Stem	Type 316 S.S.			
	Seat	Filled TFE			
	Seal	Filled TFE			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	Zinc coating for Body bolt/nut	Hot Dip Galvanized Plated			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			



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Valve location and function	Above-ground/outdoor/block
Marking	As per Specification for Specification for Ball, Gate, Globe and Check Valves NGP-00-PIP-15.03-0010-00
Actuator	N/A
Support	No
Locking device	Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**100. Ball Valves 4"- VB-23A-E3**

	PIPE CLASS	E3	Rating class	Class 900	CA=3.0mm
general	Tag Number	VB-23A-E3			
	Size Range (Inch)	4"			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	1580			
	Design Temperature (°F)(min/max)	-50/265			
	Service/Service code	Flare/ Vent/ Process Gas/ Glycol(Cold Service)/ Process Liquid			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Floating ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	RTJ to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Bevel Gear Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	ASTM A352 Gr LCC			
	Ball	Type 316 S.S.			
	Stem	Type 316 S.S.			
	Seat	Filled TFE			
	Seal	Filled TFE			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	Zinc coating for Body bolt/nut	Hot Dip Galvanized Plated			
	External painting and Colour coding	As per Specification for Coating and Painting NGP-000-PAI-15.03-0001-00			



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Valve location and function	Above-ground/outdoor/block
Marking	As per Specification for Specification for Ball, Gate, Globe and Check Valves NGP-00-PIP-15.03-0010-00
Actuator	N/A
Support	No
Locking device	Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**101. Ball Valves 6"- VB-23A-E3**

	PIPE CLASS	E3	Rating class	Class 900	CA=3.0mm
general	Tag Number	VB-23A-E3			
	Size Range (Inch)	6"			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	1580			
	Design Temperature (°F)(min/max)	-50/265			
	Service/Service code	Flare/ Vent/ Process Gas/ Glycol(Cold Service)/ Process Liquid			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Trunnion Mounted ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	RTJ to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Bevel Gear Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	DBB DESIGN, Secondary Sealant Injection for Seat and Stem Seals, anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	ASTM A352 Gr LCC			
	Ball	Type 316 S.S.			
	Stem	Type 316 S.S.			
	Seat	Filled TFE			
	Seal	Filled TFE			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	Zinc coating for Body bolt/nut	Hot Dip Galvanized Plated			
	External painting and Colour coding	As per Specification for Coating and Painting			



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		NGP-000-PAI-15.03-0001-00
	Valve location and function	Above-ground/outdoor/block
	Marking	As per Specification for Specification for Ball, Gate, Globe and Check Valves NGP-00-PIP-15.03-0010-00
	Actuator	N/A
	Support	No
	Locking device	Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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**102. Ball Valves 8”~24”- VB-23A-E3**

	PIPE CLASS	E3	Rating class	Class 900	CA=3.0mm
general	Tag Number	VB-23A-E3			
	Size Range (Inch)	8”~24”			
	Valve Type	Reduced Port			
	Design Pressure(PSIG) (max)	1580			
	Design Temperature (°F)(min/max)	-50/265			
	Service/Service code	Flare/ Vent/ Process Gas/ Glycol(Cold Service)/ Process Liquid			
	Service Component	As per Process Simulation Report NGP-001-PCS-15.00-0002-00			
design	Design Standard	API 6D			
	Body	Side entry, Split body, Bolted Body			
	Ball	Trunnion Mounted ball			
	Seat	Soft Seated, Replaceable Seats			
	End Connection	RTJ to ASME B16.5			
	Face to Face Dimension	ASME B16.10			
	Leakage Class	Rate A			
	Operation	Bevel Gear Operated			
	Fire Safe requirements(Design & Certificate)	API 607/API 6FA			
	Others	DBB DESIGN, Secondary Sealant Injection for Seat and Stem Seals, anti-static, anti-blow-out stem			
material (Note-4)	Body & Cover	ASTM A352 Gr LCC			
	Ball	Type 316 S.S.			
	Stem	Type 316 S.S.			
	Seat	Filled TFE			
	Seal	Filled TFE			
others	Test Standard	API 6D/ISO 5208/API 598			
	CERTIFICATION	EN 10204 3.1			
	Zinc coating for Body bolt/nut	Hot Dip Galvanized Plated			
	External painting and Colour coding	As per Specification for Coating and Painting			





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	NGP-000-PAI-15.03-0001-00
Valve location and function	Above-ground/outdoor/block
Marking	As per Specification for Specification for Ball, Gate, Globe and Check Valves NGP-00-PIP-15.03-0010-00
Actuator	N/A
Support	Yes
Locking device	Yes

Notes:

1. This data sheet shall be read in conjunction with NGP-00-PIP-15.03-0010-00 Specification for Ball, Gate, Globe and Check Valves.
2. A stainless steel TAG showing Valve TAG No. shall be permanently attached to the valve body.
3. Valves shall have provision of locking in Reduced opened or closed position by external padlock.(padlock is not in a scope of bidder)
4. Supplier shall certify suitability of material mentioned in the datasheet for the intended service condition specified.



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DATA SHEET

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## Data Sheet for Induction Bends

### REVISION DETAILS

			<i>HuangChao</i>	<i>Shao Mingyu</i>	<i>Zhang Liqiang</i>	<i>Kongxia</i>
00	07/07/2016	Approved for Design	Huang Chao	Shao Mingyu	Zhang Liqiang	Kong Xia
C	24/06/2016	Issued for Approval	Huang Chao	Shao Mingyu	Zhang Liqiang	Kong Xia
B	08/06/2016	Issued for Review	Huang Chao	Shao Mingyu	Zhang Liqiang	Kong Xia
A	03/06/2016	Internal Discipline Check	Huang Chao	Shao Mingyu	Zhang Liqiang	Kong Xia
REV	DATE	DESCRIPTION	PRPD	CHKD	REVD	APPD



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REVISION 00

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### REVISION HISTORY

REV.	DATE	REVISION DESCRIPTION
A	03/06/2016	Internal Discipline Check
B	08/06/2016	Issued for Review
C	24/06/2016	Issued for Approval
00	07/07/2016	Approved for Design



NASHPA Gas Processing and LPG Recovery Plant PROC-FC-CB/NASHPA/PROJ-1247/2015	
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## 1 TECHNICAL REQUIREMENT

The specific technical requirement refers to following table.

GENERAL				
1	Design Code	ISO 15590-1	Design Life	25 Years
REFERENCE DOCUMENTS				
1	NGP-000-PIP-15.03-0016-01 Specification for Induction Bends			
2	NGP-000-PIP-15.03-0001-00 Piping Material Specification			
DESIGN DATA				
1	Line Pipe Outside Diameter	219mm(8")	Design Pressure	1580 psig
2	Design Temperature	200°F	Installation	Underground /Aboveground
3	Corrosion Allowance (mm)	3	Main Fluid Handled	Gas and Condensate
4	Purchaser's Spec. No.	NGP-000-PIP-15.03-0016-01		
5	Induction bend Manufacturing Standard	ISO 15590-1		
6	Thickness of induction bends (mm)	12.7	Product Specification Level	2
7	Type of Pipe	SMLS	Steel Grade / Minimum Yield Strength	X52 / 360MPa
BEND CHARACTERISTIC				
Bend radius			R/D=5	
Min. wall thickness & Wall Thinning Rate			As per specification for induction bend, Section 4	
Minimum Tangent Length at Each End			300mm	
Tolerance of Outside Diameter of Bend End			+2mm,-1mm	
Tolerance of Roundness			less than 0.8 % ( at ends), less than 2.5%( in bend body)	
Tolerance of Bend Angle and Bend Radius			±1°(bend angle), ±1% (bend radius)	
Tolerance of Bend Planeness			not exceed 10mm	
Tolerance of End Squareness			less than 3mm	
Wall thickness of the bend extrados			No less than 11.13mm	
Wall thickness of the bend intrados			No less than 12.70mm	
COATING				
1	Project Spec	As per NGP-000-PAI-15.03-0001-00		
2	Type of External Coating	As per section 9.2 of Specification for Coating and Painting		



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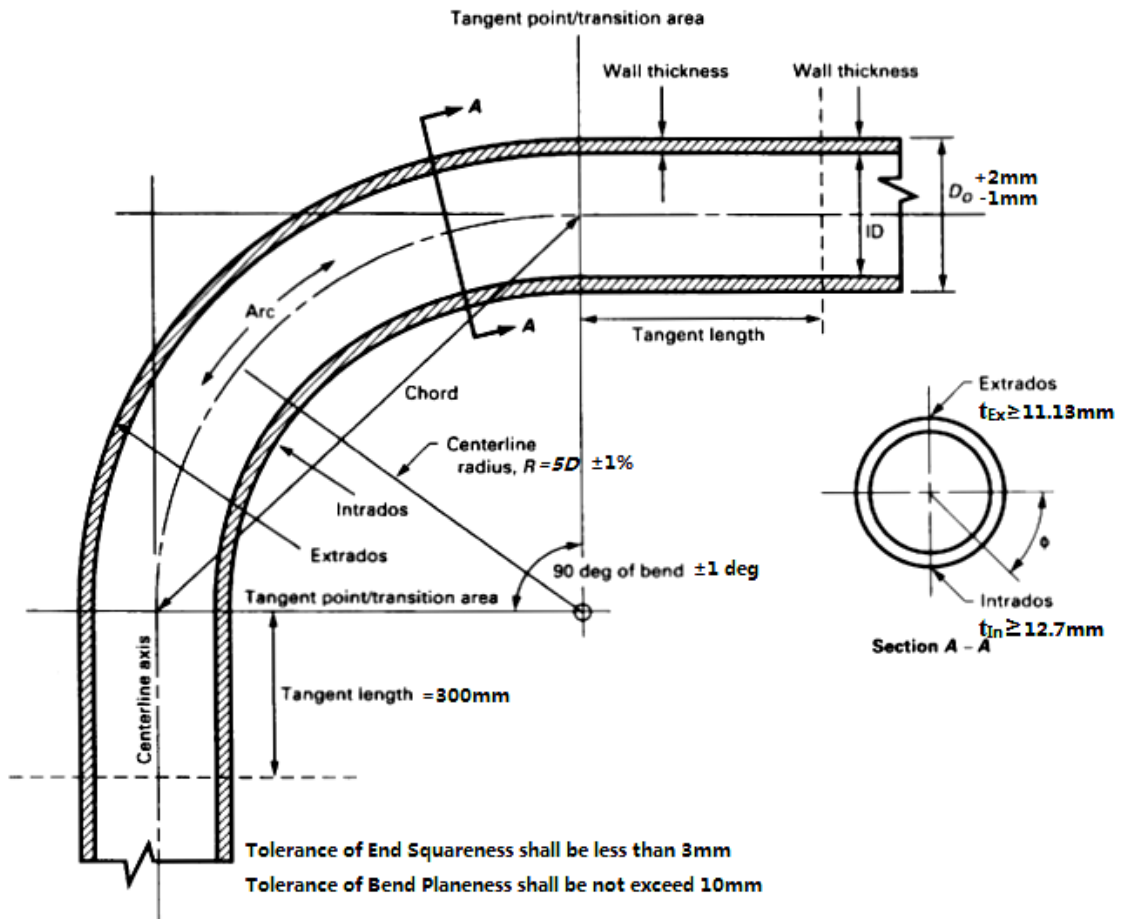
DOC. NO. NGP-000-PIP-15.17-0006-01

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The sketch of 90° bends of flow lines refers to following figure.



Note1: More detailed requirements are shown in the Specification for induction bend NGP-000-PIP-15.03-0016-01.

SUPPLIER's products shall fulfil the Specification.



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## 2 QUANTITY OF INDUCTION BENDS

Quantity of induction bends refer to the following table.

Location	Pipe Specification	Wall thickness (mm)	Bend Angle	Quantity (Nos.)	Remark
Flow line	8" PI 5L PLS2 X52 SMLS	12.7	45 °	12	
			90 °	12	



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SPECIFICATION

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## Piping Material Specification

### REVISION DETAILS

REV	DATE	DESCRIPTION	PRPD	CHKD	REVD	APPD
			<i>Wang Jing</i>	<i>Wang Shaobo</i>	<i>Liu Zijian</i>	<i>Xu Feng</i>
02	01/08/2016	Approved for Use	Wang Jing	Wang Shaobo	Liu Zijian	Xu Feng
01	28/06/2016	Approved for Use	Wang Jing	Wang Shaobo	Liu Zijian	Xu Feng
00	20/05/2016	Approved for Use	Wang Jing	Wang Shaobo	Liu Zijian	Xu Feng
C	23/03/2016	Issued for Approval	Wang Jing	Wang Shaobo	Liu Zijian	Xu Feng
B	25/01/2016	Issued for Review	Wang Jing	Wang Shaobo	Liu Zijian	Xu Feng
A	12/01/2016	Internal Discipline Check	Wang Jing	Wang Shaobo	Liu Zijian	Xu Feng





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DESCRIPTION Piping Material Specification

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### REVISION HISTORY

REV.	DATE	REVISION DESCRIPTION
A	12/01/2016	Internal Discipline Check
B	25/01/2016	Issued for Review
C	23/03/2016	Issued for Approval
00	20/05/2016	Approved for Use
01	28/06/2016	Approved for Use
02	01/08/2016	Approved for Use



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DESCRIPTION           Piping Material Specification

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## 1.0 GENERAL

### 1.1 Introduction

OIL & GAS Development Company Ltd. (OGDCL) is operating NASHPA Oil & Gas fields in Khyber Pakhtoonkhuwa of Islamic Republic of Pakistan. OGDCL intends to install LPG Recovery Plant, Compressors & Allied Facilities at these field.

### 1.2 Scope

This specification covers material and component requirements for all piping systems of the PROJECT within the scope of ASME Code B31.3 and B31.8.

This specification shall be applied to piping materials indicated on the Piping and Instrument Diagram (hereinafter referred to as P&ID).

### 1.3 Definitions

Within this document the following definitions apply:

<b>Project</b>	NASHPA Gas Processing and LPG Recovery Plant PROC-FC-CB/NASHPA/PROJ-1247 /2015
<b>Company / Owner</b>	Oil & Gas Development Company Ltd.(OGDCL)
<b>Consultant</b>	Zishan Engineers (Pvt.) Ltd.
<b>Contractor</b>	Hong Kong Huihua Global Technology Limited Wholly owned Subsidiary of China OIL HBP Science and Technology Corporation Ltd
<b>Manufacturer/Supplier/Vendor</b>	Patry(ies), which manufactures and/or supplies material, equipment and service to perform the duties as specified by CONTRACTOR in the scope of supply
<b>Shall</b>	Indicates a mandatory requirement
<b>Should</b>	Indicates a strong recommendation to comply with the requirement of this document

## 2.0 CODES AND STANDARDS

### 2.1 Codes, Standards and Regulations

The following Codes shall be interpreted as the minimum requirements applicable to the subject work, and no statement contained in this Specification shall be construed as limiting the work to such minimum requirements. All referenced Codes, Standards, References and Specifications shall be considered "latest edition" unless otherwise noted.



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ASME

ASME B 31.3 Process Piping

ASME B 31.8 Gas Transmission and Distribution Piping Systems

ASME B36.10M Welded and Seamless Wrought Steel Pipe

ASME B 16.5 Pipe Flanges and Flanged Fittings

ASME B 16.9 Factory-Made Wrought Steel Butt Welding Fittings

ASME B 16.11 Forged Steel Fittings, Socket-Welding and Threaded

ASME B 16.20 Metallic Gaskets for Pipe Flanges – Ring-Joint, Spiral-Wound

ASME B 16.21 Non-metallic Gaskets for Pipe Flanges

ASME B 18.2.1 Stud Bolts

ASME B 18.2.2 Heavy Nuts

ASME B 16.34 Valves-Flanged, Threaded and Welding End

ASME B 16.10 Face to Face and End to End Dimensions of Valves

ASME B 16.47 Large Diameter Steel Flanges

ASME B 16.25 Butt welding ends

ASME  
SECTION V Non Destructive Examination

ASTM A370 Standard Test Methods and Definitions for Mechanical Testing Steel Products

API

API6D  
/ISO14313 Specification for Pipeline Valves

API 5L Specification for Line Pipe



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API RP 520	Sizing and Selection of Pressure Relieving Devices in Refineries
API 598	Valve Inspection and Testing
API 601	Metallic Gaskets
API 1104	Welding of Pipeline and Related facilities
API 526	Flanged Steel Pressure Relief Valves
API 15LR	Specification For Low Pressure Fiberglass Line Pipe and Fittings
ISO	
ISO 1127	Stainless Steel Tubes- Dimensions, Tolerances and Conventional Masses
ISO 4200	Plain End Tubes, Welded and Seamless- General Table of dimensions and masses per unit length
ISO 15494	High Density Poly-Ethylene Pipes and Fittings
ISO 9001	Quality Management System
ISO 9004	Managing For the Sustained Success of an Organization - A Quality Management Approach
ISO 15590-1	Petroleum and Natural Gas Industry - Induction Bends, Fittings and Flanges for Pipeline Transportation Systems - Part 1: Induction Bends
ISO 15761	Steel gate, globe and check valves for sizes DN 100 and smaller, for the petroleum and natural gas industries

## 2.2 Project Specification

Following specifications shall be referred for the project:

Piping Design Basis	NGP-000-PIP-15.05-0001-00
Specification for Stress Analysis	NGP-000-PIP-15.03-0002-00
Specification for Carbon and Stainless Steel Pipes	NGP-000-PIP-15.03-0008-00



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Specification for Carbon and Stainless Steel Fittings	NGP-000-PIP-15.03-0009-00
Specification for Ball, Gate, Globe and Check Valves	NGP-000-PIP-15.03-0010-00
Specification for Stud Bolts and Nuts	NGP-000-PIP-15.03-0007-00
Specification for Gaskets	NGP-000-PIP-15.03-0006-00
Specification for Steel Flanges	NGP-000-PIP-15.03-0011-00
Specification for Induction Bends	NGP-000-PIP-15.03-0016-00
Data Sheet for Gate, Globe and Check Valves	NGP-000-PIP-15.17-0001-00
Data Sheet for Ball Valves	NGP-000-PIP-15.17-0002-00
Data Sheet for Induction Bends	NGP-000-PIP-15.17-0006-00
Specification for Coating and Painting	NGP-000-PAI-15.03-0001-00

### 3.0 GENERAL TECHNICAL REQUIREMENTS

Design limits (pressure, temperature, size ranges, etc.) are shown in each piping material class. The design conditions indicated in each piping class represent the design limits and shall never be exceeded. All piping components and pipe wall thicknesses shown in each piping class are based on these limits.

3.1 Thickness calculation shall be as per ASME B31.3. Allowances for corrosion or/and erosion shall be determined by the intended service and shall be added to all surfaces exposed to the flowing medium. As a general rule, the minimum values for corrosion allowance shall correspond to the respective piping Classes, unless stated otherwise in the project specifications.

The minimum wall thickness after reduction by corrosion allowance, mill tolerance and threading allowance (where applicable) shall not be less than the following:

Nominal Pipe Size (NPS)	Minimum Corroded Thickness
½" to ¾"	1.0 mm
1" to 8"	1.5 mm
10"	2.3 mm
12" to 14"	2.8 mm
16" to 24"	3.1 mm
26" to 36"	3.8 mm



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38" to 46"

4.6mm

3.3 Specialty Items are not included in the piping classes. They will be managed and numbered by means of a dedicated data sheet.

3.4 Pipe or fittings in nominal sizes (NPS) ¼", 1 ¼", 2 ½", 3 ½", 4 ½", 5" and 22" shall not be selected except when necessary to match equipment connections.

3.5 When there is a choice between reduced port and full port valves, full port valves shall only be used when specifically indicated on P & IDs.

3.6 Valves shall be gear operated in accordance with the following table:

	150#	300#	600#	900#
GATE	NPS ≥ 16"	NPS ≥ 12"	NPS ≥ 8"	NPS ≥ 8"
GLOBE	NPS ≥ 10"	NPS ≥ 10"	NPS ≥ 8"	NPS ≥ 6"
BALL	NPS ≥ 6"	NPS ≥ 6"	NPS ≥ 4"	NPS ≥ 4"

3.7 Valve face-to-face as well as end-to-end dimensions shall be according to ASME B16.10.

VENDOR shall furnish certified dimension drawings for all valves.

3.8 Post Weld Heat Treatment (PWHT) shall be in accordance with ASME B31.3.

3.9 To avoid electrochemical corrosion, the interconnected piping belonging to different piping material classes (e.g. Carbon Steel / Duplex Stainless Steel) shall be isolated using the isolation kits.

3.10 General Requirement and Installation Rules for Flanges and Fittings

- n Wall thickness of butt-welding fittings and welding neck flanges shall be same as corresponding pipe wall thickness. Fittings shall be according to the pipe type (material grade). Pipe bends shall be made from the same pipe material specified for the service.
- n The minimum size for branch connections shall be NPS 3/4, except where NPS 1/2 pipe is used for instrument piping.
- n The thicknesses of fittings made of carbon and alloy steels shall be in accordance with the standard ASME B 36.10M.
- n The thicknesses of fittings made of stainless steel shall comply with the standard ASME B 36.19.



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- n The dimensions of forged, threaded or socket-welding fittings of the 3000 # and 6000 # series shall comply with the standard ASME B16.11.
- n The dimensions of butt-welding fittings shall be in accordance with the standard ASME B16.9, except that tolerances for Duplex stainless steel fittings in schedule 10S, which shall be in accordance with MSS SP 43.
- n Threads of galvanized fittings shall be free of galvanizing.
- n All flanges 24" and smaller be furnished in strict accordance with ASME B16.5.
- n Flanges of 26" and larger shall be to ASME B 16.47 Series A.
- n Details of flanges which mate to a higher rated specification. E.g. specification breaks at valves, control valves, etc. shall be as per the line specification except that the rating and facing shall be specified to match the higher rated specification.
- n Weld neck flanges shall be bored to the inside diameter of the pipe to which they are to be welded.
- n Flanges shall be installed with bolt holes straddling normal horizontal and vertical centerlines.
- n Flat face flanges shall be used when mating to cast bronze, iron or aluminum flanges. Lap Joint flanges, RF, shall not be used.
- n Long radius butt weld elbows shall be used wherever possible. Short radius elbows may be used only where requirements so dictate space.
- n Reduction in line size shall be made only by reducing or swages. No bushings shall be used.
- n Welding caps shall normally be used to close the ends of welded lines. Where required for future extension, blind flanges shall be used.
- n Special fittings shall only be permitted where no standard fittings can be employed.
- n Stud bolts, nuts and gaskets shall be the type specified on the relevant material classification.
- n Threaded and Socket Welded Piping:
  - a) Use of half coupling is prohibited.
  - b) Threaded plugs shall be solid steel round or hexagonal bar stock.





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- c) The use of threaded nipples is not permitted within socket weld material classes except where connection to equipment or instrumentation is required. Should the use of a threads covered. Threaded nipples for connections to instruments and equipment shall be at least schedule 160.
- d) PTFE tape may be used on threaded connections to ensure adequate sealing, except where connection is to be seal welded.
- e) Threaded full length pipe nipples, street ells, or street tees shall not be used

### 3.11 Special Considerations for LPG

- n Piping materials, including gaskets and thread compounds, shall be suitable for use with LPG throughout the range of temperatures to which they will be subjected. The temperature limitations for pipe materials shall be as specified in ASME B31.3.
- n Piping which would be exposed during an emergency to the cold of an LPG or refrigerant spill or the heat of an ignited spill when either exposure could result in a failure of the piping which would significantly increase the emergency shall be:
  - a) Made of material that is suitable for both its normal operating temperature and the extreme temperatures to which it might be subjected during an emergency;
  - b) Protected by insulation or other means to delay failure due to such extreme temperatures until corrective action may be taken by the operator;
  - c) Capable of being isolated and having the flow stopped in piping that would be exposed only to the heat of an ignited spill during the emergency.
- n Piping insulation used in areas where the mitigation of fire exposure is necessary shall be made of material which will not propagate fire and shall maintain any properties which are necessary during an emergency when exposed to fire, heat, cold, or water.
- n Furnace lap-weld, furnace butt-weld, cast iron, malleable iron, and ductile iron pipe shall be prohibited.
- n When longitudinal or spiral weld pipe is used (welded with or without filler metal), the weld and heat-affected zone shall comply with ASME B31.3.
- n Threaded pipe shall be at least schedule 80.



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- n A liquid line, excluding loading arms or hoses, on a storage container, cold box, or other major item of insulated equipment external to the outer shell or jacket whose failure can release a significant quantity of flammable fluid shall not be made of aluminum, copper, or copper alloy, or other material which has low resistance to flame temperatures unless such material is protected against fire exposure. Transition joints may be used if they are protected against fire exposure.



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S. No.	Piping Specification	Service	Piping Class	Design Code	C.A. (mm)	Temp (°F)	PSIG
1	A1  CARBON STEEL	-FUEL OIL	Class 150# RF	ASME B31.3	1.6	-20 to 100	285
		-HOT OIL				200	260
		-STABILIZED CONDENSATE				300	230
		-GLYCOL				400	200
		-TREATED GAS				500	170
		SALES GAS				600	140
		LPG				650	125
		-FIRE WATER (A / G)				700	110
		2				A2  CARBON STEEL	-RAW GAS
-FUEL GAS	200		260				
-OPEN DRAIN / VENTS	300		230				
-CLOSED DRAIN	500		170				
	600		140				
	650		125				
3	A3  LOW TEMPERATURE CARBON STEEL	-FLARE / VENT	Class 150# RF	ASME B31.3	3.0	-50 to 100	285
		-PROCESS GAS				200	260
		-GLYCOL (COLD SERVICE)				300	230
						400	200
		-PROCESS LIQUID				500	170
						600	140
4	A4  GALVANIZED CARBON STEEL	-UTILITY, INSTRUMENT & PLANT AIR	Class 150# RF	ASME B31.3	1.6	-20 to 100	285
						200	260
						300	230



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5	A6  304 STAINLESS STEEL	-LIQUIFIED GAS UNDER -100 °C	Class150# RF	ASME B31.3	NIL	-150 to 100	275
						200	230
						300	205
						400	190
						500	170
						600	140
						650	125
						700	110
6	A7 G.R.E	-FIRE WATER (U / G) -PRODUCE WATER (U / G)	Class150# RF	ASME B31.3	NIL	-20 to 100	285
7	A8 CARBON STEEL	-PRODUCE WATER	Class150# RF	ASME B31.3	4.5	-20 to 100	285
						200	260
						300	230
						400	200
						500	170
						600	140
						650	125
700	110						
8	B1  CARBON STEEL	-FUEL OIL -HOT OIL -STABILIZED CONDENSATE - GLYCOL -TREATED GAS SALES GAS	Class 300# RF	ASME B31.3	1.6	-20 to 100	740
						200	675
						300	655
						500	600
						600	550
						650	535
						700	535
9	B2  CARBON STEEL	-RAW GAS -FUEL GAS -OPEN DRAIN / VENTS -CLOSED DRAIN	Class 300# RF	ASME B31.3	3.0	-20 to 100	740
						200	675
						300	655
						500	600
						600	550
						650	535
						700	535



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10	B3 LOW TEMPERATURE CARBON STEEL	-FLARE / VENT	Class 300# RF	ASME B31.3	3.0	-50 to 100	740
		-PROCESS GAS				200	675
		-GLYCOL (COLD SERVICE)				300	655
		-PROCESS LIQUID				400	635
		500				600	
		600				550	
		650				535	
11	B6  304 STAINLESS STEEL	-LIQUIFIED GAS UNDER -100 °C	Class 300# RF	ASME B31.3	NIL	-150 to 100	720
		200				600	
		300				540	
		400				495	
		500				465	
		600				440	
		650				430	
700	420						
12	D1  CARBON STEEL	-FUEL OIL	Class 600# RF	ASME B31.3	1.6	-20 to 100	1480
		-HOT OIL				200	1350
		-STABILIZED CONDENSATE				300	1315
		- GLYCOL				400	1270
		-TREATED GAS				500	1200
		600				1095	
		650				1075	
700	1065						
13	D2  CARBON STEEL	-RAW GAS	Class 600# RF	ASME B31.3	3.0	-20 to 100	1480
		-FUEL GAS				200	1350
		-OPEN DRAIN / VENTS				300	1315
		-CLOSED DRAIN				400	1270
		500				1200	
		600				1095	
		650				1075	
700	1065						



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S. No.	Piping Specification	Service	Piping Class	Design Code	C.A. (mm)	Temp (°F)	PSIG
14	D3  LOW TEMPERATURE CARBON STEEL	-FLARE / VENT -PROCESS GAS -GLYCOL (COLD SERVICE) -PROCESS LIQUID	Class 600# RF	ASME B31.3	3.0	-50 to 100 200 300 400 500 600 650	1480 1350 1315 1270 1200 1095 1075
15	D6  304 STAINLESS STEEL	-LIQUIFIED GAS UNDER -100 °C	Class 600# RF	ASME B31.3	NIL	-150 to 100 200 300 400 500 600 650 700	1440 1200 1075 995 930 885 865 845
16	D8 CARBON STEEL	-FLOW LINES	Class 600# RF	ASME B31.3	3.0	-20 to 100 200 300 400 500 600 650 700	1480 1350 1315 1270 1200 1095 1075 1065
17	D9 CARBON STEEL	-PRODUCE WATER	Class 600# RF	ASME B31.3	4.5	-20 to 100 200 300 400 500 600 650 700	1480 1350 1315 1270 1200 1095 1075 1065



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S. No.	Piping Specification	Service	Piping Class	Design Code	C.A. (mm)	Temp (°F)	PSIG
18	E1  CARBON STEEL	-FUEL OIL	Class 900# RTJ	ASME B31.3	1.6	-20 to 100	2220
		-HOT OIL				200	2025
		-STABILIZED CONDENSATE				300	1970
		-GLYCOL				400	1900
		-TREATED GAS				500	1795
		SALES GAS LPG				600	1640
						650	1610
						700	1600
19	E2  CARBON STEEL	-RAW GAS	Class 900# RTJ	ASME B31.3	3.0	-20 to 100	2220
		-FUEL GAS				200	2025
		-OPEN DRAIN / VENTS				300	1970
		-CLOSED DRAIN				400	1900
						500	1795
						600	1640
						650	1610
						700	1600
20	E3  LOW TEMPERATURE CARBON STEEL	-FLARE / VENT	Class 900# RTJ	ASME B31.3	3.0	-50 to 100	2220
		-PROCESS GAS				200	2025
		-GLYCOL (COLD SERVICE)				300	1970
						400	1900
		-PROCESS LIQUID				500	1795
						600	1640
						650	1610
21	E6  304 STAINLESS STEEL	-LIQUIFIED GAS UNDER -100 °C	Class 900# RTJ	ASME B31.3	NIL	-150 to 100	2160
						200	1800
						300	1615
						400	1490
						500	1395
						600	1325
						650	1295
						700	1265



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S. No.	Piping Specification	Service	Piping Class	Design Code	C.A. (mm)	Temp (°F)	PSIG
22	E8 CARBON STEEL	-FLOW LINES	Class 900# RTJ	ASME B31.3	3.0	-20 to 100	2220
						200	2025
						300	1970
						400	1900
						500	1795
						600	1640
						650	1610
						700	1600







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NOMINAL PIPE SIZE	1/2"	3/4"	1"	1-1/2"	2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	90° BRANCH CONNECTIONS																	
MIN. WALL THK	SCH 160				SCH 80		SCH 40			SCH STD							NOMINAL BRANCH SIZE ( in. )																	
PIPE	CARBON STEEL, ASTM A106 Gr. B, SMLS ASME B36.10M																NOMINAL RUN PIPE SIZE ( in. )	1/2	3/4	1	1-1/2	2	3	4	6	8	10	12	14	16	18	20	24	
FLANGES	ASME B16.5 Class 150 Raised Face, ASTM A105																	24	S	S	S	S	W	W	W	W	W	W	R	R	R	R	R	E
FITTINGS	ASME B16.11 S.W. Class 6000, ASTM A 105,				ASME B16.9, Beveled Ends, Wall Thk. to Match Pipe SMLS, ASTM A234 Gr. WPB,													20	S	S	S	S	W	W	W	W	W	R	R	R	R	R	E	
UNIONS	ASME B16.11, Class 6000, S.W. Ground Joint, ASTM A 105																	18	S	S	S	S	W	W	W	W	R	R	R	R	R	E		
PLUG	Square Head 6000# ASTM A 105 ASME B16.11																	16	S	S	S	S	W	W	W	R	R	R	R	R	E			
VENTS / DRAINS	1/2"	3/4"			3/4" / 1"			3/4" / 1 1/2"						14	S	S		S	S	W	W	W	R	R	R	R	E							
THR'D NIPPLE & SWAGES	SCH. 160 A106-B SMLS																	12	S	S	S	S	W	W	W	R	R	R	E					
GASKETS	Class 150, 4.45mm THK.SPIRAL WOUND 304SS RING 304 SS WINDING, FLEXIBLE GRAPHITE, ASME B16.20																	10	S	S	S	S	W	W	R	R	R	E						
BOLTING	STUDS : ASTM A193 Gr. B7, Hot Dip Galvanized plated NUTS : ASTM A194 Gr. 2H, Heavy Hex, Hot Dip Galvanized plated																	8	S	S	S	S	W	W	R	R	E							
SPEC. PLATE / BLANK & SPACER					SPEC. PLATE ASTM A516 Gr. 60, ASME B16.48				BLANK & SPACER ASTM A516 Gr. 60, ASME B16.48									6	S	S	S	S	W	R	R	E								
VALVES	GATE	VG-101-A2				VG-202-A2												4	S	S	S	S	R	R	E									
	GLOBE	VGL-101-A2				VGL-202-A2												3	S	S	S	S	R	E										
	CHECK	VC-101-A2				VC-202-A2												2	S	S	S	S	E											
	BALL	≤350 °F VB-101-A2 >350 °F VB-105-A2				≤350 °F VB-202-A2 >350 °F VB-209-A2												1-1/2	R	R	R	E												
FOR SPEC. NOTES SEE SHEET 40 OF 72																		DESIGN CONDITIONS												STUD BOLTS				
SERVICE: RAW GAS, FUEL GAS, OPEN DRAIN / VENTS, CLOSED DRAIN																		TEMP °F				PRESS psig				NOMINAL PIPE SIZE		DIA. ,in. & LENGTH, mm		NO. OF BOLTS				
																		-20 TO 100				285				1/2"		1/2 x 60		4				
																		200				260				3/4"		1/2 x 70		4				
																		300				230				1"		1/2 x 70		4				
																		400				200				1-1/2"		1/2 x 80		4				
																		500				170				2"		5/8 x 90		4				
																		600				140				3"		5/8 x 100		4				
																		650				125				4"		5/8 x 100		8				
																		700				110				6"		3/4 x 110		8				
																		°C				barg				8"		3/4 x 110		8				
																		-29 TO 38				19.66				10"		7/8 x 120		12				
																		93				17.93				12"		7/8 x 120		12				
																		149				15.86				14"		1 x 140		12				
																		204				13.79				16"		1 x 140		16				
																		260				11.72				18"		1 1/8 x 150		16				
																		316				9.66				20"		1 1/8 x 160		20				
																		343				8.62				24"		1 1/4 x 180		20				
																		371				7.59												
DESCRIPTION		DRN	DESCRIPTION		DRN	DESCRIPTION		DRN	DESCRIPTION		DRN	DESCRIPTION		DRN	DESCRIPTION		DRN	MATERIAL : CARBON STEEL		RATING : 150 #														
02 FOR DESIGN		CHK			CHK			CHK			CHK			CHK			CHK	CORR. ALLOWANCE : 3.0mm		SPEC. A2 REV. 02														
		APP			APP			APP			APP			APP			APP	PIPE WALL TOLERANCE : ±12.5%																
			DRAWN		CHECKED	APPROVED		CLIENT: Oil & Gas Development Company Ltd.		PROJECT:		DESIGN CODE : ASME B.31.3																						
			NAME					JOB NO.:																										
			PIPING MATERIAL SPECIFICATION																															

LEGEND:  
R Reducing Tee  
S Socket  
E Equal Tee  
W Weldolet

Note : Reducing fittings thickness shall match heavier pipe thickness







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MIN. WALL THK	SCH 80S				SCH 40S		SCH 10S									
PIPE	ASTM A 312 TP 304 SMLS, ASME B36.10M 18" to 24" ASTM A 312 TP 304 STRAIGHT SEAM WELDED, ASME B36.10M															
	SW / Plain Ends					BW Beveled Ends										
FLANGES	ASME B 16.5 Class 150 Raised Face, ASTM A 182 F-304															
	Socket Weld				Weld Neck, Bore to Match Pipe I.D											
FITTINGS	ASME B16.11 S.W				ASME B16.9, Beveled Ends, Wall Thk. to Match Pipe SMLS, ASTM A 403 WP304											
	Class 3000, ASTM A 182 GR F304				18" to 24" STRAIGHT SEAM WELDED ASTM A 403 WP304											
UNIONS	ASME B16.11, Class 3000, S.W.															
	Ground Joint, ASTM A 182 GR F304															
PLUG	Square Head 3000#															
	ASTM A 182 GR F304 ASME B16.11															
VENTS / DRAINS	1/2"	3/4"			3/4" / 1"			3/4" / 1 1/2"								
	Use 'in spec.' branch connection with 4" long Nipple and Gate Valve with Thread Cap															
THR'D NIPPLE & SWAGES	SCH 80S A 312 TP304 SMLS															
	SCH 80S A 312 TP304 MSS-SP-95															
GASKETS	Class 150, 4.45mm THK.SPIRAL WOUND 304SS RING 304 SS WINDING, FLEXIBLE GRAPHITE ASME B16.20															
BOLTING	STUDS : ASTM A320 Gr. B8															
	NUTS : ASTM A194 Gr. 8A, Heavy Hex															
SPEC. PLATE / BLANK & SPACER					SPEC. PLATE											
					ASTM A-240 Gr. 304, ASME B16.48											
VALVES	GATE	VG-103-A6				VG-203-A6										
	GLOBE	VGL-104-A6				VGL-205-A6										
	CHECK	VC-103-A6				VC-205-A6										
	BALL	VB-109-A6				VB-206-A6										

		90° BRANCH CONNECTIONS															
		NOMINAL BRANCH SIZE ( in. )															
NOMINAL RUN PIPE SIZE ( in. )	1/2	3/4	1	1-1/2	2	3	4	6	8	10	12	14	16	18	20	24	
	24	S	S	S	S	W	W	W	W	W	W	R	R	R	R	E	
	20	S	S	S	S	W	W	W	W	W	W	R	R	R	R	E	E
	18	S	S	S	S	W	W	W	W	R	R	R	R	R	E		
	16	S	S	S	S	W	W	W	R	R	R	R	R	E			
	14	S	S	S	S	W	W	W	R	R	R	R	E				
	12	S	S	S	S	W	W	W	R	R	R	E					
	10	S	S	S	S	W	W	R	R	R	E						
	8	S	S	S	S	W	W	R	R	E							
	6	S	S	S	S	W	R	R	E								
	4	S	S	S	S	R	R	E									
	3	S	S	S	S	R	E										
	2	S	S	S	S	E											
	1-1/2	R	R	R	E												
1	R	R	E														
3/4	R	E															
1/2	E																

LEGEND:  
R Reducing Tee  
S Socket  
E Equal Tee  
W Weldolet

Note : Reducing fittings thickness shall match heavier pipe thickness

FOR SPEC. NOTES SEE SHEET 40 OF 72															
SERVICE: LIQUIFIED GAS UNDER - 100 C,															
HYDROTEST LIMITED BY : FLANGES															
BARG. 27 PSIG.405															
TEMP °F															
PRESS psig															
NOMINAL PIPE SIZE															
DIA. in. & LENGTH, mm															
NO. OF BOLTS															
-150 TO 100 275 1/2" 1/2 x 60 4															
200 230 3/4" 1/2 x 70 4															
300 205 1" 1/2 x 70 4															
400 190 1-1/2" 1/2 x 80 2"															
500 170 2" 5/8 x 90 4															
600 140 3" 5/8 x 100 4															
650 125 4" 5/8 x 100 8															
700 110 6" 3/4 x 110 8															
°C barg 8" 3/4 x 110 8															
-101 TO 38 19.00 10" 7/8 x 120 12															
93 15.70 12" 7/8 x 120 12															
149 14.20 14" 1 x 140 12															
204 13.20 16" 1 x 140 16															
260 12.10 18" 1 1/8 x 150 16															
316 9.30 20" 1 1/8 x 160 20															
343 8.40 24" 1 1/4 x 180 20															
371 7.40															

DESCRIPTION	DRN	DESCRIPTION	DRN	DESCRIPTION	DRN	316	9.30	20"	1 1/8 x 160	20		
02 FOR DESIGN	CHK		CHK		CHK	343	8.40	24"	1 1/4 x 180	20		
	APP		APP		APP	371	7.40					
DRAWN			CHECKED	APPROVE	CLIENT: Oil & Gas Development Company Ltd.			MATERIAL : STAINLESS STEEL ( 304)			RATING : 150 #	
NAME					PROJECT:			CORR. ALLOWANCE : NIL			SPEC. A6 REV.02	
PIPING MATERIAL SPECIFICATION					JOB NO.:			PIPE WALL TOLERANCE : ±12.5%				
								DESIGN CODE : ASMEB.31.3				





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NOMINAL PIPE SIZE	1/2"	3/4"	1"	1-1/2"	2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	90° BRANCH CONNECTIONS																			
MIN. WALL THK	XXS	SCH 160				80	SCH 40				SCH STD				XS	NOMINAL BRANCH SIZE ( in. )																				
PIPE	CARBON STEEL, ASTM A106 Gr. B, SMLS ASME B36.10M																NOMINAL RUN PIPE SIZE ( in. )																			
FLANGES	ASME B16.5 Class 150 Raised Face, ASTM A 105																NOMINAL BRANCH SIZE ( in. )																			
FITTINGS	ASME B16.11 S.W. Class6000, ASTM A 105,				ASME B16.9, Beveled Ends, Wall Thk. to Match Pipe SMLS, ASTM A 234 Gr. WPB,												ASME B16.11 S.W. Class6000, ASTM A 105,				NOMINAL BRANCH SIZE ( in. )															
UNIONS	ASME B16.11, Class 6000, S.W. Ground Joint, ASTM A 105				ASME B16.9, Beveled Ends, Wall Thk. to Match Pipe SMLS, ASTM A 234 Gr. WPB,												ASME B16.11 S.W. Class6000, ASTM A 105,				NOMINAL BRANCH SIZE ( in. )															
PLUG	Square Head 6000# ASTM A 105 ASME B16.11				ASME B16.9, Beveled Ends, Wall Thk. to Match Pipe SMLS, ASTM A 234 Gr. WPB,												ASME B16.11 S.W. Class6000, ASTM A 105,				NOMINAL BRANCH SIZE ( in. )															
VENTS / DRAINS	1/2"	3/4"				3/4" / 1"				3/4" / 1 1/2"				NOMINAL BRANCH SIZE ( in. )																						
THR'D NIPPLE & SWAGES	SCH .XXS A 106-B SMLS				SCH .XXS A 106-B SMLS MSS-SP-95												SCH .XXS A 106-B SMLS MSS-SP-95				NOMINAL BRANCH SIZE ( in. )															
GASKETS	Class 150, 4.45mm THK.SPIRAL WOUND 304SS RING 304 SS WINDING, FLEXIBLE GRAPHITE, ASME B16.20																NOMINAL BRANCH SIZE ( in. )																			
BOLTING	STUDS : ASTM A193 Gr. B7, Hot Dip Galvanized plated																NUTS : ASTM A194 Gr. 2H, Heavy Hex, Hot Dip Galvanized plated																			
SPEC. PLATE / BLANK & SPACER	SPEC. PLATE				BLANK & SPACER				SPEC. PLATE				BLANK & SPACER				NOMINAL BRANCH SIZE ( in. )																			
VALVES	GATE	VG-101-A8				VG-202-A8				VG-101-A8				VG-202-A8				NOMINAL BRANCH SIZE ( in. )																		
	GLOBE	VGL-101-A8				VGL-202-A8				VGL-101-A8				VGL-202-A8				NOMINAL BRANCH SIZE ( in. )																		
	CHECK	VC-101-A8				VC-202-A8				VC-101-A8				VC-202-A8				NOMINAL BRANCH SIZE ( in. )																		
	BALL	≤350 °F VB-101-A8 >350 °F VB-105-A8				≤350 °F VB-202-A8 >350 °F VB-209-A8				≤350 °F VB-101-A8 >350 °F VB-105-A8				≤350 °F VB-202-A8 >350 °F VB-209-A8				NOMINAL BRANCH SIZE ( in. )																		
FOR SPEC. NOTES SEE SHEET 40 OF 72																		LEGEND: R Reducing Tee S Sockolet E Equal Tee W Weldolet																		
SERVICE: PRODUCE WATER																		Note : Reducing fittings thickness shall match heavier pipe thickness																		
HYDROTEST LIMITED BY :																		DESIGN CONDITIONS																		
BARG. 26 PSIG.375																		STUD BOLTS																		
FLANGES																		TEMP °F																		
																		PRESS psig																		
																		NOMINAL PIPE SIZE																		
																		DIA. ,in. & LENGTH, mm																		
																		NO. OF BOLTS																		
																		-20 TO 100																		
																		285																		
																		200																		
																		260																		
																		300																		
																		230																		
																		400																		
																		200																		
																		500																		
																		170																		
																		600																		
																		140																		
																		650																		
																		125																		
																		700																		
																		110																		
																		°C																		
																		barg																		
																		-29 TO 38																		
																		19.66																		
																		93																		
																		17.93																		
																		149																		
																		15.86																		
																		204																		
																		13.79																		
																		260																		
																		11.72																		
																		316																		
																		9.66																		
																		343																		
																		8.62																		
																		371																		
																		7.59																		
DESCRIPTION																		MATERIAL : CARBON STEEL																		
02 FOR DESIGN																		CORR. ALLOWANCE : 4.5mm																		
DRN																		PIPE WALL TOLERANCE : ±12.5%																		
CHK																		DESIGN CODE : ASME B.31.3																		
APP																		RATING : 150 #																		
DRAWN																		SPEC. A8 REV. 02																		
CHECKED																																				
APPROVED																																				
CLIENT: Oil & Gas Development Company Ltd.																																				
PROJECT:																																				
PIPING MATERIAL SPECIFICATION																		JOB NO.:																		



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NOMINAL PIPE SIZE	1/2"	3/4"	1"	1-1/2"	2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	90° BRANCH CONNECTIONS																	
MIN. WALL THK	SCH 80			SCH 40				SCH STD			SCH XS		SCH 40			NOMINAL BRANCH SIZE ( in. )																		
PIPE	CARBON STEEL, ASTM A106 Gr. B, SMLS ASME B36.10M																NOMINAL RUN PIPE SIZE ( in. )	1/2	3/4	1	1-1/2	2	3	4	6	8	10	12	14	16	18	20	24	
FLANGES	ASME B16.5 Class 300 Raised Face, ASTM A 105																	24	S	S	S	S	W	W	W	W	W	W	R	R	R	R	R	E
FITTINGS	ASME B16.11 S.W Class 3000, ASTM A 105,			ASME B16.9, Beveled Ends, Wall Thk. to Match Pipe SMLS, ASTM A234 Gr. WPB,														20	S	S	S	S	W	W	W	W	W	R	R	R	R	R	E	
UNIONS	ASME B16.11, Class 3000, S.W. Ground Joint, ASTM A 105																	18	S	S	S	S	W	W	W	W	R	R	R	R	R	E		
PLUG	Square Head 3000# ASTM A105 ASME B16.11																	16	S	S	S	S	W	W	W	R	R	R	R	R	E			
VENTS / DRAINS	1/2"	3/4"			3/4" / 1"			3/4" / 1 1/2"						14	S	S		S	S	W	W	W	R	R	R	R	E							
THR'D NIPPLE & SWAGES	SCH 160 A106-B SMLS																	12	S	S	S	S	W	W	W	R	R	R	E					
GASKETS	Class 300, 4.45mm THK.SPIRAL WOUND 304SS RING 304 SS WINDING, FLEXIBLE GRAPHITE, ASME B16.20																	10	S	S	S	S	W	W	R	R	R	E						
BOLTING	STUDS : ASTM A193 Gr. B7, Hot Dip Galvanized plated NUTS : ASTM A194 Gr. 2H, Heavy Hex, Hot Dip Galvanized plated																	8	S	S	S	S	W	W	R	R	E							
SPEC. PLATE / BLANK & SPACER				SPEC. PLATE ASTM A516 Gr. 60, ASME B16.48				BLANK & SPACER ASTM A516 Gr. 60, ASME B16.48						6	S	S		S	S	W	R	R	E											
VALVES	GATE	VG-101-B1			VG-211-B1											4	S	S	S	S	R	R	E											
	GLOBE	VGL-101-B1			VGL-211-B1											3	S	S	S	S	R	E												
	CHECK	VC-101-B1			VC-211-B1, VC-217-B1											2	S	R	R	R	E													
	BALL	≤350 °F VB-106-B1 >350 °F VB-108-B1			≤350 °F VB-211-B1 >350 °F VB-219-B1											1-1/2	R	R	R	E														
FOR SPEC. NOTES SEE SHEET 40 OF 72																	LEGEND: R Reducing Tee S Sockolet E Equal Tee W Weldolet																	
SERVICE: FUEL OIL, HOT OIL, STABILIZED CONDENSATE GLYCOL, TREATED GAS (SALES GAS, LPG)					HYDROTEST LIMITED BY : BARG. 62				FLANGES PSIG.900				DESIGN CONDITIONS										STUD BOLTS											
																	TEMP °F	PRESS psig					NOMINAL PIPE SIZE	DIA. .in. & LENGTH, mm		NO. OF BOLTS								
																	-20 TO 100	740					1/2"	1/2 x 70		4								
																	200	675					3/4"	5/8 x 80		4								
																	300	655					1"	5/8 x 80		4								
																	400	635					1-1/2"	3/4 x 100		4								
																	500	600					2"	5/8 x 100		8								
																	600	550					3"	3/4 x 110		8								
																	650	535					4"	3/4 x 120		8								
																	700	535					6"	3/4 x 130		12								
																	°C	barg					8"	7/8 x 140		12								
																	-29 TO 38	51.03					10"	1 x 160		16								
																	93	46.55					12"	1 1/8 x 180		16								
																	149	45.17					14"	1 1/8 x 180		20								
																	204	43.79					16"	1 1/4 x 190		20								
																	260	41.38					18"	1 1/4 x 200		24								
DESCRIPTION		DRN	DESCRIPTION		DRN	DESCRIPTI		DRN	316		37.93					20"		1 1/4 x 210			24													
02 FOR DESIGN		CHK			CHK	ON		CHK	343		36.90					24"		1 1/2 x 300			24													
		APP			APP			APP	371		36.90																							
				DRAWN	CHECKE	APPROVED	CLIENT: Oil & Gas Development Company Ltd.				MATERIAL :CARBON STEEL					RATING : 300 #																		
				NAME			PROJECT:				CORR. ALLOWANCE : 1.6mm					SPEC. B1 REV. 02																		
				PIPING MATERIAL SPECIFICATION			JOB NO.:				PIPE WALL TOLERANCE : ±12.5%																							
											DESIGN CODE : ASMEB.31.3																							











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NOMINAL PIPE SIZE	1/2"	3/4"	1"	1-1/2"	2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	90° BRANCH CONNECTIONS																														
MIN. WALL THK	SCH 160						SCH 80												NOMINAL BRANCH SIZE ( in. )																												
PIPE	CARBON STEEL, ASTM A106 Gr. B, SMLS ASME B36.10M																																														
FLANGES	SW / Plain Ends												BW Beveled Ends																																		
FITTINGS	ASME B16.5 Class 600 Raised Face, ASTM A 105												ASME B16.9, Beveled Ends, Wall Thk. to Match Pipe																																		
UNIONS	ASME B16.11, Class 6000, S.W.												ASME B16.11, Class 6000, S.W.																																		
PLUG	Square Head 6000# ASTM A105												Square Head 6000# ASTM A105																																		
VENTS / DRAINS	1/2"	3/4"			3/4" / 1"			3/4" / 1 1/2"			Use 'in spec.' branch connection with 4" long Nipple and Ball valve and Globe valve with Thread Cap																																				
THR'D NIPPLE & SWAGES	SCH 160 A106-B SMLS												SCH 160 A106-B SMLS MSS-SP-95																																		
GASKETS	Class 600, 4.45mm THK.SPIRAL WOUND 304SS RING 304 SS WINDING, FLEXIBLE GRAPHITE, ASME B16.20																																														
BOLTING	STUDS : ASTM A193 Gr. B7, Hot Dip Galvanized plated NUTS : ASTM A194 Gr. 2H, Heavy Hex, Hot Dip Galvanized plated																																														
SPEC. PLATE / BLANK & SPACER	SPEC. PLATE						SPEC. PLATE						BLANK & SPACER																																		
VALVES	GATE						GLOBE						CHECK						BALL																												
	VG-121-D1						VGL-121-D1						VC-121-D1						≤350 °F VB-121-D1 >350 °F VB-125-D1																												
	VG-221-D1						VGL-221-D1						VC-221-D1						≤350 °F VB-221-D1 >350 °F VB-229-D1																												
FOR SPEC. NOTES SEE SHEET 40 OF 72																																															
SERVICE: FUEL OIL, HOT OIL, STABILIZED CONDENSATE												GLYCOL, TREATED GAS (SALES GAS, LPG)												HYDROTEST LIMITED BY :		FLANGES		DESIGN CONDITIONS		STUD BOLTS																	
																								BARG. 138.6		PSIG.2010		TEMP °F		PRESS psig		NOMINAL PIPE SIZE		DIA. .in. & LENGTH, mm		NO. OF BOLTS											
																												-20 TO 100		1480		1/2"		1 1/2 x 80		4											
																												200		1350		3/4"		5/8 x 90		4											
																												300		1315		1"		5/8 x 90		4											
																												400		1270		1-1/2"		3/4 x 110		4											
																												500		1200		2"		5/8 x 110		8											
																												600		1095		3"		3/4 x 130		8											
																												650		1075		4"		7/8x 150		8											
																												700		1065		6"		1 x 170		12											
																												°C		barg		8"		1 1/8 x 200		12											
																												-29 TO 38		102.07		10"		1 1/4 x 260		16											
																												93		93.10		12"		1 1/4 x 260		20											
																												149		90.69		14"		1 3/8 x 270		20											
																												204		87.59		16"		1 1/2 x 300		20											
																												260		82.76		18"		1 5/8 x 320		20											
																												316		75.52		20"		1 5/8 x 340		24											
																												343		74.14		24"		1 7/8 x 380		24											
																												371		73.45																	
DESCRIPTION												DRN						CHECKE						APPROVED						CLIENT: Oil & Gas Development Company Ltd.						MATERIAL :CARBON STEEL						RATING : 600 #					
02 FOR DESIGN												CHK						APP						PROJECT:						CORR. ALLOWANCE : 1.6mm						SPEC. D1 REV. 02											
												DRAWN						CHECKE						APPROVED						JOB NO.:						PIPE WALL TOLERANCE : ±12.5%											
												PIPING MATERIAL SPECIFICATION																		DESIGN CODE : ASMEB.31.3																	

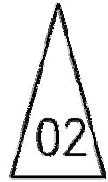












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NOMINAL PIPE SIZE	1/2"	3/4"	1"	1-1/2"	2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	90° BRANCH CONNECTIONS																																																																																																																																																																																																																																																																																																																
MIN. WALL THK	XXS			SCH 160			SCH 120	SCH 100	SCH 40								NOMINAL BRANCH SIZE ( in. )																																																																																																																																																																																																																																																																																																																
PIPE	CARBON STEEL, ASTM A106 Gr. B, SMLS ASME B36.10M																<table border="1"> <tr> <th>NOMINAL RUN PIPE SIZE ( in. )</th> <th>1/2</th> <th>3/4</th> <th>1</th> <th>1-1/2</th> <th>2</th> <th>3</th> <th>4</th> <th>6</th> <th>8</th> <th>10</th> <th>12</th> <th>14</th> <th>16</th> <th>18</th> <th>20</th> <th>24</th> </tr> <tr> <td>24</td> <td>S</td> <td>S</td> <td>S</td> <td>S</td> <td>W</td> <td>W</td> <td>W</td> <td>W</td> <td>W</td> <td>W</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>E</td> </tr> <tr> <td>20</td> <td>S</td> <td>S</td> <td>S</td> <td>S</td> <td>W</td> <td>W</td> <td>W</td> <td>W</td> <td>W</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>E</td> <td></td> </tr> <tr> <td>18</td> <td>S</td> <td>S</td> <td>S</td> <td>S</td> <td>W</td> <td>W</td> <td>W</td> <td>W</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>E</td> <td></td> <td></td> </tr> <tr> <td>16</td> <td>S</td> <td>S</td> <td>S</td> <td>S</td> <td>W</td> <td>W</td> <td>W</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>E</td> <td></td> <td></td> <td></td> </tr> <tr> <td>14</td> <td>S</td> <td>S</td> <td>S</td> <td>S</td> <td>W</td> <td>W</td> <td>W</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>E</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>12</td> <td>S</td> <td>S</td> <td>S</td> <td>S</td> <td>W</td> <td>W</td> <td>W</td> <td>R</td> <td>R</td> <td>R</td> <td>E</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>10</td> <td>S</td> <td>S</td> <td>S</td> <td>S</td> <td>W</td> <td>W</td> <td>R</td> <td>R</td> <td>R</td> <td>E</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>8</td> <td>S</td> <td>S</td> <td>S</td> <td>S</td> <td>W</td> <td>W</td> <td>R</td> <td>R</td> <td>E</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>6</td> <td>S</td> <td>S</td> <td>S</td> <td>S</td> <td>W</td> <td>R</td> <td>R</td> <td>E</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>4</td> <td>S</td> <td>S</td> <td>S</td> <td>S</td> <td>R</td> <td>R</td> <td>E</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>3</td> <td>S</td> <td>S</td> <td>S</td> <td>S</td> <td>R</td> <td>E</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>S</td> <td>R</td> <td>R</td> <td>R</td> <td>E</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>1-1/2</td> <td>R</td> <td>R</td> <td>R</td> <td>E</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>1</td> <td>R</td> <td>R</td> <td>E</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>3/4</td> <td>R</td> <td>E</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>1/2</td> <td>E</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>																NOMINAL RUN PIPE SIZE ( in. )	1/2	3/4	1	1-1/2	2	3	4	6	8	10	12	14	16	18	20	24	24	S	S	S	S	W	W	W	W	W	W	R	R	R	R	R	E	20	S	S	S	S	W	W	W	W	W	R	R	R	R	R	E		18	S	S	S	S	W	W	W	W	R	R	R	R	R	E			16	S	S	S	S	W	W	W	R	R	R	R	R	E				14	S	S	S	S	W	W	W	R	R	R	R	E					12	S	S	S	S	W	W	W	R	R	R	E						10	S	S	S	S	W	W	R	R	R	E							8	S	S	S	S	W	W	R	R	E								6	S	S	S	S	W	R	R	E									4	S	S	S	S	R	R	E										3	S	S	S	S	R	E											2	S	R	R	R	E												1-1/2	R	R	R	E													1	R	R	E														3/4	R	E															1/2	E															
NOMINAL RUN PIPE SIZE ( in. )	1/2	3/4	1	1-1/2	2	3	4	6	8	10	12	14	16	18	20	24																																																																																																																																																																																																																																																																																																																	
24	S	S	S	S	W	W	W	W	W	W	R	R	R	R	R	E																																																																																																																																																																																																																																																																																																																	
20	S	S	S	S	W	W	W	W	W	R	R	R	R	R	E																																																																																																																																																																																																																																																																																																																		
18	S	S	S	S	W	W	W	W	R	R	R	R	R	E																																																																																																																																																																																																																																																																																																																			
16	S	S	S	S	W	W	W	R	R	R	R	R	E																																																																																																																																																																																																																																																																																																																				
14	S	S	S	S	W	W	W	R	R	R	R	E																																																																																																																																																																																																																																																																																																																					
12	S	S	S	S	W	W	W	R	R	R	E																																																																																																																																																																																																																																																																																																																						
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3	S	S	S	S	R	E																																																																																																																																																																																																																																																																																																																											
2	S	R	R	R	E																																																																																																																																																																																																																																																																																																																												
1-1/2	R	R	R	E																																																																																																																																																																																																																																																																																																																													
1	R	R	E																																																																																																																																																																																																																																																																																																																														
3/4	R	E																																																																																																																																																																																																																																																																																																																															
1/2	E																																																																																																																																																																																																																																																																																																																																
FLANGES	ASME B16.5 Class 600 Raised Face, ASTM A 105																																																																																																																																																																																																																																																																																																																																
FITTINGS	ASME B16.11 S.W. Class 6000, ASTM A-105,								ASME B16.9, Beveled Ends, Wall Thk. to Match Pipe SMLS, ASTM A234 Gr. WPB,																																																																																																																																																																																																																																																																																																																								
UNIONS	ASME B16.11, Class 6000, S.W. Ground Joint, ASTM A 105																																																																																																																																																																																																																																																																																																																																
PLUG	Square Head 6000# ASTM A105 ASME B16.11																																																																																																																																																																																																																																																																																																																																
VENTS / DRAINS	1/2"	3/4"			3/4" / 1"			3/4" / 1 1/2"			Use 'in spec.' branch connection with 4" long Nipple and Ball valve and Globe valve with Thread Cap																																																																																																																																																																																																																																																																																																																						
THR'D NIPPLE & SWAGES	SCH XXS A106-B SMLS								SCH XXS A106-B SMLS MSS-SP-95																																																																																																																																																																																																																																																																																																																								
GASKETS	Class 600, 4.45mm THK.SPIRAL WOUND 304SS RING 304 SS WINDING, FLEXIBLE GRAPHITE, ASME B16.20																																																																																																																																																																																																																																																																																																																																
BOLTING	STUDS : ASTM A193 Gr. B7, Hot Dip Galvanized plated NUTS : ASTM A194 Gr. 2H, Heavy Hex, Hot Dip Galvanized plated																																																																																																																																																																																																																																																																																																																																
SPEC. PLATE / BLANK & SPACER					SPEC. PLATE ASTM A516 Gr. 60, ASME B16.48				BLANK & SPACER ASTM A516 Gr. 60, ASME B16.48																																																																																																																																																																																																																																																																																																																								
VALVES	GATE	VG-121-D9			VG-222-D9																																																																																																																																																																																																																																																																																																																												
	GLOBE	VGL-121-D9			VGL-222-D9																																																																																																																																																																																																																																																																																																																												
	CHECK	VC-121-D9			VC-222-D9																																																																																																																																																																																																																																																																																																																												
	BALL	≤350 °F VB-121-D9>350 °F VB-125-D9			≤350 °F VB-222-D9 >350 °F VB-229-D9																																																																																																																																																																																																																																																																																																																												
FOR SPEC. NOTES SEE SHEET 40 OF 72																																																																																																																																																																																																																																																																																																																																	
SERVICE: RAW GAS, FUEL GAS, OPEN DRAIN / VENTS, CLOSED DRAIN								HYDROTEST LIMITED BY :		FLANGES		DESIGN CONDITIONS				STUD BOLTS																																																																																																																																																																																																																																																																																																																	
								BARG.	138.6	PSIG.	2010	TEMP °F	PRESS psig	NOMINAL PIPE SIZE	DIA. .in. & LENGTH, mm	NO. OF BOLTS																																																																																																																																																																																																																																																																																																																	
												-20 TO 100	1480	1/2"	1/2 x 80	4																																																																																																																																																																																																																																																																																																																	
												200	1350	3/4"	5/8 x 90	4																																																																																																																																																																																																																																																																																																																	
												300	1315	1"	5/8 x 90	4																																																																																																																																																																																																																																																																																																																	
												400	1270	1-1/2"	3/4 x 110	4																																																																																																																																																																																																																																																																																																																	
												500	1200	2"	5/8 x 110	8																																																																																																																																																																																																																																																																																																																	
												600	1095	3"	3/4 x 130	8																																																																																																																																																																																																																																																																																																																	
												650	1075	4"	7/8 x 150	8																																																																																																																																																																																																																																																																																																																	
												700	1065	6"	1 x 170	12																																																																																																																																																																																																																																																																																																																	
												°C	barg	8"	1 1/8 x 200	12																																																																																																																																																																																																																																																																																																																	
												-29 TO 38	102.07	10"	1 1/4 x 260	16																																																																																																																																																																																																																																																																																																																	
												93	93.10	12"	1 1/4 x 260	20																																																																																																																																																																																																																																																																																																																	
												149	90.69	14"	1 3/8 x 270	20																																																																																																																																																																																																																																																																																																																	
												204	87.59	16"	1 1/2 x 300	20																																																																																																																																																																																																																																																																																																																	
												260	82.76	18"	1 5/8 x 320	20																																																																																																																																																																																																																																																																																																																	
DESCRIPTION		DRN	DESCRIPTION		DRN	DESCRIPTION		DRN	316	75.52		20"		1 5/8 x 340		24																																																																																																																																																																																																																																																																																																																	
02 FOR DESIGN		CHK			CHK			CHK	343	74.14		24"		1 7/8 x 380		24																																																																																																																																																																																																																																																																																																																	
		APP			APP			APP	371	73.45																																																																																																																																																																																																																																																																																																																							
			DRAWN	CHECKED	APPROVED	CLIENT: Oil & Gas Development Company Ltd.				MATERIAL : CARBON STEEL				RATING :600 #																																																																																																																																																																																																																																																																																																																			
			NAME			PROJECT:				CORR. ALLOWANCE : 4.5mm				SPEC. D9 REV. 02																																																																																																																																																																																																																																																																																																																			
			PIPING MATERIAL SPECIFICATION			JOB NO.:				PIPE WALL TOLERANCE : ±12.5%																																																																																																																																																																																																																																																																																																																							
										DESIGN CODE : ASME B.31.3																																																																																																																																																																																																																																																																																																																							







NASHPA Gas Processing and LPG Recovery Plant PROC-FC-CB/NASHPA/PROJ-1247 /2015	
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DESCRIPTION	Piping Material Specification
REVISION	02
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NOMINAL PIPE SIZE	1/2"	3/4"	1"	1-1/2"	2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	90° BRANCH CONNECTIONS																
MIN. WALL THK	SCH 160								SCH 120								NOMINAL BRANCH SIZE ( in. )																
PIPE	ASTM A - 333 GR. 6 SMLS, ASME B36.10M																NOMINAL RUN PIPE SIZE ( in. )	1/2	3/4	1	1-1/2	2	3	4	6	8	10	12	14	16	18	20	24
	SW / Plain Ends								BW Beveled Ends									S	S	S	S	W	W	W	W	W	W	R	R	R	R	R	E
FLANGES	ASME B16.5 Class 900 RTJ ASTM A 350 LF2																20	S	S	S	S	W	W	W	W	W	R	R	R	R	R	E	
	Socket Weld								Weld Neck, Bore to Match Pipe I.D								18	S	S	S	S	W	W	W	W	R	R	R	R	R	E		
FITTINGS	ASME B16.11 S.W								ASME B16.9, BW ,WALL THICKNESS TO MATCH PIPE								16	S	S	S	S	W	W	W	R	R	R	R	R	E			
	Class 6000,ASTM A350 LF2,								SMLS, ASTM A 420 WPL6 PER								14	S	S	S	S	W	W	W	R	R	R	R	R	E			
UNIONS	ASME B16.11, Class 6000, S.W.								Use Flange Connection								12	S	S	S	S	W	W	W	R	R	R	R	E				
	Ground Joint, ASTM A 350 LF2																10	S	S	S	S	W	W	R	R	R	E						
PLUG	Square Head 6000# ASTM A350 LF2																8	S	S	S	S	W	W	R	R	E							
	ASME B16.11																6	S	S	S	S	W	R	R	E								
VENTS / DRAINS	1/2"	3/4"				3/4" / 1"				3/4" / 1 1/2"				4	S	S	S	S	R	R	E	LEGEND:											
	Use 'in spec.' branch connection with 4" long Nipple and Ball valve and Globe valve with Thread Cap																3	S	S	S	S	R	E	R Reducing Tee									
THR'D NIPPLE & SWAGES	SCH.160 A 333 GR.6																2	S	R	R	R	E	S Sockolet										
	SCH 160 A 333 GR.6 MSS-SP-95																1-1/2	R	R	R	E	E Equal Tee											
GASKETS	OVAL RING, SOFT IRON, MAX BHN 90 ASME B16.20																1	R	R	E	W Weldolet												
																	3/4	R	E														
BOLTING	STUDS : ASTM A320 Gr. L7, Hot Dip Galvanized plated																1/2	E															
	NUTS : ASTM A194 Gr. 7, Heavy Hex, Hot Dip Galvanized plated																																
SPEC. PLATE / BLANK & SPACER									SPEC. PLATE				BLANK & SPACER																				
									ASTM A516 Gr. 60, ASME B16.48				ASTM A516 Gr. 60, ASME B16.48																				
VALVES	GATE	VG-124-E3				VG-234-E3																											
	GLOBE	VGL-124-E3				VGL-235-E3																											
	CHECK	VC-124-E3				VC-237-E3																											
	BALL	VB-127-E3				VB-23A-E3																											
FOR SPEC. NOTES SEE SHEET 40 OF 72																																	
SERVICE: FLARE / VENT, PROCESS GAS, GLYCOL (COLD SERVICE), PROCESS LIQUID	HYDROTEST LIMITED BY :								FLANGES																								
	BARG. 163.5								PSIG.2370																								
TEMP °F																	DESIGN CONDITIONS						STUD BOLTS										
-50 TO 100																	PRESS			NOMINAL PIPE SIZE			DIA. ,in. & LENGTH, mm			NO. OF BOLTS							
200																	2220			1/2"			3/4 x 110			4							
300																	2025			3/4"			3/4 x 120			4							
400																	1900			1-1/2"			1 x 140			4							
500																	1795			2"			7/8 x 150			8							
600																	1640			3"			7/8 x 150			8							
650																	1610			4"			1 1/8 x 180			8							
																				6"			1 1/8 x 200			8							
°C																	barg			8"			1 3/8 x 220			12							
-45 TO 38																	153.10			10"			1 3/8 x 240			12							
93																	139.66			12"			1 3/8 x 260			16							
149																	135.86			14"			1 1/2 x 280			20							
204																	131.03			16"			1 5/8 x 290			20							
260																	123.79			18"			1 7/8 x 330			20							
DESCRIPTION	DRN	CHK	APP	DESCRIPTION	DRN	CHK	APP	DESCRIPTION	DRN	CHK	APP	316		113.10		20"		2 x 360		20													
												343		111.03		24"		2 1/2 x 450		20													
				DRAWN	CHECKED	APPROVED	CLIENT: Oil & Gas Development Company Ltd.				MATERIAL : LOW TEMP CARBON STEEL				RATING : 900 #																		
				NAME			PROJECT:				CORR. ALLOWANCE : 3.0mm				SPEC. E3 REV. 02																		
				PIPING MATERIAL SPECIFICATION				JOB NO.:				PIPE WALL TOLERANCE : ±12.5%																					
												DESIGN CODE : ASME B.31.3																					



NASHPA Gas Processing and LPG Recovery Plant  
PROC-FC-CB/NASHPA/PROJ-1247 /2015

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NOMINAL PIPE SIZE	1/2"	3/4"	1"	1-1/2"	2"	3"	4"	6"	8"	10"	12"	14"	16"	90° BRANCH CONNECTIONS																								
MIN. WALL THK	SCH 160							SCH 120							NOMINAL BRANCH SIZE ( in. )																							
PIPE	ASTM A 312 TP 304 SMLS, ASME B36.10M													1/2	3/4	1	1-1/2	2	3	4	6	8	10	12	14	16	18	20	24									
FLANGES	SW / Plain Ends							BW Beveled Ends							24	20	18	16	14	12	10	8	6	4	3	2	W	W	W	W	W	W	R	R	R	R	R	E
FITTINGS	ASME B16.11 S.W							ASME B16.9, Beveled Ends, Wall Thk. to Match Pipe SMLS, ASTM A 403							20	18	16	14	12	10	8	6	4	3	2	W	W	W	W	W	W	R	R	R	R	R	E	
UNIONS	ASME B16.11, Class 6000, S.W.							ASME B16.9, Beveled Ends, Wall Thk. to Match Pipe SMLS, ASTM A 403							18	16	14	12	10	8	6	4	3	2	W	W	W	W	W	W	R	R	R	R	R	E		
PLUG	Square Head 6000#							ASME B16.9, Beveled Ends, Wall Thk. to Match Pipe SMLS, ASTM A 403							16	14	12	10	8	6	4	3	2	W	W	W	W	W	W	R	R	R	R	R	E			
VENTS / DRAINS	1/2"			3/4"											14	12	10	8	6	4	3	2	W	W	W	W	W	W	R	R	R	R	R	E				
THR'D NIPPLE & SWAGES	SCH 160 A 312 TP304 SMLS														12	10	8	6	4	3	2	W	W	W	W	W	W	R	R	R	R	R	E					
GASKETS	OVAL RING, SOFT IRON, MAX BHN 90 ASME B16.20													10	8	6	4	3	2	W	W	W	W	W	W	R	R	R	R	R	E							
BOLTING	STUDS : ASTM A320 Gr. B8													8	6	4	3	2	W	W	W	W	W	W	R	R	R	R	R	E								
SPEC. PLATE / BLANK & SPACER								SPEC. PLATE ASTM A-240 Gr. 304, ASME B16.48							6	4	3	2	W	W	W	W	W	W	R	R	R	R	R	E								
VALVES	GATE	VG-123-E6					VG-233-E6					4	3	2	W	W	W	W	W	W	W	R	R	R	R	R	E											
	GLOBE	VGL-125-E6					VGL-236-E6					3	2	W	W	W	W	W	W	W	R	R	R	R	R	E												
	CHECK	VC-123-E6					VC-235-E6					2	W	W	W	W	W	W	W	R	R	R	R	R	E													
	BALL	VB-131-E6					VB-236-E6					1-1/2	1	W	W	W	W	W	W	R	R	R	R	R	E													
FOR SPEC. NOTES SEE SHEET 40 OF 72													LEGEND: R Reducing Tee S Sockolet E Equal Tee W Weldolet																									
SERVICE: LIQUIFIED GAS UNDER - 100 C													Note : Reducing fittings thickness shall match heavier pipe thickness																									
HYDROTEST LIMITED BY :													DESIGN CONDITIONS																									
BARG. 163.5													PRESS																									
FLANGES													NOMINAL																									
PSIG.2370													PIPE SIZE																									
													DIA. ,in. & NO. OF																									
													LENGTH, mm BOLTS																									
													-150 TO 100																									
													200																									
													300																									
													400																									
													500																									
													600																									
													650																									
													700																									
													°C																									
													-101 TO 38																									
													93																									
													149																									
													204																									
													260																									
													316																									
													343																									
													371																									
DESCRIPTION			DRN			DESCRIPTION			DRN			DESCRIPTION			DRN			MATERIAL :			RATING : 900 #																	
02 FOR DESIGN			CHK						CHK						CORR. ALLOWANCE : NIL			SPEC. E6 REV.02																				
			APP						APP						PIPE WALL TOLERANCE : ±12.5%																							
						DRAWN			CHECKED			APPROVED			DESIGN CODE : ASME B.31.3																							
						NAME						CLIENT: Oil & Gas Development Company Ltd.																										
						PIPING MATERIAL SPECIFICATION						PROJECT:																										
												JOB NO.:																										





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**GENERAL NOTES:**

- 1: ALL PIPING SHALL BE DESIGNED AND INSTALLED IN CONFORMANCE WITH ANSI B 31.3 UNLESS MODIFIED BY THE JOB SPECIFICATION.
- 2: INSERTED PIPING BRANCHES WITH REINFORCING PADS MAY NOT BE USED.
- 3: THE ANGLE BETWEEN ANY BRANCH AND HEADER SHALL NOT BE USED.
- 4: ALL INSTRUMENT AIR, STEAM AND FUEL GAS CONNECTIONS SHALL BE MADE FROM THE TOP OF THE HEADER.
- 5: HIGH POINT VENTS AND LOW POINT DRAINS SHALL BE PROVIDED TO FACILITATE HYDROSTATIC TESTING.
- 6: CERTAIN DRAINS AND VENTS SHALL BE EQUIPPED WITH PERMANENT VALVES AS DETERMINED BY ISSUER DURING FABRICATION. THE MINIMUM SIZE CONNECTION SHALL BE 1/2" NPS.
- 7: ALL BRANCH CONNECTIONS SHALL BE JOINED TO HEADER WITH FULL PENETRATION WELDS.
- 8: ALL PIPING COMPONENTS REQUIRING SERVICE SHALL BE LOCATED WHERE THEY CAN BE ACCESSED CONVENIENTLY.
- 9: PIPING ARRANGEMENTS AROUND EQUIPMENT SHALL PROVIDE FOR MAINTENANCE AND SERVICE OF THE EQUIPMENT WITH A MINIMUM DISMANTLING OF PIPING SYSTEMS.
- 10: PIPING, PIPE SUPPORTS, VALVES, VALVE HANDLES AND VALVE OPERATORS SHALL BE LOCATED SAFELY TO PREVENT STUMBLING OR STRIKING HAZARDS TO OPERATING PERSONNEL.
- 11: ALL PIPING SHALL BE ARRANGED IN AS NEAT AND SIMPLE A MANNER AS POSSIBLE. IN GENERAL, PROCESS PIPING SHOULD BE ARRANGED ON OVERHEAD RACKS.
- 12: PIPING HEADER SHOULD TERMINATE WITH FLANGES. FUTURE EXPANSION SHOULD BE CONSIDERED FOR ALL PIPING SYSTEMS.
- 13: PIPEWAYS SHALL BE DESIGNED WITH A MINIMUM OF 20% MORE PIPE SPACE THAN IS REQUIRED FOR INITIAL INSTALLATION, UNLESS OTHERWISE SPECIFIED IN THE JOB SPECIFICATION.
- 14: HOT AND COLD PIPING SHALL BE GROUPED WITH THE HOTTEST PIPING ON THE OUTSIDE. HEAVIER LINES SHALL BE LOCATED ON THE OUTSIDE OF PIPE RACKS AS CLOSE TO THE COLUMN AS PRACTICAL.
- 15: PIPING SHALL BE INSTALLED WITH SUPPORTS. PULSATION DAMPERS AND OTHER NECESSARY DEVICES AS REQUIRED TO PREVENT EXCESSIVE EQUIPMENT AND PIPING VIBRATION. EXCESSIVE VIBRATIONS ARE THOSE WHICH WOULD CAUSE DAMAGE TO THE EQUIPMENT. THE JOB SPECIFICATION WILL INDICATE THE ALLOWABLE VIBRATION LEVELS BASED ON THE ASSOCIATED EQUIPMENT. IN GENERAL, THE ALLOWABLE VIBRATION PEAK VELOCITY WILL BE TWICE THAT ALLOWED FOR THE INDICATED EQUIPMENT. IN LIEU OF ANY OTHER INFORMATION, THE MAXIMUM ALLOWABLE PEAK VELOCITY IN ANY PART OF THE PART OF THE PIPING SYSTEM SHALL BE 15 MM/S(0.6"/SEC.)
- 16: PIPING SHALL BE DESIGNED SO THAT PROCESS EQUIPMENT CONNECTIONS CAN BE ISOLATED FOR SAFE MAINTENANCE. THIS MAY BE ACCOMPLISHED BY PROVIDING FOR THE INSERTION OF BLANKS (BLINDS) OR SPECTACLE BLINDS AT STRATEGIC POINTS. THE BLINDS SHALL BE INSTALLED SO THAT INSERTION OR OPERATION CAN BE MADE FROM PERMANENT PLATFORMS WALKWAYS OR GRADE.
- 17: IF BLINDS ARE NOT PROVIDED IN THE DESIGN, THE PIPING ARRANGEMENT SHALL PROVIDE ISOLATION BY VALVE REMOVAL OR REMOVAL OF OTHER COMPONENTS TO ACCOMPLISH SAFE ISOLATION.
- 18: PIPING DESIGN SHALL PROVIDE ADEQUATE APACE TO ALLOW LINE-UP CLAMPS TO BE USED ON FIELD WELDS IF PRACTICAL.
- 19: PIPING SHALL BE ADEQUATELY SUPPORTED FOR THE DEAD WEIGHT OF PIPE. FILLED WITH WATER, INCLUDING ATTACHED UNSUPPORTED COMPONENTS, INSULATION AND OTHER EXTERNAL SUSTAINED LOADINGS. ANALYSIS OF SUPPORTS FOR PERIODIC LOADINGS SHALL BE IN ACCORDANCE WITH ASME B31.3.
- 20: THE MINIMUM SPACING FOR STANCHION SHALL BE SUCH THAT THE STRESS DEVELOPED BY THE PIPING SHALL BE LESS THAN THE ALLOWABLE STRESS FOR SUSTAINED LOADS PER ANSI B31.3 AND IN NO CASE SHALL THE DEFLECTION EXCEED 25 mm (1 INCH).
- 21: PIPING PASSING THROUGH FIREWALLS SHALL BE SEALED WITH A FIRE RETARDING SEAL.
- 23: CARBON STEEL AND LOW-ALLOY CARBON STEEL COMPONENTS SHALL HAVE A MAXIMUM HARDNESS OF 235 BHN (HRC 22), SHALL NOT HAVE MORE THAN 1.0% NICKEL CONTENT AND SHALL NOT INCLUDE HARDENEABLE STEEL SUCH AS AISI – 4140
- 24: ALL WELDS MUST BE STRESS RELIEVED SO THAT WELD METAL, HEAT AFFECTED ZONE AND BASE METAL HAVE HARDNESS LESS THAN HRC 22



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- 25: USE PTFE FILLED GASKETS WHERE LINE DESIGN TEMPERATURE FOR CONTINUOUS SERVICE IS BELOW -50°F (-46°C)
- 26: THE MATERIAL SHALL BE IMPACT TESTED FOR SERVICES LESS THAN -20 oF(-29 °C).
- 27: IN SPEC. E8, THICKNESS ARE BASED ON DESIGN PRESSURE OF 1580psig FOR FLOW LINES.
- 28: IN SPEC. D8, THICKNESS ARE BASED ON DESIGN PRESSURE OF 1340psig FOR FLOW LINES.
- 29: FOR PRESSURE GAUGE, PIPING VALVE USE 3/4" FLANGE TYPE GATE VALVE, TAG NUMBER : PD/PDT-A1, PD/PDT-A2 and PD/PDT-A3 etc.





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## 1.0 GATE VALVE

### 1.1 VG-101 (A1, A2, A8, B1, B2)

Gate valve with stem protector.

Rating: Class 800

Ends: Socket weld

Style: OS&Y, bolted bonnet, bolted gland, solid wedge, replaceable seats.

Operator: Handwheel

Materials:

Body: ASTM A105N

Bolting: Hot Dip Galvanized plated

Stem: Type 316 S.S.

Packing: Mfr. Std.

Seats: Hard Faced Type 316 S.S.

Design and Test: ISO 15761

### 1.2 VG-102(A4)

Gate valve with stem protector.

Rating: Class 800

Ends: Threaded

Style: OS&Y, bolted bonnet, bolted gland, solid wedge, replaceable seats.

Operator: Handwheel

Materials:

Body: ASTM A105N

Bolting: Hot Dip Galvanized plated

Stem: 13% Cr. S.S.

Packing: Mfr. Std.

Seats: Hard Faced 13% Cr. S.S.

Design and Test: ISO 15761

### 1.3 VG-103(A6, B6)

Gate valve with stem protector.

Rating: Class 800

Ends: Socket Weld

Style: OS&Y, bolted bonnet, bolted gland, solid wedge, replaceable seats.

Operator: Handwheel

Materials:

Body: Type 316 S.S.

Stem: Type 316 S.S.

Packing: Mfr. Std.

Seats: Hard Faced Type 316 S.S.

Design and Test: ISO 15761

### 1.4 VG-104 (A3, B3)

Gate valve with stem protector.

Rating: Class 800

Ends: Socket weld

Style: OS&Y, bolted bonnet, bolted gland, solid wedge, replaceable seats.

Operator: Handwheel

Materials:

Body: ASTM A350 LF2

Bolting: Hot Dip Galvanized plated



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Stem: Type 316 S.S. Packing: Mfr. Std.

Seats: Hard Faced Type 316 S.S.

Design and Test: ISO 15761

1.5 VG-121(D1, D2, D9, E1, E2)

Gate valve with stem protector.

Rating: Class 1500

Ends: Socket weld

Style: OS&Y, bolted bonnet, bolted gland, solid wedge, replaceable seats.

Operator: Handwheel

Materials:

Body: ASTM A105N

Bolting: Hot Dip Galvanized plated

Stem: Type 316 S.S.

Packing: Mfr. Std.

Seats: Hard Faced Type 316 S.S.

Design and Test: ISO 15761

1.6 VG-123(D6, E6)

Gate valve with stem protector.

Rating: Class 1500

Ends: Socket Weld

Style: OS&Y, bolted bonnet, bolted gland, solid wedge, replaceable seats.

Operator: Handwheel

Materials:

Body: Type 316 S.S.

Stem: Type 316 S.S.

Packing: Mfr. Std.

Seats: Hard Faced Type 316 S.S.

Design and Test: ISO 15761

1.7 VG-124(D3, E3)

Gate valve with stem protector.

Rating: Class 1500

Ends: Socket weld

Style: OS&Y, bolted bonnet, bolted gland, solid wedge, replaceable seats.

Operator: Handwheel

Materials:

Body: ASTM A350 LF2

Bolting: Hot Dip Galvanized plated

Stem: Type 316 S.S.

Packing: Mfr. Std.

Seats: Hard Faced Type 316 S.S.

Design and Test: ISO 15761

1.8 VG-125(D8, E8)

Gate valve with stem protector.

Rating: Class 1500

Ends: Socket weld

Style: OS&Y, bolted bonnet, bolted gland, solid wedge, replaceable seats.

Operator: Handwheel

Materials:



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Body: ASTM A105N

Bolting: Hot Dip Galvanized plated

Stem: ASTM A 182 F6.

Packing: Mfr. Std.

Seats: A 105N + Stellite Gr.6

Dimensions: Mfr. Std.

Design and Test: ISO 15761

1.9 VG-201 (A1, A4)



Gate valve with stem protector.

Rating: Class 150

Ends: Raised face flange.

Style: OS&Y, bolted bonnet, bolted gland, 50mm Solid Wedge, 80mm to 600mm Flexible Wedge, replaceable seats.

Operator: 50mm to 350mm Handwheel, 400mm to 600mm Bevel gear

Materials:

Body: ASTM A216 Gr. WCB

Bolting: Hot Dip Galvanized plated

Stem: 13% Cr. S.S.

Packing: Mfr. Std.

Seats: Hard Faced 13% Cr. S.S.

Design and Test: API Std. 600

1.10 VG-202(A2, A8)

Gate valve with stem protector.

Rating: Class 150

Ends: Raised face flange.

Style: OS&Y, bolted bonnet, bolted gland, 50mm Solid Wedge, 80mm to 600mm Flexible Wedge, replaceable seats.

Operator: 50mm to 350mm Handwheel, 400mm to 600mm Bevel gear

Materials:

Body: ASTM A216 Gr. WCB

Bolting: Hot Dip Galvanized plated

Stem: Type 316 S.S.

Packing: Mfr. Std.

Seats: Hard Faced Type 316 S.S.

Design and Test: API Std. 600

1.11 VG-203(A6)

Gate valve with stem protector.

Rating: Class 150

Ends: Raised face flange.

Style: OS&Y, bolted bonnet, bolted gland, 50mm Solid Wedge, 80mm to 600mm Flexible Wedge, replaceable seats.

Operator: 50mm to 350mm Handwheel, 400mm to 600mm Bevel gear

Materials

Body: Type 316 S.S.

Stem: Type 316 S.S.

Packing : Mfr. Std.

Seats: Hard Faced Type 316 S.S.

Design and Test: API Std. 600

1.12 VG-204(A3)



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Gate valve with stem protector.

Rating: Class 150

Ends: Raised face flange.

Style: OS&Y, bolted bonnet, bolted gland, ~~50mm Solid Wedge, 80mm to 600mm~~ Flexible Wedge, replaceable seats.

Operator: 50mm to 350mm Handwheel, 400mm to 600mm Bevel gear

Materials:

Body: ASTM A352 Gr. LCC

Bolting: Hot Dip Galvanized plated

Stem: Type 316 S.S.

Packing: Mfr. Std.

Seats: Hard Faced Type 316 S.S.

Design and Test: API Std. 600

1.13 VG-211(B1)

Gate valve with stem protector.

Rating: Class 300

Ends: Raised face flange.

Style: OS&Y, bolted bonnet, bolted gland, ~~50mm Solid Wedge, 80mm to 600mm~~ Flexible Wedge, replaceable seats.

Operator: 50mm to 250mm Handwheel, 300mm to 600mm Bevel gear

Materials:

Body: ASTM A216 Gr. WCB

Bolting: Hot Dip Galvanized plated

Stem: 13% Cr. S.S.

Packing: Mfr. Std.

Seats: Hard Faced 13% Cr. S.S.

Design and Test: API Std. 600

1.14 VG-212(B2)

Gate valve with stem protector.

Rating: Class 300

Ends: Raised face flange.

Style: OS&Y, bolted bonnet, bolted gland, ~~50mm Solid Wedge, 80mm to 600mm~~ Flexible Wedge, replaceable seats.

Operator: 50mm to 250mm Handwheel, 300mm to 600mm Bevel gear

Materials:

Body: ASTM A216 Gr. WCB

Bolting: Hot Dip Galvanized plated

Stem: Type 316 S.S.

Packing: Mfr. Std.

Seats: Hard Faced Type 316 S.S.

Design and Test: API Std. 600

1.15 VG-213(B6)

Gate valve with stem protector.

Rating: Class 300

Ends: Raised face flange.

Style: OS&Y, bolted bonnet, bolted gland, ~~50mm Solid Wedge, 80mm to 600mm~~ Flexible Wedge), replaceable seats.

Operator: 50mm to 250mm Handwheel, 300mm to 600mm Bevel gear





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Materials:

Body: Type 316 S.S.

Stem: Type 316 S.S.

Packing: Mfr. Std.

Seats: Hard Faced Type 316 S.S.

Design and Test: API Std. 600

1.16 VG-214(B3)

Gate valve with stem protector.

Rating: Class 300

Ends: Raised face flange.

Style: OS&Y, bolted bonnet, bolted gland, 50mm Solid Wedge, 80mm to 600mm Flexible Wedge), replaceable seats.

Operator: 50mm to 250mm Handwheel, 300mm to 600mm Bevel gear

Materials:

Body: ASTM A352 Gr. LCC

Bolting: Hot Dip Galvanized plated

Stem: Type 316 S.S.

Packing: Mfr. Std.

Seats: Hard Faced Type 316 S.S.

Design and Test: API Std. 600

1.17 VG-221(D1)

Gate valve with stem protector.

Rating: Class 600

Ends: Raised face flange.

Style: OS&Y, bolted bonnet, bolted gland, 50mm Solid Wedge, 80mm to 600mm Flexible Wedge), replaceable seats.

Operator: 50mm to 150mm Handwheel, 200mm to 600mm Bevel gear

Materials:

Body: ASTM A216 Gr. WCB

Bolting: Hot Dip Galvanized plated

Stem: 13% Cr. S.S.

Packing: Mfr. Std.

Seats: Hard Faced 13% Cr. S.S.

Design and Test: API Std. 600

1.18 VG-222(D2, D9)

Gate valve with stem protector.

Rating: Class 600

Ends: Raised face flange.

Style: OS&Y, bolted bonnet, bolted gland, 50mm Solid Wedge, 80mm to 600mm Flexible Wedge), replaceable seats.

Operator: 50mm to 150mm Handwheel, 200mm to 600mm Bevel gear

Materials:

Body: ASTM A216 Gr. WCB

Bolting: Hot Dip Galvanized plated

Stem: Type 316 S.S.

Packing: Mfr. Std.

Seats: Hard Faced Type 316 S.S.

Design and Test: API Std. 600

1.19 VG-223(D6)

Gate valve with stem protector.





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Rating: Class 600  
Ends: Raised face flange.  
Style: OS&Y, bolted bonnet, bolted gland, 50mm Solid Wedge, 80mm to 600mm Flexible Wedge), replaceable seats.  
Operator: 50mm to 150mm Handwheel, 200mm to 600mm Bevel gear  
Materials  
Body: Type 316 S.S. Stem: Type 316 S.S.  
Packing: Mfr. Std. Seats: Hard Faced Type 316 S.S.

1.20 VG-224(D3)

Gate valve with stem protector.  
Rating: Class 600  
Ends: Raised face flange.  
Style: OS&Y, bolted bonnet, bolted gland, 50mm Solid Wedge, 80mm to 600mm Flexible Wedge), replaceable seats.  
Operator: 50mm to 150mm Handwheel, 200mm to 600mm Bevel gear  
Materials:  
Body: ASTM A352 Gr. LCC Bolting: Hot Dip Galvanized plated  
Stem: Type 316 S.S. Packing: Mfr. Std.  
Seats: Hard Faced Type 316 S.S.  
Design and Test: API Std. 600



1.21 VG-231(E1)

Gate valve with stem protector.  
Rating: Class 900  
Ends: RTJ.  
Style: OS&Y, bolted bonnet, bolted gland, 50mm Solid Wedge, 80mm to 600mm Flexible Wedge), replaceable seats.  
Operator: 50mm to 150mm Handwheel, 200mm to 600mm Bevel gear  
Materials:  
Body: ASTM A216 Gr. WCB Bolting: Hot Dip Galvanized plated  
Stem: 13% Cr. S.S. Packing: Mfr. Std.  
Seats: Hard Faced 13% Cr. S.S.  
Design and Test: API Std. 600

1.22 VG-232(E2)

Gate valve with stem protector.  
Rating: Class 900  
Ends: RTJ.  
Style: OS&Y, bolted bonnet, bolted gland, 50mm Solid Wedge, 80mm to 600mm Flexible Wedge), replaceable seats.  
Operator: 50mm to 150mm Handwheel, 200mm to 600mm Bevel gear  
Materials:  
Body: ASTM A216 Gr. WCB Bolting: Hot Dip Galvanized plated  
Stem: Type 316 S.S. Packing: Mfr. Std.



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Seats: Hard Faced Type 316 S.S.

Design and Test: API Std. 600

1.23 VG-233(E6)

Gate valve with stem protector.

Rating: Class 900

Ends: RTJ.

Style: OS&Y, bolted bonnet, bolted gland, 50mm Solid Wedge, 80mm to 600mm Flexible Wedge), replaceable seats.

Operator: 50mm to 150mm Handwheel, 200mm to 600mm Bevel gear

Materials:

Body: Type 316 S.S.

Stem: Type 316 S.S.

Packing: Mfr. Std.

Seats: Hard Faced Type 316 S.S.

Design and Test: API Std. 600

1.24 VG-234(E3)

Gate valve with stem protector.

Rating: Class 900

Ends: RTJ.

Style: OS&Y, bolted bonnet, bolted gland, 50mm Solid Wedge, 80mm to 600mm Flexible Wedge), replaceable seats.

Operator: 50mm to 150mm Handwheel, 200mm to 600mm Bevel gear

Body: ASTM A352 Gr. LCC

Bolting: Hot Dip Galvanized plated

Stem: Type 316 S.S.

Packing: Mfr. Std.

Seats: Hard Faced Type 316 S.S.

Design and Test: API Std. 600



## 2.0 GLOBE VALVE

2.1 VGL-101 (A1, A2, A8, B1, B2)

Globe valve with stem protector.

Rating: Class 800

Ends: Socket weld

Style: OS&Y, bolted bonnet, Rising Stem, Straight Pattern, integrated seats.

Operator: Handwheel

Materials:

Body: ASTM A105N

Bolting: Hot Dip Galvanized plated

Stem: Type 316 S.S.

Packing: Mfr. Std.

Seats: Hard Faced Type 316 S.S.

Dimensions: Mfr. Std.

Design and Test: ISO 15761

2.2 VGL-102(A4)

Globe valve with stem protector.

Rating: Class 800

Ends: Threaded





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Style: OS&Y, bolted bonnet, Rising Stem, Straight Pattern, **integrated** seats, plug type disc.

Operator: Handwheel

Materials:

Body: ASTM A105N

Stem: 13% Cr. S.S.

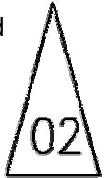
Seats: Hard Faced 13% Cr. S.S

Bolting: Hot Dip Galvanized plated

Packing: Mfr. Std.

Dimensions: Mfr. Std.

Design and Test: ISO 15761



### 2.3 VGL-103 (A3, B3)

Globe valve with stem protector.

Rating: Class 800

Ends: Socket weld

Style: OS&Y, bolted bonnet, Rising Stem, Straight Pattern, **integrated** seats.

Operator: Handwheel

Materials:

Body: ASTM A350 LF2

Stem: Type 316 S.S.

Seats: Hard Faced Type 316 S.S.

Bolting: Hot Dip Galvanized plated

Packing: Mfr. Std.

Dimensions: Mfr. Std.

Design and Test: ISO 15761

### 2.4 VGL-104 (A6, B6)

Globe valve with stem protector.

Rating: Class 800

Ends: Socket weld

Style: OS&Y, bolted bonnet, Rising Stem, Straight Pattern, **integrated** seats.

Operator: Handwheel

Materials:

Body: Type 316 S.S

Packing: Mfr. Std.

Stem: Type 316 S.S.

Seats: Hard Faced Type 316 S.S.

Dimensions: Mfr. Std.

Design and Test: ISO 15761

### 2.5 VGL-121(D1, D2, D9, E1, E2)

Globe valve with stem protector.

Rating: Class 1500

Ends: Socket weld

Style: OS&Y, bolted bonnet, Rising Stem, Straight Pattern, **integrated** seats.

Operator: Handwheel

Materials:

Body: ASTM A105N

Stem: Type 316 S.S.

Seats: Hard Faced Type 316 S.S.

Bolting: Hot Dip Galvanized plated

Packing: Mfr. Std.

Dimensions: Mfr. Std.



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- Design and Test: ISO 15761
- 2.6 VGL-123(D8, E8)
- Globe valve with stem protector.
- Rating: Class 1500
- Ends: Socket weld
- Style: OS&Y, bolted bonnet, Rising Stem, Straight Pattern, **integrated** seats, plug type disc.
- Operator: Handwheel
- Materials:
- Body: ASTM A105N Bolting: Hot Dip Galvanized plated
- Stem: ASTM A 182 F6. Packing: Mfr. Std.
- Seats: A 105N + Stellite Gr.6
- Dimensions: Mfr. Std.
- Design and Test: ISO 15761
- 2.7 VGL-124( D3, E3)
- Globe valve with stem protector.
- Rating: Class 1500
- Ends: Socket weld
- Style: OS&Y, bolted bonnet, Rising Stem, Straight Pattern, **integrated** seats.
- Operator: Handwheel
- Materials:
- Body: ASTM A350 LF2 Bolting: Hot Dip Galvanized plated
- Stem: Type 316 S.S. Packing: Mfr. Std.
- Seats: Hard Faced Type 316 S.S.
- Dimensions: Mfr. Std.
- Design and Test: ISO 15761
- 2.8 VGL-125( D6, E6)
- Globe valve with stem protector.
- Rating: Class 1500
- Ends: Socket weld
- Style: OS&Y, bolted bonnet, Rising Stem, Straight Pattern, **integrated** seats.
- Operator: Handwheel
- Materials:
- Body: Type 316 S.S. Stem: Type 316 S.S.
- Packing: Mfr. Std. Seats: Hard Faced Type 316 S.S.
- Dimensions: Mfr. Std.
- Design and Test: ISO 15761
- 2.9 VGL-201 (A1, A4)
- Globe valve with stem protector.
- Rating: Class 150
- Ends: Raised face flange.
- Style: OS&Y, bolted bonnet, Rising Stem, Straight Pattern, replaceable seats, plug type disc.





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Operator: 50mm to 200mm Handwheel, 250mm to 600mm Bevel gear

Materials:

Body: ASTM A216 Gr. WCB

Bolting: Hot Dip Galvanized plated

Stem: 13% Cr. S.S.

Packing: Mfr. Std.

Seats: Hard Faced 13% Cr. S.S.

Design and Test: ASME B16.34

2.10 VGL-202(A2, A8)

Globe valve with stem protector.

Rating: Class 150

Ends: Raised face flange.

Style: OS&Y, bolted bonnet, Rising Stem, Straight Pattern, replaceable seats.

Operator: 50mm to 200mm Handwheel, 250mm to 600mm Bevel gear

Materials:

Body: ASTM A216 Gr. WCB

Bolting: Hot Dip Galvanized plated

Stem: Type 316 S.S.

Packing: Mfr. Std.

Seats: Hard Faced Type 316 S.S.

Design and Test: ASME B16.34

2.11 VGL-204(A3)

Globe valve with stem protector.

Rating: Class 150

Ends: Raised face flange.

Style: OS&Y, bolted bonnet, Rising Stem, Straight Pattern, replaceable seats.

Operator: 50mm to 200mm Handwheel, 250mm to 600mm Bevel gear

Materials:

Body: ASTM A352 Gr. LCC

Bolting: Hot Dip Galvanized plated

Stem: Type 316 S.S.

Packing: Mfr. Std.

Seats: Hard Faced Type 316 S.S.

Design and Test: ASME B16.34

2.12 VGL-205(A6)

Globe valve with stem protector.

Rating: Class 150

Ends: Raised face flange.

Style: OS&Y, bolted bonnet, Rising Stem, Straight Pattern, replaceable seats.

Operator: 50mm to 200mm Handwheel, 250mm to 600mm Bevel gear

Materials:

Body: Type 316 S.S.

Stem: Type 316 S.S.

Packing: Mfr. Std.

Seats: Hard Faced Type 316 S.S.

Design and Test: ASME B16.34

2.13 VGL-211(B1)

Globe valve with stem protector.

Rating: Class 300

Ends: Raised face flange.



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Style: OS&Y, bolted bonnet, Rising Stem, Straight Pattern, replaceable seats, plug type disc.

Operator: 50mm to 200mm Handwheel, 250mm to 600mm Bevel gear

Materials:

Body: ASTM A216 Gr. WCB

Bolting: Hot Dip Galvanized plated

Stem: 13% Cr. S.S.

Packing: Mfr. Std.

Seats: Hard Faced 13% Cr. S.S.

Design and Test: ASME B16.34

#### 2.14 VGL-212(B2)

Globe valve with stem protector.

Rating: Class 300

Ends: Raised face flange.

Style: OS&Y, bolted bonnet, Rising Stem, Straight Pattern, replaceable seats.

Operator: 50mm to 200mm Handwheel, 250mm to 600mm Bevel gear

Materials:

Body: ASTM A216 Gr. WCB

Bolting: Hot Dip Galvanized plated

Stem: Type 316 S.S.

Packing: Mfr. Std.

Seats: Hard Faced Type 316 S.S.

Design and Test: ASME B16.34

#### 2.15 VGL-214(B3)

Globe valve with stem protector.

Rating: Class 300

Ends: Raised face flange.

Style: OS&Y, bolted bonnet, Rising Stem, Straight Pattern, replaceable seats.

Operator: 50mm to 200mm Handwheel, 250mm to 600mm Bevel gear

Materials:

Body: ASTM A352 Gr. LCC

Bolting: Hot Dip Galvanized plated

Stem: Type 316 S.S.

Packing: Mfr. Std.

Seats: Hard Faced Type 316 S.S.

Design and Test: ASME B16.34

#### 2.16 VGL-215(B6)

Globe valve with stem protector.

Rating: Class 300

Ends: Raised face flange.

Style: OS&Y, bolted bonnet, Rising Stem, Straight Pattern, replaceable seats.

Operator: 50mm to 200mm Handwheel, 250mm to 600mm Bevel gear

Materials:

Body: Type 316 S.S.

Stem: Type 316 S.S.

Packing: Mfr. Std.

Seats: Hard Faced Type 316 S.S.

Design and Test: ASME B16.34

#### 2.17 VGL-221(D1)

Globe valve with stem protector.



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Rating: Class 600  
Ends: Raised face flange.  
Style: OS&Y, bolted bonnet, Rising Stem, Straight Pattern, replaceable seats, plug type disc.  
Operator: 50mm to 150mm Handwheel, 200mm to 600mm Bevel gear  
Materials:  
Body: ASTM A216 Gr. WCB Bolting: Hot Dip Galvanized plated  
Stem: 13% Cr. S.S. Packing: Mfr. Std.  
Seats: Hard Faced 13% Cr. S.S.  
Design and Test: ASME B16.34

2.18 VGL-222(D2, D9)

Globe valve with stem protector.  
Rating: Class 600  
Ends: Raised face flange.  
Style: OS&Y, bolted bonnet, Rising Stem, Straight Pattern, replaceable seats.  
Operator: 50mm to 150mm Handwheel, 200mm to 600mm Bevel gear  
Materials:  
Body: ASTM A216 Gr. WCB Bolting: Hot Dip Galvanized plated  
Stem: Type 316 S.S. Packing: Mfr. Std.  
Seats: Hard Faced Type 316 S.S.  
Design and Test: ASME B16.34

2.19 VGL-224(D3)

Globe valve with stem protector.  
Rating: Class 600  
Ends: Raised face flange.  
Style: OS&Y, bolted bonnet, Rising Stem, Straight Pattern, replaceable seats.  
Operator: 50mm to 150mm Handwheel, 200mm to 600mm Bevel gear  
Materials:  
Body: ASTM A352 Gr. LCC Bolting: Hot Dip Galvanized plated  
Stem: Type 316 S.S. Packing: Mfr. Std.  
Seats: Hard Faced Type 316 S.S.  
Design and Test: ASME B16.34

2.20 VGL-225(D8)

Globe valve with stem protector.  
Rating: Class 600  
Ends: Raised face flange  
Style: OS&Y, bolted bonnet, Rising Stem, Straight Pattern, replaceable seats, plug type disc.  
Operator: 50mm to 100mm Handwheel, 150mm to 600mm Bevel gear  
Materials:  
Body: ASTM A 216 Gr WCB Bolting: Hot Dip Galvanized plated  
Stem: ASTM A 182 F6 Packing: Mfr. Std.  
Seats: Hard face A 105N + Stellite Gr.6



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Design and Test: ASME B16.34

2.21 VGL-226(D6)

Globe valve with stem protector.

Rating: Class 600

Ends: Raised face flange.

Style: OS&Y, bolted bonnet, Rising Stem, Straight Pattern, replaceable seats.

Operator: 50mm to 150mm Handwheel, 200mm to 600mm Bevel gear

Materials:

Body: Type 316 S.S.

Stem: Type 316 S.S.

Packing: Mfr. Std.

Seats: Hard Faced Type 316 S.S.

Design and Test: ASME B16.34

2.22 VGL-231(E1)

Globe valve with stem protector.

Rating: Class 900

Ends: RTJ

Style: OS&Y, bolted bonnet, Rising Stem, Straight Pattern, replaceable seats, plug type disc.

Operator: 50mm to 100mm Handwheel, 150mm to 600mm Bevel gear

Materials:

Body: ASTM A216 Gr. WCB

Bolting: Hot Dip Galvanized plated

Stem: 13% Cr. S.S.

Packing: Mfr. Std.

Seats: Hard Faced 13% Cr. S.S.

Design and Test: ASME B16.34

2.23 VGL-232(E2)

Globe valve with stem protector.

Rating: Class 900

Ends: RTJ

Style: OS&Y, bolted bonnet, Rising Stem, Straight Pattern, replaceable seats.

Operator: 50mm to 100mm Handwheel, 150mm to 600mm Bevel gear

Materials:

Body: ASTM A216 Gr. WCB

Bolting: Hot Dip Galvanized plated

Stem: Type 316 S.S.

Packing: Mfr. Std.

Seats: Hard Faced Type 316 S.S.

Design and Test: ASME B16.34

2.24 VGL-234(E8)

Globe valve with stem protector.

Rating: Class 900

Ends: RTJ

Style: OS&Y, bolted bonnet, Rising Stem, Straight Pattern, replaceable seats, plug type disc.

Operator: 50mm to 100mm Handwheel, 150mm to 600mm Bevel gear

Materials:

Body: ASTM A216 Gr. WCB

Bolting: Hot Dip Galvanized plated



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Stem: ASTM A 182 F6

Packing: Mfr. Std.

Seats: A 105N + Stellite Gr.6

Design and Test: ASME B16.34

### 2.25 VGL-235(E3)

Globe valve with stem protector.

Rating: Class 900

Ends: RTJ

Style: OS&Y, bolted bonnet, Rising Stem, Straight Pattern, replaceable seats.

Operator: 50mm to 100mm Handwheel, 150mm to 600mm Bevel gear

Materials:

Body: ASTM A352 Gr. LCC

Bolting: Hot Dip Galvanized plated

Stem: Type 316 S.S.

Packing: Mfr. Std.

Seats: Hard Faced Type 316 S.S.

Design and Test: ASME B16.34

### 2.26 VGL-236(E6)

Globe valve with stem protector.

Rating: Class 900

Ends: RTJ

Style: OS&Y, bolted bonnet, Rising Stem, Straight Pattern, replaceable seats.

Operator: 50mm to 100mm Handwheel, 150mm to 600mm Bevel gear

Materials:

Body: Type 316 S.S.

Stem: Type 316 S.S.

Packing: Mfr. Std.

Seats: Hard Faced Type 316 S.S.

Design and Test: ASME B16.34

## 3.0 CHECK VALVE

### 3.1 VC-101 (A1, A2, A8, B1, B2)

Rating: Class 800

Ends: Socket Weld.

Style: Bolted bonnet, swing type

Materials:

Body: ASTM A105N

Bolting: Hot Dip Galvanized plated

Seats: Hard Faced Type 316 S.S.

Seal: Mfr. Std.

Pin: Type 316 S.S.

Dimensions: Mfr. Std.

Design and Test: ISO 15761

### 3.2 VC-102(A4)

Rating: Class 800

Ends: Threaded

Style: Bolted bonnet, piston type, replaceable seat

Materials:

Body: ASTM A105N

Bolting: Hot Dip Galvanized plated



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Seats: Hard Faced 13% Cr. S.S. Seal: Mfr. Std.  
Piston: 13% Cr. S.S.

Dimensions: Mfr. Std.  
Design and Test: ISO 15761

3.3 VC-103(A6, B6)

Rating: Class 800  
Ends: Socket Weld.  
Style: Bolted bonnet, swing type

Materials:

Body: Type 316 S.S. Pin: Type 316 S.S.  
Seal: Mfr. Std. Seats: Hard Faced Type 316 S.S.

Dimensions: Mfr. Std.  
Design and Test: ISO 15761

3.4 VC-104 (A3, B3)

Rating: Class 800  
Ends: Socket Weld.  
Style: Bolted bonnet, swing type

Materials:

Body: ASTM A350 LF2 Bolting: Hot Dip Galvanized plated  
Seats: Hard Faced Type 316 S.S. Seal: Mfr. Std.  
Pin: Type 316 S.S.

Dimensions: Mfr. Std.  
Design and Test: ISO 15761

3.5 VC-121(D1, D2, D9, E1, E2)

Rating: Class 1500  
Ends: Socket Weld.  
Style: Bolted bonnet, swing type

Materials:

Body: ASTM A105N Bolting: Hot Dip Galvanized plated  
Seats: Hard Faced Type 316 S.S. Seal: Mfr. Std.  
Pin: Type 316 S.S.

Dimensions: Mfr. Std.  
Design and Test: ISO 15761

3.6 VC-123(D6, E6)

Rating: Class 1500  
Ends: Socket Weld.  
Style: Bolted bonnet, swing type

Materials:

Body: Type 316 S.S. Pin: Type 316 S.S.  
Seal: Mfr. Std. Seats: Hard Faced Type 316 S.S.

Dimensions: Mfr. Std.  
Design and Test: ISO 15761





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3.7 VC-124(D3, E3)

Rating: Class 1500

Ends: Socket Weld.

Style: Bolted bonnet, swing type

Materials:

Body: ASTM A350 LF2

Bolting: Hot Dip Galvanized plated

Seats: Hard Faced Type 316 S.S.

Seal: Mfr. Std.

Pin: Type 316 S.S.

Dimensions: Mfr. Std.

Design and Test: ISO 15761

3.8 VC-201(A1, A4)

Rating: Class 150

Ends: Raised face flange

Style: Bolted bonnet, swing type, replaceable seats

Materials:

Body: ASTM A216 Gr. WCB

Bolting: Hot Dip Galvanized plated

Pin: 13% Cr. S.S.

Seal: Mfr. Std.

Seats: Hard Faced 13% Cr. S.S.

Disc: Type 316 S.S.

Design and Test: ASME B16.34

3.9 VC-202(A2, A8)

Rating: Class 150

Ends: Raised face flange

Style: Bolted bonnet, piston type, replaceable seats

Materials:

Body: ASTM A216 Gr. WCB

Bolting: Hot Dip Galvanized plated

Seats: Hard Faced Type 316 S.S.

Seal: Mfr. Std.

Piston: Type 316 S.S.

Design and Test: ASME B16.34

3.10 VC-205(A6)

Rating: Class 150

Ends: Raised face flange

Style: Bolted bonnet, swing type, replaceable seats

Materials:

Body: Type 316 S.S.

Pin: Type 316 S.S.

Seal: Mfr. Std.

Seats: Hard Faced Type 316 S.S.

Disc: Type 316 S.S.

Design and Test: ASME B16.34

3.11 VC-206(A3)

Rating: Class 150



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Ends: Raised face flange  
Style: Bolted bonnet, piston type, replaceable seats

Materials:

Body: ASTM A352 Gr. LCC Bolting: Hot Dip Galvanized plated  
Seats: Hard Faced Type 316 S.S. Seal: Mfr. Std.  
Piston: Type 316 S.S.

Design and Test: ASME B16.34

3.12 VC-211(B1)

Rating: Class 300  
Ends: Raised face flange  
Style: Bolted bonnet, swing type, replaceable seats

Materials:

Body: ASTM A216 Gr. WCB Bolting: Hot Dip Galvanized plated  
Pin: 13% Cr. S.S. Seal: Mfr. Std.  
Seats: Hard Faced 13% Cr. S.S. Disc: Type 316 S.S.

Design and Test: ASME B16.34

3.13 VC-212(B2)

Rating: Class 300  
Ends: Raised face flange  
Style: Bolted bonnet, piston type, replaceable seats

Materials:

Body: ASTM A216 Gr. WCB Bolting: Hot Dip Galvanized plated  
Seats: Hard Faced Type 316 S.S. Seal: Mfr. Std.  
Piston: Type 316 S.S.

Design and Test: ASME B16.34

3.14 VC-215(B6)

Rating: Class 300  
Ends: Raised face flange  
Style: Bolted bonnet, swing type, replaceable seats

Materials:

Body: Type 316 S.S. Disc: Type 316 S.S.  
Pin: Type 316 S.S. Seal: Mfr. Std.  
Seats: Hard Faced Type 316 S.S.

Design and Test: ASME B16.34

3.15 VC-216(B3)

Rating: Class 300  
Ends: Raised face flange  
Style: Bolted bonnet, piston type, replaceable seats

Materials:

Body: ASTM A352 Gr. LCC Bolting: Hot Dip Galvanized plated  
Seats: Hard Faced Type 316 S.S. Seal: Mfr. Std.  
Piston: Type 316 S.S.



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3.16 VC-217(B1)

Rating: Class 300

Ends: Raised face flange

Style: Bolted bonnet, piston type, replaceable seats

Materials:

Body: ASTM A216 Gr. WCB

Bolting: Hot Dip Galvanized plated

Seats: 13% Cr. S.S.

Seal: Mfr. Std.

Piston: Hard Faced 13% Cr. S.S.

Design and Test: ASME B16.34



3.17 VC-221(D1)

Rating: Class 600

Ends: Raised face flange

Style: Bolted bonnet, swing type, replaceable seats

Materials:

Body: ASTM A216 Gr. WCB

Bolting: Hot Dip Galvanized plated

Pin: 13% Cr. S.S.

Seal: Mfr. Std.

Seats: Hard Faced 13% Cr. S.S.

Disc: Type 316 S.S.

Design and Test: ASME B16.34

3.18 VC-222(D2, D9)

Rating: Class 600

Ends: Raised face flange

Style: Bolted bonnet, , piston type, replaceable seats

Materials:

Body: ASTM A216 Gr. WCB

Bolting: Hot Dip Galvanized plated

Seats: Hard Faced Type 316 S.S.

Seal: Mfr. Std.

Piston: Type 316 S.S.

Design and Test: ASME B16.34

3.19 VC-225(D6)

Rating: Class 600

Ends: Raised face flange

Style: Bolted bonnet, swing type, replaceable seats

Materials:

Body: Type 316 S.S.

Disc: Type 316 S.S.

Pin: Type 316 S.S.

Seal: Mfr. Std.

Seats: Hard Faced Type 316 S.S.

Design and Test: ASME B16.34

3.20 VC-228(D6)

Rating: Class 600

Ends: Raised face flange

Style: Bolted bonnet, piston type, replaceable seats



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Materials:

Body: Type 316 S.S.

Disc: Type 316 S.S.

Piston: Type 316 S.S.

Seal: Mfr. Std.

Seats: Hard Faced Type 316 S.S.

Design and Test: ASME B16.34

3.21 VC-226(D3)

Rating: Class 600

Ends: Raised face flange

Style: Bolted bonnet, piston type, replaceable seats

Materials:

Body: ASTM A352 Gr. LCC

Bolting: Hot Dip Galvanized plated

Seats: Hard Faced Type 316 S.S.

Seal: Mfr. Std.

Piston: Type 316 S.S.

Design and Test: ASME B16.34

3.22 VC-227 (D8)

Rating: Class 600

Ends: Raised face flange

Style: Bolted bonnet, swing type, fire safe seats, replaceable seats

Materials:

Body: ASTM A216 Gr. WCB.

Bolting: Hot Dip Galvanized plated

Pin: 13% Cr. S.S

Seal: Mfr. Std.

Seats: A 105N + Stellite Gr.6

Disc: A 216 WCB + A 182 F6

Design and Test: ASME B16.34

3.23 VC-231 (E1)

Rating: Class 900

Ends: RTJ

Style: Bolted bonnet, swing type, replaceable seats

Materials:

Body: ASTM A216 Gr. WCB

Bolting: Hot Dip Galvanized plated

Pin: 13% Cr. S.S.

Seal: Mfr. Std.

Seats: Hard Faced 13% Cr. S.S.

Disc: Type 316 S.S.

Design and Test: ASME B16.34

3.24 VC-232(E2)

Rating: Class 900

Ends: RTJ

Style: Bolted bonnet, piston type, replaceable seats

Materials:

Body: ASTM A216 Gr. WCB

Bolting: Hot Dip Galvanized plated

Seats: Hard Faced Type 316 S.S.

Seal: Mfr. Std.

Piston: Type 316 S.S.

Design and Test: ASME B16.34



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3.25 VC-235 (E6)

Rating: Class 900

Ends: RTJ

Style: Bolted bonnet, swing type, replaceable seats

Materials:

Body: Type 316 S.S.

Disc: Type 316 S.S.

Pin: Type 316 S.S.

Seal: Mfr. Std.

Seats: Hard Faced Type 316 S.S.

Design and Test: ASME B16.34

3.26 VC-236 (E8)

Rating: Class 900

Ends: RTJ

Style: Bolted bonnet, swing type, fire safe seats, replaceable seats

Materials:

Body: ASTM A216 Gr. WCB.

Bolting: Hot Dip Galvanized plated

Pin: 13% Cr. S.S

Seal: Mfr. Std.

Seats: Hard face A 105N + Stellite Gr.6

Disc: A 216 WCB + A 182 F6

Design and Test: ASME B16.34

3.27 VC-237(E3)

Rating: Class 900

Ends: RTJ

Style: Bolted bonnet, piston type, replaceable seats

Materials:

Body: ASTM A352 Gr. LCC

Bolting: Hot Dip Galvanized plated

Seats: Hard Faced Type 316 S.S.

Seal: Mfr. Std.

Piston: Type 316 S.S.

Design and Test: ASME B16.34

## 4.0 BALL VALVE

4.1 VB-101 (A1, A2, A8)

Rating: Class 150 (285 psig @ 100°F –215 psig @ 350 °F)

Ends: Raised face flange

Style: Bolted body, replaceable seats, regular port, floating ball.

Materials:

Body: ASTM A105N

Bolting: Hot Dip Galvanized plated

Stem: Type 316 S.S.

Seal: Filled Teflon.

Seats: Filled Teflon

Ball: Type 316 S.S.

Dimensions: Mfr. Std.

Design and Test: API 6D

4.2 VB-102 (A3)

Rating: Class 150 (285 psig @ -50oF –215 psig @ 350 °F)



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Ends: Raised face flange

Style: Bolted body, replaceable seats, regular port, floating ball.

Materials:

Body: ASTM A350 LF2.

Bolting: Hot Dip Galvanized plated

Stem: Type 316 S.S.

Seal: Filled Teflon.

Seats: Filled Teflon

Ball: Type 316 S.S.

Dimensions: Mfr. Std.

Design and Test: API 6D

4.3 VB-103(A4)

Rating: **Class 800** (285 psig @ 100°F – 230 psig @ 300 °F)

Ends: Threaded

Style: Bolted body, replaceable seats, full port, floating ball.

Materials:

Body: ASTM A105N

Bolting: Hot Dip Galvanized plated

Stem: 13% Cr. S.S.

Seal: Filled Teflon

Seats: Filled Teflon

Ball: Type 316 S.S.

Dimensions: Mfr. Std.

Design and Test: API 6D

4.4 VB-105 (A1, A2, A8)

Rating: Class 150 (215 psig @ 350 °F– 110 psig @ 700 °F)

Ends: Raised face flange

Style: Bolted body, replaceable seats, regular port, floating ball.

Materials:

Body: ASTM A105N

Bolting: Hot Dip Galvanized plated

Stem: Type 316 S.S.

Seal: Mfr. Std..

Seats: Mfr. Std.

Ball: Type 316 S.S.

Dimensions: Mfr. Std.

Design and Test: API 6D

4.5 VB-106 (B1, B2)

Rating: Class 300 (740 psig @ 100°F – 645 psig @ 350 °F)

Ends: Raised face flange

Style: Bolted body, replaceable seats, regular port, floating ball.

Materials:

Body: ASTM A105N

Bolting: Hot Dip Galvanized plated

Stem: Type 316 S.S.

Seal: Filled Teflon.

Seats: Filled Teflon

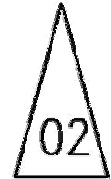
Ball: Type 316 S.S.

Dimensions: Mfr. Std.

Design and Test: API 6D

4.6 VB-107 (B3)

Rating: Class 300 (740 psig @ -50°F – 645 psig @ 350 oF)





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Ends: Raised face flange

Style: Bolted body, replaceable seats, regular port, floating ball.

Materials:

Body: ASTM A350 LF2.

Bolting: Hot Dip Galvanized plated

Stem: Type 316 S.S.

Seal: Filled Teflon.

Seats: Filled Teflon

Ball: Type 316 S.S.

Dimensions: Mfr. Std.

Design and Test: API 6D

#### 4.7 VB-108 (B1, B2)

Rating: Class 300 (645 psig @ 350 °F – 535 psig @ 700 °F)

Ends: Raised face flange

Style: Bolted body, replaceable seats, regular port, floating ball.

Materials:

Body: ASTM A105N

Bolting: Hot Dip Galvanized plated

Stem: Type 316 S.S.

Seal: Mfr. Std..

Seats: Mfr. Std.

Ball: Type 316 S.S.

Dimensions: Mfr. Std.

Design and Test: API 6D

#### 4.8 VB-109 (A6)

Rating: Class 150 (275 psig @ -150°F – 200 psig @ 350 °F)

Ends: Raised face flange

Style: Bolted body, replaceable seats, regular port, floating ball.

Materials:

Body: Type 316 S.S.

Ball: Type 316 S.S.

Stem: Type 316 S.S.

Seal: Mfr. Std..

Seats: Mfr. Std.

Dimensions: Mfr. Std.

Design and Test: API 6D

#### 4.9 VB-110 (B6)

Rating: Class 300(720 psig @ -150°F – 520 psig @ 350 °F)

Ends: Raised face flange

Style: Bolted body, replaceable seats, regular port, floating ball.

Materials:

Body: Type 316 S.S.

Ball: Type 316 S.S.

Stem: Type 316 S.S.

Seal: Mfr. Std..

Seats: Mfr. Std.

Dimensions: Mfr. Std.

Design and Test: API 6D

#### 4.10 VB-121(D1, D2, D9)

Rating: Class 600 (1480 psig @ 100°F –1295 psig @ 350 °F)

Ends: Raised face flange



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Style: Bolted body, replaceable seats, regular port, floating ball.

Materials:

Body: ASTM A105N

Bolting: Hot Dip Galvanized plated

Stem: Type 316 S.S.

Seal: Filled Teflon.

Seats: Filled Teflon

Ball: Type 316 S.S.

Dimensions: Mfr. Std.

Design and Test: API 6D

#### 4.11 VB-122(D3)

Rating: Class 600 (1480 psig @ -50°F –1295 psig @ 350 °F)

Ends: Raised face flange

Style: Bolted body, replaceable seats, regular port, floating ball.

Materials:

Body: ASTM A 350 LF2.

Bolting: Hot Dip Galvanized plated

Stem: Type 316 S.S.

Seal: Filled Teflon.

Seats: Filled Teflon

Ball: Type 316 S.S.

Dimensions: Mfr. Std.

Design and Test: API 6D

#### 4.12 VB-124(D8)

Rating: Class 600 (1480 psig @ -50°F –1430 psig @ 350 °F)

Ends: Raised face flange

Style: Bolted body, replaceable seats, regular port, floating ball, fire safe.

Materials:

Body: ASTM A105N

Bolting: Hot Dip Galvanized plated

Stem: 13% Cr. S.S.

Seal: Filled Teflon.

Seats: Filled Teflon

Ball: A 182 F6 Class2

Dimensions: Mfr. Std.

Design and Test: API 6D

#### 4.13 VB-125(D1, D2, D9)

Rating: Class 600 (1295 psig @ 350 °F–1065 psig @ 700 °F)

Ends: Raised face flange

Style: Bolted body, replaceable seats, regular port, floating ball.

Materials:

Body: ASTM A105N

Bolting: Hot Dip Galvanized plated

Stem: Type 316 S.S.

Seal: Mfr. Std.

Seats: Mfr. Std.

Ball: Type 316 S.S.

Dimensions: Mfr. Std.

Design and Test: API 6D

#### 4.14 VB-126(E1, E2)

Rating: Class 900 (2220 psig @ 100°F– 1935 psig @ 350 °F)

Ends: RTJ

Style: Bolted body, replaceable seats, regular port, floating ball.

Materials:

Body: ASTM A105N

Bolting: Hot Dip Galvanized plated





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Stem: Type 316 S.S. Seal: Filled Teflon.  
Seats: Filled Teflon Ball: Type 316 S.S.  
Dimensions: Mfr. Std.  
Design and Test: API 6D

4.15 VB-127(E3)

Rating: Class 900 (2220 psig @ -50°F – 1935 psig @ 350 °F)  
Ends: RTJ  
Style: Bolted body, replaceable seats, regular port, floating ball.  
Materials:

Body: ASTM A 350 LF2. Bolting: Hot Dip Galvanized plated  
Stem: Type 316 S.S. Seal: Filled Teflon.  
Seats: Filled Teflon Ball: Type 316 S.S.

Dimensions: Mfr. Std.  
Design and Test: API 6D

4.16 VB-128(E8)

Rating: Class 900 (2200 psig @ 100°F – 1920 psig @ 350 °F)  
Ends: RTJ  
Style: Bolted body, replaceable seats, regular port, floating ball, fire safe.  
Materials:

Body: ASTM A105N Bolting: Hot Dip Galvanized plated  
Stem: 13% Cr. S.S. Seal: Filled Teflon.  
Seats: Filled Teflon Ball: A 182 F6 Class2

Dimensions: Mfr. Std.  
Design and Test: API 6D

4.17 VB-129(E1, E2)

Rating: Class 900 (1935 psig @ 350°F – 1600 psig @ 700 °F)  
Ends: RTJ  
Style: Bolted body, replaceable seats, regular port, floating ball.  
Materials:

Body: ASTM A105N Bolting: Hot Dip Galvanized plated  
Stem: Type 316 S.S. Seal: Mfr. Std.  
Seats: Mfr. Std. Ball: Type 316 S.S.

Dimensions: Mfr. Std.  
Design and Test: API 6D

4.18 VB-130 (D6)

Rating: Class 600(1440 psig @ -150°F – 1035 psig @ 350 °F)  
Ends: Raised face flange  
Style: Bolted body, replaceable seats, regular port, floating ball.  
Materials:

Body: Type 316 S.S. Ball: Type 316 S.S.  
Stem: Type 316 S.S. Seal: Mfr. Std..  
Seats: Mfr. Std.



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Dimensions: Mfr. Std.

Design and Test: API 6D

4.19 VB-131 (E6)

Rating: Class 900(1440 psig @ -150°F – 1035 psig @ 350 °F)

Ends: RTJ

Style: Bolted body, replaceable seats, regular port, floating ball.

Materials:

Body: Type 316 S.S.

Ball: Type 316 S.S.

Stem: Type 316 S.S.

Seal: Mfr. Std..

Seats: Mfr. Std.

Dimensions: Mfr. Std.

Design and Test: API 6D

4.20 VB-201(A1)

Rating: Class 150 (285 psig @ 100°F – 215 psig @ 350 °F)

Ends: Raised face flange.

Style: Bolted body, replaceable seats, regular port, trunnion mounted ball over 4 inch.

Operator: 50mm to 100mm Level, 150mm to 600mm Bevel gear

Materials:

Body: ASTM A216 Gr. WCB

Bolting: Hot Dip Galvanized plated

Stem: 13% Cr. S.S.

Seal: PTFE

Seats: PTFE

Ball: A105N Chrome Plated Steel

Design and Test: API 6D

4.21 VB-202(A2, A8)

Rating: Class 150 (285 psig @ 100°F – 215 psig @ 350 °F)

Ends: Raised face flange.

Style: Bolted body, replaceable seats, regular port, trunnion mounted ball over 4 inch.

Operator: 50mm to 100mm Level, 150mm to 600mm Bevel gear

Materials:

Body: ASTM A 216 Gr. WCB

Bolting: Hot Dip Galvanized plated

Stem: Type 316 S.S.

Seal: PTFE

Seats: PTFE

Ball: Type 316 S.S.

Design and Test: API 6D

4.22 VB-203(A4)

Rating: Class 150 (285 psig @ 100°F – 230 psig @ 300 °F)

Ends: Raised face flange.

Style: Bolted body, replaceable seats, regular port, trunnion mounted ball over 4 inch.

Operator: 50mm to 100mm Level, 150mm to 600mm Bevel gear

Materials:

Body: ASTM A 216 Gr. WCB

Bolting: Hot Dip Galvanized plated

Stem: 13% Cr. S.S.Nickel Plated

Seal: PTFE

Seats: PTFE

Ball: Type 316 S.S.Nickel Plated

Design and Test: API 6D

4.23 VB-206(A6)





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Operator: 50mm to 100mm Handwheel, 150mm to 600mm Bevel gear

Materials:

Body: ASTM A216 Gr. WCB

Bolting: Hot Dip Galvanized plated

Stem: Type 316 S.S.

Seal: PTFE

Seats: PTFE

Ball: Type 316 S.S.

Design and Test: API 6D

4.28 VB-216(B6)

Rating: Class 300 (720 psig @ -150°F – 520 psig @ 350 °F)

Ends: Raised faced Flange.

Style: Bolted body, replaceable seats, regular port, trunnion mounted ball over 4 inch.

Operator: 50mm to 100mm Level, 150mm to 600mm Bevel gear

Materials:

Body: Type 316 S.S.

Ball: Type 316 S.S.

Stem: Type 316 S.S.

Seal: PTFE.

Seats: PTFE

Design and Test: API 6D

4.29 VB-218(B3)

Rating: Class 300 (740 psig @ -50°F – 645 psig @ 350 °F)

Ends: Raised face flange.

Style: Bolted body, replaceable seats, regular port, trunnion mounted ball over 4 inch.

Operator: 50mm to 100mm Level, 150mm to 600mm Bevel gear

Materials:

Body: ASTM A352 Gr. LCC

Bolting: Hot Dip Galvanized plated

Stem: Type 316 S.S.

Seal: PTFE

Seats: PTFE

Ball: Type 316 S.S.

Design and Test: API 6D

4.30 VB-219(B1, B2)

Rating: Class 300 (645 psig @ 350 °F– 535 psig @ 700 °F)

Ends: Raised face flange.

Style: Bolted body, replaceable seats, regular port, trunnion mounted ball over 4 inch.

Operator: 50mm to 100mm Level, 150mm to 600mm Bevel gear

Materials:

Body: ASTM A216 Gr. WCB

Bolting: Hot Dip Galvanized plated

Stem: Type 316 S.S.

Seal: Mfr. Std

Seats: Mfr. Std

Ball: Type 316 S.S.

Design and Test: API 6D

4.31 VB-221(D1)

Rating: Class 600 (1480 psig @ 100°F – 1295 psig @ 350 °F)

Ends: Raised face flange.

Style: Bolted body, replaceable seats, regular port, trunnion mounted ball over 4 inch.

Operator: 50mm to 80mm Level, 100mm to 600mm Bevel gear

Materials:

Body: ASTM A216 Gr. WCB

Bolting: Hot Dip Galvanized plated



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Stem: 13% Cr. S.S.

Seal: PTFE

Seats: PTFE

Ball: A105N Chrome Plated Steel

Design and Test: API 6D

4.32 VB-222(D2, D9)

Rating: Class 600 (1480 psig @ 100°F – 1295 psig @ 350 °F)

Ends: Raised face flange.

Style: Bolted body, replaceable seats, regular port, trunnion mounted ball over 4 inch.

Operator: 50mm to 80mm Level, 100mm to 600mm Bevel gear

Materials:

Body: ASTM A216 Gr. WCB

Bolting: Hot Dip Galvanized plated

Stem: Type 316 S.S.

Seal: PTFE

Seats: PTFE

Ball: Type 316 S.S.

Design and Test: API 6D

4.33 VB-226(D6)

Rating: Class 600 (1440 psig @ -150°F – 1035 psig @ 350 °F)

Ends: Raised faced Flange.

Style: Bolted body, replaceable seats, regular port, trunnion mounted ball over 4 inch.

Operator: 50mm to 80mm Level, 100mm to 600mm Bevel gear

Materials:

Body: Type 316 S.S.

Ball: Type 316 S.S.

Stem: Type 316 S.S.

Seal: PTFE.

Seats: PTFE

Design and Test: API 6D

4.34 VB-228(D3)

Rating: Class 600 (1480 psig @ -50°F – 1295 psig @ 350 °F)

Ends: Raised face flange.

Style: Bolted body, replaceable seats, regular port, trunnion mounted ball over 4 inch.

Operator: 50mm to 80mm Level, 100mm to 600mm Bevel gear

Materials:

Body: ASTM A352 Gr. LCC

Bolting: Hot Dip Galvanized plated

Stem: Type 316 S.S.

Seal: PTFE

Seats: PTFE

Ball: Type 316 S.S.

Design and Test: API 6D

4.35 VB-229(D1, D2, D9)

Rating: Class 600 (1295 psig @ 350 °F– 1065 psig @ 700 °F)

Ends: Raised face flange.

Style: Bolted body, replaceable seats, regular port, trunnion mounted ball over 4 inch.

Operator: 50mm to 80mm Level, 100mm to 600mm Bevel gear

Materials:

Body: ASTM A216 Gr. WCB

Bolting: Hot Dip Galvanized plated

Stem: Type 316 S.S.

Seal: Mfr. Std

Seats: Mfr. Std

Ball: Type 316 S.S.

Design and Test: API 6D



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4.36 VB-22A(D8)

Rating: Class 600 (1500 psig @ 100°F – 1430 psig @ 350 °F)  
Ends: Raised face flange  
Style: Bolted body, replaceable seats, regular port, trunnion mounted ball over 4 inch, Fire safe.  
Operator: 50mm to 80mm Level, 100mm to 600mm Bevel gear  
Materials:  
Body: ASTM A216 Gr. WCB Bolting: Hot Dip Galvanized plated  
Stem: ASTM A 182 F6 Seal: Viton AED  
Seats: Viton AED Ball: A 105/350LF-2 + 3 MIL ENP  
Design and Test: API 6D

4.37 VB-22B(D8)

Rating: Class 600 (1500 psig @ 100°F – 1430 psig @ 350 °F)  
Ends: Raised face flange  
Style: Bolted body, replaceable seats, full port, trunnion mounted ball over 4 inch, Fire safe.  
Operator: 50mm to 80mm Level, 100mm to 600mm Bevel gear  
Materials:  
Body: ASTM A216 Gr. WCB Bolting: Hot Dip Galvanized plated  
Stem: ASTM A 182 F6 Seal: Viton AED  
Seats: Viton AED Ball: A 105/350LF-2 + 3 MIL ENP  
Design and Test: API 6D

4.38 VB-231(E1)

Rating: Class 900 (2220 psig @ 100°F – 1935 psig @ 350 °F)  
Ends: RTJ.  
Style: Bolted body, replaceable seats, regular port, trunnion mounted ball over 4 inch.  
Operator: 50mm to 80mm Level, 100mm to 600mm Bevel gear  
Materials:  
Body: ASTM A216 Gr. WCB Bolting: Hot Dip Galvanized plated  
Stem: 13% Cr. S.S. Seal: PTFE  
Seats: PTFE Ball: A105N Chrome Plated Steel  
Design and Test: API 6D

4.39 VB-232(E2)

Rating: Class 900 (2220 psig @ 100°F – 1935 psig @ 350 °F)  
Ends: RTJ.  
Style: Bolted body, replaceable seats, regular port, trunnion mounted ball over 4 inch.  
Operator: 50mm to 80mm Level, 100mm to 600mm Bevel gear  
Materials:  
Body: ASTM A216 Gr. WCB Bolting: Hot Dip Galvanized plated  
Stem: Type 316 S.S. Seal: PTFE  
Seats: PTFE Ball: Type 316 S.S.  
Design and Test: API 6D

4.40 VB-236(E6)

Rating: Class 900 (2160 psig @ -150°F – 1550 psig @ 350 °F)  
Ends: RTJ.



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Style: Bolted body, replaceable seats, regular port, trunnion mounted ball over 4 inch.

Operator: 50mm to 80mm Level, 100mm to 600mm Bevel gear

Materials:

Body: Type 316 S.S.

Ball: Type 316 S.S.

Stem: Type 316 S.S.

Seal: PTFE.

Seats: PTFE

Design and Test: API 6D

4.41 VB-238(E8)

Rating: Class 900 (2200 psig @ 100°F – 1920 psig @ 350 °F)

Ends: RTJ.

Style: Bolted body, replaceable seats, regular port, trunnion mounted ball over 4 inch, Fire safe.

Operator: 50mm to 80mm Level, 100mm to 600mm Bevel gear

Materials:

Body: ASTM A216 Gr. WCB

Bolting: Hot Dip Galvanized plated

Stem: ASTM A 182 F6

Seal: Viton AED

Seats: Viton AED

Ball: A 105/350LF-2 + 3 MIL ENP

Design and Test: API 6D

4.42 VB-239(E8)

Rating: Class 900 (2200 psig @ 100°F – 1920 psig @ 350 °F)

Ends: RTJ.

Style: Bolted body, replaceable seats, full port, trunnion mounted ball over 4 inch, Fire safe.

Operator: 50mm to 80mm Level, 100mm to 600mm Bevel gear

Materials:

Body: ASTM A216 Gr. WCB

Bolting: Hot Dip Galvanized plated

Stem: ASTM A 182 F6

Seal: Viton AED

Seats: Viton AED

Ball: A 105/350LF-2 + 3 MIL ENP

Design and Test: API 6D

4.43 VB-23A(E3)

Rating: Class 900 (2220 psig @ -50°F – 1935 psig @ 350 °F)

Ends: RTJ.

Style: Bolted body, replaceable seats, regular port, trunnion mounted ball over 4 inch.

Operator: 50mm to 80mm Level, 100mm to 600mm Bevel gear

Materials:  
Body: ASTM A352 Gr. LCC

Bolting: Hot Dip Galvanized plated

Stem: Type 316 S.S.

Seal: PTFE

Seats: PTFE

Ball: Type 316 S.S.

Design and Test: API 6D

4.44 VB-23B(E1, E2)

Rating: Class 900 (1935 psig @ 350°F – 1600 psig @ 700 °F)

Ends: RTJ.

Style: Bolted body, replaceable seats, regular port, trunnion mounted ball over 4 inch.

Operator: 50mm to 80mm Level, 100mm to 600mm Bevel gear

Materials:



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Body:   ASTM A216 Gr. WCB

Bolting:   Hot Dip Galvanized plated

Stem:   Type 316 S.S.

Seal:   Mfr. Std

Seats:   Mfr. Std

Ball:   Type 316 S.S.

Design and Test:   API 6D





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PROJECT NO.: NASHPA 1247



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## Specification for Stress Analysis

### REVISION DETAILS

REV	DATE	DESCRIPTION	PRPD	CHKD	REVD	APPD
			<i>Gao Dejie</i>	<i>Ni Ying</i>	<i>Liu Zijian</i>	<i>xufeng</i>
00	05/04/2016	Approved for Use	Gao Dejie	Ni Ying	Liu Zijian	Xu Feng
C	21/03/2016	Issued for Approval	Gao Dejie	Ni Ying	Liu Zijian	Xu Feng
B1	09/03/2016	Issued for Review	Gao Dejie	Ni Ying	Liu Zijian	Xu Feng
B	25/01/2016	Issued for Review	Gao Dejie	Ni Ying	Liu Zijian	Xu Feng
A	13/01/2016	Internal Discipline Check	Gao Dejie	Ni Ying	Liu Zijian	Xu Feng



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A	13/01/2016	Internal Discipline Check
B	25/01/2016	Issued for Review
B1	09/03/2016	Issued for Review
C	21/03/2016	Issued for Approval
00	05/04/2016	Approved for Use



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## 1.0 GENERAL

### 1.1 Introduction

OIL & GAS Development Company Ltd. (OGDCL) is operating NASHPA Oil & Gas fields in Khyber Pakhtunkhwa of Islamic Republic of Pakistan. OGDCL intends to install LPG Recovery Plant, Compressors & Allied Facilities at this field.

### 1.2 Scope

This specification is to establish guidelines and procedures that must be followed in order to provide a uniform approach to Stress Analysis, starting with the Critical Line List, and ending with field inspection after installation and start-up.

### 1.3 Definitions

Within this document the following definitions apply:

<b>Project</b>	NASHPA Gas Processing and LPG Recovery Plant PROC-FC-CB/NASHPA/PROJ-1247 /2015
<b>Company/Owner</b>	Oil & Gas Development Company Ltd.(OGDCL)
<b>Consultant</b>	Zishan Engineers (Pvt.) Ltd.
<b>Contractor</b>	Hong Kong Huihua Global Technology Limited Wholly owned Subsidiary of China OIL HBP Science and Technology Corporation Ltd.
<b>Manufacturer/Supplier/Vendor</b>	Party(ies), which manufactures and/or supplies material, equipment and service to perform the duties as specified by CONTRACTOR in the scope of supply
<b>Shall</b>	Indicates a mandatory requirement
<b>Should</b>	Indicates a strong recommendation to comply with the requirement of this document

## 2.0 CODES AND STANDARDS

### 2.1 Codes, Standards and Regulations

ASME B 31.3	Process Piping
ASME B 31.8	Gas Transmission and Distribution Piping Systems
ASME B 16.5	Pipe Flanges and Flanged Ends
API 610	Centrifugal Pumps for General Refinery Services
API 617	Centrifugal Compressor for General Refinery Services



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API 661	Air Cooled Heat Exchangers for General Refinery Services
API 650	Welded Steel Tanks for Oil Storage
API 560	Fired Heaters for General Refinery Services
API 660	Shell-and-Tube Heat Exchanger for General Refinery Services
API 618	Reciprocating Compressor for Petroleum, Chemical and Gas Industry Services
API RP 520	Recommended Practices for Design and Installation of Pressure Relieving Systems in Refineries

## 2.2 Project Specification

Piping Design Basis	NGP-000-PIP-15.05-0001-00
Piping Material Specification	NGP-000-PIP-15.03-0001-00
Specification for Insulation	NGP-000-PIP-15.03-0004-00
Specification for Fabrication / Installation of Equipment & Piping	NGP-000-PIP-15.03-0005-00
Specification for Ball, Gate, Globe and Check Valves	NGP-000-PIP-15.03-0010-00
Specification for Pipe Support	NGP-000-PIP-15.03-0014-00

## 3.0 ENVIRONMENTAL DESIGN CRITERIA

### 3.1 Environmental Data

Environmental conditions for the piping covered by this specification shall be in accordance with Specification NGP-000-COM-15.05-0001-00-Environmental Conditions.

## 4.0 EXTENT OF ANALYSIS

All the plant lines shall be submitted to the stress analysis specialists to comply with these Job Specifications.

An accurate analysis shall be performed in order to determine the degree of criticality of all piping systems and thus to establish the accuracy of the calculation methods to be adopted for verifying piping systems reliability and safety.

The piping stress leader has the full responsibility to adapt the adequacy of the calculation level in function of the pipes diameter, the pipes materials, the design conditions, the connected equipment typology, the fluids characteristics, the supports typologies, the load cases involved and the layout configurations.

The Stress Analysis Designer shall define the degree of criticality of a pipeline on the base of the following documentations and criteria:

a) The PFDs



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b) The P&IDs

c) The Line List

d) The criteria established in Para 4.1

On such bases the Stress Analysis Designer will establish the accuracy of the calculation method to be used when verifying the piping systems flexibility requirements.

#### 4.1 Flexibility Checking Level Definition

Piping systems stress can be analyzed by approximate, simplified, or detailed calculation methods according to the following Flexibility Check Levels definition:

##### Level 1: Visual analysis

Approximate visual inspection procedure or analysis executed by means of charts and cantilever method. These methods must be applied only if used within the range of configurations for which their adequacy has been demonstrated.

This procedure shall be restricted to lines that are similar to other, or lines clearly possessing adequate flexibility.

All lines are subject to visual inspection of the fabrication isometric to ensure adequate flexibility and supporting to suit thermal, environmental and installation conditions.

##### Level 2: Simplified analysis

Analysis based on a short-cut, simplified calculation performed by using a specific computer program. The calculation model geometry shall be simplified compared to the actual geometry and shall be based on a conservative configuration. As an alternative, a visual checking with the use of charts is allowed provided these methods are used within their range of validity for which their accuracy is known.

The analysis shall be carried out to meet the requirements of the applicable piping code.

For this typology of analysis no calculation note will be produced.

In case of special requirements or where simplifications could give wrong results, a detailed calculation must be performed.

##### Level 3: Detailed Analysis

Analysis based on a detailed calculation performed by using a specific computer program. The calculation model geometry shall be exactly in accordance with the piping ISOs.

The analysis shall be carried out to meet the requirements of the applicable piping code.

For this typology of analysis a calculation note will be produced.

#### 4.2 Selection Criteria for Analysis

The Flexibility Check Level shall be defined for each line in accordance to TABLE 1.

TABLE 1: CRITICAL LINE LIST CRITERIA



CONNECTION TYPE		LINE MAXIMUM PIPE SIZE	DIFFERENCE BETWEEN BASIC AND MAXIMUM METAL TEMPERATURE (C°)				
			Ambient				
			&Below90	120	200	350	Above
A	Rotating Equipment	Ø<3"	<--- level 1 --->   <-----level 2 ----->				
		Ø≥3"	<level 2>   <-----level 3 ----->				
B	Air Cooled Heat Exchanger	Ø<3"	<--- level 1 --->   <-----level 2 ----->				
		Ø≥3"	<level 2>   <-----level 3 ----->				
C	Reciprocating Equipment	Ø<3"	<--- level 1 --->   <-----level 2 ----->				
		Ø≥3"	<level 2>   <-----level 3 ----->				
D	Equipment Subject to Significant Thermal Growth	Ø<3"	<--- level 1 --->   <-----level 2 ----->				
		Ø≥3"	<level 2>   <-----level 3 ----->				
E	Thick walled piping	t≥ 19mm	<----- level 3 ----->				
F	High Pressure ≥ Class 900 lb	Ø<3"	<--- level 1 --->   <-----level 2 ----->				
		Ø≥3"	<----- level 3 ----->				
G	Cryogenic	Ø<3"	Level 1				
		Ø≥3"	Level 2 from ambient to -29°C Level 3 from -30°C to lower				
H	High Temperature	Ø<3"	<--- level 1 --->   <-----level 2 ----->				
		Ø≥3"	<--- level 2 --->   <-----level 3 ----->				
I	Large Diameter	Ø<3"	<--- level 1 --->   <-----level 2 ----->				
		Ø≥16"	<-----level 3 ----->				



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J	Subject to Highly Cyclic Temperature Conditions Greater than 7000 Cycles for the Expected Design Life of the piping system	All Ø	<-----level 3 ----->
K	Containing Lethal Fluid as defined by ASME B31.3.(Fluid "M")	All Ø	<-----level 3 ----->

Note: 1. Definition of Checking Level 1,2,3 is according to paragraph: Flexibility Checking Level Definition;

2. Vendor shall perform the dynamic analysis according to level 3.

3. Contractor specify the allowable axial and lateral deflection which shall be considered during stress analysis of Process Piping.

**4.2 Allowable Loads For Equipment**

The forces and moments which are acted on equipment shall be within the allowable loads defined in the following applicable standards.

- a) Nozzle allowable loads for Centrifugal API Pump shall comply with API 610 (Latest Edition), if not provided by Vendor.
- b) Nozzle allowable loads for Reciprocating Pumps shall be provided by respective Vendor.
- c) Nozzle allowable loads for Non-API Pumps shall be provided by respective Vendor.
- d) Nozzle allowable loads for Centrifugal Compressor shall comply with API 617 (Latest Edition), if not provided by Vendor.
- e) Nozzle allowable loads for Reciprocating Compressor shall comply with API 618 (Latest Edition), if not provided by vendor.
- f) Nozzle allowable loads for pressure vessels shall be as per "Specification for unfired pressure vessels", if not provided by vendor.
- g) Nozzle allowable loads for Shell & Tube Heat Exchanger shall be as specified by vendor.
- h) Nozzle allowable loads for air fin cooler shall comply with API 661 (Latest Edition), if not provided by vendor.
- i) Nozzle allowable loads for heater shall comply with API 560 (Latest Edition), if not provided by respective vendor.





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#### 4.3 Friction Coefficient

The following friction coefficient shall be used to calculate forces at sliding surfaces.

Steel on Steel 0.3

Stainless steel on PTFE 0.06

PTFE on PTFE 0.1

#### 4.4 Stress Critical Line List

The Critical Line List contains the following information:

- a) Line numbers;
- b) Line size;
- c) Pipe class;
- d) Tracing type;
- e) Insulation type and thickness;
- f) Operating temperature and pressure;
- g) Design temperature and pressure;
- h) Type of fluid and flow direction.
- i) Fluid Density.
- j) Hydro test Pressure.

### 5.0 STRESS SKETCHES AND ANALYSIS

**5.1 To ensure an efficient Stress Analysis the following information must be shown on the Stress Sketch:**

- a) Branch points complete with line number.
- b) Co-ordinates and elevation of at least one reference point to assist in locating on orthographic.
- c) Design and operating pressures and temperatures.
- d) Direction of flow.
- e) Insulation type and thickness.
- f) Line numbers.
- g) Line sizes.
- h) Location and size of reducers.
- i) Location and type of all proposed pipe supports.
- j) Location of structural steel supports.



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- k) North Arrow.
- l) Pipe schedule.
- m) Piping class and specification breaks,
- n) Piping materials,
- o) Tracing type.
- p) Node numbers shall be marked on each supports, elbows and skid termination point (if any).
- q) Hydro test Pressure and requirement of PWHT / RT shall also be marked.

## 5.2 Load Cases

The following are the load cases included in CAESAR II analysis:

LOAD CASE	DESCRIPTION	TYPE
L1	WW+HP	HYD
L2	W+T1+P1	OPE
L3	W+T2+P2	OPE
L4	W+T1+P1+WIN1	OPE
L5	W+T2+P2+WIN1	OPE
L6	W+T1+P1+U1	OPE
L7	W+T2+P2+U1	OPE
L8	W+D1+T1+P1	OPE
L9	W+D1+T2+P2	OPE
L10	W+P1	SUS
L11	W+P2	SUS
L12	L4-L2	OCC
L13	L5-L3	OCC
L14	L6-L2	OCC
L15	L7-L3	OCC
L16	L8-L2	OCC
L17	L9-L3	OCC
L18	L2-L10	EXP
L19	L3-L11	EXP

### Legends

W	Weight of piping components, Weight of fluid etc.
T1	Thermal Case 1 (Operating Temperature)
T2	Thermal Case 2 (Design Temperature)
P1	Pressure Case 1 (Operating Pressure.)



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P2	Pressure Case 2 (Design Pressure.)
HP	Hydro Test Pressure.
WW	Water Filled Weight.
WIN1	Wind
U1	Seismic
D1	Displacement
HYD	Hydro Test Case
OPE	Operating Case
SUS	Sustained Case
EXP	Expansion Case
OCC	Occasional Case

### 5.3 Calculation Note

Calculation Notes shall be issued only for lines with Flexibility Level 3. The Calculation Note will include the following minimum information:

- a) Basic design data and conditions, always including the design conditions
- b) Isometric layout of the complete piping system
- c) Anchor positions and principal displacements
- d) Input echo
- e) Load cases
- f) Report of the Main Code Stressed elements
- g) Report of Forces and Moments acting on supports and equipment nozzles calculation nodes
- h) Report of Code Compliance
- i) Report of Displacements

### 5.4 Design and Construction Modification

During the design and construction activity some changes may occur to pipe system. Major or Minor changes are defined as follows.

#### 5.4.1 Major Changes:

- a) Material modification for Pressure Parts
- b) Diameter and thickness modification (for Pressure Part)
- c) Design Temperature and Pressure variations
- d) Main modification on isometric routing
- e) Main modification on piping supports typologies and positions



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#### 5.4.2 Minor Changes:

- a) Coordinates
- b) Small modification on pipe length
- c) Additional or revised information by instrument or piping (drain, vents, etc.)
- d) Revised Text information on isometric or on Calculation Note.

Only Major Changes are recorded on the relevant Calculation Note.

Since Stress Analysis Calculation Isometrics are to be considered valid only for:

- a) Piping system routing;
- b) Calculation nodes indication;
- c) Supports typology and position indication.

Calculation Isometric shall not be updated if other than the above information on the related "Piping ISOs" are modified or if the routing modification is considered minor or if the additional support is judged by the stress engineer not to modify significantly the system stresses.

## 6.0 DOCUMENTATION AND RECORDS

6.1 The Document Control System shall have cross-references between the Critical Line List, the Stress Sketch, and the Stress Analysis File Number.

6.2 Stress analysis report shall be submitted for OGDCL approval after the stress verification has been done on the piping design. The changes due to stress analysis shall be incorporated in the drawings by EPCC CONTRACTOR.

6.3 At the completion of the project, the final versions of the Critical Line List, the Stress Sketch, and the Stress Analysis Electronic Files, including any changes made during construction or start-up, shall be submitted to the Owner's Records Department.



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## Specification for Gaskets

### REVISION DETAILS

REV	DATE	DESCRIPTION	PRPD	CHKD	REVD	APPD
00	06/05/2016	Approved for Use	Zhu Wei	Wu Yuyan	Liu Zijian	Xu Feng
C	21/03/2016	Issued for Approval	Zhu Wei	Wu Yuyan	Liu Zijian	Xu Feng
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## 1.0 GENERAL

### 1.1 Introduction

OIL & GAS Development Company Ltd. (OGDCL) is operating NASHPA Oil & Gas fields in Khyber Pakhtoonkhuwa of Islamic Republic of Pakistan. OGDCL intends to install LPG Recovery Plant, Compressors & Allied Facilities at these field.

### 1.2 Scope

This specification covers the following types of gaskets:

Non-metallic type consisting of a flat continuous non-metallic ring.

Combination type consisting of either a metallic core and non-metallic casing or a metallic retainer with non-metallic inserts for use in a High Pressure Gas pipeline and its associated equipment.

### 1.3 Definitions

Within this document the following definitions apply:

<b>Project</b>	NASHPA Gas Processing and LPG Recovery Plant PROC-FC-CB/NASHPA/PROJ-1247 /2015
<b>Company / Owner</b>	Oil & Gas Development Company Ltd.(OGDCL)
<b>Consultant</b>	Zishan Engineers (Pvt.) Ltd.
<b>Contractor</b>	Hong Kong Huihua Global Technology Limited Wholly owned Subsidiary of China OIL HBP Science and Technology Corporation Ltd.
<b>Manufacturer/Supplier/Vendor</b>	Patry(ies), which manufactures and/or supplies material, equipment and service to perform the duties as specified by CONTRACTOR in the scope of supply
<b>Shall</b>	Indicates a mandatory requirement
<b>Should</b>	Indicates a strong recommendation to comply with the requirement of this document

### 1.4 Errors or Omissions

1.4.1 The review and comment by COMPANY/CONSULTANT/CONTRACTOR of any VENDOR's drawings, procedures or documents shall only indicate acceptance of general requirements and shall not relieve VENDOR of its obligations to comply with the requirements of this specification and other related parts of the Contract Documents.

1.4.2 Any errors or omissions noted by VENDOR in this Specification shall be immediately brought to the attention of COMPANY/CONSULTANT/CONTRACTOR.





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### 1.5 Deviations

All deviations to this Specification, other related specifications or attachments shall be brought to the knowledge of COMPANY/CONTRACTOR as a section in the bid. All deviations made during the procurement, design, manufacturing, testing and inspection shall be with written approval of COMPANY/CONTRACTOR prior to execution of Work. Such deviations shall be shown in the documentation prepared by VENDOR

### 1.6 Conflicting Requirement

In the event of any conflict, inconsistency or ambiguity between VENDOR's scope of work, this Specification, National Codes and Standards, and referenced in the Project Specification or any other documents, VENDOR shall refer to COMPANY/CONTRACTOR whose decision shall prevail.

### 1.7 Reporting Procedure

1.7.1 A reporting and documentation system shall be agreed between VENDOR and COMPANY/CONSULTANT/CONTRACTOR for the status of procurement, design, manufacturing, inspection, testing and shipment of the equipment/material to be supplied under this specification. VENDOR shall provide reports and summaries for production performance and testing operations in conformance with a manufacturing schedule approved by COMPANY.

1.7.2 Daily, weekly, monthly and run summaries of all major aspects of the production process shall be provided as reports to COMPANY/CONSULTANT/CONTRACTOR.

#### 1.7.3 Third Party Inspection

In addition to the inspection and witnessing of tests by the inspectors to be appointed by the COMPANY during the manufacturing and shipment of the equipment/material, COMPANY may appoint a third party or its own inspector for witnessing of the inspection and tests to be carried out at VENDOR's facility under this specification.

### 1.8 Unit Responsibility

VENDOR shall be responsible for the complete design, manufacture, supply, fabrication, construction, installation/erection, inspection and testing of the Gaskets, including full compliance with all applicable design codes and standards, including those listed in Section 2.0 of this document and the requirements of the certifying authority, if applicable. VENDOR shall handle and expedite drawings and data, and supervise and coordinate all inspection and testing.

VENDOR shall guarantee that all material and parts included in construction of the specified Centrifugal pump shall be new, unused and of the required/ specified grade.

### 1.9 Documentation

1.9.1 Documents, calculation sheets, drawings, etc., to be submitted to the COMPANY/CONTRACTOR shall be in English Language.

1.9.2 Unless otherwise specified, the metric units shall be used in documents and drawings, except that pipe sizes, flange sizes and bolts/nuts shall be indicated in inches.



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1.9.3 The form of drawings and documents may be as per the CONTRACTOR/VENDOR's Standards. However, the format of the data sheet will be submitted to COMPANY for approval.

1.9.4 Variations from or additions to this specification shall be called to the attention of the COMPANY and approved in writing by the COMPANY prior to starting fabrication.

1.9.5 Information for installation, operating, maintenance or inspection purposes shall be submitted to COMPANY.

### 1.10 Work Procedure

1.10.1 The CONTRACTOR / SUPPLIER shall submit for approval to the COMPANY detailed procedures for:

- a. Surface cleaning / preparation
- b. Paint material storage and preparation procedure
- c. Primer application
- d. Intermediate and finish coat application
- e. Inspection and data recording procedures
- f. Paint repair procedure
- g. Painted equipment/material transportation, storage and handling procedure
- h. Type of abrasive to be used

The above procedure shall include the application equipment / tools. All procedures shall meet the minimum requirement stated in this specification.

1.10.2 Material specification for the cleaning and painting, and mixing materials, shall be submitted to the COMPANY for approval. Detailed CONTRACTOR / SUPPLIER's / manufacturer's data shall be submitted with these specifications. Material shall not be procured prior to approval of the COMPANY.

## 2.0 REFERENCE CODES & STANDARDS

ASME B16.20 Metallic Gaskets for Pipe Flanges-Ring-Joint, Spiral-Would, and Jacketed.

ASME B 16.21 Non-metallic Gaskets for Pipe Flanges

ASME B 16.5 Pipe Flanges and Flanged Fittings

## 3.0 GENERAL REQUIREMENTS

3.1 Type: The gaskets covered by this specification shall be suitable for use with RF Flanges ANSI Class 150, 300, 400 & 600, and RTJ Flanges ANSI Class 900. Ring joint shall conform to ASME B16.20 and shall be suitable for ring type joint flanges of respective standards. Ring joint gaskets shall be Oval Type.

## 4.0 PRESSURE TEMPERATURE RATING

All gaskets covered by this specification shall be suitable for use with natural gas at the maximum operating pressure and temperature.



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## 5.0 GOVERNING SPECIFICATIONS

5.1 Gaskets up to and including 609.6mm (24 inch) size shall conform to ANSI B16.5 Annex E latest edition, except as allowed for, in sub-clause 16.6.4 (b).

5.2 If a proprietary combination gasket offered does not conform entirely to the standards called for in sub-clause 16.6.4 (a) then the Manufacturer must provide sufficient substantiating evidence with his tender to enable the Purchaser to satisfy himself of the gaskets suitability for use under all the conditions specified.

5.3 Corrugated insert gasket as per ASME B 16.20 shall match flanges to ASME B 16.5 upto 24"

5.4 Spiral wound gasket as per ASME B 16.20 shall match flanges to ASME B 16.5 upto 24".

5.5 Non metallic gasket as per ASME B 16.21 shall match flanges to ASME B 16.5 upto 24".

5.6 Oval ring, soft iron gasket as per ASME B 16.20 shall match flanges to ASME B 16.5 upto 24"

## 6.0 DIMENSIONS

6.1 Non-metallic and combination type

Gaskets up to (24 inches) in size excluding (22 inches) shall conform to ANSI B 16.5 Latest edition.

I.D. of Gasket (G) shall be as listed.

O. D. of Gasket (R) shall be increased to the bolt P.C.D minus one bolt diameter of the flange.

6.2 All gaskets shall be of the thickness and finish suitable for use at the design and service conditions specified.

6.3 All gaskets shall offer a continuous face to their adjacent flanges.

## 7.0 MATERIALS

### 7.1 Non-metallic gaskets

Shall be made either from Klingerite, or other similar proprietary material recommended by the manufacturer as suitable for use at the specified design and service conditions.

### 7.2 Combination gaskets

All metallic components shall be spiral wound 304 or 316 SS.

All non-metallic components must be either creep resistant or suitably restrained by the metallic parts, and free from any age hardening properties which would ultimately impair their sealing properties.

## 8.0 INSPECTION

Visual inspection only, at the Purchaser's option, will be required.

## 9.0 MARKING

Each gasket shall be clearly tagged by the Manufacturer with:

- a. Flange size



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b. Flange rating

## 10.0 PACKING

Gaskets shall be packed so as to prevent damage during shipment.



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DOC. NO. NGP-000-PIP-15.03-0007-00

DESCRIPTION Specification for Stud Bolts and Nuts

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## 1.0 GENERAL

### 1.1 Introduction

OIL & GAS Development Company Ltd. (OGDCL) is operating NASHPA Oil & Gas fields in Khyber Pakhtunkhwa of Islamic Republic of Pakistan. OGDCL intends to install LPG Recovery Plant, Compressors & Allied Facilities at this field.

### 1.2 Scope

This specification covers the minimum technical requirement for design, manufacture, supply, inspection, testing and commissioning of Stud Bolts and Nuts to be used in NASHPA Gas Processing and LPG Recovery Plant PROC-FC-CB/NASHPA/PROJ-1247 /2015.

### 1.3 Definitions

Within this document the following definitions apply:

<b>Project</b>	NASHPA Gas Processing and LPG Recovery Plant PROC-FC-CB/NASHPA/PROJ-1247 /2015
<b>Company/Owner</b>	Oil & Gas Development Company Ltd.(OGDCL)
<b>Consultant</b>	Zishan Engineers (Pvt.) Ltd.
<b>Contractor</b>	Hong Kong Huihua Global Technology Limited Wholly owned Subsidiary of China OIL HBP Science and Technology Corporation Ltd.
<b>Manufacturer/Supplier/Vendor</b>	Party(ies), which manufactures and/or supplies material, equipment and service to perform the duties as specified by CONTRACTOR in the scope of supply
<b>Shall</b>	Indicates a mandatory requirement
<b>Should</b>	Indicates a strong recommendation to comply with the requirement of this document

### 1.4 Errors or Omissions

1.4.1 The review and comment by COMPANY/CONSULTANT/CONTRACTOR of any VENDOR's drawings, procedures or documents shall only indicate acceptance of general requirements and shall not relieve VENDOR of its obligations to comply with the requirements of this specification and other related parts of the Contract Documents.

1.4.2 Any errors or omissions noted by VENDOR in this Specification shall be immediately brought to the attention of COMPANY/CONSULTANT/CONTRACTOR.

### 1.5 Deviations





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All deviations to this Specification, other related specifications or attachments shall be brought to the knowledge of COMPANY/CONTRACTOR as a section in the bid. All deviations made during the procurement, design, manufacturing, testing and inspection shall be with written approval of COMPANY/CONTRACTOR prior to execution of Work. Such deviations shall be shown in the documentation prepared by VENDOR.

### 1.6 Conflicting Requirement

In the event of any conflict, inconsistency or ambiguity between VENDOR's scope of work, this Specification, National Codes and Standards, and referenced in the Project Specification or any other documents, VENDOR shall refer to COMPANY/CONTRACTOR whose decision shall prevail.

### 1.7 Reporting Procedure

1.7.1 A reporting and documentation system shall be agreed between VENDOR and COMPANY/CONSULTANT/CONTRACTOR for the status of procurement, design, manufacturing, inspection, testing and shipment of the equipment/material to be supplied under this specification. VENDOR shall provide reports and summaries for production performance and testing operations in conformance with a manufacturing schedule approved by COMPANY.

1.7.2 Daily, weekly, monthly and run summaries of all major aspects of the production process shall be provided as reports to COMPANY/CONSULTANT/CONTRACTOR.

#### 1.7.3 Third Party Inspection

In addition to the inspection and witnessing of tests by the inspectors to be appointed by the COMPANY during the manufacturing and shipment of the equipment/material, COMPANY may appoint a third party or its own inspector for witnessing of the inspection and tests to be carried out at VENDOR's facility under this specification.

### 1.8 Unit Responsibility

VENDOR shall be responsible for the complete design, manufacture, supply, fabrication, construction, installation/erection, inspection and testing of Stud Bolts and Nuts, including full compliance with all applicable design codes and standards, including those listed in Section 2.0 of this document and the requirements of the certifying authority, if applicable. VENDOR shall handle and expedite drawings and data, and supervise and coordinate all inspection and testing.

VENDOR shall guarantee that all material and parts included in construction of the specified Stud Bolts and Nuts shall be new, unused and of the required/ specified grade.

### 1.9 Documentation

1.9.1 Documents, calculation sheets, drawings, etc., to be submitted to the COMPANY/CONTRACTOR shall be in English Language.

1.9.2 Unless otherwise specified, the metric units shall be used in documents and drawings, except that pipe sizes, flange sizes and bolts/nuts shall be indicated in inches.

1.9.3 The form of drawings and documents may be as per the CONTRACTOR/VENDOR's Standards. However, the format of the data sheet should be submitted to COMPANY by VENDOR for approval.



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1.9.4 Variations from or additions to this specification shall be called to the attention of the COMPANY and approved in writing by the COMPANY prior to starting fabrication.

1.9.5 Information for installation, operating, maintenance or inspection purposes shall be submitted to COMPANY.

## 2.0 CODES AND STANDARDS

### 2.1 Codes, Standards and Regulations

Stud Bolts and Nuts shall be designed, manufactured and tested in accordance with the requirements of this specification, other referenced Project Specifications and the Latest Editions of following Codes, Standards and Statutory Regulations (where applicable):

ASME B1.1	Unified Inch Screw Threads
ASME B16.5	Pipe Flanges and Flanged Fittings NPS 1/2 Through NPS 24 Metric/Inch Standard
ANSI B18.2.1	Square, Hex, Heavy Hex, and Askew Head Bolts and Hex, Heavy Hex, Hex Flange, Lobed Head, and Lag Screws (Inch Series)
ANSI B18.2.2	Nuts for General Applications: Machine Screw Nuts, Hex, Square, Hex Flange, and Coupling Nuts (Inch Series)
ANSI B 1.20.1	Pipe Threads, General Purpose(Inch)
ASTM A193	Standard Specification for Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature Service
ASTM A194	Standard Specification for Carbon and Alloy Steel Nuts for Bolts for High Pressure or High Temperature Service, or Both
ASTM A320	Standard Specification for Alloy-Steel and Stainless Steel Bolting Materials for Low-Temperature Service
ASTM A307	Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength

2.2 In addition to the requirements of this General Specification, all requirements of the governing Statutory Authority, i.e., in the country and/or its subdivision where Stud Bolts and Nuts are to be installed, shall be met.

### 2.3 Project Specification

Piping Material Specification	NGP-000-PIP-15.03-0001-00
Specification for Steel Flanges	NGP-000-PIP-15.03-0011-00

## 3.0 ENVIRONMENTAL DESIGN CRITERIA



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### 3.1 Environmental Data

Environmental conditions for Stud Bolts and Nuts covered by this specification shall be in accordance with Specification 'Environmental Conditions' (NGP-000-COM-15.05-0001-00).

### 4.0 SIZES

This specification covers sizes from 12.7 to 89 mm (1/2" to 3-1/2") bolt diameter.

Length for standard flange assembly shall be in accordance with ASME B16.5. Length for special flange assembly (e.g. Wafer valve, spectacle blind and so on) is specified in the Material Requisition."

### 5.0 TYPE

Each stud bolt shall be threaded full length and supplied with two hexagonal head nuts and two washers.

### 6.0 DIMENSIONS

Dimensions shall be in accordance with ANSI B18.2.

### 7.0 MATERIALS

Stud bolts shall be alloy steel in accordance with ASTM A193 Grade B7, Hot Dip Galvanized plated,  
ASTM A320 Grade L7, Hot Dip Galvanized plated,  
ASTM A320 Grade B8.

Nuts shall be carbon steel to ASTM A194 Grade 2H, Heavy Hex , Hot Dip Galvanized plated,  
ASTM A194 Grade 7, Heavy Hex, Hot Dip Galvanized plated,  
ASTM A194 Grade 8A, Heavy Hex (Impact Tested).

Washers shall be in accordance with ASTM A307.

Nuts machined from bar stock in such a manner that the axis will be parallel to the direction of rolling of the bar are not acceptable.

### 8.0 THREADS

All bolting supplied to this specification shall be threaded in accordance with ANSI B1.1.

Stud bolts shall have Class 2A dimension. Nuts shall have Class 2B dimensions.

### 9.0 PACKING

All stud bolts shall be suitably protected so as to prevent rust and/or mechanical damage during transit.

The method of protection shall be approved by the Purchaser.

### 10.0 INSPECTION

Unless otherwise indicated in the Purchase Order all material shall be subject to inspection by the Purchaser or his representative.



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### 11.0 CERTIFICATION

The CONTRACTOR/SUPPLIER shall furnish certificates of compliance with the relevant specification and of chemical analyses and mechanical tests carried out.



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PROJECT NO.: NASHPA 1247



DOCUMENT NO.:  
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## Specification for Carbon and Stainless Steel Pipes

### REVISION DETAILS

REV	DATE	DESCRIPTION	PRPD	CHKD	REVD	APPD
			<i>Lan Houdong</i>	<i>Wang Shaobo</i>	<i>Liu Zijian</i>	<i>Xu Feng</i>
02	29/06/2016	Approved for Use	Lan Houdong	Wang Shaobo	Liu Zijian	Xu Feng
01	16/05/2016	Approved for Use	Lan Houdong	Wang Shaobo	Liu Zijian	Xu Feng
00	09/05/2016	Approved for Use	Lan Houdong	Wang Shaobo	Liu Zijian	Xu Feng
C	21/03/2016	Issued for Approval	Lan Houdong	Wang Shaobo	Liu Zijian	Xu Feng
B	25/01/2016	Issued for Review	Lan Houdong	Wang Shaobo	Liu Zijian	Xu Feng
A	10/01/2016	Internal Discipline Check	Lan Houdong	Wang Shaobo	Liu Zijian	Xu Feng



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### REVISION HISTORY

REV.	DATE	REVISION DESCRIPTION
A	10/01/2016	Internal Discipline Check
B	25/01/2016	Issued for Review
C	21/03/2016	Issued for Approval
00	09/05/2016	Approved for Use
01	16/05/2016	Approved for Use
02	29/06/2016	Approved for Use



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## 1.0 GENERAL

### 1.1 Introduction

OIL & GAS Development Company Ltd. (OGDCL) is operating NASHPA Oil & Gas fields in Khyber Pakhtunkhwa of Islamic Republic of Pakistan. OGDCL intends to install LPG Recovery Plant, Compressors & Allied Facilities at this field.

### 1.2 Scope

This specification covers the minimum technical requirement for design, manufacture, supply, inspection, testing and commissioning of Carbon and Stainless Steel Pipes to be used in NASHPA Gas Processing and LPG Recovery Plant PROC-FC-CB/NASHPA/PROJ-1247 /2015.

### 1.3 Definitions

Within this document the following definitions apply:

<b>Project</b>	NASHPA Gas Processing and LPG Recovery Plant PROC-FC-CB/NASHPA/PROJ-1247 /2015
<b>Company/Owner</b>	Oil & Gas Development Company Ltd.(OGDCL)
<b>Consultant</b>	Zishan Engineers (Pvt.) Ltd.
<b>Contractor</b>	Hong Kong Huihua Global Technology Limited Wholly owned Subsidiary of China OIL HBP Science and Technology Corporation Ltd.
<b>Manufacturer/Supplier/Vendor</b>	Party(ies), which manufactures and/or supplies material, equipment and service to perform the duties as specified by CONTRACTOR in the scope of supply
<b>Shall</b>	Indicates a mandatory requirement
<b>Should</b>	Indicates a strong recommendation to comply with the requirement of this document

### 1.4 Errors or Omissions

1.4.1 The review and comment by COMPANY/CONSULTANT/CONTRACTOR of any VENDOR's drawings, procedures or documents shall only indicate acceptance of general requirements and shall not relieve VENDOR of its obligations to comply with the requirements of this specification and other related parts of the Contract Documents.

1.4.2 Any errors or omissions noted by VENDOR in this Specification shall be immediately brought to the attention of COMPANY/CONSULTANT/CONTRACTOR.

### 1.5 Deviations





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All deviations to this Specification, other related specifications or attachments shall be brought to the knowledge of COMPANY/CONTRACTOR as a section in the bid. All deviations made during the procurement, design, manufacturing, testing and inspection shall be with written approval of COMPANY/CONTRACTOR prior to execution of Work. Such deviations shall be shown in the documentation prepared by VENDOR

### 1.6 Conflicting Requirement

In the event of any conflict, inconsistency or ambiguity between VENDOR's scope of work, this Specification, National Codes and Standards, and referenced in the Project Specification or any other documents, VENDOR shall refer to COMPANY/CONTRACTOR whose decision shall prevail.

### 1.7 Reporting Procedure

1.7.1 A reporting and documentation system shall be agreed between VENDOR and COMPANY/CONSULTANT/CONTRACTOR for the status of procurement, design, manufacturing, inspection, testing and shipment of the equipment/material to be supplied under this specification. VENDOR shall provide reports and summaries for production performance and testing operations in conformance with a manufacturing schedule approved by COMPANY.

1.7.2 Daily, weekly, monthly and run summaries of all major aspects of the production process shall be provided as reports to COMPANY/CONSULTANT/CONTRACTOR.

#### 1.7.3 Third Party Inspection

In addition to the inspection and witnessing of tests by the inspectors to be appointed by the COMPANY during the manufacturing and shipment of the equipment/material, COMPANY may appoint a third party or its own inspector for witnessing of the inspection and tests to be carried out at VENDOR's facility under this specification.

### 1.8 Unit Responsibility

VENDOR shall be responsible for the complete design, manufacture, supply, fabrication, construction, installation/erection, inspection and testing of Carbon and Stainless Steel Pipes, including full compliance with all applicable design codes and standards, including those listed in Section 2.0 of this document and the requirements of the certifying authority, if applicable. VENDOR shall handle and expedite drawings and data, and supervise and coordinate all inspection and testing.

VENDOR shall guarantee that all material and parts included in construction of the specified Carbon and Stainless Steel Pipes shall be new, unused and of the required/ specified grade.

### 1.9 Documentation

1.9.1 Documents, calculation sheets, drawings, etc., to be submitted to the COMPANY/CONTRACTOR shall be in English Language.

1.9.2 Unless otherwise specified, the metric units shall be used in documents and drawings, except that pipe sizes, flange sizes and bolts/nuts shall be indicated in inches.

1.9.3 The form of drawings and documents may be as per the CONTRACTOR/VENDOR's Standards. However, the format of the data sheet should be submitted to COMPANY by VENDOR for approval.



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1.9.4 Variations from or additions to this specification shall be called to the attention of the COMPANY and approved in writing by the COMPANY prior to starting fabrication.

1.9.5 Information for installation, operating, maintenance or inspection purposes shall be submitted to COMPANY.

## 2.0 CODES AND STANDARDS

### 2.1 Codes, Standards and Regulations

Carbon and Stainless Steel Pipes shall be designed, manufactured and tested in accordance with the requirements of this specification, other referenced Project Specifications and the Latest Editions of following Codes, Standards and Statutory Regulations (where applicable):

ASTM A106	Standard Specification for Seamless Carbon Steel Pipe for High-Temperature Service
ASTM A312	Standard Specification for Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes
ASTM A333	Standard Specification for Seamless and Welded Steel Pipe for Low-Temperature Service
ASME B36.10	Welded and Seamless Wrought Steel Pipe
ASME B36.19	Stainless Steel Pipe
ASME B1.20.1	Pipe Threads, General Purpose (Inch)
ASME B31.3	Process Piping
MSS-SP-25	Standard Marking System for Valves, Fittings, Flanges, and Unions
API 5L	Specification for Line Pipe

2.2 In addition to the requirements of this General Specification, all requirements of the governing Statutory Authority, i.e., in the country and/or its subdivision where Carbon and Stainless Steel Pipes are to be installed, shall be met.

### 2.3 Project Specification

Piping Material Specification	NGP-000-PIP-15.03-0001-00
Specification for Coating and Painting	NGP-000-PAI-15.03-0001-00
Specifications for Export Packing and Crating	NGP-000-COM-15.05-0002-00

## 3.0 ENVIRONMENTAL DESIGN CRITERIA

### 3.1 Area Classification



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The area classification for Carbon and Stainless Steel Pipes will be as indicated in Material take-off.

### 3.2 Environmental Data

Environmental conditions for Carbon and Stainless Steel Pipes covered by this specification shall be in accordance with Specification 'Environmental Conditions' (NGP-000-COM-15.05-0001-00).

## 4.0 GENERAL REQUIREMENTS

4.1 Carbon Steel, seamless and welded pipes for high temperature services as per ASTM specification of A106 Gr. B or API 5L Gr. B.

4.2 Carbon Steel, seamless pipes for Low temperature services as per ASTM specification of A333 Gr.6.

4.3 Carbon Steel Seamless, Galvanized, Screwed ended as per ASTM specification of A106 Gr. B.

4.4 Austenitic Stainless Steel Seamless Pipes as per ASTM specifications of A312 Gr.TP304; 18" to 24" Austenitic Stainless Steel Pipes as per ASTM A 312 TP 304 straight seam welded, and the weld joint strength reduction factor is 1.0.

4.5 The design, dimensions and weight of Carbon and Stainless Steel pipes shall comply with ASME B36.10M.

4.6 Unless specified otherwise, Pipes NPS ¼" through NPS 26 shall be furnished in single random length.

4.7 Except where threaded pipe is specified, NPS 1 ½" and smaller pipe shall be furnished with plain ends, Cut Square.

4.8 Pipes NPS 2 and larger shall be with beveled ends to an angle of 30° + 5° - 0° measured from a perpendicular drawn to the axis of the pipe with a root face of 1.6 mm ± 0.5mm.

4.9 Threaded pipe shall be furnished with taper-threaded ends in accordance with ASME B1.20.1.

4.10 For a distance of 100mm both ends of the pipe, variation in outside diameter shall not be more than +0.5% or -0.1% max.

4.11 In case of wall thickness variation, wall thickness shall not deviate from the nominal thickness by more than 12.5% or -12.5%.

4.12 The weight of finished length of pipe shall not be less than 98.5%.

4.13 Pipe not in accordance with the purchase order and this specification shall be subject to rejection.

4.14 The CONTRACTOR/SUPPLIER shall refer all conflicts between the requirements of the purchase order and this Specification to the COMPANY in writing, for clarification and resolution before proceeding with the manufacture and or procurement of the affected pipe.

4.15 Any substitution to, or variance from, this specification or purchase order require written approval from the COMPANY before implementation.

4.16 The CONTRACTOR/SUPPLIER shall have an established, routine, and documented quality control program. When requested, the CONTRACTOR / SUPPLIER shall submit this quality control program to the COMPANY for approval.





**5.0 MATERIAL**

5.1 Material used in the manufacturing of pipes shall be new and unused.

5.2 The Steel shall be made by one or more of the following processes: open-hearth, electric-furnace or basic-oxygen process, and shall be fully killed and made to fine grain practice.

5.3 Carbon Steel / Stainless Steel pipes shall conform to the requirements of chemical composition prescribed in Table 1 of the relevant ASTM Specifications.

5.4 At the request of the COMPANY an analysis for chemical composition shall be done. For this analysis, two pipes from each lot made by the CONTRACTOR / SUPPLIER. The result of these analyses shall be reported to the COMPANY.

5.5 Pipes shall have a maximum hardness of 235 BHN (HRC 22), shall not have more than 1.0% nickel content and shall not include hardenable steel such as AISI – 4140.

**6.0 TESTING & INSPECTION**

6.1 All CONTRACTOR / SUPPLIER facilities, materials, and fabrication work shall be subject to inspection by the COMPANY.

6.2 Pipe containing defects originating with the CONTRACTOR / SUPPLIER design, materials, or workmanship, or which are not in complete compliance with the requirements of the purchase order and referenced documents will be subject to rejection.

6.3 Inspection and acceptance of the pipe by the COMPANY does not relieve the CONTRACTOR / SUPPLIER of the responsibility to comply with the requirements of this specification and the purchase order.

6.4 The Pipes CONTRACTOR /SUPPLIER shall perform all testing and examination required by the referenced standards and the purchase order.

6.5 Impact testing, when required, shall meet the requirements of ASME B31.3.

**7.0 FLOW LINES**

**7.1 General Requirements**

7.1.1 The Carbon Steel pipe used for flow lines from existing NASHPA-1, 2, 3, 4 & MELA – NASHPA trunk line to each individual’s scrapper receiver, as well as the pipe material strength/grade, shall comply with the prescription of API 5L X52 PSL2.

7.1.2 The finished pipes shall meet the requirements stated in tables below for tensile properties.

Table 1 Tensile Properties

Grade	YS Mpa		TS Mpa		Elongation% minimum (on 50mm or 2 inch)
	Min,	Max.	min.	Max.	
API 5L	360	530	460	760	As per API 5L



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7.1.3 The rest of requirements shall be in accordance with the detail of 4.10 to 4.16 in section 4.0 “general requirements”.

## 7.2 Material

7.2.1 Material used in the manufacturing of pipes shall be new and unused.

7.2.2 The Steel shall be made by one or more of the following processes: open-hearth, electric-furnace or basic-oxygen process, and shall be fully killed and made to fine grain practice. The requirements of product specification level 2 (PSL2) to API 5L shall be applied.

7.2.3 The carbon steel pipe used for flow lines shall be manufactured from steel which shall have a chemical composition ensuring proper ductility, strength, toughness and weld-ability under all conventional welding process and techniques. The chemical elements shall comply with Table 5 of API 5L.

7.2.4 At the request of the COMPANY an analysis for chemical composition shall be done. For this analysis, two pipes from each lot made by the CONTRACTOR / SUPPLIER. The result of these analyses shall be reported to the COMPANY.

7.2.5 The procedure qualification shall meet the requirements of API 5L, Annex B.

## 7.3 Testing & Inspection

7.3.1 All CONTRACTOR / SUPPLIER facilities, materials, and fabrication work shall be subject to inspection by the COMPANY.

7.3.2 Pipe containing defects originating with the CONTRACTOR / SUPPLIER design, materials, or workmanship, or which are not in complete compliance with the requirements of the purchase order and referenced documents will be subject to rejection.

7.3.3 Inspection and acceptance of the pipe by the COMPANY does not relieve the CONTRACTOR / SUPPLIER of the responsibility to comply with the requirements of this specification and the purchase order.

7.3.4 The Pipes CONTRACTOR /SUPPLIER shall perform all testing and examination required by the referenced standards and the purchase order.

7.3.5 Impact testing, when required, shall meet the requirements of API 5L, section 9.8.27(20). The average Charpy absorbed energy for pipe body shall be minimum 27J, and individual test value for any test piece shall be no less than 75% of the required minimum average absorbed energy values.

## 8.0 MARKING

8.1 All Marking Shall be in English.

8.2 Both ends of each pipe length shall be externally hard die stamped as a minimum with following information or according to the marking requirements of MSS-SP-25 and any additional requirements contained in the applicable material specifications:

n Heat/Cast No.



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- n Material/Manufacturer's Name
- n Outside diameter/ wall thickness
- n Work Inspector/Inspection Authority

**8.3** Marking shall be stenciled on the inside of the pipe within 200mm of the beveled ends.

**8.4** The pipes may be carefully die stamped on the Beveled end.

## **9.0 ENGINEERING DATA REQUIREMENTS**

### **9.1 General**

9.1.1 All records indicated herein shall be fully identified with the specific materials they represent. All records shall be available for examination to the COMPANY by the CONTRACTOR / SUPPLIER at the time and place of inspection.

9.1.2 If Engineering data beyond those listed in this Practice are required, a statement of those requirements shall be included in the request for quotation and/or the purchase order.

9.1.3 All required engineering data shall be in English.

### **9.2 Welding Procedures**

Welding Procedure Specifications (WPS) and Procedure Qualification Records (PQR), if applicable, shall be in accordance with ASME Boiler and Pressure Vessel Code, Section IX. Individual WPSs and PQRs shall be available for examination upon request.

### **9.3 Material Test Reports**

CONTRACTOR / SUPPLIER shall furnish Material Test Reports (MTRs) that show actual results of chemical analyses, mechanical tests, impact test results (if applicable), and heat treatment (if applicable) in compliance with the referenced material specification. The test reports shall be traceable to each production lot. These documents shall be identified with COMPANY order number and shall be signed by the CONTRACTOR / SUPPLIER.

### **9.4 Certificate**

CONTRACTOR / SUPPLIER shall be liable to provide certificates of the manufactured pipes. This certificate in addition to the information required by specification A530/ A530M, the certification shall state whether or not the material was hydraulically tested. In case of nondestructively tested, the certificate shall so state.

## **10.0 SHIPPING AND HANDLING**

**10.1** Pipe shall be prepared for shipment in a manner that damages or atmospheric corrosion of internal or external surfaces is avoided during storage and transport.

**10.2** Pipe ends shall be protected with wood, plastic, or metal covers. These covers shall protect the ends and prevent dirt and other foreign matter from entering the interior. Butt welding bevels are protected with metal covers, a layer of nonmetallic material shall also be provided between the butt-welding bevel and the metal cover. Tape shall not be used as the sole covering method.



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- 10.3** Machined or threaded surfaces of Ferritic pipe shall be coated with an easily removable rust preventative compound, unless otherwise specified by purchaser. Pipe cleaned for special service shall not have rust preventative compound applied.
- 10.4** The CONTRACTOR/SUPPLIER shall give assurance of required vapor-proof barrier material for Austenitic Stainless Steel pipe.
- 10.5** The Packing of the pipes shall also meet the packing requirements as detailed in Specification for Export Crating and Packing (NGP-000-COM-15.05-0002-00).

# **APPENDIX-L**



**Appendix – L**

<b>OVERALL WEIGHT FACTORS</b>		
<b>A</b>	<b>Construction</b>	<b>80.00</b>
	– Civil	25.00
	– Mechanical	50.00
	– Electrical	10.00
	– Instrumentation	15.00
<b>B</b>	<b>Pre-commissioning, Commissioning, Training and Testing</b>	<b>20.00</b>
<b>T O T A L:</b>		<b>100.00</b>

# **APPENDIX-L1**

## APPENDIX-L1

### 1.0. CONSTRUCTION, INSTALLATION, PRE-COMMISSIONING, COMMISSIONING AND START UP.

The construction progress will be measured in accordance with the standard Work Breakdown Structure (WBS), by quantitative work volume which will be based on the Bill of Quantities (BOQ).

The following functional work breakdown will be applied for the progress measurement of the construction:

<b>Sr. No.</b>	<b>Discipline</b>	<b>Weighted %</b>	<b>Cumulative Weighted %</b>
<b>1.1</b>	<b>Construction Works</b>	<b>80.0%</b>	<b>80.0%</b>
1.1.1	Civil Works	25.0%	20.0%
1.1.2	Mechanical Works	50.0%	60.0%
1.1.3	Electrical Works	10.0%	68.0%
1.1.4	Instrumentation Works	15.0%	80.0%
<b>1.2</b>	<b>Commissioning &amp; Start Up</b>	<b>20.0%</b>	<b>100.0%</b>

### 1.1 Construction Works

#### 1.1.1. CIVIL WORKS

The breakdown of the civil works into various sub-categories is given below:

<b>Sr. No.</b>	<b>Discipline</b>	<b>Weighted %</b>
1.1.1.1	Pipe Rack / Supports	20.0%
1.1.1.2	Equipment Foundations	45.0%
1.1.1.3	Underground Services	15.0%
1.1.1.4	Leveling / Grading Works, Concrete Paving, Gravel Works	20.0%

### 1.1.1.1. Pipe Rack / Supports

Stage	Weighted %	Cumulative Weighted %
Layout and Marking	4.0%	4.0%
Excavation for Foundation	15.0%	19.0%
Blinding Concrete	5.0%	24.0%
Formwork for Foundations	20.0%	44.0%
Rebar placing and binding	20.0%	64.0%
Concreting and Curing etc.	30.0%	94.0%
Back Filling	4.0%	98.0%
Punch list	2.0%	100.0%

### 1.1.1.2. Equipment Foundations

Stage	Weighted %	Cumulative Weighted %
Layout and Marking	5.0%	5.0%
Excavation for Foundation / Pile Drilling	10.0%	15.0%
Formwork for foundations	10.0%	25.0%
Blinding Concrete	5.0%	30.0%
Rebar placing and binding for Foundations	15.0%	45.0%
Concreting and curing etc.	48.0%	93.0%
Backfilling	5.0%	98.0%
Punch List	2.0%	100.0%

### 1.1.1.3. Underground Services

Stage	Weighted %	Cumulative Weighted %
Layout and Marking	5.0%	5.0%
Excavation for Trenches / Crossings	23.0%	28.0%
Filling of fine sand	15.0%	43.0%
Blinding Concrete/Brick Laying	10.0%	53.0%
Rebar placing and binding	10.0%	63.0%

Concreting & Curing / Crossings	20.0%	88.0%
Backfilling	10.0%	98.0%
Punch List	2.0%	100.0%

#### 1.1.1.4. LEVELING / GRADING WORKS, CONCRETE PAVING, GRAVEL WORKS

##### a. Leveling / Grading Works

Stage	Weighted %	Cumulative Weighted %
Layout and Marking	10.0%	10.0%
Cutting	40.0%	50.0%
Filling and Compaction	48.0%	98.0%
Punch List	2.0%	100.0%

##### b. Concrete Paving

Stage	Weighted %	Cumulative Weighted %
Layout and Marking	10.0%	10.0%
Excavation	20.0%	30.0%
Blinding Concrete	10.0%	40.0%
Formwork	10.0%	50.0%
Rebar	10.0%	60.0%
Concreting / Curing etc.	28.0%	88.0%
Back Filling	10.0%	98.0%
Punch List	2.0%	100.0%

##### c. Gravel Works

Stage	Weighted %	Cumulative Weighted %
Layout and Marking	10.0%	10.0%
Surface Compaction	20.0%	30.0%
Base coarse, laying and compaction	68.0%	98.0%
Punch List	2.0%	100.0%

## 1.1.2. MECHANICAL WORKS

The breakdown of the mechanical works into various sub-categories is given below:

Sr. No.	Stage	Weighted %
1.1.2.1	Reciprocating Compressor Packages Installation	35.0%
1.1.2.2	Instrument Air Compressor & Air Dryer Installation	8.0%
1.1.2.3	Piping Shop Fabrication	10.0%
1.1.2.4	Piping Field Fabrication Installation	27.0%
1.1.2.5	Structure Fabrication Installation	20.0%

### 1.1.2.1 Reciprocating Compressor Packages Installation

Stage	Weighted %	Cumulative Weighted %
Marking/level checking of foundation	5.0%	5.00%
Grouting of shims on foundation	10.0%	15.0%
Rigging study	10.0%	25.0%
Marking of Equipment	2.0%	27.0%
Placement and fixing on foundation	50.0%	77.0%
Initial alignment	5.0%	82.0%
Stress free connection checking	3.0%	85.0%
Final alignment	3.0%	88.0%
Protocol witness	3.0%	91.0%
Rotation check	2.0%	93.0%
Hot bolting	2.0%	95.0%
Punch List	5.0%	100.0%

### 1.1.2.2 Instrument Air Compressor & Air Dryer Installation

Stage	Weighted %	Cumulative Weighted %
Marking/level checking of foundation	5.0%	5.0%
Grouting of shims on foundation	11.0%	16.0%
Rigging study	5.0%	21.0%
Marking of Equipment	5.0%	26.0%
Placement on foundation	45.0%	71.0%
Alignment on X, Y and Z axis	10.0%	81.0%
Fixing	5.0%	86.0%
Protocol witness	3.0%	89.0%
Hot bolting	5.0%	94.0%
Installation of Filters, Cartridge / Strainers Elements etc.	2.0%	96.0%
Punch List	4.0%	100.0%

### 1.1.2.3 Piping Shop Fabrication

Stage	Weighted %	Cumulative Weighted %
Marking and cutting of pipes	14.0%	14.0%
Fit up	10.0%	24.0%
Inspection	3.0%	27.0%
Welding	15.0%	42.0%
Inspection (Radiography)	5.0%	47.0%
Inspection (Visual)	1.0%	48.0%
Marking and cutting of support material	3.0%	51.0%
Fit up	10.0%	61.0%
Inspection	3.0%	64.0%

Welding	15.0%	79.0%
Inspection	2.0%	81.0%
Inspection (Visual)	1.0%	82.0%
Sand Blasting and Painting	5.0%	87.0%
Stacking of spools in the yard	5.0%	92.0%
Leak Test	2.0%	94.0%
Flushing / Air Blowing	2.0%	96.0%
Punch list	4.0%	100.0%

#### 1.1.2.4 Piping Field Fabrication Installation

Stage	Weighted %	Cumulative Weighted %
Fit up for support installation	13.0%	13.0%
Welding	15.0%	28.0%
Inspection	2.0%	30.0%
Inspection (Visual)	1.0%	31.0%
Shifting of prefabricated spools at site	3.0%	34.0%
Fit up of Piping spools at site	10.0%	44.0%
Inspection	2.0%	46.0%
Welding	15.0%	61.0%
Inspection (Radiography)	5.0%	66.0%
Inspection (Visual)	1.0%	67.0%
Pressure test	12.0%	79.0%
Sand Blasting and Painting	12.0%	91.0%
Hot bolting	3.0%	94.0%
Leak Test	2.0%	96.0%
Flushing / Air Blowing	2.0%	98.0%
Punch list	2.0%	100.0%



### 1.1.2.5. Structure Fabrication Installation

<b>Stage</b>	<b>Weighted %</b>	<b>Cumulative Weighted %</b>
Marking and cutting of material	10.0%	10.00%
Cutting of main members	10.0%	20.0%
Cutting of base plates	10.0%	30.0%
Drilling	13.0%	43.0%
Cutting of Secondary members	15.0%	58.0%
Drilling of secondary members	10.0%	68.0%
Welding	20.0%	88.0%
Sand Blasting and Painting	10.0%	98.0%
Punch List	2.0%	100.0%

### 1.1.3. ELECTRICAL WORKS

The breakdown of the electrical works into various sub-categories is given below:

Sr. No.	Stage	Weighted %
1.1.3.1	Cable Laying (MCC-CCR / Field Package)	15.0%
1.1.3.2	Panel Installation / Modification Works	15.0%
1.1.3.3	Earthing Work & Lightning Protection	15.0%
1.1.3.4	Plant Lighting Work	15.0%
1.1.3.5	Electrical Heat Tracing	10.0%
1.1.3.6	Electrical Equipment Installation	10.0%
1.1.3.7	Cathodic Protection	10.0%
1.1.3.8	Cable Termination	10.0%

#### 1.1.3.1. Cable Laying

Stage	Weighted %	Cumulative Weighted %
Laying of power cable and tagging at both ends	17.0%	17.0%
Laying of control cable and tagging at both ends	17.0%	34.0%
Cable dressing	5.0%	39.0%
Excavation & Back filling of cable trench (caution tape, sand and bricks to be required)	5.0%	44.0%
Installation of Cable Trays	20%	64.0%
Termination of power cables	17.0%	81.0%
Termination of control cables	17.0%	98.0%
Punch List	2.0%	100.0%

### 1.1.3.2. Panel Installation (Lighting Distribution Boards) / Modification Works (MCC ROOM / UPS)

Stage	Weighted %	Cumulative Weighted %
Case opening and inspection of Package MCC Panels, LDBs for any damage due to transportation	5.0%	5.0%
Package MCC Panel & LDB Placement at field /MCC Room, leveling and grouting etc.	40.0%	45.0%
Cable tray (ladder type) installation/fixing in the trench for Power & control cables	10.0%	55.0%
Check & verification of existing spare breakers to be used in MDB, UPS DB & MCC, & Termination of power cables.	35.0%	90.0%
Earthing of panels	8.0%	98.0%
Punch List	2.0%	100.0%

### 1.1.3.3. Earthing Works & Lightning Protection

Stage	Weighted %	Cumulative Weighted %
Preparation of earthing pits	25.0%	25.0%
Insertion of earthing rods into pits and interconnection of earthing pits	20.0%	45.0%
Laying of earthing conductor	15.0%	60.0%
Termination of earthing conductor to individual equipment	15.0%	75.0%
Installation of lightning arrestors	15.0%	90.0%
Termination of earthing conductor to each arrestor	8.0%	98.0%
Punch List	2.0%	100.0%

#### 1.1.3.4. Plant Lighting Works

Stage	Weighted %	Cumulative Weighted %
Checking of pole foundation	5.0%	5.0%
Pole installation	20.0%	25.0%
Installation of lighting fixture and JB's on each pole	28.0%	53.0%
Fixing of cable Glands	20.0%	73.0%
Cable termination	20.0%	93.0%
Earthing of each pole	5.0%	98.0%
Punch List	2.0%	100.0%

#### 1.1.3.5. Electrical Heat Tracing

Stage	Weighted %	Cumulative Weighted %
Case opening and inspection of Heat Tracing material for any damage due to transportation	5.0%	5.0%
Installation of complete Heat Tracing Material including of Junction boxes	35.0%	45.0%
Fixing of cable Glands	25.0%	65.0%
Cable termination	25.0%	90.0%
Earthing of Heat Tracing JB	8.0%	98.0%
Punch List	2.0%	100.0%

### 1.1.3.6. Electrical Equipment Installation

Stage	Weighted %	Cumulative Weighted %
Case opening and inspection for any damage due to transportation	5.0%	5.0%
Installation/Placement of equipment	10.0%	15.0%
Grouting/Leveling	5.0%	20.0%
Laying and tagging of incoming and out-going cables / tubing	25.0%	45.0%
Fixing of cable Glands / tube fittings	25.0%	70.0%
Cable termination	28.0%	98.0%
Punch List	2.0%	100.0%

### 1.1.3.7. Cathodic Protection

Stage	Weighted %	Cumulative Weighted %
Case opening and inspection of Transformer Rectifier for any damage due to transportation	5.0%	5.0%
Installation of CP Transformer Rectifier with complete accessories for piping.	35.0%	40.0%
Installation of CP Test Station	30.0%	70.0%
Cathodic Protection Cable Termination	28.0%	98.0%
Punch List	2.0%	100.0%

### 1.1.3.8. Cable Termination

Stage	Weighted %	Cumulative Weighted %
Installation of Glands	25.0%	25.0%
Fixing of Thimbles	25.0%	50.0%
Cable fixing (with proper Nut Bolts)	25.0%	75.0%
Cable Dressing	23.0%	98.0%
Punch List	2.0%	100.0%

#### **1.1.4. INSTRUMENTATION WORKS**

The breakdown of the Instrument works into various sub-categories is given below:

<b>Sr. No.</b>	<b>Stage</b>	<b>Weighted %</b>
1.1.4.1	Cable Laying (Rack / Area)	15.0%
1.1.4.2	Control Room Installation Works	15.0%
1.1.4.3	Mounting and Installation of Instruments & F&G Detectors	40.0%
1.1.4.4	Cable termination from individual instrument to the respective JBs/Control Panels	10.0%
1.1.4.5	Cable termination from JBs/Control Panels to Control Room	10.0%
1.1.4.6	Tube Work	10.0%

##### **1.1.4.1. Cable Laying (Rack / Area)**

<b>Stage</b>	<b>Weighted %</b>	<b>Cumulative Weighted %</b>
Dismantalling / Disconnection of Instrument cables of relocated instruments	10.0%	10.0%
Laying of Instruments / Control cables and tagging at both ends	30.0%	40.0%
Cable dressing	10.0%	50.0%
Installation of Cable Trays	20.0%	70.0%
Excavation and Back filling of cable Trench (caution tape, sand and bricks to be required)	25.0%	95.0%
Punch List	5.0%	100.0%

#### 1.1.4.2. Control Room Installation Works

Stage	Weighted %	Cumulative Weighted %
Case opening and inspection for any damage due to transportation	20.0%	20.0%
Console / Panel placements, leveling and grouting	25.0%	45.0%
Installation of communication switches / equipments etc in Control room	25.0%	70.0%
Termination of instruments and communication cables in control room	20.0%	90.0%
Earthing of panels/consoles	5.0%	95.0%
Punch List	5.0%	100.0%

#### 1.1.4.3. Mounting And Installation of Instruments and F&G Detectors

Stage	Weighted %	Cumulative Weighted %
Installation of Supplies	10.0%	10.0%
Dismantalling, Relocation and Re-installation of existing Instruments	15.0%	25.0%
Installation of Instruments and F&G Detectors	40.0%	65.0%
Fabrication and Installation of Mounting Supports for field Instruments and Fire & Gas Detectors	30.0%	95.0%
Punch List	5.0%	100.0%

#### 1.1.4.4. Cable Termination from Individual Instrument to the Respective JBS/Control Panels

Stage	Weighted %	Cumulative Weighted %
Installation of Junction Boxes	15.0%	15.0%
Installation of Glands	25.0%	40.0%
Fixing of Thimbles	10.0%	50.0%

Cable fixing (with proper Nut Bolts)	30.0%	80.0%
Cable Dressing	15.0%	95.0%
Punch List	5.0%	100.0%

#### 1.1.4.5. Cable Termination from JBS/Control Panels to CCR

Stage	Weighted %	Cumulative Weighted %
Installation of Glands	30.0%	30.0%
Fixing of Thimbles	15.0%	45.0%
Cable fixing (with proper Nut Bolts)	30.0%	75.0%
Cable Dressing	20.0%	95.0%
Punch List	5.0%	100.0%

#### 1.1.4.6. Tube Works

Stage	Weighted %	Cumulative Weighted %
Installation of Supports	20.0%	20.0%
Installation of Tube Tray	20.0%	40.0%
Cutting and Bending of Tubes	20.0%	60.0%
Installation & Ferrule Fittings	30.0%	90.0%
Tube Alignment	5.0%	95.0%
Punch List	5.0%	100.0%