



MECHANICAL DESIGN DATA	
ITEM NO.	V-100A
CODE	ASME SEC. VIII DIV.1 ED.2013 ADD.A11
U STAMP	YES
SERVICE	SOUR GAS
EQUIPMENT	MERCURY REMOVAL VESSEL
QUANTITY	1
VOLUME	M ³ 11.706
DESIGN PRESSURE (INT./EXT.)	kPa(g) 8618.45 (1250) / -
DESIGN TEMPERATURE (MAX./MIN.)	°C (°F) 60 (140)
OPERATING TEMPERATURE	°C (°F) 43.33 (110)
OPERATING PRESSURE	kPa(g) 7239.47 (1050)
MAWP @ TEMPERATURE	kPa(g) 8618.45 (1250) @ 60 (140)
MDMT @ MAWP	-10 (14) @ 8618.44 (1250)
RADIOGRAPHY	FULL (RT-1)
JOINT EFFICIENCY	% 100
CORROSION ALLOWANCE	MM 3
HYDRO TEST PRESSURE	kPa(g) 11203.98 (1625)
STRESS RELIEVING	YES
PWHT	YES
IMPACT TEST	NO (EXEMPTED AS PER UCS-66)
PERSONNEL PROTECTION	NO
INSULATION	NO
FIRE PROOFING	NO
LETHAL / NON LETHAL	NON LETHAL
LADDER, PLATFORM	YES
SEISMIC ZONE (CODE) (SOIL PROFILE)	2A (UBC 1997) (SD)
WIND SPEED (CODE)	KM/HR 160 (ASCE 7-05)
SUPPORT	SKIRT
VESSEL EMPTY WEIGHT	KG'S 37,880 (Approximate)
VESSEL TEST WEIGHT	KG'S 45,636 (Approximate)
OPERATING WEIGHT	KG'S 49,500 (Approximate)

MATERIAL SPECIFICATION			
SHELL	SA 516 GR.70N + NACE MR. 0175	SUPPORT (SKIRT)	SA 36 / SA 516 GR.70N
HEAD	SA 516 GR.70N + NACE MR. 0175	LIFTING LUGS / PAD	SA 36 / SA 516 GR.70N
FORGING	SA-350 LF2 CL. 1N + NACE MR. 0175	FITTINGS (INT. & EXT.)	SA 234 WPB + NACE MR. 0175
NOZZLES FLANGE	SA-350 LF2 CL. 1N + NACE MR. 0175	NAME PLATE / BRACKET	SS 304 / SA 516 GR. 70N
NOZZLES NECK	SA-350 LF2 CL. 1N + NACE MR. 0175	EARTHING LUGS	SS 304
GASKET	SPIRAL WOUND	INTERNALS	SA 516 GR.70N + NACE MR. 0175
BOLTS/NUTS	SA 193 GR. B7 / SA 194 GR. 2H	EXTERNALS	SA 516 GR.70N / SA 36
ANCHOR BOLTS	SA 36		

NOZZLE LOADING						
*SRF :- SELF REINFORCEMENT.						
N4, N6, N8, N9, N10	2"	1435	1435	1435	380	380
N5	3"	2930	2930	2930	1140	1140
N7	4"	4100	4100	4100	2080	2080
N3	6"	7000	7000	7000	5230	5230
N1, N2	14"	17500	17500	17500	26110	26110
NOZZLE TAG	NPS	FL	FC	FA	ML	MC
					MT	
NOZZLES		DIRECT LOADS (N)			MOMENT LOADS (N-M)	

PAINTING (HOLD CLIENT TO CONFIRM)			
EXTERNAL PAINTING		INTERNAL COATING	
SURFACE PREPARATION	SAND BLASTING	SA 2 1/2	SURFACE PREPARATION
PRIMER	INORGANIC FINE PRIMER	DFT 75µ	PRIMER
INTER COAT	POLYAMIDE EPOXY	DFT 125µ	INTER COAT
TOP COAT	POLYURETHANE	DFT 75µ	TOP COAT
TOTAL DFT	275µ		TOTAL DFT

MATERIAL LIST						
P/No	DESCRIPTION	SIZE	QTY	Wt. (Kg)	REF DWG/STD	REMARKS
5	Plate 20 mm THK SA 36	6001 x 1322	1	124.03		SKIRT
4	Plate 16 mm THK SA 516 GR.70N	6013 x 799	1	603.5		SKIRT
3	Dishend Ellipsoidal Head 21.62 mm THK (Min) / 70 mm THK (Nom) SA 516 GR.70N+NACE 1800 mm ID	S.F 50 x 70 THK	2	5013.3		DISHENDS
2	Plate 65 mm THK SA 516 GR.70N+NACE	5859 x 1900	1	5680.2		SHELL
1	Plate 65 mm THK SA 516 GR.70N+NACE	5859 x 2000	1	5979.1		SHELL

GENERAL NOTES

- 1- ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE STATED.
- 2- ALL MATERIAL SHALL BE COMPLY WITH NACE STANDARD MR 0175.
- 3- ALL NOZZLE FLANGES SHALL BE IN ACCORDANCE WITH ASME B16.5 EDITION 2009.
- 4- ALL NOZZLE SHALL BE FLUSH WITH INSIDE SURFACE OF THE VESSEL, UNLESS OTHERWISE SPECIFIED.
- 5- FLANGE BOLT HOLES SHALL STRADDLE THE NORMAL HORIZONTAL & VERTICAL CENTERLINE OF VESSEL.
- 6- REINFORCEMENT PADS SHALL BE PROVIDED WITH DN 8 (1/4") FPT TELL-TALE HOLES WHICH SHALL BE FILLED WITH GREASE AFTER HYDROSTATIC TEST WHERE A REINFORCEMENT PAD IS DIVIDED INTO TWO PIECES, A TELL-TALE HOLE SHALL BE PROVIDED AT EACH PIECE AND SEAMS SHALL BE LOCATED ON CIRCUMFERENTIAL DIRECTION OF THE VESSEL. TELL-TALE HOLES SHOULD ALSO BE LOCATED ON CIRCUMFERENTIAL DIRECTION OF THE VESSEL AS MUCH AS POSSIBLE.
- 7- WHERE MULTIPLE NOZZLES INTENDED FOR MOUNTING INSTRUMENT COLUMNS SHALL BE INSTALLED WITH SPECIAL FIXTURES TO ACHIEVE CLOSE TOLERANCES SPECIFIED (GENERALLY A JIG-SET).
- 8- THE WELDS THAT ARE NOT ACCESSIBLE FROM THE BACKSIDE AND REQUIRE WELDING FROM ONLY ONE SIDE SHALL HAVE THE ROOT PASS DEPOSITED WITH GTAW PROCESS.
- 9- HYDROSTATIC TEST SHALL BE AS PER ASME SECTION VIII DIV.1, UG-99 (b).
- 10- ALL NOZZLE GROOVE WELDS TO BE EXAMINED BY "UT" & ALL FILLET WELDS SHALL BE EXAMINED BY "DPT"
- 11- HARDNESS OF THE MATERIAL SHOULD BE LESS THAN 200 HB.
- 12- IMMEDIATELY AFTER HYDROTEST, VESSELS SHALL BE DRAINED AND TELL TALE HOLES SHALL BE PLUGGED WITH GREASE.

13- PRIOR TO FINAL INSPECTION AND HYDROSTATIC TEST, THE INSIDE AND OUTSIDE OF THE VESSEL SHALL BE THOROUGHLY CLEANED AND SHALL BE FREE FROM ALL SLAG, SCALE, DIRT, GRIT, WELD SPATTER, AND PIECES OF METAL, PAINT, OIL, ETC.

14- ALL PAD-TYPE WELDED ATTACHMENTS SHALL BE PNEUMATICALLY TESTED WITH 1 BAR(G) AIR AND A SOAP SOLUTION PRIOR TO STRESS RELIEF AND/OR HYDROSTATIC TEST.

15- MACHINED SURFACES SHALL NOT BE PAINTED.

16- WELDING SYMBOLS STANDARD : AWS A2.4.

17- THE VESSEL SHALL BE PERFORMED HEAT TREATMENT AS PER UCS-56.

REVISION HISTORY:

1- NOZZLE "N1" INTERNAL PROJECTION CHANGED.
 2- NOZZLE "N5" PROJECTION CHANGED.
 3- NOZZLES "N8, N9 & N10" ADD FOR "GAS SAMPLING POINT".
 4- NOZZLE "N5" PROJECTION & ELEVATION CHANGED.
 5- INTERNAL ATTACHMENT CHANGED WHICH IS IN CLIENTS SCOPE.

REVISION HISTORY:

1- ADD RETAINING PLATE
 2- NOZZLE "N1" PROJECTION CHANGED.
 3- SKIRT MATERIAL CHANGED
 4- NOZZLE "N8, N9 & N10" INTERNAL PROJECTION CHANGED.

MOMENT AND SHEAR FORCE AT BASE (OPERATING CONDITION)

	MOMENT (N-M)	SHEAR (N)
EARTHQUAKE	40,0870	80,840
WIND	10,4988	19,577

NO.	DESCRIPTION	DM-15014-P11-CS-0100
9	MECHANICAL DESIGN CALCULATION FOR MERCURY REMOVAL VESSEL (V-100A)	
8	STANDARD TOLERANCE DRAWING	X15-STD-001
7	TEMPLATE AND GAUGE PLATE DETAIL DRAWING OF MERCURY REMOVAL VESSEL (V-100A)	DM.15014-P11-00106
6	DISH END DRAWING OF MERCURY REMOVAL VESSEL (V-100A)	DM.15014-P11-00105
5	LADDER PLATFORM DETAIL DRAWING OF MERCURY REMOVAL VESSEL (V-100A)	DM.15014-P11-00104
4	NAME PLATE WITH BRACKET DETAIL DRAWING OF MERCURY REMOVAL VESSEL (V-100A)	DM.15014-P11-00103
3	MANWAY DAVIT ARM DETAIL DRAWING OF MERCURY REMOVAL VESSEL (V-100A)	DM.15014-P11-00102
2	DETAIL DRAWING OF MERCURY REMOVAL VESSEL (V-100A)	DM.15014-P11-00101 (SHEET 02 OF 02)
1	DETAIL DRAWING OF MERCURY REMOVAL VESSEL (V-100A)	DM.15014-P11-00101 (SHEET 01 OF 02)

REFERENCE DRAWINGS

S/NO	TITLE/DESCRIPTION	L/MW DRAWING NO.
7	AS BUILT AS MARKED	UM SZ SR 16-06-15
6	ISSUED FOR FABRICATION	UM SZ SR 07-05-15
5	ISSUED FOR FABRICATION	UM SZ SR 07-04-15
4	ISSUED FOR FABRICATION	UM SZ SR 27-03-15
3	ISSUED FOR FABRICATION	UM SZ SR 25-03-15
2	ISSUED FOR FABRICATION	UM SZ SR 20-03-15
1	CLIENT COMMENTS INCORPORATED	RR SZ SR 02-03-15
0	ISSUED FOR APPROVAL	RR SZ SR 02-02-15

NOZZLE DATA

MARK NO.	QTY	DN/MS/ SIZE	PROJECTION (CL. VESSEL INFLUENCE FACED)	SERVICE	TYP.	O.D.	SCH.	THK.	TYPE	RATING (L.B.)	BARREL O.D.	R.F. HEIGHT	
A01/2	2	1D 400	SEE DWG.	ACCESS OPENING	PLATE	420	-	10	-	-	-	-	
SV1/2	2	80(3)	SEE DWG.	SKIRT VENT	PIPE	88.9	80	7.62	-	-	-	-	
M2	1	500(20)	SEE DWG.	MANWAY (WITH BLIND DAVIT)	SRF*	508	80	26.19	WNRF	900#	695.63	120	145
M1	1	500(20)	1500	MANWAY (M1)	SRF*	508	80	26.19	WNRF	900#	695.63	120	130
N8/9/10	3	50(2)	1150	GAS SAMPLING POINT	SRF*	104.64	-	26.92	LWNRF	900#	-	-	-
N7	1	50(2)	325	DRAIN WITH BLIND	SRF*	104.64	-	26.92	LWNRF	900#	-	-	-
N6	1	50(2)	325	VENT WITH BLIND	SRF*	60.33	160	8.74	WNRF	900#	122.85	40	4.5
N5	1	80(3)	1700	UTILITY	SRF*	88.9	160	11.13	WNRF	900#	186.65	60	60
N4	1	50(2)	SEE DWG.	PRV	SRF*	60.33	160	8.74	WNRF	900#	122.85	40	4.5
N3	1	150(6)	1350	UNLOADING WITH BLIND	SRF*	168.3	80	10.97	WNRF	900#	306.33	65	80
N2	1	350(14)	1700	OUTLET	SRF*	355.6	80	19.05	WNRF	900#	497.5	90	105
N1	1	350(14)	SEE DWG.	INLET	SRF*	355.6	80	19.05	WNRF	900#	417.5	50	107

NOZZLE NECK NOZZLE FLANGE REINFORCEMENT DATA

DESIGN ENGINEERING COMPANY LIMITED

DESIGN ENGINEERING LIMITED
 100, GANESHAJI STREET, CHENNAI - 600 086, INDIA
 TEL: 91-44-2632-1111, FAX: 91-44-2632-1111

PROJECT: FABRICATION AND SUPPLY OF MERCURY REMOVAL VESSELS

TITLE: GA. OF MERCURY REMOVAL VESSEL (V-100A)

PROJECT NO. DM.15014 DRAWING NO. DM.15014-P11-00100 REV. SHEET 7 OF 1

DATE: 30-11-2015