

**OIL & GAS DEVELOPMENT COMPANY LIMITED**  
**PROCUREMENT DEPARTMENT, ISLAMABAD**  
**FOREIGN SECTION A**

(To be completed, filled in, signed and stamped by the principal)

ANNEXURE 'A'

**Material** ENGINE DRIVEN PRODUCED WATER PUMP FOR LIQUID HANDLING FACILITIES  
**Tender Enquiry No** PROC-FA/CB/P&P/PUMP-3124/2017  
**Due Date**  
**Evaluation Criteria** FULL

**SCHEDULE OF REQUIREMENT**

Sr No	Description	Unit	Quantity	Unit Price (FOB)	Total Price (FOB)	Unit Price C & F BY SEA	Total Price C & F BY SEA	Deviated From Tender Spec. If Any
1	Produce Water Re-Injection Pump with Engine (Gas Engine Driven) API 674 , ISO 8528 & ISO 3046/1 , Type: PD (Reciprocating), Plunger Type, Mat: as per NACE, Suc/Dis VTS RF, with 02 Year Spares as per attached TOR	Number	1					

Note:

- i. **Bid bond**:-Pursuant to tender clause # 2.2, 11.4, 13 & 35.3.2, bid(s) must be accompanied by an upfront bid bond in the form of pay order/ demand draft or bank guarantee issued by scheduled bank of Pakistan or a branch of foreign bank operating in Pakistan, for an amount of US\$ 3,000/- (US\$ Three thousand only) or equivalent Pak Rupees, with technical bid and valid for 150 days from the date of opening of the bids. The bank guarantee must be issued in accordance with the format as per Annexure-C of the tender documents.
- ii. **Shipment from ACU member Countries**: In case of shipment from ACU member countries, the LC beneficiary should be of that particular country from where the consignment is being shipped.
- iii. **Terms and conditions**:-Bidders are advice to carefully read all the terms and conditions of the Tender Document available at OGDCL web site in the master tender document.
- iv. **Summary rejection criteria**: - The summary rejection criteria at clause 35 of the tender document may also be examined carefully. Any bid not meeting the criteria spelled in the clause # 35 shall be summarily rejected without any right of appeal. The detailed tender document is available on OGDCL website as" Master set of tender document-Foreign".

## Terms of reference (TOR)

### Scope of supply:

1. Supply of Gas Engine Driven Produced Water Re-Injection Pump (Quantity: 01 No.) The OEM / supplier should provide 03 set of operation and maintenance / instruction manuals (Hard copy and soft copy) with all P&ID's, all mechanical /instrument / electrical drawings, Quality plan, list of recommended lubricants / chemical, installation drawings etc.
2. Two years recommended spare parts with list for Engine, Pump and Package (The spare parts list should be fully detailed with item wise price & quantity).
3. Selection of Package Spares are optional.

### Code and Standards:

- a. API
- b. AISI
- c. BS 5514 and other Relevant British standard specifications & code of practices.
- d. ISO 8528 & 3046/1
- e. NFPA-37 ( Standard for Installation and Use of Stationary Combustion Engines and Gas Turbines)
- f. ANSI
- g. ASME

### Site Conditions:

- a. Max. Ambient temperature = 52 °C
- b. Minimum Ambient temperature = - 2°C
- c. Altitude (above mean sea level) = 230 ft
- d. Average barometric pressure= 14.38 Psi
- e. Relative Humidity 77% -20 % (Max-Min)

### Technical Data.

#### Pump Details

- I. Positive Displacement, horizontal, Capacity 117 USGPM. Quantity: 01 No (Ref Doc. 2547-DOC-001).
- II. Pump must be manufactured as per **API 674**.
- III. Material of construction of complete Pump: SS316/316L (must be fully compatible with operating conditions as well as service medium of the pump).
- IV. Preferred sizes for Suction & discharge nozzle: 6(VTC) "150lb RF Type & 4 "600lb RF Type. (Vender can offer suitable sizes).
- V. **Operating Conditions**

Sr. No.	Description	
1.	Type of Liquid	Water + Condensate
2.	Casing	Plunger Type
3.	Service	Produce Water
4.	No of Plunger	To meet the required parameter
5.	Capacity	Normal = 117 USGPM
6.	MAWP	Discharge Pressure=751 psi Differential Pressure= 750 psi Suction Pressure= 1 psi (Operating pressure varies as per requirement)
7.	NPSH Available	Normal = 30ft.
8.	Pumping Temperatures	Min=38 F~ Max= 100F
9.	Design Temp	180°F
10.	Corrosion Allowance	6mm

#### VI. Driver Details

The Gas Engine Net Output (Excluding all utilities load i.e fan, pump etc.) should be capable of developing 25% greater horsepower than the pump required power, designed for most suitable number and layout of cylinder, water cooled, naturally aspired, continuous duty, digital tachometer and all necessary gauges in instrument panel. Preferred brand of engines like CAT, Waukesha, Perkins or equivalent are acceptable engine manufacturers.

- a. Fuel Gas System: Filter & pressure regulator to regulate the available 80-100 psi fuel gas pressure with gas scrubber.
- b. Control System: Governor, Mechanical electronic Air/fuel ratio control.
- c. Cooling system: Jacket water pump, belt driven radiator fan, with level switches, thermostats for pre- alarm & trip, expansion tank, pressure gauges etc. radiator.
- d. Pneumatic Start System Air supplied at 100Psi.
- e. Guard : Meet criteria for IEC standard and OSHA regulation
- f. Muffler: Spark arresting muffler.
- g. Reduction Gear Box if required
- h. Protection System/ Securities : Standard Service indicators to be provided including but not limited to the following
  - Low Oil Pressure (Indication, Alarm& Shut Down)
  - High Water Temperature (Indication, Alarm& Shut Down)
  - Engine Over Speed (Indication, Alarm& Shut Down)

- Low Lube Oil Level (Indication, Alarm& Shut Down)
  - Cylinder Temperature (Indication, Alarm& Shut Down)
  - Lube Oil Differential Pressure (Indication, Alarm)
  - Air Filter Differential Pressure (Indication, Alarm)
  - High Lube Oil Temperature (Indication, Alarm& Shut Down)
  - Low Jacket Water Level (Indication, Alarm& Shut Down)
  - Engine Exhaust Manifold Temperature (Indication, Alarm& Shut Down)
  - Low Fuel Gas Pressure(Indication, Alarm& Shut Down)
  - Radiator Cooler Fan Vibration(Indication, Alarm& Shut Down)
  - Vibration Switch(Indication, Alarm& Shut Down)
  - Emergency Stop(Indication, Alarm& Shut Down)
  - Provide two additional out puts for Control Room from its local control panel.
    - Running Indication
    - Common Alarm
- h. Air Intake system: Air Filtration for dusty/ humid environment conditions
- i. Jacket Water Heater
- j. Lube Oil Cooler
- VII. Local Control Panel: Start Stop Push Button, Duty/ Standby Push Button, Annunciator panel will be located on outside front of panel, PLC system, and other accessories.
- VIII. Serial Communication interface for control room with HMI for monitoring main parameter appropriate distance.
- IX. Lubricant should be mentioned in the Bid.
- X. Special Tools: Spark Plug Puller Kit, Digital Diagnostic tool.
- XI. Package utilization: Plunger pump with engine with listed items: structural steel skid, heavy duty oilfield type skid size to contain the entire pump and engine unit with following components:
- Engine adjusting base
  - Exhaust tubing and supports
  - Grouting holes
  - Lifting eyes
  - Steel metal tool box
  - Interconnection piping spool pieces on suction and discharge should be provide with appropriate bolting, gaskets and pipe components (valves, dampener brackets etc) mounted on the skid and terminated at skid edge.
  - Standard steel safety guards.
  - Paint as per standard.
- VII. Warranty: 01 year after commissioning.
- VIII. Commissioning: After receipt and acceptance of package by OGDCL, the Bidder will be responsible for installation, alignment, grouting and commission at Qadirpur Gas Field OGDCL.

### Reference Documents for Pump Design/Selection:

- |    |              |                         |
|----|--------------|-------------------------|
| 1. | 2547-DOC-001 | Pump Data Sheet         |
| 2. | 2547-DOC-002 | Fuel Gas Composition    |
| 3. | 2547-DOC-003 | Site Environmental Data |

### **General Terms & Conditions**

- A. Provide detailed technical specifications brochures of the manufacturer in original in English with technical bid.
  - (a) The following test to be performed by manufacturer and certificates to be provided
    - Package performance test
    - Complete pump package including gas engine, pump etc by packager/manufacturer under designed conditions for a minimum of 72 hours.
- B. Provide Technical Literature for **quoted model of pump & engine** along with technical bid.
- C. Provide all MTC and performance test report of the pump, engine and package with supply.
- D. 220/415 VAC@50HZ volts supply is available at proposed site. Dc converter for 12/24 Volt for Panel and securities should be provided.
- E. Detailed list of equipment/ packages clearly mentioning skid mounted equipment and loose items to be shipped.
- F. Availability of Spare Parts of the equipment being supplied with country of origin along with lead time period.
- G. List of spares for startup and commissioning. All spares for commissioning & startup shall be covered.
- H. Pre commissioning and Commissioning Plan/ Procedure.
- I. Bidder shall mention firm delivery period and submit schedule with target delivery date with work/ delivery schedule starting from date establishment of L/C.

### **Eligibility Criteria for Technical Evaluation**

The following information shall be submitted along with the Technical Bid least but not limited

1. Provide the Data Sheets of main Equipment's (Pump & Engine).
2. Pump should be manufactured on API 674 standard and Manufacturer should be API certified. Valid Certificate should be provided
3. OEM for pump and engine should be ISO 9000~2000 Certified. Relevant Valid ISO Certificate should be provided.
4. Engine should be manufactured on ISO 8528 and ISO 3046/1.
5. Environmental & HSE Certification should be provided. *(Like ISO 14001, ISO 45001, OHSAS 18001)*
6. Authorization letter from manufacturer for Bidder/ Packager should be provided.
7. QA/QC, HSE system/ procedures of your organization should be provided.
8. Provide P&ID diagram showing limits of supply prepared by supplier.

9. Bidder/ Manufacturer should provide details of supplied at least 05 Gas/Diesel Engines of same Brand, same/ higher capacities in oil & gas sector, fertilizers & refineries with in Pakistan during last 10 years (2006~2016). Verifiable proof should be provided. Supply of Gas Engines outside Pakistan will not be considered. Provided details should include Model Number with Brand Name, Date of Supply, Amount of project, address of client.
10. Provide a comprehensive list and details of related project executed by the bidder during last (07) seven years (2010~2016). Certificate of satisfactory supply & completion by respective client/ owner should be attached. Only those projects whose completion certificate are attached would be considered in experience & track record of the bidder/manufacturer or packager.
11. The bidder/ manufacturer should confirm its ability to provide service engineer during installation, commissioning & startup of package and later on as and when required basis at OGDCL site. Only boarding/lodging may be provided at site. Bidder/ manufacturer to provide drawing for foundation prior to shipment of package. Civil work will be in OGDCL scope.
12. The manufacturer of engine or bidder should have been well established workshop and after sale service facilities in Pakistan, (Both for spare parts and repair). The workshop setup should have authorization from OEM.
13. Bidder should arrange factory acceptance test at manufacturer works. The factory acceptance test shall be witnessed by two OGDCL engineers. All cost including air tickets, boarding, lodging, local transportation at destination per person will be in bidder scope. All other arrangements, test equipment's, documentation for FAT will also be in bidder scope. FAT procedure submitted with Technical Bid.
14. Statement that goods are "Brand New" and Quoted Model/ spares shouldn't be obsoleted at least (10) years after supply.
15. Should submit the complete Plan on PRIMAVERA.
16. Delivery Period: 180-210 days. (after LC)
17. Provide Compliance of TOR dully mark and signed by bidder. Any deviation to TOR should be clearly mentioned separately.

**Financial Bid Format:**

S#	Scope	Unit Price	Total Price
1.	Supply of Gas Engine Driven Produced Water Re-Injection Pump (Quantity: 01 No.)		
2.	Installation/Commissioning (Installation, Leveling, Alignment, Grouting, Start Up, Testing)		
3.	Factory Acceptance Test.		

4.	Special and preventive maintenance tools (01 set).		
5.	02 years Spare parts for engine/Pump and Package (with list of spares and unit cost of each spare part separately, as an Optional Item)		

Evaluation will be on the basis of Sr# 1, 02 and 03 selection of Spare parts and Tools will be on OGDCL choice.

**Bidder should fill the below mentioned table and provide the copies of verifiable documents as required**

	Requirement	Bidder Response/ Confirmation
1	<b>Engine</b>	
	Model	
	Make	
	Power Normal KW	
	Power Rated KW	
	RPM	
	Fuel Gas System with Scrubber	
	Fuel Consumption	
	Speed Regulation	
	Control System	
	Aspiration	
	Pneumatic Start System	
	Engine Cooling System	
	Engine Lube Oil System	
	Exhaust Control System	
	Guard	
	Muffler	
	Low Oil Pressure (Indication, Alarm& Shut Down)	
	High Water Temperature (Indication, Alarm& Shut Down)	
	Engine Over Speed (Indication, Alarm& Shut Down)	
	Low Lube Oil Level (Indication, Alarm& Shut Down)	
	Cylinder Temperature (Indication, Alarm& Shut Down)	
	Lube Oil Differential Pressure (Indication, Alarm)	
	Air Filter Differential Pressure (Indication, Alarm)	
	High Lube Oil Temperature (Indication, Alarm& Shut Down)	
	Low Jacket Water Level (Indication, Alarm& Shut Down)	
	Engine Exhaust Manifold Temperature (Indication, Alarm& Shut Down)	
	Low Fuel Gas Pressure(Indication, Alarm& Shut Down)	
	Radiator Cooler Fan Vibration(Indication, Alarm& Shut Down)	
	Vibration Switch(Indication, Alarm& Shut Down)	
	Emergency Stop(Indication, Alarm& Shut Down)	
	Air Intake system	
	Jacket Water Heater	
	Lube Oil Cooler	
	Local Control Panel	
	PLC system	
	Serial Communication interface for control room with HMI	
	DC Converter 12/24 Volts for Securities	
2	<b>PUMP</b>	
	API certified Pump	
	Pump Max Power	
	Pump Casing Type	
	Pump No of Plungers	
	Pump Capacity	
	Pump Suction Pressure	
	Pump Discharge Pressure	
	API Code	





	Pump Casing Material	
	Pump Plunger Material	
	NPSH	
	Minimum Design Temperature	
	Reduction Gear Box	
3.	<b>General</b>	
	Singal Skid	
	Warranty 01 Year After Commissioning	
	Installation/Commissioning (Installation, Leveling, Alignment, Grouting, Start Up, Testing)	
	02 Years Spare parts for engine/Pump and Package	
	Certificate that the quoted model of pump/ engine will not Obsolete at least (10 years)	
	Tools List	
	Delivery Period	
	ISO 9000-2000 Valid Certificate	
	API Valid Certificate	
	OEM Authority Letter (Copy Provided)	
	MTC's	
	Bidder/Manufacturer must have Minimum 10 years of experience As per clause 9&10 of TOR	
	After Sale Services in Pakistan as per clause 12 of TOR	
	Address of Workshop Facilities in Pakistan	
	Factory Acceptance Test as per clause #13 of TOR	
	Evaluation will be on the basis of Sr# 01 ~03	



OIL & GAS DEVELOPMENT COMPANY  
PAKISTAN

(DATA SHEET)

DOCUMENT NO. : 2547-DOC-001

		<b>CLIENT</b> <b>PRODUCED WATER ADEQUACY &amp; CAPACITY ENHANCEMENT AT QADIRPUR GAS FIELD</b>			<b>CONSULTANT</b> 																					
<b>DOC. TITLE</b> <b>DATA SHEET FOR INJECTION WELL PUMP (RECIPROCATING PUMP)</b>																										
<b>DOC. NO.</b> <b>2547-PDS-014</b>		<b>REV 0</b>																								
<b>APPLICABLE TO:</b> <input type="radio"/> PROPOSAL <input checked="" type="radio"/> PURCHASE <input type="radio"/> AS BUILT <b>FOR:</b> OIL & GAS DEVELOPMENT COMPANY LIMITED <b>SITE:</b> QADIRPUR GAS FIELD <b>SERVICE:</b> PRODUCED WATER <b>MANUFACTURER:</b>		<b>UNIT:</b> WELL INJECTION PUMP <b>NO. OF PUMPS REQUIRED:</b> 2 <b>TYPE:</b> PD PUMP <b>SERIAL NO.:</b>																								
<b>NOTE:</b> <input type="radio"/> INDICATES INFORMATION TO BE COMPLETED BY PURCHASER <input type="checkbox"/> BY MANUFACTURER																										
<b>GENERAL</b>																										
<b>OPERATING CONDITION</b> CAPACITY (USGPM) Maximum: 117 Normal: Minimum: DISCHARGE PRESSURE (PSIG) Maximum: 751 Normal: Minimum: 749 SUCTION PRESSURE (PSIG) Maximum: 1 Normal: Minimum: 0.7 DIFFERENTIAL PRESSURE (PSIG) Maximum: 750 Normal: Minimum: NPSH AVAILABLE (ft) Without Accelerated Head 30 ACTUAL VTS				<b>LIQUID PROPERTIES</b> TYPE OR NAME OF LIQUID Water + Condensate PUMPING TEMPERATURE, °F Minimum 38 Maximum 100 SPECIFIC GRAVITY Minimum 0.9 Maximum 1.00 VISCOSITY Minimum 0.55 Maximum 0.65 CORROSIVE / EROSION AGENT Chloride & dissolved CO <sub>2</sub> CHLORIDE CONCENTRATION (PPM) LIQUID <input checked="" type="radio"/> TOXIC <input type="radio"/> FLAMMABLE <input type="radio"/> OTHER																						
<b>PROCESS DATA</b> Fluid Produced water Density lb/ft <sup>3</sup> 61.77 Viscosity cP 0.98 Pump Temperature °F 40-100 Suction Pressure psig Discharge Pressure psia Differential Pressure psig Vapour Pressure psi 2.2 Design Temperature °F 180 NPSHr ft Vendor to advise minimum requirement Corrosion Allowance 6 mm				<b>SITE AND UTILITY DATA</b> LOCATION <input type="radio"/> INDOOR <input checked="" type="radio"/> OUTDOOR <input type="radio"/> HEATED <input type="radio"/> UNHEATED <input type="radio"/> UNDER ROOF AREA CLASSIFICATION Zone 1, Group IIA & Temperature Class T3 SITE DATA RANGE OF AMBIENT TEMPERATURE: MIN/MAX 38 / 100 °F UNUSUAL CONDITIONS <input checked="" type="radio"/> DUST <input type="radio"/> SALT ATMOSPHERE <input type="radio"/> FUMES <input type="radio"/> OTHER <b>UTILITY CONDITIONS</b> <table border="1"> <tr> <th>ELECTRICITY</th> <th>DRIVERS</th> <th>HEATING</th> <th>CONTROL</th> <th>SHUTDOWN</th> </tr> <tr> <td>VOLTAG</td> <td>440</td> <td></td> <td></td> <td></td> </tr> <tr> <td>HERTZ</td> <td>40</td> <td></td> <td></td> <td></td> </tr> <tr> <td>PHASE</td> <td>3</td> <td></td> <td></td> <td></td> </tr> </table>			ELECTRICITY	DRIVERS	HEATING	CONTROL	SHUTDOWN	VOLTAG	440				HERTZ	40				PHASE	3			
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<b>VALVE/FEED TYPE NUMBER</b> <b>SUCTION Plate (VTS) VTS</b> <b>DISCHARGE Plate (VTS) VTS</b>				<b>APPLICABLE SPECIFICATIONS</b> <input checked="" type="radio"/> API 674 POSITIVE DISPLACEMENT PUMPS <input type="radio"/> GOVERNING SPECIFICATION ( IF DIFFERENT )																						
<b>PERFORMANCE</b> RATED CAPACITY (USGPM) HYDRAULIC kW EFFICIENCY, % ACTUAL HORSE POWER, kW MAXIMUM PRESSURE (BARG) HYDRO TEST PRESSURE (BARG) VTS PLUNGER SPEED (strokes/min) (VTS) DIAMETER (mm) (VTS) STROKE LENGTH (mm) (VTS)				<b>OTHER</b> CONTROL TYPE <input type="radio"/> MANUAL <input checked="" type="radio"/> AUTOMATIC <input type="radio"/> REMOTE <input checked="" type="radio"/> LOCAL <input type="radio"/> PNEUMATIC <input checked="" type="radio"/> ELECTRONIC SHIPMENT <input type="radio"/> DOMESTIC <input type="radio"/> EXPORT <input type="radio"/> EXPORT BOXING <input type="radio"/> OUTDOOR STORAGE MORE THAN 6 MONTHS LUBRICATION FLUID <input checked="" type="radio"/> CRANKCASE <input type="radio"/> INTERMEDIATE <input checked="" type="radio"/> HYDRAULIC FLUID VENDOR FURNISHED RELIEF VALVE <input checked="" type="radio"/> INTERNAL <input type="radio"/> EXTERNAL NAMEPLATE UNITS <input checked="" type="radio"/> US CUSTOMARY <input type="radio"/> SI																						
<b>QA INSPECTION AND TEST</b> <input type="radio"/> COMPLIANCE WITH INSPECTORS CHECK LIST <input checked="" type="radio"/> CERTIFICATE OF MATERIALS <input type="radio"/> FINAL ASSEMBLY CLEARANCE <table border="1"> <tr> <th>TESTS</th> <th>REQ'D</th> <th>WIT</th> <th>OBS</th> </tr> <tr> <td>HYDROSTATIC</td> <td><input type="radio"/></td> <td><input checked="" type="radio"/></td> <td><input type="radio"/></td> </tr> <tr> <td>STEADY STATE ACCURACY</td> <td><input type="radio"/></td> <td><input checked="" type="radio"/></td> <td><input type="radio"/></td> </tr> <tr> <td>LINEARITY</td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> </tr> <tr> <td></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> </tr> </table>				TESTS	REQ'D	WIT	OBS	HYDROSTATIC	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	STEADY STATE ACCURACY	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	LINEARITY	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
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Note 1 = * VTS (Vendor To Specify) Note 2 = Vendor shall send duly furnished API-674 data sheet Note 3 = Volumetric rate is based on 100 % volumetric efficiency & Brake Horsepower/Kilowatts is based on 90 % mechanical efficiency. Note 4 = Pump skid packaged to meet the most stringent requirements of API 674																										
10/15/2015 0 Date Rev		ISSUED FOR TENDER Description			AUD NWS AJ PREP CKD APPR																					



OIL & GAS DEVELOPMENT COMPANY  
PAKISTAN

(FUEL GAS COMPOSITION)

DOCUMENT NO. : 2547-DOC-002



## FUEL GAS COMPOSITION

The fuel gas composition for Engine driven pump is presented here under:

COMPONENT	Mole %
H <sub>2</sub> S	14 ppm
CO <sub>2</sub>	1.93
N <sub>2</sub>	12.67
C <sub>1</sub>	83.7
C <sub>2</sub>	1.11
C <sub>3</sub>	0.30
C <sub>4</sub>	0.15
C <sub>5</sub>	0.07
C <sub>6+</sub>	0.06



**OIL & GAS DEVELOPMENT COMPANY  
LIMITED**

(SITE ENVIRONMENTAL DATA)  
DOCUMENT NO. : 2547-DOC-003



1.1 **ENVIRONMENTAL DESIGN CRITERIA**

1.2 **Scope**

This specification cover minimum, site environmental data.

1.3 **Site Environmental Data**

The following table gives the site and environmental conditions applicable to the location and specific to design and sizing of equipment:

Description	Data	Unit
Ambient Temperature (min.)	41	°F
Ambient Temperature (max.)	131	°F
North / East	30° 17' 0"/71° 40'	
Average Monthly rainfall	0 to 50	mm
Maximum wind velocity	100	Miles / hr
Dry bulb temperature (max )	124	°F
Dry bulb temperature (min )	25	°F
Relative Humidity (Summer)	20-70	%
Relative Humidity (Winter )	45-55	%
Wet Bulb Temperature	82	°F
Area Classification	Class-1,Zone 1 & 2, Gas Group IIA & IIB with temperature classification T3	