



## **GAIL GAS LTD**

(A wholly owned subsidiary of GAIL (India) Limited)

### **CNG AND CITY GAS DISTRIBUTION PROJECT**

#### **BID DOCUMENT FOR SUPPLY OF SS FITTINGS AND VALVES VOLUME – II OF II (TECHNICAL)**

**(BID DOCUMENT NO: 110290/WGI/GAIL GAS/26-R0)**

**LIMITED INTERNATIONAL COMPETITIVE BIDDING**



**DELIVERS. EVOLVES.**

WHOLE LIFE SOLUTIONS FOR PIPELINE AND SUBSEA SYSTEMS

**ISSUED BY**

**JPKENNY**





**GAIL GAS LIMITED  
CITY GAS DISTRIBUTION PROJECT**



<b>MATERIAL REQUISITION FOR SS FITTINGS &amp; VALVES</b>	CLIENT JOB NO.	
	TOTAL SHEETS	10

<b>DOCUMENT NO</b>	11	0290	02	08	06	28
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0	01/10/10	ISSUED FOR TENDER	AS	JLG	PKS
C	30/09/10	CLIENT'S COMMENTS INCORPORATED	AS	JLG	PKS
B	14/09/10	ISSUED FOR APPROVAL	AS	JLG	PKS
A	25/08/10	ISSUED FOR IDC	AS	JLG	PKS
	<b>DATE</b>	<b>DESCRIPTION</b>	<b>PREP</b>	<b>CHK</b>	<b>APPR</b>

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**J P KENNY**



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**LIST OF ATTACHMENTS**

<b>S.NO.</b>	<b>DOCUMENT TITLE</b>	<b>DOCUMENT NUMBER</b>	<b>NO. Of Pages</b>
1.0	TECHNICAL SPECIFICATION FOR SS FITTINGS.	11-0290-02-08-02-028	6
2.0	TECHNICAL SPECIFICATION FOR SS VALVES	11-0290-02-08-02-027	5
3.0	DATA SHEET FOR 3/4" 3 WAY SS BALL VALVE	11-0290-02-08-03-031	2
4.0	DATA SHEET FOR 3/4" 2 WAYSS BALL VALVE	11-0290-02-08-03-027	3
5.0	DATA SHEET FOR 3/4" SS NON RETURN VALVE	11-0290-02-08-03-028	2
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## 1.0 SCOPE OF SUPPLY (SOS)

### 1.1 General

This requisition describes the scope of supply of SS Fittings, Valves, to be used in the city gas Distribution project of GAIL GAS Ltd.

The scope of supply includes the design, manufacture, inspection, testing, packing, preparation for shipment and documentation requirements of these items in accordance with the requirements of this Requisition and the Vendor Drawing / Data Requirements List (VDR) and those detailed in Specification.

### 1.2 Material Delivery Requirements

The finished materials are to be delivered by the Supplier at the nominated delivery point, fixed by the Purchaser/ Purchaser Representative.

The Supplier shall be responsible for all handling and transportation between his production plant and the nominated delivery point in accordance with this specification.

### 1.3 SS Fittings, Valves:

The type and quantities of are SS Fittings, Valves as detailed below:

S.NO	SIZE	Required Quantity
SS FITTINGS - GROUP (A)		
1	90 Degree Union Elbow Size : 1" OD X 1" OD Material : SS316 ,Pressure Rating 6000 Psig .Double ferrule type end connections at both ends.	60
2	90 Degree Union Elbow Size : ¾" OD X ¾" OD Material : SS316 ,Pressure Rating 6000 Psig .Double ferrule type end connections at both ends.	600
3	90 Degree Union Elbow Size : 1/2" OD X 1/2" OD Material : SS316 ,Pressure Rating 6000 Psig .Double ferrule type end connections at both ends.	600
4	Equal Tee Size : ¾" OD X ¾" OD X ¾" OD, Material : SS316 Pressure Rating 6000 Psig. Double ferrule type end connections at all ends.	250
5	Cross Size : ¾" OD X ¾" OD X ¾"ODX ¾" OD, Material : SS316 Pressure Rating 6000 Psig. Double ferrule type end connections at all ends.	20
6	Cross Size : 1/2" OD X 1/2" OD X 1/2" ODX 1/2" OD, Material : SS316 Pressure Rating 6000 Psig. Double ferrule type end	30



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		connections at all ends.	
7		Reducing Tee Size : 3/4" OD X 1/2" OD X 3/4" OD, Material : SS316 Pressure Rating 6000 Psig. Double ferrule type end connections at all ends.	400
8		Union Size : 1" X 1" Tube OD Material : SS316 Pressure Rating 6000 Psig. Double ferrule type end connections at both ends.	150
9		Union Size : 3/4" X 3/4" Tube OD Material : SS316 Pressure Rating 6000 Psig. Double ferrule type end connections at both ends.	700
10		Union Size : 1/2" X 1/2" Tube OD Material : SS316. Pressure Rating 6000 Psig. Double ferrule type end connections at both ends.	400
11		Concentric Union Size : 1" X 3/4" .Tube OD material : SS 316 Pressure Rating 6000 Psig. Double ferrule type end connections at both ends.	35
12		Concentric Union Size : 3/4" X 1/2" .Tube OD material : SS 316 Pressure Rating 6000 Psig. Double ferrule type end connections at both ends.	20
13		Front & Back Ferrule 1 " OD, material SS 316. Pressure Rating 6000 Psig.	150
14		Nut 1 " OD, material SS 316 .Pressure Rating 6000 Psig.	150
15		Front & Back Ferrule 3/4 " OD, material SS 316. Pressure Rating 6000 Psig.	900
16		Nut 3/4 " OD, material SS 316 .Pressure Rating 6000 Psig.	900
17		Front & Back Ferrule 1/2 " OD, material SS 316. Pressure Rating 6000 Psig.	400
18		Nut 1/2" OD, material SS 316. Pressure Rating 6000 Psig.	400
19		3/4 " OD Plug, material SS 316. Pressure Rating 6000 Psig. Double ferrule type end connections at both ends.	40
20		S.S 316 Red.Male Connector 1/2"OD x 1/4 Male NPT", Pressure Rating 6000 Psig, Double ferrule type end connections at both ends.	10
21		S.S 316 Quick Connector Coupler 1/2" OD( Body & Stem),	10

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		minimum Pressure Rating 3000 Psig	
22		Conductive core Hose Assembly 1/2"ODx 60" long, Material : thermoplastic, end connection SS316, minimum Pressure Rating 3000 Psig	10
23		1/2 " OD Plug, material SS 316. Pressure Rating 6000 Psig. Double ferrule type end connections at both ends.	80
24		3/4 " OD End Cap, material SS 316. Pressure Rating 6000 Psig . Double ferrule type end connections at both ends.	250
25		1/2 " OD End Cap, material SS 316. Pressure Rating 6000 Psig . Double ferrule type end connections at both ends.	10
26		Equal Tee Size : 1" OD X1" OD X 1" OD, Material : SS316 Pressure Rating 6000 Psig. Double ferrule type end connections at all ends	10
27		Reducing Tee Size : 1" OD X 3/4" OD X 1" OD, Material : SS316 Pressure Rating 6000 Psig. Double ferrule type end connections at all ends	10
28		Reducing Tee Size : 1" OD X 1/2" OD X 1" OD, Material : SS316 Pressure Rating 6000 Psig. Double ferrule type end connections at all ends	10
29		Reducing Tee Size : 1" OD X 3/4" OD X 1/2" OD, Material : SS316 Pressure Rating 6000 Psig. Double ferrule type end connections at all ends	10
30		Concentric Union Size : 1" X 1/2" .Tube OD material : SS 316 Pressure Rating 6000 Psig. Double ferrule type end connections at both ends.	10
31		Reducing Port Connector 1"x3/4" Tube OD material : SS 316 Pressure Rating 6000 Psig. Double ferrule type end connections at both ends.	10
32		Reducing Port Connector 3/4"x1/2" Tube OD material : SS 316 Pressure Rating 6000 Psig. Double ferrule type end connections at both ends."	10
33		Port Connector 1" Tube OD material : SS 316 Pressure Rating 6000 Psig. Double ferrule	10

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		type end connections at both ends.	
34		Port Connector 3/4" Tube OD material : SS 316 Pressure Rating 6000 Psig. Double ferrule type end connections at both ends.	10
35		Port Connector 1/2" Tube OD material : SS 316 Pressure Rating 6000 Psig. Double ferrule type end connections at both ends.	10
36		Male Connector 1" OD X 1" M NPT material : SS 316 Pressure Rating 6000 Psig. Double ferrule type end connections at both ends.	10
37		Male Connector 3/4" OD X 3/4" M NPT material : SS 316 Pressure Rating 6000 Psig. Double ferrule type end connections at both ends	10
38		MaleConnector 1/2" OD X 1/2" M NPT material : SS 316 Pressure Rating 6000 Psig. Double ferrule type end connections at both ends	10
39		1 " OD Plug, material SS 316. Pressure Rating 6000 Psig. Double ferrule type end connections at both ends.	10
SS VALVES - GROUP (B)			
40		2-way Ball valve 3/4", W.P: 255bar g, Size: 3/4" OD with nut, front and back ferrule on both sides Nylon with SS/Brass inserts Handle, Body: SS 316, Peek Seats (suitable for 6000 psi pressure CNG application).	200
41		2-way Ball valve 3/4", W.P: 255bar g, Size: 3/4" OD with nut, front and back ferrule on both sides Nylon with SS/Brass inserts Handle, Body: SS 316, Peek Seats with lock-in facilities (suitable for 6000 psi pressure CNG application).	80
42		2-way Ball valve 1/2",W.P: 255bar g, Size: 1/2"OD with nut, front and back ferrule on both sides Nylon with SS/Brass inserts Handle, Body: SS 316, Peek Seats (suitable for 6000 psi pressure CNG application).	300

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43	3-way Ball valve 3/4" OD end connection & 1/4" NPT (F) bottom end connection (zero leakage) W.P: 255bar g, with nut, front and back ferrule on both sides Nylon with SS/Brass inserts Handle, Body: SS 316, Peek Seats (suitable for 6000 psi pressure CNG application).	30
44	Non-return valve 3/4" , W .P : 255 bar g, Size: 3/4" OD with nut, front and back ferrule on both sides. Cracking pressure= 1 Psi (Suitable for 6000 psi pressure CNG application),Seal BUNA-N /Equivalent	60
45	Non-return valve 1/2" , W .P : 255 bar g, Size: 1/2" OD with nut, front and back ferrule on both sides. Cracking pressure= 1 Psi (Suitable for 6000 psi pressure CNG application),Seal BUNA-N /Equivalent	300

**2.0 DELIVERY LOCATIONS**

All items will be delivered at Dewas, Kota, CWC Ghaziabad, Sonipat.

**3.0 GENERAL NOTES**

- 3.1 SS Valves/ Fittings shall be used for R-LNG service. Accordingly tests as per specification shall be applicable.
- 3.2 All material shall be delivered at Company's designated storage yard. The destination for delivery of the valves, fittings shall be at designated GAIL gas store at as per clause 2.0.
- 3.3 Bidder must submit duly filled up and signed data sheets and Quality Manuals along with his offer.

In the absence of this information, Company reserves the right to reject bidder's offer without any reference to Bidder in this regard.

**4.0 REMARKS**

- 4.1 Supplier's Compliance  
Supplier shall submit his bid in full compliance with the requirements of this MR and attachments. Supplier must include following statement in his bid:

We certify that our bid is fully complying with your enquiry dated\_\_\_\_\_ and reference\_\_\_\_\_

- 4.2 Compliance with Specification

The supplier shall be completely responsible for the design, materials, fabrication, testing, inspection, preparation for shipment & transfer of above material strictly in accordance with the MR & all attachments.

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4.3 Supplier's Scope

Supplier's scope of work supply includes the equipment with all internals & accessories shown on the data sheets, specifications and all unmentioned parts necessary for a satisfactory operation & testing except those which are indicated to be out of Supplier's supply.

4.4 Inspection

The manufacturer shall furnish typical test reports of all tests conducted on SS fittings / SS valves as per the technical specification & data sheet of tender.

**5.0 SPECIAL INSTRUCTIONS TO BIDDERS**

5.1 Bidder to note that no correspondence shall be entered into or entertained after the bid submission.

5.2 Bidder shall furnish quotation only in case he can supply material strictly as per this Material Requisition and specification/data sheets forming part of Material Requisition.

5.3 If the offer contains any technical deviations or clarifications or stipulates any technical specifications (even if in line with MR requirements) and does not include complete scope & technical/ performance data required to be submitted with the offer, the offer shall be liable for rejection.


5.4 The submission of prices by the Bidder shall be construed to mean that he has confirmed compliance with all technical specifications of the corresponding item(s).

5.5 Bidder must submit all documents as listed in checklist along with his offer.

5.6 Vendors for bought out items to be restricted to the approved vendor list attached with MR. Approval of additional vendor if required, for all critical bought out items shall be obtained by the supplier from the purchaser before placement of order. Credentials/ PTR of the additional vendor proposed to be submitted by supplier for review and approval of Purchaser/ Purchaser's representative

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LIST OF RECOMMENDED THIRD PARTY INSPECTION AGENCY								
S.NO	ITEM	NAME OF VENDOR	CONTACT PERSON	ADDRESS	PHONE NO	FAX NO	QUALIFIED FOR SIZE	
1	Third Party Inspection Agency	THIRD PARTY INSPECTION AGENCY						
		Tata Projects Ltd.		22,Sarvodaya Society,Nizampura,Bandra-390002	0265-2392863	0265-2785952		
		Indian Register of Shipping		72,maker tower "F" 7 th floor coffe parade mumbai 400005 India	022-40804080	022-22181241		
		Bax counsel Insepection Bureau Pvt. Ltd.		303, Madhava,Bandra Kurla Complex, Bandra(E),Mumbai-400051	022-26591526,022-26590236	022-26591526		
		Bureau VeritasQI		The Leela Galleria,5th floor,Andheri-Kurla Road,Andheri(E),Mumbai-400059	022-26956300	022-26956309		
		Germanischer Lloyd		304-305, Anna Salai,Teyanampet,Chennai-600018	044-24320335	044-24328186		
		Velosi Certification Services,Mumbai		Velosi Certification Services(I)Pvt.Ltd.,21 2,Shivkrupa Complex Centre,Off Ghokhale Road,Navpada Thane(W)400602	022-25376770	022-25426777		
		ABS Industrial Verification Ltd., Mumbai		404,Mayuresh Chambers,Sector-11,CBD Belapur(E),Navi Mumbai-400614	022-27578780 /1 /2	022-27578784 /5		
		Certification Engineers International Ltd.		EIL Bhavan,5th floor,1,Bhikaji Camma Place,New Delhi-110066	011-26167539,26102121	011-26101419		
		M/s DNV India		230, dheeraj heritage sv road santacruz(w) mumbai-400054 india	0 22-67106681	0 226710 6680		
		International Certification Systems		E-7,Chand Society, Juhu Road, Juhu, Mumbai-400049	022-26245747	022-226248167		
SGS		SGS India Pvt. Ltd.,SGS House,4B,A.S.Marg,Vikhroli(W),Mumbai-	022-25798421 to 28	022-25798431 to 33				
Note: 1.0 The details of Vendors indicated in this list are based on the information available with GAIL, Contractor shall verify capabilities of each vendor for producing the quantity with proper Quality. Owner does not take any responsibility on the performance of the Vendor								
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C	30/09/10	CLIENT'S COMMENTS INCORPORATED	AS	JLG	PKS
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A	25/08/10	ISSUED FOR IDC	AS	JLG	PKS
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## 1.0 INTRODUCTION

Gail Gas limited is inviting tenders on Competitive Bidding basis procurement of SS fittings for CNG Station.

## 2.0 AMBIENT CONDITIONS

The climatic conditions to be considered for selection, design and derating of SS fittings shall be as indicated below:

- Ambient Temp. min/max degree C : 4.7 °C / 47 °C
- Relative humidity : 94 %

## 3.0 SCOPE

The Technical Specification covers the design, engineering, fabrication/manufacturing, inspection, supply, testing at works for CNG station as described below. The vendor has to supply these items conforming to applicable relevant codes as described in clause 4.0 below.

## 4.0 REFERENCE DOCUMENTS

4.1 The latest edition of following standards are referred to in this specification:

ASME B31.3 : Chemical Plant and Petroleum Refinery Piping  
ASME B31.1 : For Power Piping  
ASME Sec. VIII : For Boilers and Pressure Vessels  
SAE-J-514 : For Wall Thickness.  
AGA 1-93, BS970 Para 4 1970 Grade SS316. C.G.A. and NGV Standards.

4.2 The quality assurance program of the manufacturer shall have been audited and ISO 9000 certification achieved by the manufacturer through any one of the following auditing/inspection agencies:-

- ASME
- British Standard Institute
- Det Norske Veritas (DNV)
- Lloyd's Register
- TUV

4.3 In case of conflict between the requirements of this specification and the standards referred to in clause 4.1 above, the requirements of this specification shall govern.

## 5.0 FITTINGS

5.1 The fitting shall have type approval to either of ASTM F1387/ECER110 test protocols witnessed by any one of auditing/inspection agencies as in clause 4.2.

5.2 Fittings shall be manufactured from the following materials

- The basic material for fittings shall be SS 316.
- Bar stock shall be as per BS -316-S31, DIN 4401 or ASME SA 479 Gr SS316 but with carbon content < 0.05% to provide increased resistance to corrosion.
- Forgings shall be as per BS 970-316-S31, DIN 4401 or ASME SA-182 Gr SS316

5.3 The fitting end connections shall be compatible to tube of hardness  $\leq$  Rb80.

5.4 All component parts of the fitting shall be of the same material.



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5.4.1 The ferrule material shall be able to withstand an atmosphere of natural gas, oil and moisture without rusting.

## 6.5 Design and Manufacture

6.5.1 All fittings shall be designed for 6000 psig pressure.

6.5.2 All fittings shall be designed in conformance with the requirements of ASME B31.3 and applicable standards. Area classification applicable for all items shall be Class 1, Division 1, Group D as per NEC or Zone-1, Group IIA/IIB specification or equivalent specification. All fittings shall be designed so that all parts / components meet the requirements for the specified area classification.

6.5.3 The SS fittings shall be of flare less design and four piece construction, consisting of front and rear ferrules, nut and body suitable for use on SS tubes conforming to ASTM A 269 TP 316L. All the parts should be interchangeable with any other reputed fittings.

6.5.4 Fittings shall be rated for at least the design pressure as stipulated in the material requisition. The design of fitting shall ensure that they shall be capable of holding full tube burst pressure after only one and a quarter turn pull of the nut.

6.5.5 The threaded ends of fittings shall be NPT as per ASME B.1.20.1. Especially male threads are to be made by cold rolling method and shall be protected by plastic caps.

6.5.6 Spanner hold shall be metric.

6.5.7. The fittings shall hold the tube with a collective action producing a firm grip on the tube without substantially reducing the wall thickness.

6.5.8 Fittings shall not torque the tubing during original or subsequent make up of the connection and should use geometry for inspection before and after make up. The fitting shall not require disassembly for inspection before or after make up.

6.5.9 The gap inspection gauge shall be easily insert able at finger tight position of nut. The gap inspection gauge shall not be insert able between the nut and shoulder of the fitting after completing only one and a quarter turn pull up of the nut.

6.5.10 The tube seat counter bore in the body shall be faced flat 90° to the axis of the tubing to minimize tube expansion and subsequent galling.

6.5.11 The sealing and gripping power of the fitting shall be controlled such that the action between ferrules will overcome commercial variations in tubing wall thickness, hardness, diameter and installer skill.

6.5.12 The seal contact areas of the fitting body shall have a machined finish of 32 Ra or better.

6.5.13 The fitting body shall have no machined stop or shoulder to preclude additional tightening in subsequent make up. If shoulder is provided, supplier to supply hydraulic swaging tool with the supply of fittings to enable efficient swaging. This shall be at no extra cost to Gail Gas Limited.

6.5.14 Front Ferrule:

- i. The front ferrule shall affect a long, smooth repeatable seal by contact with body and a grip hold on the tube surface.
- ii. The front ferrule shall always remain in a sprung condition to compensate for thermal stresses and to accomplish repeated make or break.
- iii. The sealing cone of body where front ferrule seats shall be burnished to remove tool marks and to give extra smooth surface for proper sealing.
- iv. Front ferrule, shall be significantly hardened than the tubing up to Rb 90 hardness.



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6.5.15 Rear Ferrule:

- i. The rear ferrule shall collet the tubing surface, improving the performance of the tubing in systems of high impulse or vibration.
- ii. Rear ferrule, which grips the tubing and not typically wetted part shall be significantly hardened than the tubing up to Rb 90 hardness.

6.5.16 Nuts shall have silver plated threads to act as a lubricating agent to avoid galling and to reduce tightening torque.

6.5.17 Fittings shall be suitable to operate at high temperature and pressure combinations.

**7.0 TESTING REQUIREMENT FOR FITTINGS**

7.1 The Manufacturer shall submit typical type test reports for the following tests AS MINIMUM.

- i. Visual Examination
- ii. Hydraulic burst pressure test
- iii. Gas pressure test for 25 remakes at 5000 psig. No leakage should be detectable even after 25 remakes.
- iv. Helium leak test under 0.0002 psia negative pressure, leaks into assembly greater than  $4.0 \times 10^{-9}$  atm-cc/sec being unacceptable.
- v. Impulse and vibration testing by "rotary beam method" or 500,000 impulse cycles and 10 million vibration cycles with detectable leakage at full operating pressure throughout till the end of the test.
- vii. All Fittings should be hydro-tested to a pressure of 1.5 times the operating pressure.

**8.0 TEST REPORTS AND CERTIFICATES**

8.1 The manufacturer shall supply material compliance certificates conforming that raw material for fittings conforms to the requirements of ASME Section-II and ASME Section-III sub sections NB, NC and ND.

8.2 The manufacturer shall furnish test procedure and typical test reports of all tests conducted on fittings as per the requirements of clause 7.0

**9.0 MARKINGS, PACKING AND SHIPMENT**

9.1 Heat code traceability number shall be stamped or etched on both body nut and ferrules (front and back) of each fitting.

9.2 Replacement nuts and ferrules shall be packaged in a manner so as to allow safe and simple replacement.

9.3 All items shall be suitably wrapped and packaged to withstand rough handling during shipment and inland journey.

9.4 Items shall be properly tagged and packaged separately to facilitate easy identification.

9.5 Items shall be wrapped and packaged in such a way that they can be preserved in original as new condition.

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## 10.0 DOCUMENTATION

10.1 All documents shall be furnished in English Language only.

10.2 At the time of bidding, bidder shall submit the following documents:

- i. Reference list of previous supplies for similar items giving the following details:
  - a) Name of the customer
  - b) Specification of the item i.e. size and pressure & temperature rating
  - c) Service
  - d) Quantity
  - e) Year of supply
- ii. Test procedures and typical certificates to be submitted as per clause 8.0 and 10.0 of this specification.
- iii. Manufacturer Quality Manuals.
- iv. Copy of ISO 9000 certification for supplier / manufacturer.

10.3 The following test certificates shall be furnished along with the shipment:

- i. Test certificates of chemical, mechanical testing, (Heat Code Traceability).
- ii. Manufacturer standard shop inspection and test reports
- iii. Test procedure and certificates to be submitted as per the requirements of clause 8.0 of this specification
- iv. Manufacturer compliance certificate

## 11.0 GUARANTEE

11.1 The manufacturer shall guarantee that the design, materials, manufacturing and testing of fittings comply with the requirements of this specification and applicable codes and standards. Manufacturer shall replace all fittings, which are defective or fail during field pressure testing or fail to perform satisfactorily due to inadequate engineering, sub standard material and workmanship.

11.2 The manufacturer shall guarantee the fittings against any defect, failure or malfunctioning occurring during 12 months from the date of commissioning or 24 months from the date of supply, whichever is earlier.

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0	01/10/10	ISSUED FOR TENDER	AS	JLG	PKS
C	30/09/10	CLIENT'S COMMENTS INCORPORATED	AS	JLG	PKS
B	14/09/10	ISSUED FOR APPROVAL	AS	JLG	PKS
A	25/08/10	ISSUED FOR IDC	AS	JLG	PKS
<b>REV</b>	<b>DATE</b>	<b>DESCRIPTION</b>	<b>PREP</b>	<b>CHK</b>	<b>APPR</b>

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## 1.0 INTRODUCTION

Gail Gas limited is inviting tenders on Competitive Bidding basis for procurement of SS Valves for CNG Station.

## 2.0 AMBIENT CONDITIONS

The climatic conditions to be considered for selection, design and derating of SS Valves shall be as indicated below:

- Ambient Temp. min/max degree C : 4.7 °C / 47 °C
- Relative humidity : 94 %

## 3.0 SCOPE

This specification covers the requirements for the design, manufacture, inspection, testing at works and supply of ball valves.

## 4.0 REFERENCE DOCUMENTS

4.1 The latest edition of following standards are referred to in this specification:

MSS SP-99 : Instrument Valves  
ASME/ASTM B 31.3 : Chemical Plant and Petroleum Refinery Piping

4.2 In case of conflict between the requirements of this specification and the standards referred to in clause 4.1 above, the requirements of this specification shall govern.

## 5.0 MATERIALS

5.1 The valve body will be made out of material conforming to ASTM A 479 Gr. SS 316./ ASTM A351 SS316

5.2 MOC of ball shall conform to ASTM A 276 Gr. SS 316./ Equivalent.

5.3 MOC of seat shall be PEEK.

## 6.0 DESIGN AND MANUFACTURE

6.1 All ball valves shall be designed in conformance with the requirements of ASME B31.3, MSS SP-99 and applicable standards. Area classification applicable for all items shall be Class 1, Division 1, Group D as per NEC or Zone-1, Group IIA/IIB as per IS/IEC specification or equivalent specification. All parts / components shall meet the requirements for the specified area classification.

6.2 Valves shall be rated for a maximum design pressure rating of 6000 psig and shall be capable of operation between Design Temperature range of -40° C to +121° C

6.3 Valves shall have spring loaded PEEK seats allowing seal-ability over the full pressure range at any port and low operating torque over the full range of pressure and temperatures.

6.4 Valve shall have Nylon with brass insert handle. Handle shall indicate the direction of flow.

6.5 Manufacturer should have Type Approval Certificate for using these valves for high pressure application from any one of the following:



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- Det Norske Veritas (DNV)
- Lloyd's Register
- TUV

**7.0 INSPECTION AND TESTING**

7.1 The Valve Manufacturer shall submit factory test reports for the following tests carried out on each valves:

- i. Hydrostatic seat leak test shall be carried out with de-ionized water. There shall be no detectable seat leakage at 1.1 times the rated pressure of the valve.
- ii. Gas pressure test for seat shall be carried out with nitrogen at 1000 psig. There shall be no detectable external leakage. Maximum allowable seat leakage shall be 0.1 std-cc/min.

**8.0 OTHER REQUIREMENTS**

8.1 Manufacturer should conform that valves are approved by Rail Road Commission of Texas, LP Gas Division under regulation for compressed natural gas or ASME/ AGA NGV 3.1 1995, CAN / CGA 12.3-M95 "Fuel Systems Components for Natural Gas Powered Vehicles" by "Canadian Gas Association".

8.2 Spares and Accessories

- i. Manufacturer shall furnish a list of recommended spares and accessories for valves required during startup and commissioning.

**9.0 TEST REPORTS AND CERTIFICATES**

9.1 The manufacturer shall supply material compliance certificates.

9.2 The valve manufacturer shall provide test procedure and valve inspection and test report for type test carried out on similar valves as per the requirements of clause 7.0.

**10.0 MARKINGS, PACKING AND SHIPMENT**

10.1 Heat code shall be marked on valve body to facilitate traceability.

10.2 All items shall be suitably wrapped and packaged to withstand rough handling during ocean shipment and inland journey.

10.3 Each item shall be properly tagged and packaged separately to facilitate easy identification.



10.4 All items shall be wrapped and packaged in such a way that they can be preserved in their original, as new condition.

**11.0 DOCUMENTATION**

11.1 All documents shall be furnished in English Language only.

11.2 At the time of bidding, bidder shall submit the following documents:

- i. Reference list of previous supplies for similar items giving the following details:
  - a) Name of the customer

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- b) Specification of the item i.e. size and pressure & temperature rating
- c) Service
- d) Quantity
- e) Year of supply
- f) Copy of third party inspection certificates



- ii. Copy of ISO 9000 certification for supplier / manufacturer.
- iii. Manufacturer Quality Manuals.
- iv. Technical descriptive catalogue of manufacturer.
- v. General arrangement / assembly drawing of valve showing all features.
- vi. Sectional drawing showing major parts with reference number and material specification.

11.3 Prior to shipment, manufacturer shall submit following test certificates and documents:

- i. Test certificates of chemical, mechanical testing.
- ii. Manufacturer standard shop inspection and test reports.
- iii. The test report for specified tests.
- iv. Test procedure and certificates to be submitted as per the requirements of clause 9.0 of this specification.
- v. Manual for installation, erection, maintenance and operating instructions including a list of recommended spares for valves.

**12.0 GUARANTEE**

The manufacturer shall guarantee that the design, materials, manufacturing and testing of valves comply with the requirements of this specification and applicable codes and standards. Manufacturer shall replace all valves, which are defective or fail during field pressure testing or fail to perform satisfactorily due to inadequate engineering, sub standard material and workmanship.

 	<p style="text-align: center;">SPECIFICATION FOR SS VALVES</p>	Document No.	Rev
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**JPKENNY**



**GAIL GAS LIMITED  
CITY GAS DISTRIBUTION PROJECT**



<b>DATASHEET FOR 3/4" THREE WAY SS BALL VALVE</b>				<b>CLIENT JOB NO.</b>		-
				<b>TOTAL SHEETS</b>		02
<b>DOCUMENT NO</b>	11	0290	02	08	03	031

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REV.	DATE	DESCRIPTION	PREP	CHKD	APPD
0	01/10/10	ISSUED FOR TENDER	AS	JLG	PKS
C	30/09/10	CLIENT'S COMMENTS INCORPORATED	AS	JLG	PKS
B	14/09/10	ISSUED FOR APPROVAL	AS	JLG	PKS
A	25/08/10	ISSUED FOR IDC	AS	JLG	PKS

<b>DATA SHEET</b>  <b>THREE WAY BALL VALVES</b> (3/4" and 6000 Psig)	PROJECT No. : 110290
	CLIENT : Gail Gas Limited
	CONSULTANT : WGI
	REV : 0
	TAG No. :
	REQ No. :

PROJECT : City Gas Distribution Project.

<b>GENERAL SPECIFICATION</b>			
1			
2	FLUID HANDLED	CNG	REFERENCE CODE
3	OPERATING PRESSURE	255 bar	END CONNECTION
4	OPERATING TEMPERATURE	55 DEG C	3/4" Double Ferrule Type
5	DESIGN PRESSURE	6000 Psig	
6			BORE TYPE
7			VALVE OPERATION
8			Manual Shut off
9			VALVE TYPE
10			Trunion / Floating
11	MODEL NUMBER		SPECIAL REQUIREMENT
12			

<b>VALVE MATERIAL SPECIFICATION</b>			
13			
14	PART	SPECIFIED MATERIAL	MATERIAL OFFERED(*)
15	HANDLE	Nylon with brass/ SS insert	
16	BODY	SS 316	
17	STEM	SS316	
18	BALL	SS316	
19	SEAT	PEEK	
20	STEM SEAL	Nitrile rubber/ Ultra low Temp. Fluorocarbon/D2000	
21	Cv	*	

- NOTE:
1. VALVES FITTED COMPLETE WITH END CONNECTIONS AT ENDS.
  2. THIS DATA SHEET SHALL BE READ IN CONJUNCTION WITH THE TECHNICAL SPECIFICATION ENCLOSED ALONG WITH THIS REQUISITION.
  3. BIDDER TO FURNISH DETAILS OF MATERIALS OFFERED FOR OTHER MAJOR PARTS OF THE EQUIPMENT ALONG WITH OPERATING DATA
  4. BIDDER SHALL FURNISH CATALOGUE MARKING MODEL OFFERED.
  5. (\*) VENDOR TO FURNISH ALONG WITH OFFER
  6. EACH VALVE SHOULD BE HYDRO-TESTED TO 1.5 TIMES THE OPERATING PRESSURE. TESTING OF OTHER PARTS OF EACH VALVE TO BE CARRIED OUT AS MENTIONED IN THE TECHNICAL SPECIFICATIONS.



**DATASHEET FOR 3/4" THREE WAY SS BALL VALVE**

<b>DOCUMENT NO.</b>	<b>REV</b>
11-0290-02-08-03-031	0

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DATASHEET FOR 3/4" SS BALL VALVE				CLIENT JOB NO.		-
				TOTAL SHEETS		03
DOCUMENT NO	11	0290	02	08	03	027

Blank area for drawing or data.

REV.	DATE	DESCRIPTION	PREP	CHKD	APPD
0	01/10/10	ISSUED FOR TENDER	AS	JLG	PKS
C	30/09/10	CLIENT'S COMMENTS INCORPORATED	AS	JLG	PKS
B	14/09/10	ISSUED FOR APPROVAL	AS	JLG	PKS
A	25/08/10	ISSUED FOR IDC	AS	JLG	PKS

DATA SHEET  BALL VALVES (3/4" and 6000 Psig)	PROJECT No. : 110290
	CLIENT : Gail Gas Limited
	CONSULTANT : WGI
	REV : 0
	TAG No. :
REQ No. :	

PROJECT : City Gas Distribution Project.

<b>GENERAL SPECIFICATION</b>			
1			
2	FLUID HANDLED	CNG	REFERENCE CODE
3	OPERATING PRESSURE	255 bar	END CONNECTION
4	OPERATING TEMPERATURE	55 DEG C	3/4" Double Ferrule Type
5	DESIGN PRESSURE	6000 Psig	
6			BORE TYPE
7			VALVE OPERATION
8			Manual Shut off
9			VALVE TYPE
10			Floating
11	MODEL NUMBER		SPECIAL REQUIREMENT
12			

<b>VALVE MATERIAL SPECIFICATION</b>			
14	PART	SPECIFIED MATERIAL	MATERIAL OFFERED(*)
15	HANDLE	Nylon with brass/ SS insert	
16	BODY	SS 316	
17	STEM	SS316	
18	BALL	SS316	
19	SEAT	PEEK	
20	STEM SEAL	Nitrile rubber/ Ultra low Temp. Fluorocarbon/D2000	
21	Cv	*	

<b>CERTIFICATES</b>			
22	ASME/ AGA NGV 3.1 / CGA 12.3-M95,		:
	Classification : Manual Valve		
	Pressure : 4500 psig (310 bar)		:
	Temperature : -40°F to 250 °F (-40°C to 121 °C)		
23	ASME/ IAS NGV 4.6/ CSA 12.56-M99,		
	Classification : Class A		
	Pressure : 4500 psig (310 bar)		
	Temperature : -40°F to 185 °F (-40°C to 85 °C)		
24	ECE R110 Manual Service Valve Type Approval to 4500 psig (310 bar)		

NOTE:

- VALVES FITTED COMPLETE WITH END CONNECTIONS AT BOTH ENDS
- THIS DATA SHEET SHALL BE READ IN CONJUNCTION WITH THE TECHNICAL SPECIFICATION ENCLOSED ALONG WITH THIS REQUISITION.
- BIDDER TO FURNISH DETAILS OF MATERIALS OFFERED FOR OTHER MAJOR PARTS OF THE EQUIPMENT ALONG WITH OPERATING DATA



**DATASHEET FOR 3/4" SS BALL VALVE**

<b>DOCUMENT NO.</b>	<b>REV</b>
11-0290-02-08-03-027	0
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- 4. BIDDER SHALL FURNISH CATALOGUE MARKING MODEL OFFERED.
- 5. (\*) VENDOR TO FURNISH ALONG WITH OFFER
- 6. EACH VALVE SHOULD BE HYDRO-TESTED TO 1.5 TIMES THE OPERATING PRESSURE. TESTING OF OTHER PARTS OF EACH VALVE TO BE CARRIED OUT AS MENTIONED IN THE TECHNICAL SPECIFICATIONS.
- 7. VENDOR SHALL SUBMIT ALL THESE THREE CERTIFICATES WRITTEN ABOVE.

	<b>DATASHEET FOR 3/4" SS BALL VALVE</b>	DOCUMENT NO.	REV
		11-0290-02-08-03-027	0
		<b>SHEET 3 OF 3</b> <b>Page 26 of 33</b>	

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CITY GAS DISTRIBUTION PROJECT



DATASHEET FOR 3/4" SS NON RETURN VALVE				CLIENT JOB NO.		-
				TOTAL SHEETS		02
DOCUMENT NO	11	0290	02	08	03	028

REV.	DATE	DESCRIPTION	PREP	CHKD	APPD
0	01/10/10	ISSUED FOR TENDER	AS	JLG	PKS
C	30/09/10	CLIENT'S COMMENTS INCORPORATED	AS	JLG	PKS
B	14/09/10	ISSUED FOR APPROVAL	AS	JLG	PKS
A	25/08/10	ISSUED FOR IDC	AS	JLG	PKS

<b>DATA SHEET</b>  <b>NON-RETURN VALVE</b> (3/4" and 6000Psig)			PROJECT No. : 110290
			CLIENT : Gail Gas Limited
			CONSULTANT : WGI
			REV : 0
			TAG No. :
DOCUMENT No. :			REQ No. :
PROJECT : City Gas Distribution Project.			
GENERAL SPECIFICATION			
1			
2	FLUID HANDLED	CNG	REFERENCE CODE
3	OPERATING PRESSURE	255 bar	END CONNECTION
4	OPERATING TEMPERATURE	55 DEG C	CRACKING PRESSURE
5	DESIGN PRESSURE	6000 Psig	Cv
6			VALVE TYPE
7			SPECIAL REQUIREMENT
8			
9			
10	VALVE MATERIAL SPECIFICATION		
11	PART	SPECIFIED MATERIAL	MATERIAL OFFERED
12			
13			
14	SEAL	BUNA-N/Equivalent	*
15	BODY	SS316	*
16			
17			
18			
19			
20	TESTING		
20.1	EACH OFFERED VALVE SHALL BE FACTORY TESTED FOR CRACK AND RESEAL PERFORMANCE WITH A LIQUID LEAK DETECTOR		
20.2	EACH VALVE SHALL BE TESTED TO ENSURE IT SEALS WITHIN 5 SECONDS AT THE APPROPRIATE RESEAL PRESSURE		
	CERTIFICATE		
21	ECE R110 Manual Service Valve Type Approval to 4500 psig (310 bar)		

- NOTE:**
1. VALVES FITTED COMPLETE WITH END CONNECTIONS AT BOTH ENDS
  2. BIDDER TO FURNISH DETAILS OF MATERIALS OFFERED FOR OTHER MAJOR PARTS OF THE EQUIPMENT ALONG WITH OPERATING DATA
  3. BIDDER SHALL FURNISH CATALOGUE MARKING MODEL OFFERED
  4. BIDDER TO FURNISH MOC FOR ALL OTHER PARTS OF THE EQUIPMENT
  5. (\*) BIDDER TO SPECIFY
  6. EACH VALVE SHOULD BE HYDRO-TESTED TO 1.5 TIMES THE OPERATING PRESSURE. TESTING OF OTHER PARTS OF EACH VALVE TO BE CARRIED OUT AS MENTIONED IN THE TECHNICAL SPECIFICATIONS.

JP KENNY



GAIL GAS LIMITED  
CITY GAS DISTRIBUTION PROJECT



DATASHEET FOR 1/2" SS BALL VALVE				CLIENT JOB NO.		-
				TOTAL SHEETS		03
DOCUMENT NO	11	0290	02	08	03	029

REV.	DATE	DESCRIPTION	PREP	CHKD	APPD
0	01/10/10	ISSUED FOR TENDER	AS	JLG	PKS
C	30/09/10	CLIENT'S COMMENTS INCORPORATED	AS	JLG	PKS
B	14/09/10	ISSUED FOR APPROVAL	AS	JLG	PKS
A	25/08/10	ISSUED FOR IDC	AS	JLG	PKS

DATA SHEET  BALL VALVES (1/2" and 6000 Psig)	PROJECT No. : 110290
	CLIENT : Gail Gas Limited
	CONSULTANT : WGI
	REV : 0
	TAG No. :
REQ No. :	

PROJECT : City Gas Distribution Project.

<b>GENERAL SPECIFICATION</b>			
1			
2	FLUID HANDLED	CNG	REFERENCE CODE
3	OPERATING PRESSURE	255 bar	END CONNECTION
4	OPERATING TEMPERATURE	55 DEG C	1/2" Double Ferrule Type
5	DESIGN PRESSURE	6000 Psig	
6			BORE TYPE
7			VALVE OPERATION
8			Manual Shut off
9			VALVE TYPE
10			Floating
11	MODEL NUMBER		SPECIAL REQUIREMENT
12			

<b>VALVE MATERIAL SPECIFICATION</b>			
13			
14	PART	SPECIFIED MATERIAL	MATERIAL OFFERED(*)
15	HANDLE	Nylon with brass/ SS insert	
16	BODY	SS 316	
17	STEM	SS316	
18	BALL	SS316	
19	SEAT	PEEK	
20	STEM SEAL	Nitrile rubber/ Ultra low Temp. Fluorocarbon/D2000	
21	Cv	*	

<b>CERTIFICATES</b>			
22	ASME/ AGA NGV 3.1 / CGA 12.3-M95,		:
	Classification : Manual Valve		
	Pressure : 4500 psig (310 bar)		:
	Temperature : -40°F to 250 °F ( -40°C to 121 °C)		
23	ANSI/ IAS NGV 4.6/ CSA 12.56-M99,		
	Classification : Class A		
	Pressure : 4500 psig (310 bar)		
	Temperature : -40°F to 185 °F (-40°C to 85 °C)		
24	ECE R110 Manual Service Valve Type Approval to 4500 psig (310 bar)		

NOTE:

- VALVES FITTED COMPLETE WITH END CONNECTIONS AT BOTH ENDS
- THIS DATA SHEET SHALL BE READ IN CONJUNCTION WITH THE TECHNICAL SPECIFICATION ENCLOSED ALONG WITH THIS REQUISITION.
- BIDDER TO FURNISH DETAILS OF MATERIALS OFFERED FOR OTHER MAJOR PARTS OF THE EQUIPMENT ALONG WITH OPERATING DATA
- BIDDER SHALL FURNISH CATALOGUE MARKING MODEL OFFERED.

	<b>DATASHEET FOR 1/2" SS BALL VALVE</b>	<b>DOCUMENT NO.</b>	<b>REV</b>
		11-0290-02-08-03-029	0
		<b>SHEET 2 OF 3</b> <b>Page 30 of 33</b>	

5. (\*) VENDOR TO FURNISH ALONG WITH OFFER

6. EACH VALVE SHOULD BE HYDRO-TESTED TO 1.5 TIMES THE OPERATING PRESSURE. TESTING OF OTHER PARTS OF EACH VALVE TO BE CARRIED OUT AS MENTIONED IN THE TECHNICAL SPECIFICATIONS.

7. VENDOR SHALL SUBMIT ALL THESE THREE CERTIFICATES WRITTEN ABOVE.

**J P KENNY**



DATASHEET FOR 1/2" SS BALL VALVE

DOCUMENT NO.

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JP KENNY



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CITY GAS DISTRIBUTION PROJECT



DATASHEET FOR 1/2" SS NON RETURN VALVE				CLIENT JOB NO.		-
				TOTAL SHEETS		02
DOCUMENT NO	11	0290	02	08	03	030

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0	01/10/10	ISSUED FOR TENDER	AS	JLG	PKS
C	30/09/10	CLIENT'S COMMENTS INCORPORATED	AS	JLG	PKS
B	14/09/10	ISSUED FOR APPROVAL	AS	JLG	PKS
A	25/08/10	ISSUED FOR IDC	AS	JLG	PKS
REV.	DATE	DESCRIPTION	PREP	CHKD	APPD

<b>DATA SHEET</b>  NON-RETURN VALVE (1/2" and 6000Psig)			PROJECT No. : 110290
			CLIENT : Gail Gas Limited
			CONSULTANT : WGI
			REV : 0
			TAG No. :
DOCUMENT No. :			REQ No. :
PROJECT : City Gas Distribution Project .			
1	GENERAL SPECIFICATION		
2	FLUID HANDLED	CNG	REFERENCE CODE
3	OPERATING PRESSURE	255 bar	END CONNECTION
4	OPERATING TEMPERATURE	55 DEG C	CRACKING PRESSURE
5	DESIGN PRESSURE	6000 Psig	Cv
6			VALVE TYPE
7			SPECIAL REQUIREMENT
8			
9			
10	VALVE MATERIAL SPECIFICATION		
11	PART	SPECIFIED MATERIAL	MATERIAL OFFERED
12			
13			
14	SEAL	BUNA-N/Equivalent	*
15	BODY	SS316	*
16			
17			
18			
19			
20	TESTING		
20.1	EACH OFFERED VALVE SHALL BE FACTORY TESTED FOR CRACK AND RESEAL PERFORMANCE WITH A LIQUID LEAK DETECTOR		:
20.2	EACH VALVE SHALL BE TESTED TO ENSURE IT SEALS WITHIN 5 SECONDS AT THE APPROPRIATE RESEAL PRESSURE		
	CERTIFICATE		
21	ECE R110 Manual Service Valve Type Approval to 4500 psig (310 bar)		

- NOTE:**
- 1 VALVES FITTED COMPLETE WITH END CONNECTIONS AT BOTH ENDS
  2. BIDDER TO FURNISH DETAILS OF MATERIALS OFFERED FOR OTHER MAJOR PARTS OF THE EQUIPMENT ALONG WITH OPERATING DATA
  3. BIDDER SHALL FURNISH CATALOGUE MARKING MODEL OFFERED
  4. BIDDER TO FURNISH MOC FOR ALL OTHER PARTS OF THE EQUIPMENT
  5. (\*) BIDDER TO SPECIFY
  - 6 EACH VALVE SHOULD BE HYDRO-TESTED TO 1.5 TIMES THE OPERATING PRESSURE. TESTING OF OTHER PARTS OF EACH VALVE TO BE CARRIED OUT AS MENTIONED IN THE TECHNICAL SPECIFICATIONS.