AAVANTIKA GAS LIMITED

(A JOINT VENTURE COMPANY OF GAIL & HPCL)

CITY GAS DISTRIBUTION PROJECT IN INDORE,
UJJAIN, PITHAMPUR & GWALIOR

REQUEST FOR QUOTATION (MANUAL SUBMISSION)

SUPPLY OF 4" UG BALL VALVE ANSI #600

RFQ No.: AGL/0527/MANUAL TENDER/4" UG BALL VALVE/02-2026

OPEN COMPETITIVE BIDDING

ISSUE DATE: 02.03.2026

Important Dates

Date of Start for Manually Submission of RFQ at AGL HO	**03/03/2026**
Last Date & Time of Submission of RFQ (Physical Bid)	**17/03/2026 up to 16.00 Hrs**
Date & Time of Opening of Priced Bid at AGL HO	**17/03/2026 up to 16.30 Hrs**

CONTACT PERSON at Aavantika Gas Limited:
1) Mr. Varender Sharma, Ch Mngr: Mobile – 98889 25792 / Email: varender.sharma@aglonline.net
2) Mr. Himanshu Shrivastava, Mngr, Mobile – 9131099726 / Email: himanshu.s@aglonline.net
3) Mr. Anurag Singh, Engineer: Mobile – 86006 90470 / Email: anurag@aglonline.net
4) cp@aglonline.net 0731-4222520

Aavantika Gas Ltd. (AGL) is a Joint venture of GAIL & HPCL for implementation of City Gas projects in Indore, Ujjain, Pithampur & Gwalior for CNG in transportation sector and PNG supply to Industrial, Commercial and Domestic consumers.

1. SCOPE OF WORK:

The scope of work by the bidder shall include the following:

- The pipeline between GAIL IDS-1 and CGS – Pithampur skid inlet has been designed with 600# pressure rating, hence Class 600# valve is required.
- Supply of 4" BW Ball Valve ASTM 600#, A 216 GR. WCB API 6D
- EN 10204 3.2 Certification including TPIA Charges in scope of Vendor
- Insurance is in scope of vendor
- Freight is in scope of vendor but payment will be done by AGL at actual cost
- Submission of all relevant MTC, IRN and Material Data sheet.
- Ball Valve should have been supplied within (5) years reckoned from the bid due date, to any hydrocarbon company.
- Bidder should submit completion certificate for the supplied ball valve having cross reference with the order of award.

2. TECHNICAL BIDDER QUALIFICATION CRITERIA (BQC):

Bidder should have supplied at least one Ball Valve (minimum diameter 4") having 600# pressure rating to be installed on API 5L X52 for 4" Carbon Steel Pipe.
Ball Valve should have been supplied within (5) years reckoned from the bid due date, to any hydrocarbon company in India

3. DOCUMENTS TO BE SUBMITTED IN SUPPORT OF TECHNICAL BQC:

Bidder has to submit the order of award along with the supply confirmation OR completion certificate, duly issued by the owner having cross reference to the order of award.

Other Required Documents:

a) Sealed and Signed copy of RFQ document and Corrigendum if any.
b) GST and PAN Card of the firm.
c) Last Financial Year Audited Balance Sheet FY 2024-25.

4. BID EVALUATION:

- Evaluation shall be done on lowest cost basis to the Purchaser considering Input Tax Credit, if any.
- If quoted amount of two or more L-1 ranked bidders are same, then contract will be awarded to that L-1 bidder whose Turnover as per Last Audited Balance Sheet will be higher.

5. DELIVERY PERIOD:

Delivery period for above Scope of Work will be Fifteen (15) Weeks form date of Issuance of Order of Award.

6. PAYMENT TERMS:

100% (GST Compliant Invoice) Invoice value with taxes and duties will be paid within 15 days, after delivery of material, after adjustment against applicable PRS (PRS will apply on value excluding Input Tax Credit amount) and on submission of invoice complete in all respect, along with following documents:

i) LR / GR in original.
ii) Packing List.
iv) Proof of applicable customs clearance including payment of custom duty for imports permitted in the contract.
v) Dispatch instructions / clearance by purchaser and Transit Insurance.
vi) Documents / drawings as specified in Vendor Data Requirement in Material Requisition Technical Specification.

vii) Test Certificate.
viii) No Dues No Claim Certificate

MODE OF PAYMENT

- Payment will be made by way of normal banking channels.
- Deduction at source
  Purchaser will release the payment after off-setting all dues to the Purchaser payable by the seller under the contract. Deduction will be made at the source as per the law in force.

7. PRICE REDUCTION SCHEDULE (PRS):

In supply contract, the portion of supply completed in all respects which can be used for commercial operation shall not be considered for applying PRS, if delivered within contractual delivery period. The remaining supplies which are completed beyond the contractual delivery shall attract the price reduction schedule @0.5% per week or part thereof of the delayed delivery value maximum up to 5% of total Order value.

8. SUBMISSION OF QUOTATION:

PLEASE SUBMIT YOUR MOST COMPETITIVE QUOTATION IN SEALED ENVELOPE COMPLETE WITH ABOVE DETAILS IN SCHEDULES OF RATES(SOR) LATEST BY 17.03.2026 UPTO 16:00 HRS AT AGL HO.

Quotation Opening Time: 17.03.2026 at 16:30 HRS at AGL HO.

Bid should be submitted in a single envelope containing below:

i. **The Original copy of SOR with QUOTED prices.**
ii. **Documents pertaining to Serial No. 2 & 3 above.**
iii. **Bidder has to submit No Deviation Confirmation in their Letter head as per Form-1.**
iv. **In case bidder is not covered under GST, then a declaration has to be submitted stating the same.**

All the above are to be enclosed in a Sealed Envelope super scripted as – "QUOTATION – NOT TO BE OPENED"–

To,

Contracts and Procurement Department
Aavantika Gas Limited
202 – B, 2nd Floor, NRK Business Park,
Vijay Nagar Square, A.B. Road,
Indore (M.P), Pin – 452010, Contact No. 0731-4222520

NOTE:

a. Bidders should fill their rates in the prescribed Schedule of Rates (SOR) format as per defined Schedule of Rates (SOR), no other format is acceptable.
b. Bid shall be accepted only after complying the Technical BQC as per Serial No. 2 & 3 above.

9. APPLICABILITY OF LAW & JURISDICTION:

The RFQ shall be governed and interpreted in accordance with the applicable laws of India and Courts at Indore (Madhya Pradesh) shall be exclusive Jurisdiction.

10. OTHER TERMS & CONDITIONS:

a) AGL reserves the right to accept or reject any or all Quotations received at its absolute Discretion without assigning any reason whatsoever.

b) Validity of submitted proposal should be 02 Months from the due date of RFQ submission.

11. SCHEDULE OF RATES (SOR):

Sr. No	Description	Quantity	Total Amount Excluding GST in Rs.	GST %	Total Amount Including GST in Rs.
1	**4" UG Ball Valve ANSI #600**	2 Nos			
Total Amount Including GST in Rs. (in words)					

Please submit your most competitive **Quotation in Sealed Envelope** complete with above details in **Schedule of Rates (SOR) latest by 17.03.2026 upto 16:00 Hrs.**

FORM - 1

NO DEVIATION CONFIRMATION
(ON BIDDER'S LETTERHEAD)

To,
Aavantika Gas Limited
202 – B, 2ndFloor, NRK Business Park,
Vijay Nagar Square, A.B. Road,
Indore (M.P), Pin – 452010

Dear Sir,

We understand that any deviation / exception in any form may result in rejection of bid. We, therefore, certify that we have not taken any exceptions/deviations anywhere in the bid and we agree that if any deviation / exception is mentioned or noticed, our bid may be rejected.

SEAL AND SIGNATURE OF BIDDER

FORM – 2

DECLARATION
(ON BIDDER'S LETTER HEAD)

No. Date:

Aavantika Gas Limited,
Indore (M.P.)

We hereby confirm that we have not been banned /Holiday listed by any CGD Company for the similar requisite works.

SEAL AND SIGNATURE OF BIDDER

FORM – 3

BIDDER GENERAL INFORMATION

No. Date:

Aavantika Gas Limited,
Indore (M.P.)

1. **Bidder Name :**
2. **Name of Owner/ MD of Organization :**
3. **Address of Registered Office :**
4. **Mobile Number :**
5. **E-mail Address :**
6. **Website :**
7. **Banker's Name :**
8. **Branch :**
9. **Branch Code :**
10. **Bank Account Number :**
11. **GSTN No. :**
12. **PAN No. :**
13. **MSME No.**

SEAL AND SIGNATURE OF BIDDER

TECHNICAL SPECIFICATION SUPPLY OF 4" UG BALL VALVE ANSI #600

1. **SCOPE OF WORK – GENERAL**

The scope of work by the bidder shall include the following:

a) Supply of 4" BW Ball Valve ASTM 600#, A 216 GR. WCB API 6D
b) EN 10204 3.2 Certification including TPIA Charges in scope of Vendor
c) Insurance is in scope of vendor
d) Freight is in scope of vendor but payment will be done by AGL at actual cost
e) Submission of all relevant MTC, IRN and Material Data sheet.
f) Ball Valve should have been supplied within (5) years reckoned from the bid due date, to any hydrocarbon company.
g) Bidder should submit completion certificate for the supplied ball valve having cross reference with the order of award.

2. **INSPECTION & QUALITY CONTROL**

a) Ensuring adequate quality assurance and control including stage wise inspection, testing and certification.
b) Appoint an independent TPIA for supply of material from Owner's approved list. The TPIA appointed by bidder shall be common for inspection of complete scope of supply. All inspection reports shall be submitted for owner's review/approval.
c) Carryout proper documentation of inspection and quality assurance programme for all equipment and bulk materials duly approved by OWNER.
d) CONTRACTOR shall immediately report to the OWNER of all change, which will affect material quality, and recommend any necessary corrective actions to be taken.

3. **INSURANCE**

a) As per GCC and SCC of Commercial Volume
b) Unless specifically excluded in the Bidding Documents all insurance cover required during the construction, pre-commissioning and testing period shall be on account of the Bidder. The insurance shall cover all material in transit for construction, all work in progress, and completion of project, third party liability, workmen compensation, and all statutory insurance covers. The Owner shall be the beneficiary of insurance Policies and nominated as Loss Payee.

4. **DELIVERY SCHEDULE**

a) The Contractor shall ensure that the delivery of Ball Valve completed Within Fifteen (15) weeks from the date of issuance of order of award.

5. **PIPING MATERIAL SPECIFICATION**

GENERAL NOTES

a) This specification describes the minimum requirements for the design, furnishing of materials, fabrication, and inspection and testing of pipes, fittings and valves. All material shall confirm to ASTM, API or BS standards. Design and fabrication shall confirm to ANSI / ASME for

pressure piping, ANSI B 31.3 – Chemical Plant and petroleum Refinery Piping, and ANSI B 31.8 – Gas transmission and Distribution piping system.

DEFINITIONS

- Shall : This verbal form indicates requirements strictly to be followed in order to confirm to the standards and from which no deviation is permitted.
- Should : This verbal form indicates that among several possibilities one is particularly suitable without mentioning or excluding others or that a certain course of action is preferred but not necessarily required.
- May : This verbal form indicates a course of action permissible within the limits of this standard.
- Can : This verbal form is used for statements of possibility & capability, whether material, physical or casual.

CODES AND STANDARDS

The latest revision of the following shall be considered as part of this specification.

ASME B 16.5	Steel 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.
ASME B 16.21	Non-Metallic Flat Gasket for Pipe Flanges
ASME B 16.47	Large Diameter Steel Flanges (26" throu 60")
ASME B 31.3	Process Piping
ASME B 31.4	Pipeline Transportation system for Liquid hydrocarbons & other Liquids
ASME B 31.8	Gas Transmissions and Distribution Piping System
ASME B 36.10	Welded and Seamless Wrought Steel Pipe
ASME B 46.1	Surface Texture API 5L Line Pipe
API 6D	Pipeline Valves
API 590	Steel Line Blank
API 600	Steel Gate Valves Flanges and Butt welding Ends
API 602	Compact Steel Gate Valves
MSS SP 44	Steel Pipe line Flanges
MSS SP 75	Specification for High Test Wrought Butt Welding Fittings
MSS SP 97	Integrally Reinforced Forged Branch Outlet Fitting – Socket Welding, Threaded and Butt welding Ends
ASTM A 105	Forging, Carbon Steel for Piping Components
ASTM A 193	Alloy Steel and Stainless Steel Bolting Materials for High temp Service.
ASTM A 194	Carbon and Alloy Steel Nuts for Bolts for High Pressure and High Temperature Service
ASTM A 320	Standard Specification for Alloy Steel and Stainless Steel Bolting Materials
ASTM A 216	Steel Casting, Carbon, Suitable for Fusion Welding, for High Temperature Service.

ASTM A 234	Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and Elevated Temperature
ASTM A 285	Pressure Vessel Plates, Carbon Steel, Low and Intermediate Tensile Strength.
ASTM A 694	Forging, Carbon and Alloy Steel, for Pipe Flanges, Fitting, Valves and Parts for High Pressure Transmission Service.
ASTM A 333	Low temperature service seamless pipe.
ASTM A 350	Forged Carbon and Low Alloy Steel requiring Notch Toughness Testing for Piping Components
ASTM A 420	Piping Fittings of Wrought Carbon Steel and Alloy Steel for Low Temperature Service.
ASTM A 860	Standard Specification for Wrought High Strength Low Alloy Steel Butt Welding Fittings

ABBREVIATIONS

Flange Facing

RTJ	Ring Type Joint
FF	Flat Face
RF	Raised Face

Fittings

PE	-	Plain End
BE	-	Bevel End
Bl/V	-	Butt Weld
PBE	-	Plain Both End
POE	-	Plain One End
TSE	-	Threaded Both End
TOE	-	Threaded One End
LR	-	Long Radius
SR	-	Short Radius

Connections

BW	-	Butt-Weld
FLGD	-	Flanged
SCRO	-	Screwed
SO	-	Slip-On
SW	-	Socket Weld
THRO	-	Threaded
WN	-	Weld Neck

Wall Thickness

SCH	-	Schedule in accordance with ANSI B 36.10 or B 36.19
STD	-	Standard Weight Wall Thickness
XS	-	Extra Strong Wall Thickness
XXS	-	Double Extra Strong Wall Thickness

Valve Description

BC - Bolted Cap
BB - Bolted Bonnet
ES - Extension Stem
FD - Full Dore
MO - Motor Operated
GO - Gear Operated
NRS - Non-Rising Stem (with inside screw)
OS&Y- Outside Screw and Yoke
RB - Reducer Bore
RS - Rising Stem
SC - Screwed Cap
UB - Union Bonnet
UC - Union Cap
WB - Welded Bonnet

Pipes Description

BE - Beveled End
CS - Carbon Steel
ERW - Electric Resistance Welded
EFW - Electric Fusion Welded
FS - Forged Steel
HFI - High Frequency Induction
KCS - Killed Carbon Steel
KFS - Killed Forged Steel
OH - Open Hearth
SAW - Submerged Arc Welded
SMLS- Seamless

Miscellaneous

BOP - Bottom of Pipe
ASME- American Standard Mechanical Engineering
ASTM- American Standard Test Material
CL - Centre Line
CC - Concentric Reducer
EC - Eccentric Reducer
CPLG- Coupling
EL - Elevation
FFL - Finished Ground

PIPING CLASSES DESCRIPTION

Piping Classes assigned for the project are based on the following 2-digit system

First Digit

Numerical, denoting the basic system rating or flange class i.e.

1 = ASME Class 150
3 = ASME Class 300

6 = ASME Class 600
9 = ASME Class 900

Second Digit
Letter, denoting the material
A - Carbon Steel
c - Stainless Steel
F - Fiberglass Reinforced plastic/epoxy (FRP)
G - Galvanized
p - Plastic (PEHD)
s - Stainless Steel
v - PVC

Third Digit
Sequential number to differentiate two or more piping classes of the same rating and same material but presenting some difference related to the handled fluid.

Fourth Digit
Letter, denoting the aboveground and underground
U = Underground

PIPING SPECIFICATION	AAVANTIKA GAS LIMITED	RATING 150#
1A1		CODE ANSI B 31.8
TEMPERATURE (0 TO 60 °C)		BASIC MATERIAL
PRESSURE (18.75 bar g)		CORROSION ALW 1.5 mm

BRANCH TABLE

HEADER SIZE \ BRANCH SIZE	1/2"	3/4"	1"	1.1/2"	2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	28"	30"	32"	36"
1/2"	T																			
3/4"	T	T																		
1"	T	T	T																	
1.1/2"	T	T	T	T																
2"	S	S	S	T	T															
3"	S	S	S	S	T	T														
4"	S	S	S	S	T	T	T													
6"	S	S	S	S	W	T	T	T												
8"	S	S	S	S	W	W	T	T	T											
10"	S	S	S	S	W	W	T	T	T	T										
12"	S	S	S	S	W	W	W	T	T	T	T									
14"	S	S	S	S	W	W	W	T	T	T	T	T								
16"	S	S	S	S	W	W	W	W	T	T	T	T	T							
18"	S	S	S	S	W	W	W	W	T	T	T	T	T	T						
20"	S	S	S	S	W	W	W	W	W	T	T	T	T	T	T					
24"																				
28"																				
30"																				
32"																				
36"																				

LEGEND

T : TEE - BW

S: SOCKOLET - BW

W : WELDOLET - BW

PIPING SPECIFICATION		AAVANTIKA GAS LIMITED	RATING	300#
3A1			CODE	ANSI B 31.8
TEMPERATURE (0 TO 60 °C)			BASIC MATERIAL	
PRESSURE	(49 bar g)		CORROSION ALW	1.5 mm

BRANCH TABLE

HEADER SIZE \ BRANCH SIZE	1/2"	3/4"	1"	1.1/2"	2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	28"	30"	32"	36"
1/2"	T																			
3/4"	T	T																		
1"	T	T	T																	
1.1/2"	T	T	T	T																
2"	S	T	T	T	T															
3"	S	S	S	S	T	T														
4"	S	S	S	S	T	T	T													
6"	S	S	S	S	W	T	T	T												
8"	S	S	S	S	W	W	T	T	T											
10"	S	S	S	S	W	W	T	T	T	T										
12"	S	S	S	S	W	W	W	T	T	T	T									
14"	S	S	S	S	W	W	W	T	T	T	T	T								
16"	S	S	S	S	W	W	W	T	T	T	T	T	T							
18"	S	S	S	S	W	W	W	T	T	T	T	T	T	T						
20"	S	S	S	S	W	W	W	T	T	T	T	T	T	T	T					
24"	S	S	S	S	W	W	W	T	T	T	T	T	T	T	T	T				
28"	S	S	S	S	W	W	W	T	T	T	T	T	T	T	T	T	T			
30"	S	S	S	S	W	W	W	T	T	T	T	T	T	T	T	T	T	T		
32"																				
36"																				

LEGEND

T : TEE -BW

S: SOCKOLET - BW

W : WELDOLET- BW

PIPING SPECIFICATION			AAVANTIKA GAS LIMITED				RATING	600#
6A1							CODE	ANSI B 31.8
TEMPERATURE	(0 TO 60°C)						BASIC MATERIAL	
DESIGN PRESSURE	(98 bar g)						CORROSION ALLOWANCE	1.5 mm
ITEM	SHORT CODE	SIZE FROM-THRU	DESCRIPTION	RATING AND/OR SCHED.	DIMENSION STANDARD	MATERIAL	REMARKS	
PIPELINE	PL	2"-4"	BE	6.4 mm	API 5L	API 5L Gr. B		
		6"-10"	BE	6.4 mm	API 5L	API 5L Gr. X42		
PIPES	P	0.50" - 0.75"	PE, SEAMLESS	S160	ANSI B36-10	ASTM A 106 Gr.B		
		1" - 1.50"	PE, SEAMLESS	S160	ANSI B36-10			
		2"	BE, SEAMLESS	S80	ANSI B36-10			
		3"	BE, SEAMLESS	STD	ANSI B36-10			
		4" - 10"	BE, SEAMLESS	XS	ANSI B36-10			
		12" - 14"	BE, SEAMLESS	Sch 60	ANSI B36-10	ASTM A 106 Gr.B		
ELBOWS 90 LR	E	0.50" - 0.75"	SW	6000#	ANSI B16-11	ASTM A105		
		1" - 1.50"	SW	3000#	ANSI B16-11			
		2" - 14"	BW, 1.5D		ANSI B16-9	ASTM A 234 Gr WPB		
ELBOWS 45 LR	E45	0.50" - 0.75"	SW	6000#	ANSI B16-11	ASTM A105		
		1" - 1.50"	SW	3000#	ANSI B16-11			
		2" - 14"	BW, 1.5D		ANSI B16-9	ASTM A 234 Gr WPB		
TEES EQUAL	T	0.50" - 0.75"	SW	6000#	ANSI B16-11	ASTM A105		
		1" - 1.50"	SW	3000#				
		2" - 14"	BW - ANSI B16-25		ANSI B16-9	ASTM A 234 Gr WPB		
TEES RED	TR	0.50" - 0.75"	SW	6000#	ANSI B16-11	ASTM A105		
		1" - 1.50"	SW	3000#				
		2" - 14"	BW - ANSI B16-25		ANSI B16-9	ASTM A 234 Gr WPB		
SOCKOLET	S	0.50" - 0.75"	SW	6000#	MSS-SP 97	ASTM A105		
		1" -1.50"	SW	3000#	MSS-SP 97	ASTM A105		
WELDOLETS	W	2" - 14"	BW - ANSI B16-25	XXS	MSS-SP97	ASTM A105		
CAPS	C	0.50" - 0.75"	SCRF	6000#	ASME B16-11	ASTM A105		
		1" - 1.50"	SCRF	3000#	ASME B16-11			
		2" - 14"	BW		ASME B16-9	ASTM A 234 Gr WPB		
PLUG	P	0.50" - 0.75"	SCRM	6000#	ASME B16-11	ASTM A 234 Gr WPB		
		1" - 1.50"	SCRM	3000#	ASME B16-11			
NIPPLES	NA	0.50" - 0.75"	PBE, SEAMLESS		ANSI B36-10	ASTM A 106 Gr.B		
	NB	1" -1.50"	PBE, SEAMLESS		ANSI B36-10	ASTM A 106 Gr.B		
FULL COUPLINGS	CF	0.50" - 0.75"	SW	6000#	ANSI B16-11	ASTM A105		
		1" -1.50"	SW	3000#				
HALF COUPLINGS	HC	0.50" - 0.75"	SW	6000#	ANSI B16-11	ASTM A105		
		1" - 1.50"	SW	3000#				

NOTE: M=THICKNESS TO MATCH PIPE WALL THICKNESS

6. TECHNICAL SPECIFICATION FOR BALL VALVES

6.1. SCOPE

a) This specification covers the minimum requirement for design, manufacturing, Inspection, Testing and supply of Carbon Steel Ball Valves covering sizes 4." NB through 36"NB (900mm) for ANSI pressure classes # 300 through # 900 to be used in cross country Gas pipeline(onshore) and City Gas distribution for handling non-sour hydrocarbon in liquid or gaseous phase

6.2. REFERENCE DOCUMENTS

All valves shall be manufactured and supplied in accordance with the latest edition of American Petroleum Institute (API) Specification 6D / ISO 14313, with additions and modifications as indicated in the following sections of this specification.

Reference has also been made in this specification to the latest edition of the following Codes, Standards and Specifications:

API 6D	Specification for Pipeline Valves.
API 605	Large Diameter Carbon Steel Flanges
API 6FA	Specification for Fire Test for Valves.
API 5L	Specification for Line Pipe
API 1104	Specification for Welding Pipelines and related facilities.
ASME 16.10	Face to Face and End to End Dimensions of Valves
ASME 16.20	Metallic gasket for pipe flanges - Ring joint or spiral wounds and jacketed
ASME 16.21	Non Metallic Gaskets for pipe flanges
ASME B 16.5	Steel Pipe Flanges and Flanged Fittings
ASME B 16.34	Valves - Flanged, Threaded and Welding Ends
ASME B 16.5	Steel Pipe Flanges and Flanged Fittings
ASME B 31.3	Process Piping
ASME B 31.8	Gas Transmission and Distribution Piping Systems
ASME Sec VIII Div .I/Div.II	Boiler and Pressure Vessel Code - Rules for Construction of Pressure Vessels
ASTM A370	Standard Test Methods and Definitions for Mechanical Testing of Steel Products.
ASTM B 733	Auto catalytic Nickel Phosphorous Coating on Metals.
BS 6755-1	Testing of Valves Specification for production pressure testing requirements
EN 1004511	Metallic products Charpy Impact test -test methods (U & V Notches)
BS 6755-2	Testing of Valves. Specification for fire type-testing requirement
EN 10204	Metallic Materials -Types of Inspection documents
MSS-SP-6	Standard Finishes for Contact Faces of Pipe Flanges and Connecting - end Flanges of Valves and Fittings
MSS-SP-25	Standard marking system for Valves, Fittings, Flanges and Union.

MSS-SP-44	Steel Pipeline Flanges
MSS-SP-53	Quality Std for Steel Casting & Forgings for Valves, Flanges & Fittings & Other Piping Components - Magnetic Particle Examination Method.
MSS-SP-55	Quality Standard for Steel casting of valves, Flanges, Fittings & other Piping components (Visual Method)
MSS-SP-72	Ball Valves with Flanged or Butt welding ends for General Service
ISO 5208	Industrial Valves - Pressure Testing of Valves
ISO 10497	Testing of Valves -fire type testing requirements
ISO 13623	Petroleum & Natural Gas Industry - pipeline transportation system
ISO 14313	Petroleum & Natural Gas Industry. Pipeline transportation system - pipeline Valves
SSPC-VIS-1	Steel Structures Painting Council Visual Standard.

In case of contradiction the most stringent shall apply

6.3. INSTRUCTIONS

a) Eventual Interpretations and deviations to this specification by the manufacturer shall be requested by writing in his offer with detailed justification and approved by the purchaser or purchaser's representative before the eventual order to the manufacturer.

b) The specifications of the steel used shall be mentioned by the material manufacturer and all potential sub-contractors (such as forging plant, casting plant and fabrication unit etc) will be described in the offer. After order no change will be accepted except for justified. In that case the asked changes shall be supported by a technical file submitted to the purchaser and the purchaser's representative for approval.

c) The manufacturer shall provide a technical description of the manufacturing methods that might influence the quality of material.

d) The purchaser/ purchaser's representative keeps the right to audit the manufacturer's and sub-contractors manufacturing and control methods. All costs for such an audit shall be borne by the manufacturer except the wages, travel expenditure, lodging and boarding of the auditors supported by the purchaser/ purchaser's representative.

e) The purchaser/ purchaser's representative shall have at any time free access to all parts of the manufacturer's facilities and to all his sub-contractors involved in the order manufacturing.

f) A copy of ISO 9001 Certificate shall be included in the offer.

g) An approval of documents can never be considered as acceptance of deviations or relaxation to requirements. A deviation is only possible after specific request to purchaser and purchaser's representative.

h) Purchaser/ purchaser's representative may verify the control equipment of the manufacturer, its calibration and the points at which it is located. If during the production certain problem arises, the purchaser/ purchaser's representative may demand supplementary tests.

6.4. MATERIALS

a) Material for major components of the valves shall be as indicated in Valve Data Sheet. In addition, the material shall also meet the requirements specified herein. Other components shall be as per Manufacturer's standard (suitable for service conditions as indicated in valve data sheet), which shall be subjected to approval by Purchaser / Purchaser's representative.

b) Carbon steel used for the manufacture of valves shall be fully killed.

c) The steel used shall be suitable for field welding to pipes, flanges or fittings manufactured under ASTM – 53, A – 105, A – 106, A – 234, A – 350, A – 352, A – 694, A – 420, A – 333, and API – 5L etc.

d) When the ball of valve is manufactured out of C.S, it shall be subjected to 75µm (0.003") thick Electrolysis nickel plating as per ASTM B733 with following classification SC2, type II, class-2. For Ball made of S.S material, ENP is not mandatory. The hardness of plating shall be minimum 50 RC.

e) For valves specified to be used for Gas service or High Vapor Pressure (HVP) liquid service; Charpy V-Notch test on each heat of base material shall be conducted as per API 6D, clause 7.5 for all pressure containing parts such as body, end flanges and welding ends as well as bolting material for pressure containing parts. Unless specified otherwise, the Charpy V-notch test shall be conducted at 0°C & -10 °C. The Charpy V-notch test specimen shall be taken in the direction of principal grain flow and notched perpendicular to the original surface of plate or forging. The minimum average absorbed energy per set of three specimens shall be 35 J with an individual minimum per specimen of 27J. Test procedure shall conform to ASTM A 370 or ISO 148.

f) For valves specified to be used for other hydrocarbon services, the Charpy V-notch requirements stated above are not applicable, unless required by the specified material standard as a mandatory requirement.

g) When Low Temperature Carbon Steel (LTCS) materials are specified in Valve Data Sheet or offered by Manufacturer, the Charpy V-notch test requirements of applicable material standard shall be complied with.

h) Valves shall be subjected to hardness test on base material for each heat for pressure containing parts. A full thickness cross section shall be taken for this purpose and the maximum hardness shall not exceed 248 HV10 based on minimum four (4) measurements representing the entire thickness.

6.5. DESIGN AND CONSTRUCTION

1) Valve design shall be as per API 6D and suitable for the process conditions indicated in the Data Sheet. The ASME Boiler & Pressure Vessel Code, Section VIII, Division 1 shall be used to design the valve body. Allowable stress requirements shall comply with the provisions of ASME B31.3 and B31.8. In addition, corrosion allowance indicated in Valve Data Sheet shall be considered in valve design. However, the minimum wall thickness shall not be less than the minimum requirement of ASME B16.34.

2) The manufacturer shall have valid license to use API monogram on valves manufactured as per API 6D.

3) Fully welded valves shall be used for main line aboveground/underground services. Other aboveground valves may be of welded or bolted type with 2 piece/3-piece construction. Threaded body joints shall not be accepted.
4) Ball shall be of single piece, solid type construction.
5) Valves shall be Full bore (FB). Full bore valves shall be suitable for the passage of all types of pipeline scraper and inspection pigs on regular basis without causing damage to either the valve component or the pig. The full bore valve shall provide an unobstructed profile for pigging operations in either direction. Full bore valves shall be designed to minimize accumulation of debris in the seat ring region to ensure that valve movement is not impeded.
6) Reduced bore valves shall be provided if specifically mentioned in data sheet. Valve body shall be manufactured by casting or forging
7) All valves 4" NB and above shall be trunnion mounting type. Valves below 4" shall be floating type unless specifically mentioned in data sheet otherwise.
8) Valve seats shall be with primary metal to metal contact. O - Rings or other seals if used for drip tight sealing shall be encased in a suitable groove in such a manner that it cannot be removed from seat ring and there is no extrusion during opening or closing operation at maximum differential pressure. The seat rings shall be designed so as to ensure sealing at low as well as high differential pressures. Seat design with PTFE inserts is not acceptable.
9) All valves shall have two seating surfaces which in close position blocks the flow from both ends. The cavity between the seating surfaces is vented through a bleed connection provided on the body cavity i.e. the valves shall be Double Block & Bleed (DBB).
10) Valves shall be designed to withstand a sustained internal vacuum of at least 1 (one) milli-bar in both open and closed positions.
11) All valves of nominal valve size 114 mm (4") NB & above shall have provision for secondary sealant injection under full line pressure for seat and stem seals. All sealant injection connections shall be provided with an internal Non-return valve. Valve design shall have a provision to replace the sealant injection fitting under full line pressure.
12) All valves shall be provided with a vent and drain connection. These connections shall be welded type as per Fig. 6.11 A/B. Body vent and drain shall be provided with valves (Ball or Plug type). All these vents & drain connections shall be provided with isolation ball valve as shown in Fig 6.11 A/B. The end connection of vent & drain line to valve body or isolation valves shall be welded type at underground location and threaded type for above ground location.
13) Valve design shall ensure repair of stem seals/packing under full line pressure.
14) Valve ends shall be either flanged/or butt welded or one end flanged and one end butt welded as indicated in the Valve Data Sheet. Flanges of the flanged end cast/forged body valves shall be integrally cast/ forged with the body of the valve. Face to face/end to end dimensions shall conform to API 6D.
15) The length of butt welding ends shall be sufficient to allow welding and heat treatment without damage of the internal parts of the valves.

16) Flanged end, if specified shall have dimensions as per ASME B 16.5 for valve sizes up to DN 600 mm (24") excluding DN 550 mm (22") and as per MSS-SP-44/ASME B16.47Series A for Valve sizes DN 550 mm (22 inches) and for DN 650mm (26") and above. Flange face shall be either raised face or ring joint type as indicated in Valve Data Sheet. In case of RTJ flanges, the groove hardness shall be minimum 140 BHN. All flanged face shall have concentric serration with 125 AARH finish.
17) Butt welding end preparation shall confirm to ASME B 16.25. Incase of difference in thickness of valve body & mating pipelines, the bevel end of valve shall be as per ASME B 31.8 or ASME B 31.4 as applicable. The end preparation shall take care of outside diameter of connecting pipe, wall thickness, material grade, SMYS & Special chemistry of welded material as indicated in the data sheet.
18) The temperature and pressure range of the valves shall be in accordance with the indicated values on the relevant piping specification and valve data sheet.
19) Wall thickness of parts used for the welding connection with the line pipe shall meet the following requirements:
20) The maximum allowable stress in the material of butt-weld connection for butt welding shall be equal to 50% of the minimum yield strength guaranteed by the specification of steel used.
21) The minimum wall thickness for butt welding connection must be greater than or equal to the largest value of either the calculated minimum thickness of butt welding connections or the nominal thickness of pipe as indicated on data sheet.
22) If the butt welding connections has a yield strength lower than the yield strength of the pipe to which it is intended to be welded, the wall thickness in each zone of the butt welding connection is at least equal to the specified pipe wall thickness times the ratio of minimum yield strength guaranteed by the specification of the steel of the pipe to minimum yield strength guaranteed by the specification of the steel of the butt welding connection.
23) The specified pipe wall thickness and grade with which the valve is intended to be used is specified in the data sheet.
24) All valves under this specification shall be designed to withstand a field hydrostatic test pressure with non-corrosive water. After installation during 24 hours when the ball is partially or fully open at a pressure level
25) P = 1.4 X MOP P = hydrostatic test pressure (bar) MOP = Maximum operating pressure at 38 ºC
26) Valve shall be provided with ball position indicator and stops of rugged construction at the fully open and fully closed positions.
27) Valves of nominal size, DN 114 mm (4") and larger, shall be equipped with support foot and lifting lugs. Tapped holes and eyebolts shall not be used for lifting lugs. Height of support foot shall be kept minimum. The lifting lugs shall be stamped with safe working load.
28) In order to avoid stress induced crack and soft seat damage during direct field welding operation to valve body, all valves shall be supplied with welded pups at both ends which shall be considered as an integral part of the valves and also the ID of the pup shall match with pipe ID. The pup piece welding shall be carried out in controlled condition of temperature at

manufacturer's workshop. Field welding of pup piece shall not be allowed. Material & length of pup piece shall be as per Data sheet.

29) When indicated in Material Requisition, valves shall have locking devices to lock the valve either in full open (LO) or full close (LC) positions. Locking devices shall be permanently attached to the valve operator and shall not interfere with operation of the valve. Locking device shall be such that the valve shall operate when the differential pressure across the valve is ≤ 3bar.

30) Valve design shall be such as to avoid bimetallic corrosion between carbon steel and high alloy steel components in the assembly. Accordingly, Suitable insulation shall be provided as required.

31) The valve stem shall be capable of withstanding the maximum operating torque required to operate the valve against the maximum differential pressure as per the appropriate class. The combined stress shall not exceed the maximum allowable stresses specified in ASME Section VIII, Division 1. The design shall take into account a safety factor of 1.5 based on the maximum output torque of the operating mechanism. The valve Manufacturer shall guarantee that the breakaway torque after long periods of non- movement cannot exceed the normal short term breakaway torque by a factor more than 1.25, and that the safety factor specified above is not compromised.

32) The valve stem shall have anti-blowout feature with antistatic device conforming to BS 5351

33) When stem extension requirement is indicated in Valve Data Sheet, the valves shall have the following provisions:

34) a) Valves provided with stem extension shall have water proof outer casing. The Length of stem extension shall be as indicated on the Valve Data Sheet. The length indicated corresponds to the distance between centreline of the valve opening and the centreline of the rim of the hand wheel on a vertical shaft or centreline of the hand wheel on a horizontal shaft.

35) b) Manual override devices shall be provided on all valves

36) c) Vent, drain and sealant connections shall be terminated adjacent to the valve operator by means of suitable piping anchored to the valve body.

37) d) The stem extension shall be self-relieving

38) e) Outer casing of stem extension shall have 3/8" or 1/2" NPT plugs at the top and bottom, for draining and filling with oil to prevent internal corrosion 6.24

39) Operating Devices

40) a) All valves of size > 12"NB shall be manually operated & hydraulically actuated. In case of manual operator, valve sizes, 100 mm (NPS 4") and below shall be wrench/ lever operated. For Valves from 6" - 12" shall be gear operated. Valve design shall be such that damage due to malfunctioning of the operator or its control gear train or power cylinder and other damaged parts can be replaced without the valve cover being removed.

41) b) The power actuator shall be in accordance with the Purchaser Specification issued for the purpose and as indicated in the Valve and Actuator Data Sheet. Operating time shall be as indicated in Valve Data Sheet. Valve operating time shall correspond to full close to full open /full

open to full close under maximum differential pressure corresponding to the valve rating. For actuated valves, the actuator's rated torque output shall be 1.25 times the break torque required to operate the ball valve under the maximum differential pressure corresponding to the Valve Class Rating.

42) c) For the manual operator of all valves, the diameter of the hand wheel or the length of operating wrench shall be such that under the maximum differential pressure, the total force required to operate the valve does not exceed 350N. Manufacturer shall also indicate the number of turns of hand wheel (In case of gear operators) required for operating the valve from full open to full close position. The wrench length or hand wheel diameter shall be in accordance with API 6D requirements. The manufacturer shall indicate the number of turns of the hand wheel (for gear operators), required for operating the valve from fully open to the fully closed position.

43) d) Direction of operation of hand wheel or wrench shall be in clock-wise direction while closing the valve. Hand wheels shall not have protruding spokes.

44) e) Gear operators, when provided, shall have a self-locking provision and shall be fully encased in water proof/splash proof enclosure and shall be filled with suitable grease.

45) Welding including repair welding of pressure retaining parts shall be as per welding procedure qualification specified in ASME Section IX. The procedure qualification shall also Include impact test and hardness test when required as per this specification and shall meet the requirements as specified therein.

46) The welders involved in welding shall be qualified in accordance with ASME Section IX.

47) Repair by welding is not permitted for forged body valves. However, repair by welding as per ASME B 16.34 is permitted for cast body valves. Repair shall be carried out before any heat treatment of casting is done. Repair welding procedure qualification shall also include impact test and hardness test when required as per this specification and shall meet the requirements as specified therein.

48) The tolerance on internal diameter and out of roundness at the ends for welded ends valves shall be as per connected pipe specification as indicated in the Valve Data Sheet.

49) When specified on the Valve Datasheet, Ball Valves shall be "fire safe" in accordance with API 6FA, for which qualifying certificates, covering the range of items offered, shall be supplied by the Manufacturer.

6.6. INSPECTION AND TESTS

1) The Manufacturer shall perform all inspection and tests as per the requirements of this specification and the relevant codes, prior to shipment, at his Works. Such inspection and tests shall be, but not limited to, the following:

2) The valve manufacturer must deliver a Certificate EN 10204 3.2 stating the quality, the mechanical properties (yield strength, tensile strength, and impact test at 0 º C & -10 ºC), the chemical analysis the process of manufacture and the marking (for ex: - heat number of material) A new

chemical analysis (upgradation) shall be done on specimen of valve in presence of TPIA.

3) All valves shall be visually inspected. The external and internal surfaces of the valves shall be free from any arc strikes, gouges and other detrimental defects.
4) Dimensional check on all valves shall be carried out as per the Purchaser's approved drawings.
5) Chemical composition and mechanical properties shall be checked as per relevant material standards and this specification, for each heat of steel used.
6) Pressure containing parts of all valves such as body, bonnet, flange, welding ends and balls etc shall be subjected to impact test on each heat of base material as per API 6D CL.7.5.
7) Notch toughness properties Charpy V: The standard impact test temperature is 0 ºC & -10 ºC. The average value per series of 3 test specimen shall be equal to 35 J/cm². The minimum value per test specimen shall be equal to 35 J/cm²; this value may drop to 27 J/cm² per test specimen per series.
8) Non Destructive Examination
9) a) Non-destructive examination of individual valve material and component consisting of but not limited to castings, forgings, plates and assembly welds shall be carried out by the Manufacturer. All castings shall be wet magnetic particle inspected 100% of the internal surfaces. Method and acceptance shall comply with MSS-SP-53.
10) b) Body castings of all valves shall be radio graphically examined as per ASME B16.34. Procedure and acceptance criteria shall be as per ASME B 16.34. For all sizes, body casting shall be subjected to 100% radiography.
11) c) All forgings shall be ultrasonically examined in accordance with the procedure and acceptance standard of Annexure E of ASME B 16.34. All forgings shall be subjected to wet magnetic particle inspection on 100% of the internal surfaces. Method and acceptance shall comply with MSS-SP-53
12) d) Bodies and bonnets made by welded assembly of segments of castings, forgings, combinations thereof shall be examined, as applicable, by methods of for cast components or for forged components and plates.
13) Full inspection by radiography shall be carried out on all welds of pressure containing parts. Acceptance criteria shall be as per ASME B 31.3 or ASME B31.8 as applicable and API 1104.
14) a) All finished weld ends subject to welding in field shall be 100% ultrasonically tested for lamination type defects for a distance of 50 mm from the end. Laminations shall not be acceptable.
15) b) Weld ends of all cast valves subject to welding in field shall be 100% radio graphically examined and acceptance criteria shall be as per ASME B16.34.
16) c) After final machining, all bevel surfaces shall be inspected by dye penetrate or wet - magnetic particle methods. All defects longer than 6.35 mm shall be rejected. Rejectable defects must be removed. Weld repair of bevel surface is not permitted.
17) All valves shall be tested in compliance with the requirements of API 6D. During pressure testing, valves shall not have sealant lines and other

cavities filled with sealant, grease or other foreign material. The drain, vent and sealant lines shall be either included in the hydrostatic shell test or tested independently. No leakage is permissible during hydrostatic testing. The body cavity self-relieving feature meeting the requirements of clause 6.8 of this specification shall also be checked.

18) A supplementary air seat test as per API 6D, Appendix C, Para C3.3 Type II shall be carried out for all valves. A bubble tight seal is required without the use of any sealant. No leakage is allowed. Test pressure shall be held for at least 15 minutes.

19) Valves shall be subjected to Operational Torque Test as per Appendix C, Para C.6, API 6D under hydraulic pressure equal to maximum differential pressure corresponding to the valve rating. For manually operated valves, it shall be established that the force required to operate the valve does not exceed the requirements stated in this specification.

20) Power actuated valves shall be tested after assembly of the valve and actuator, at the valve Manufacturer's works. At least five Open-Close-Open cycles without internal pressure and five Open-Close-Open cycles with maximum differential pressure corresponding to the valve rating shall be performed on the valve actuator assembly. The time for Full Open to Full Close shall be recorded during testing. If required, the actuator shall be adjusted to ensure that the opening and closing time is within the limits stated in Valve Data Sheet. The Hand operator provided on the actuator shall also be checked after the cyclic testing, for satisfactory manual over-ride performance. These tests shall be conducted on minimum one valve out of a lot of five (5) valves of the same size, rating and the actuator model/type. In case, the tests do not meet the requirements, retesting/rejection of the lot shall be decided by the Purchaser's Inspector.

21) a) The valve shall be subjected to at least 5 Open-Close-Open cycles with maximum differential pressure corresponding to the valve rating.

22) In case this valve fails to pass these tests, the valve shall be rejected and two more valves shall be selected randomly and subjected to testing as indicated above. If both valves pass these tests, all valves manufactured for the order (except the valve that failed) shall be deemed acceptable. If either of the two valves fails to pass these tests, all valves shall be rejected or each valve shall be tested at the option of manufacturer. Previously carried out prototype test of similar nature shall not be considered acceptable in place of this test.

23) Purchaser reserves the right to perform stage wise inspection and witness tests as indicated above at Manufacturer's works prior to shipment. Manufacturer shall give reasonable access and facilities required for inspection to the Purchaser. Purchaser or Purchaser's representative reserves the right to require additional testing at any time to confirm or further investigate a suspected fault. The cost incurred shall be borne to Manufacturer.

24) In no case shall any action of Purchaser or his inspector shall relieve the Manufacturer of his responsibility for material, design, quality or operation of valves.

25) Inspection and tests performed/witnessed by the Purchaser's Inspector shall in no way relieve the Manufacturer's obligation to perform the required inspection and tests.

6.7. TEST CERTIFICATES

a) Manufacturer shall submit the following certificates:
b) a) Mill test certificates relevant to the chemical analysis and mechanical properties of the materials used for the valve construction as per the relevant standards.
c) b) Test certificates of hydrostatic and pneumatic tests complete with records of timing and pressure of each test.
d) c) Test reports of radiograph and ultrasonic inspection.
e) e) All other test reports and certificates as required by API 6D, this specification and data sheets. The certificates shall be valid only when signed by Purchaser's Inspector. Only those valves which have been certified by Purchaser's Inspector shall be dispatched from Manufacturer's works.

6.8. PAINTING, MARKING AND SHIPMENT

a) Valve surface shall be thoroughly cleaned, freed from rust and grease and applied with sufficient coats of corrosion resistant paint. Surface preparation shall be carried out by shot blasting to SP- 6 in accordance with "Steel Structures Painting Council - Visual Standard SSPC-VIS-1". For the valves to be installed underground, when indicated in Valve Data Sheet, the external surfaces of buried portion of the valve shall be painted with three coats of suitable coal tar epoxy resin with a minimum dry film thickness of 300 microns.
b) All valves shall be marked as per API 6D. The units of marking shall be metric except nominal diameter, which shall be in inches.
c) Valve ends shall be suitably protected to avoid any damage during transit. All threaded and machined surfaces subject to corrosion shall be well protected by a coat of grease or other suitable material. All valves shall be provided with suitable protectors for flange faces, securely attached to the valves. Bevel ends shall be protected with metallic or high impact plastic bevel protectors.
d) All sealant lines and other cavities of the valve shall be filled with sealant before shipment.
e) Packaging and shipping instructions shall be as per API 6D and procurement documentation. All valves shall be transported with ball in the fully open condition.

6.9. SPARES AND ACCESSORIES

1) Manufacturer shall furnish list of recommended spares and accessories for valves required during start-up and commissioning.
2) Manufacturer shall furnish list of recommended spares and accessories required for two years of normal operation and maintenance of valves.
3) Manufacturer shall quote for spares and accessories as per Material Requisition.

6.10. APPROVED LIST

- L&T Valves
- Flow Chem
- Micro finish valves pvt ltd
- Steel strong valves India ltd
- Oswal Industries ltd
- Nylon Valves Pvt. ltd
- Petro Valves
- GM Engineering
- Virgo Valves
- Zed Valves Co. Pvt Ltd
- Leader Valves
- Valve tech Industries.

6.11. DOCUMENTATION

At the time of bidding, Manufacturer shall submit the following documents:

- Filled in Data Sheet
- General arrangement/assembly drawings showing all features and relative positions and sizes of vents, drains, gear operator/ actuator, painting, coating and other external parts together with overall dimension.
- Sectional drawing showing major parts with reference numbers and material specification. In particular, a blow up drawing of ball-seat assembly shall be furnished complying with the requirement of Clause 6.7 of this specification.
- Reference list of similar ball valves manufactured and supplied in last five years indicating all relevant details including project, year, client, location, size, rating, service etc.
- Torque curves for the power actuated valves along with the break torque and maximum allowable stem torque. In addition, sizing criteria and torque calculations shall also be submitted for power actuated valves.
- Clause wise list of deviations from this specification, if any.
- Descriptive technical catalogues of the manufacturer.
- Installation, Operational and Maintenance Manual.
- Copy of valid API 6D Certificate.
- Details of support foot including dimensions and distance from valve centreline to bottom of support foot

6.12 The Manufacturer shall submit four copies of, but not limited to, the following drawings, documents and specifications for Purchaser's approval:

- Detailed sectional drawings showing all parts with reference numbers and material specifications.
- Assembly drawings with overall dimensions and features. Drawing shall also indicate the number of turns of hand wheel (in case of gear operators) required for operating the valve from full open to full close

position and the painting scheme. Complete dimensional details of support foot (where applicable) shall be indicated in these drawings.

- Welding, heat treatment and testing procedures (Quality Assurance Plan).
- Details of corrosion resistant paint to be applied on the valves. Manufacturing of valves shall commence only after approval of the above documents. Once the approval has been given by Purchaser, any changes in design, material and method of manufacture shall be notified to Purchaser whose approval in writing of all changes shall be obtained before the valve is manufactured.

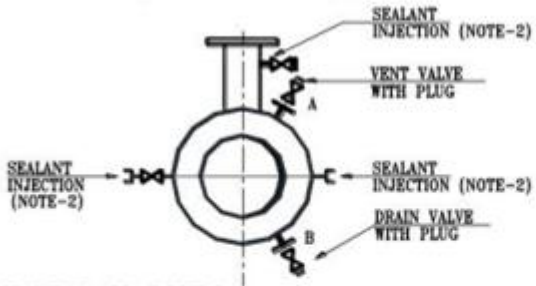
11.13 Prior to shipment, Manufacturer shall submit to Purchaser one reproducible and six copies of the following:

- Test certificates as per clause 8.0 of this specification.
- Manual for installation, erection, maintenance and operation instructions including a list of recommended spares for the valves.

11.14 CD containing all docs shall be submitted within 30 days from the approval date, Manufacturer shall submit to Purchaser one reproducible and six copies of the approved drawings, documents and specifications above.

11.15 All documents shall be in English language only.

Schematic for drain vent and stem / sealant point



FULL BORE VALVES

VALVE SIZE, DN(mm)	A, DN(mm)	B, DN(mm)
50 AND 150	–	15
200 TO 600	15	25
650 & ABOVE	15	40

NOTES:–

1 ALL VALVES (BALL OR PLUG) AND PLUGS FOR A AND B SHALL BE APPROVED BY THE PURCHASER.
2 SEALANT POINTS SHALL BE PROVIDED FOR FULL BORE VALVES OF NOMINAL VALVE SIZE 200 mm (8") & ABOVE ONLY SEALANT LINES SHALL HAVE PROVISION TO REPLACE THE SEALANT INJECTION FITTING UNDER FULL LINE PRESSURE. SEALANT LINES SHALL HAVE BLOCK VALVE & INTERNAL NON RETURN VALVE.
3 ALL VENT/DRAIN CONNECTION SHALL BE WELDED WITH THE BODY.