



RFQ No.: AGL/0512/MANUAL TENDER/INSULATION JOINT/11-2025

RFQ FOR SUPPLY OF 4" INSULATION JOINT FOR NEW CITY GATE
STATION (CGS) AT PITHAMPUR



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" INSULATION JOINT FOR NEW CITY GATE STATION (CGS) AT PITHAMPUR

RFQ No.: AGL/0512/MANUAL TENDER/INSULATION JOINT/11-2025

OPEN COMPETITIVE BIDDING

ISSUE DATE: 17.11.2025

Important Dates

Date of Start for Manually Submission of RFQ at AGL HO	17/11/2025
Last Date & Time of Submission of RFQ (Physical Bid)	05/12/2025 up to 16.00 Hrs
Date & Time of Opening of Priced Bid at AGL HO	05/12/2025 up to 16.30 Hrs

CONTACT PERSON at Aavantika Gas Limited:

- 1) Mr. Varendra Sharma, Ch Mngr: Mobile – 98889 25792 / Email: varendra.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



RFQ FOR SUPPLY OF 4" INSULATION JOINT FOR NEW CITY GATE STATION (CGS) AT PITHAMPUR



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:

- Supply of 4" Insulating Joint ANSI#600, Pipe Material API 5L GR X52, Body Material ASTM A 694 F52
- EN 10204 3.2 Certification including TPIA Charges in scope of Vendor
- Submission of all relevant MTC, IRN and Material Data sheet.

2. TECHNICAL BIDDER QUALIFICATION CRITERIA (BQC):

Bidder should have successfully supplied / executed at least One (01) similar order regarding supply of 4" Insulation Joint (monolithic) having minimum pressure rating of 600 class; within Five (05) years reckoned from the bid due date.

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 the quoted amount of two or more L-1 ranked bidders is the same, then the contract will be awarded to that L-1 bidder whose turnover as per the last audited balance sheet will be higher.

5. DELIVERY PERIOD:

Delivery period for above Scope of Work will be Five (05) 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



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- 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.

PAYING AUTHORITY:

DGM - F & A and EIC (Engineer-In-Charge)

Avantika Gas Limited

202 – B, 2nd Floor, NRK Business Park, Vijay Nagar Square, A.B. Road.

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 05.12.2025 UPTO 16:00 HRS AT AGL HO.

Quotation Opening Time: 05.12.2025 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

Avantika 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 Serial No. 14 in this RFQ, 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.

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10. OTHER TERMS & CONDITIONS:

- AGL reserves the right to accept or reject any or all Quotations received at its absolute Discretion without assigning any reason whatsoever.
- 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	Supply of 4" Insulating Joint (ANSI#600, Body Material ASTM A 694 F52)	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 **05.12.2025 upto 16:00 Hrs.**



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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



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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 Project Management Services.

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

1. SCOPE OF WORK – GENERAL

- The scope of work by the bidder shall include the following:
 - a) Supply of 4" Insulating Joint ANSI#600, Pipe Material API 5L GR X52, Body Material ASTM A 694 F52
 - 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

2. INSPECTION & QUALITY CONTROL

- Ensuring adequate quality assurance and control including stage wise inspection, testing and certification.
- 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.
- Carryout proper documentation of inspection and quality assurance programme for all equipment and bulk materials duly approved by OWNER.
- 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

- As per GCC and SCC of Commercial Volume
- 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

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

5. PIPING MATERIAL SPECIFICATION

GENERAL NOTES

- 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.



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**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



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ABBREVIATIONS

Flange Facing

RTJ	Ring Type Joint
FF	Flat Face
RF	Raised Face

Fittings

PE	-	Plain End
BE	-	Bevel End
BI/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

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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



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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

		B R A N C H S I Z E																			
		1/2"	3/4"	1"	1.1/2"	2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	28"	30"	32"	36"
H E A D E R S I Z E	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

		B R A N C H S I Z E																			
		1/2"	3/4"	1"	1.1/2"	2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	28"	30"	32"	36"
H E A D E R S I Z E	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

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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 MONOLITHIC INSULATION JOINT

6.1. SCOPE

- This specification defines the minimum technical requirements for the design, manufacture, testing and supply of monobloc type insulating joints to be installed on the pipelines for isolating buried pipelines from the above ground pipelines.

6.2. REFERENCES

API 5L	: Specification for Line Pipe
ASME B31.8	: Gas Transmission and Distribution Piping System
ASME Section VIII, Div. 1	: Boiler and Pressure Vessel Code
ASME / ASNE B16.34	: Valves – Flanged, Threaded and Welding end
ASTM A370	: Mechanical Testing of Steel Products
ASTM D2000	: Classification system for Rubber Products in Automotive.
ASTM D709	: Specification for Laminated Thermosetting Materials
BS-EN-10204	: Metallic Products - Types of Inspection Documents
ISO 2808	: Paints and Varnishes Determination of Film thickness
ISO 8501-1	: Preparation of Steel Substrates before Application of Paints and Related Products - Visual Assessment of Surface Cleanliness.

6.3. FUNCTIONAL REQUIREMENTS

- The insulating joints shall be designed so as to provide an effective electrical barrier for isolating the buried pipelines from the above ground pipelines.
- All insulating joints shall be designed and manufactured for welding to the line pipe of size and grade specified in the data sheet.
- VENDOR shall provide pup pieces on both sides of the insulating joint. The VENDOR shall specify the minimum pup piece length which shall allow welding of the insulating joint in to the pipeline system without adversely affecting the insulating material.
- The design pressure for the insulating joint shall be as specified in the data sheet. The hydrostatic test pressure shall be at least 1.5 times of the design pressure.
- The seal material shall be resistant to chemical attack by fluid transported at operating temperature and pressure of the pipelines.
- The conveyed fluid shall not permeate with time into the structure of the joint creating over pressure problems.
- The joint design shall be such that the seals are not damaged during assembly and testing.
- Recesses or protrusions in the bore of assembled joints shall not be allowed. Compliance with this requirement shall not be achieved by the use of additional fillers.
- All inner cavities of the joint shall be filled with low viscosity dielectric materials that solidify on curing. Precautions shall be taken to prevent the inclusion of air and impurities in the dielectric materials.
- Prior to the start of manufacturing the VENDOR shall submit detailed procedures for manufacturing, welding, heat treatment, quality control, non-destructive inspection testing and coating activities for OWNER approval.
- The VENDOR shall submit to the OWNER detailed longitudinal cross section drawings of the joint showing all parts, materials, dimensions, surface finishes & tolerances. All relevant calculations and other drawings necessary to prove the adequacy of the joint design shall also be submitted by the VENDOR.

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- VENDOR shall prove by calculations that joint design can withstand a torsional load of magnitude to induce a torsional stress of 5% specified minimum yield stress in the adjoining pipe pieces. The calculations shall be included in the final design calculations required to be submitted as part of the documentation package.
- The insulating joints shall be integral types joined all ends by weldings or other suitable means. Bolting or other mechanical joints shall not be employed.
- The dielectric strength of insulating joints shall be between 15 to 20 kilovolts. Each joint must show an electrical resistance of greater than 50 mega ohms when impressed with 1000 volts potential.
- The electrical resistance of the insulating joint shall not decrease with time.
- The insulating material shall not creep.
- The insulating joints shall be fitted with permanent terminal connections for electrical survey lead wires.
- Joints shall also be suitable for pigging requirement of the pipeline. Pigging shall be done with salt water or process hydrocarbons.
- All external carbon steel fasteners shall be hot dip galvanized as per ASTM A153.
- Indicative dimensional drawing shall be furnished along with the quotation. Final drawings shall be reviewed / approved by OWNER.
- Heat treatment/stress relieving, if required, shall be proposed by VENDOR.

6.4. MATERIALS

- The metallic parts of the insulating joint shall be of equivalent forged material or similar to the line pipe material given in the data sheet.
- The spacing ring shall be made of an aging resistant epoxy glass laminate having high insulating properties according to ASTM D709. Type TV, Group G.11. Compressive strength shall be a minimum of 450 MPa.
- The scaling gasket shall be composed of a suitable polymeric material in accordance with ASTM D2000.
- The filling material shall be an adhesive sealant elastomer or a low viscosity, cold curing thermosetting resin having a compressive strength above 150 MPa.
- The spacing ring, scaling gasket and filling material shall be resistant to diffusion of gases, absorption of moisture and shall be capable of maintaining their required compressive strength and insulating properties over the design life of the pipeline.
- For the internal lining, a two-pack solventless epoxy compound (cold or hot curing) shall be used.
- For the external coating, a two-pack solventless epoxy or polyurethane paint (cold curing) shall be used,
- Compatibility of all plastic materials in contact with each other shall be verified on the samples before joint manufacture.
- Mechanical properties of plastic materials shall be checked on samples before joint manufacture.
- The manufacturer must deliver a certificate EN 10204-3.1b stating quality, the mechanical properties (field strength tensile strength, elongation, Impact test at OOC) the chemical analysis the process of manufacture and the making. Notch Toughness Properties Charpy – V: The standard impact test temperature is OOC. The average value as per series of 3 tests specimen shall be equal to 35 J/Cm². The minimum value per test specimen shall not be less than 28 J/Cm².
- Chemical Composition For each heat the manufacturer shall check a chemical analysis of the steel. The choice and use of alloying elements for couplings made from high strength low alloy steels to obtain the tensile properties shall be made by the manufacturer and included and reported to identify the type of steel.

6.5. FABRICATION AND TEST

- Prior to manufacturing a meeting shall be organised between purchasing agent, engineer and Control Authority
- A. Welding Fabrication**
- All welds and repair welds shall be performed according to written procedures. The welding procedure must be submitted for approval to the control authority before any fabrication. Only welders and welder operators who are qualified shall be used in production.
 - The joints shall be furnished in accordance with the requirements of Section VIII of ASME Boiler and Pressure Vessel Code.

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- Machine welding shall be done by an electric process, preferably by submerged arc.
- All butt welds shall have full penetration. Submerged arc machine welding shall be done with at least one pass from the inside, except when accessibility makes this impossible, then a manual or machine root bead may be employed provided that a visual inspection of the root bead is possible. Backing rings shall be not used.
- Repair, chipping or grinding of welds shall be done in such a manner as not to gouge, groove, or reduce the original metal thickness below the nominal specified wall thickness.
- Welded-on braces, if used, should be removed before heat treatment and the weld spot shall be repaired and ground flush and smooth. However, when braces are required for heat treatment, they shall be cut out and the surface shall be ground flush and smooth after heat treatment. Welding shall not be permitted after heat treatment. The ground areas shall be inspected by magnetic particle or liquid penetrate testing.

B. Welding Procedures

- All welds, repair welds and repair by welding shall be performed according to written procedures. These welding procedures shall be qualified according to the requirements of the ASME Boiler and Pressure Vessel Code, Section IX. The welding procedure tests are required on material. The manufacturer shall maintain a weld record of the procedure and performance test results. The test coupons shall be submitted to the same fabrication and heat treatment as the actual couplings. The welding procedure qualification must include an impact test set in the weld and in the HAZ with requirements of Mechanical test section. And a micrographic examination described in Normalising Heat Treatment section. These tests shall be performed after eventual final heat treatment. If weld thickness is higher than 25 mm, additional impact test shall be performed on the test specimens taken in weld thickness layers.
- Macro graphic examination: the etched surface of the macro test specimen viewed macroscopically must display the image of a well performed welded joint with sufficient penetration, free from linear defects and important inclusions. In case of doubt, the etched surface must be examined microscopically and additional microscopically examinations of other areas may be required. The acceptance of inclusions can be decided upon with the NDE of the welded plates. The macro graphic examination will include hardness measurements in the welds and HAZ. The hardness will not exceed the values measured on the parent metal by more than 80 points from the welds and 100 points for HAZ, with an absolute maximum of 350 HV10.
- Transverse guided bend test

Test method

- Transverse weld test specimens shall be subjected to face and root guided bend tests. The specimens shall be approximately 1.5 in (38 mm) wide, at least 6 in (152 mm) long with the weld at the center, and shall be machined. The face bend specimen shall be bended with the inside surface of the pipe against the plunger, and the root bend specimen with the outside surface against the plunger. The manufacturer shall use a "jig" based on this dimension or a smaller dimension at this option.

Test specimen

- The weld bend test specimens, as described here above shall be cut from the coupon. The specimens may be taken from a pipe for coupling fabrication.

Acceptance criteria

- The bend test shall be acceptable if no cracks or other defects exceeding 0.12 in (3.2 mm) in any direction are present in the weld metal or between the weld metal and the coupling metal after the bending. Cracks which originate along the edges of the specimen during testing and which are less than 0.25 in (6.4 mm) measured in any direction shall not be considered unless obvious defects are observed.

Retest

- If either test fails to conform to specified requirements, the manufacturer may elect to make retests on two additional specimens from the same lot*, each of which shall conform to the requirements specified here above. If any of these specimens fail to conform to the requirements, the welding procedure qualification test is not accepted.

* A lot consists of all pieces from one heat of steel with same initial wall thickness, from the same furnace charge for final normalizing heat treatment, from the same shape and the same main pipe dimension.

C. Normalising Heat Treatment

(Not applicable on finished coupling)

- After forming and welding, all couplings shall be heat treated by normalizing. Normalizing shall be carried out in such a way that the base material acquires a fine-grained pearlitic structure. If the manufacturer can give proof by qualified manufacturing procedure that after forming, the steel of the fitting has a homogeneous fine grained pearlitic structure, he can ask for a derogation supported by technical file to the purchaser and to the control authority.
- The normalizing procedure requires the approval of the control authority. Good care shall be taken to avoid direct contact of the flames with the material to be heated.
- During the normalizing period, the temperature of the heat treatment lot shall be automatically recorded by a sufficient number of thermocouples attached to the material surface. The thermocouples shall be adequately protected against the influence of heat radiation. Temperature variations shall be within $\pm 20^{\circ}\text{C}$. The manufacturer shall furnish time temperature charts of each heat treatment lot. The couplings belonging to each treatment lot shall be specified on the charts. Temperature measurements by other means are permitted only if approved by the control authority.
- The fine-grained pearlitic structure of the steel shall be verified by at least one micrographic examination per lot, according to ASTM E 112. The grain size shall be in the range of 8 to 12.
- The manufacturer shall include in the CMTR data of this treatment.

D. Mechanical Tests

- The following mechanical tests shall be performed after final heat treatment under the supervision of the control authority delegate and the certificates shall be added to the CMTR. Test specimen may only be cut after a marking transfer by the Control Authority.

A. Tension test

Requirements

- The material shall conform to Table A; the ratio yield/tensile strength will be $\leq$ or equal to 0.85. For pieces containing welds, the fracture must be outside of the weld. If there is a fracture in weld or HAZ, the tensile strength shall at least meet the requirements for tensile properties in Table A.

Test specimen

- The test specimen shall represent all forgings from the same lot. Test specimens shall be taken after final heat treatment from a piece of pipe or plate of the same nominal thickness, same heat of steel from which the coupling is made and which has been heat treated in a lot with any of the pieces it represents. For welded pipe, this coupon (piece of pipe or plate) shall contain a weld in prolongation of the weld of the pipe.

Number of tests

- For couplings NPS 2 and greater the following number of test shall be performed:
 - Base material: one tension test per lot
 - Weld: one tension test per lot.

Test locations and orientations

- For welds, the test specimen shall be orientated transversally to the weld. For base material, test specimens shall be orientated transversally and if this orientation is not feasible, it shall be orientated longitudinally.

Test method

- Testing shall be performed in accordance with ASTM A 370 standard rectangular plate type 1-1/2" wide. Yield strength shall be determined either by the 0.2 % offset or the 0.5 % extension under load (EUL) method.

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- If the tension test specimen from any lot fails to conform to the requirements of the particular grade ordered, the manufacturer may elect to make retests on two additional pieces from the same lot, each of which shall conform to the requirements specified in Table A. If one or both of the retests fail to conform to the requirements, the whole lot of that specimen will be rejected.

B. Impact test

Requirements

- The standard impact test temperature is 0°C. The average value of a set of 3 test specimens shall be equal to 35 J/cm². The minimum value per test specimen shall not be less than 28 J/cm².

Test specimen

- The test specimen shall be machined from material obtained as in paragraph Test specimen for Tension test. Flattening of test specimens is not allowed.

Number of tests and orientation

- Three test specimens shall constitute one test set. For couplings NPS 2 and greater, the following number of tests shall be performed:
 - Base material: 2 test sets, one set shall be orientated longitudinally and another one transversally.
 - Weld: 1 test shall be orientated transversally.
 - HAZ: 1 test shall be orientated transversally.

Test method

- The notched bar impact test shall be made in accordance with ISO 148 - Charpy V - Notch. If the wall thickness of the coupling or the coupon does not enable machining of full size specimens, the largest possible size must be used but not less than (10 x 5 mm). The axis of the notch shall be orientated through the wall thickness of the coupling.

C. Flattening test

Requirements

- Flatten to 1/3 original O.D. without cracks or breaks in the coupling piece; continue flattening until meeting opposite walls of the coupling piece. No evidence of lamination of burnt metal may develop during entire test.

Test specimen

- The test specimen represents all the couplings from the same heat of steel of the same shape and of the same main pipe dimension of the couplings.

Number of tests

- For coupling nominal size lower than 2" one flattening test shall be made per test specimen.

D. Retreatment

- If the result of the mechanical tests does not conform to the requirements specified in par. 6.5, the manufacturer, with the acceptance of the purchaser and the control authority, may reheat treat the couplings as applicable and repeat all the tests specified.

E. Non Destructive Examinations (NDE)

- The following non-destructive examination shall be performed by the vendor under the supervision of the control Authority delegate and the certificates shall be added to the CMTR.
- All butt welds shall be radio graphed in accordance with ANSI 31.3 or ASME section V – non-destructive examination - article 2 - using fine grain film and lead screens.
- The fillet weld shall be 100 % dye penetrate tested in accordance with ANSI 31.3.
- U.S., magnetic, visual and dimensional examination.
- In the presence of the control authority's delegate, the manufacturer shall perform the following non-destructive examinations on all couplings according to an inspection procedure to be submitted for approval: For couplings with wall thickness larger than or equal to 6 mm, ultrasonic inspection on the whole surface (with angle probe and straight probe) to the maximum extent possible. Magnetic particle inspection on the butt welds, whole external surface and the accessible internal surface.
- Visual examination all coupling shall be visually examined.
- After machining, all the finished bevels shall be submitted to the following tests:
 - Magnetic particle or liquid penetrate
 - For coupling with wall thickness larger than or equal to 6 mm, ultrasonic inspection on 25 mm of base material.
- All insulating couplings shall be submitted to a dimensional examination.
- Acceptance criteria of the different NDE
 - Visual examination
 - The following defects are unacceptable:
 - Undercuts exceeding 1 mm in depth and 25 mm in length.
 - Undercuts of the outside weld that overlap undercuts of the inside weld.
 - Lack of penetration.
 - Continuous occurrence of under-cutting.
 - Magnetic particle inspection on the external surface. ASME Section VIII, Division 1, appendix VI.
 - Ultrasonic inspection
 - For the welds:
 - For longitudinal welds: ASME code section VIII, division 1, appendix 12
 - For base material:
 - Procedure: ASME code, section V, art. 23, SA-388 o Criteria: ASME code, section VIII, division 1, UF-55 (angle probe will be used)
 - Radiographic examination
 - For longitudinal seam welds: Criteria: ASME code, section VIII, Division 1, UW-51
 - For girth welds: Criteria: API standards 1104, section 6.0.
 - Magnetic particle or liquid penetrate on the finished bevel
 - The following defects are unacceptable:
 - Defects extending into the bevel provided the lamination is parallel to the surface and has a transverse dimension exceeding 6.35 mm.
 - All defects not parallel to the surface extending into the bevel.

F. Coupling Testing

A. Hydrostatic testing

- Hydrostatic testing by the manufacturer is required, welding insulating couplings shall be capable to withstand a shop and field hydrostatic testing in accordance with specification.

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- The insulating coupling shall be hydrostatically tested at 1.5 x the 38°C rating gauge by the ANSI B16.5 rounded off to the next higher 1 bar increment during min. 15 min., in presence of the recognised Control Authority.
- B. Electrical testing
 - After the hydrostatic tests, the insulating coupling shall be tested with 5000 V AC, 50 Hz and the holding time shall be not less than one minute. Before and after the electrical test, each insulating coupling shall be checked with an insulation check. The acceptable result is a min. value > 50 M ohm (1000 V DC).

Class Symbol	Yield Strength (min.)		Tensile Strength (min.)		Elongation in 2" Min. %
	KSI	Mpa	KSI	Mpa	
B	35	241	60	413	25
X42	42	289	60	43	25
X46	46	317	63	434	25
X52	52	358	66	455	25
X60	60	413	75	517	20
X65	65	448	77	531	20

6.6. MANUFACTURE OF INSULATING JOINTS

- The insulating joint shall be formed by sandwiching and locking in position the insulation and sealing materials in a bell and spigot type construction.
- The joint shall be assembled such that its internal components are firmly locked in position and the completed joint shall be capable of withstanding operating stresses and field hydrostatic testing of the pipeline.
- The sealing gasket shall be formed in one piece and shall have a cross section of sufficient thickness.
- The thickness of the spacing ring, sealing gasket and filling material used in the joint shall be such that voltages applied do not affect the resistance of the joint. Joints provided without a sealing gasket shall not be accepted. The gasket in the assembled joint shall have sufficient residual elasticity to ensure effective sealing of the joint. The gasket shall be fully enclosed inside the joint to prevent cold flowing. The gasket shall be placed as close as possible to the spacing ring and at least 90% of both sides of the gasket shall be in direct contact with bare metal surfaces.
- The neck of the bell shall be sealed by mastic to prevent moisture penetration from outside.
- The minimum overall length of the joint shall be as specified on the VENDOR approved drawing. The length of the joint stuff ends shall be such that the spacing ring, sealing gasket and filling material do not exceed a temperature of 60°C during welding operations. After completion of acceptance a testing, ends shall be bevelled in accordance with the specification requirements.
- All welds, except the final closure weld, shall be full penetration welds. Welding shall be conducted in accordance with the requirements of ASME Section VIII.
- Internal and external surfaces of the finished joint shall be shot blasted to a minimum cleanliness degree of Sa 2-1/2 in accordance with ISO 8501-1.
- The internal surface shall be lined with epoxy resin at least 400 micron thick. Any depressions in the internal surface shall be filled with adhesive sealant elastomer to prevent the deposition of sediment at this point.
- The external surface shall be coated and the coating shall be at least 400 microns thick.
- Internal lining and external coating shall end approximately 50mm from the ends of the joint.

6.7. PLANT ACCESS

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- OWNER designated representative (s) shall be provided access to the VENDORS plant at any time during the manufacturing or testing of any item covered under this order. OWNER shall have the right to request samples of materials used during production. OWNER shall also have the right to witness the performance of tests and to examine the results of any tests conducted in order to verify compliance with this specification.

6.8. FACTORY ACCEPTANCE TESTS

6.8.1. General

- The VENDOR shall perform the necessary inspection and testing, both during manufacture and at final testing, to ensure compliance with specification requirements. Inspection and testing shall be subject to the approval of OWNER.
- All joints shall be subjected to the following inspections and tests:
 - Visual inspection during assembly
 - Preliminary inspection of the finished joint
 - Acceptance testing.
- The tests shall be conducted at the Vendors factory or at an external laboratory. All tests shall be conducted on joints at least 7 days old. Unless otherwise specified, the tests shall be carried out at an ambient temperature between 5°C and 45°C.

6.8.2. Visual Inspection.

- During assembly of joints the VENDOR shall ensure that All materials and components used comply with the requirements of this specification; welding and surface cleaning operations are performed in accordance with IA & approved procedures and in compliance with this specification; Assembly is in accordance with approved drawings. Drawings shall be made available on site by the VENDOR.

6.8.3. Preliminary Check's

- The joints shall be subjected to preliminary checks consisting of
 - Agreement with detailed drawings
 - Measurement of electrical resistance
 - Measurement of coating and lining dry film thickness
 - Holiday detection on coating and lining
 - Adhesion test on coating and painting
- Electrical resistance measurements shall be conducted with the joint in the vertical position using a mega ohm-meter of a suitable range and with a supply voltage of 1000 Volts. The resistance of the joint shall be at least 50M ohm. Joints failing to meet these resistance requirements may be dried in hot air and the resistance re-measured, Joints with resistance less than 50M ohm shall be rejected.
- The dry film thickness of the coating or Lining shall be determined in accordance with ISO 2808, Methods 2 or 3, in at least 5 evenly spaced points.
- Holiday detection shall be performed using a detector equipped with a straight brush and set at a voltage of at least 2.5 kV, Any holidays found in the coating or lining: shall be repaired.
- Any repaired coating or lining shall be subjected to holiday detection and adhesion testing after the curing time has elapsed.

6.8.4. Acceptance Tests

- Acceptance tests shall be carried out on all joints; The testing shall be conducted by using calibrated meters, instruments and gauges and shall include, but not be limited to:
 - A. Non-destructive examination
 - B. Hydrostatic testing
 - C. Fatigue testing
 - D. Electrical Resistance Test
 - E. Di-electric strength testing
 - F. Final visual inspection
 - G. Dimensional checks

A. Non-destructive examination

- All longitudinal and circumferential welds shall be 100% film radiographed. Final closure welds shall be subject to 100% ultrasonic and magnetic particle

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inspection. Weld ends shall be inspected for lam laminations using an ultrasonic, magnetic particle or liquid penetrate technique. All non-destructive examinations shall be performed in accordance with written procedures, approved by OWNER complying with ASME, Section V. The acceptance criteria shall be as specified in ASME Section VIII unless otherwise agreed by OWNER.

B. Hydrostatic testing

- Hydrostatic testing shall be conducted for a period of not less than 1 (one) hour during which no loss in pressure or leaks shall occur. Calibrated pressure gauges and continuous recording charts shall be used to monitor test pressure and duration. Joints may be tested individually or welded in series for testing. When insulation joints are welded in series for hydro testing all such welds, including test cap to joint welds, shall meet the specification requirements.

C. Fatigue testing

- Upon successful completion of hydrostatic testing, the joint shall be subjected to a minimum of 40 pressure cycles from 10 bars to 85% of the hydrostatic test pressure. After cycling, the pressure shall be raised to the hydrostatic test pressure and maintained for at least 30 minutes.

D. Electrical Resistance Test

- After pressure testing, all joints shall be subject to electrical resistance testing as per the provisions of this specification.

E. Di-electric strength testing

- The test equipment shall include a transformer and a device for the manual regulation of the current. The transformer shall be capable of supplying at the maximum testing voltage, a secondary current of at least 0.1A. A voltmeter connected to the secondary of the transformer shall be used to monitor the applied voltage.
- An AC sinusoidal wave voltage with a frequency of 50-60 Hz shall be applied to the joint. The voltage shall be increased, within a 30 second period from 1.2 kV to a maximum of 2.5 kV. The maximum test voltage shall be maintained for 60 seconds. The applied voltage and the leakage current shall be continuously monitored, using suitable instruments for any sudden increases. The test result is considered acceptable as per the following criteria.
- No insulating breakdown occurs during the test.
- No surface arcing occurs for the whole duration of the test.

F. Final visual inspection

- The completed joint shall be free of nicks, dents, laps, arc burns and other injurious defects. The height of any weld reinforcement shall not exceed 3 mm. Plate edge offset at any weld joints shall not exceed 10% of the nominal wall thickness or 1.6mm, whichever is less.

G. Dimensional checks

- Dimensional checks including weld bevel dimensions shall be conducted on all joints.
- The tolerances on the inside diameter of the joint shall be as per relevant line pipe specifications.
- The out-of-roundness shall be as per relevant line pipe specifications.
- The tolerance on the wall thickness shall be as per line pipe specifications.
- All testing and other technical requirements of metallic parts of the insulating joints, which include pup pieces, shall comply with the relevant bare pipe specifications. The Vendor shall submit to the OWNER the detailed manufacture and testing procedures for the metallic parts of the joints for the approval.

6.9. SPECIAL REQUIREMENTS

- All external hardware all the insulating joint shall be suitable for onshore service where the atmosphere is corrosive.



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- Tag Nos. shall be marked on SS 316 plate and permanently attached.

6.10. Packing, Storage And Shipment

- Before shipment, the joint shall be packed according to a procedure prepared by VENDOR and accepted by the OWNER.
- All joints shall be suitably packed in closed containers fitted with covers to prevent damage during transport. The ends shall be suitably sealed to prevent the ingress of dirt or moisture. The bevels shall be protected by bevel protectors.
- All insulating joints shall be transported and stored in vertical position.
- Shipping instructions shall be completed in accordance with the Vendor's requirements. Details of bevel protectors and caps shall be provided to the OWNER before shipping.

6.11. CERTIFICATION

- Material certificates to BS EN 10204 3.2 shall be provided for all materials used for the isolating joint.

6.12. DOCUMENTATION

The following documents shall as a minimum be submitted to OWNER for review and acceptance:

- Assembly drawings showing dimensions, material used for construction weight and external and internal coating system.
- Welding Procedure Specifications (WPS) and Welding Procedure Qualification Records (WPQR).
- Assembly Procedure.
- Reproducible copy of final construction drawings approved by the OWNER.
- Certificates of the chemical analyses and mechanical tests carried out on the material used.
- Material certificates for all materials included in the finished product according to BS EN 10204
- Non-destructive examination report of all verification, checks and test performed.
- Statement of guarantee on heat treatments carried out (records).
- All calculations and drawings.
 - Certificates of inspections and tests in accordance with the requirements of this specification including a document showing the recording of the hydraulic test.