

GPT

Industries

ElectroStop[®], ElectroFlange[™] & ElectroJoint[™]

Monolithic & Pre-Fabricated Isolation Joints



INNOVATIVE ENGINEERING FOR CORROSION PROTECTION

Monolithic & Pre-Fabricated Isolation Joints

INDUSTRY CHALLENGES

Monolithic Isolation Joints eliminate a number of the variables which commonly cause issues with isolation kits (ie. nuts, bolts, sleeves, and washers), and greatly simplify the installation process. In opposition, many end users have concerns regarding the raw materials, manufacturing process, and testing which detracts from industry confidence in MIJs.

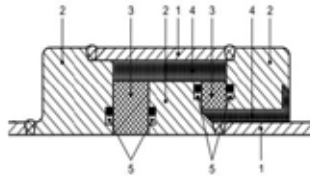
An MIJ delivered to a job site is a completed fitting, with no access or method to evaluate the internal components or assembly process. This leaves the end user having to rely on the manufacturers processes to ensure traceability, and the delivery of a quality product.



CHALLENGES

MIJ Designs

Non-metallic isolation components and elastomer seals are located in close proximity to welds. High heat input from welding close to the nonmetallic components creates a likely failure mode in the elastomeric material.



Chemical Attack and Seal Degradation –

Standard NBR or low quality elastomeric seals are often utilized in the incorrect application, and without accurate material traceability. In specific media or outside of the recommended environmental conditions O-Rings will reach compression set, or a permanent deformation of a material.



Elastomeric O-ring Damage

Signs of elastomeric O-rings melted to the steel groove. This would indicate that the O-rings experienced temperatures above the specified melting point, most likely during welding or the coating cure process. This would also give an indication that the GRE could have been compromised, again with no visual indications of the damage.



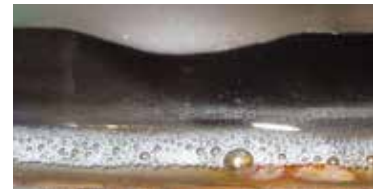
Forging & Pipe Traceability

Lot control of raw materials and traceability to material test reports is challenging in the manufacturing process. Material traceability, and test data verification was a concern when procuring monolithic isolation joints.



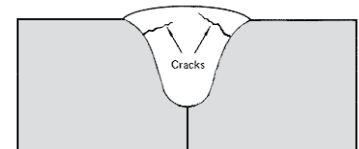
Isolation Material / Glass Reinforced Epoxy

Glass Transition (tG) temperature is relatively low which can be a failure mode in the manufacturing process. As the temperature approached the glass transition temperature, the isolation material will turn to a semisolid causing a loss of load, and a potential leak path.



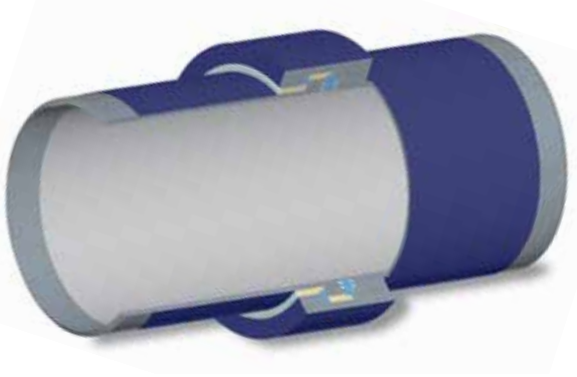
Heat Affected Zone & Weld Hardness

Exceeding the limits of NACE MR0175/ ISO 15156 (>250 HV10) have a high risk of sulfide stress cracking in the presence of H₂S and water. High metallic hardness is a symptom of poor raw material quality, and/or thermal shock in the welding process. Thermal shock can be mitigated through qualified welding procedures (ie. pre-heating, and slow cooling, etc.).



Monolithic & Pre-Fabricated Isolation Joints

ELECTROSTOP®



The ElectroStop® monolithic isolation joints ensure performance, and reliability for large diameter, and demanding applications. At a minimum each ElectroStop® MIJ undergoes a 19 point inspection & testing plan. In addition to guaranteed quality, the ElectroStop® offers customization (testing, dimensions, materials, and accessories) in order to meet the most demanding end user specifications.

The standard ElectroStop® utilizes dual Viton GF O-Ring seals, and thermosetting fiberglass resin with a 500°F (260°C) glass transition temperature. These non-metallic internal components, along with welding procedure controls eliminate the potential for damage in the manufacturing process.

ELECTROJOINT™



The ElectroJoint™ monolithic isolation joints are a leak proof, maintenance-free, and long lasting block against the flow of electrical current in sweet natural gas, and other small diameter piping systems. The ElectroJoint™ eliminates short circuits, field assembly, and any concern of improper installation. Every ElectroJoint™ MIJ is 100% hydrostatically, electrically, and weld tested. The ElectroJoint™ monolithic isolation joints are manufactured under an ISO Quality Management System.

Available Sizes: Up to NPS 8 inch, ANSI 600#

ELECTROFLANGE™



The ElectroFlange™ greatly simplifies the installation of flange isolation joints. With a prefabricated, assembled, and tested flange assembly GPT eliminates installation issues. Eliminating the flange bolt up, also eliminated the concern for improper assembly of the isolation kit, and potential damage or shorting of the isolation assembly.

The most common cause for failure of a flange isolation kit is improper installation. With the ElectroFlange™ there are no gaskets, nuts, bolts, sleeves, or washers to handle during installation. With a factory assembled, and rigorously tested flanged isolation joint we eliminate the potential for leaks, or short circuits due to an improper assembly.

All ElectroFlange™ isolation joints are assembled based on the proper procedures, eliminating flange rotation, flange misalignment, flange face finish requirements, metallic lubricants, improper loading of bolts, and other challenges customers face installing Flange Isolation Kits. Each ElectroFlange™ goes through non-destructive testing for weld quality, isolation testing, hydrostatic testing, and coating inspection. The ElectroFlange™ provides the ability to weld the joint in place, and move on; avoiding any troubleshooting or further inspection.

ElectroStop® Monolithic Isolation Joints

HIGHEST GRADE STANDARD COMPONENTS

Every ElectroStop® Monolithic Isolation Joint manufactured is designed, and tested for the most rigorous customer standards. The ElectroStop® uses Grade GF FKM or FFKM seals on every MIJ produced. In addition to improved chemical compatibility the FKM Grade GF allows for a 204°C (400°F) continuous operating temperature compared with the competitions standard offering of NBR with a maximum temperature of 135°C (250°F).

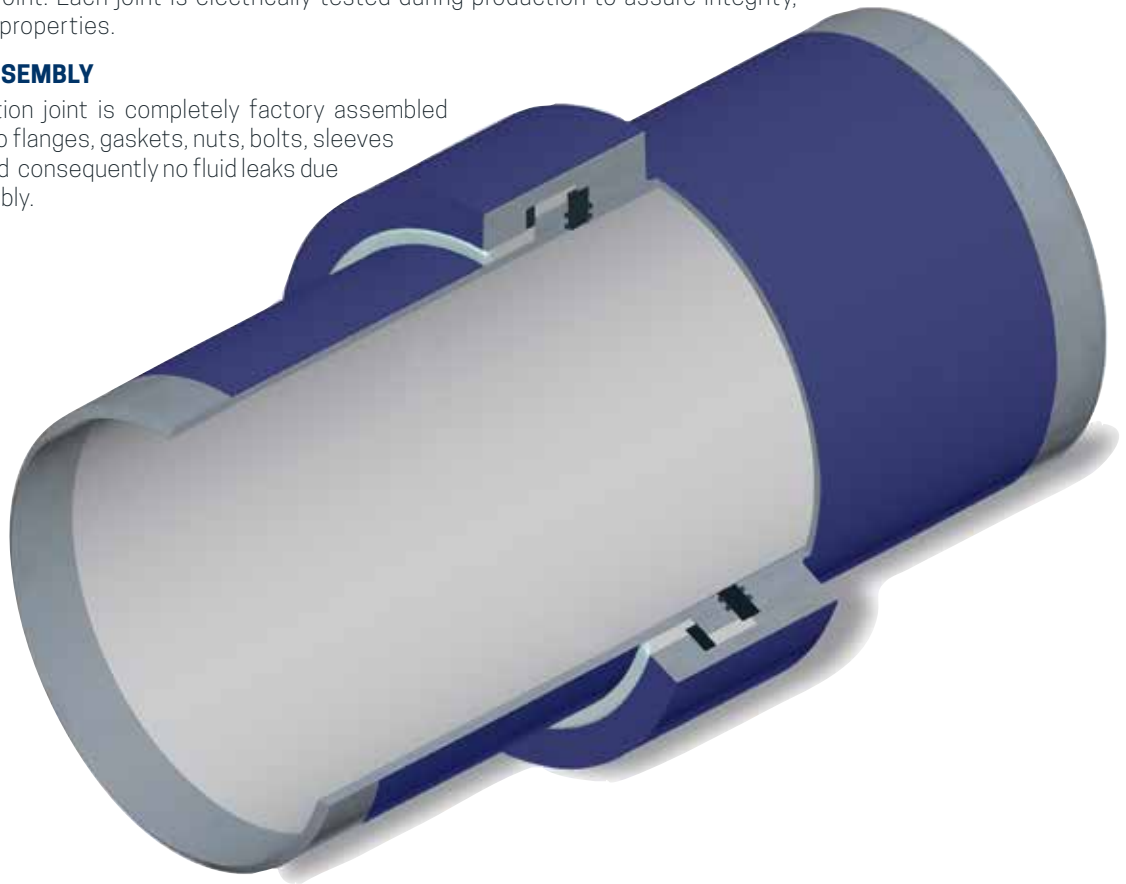
In addition to high temperature elastomeric seals, every ElectroStop® is produced with proprietary ASTM D709 CLASS IV isolation material, providing the highest allowable temperature range for Glass reinforced epoxy (GRE). The standard ElectroStop® uses GRE with a glass transition temperature (T_g) of 500°F (260°C) compared to a G10 - 239°F (115°C), or G11 - 356°F (180°C) material. The high temperature GRE also offers improved mechanical strength (Compressive, Flexural, & Impact strength)

ELIMINATES SHORT CIRCUITS

Bolts, sleeves and washers - the major source of short circuits in most isolation assemblies - are eliminated with the ElectroStop® isolation joint. Each joint is electrically tested during production to assure integrity, performance, isolating properties.

ELIMINATES FIELD ASSEMBLY

The ElectroStop® isolation joint is completely factory assembled and tested. There are no flanges, gaskets, nuts, bolts, sleeves or washers to handle and consequently no fluid leaks due to improper field assembly.



IS 100% HYDROSTATICALLY TESTED

All ElectroStop® fittings undergo hydrostatic pressure tests at 1.5 times rated operating pressure in accordance with ASME B31.3 standards. Testing is normally conducted for 60 minutes for 8" to 48" joints but can be tested per customer specifications. A pneumatic test is held at 87 psi for 10 minutes.

A pneumatic and hydrostatic report can be provided upon request.



ElectroStop® Monolithic Isolation Joints

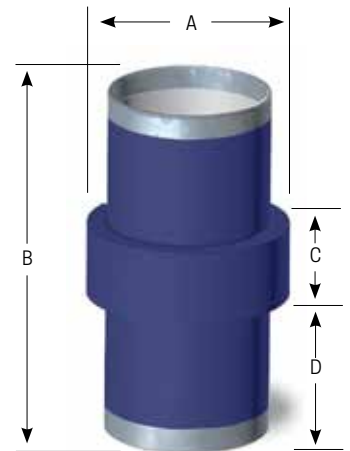
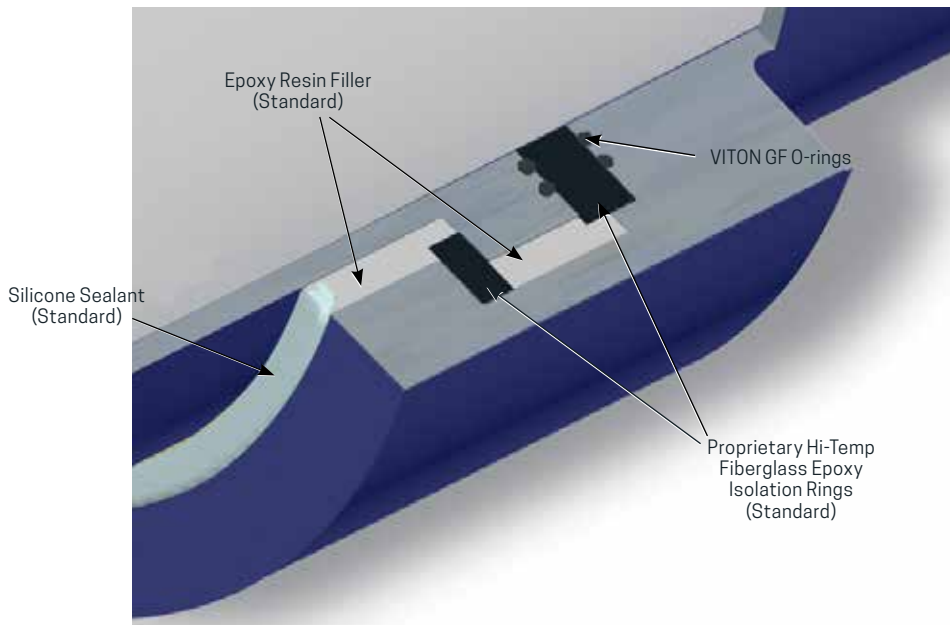
COMPLETELY WELD INSPECTED

All ElectroStop® isolation joint fittings undergo a weld inspection with combinations of phased array ultrasonic test (PAUT), magnetic particle test (MT) and Visual test (VT) on all welds. In addition, Radiography tests (RT) can be conducted upon request.

Manufactured under an ISO 9001:2015 Quality Management System

MONOLITHIC ISOLATION JOINT SPECIFICATION

Monolithic isolation fittings shall be bolt less and completely factory assembled in accordance with the appropriate requirements of ASTM, API and DIN. All welds shall be butt weld construction. The dielectric isolation material shall be a 500°F (260°C) thermosetting fiberglass epoxy material. Sealing shall be by dual static, self energized Viton GF "O" ring seals housed in accurately machined grooves, fully protected from cavitation in full compliance with ASME design codes. Interior and Exterior coating shall be in accordance to specific customer requirements. Coating shall be applied to within 2" of each end ID & OD. Each unit shall be tested for Electrical (@5kv AC (Upon request) & 1Kv DC > 25 Mohm), Hydrostatic (@ 1.5 x O.P.) and Weld (Phased Array Ultrasonic/Magnetic Particle). The Monolithic Isolation Fitting shall be the ElectroStop® Isolation Fitting manufactured under an ISO 9001:2015 Quality Management System.



- » All O-rings in the ElectroStop® are certified FKM GF (400°F (204°C) Rated)
- » GRE in the ElectroStop is a proprietary, high temperature isolating material (500°F (260°C) Rated)
- » U.S. Made Steel
- » Controlled loading during manufacture
- » Quickest delivery in the industry
- » Controlled temperature during welding
- » Each joint is traceable and serialized
- » Canadian Registration Number (CRN) Certified

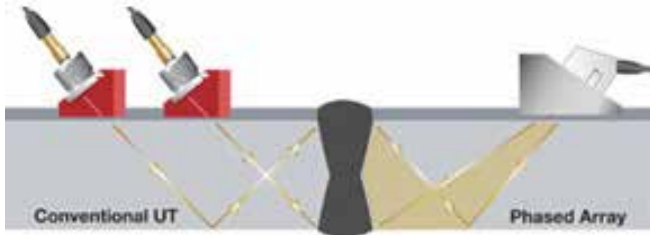
Most monolithic isolation joints are installed in ambient temperature operating conditions, however heat is a common cause of failure. During the welding operation and coating curing operation at many monolithic isolation joint (MIJ) manufacturers, the joints are exposed to temperatures far above the elastomeric seal temperature rating and the glass reinforced epoxy (GRE) temperature rating.

Thermally monitored welding, and high temperature non-metallic materials ensure that internal components are not damaged by heat input in the manufacturing process.

Monolithic Isolation Joints

PHASED ARRAY ULTRASONIC TESTING (PAUT)

GPT utilizes Phased Array Ultrasonic Testing (PAUT) to complete volumetric inspection of butt welds. Conventional UT requires the technician to utilize three different wedges at individual angles to interpret signals. The PAUT system has 32 elements which scan the body of the weld, and create an image of the weld for review. The PAUT provides electronic rastering, as opposed to conventional UT requiring the technician to perform a manual scan pattern for a complete inspection.



The PAUT generates electronic reports which can be reviewed by others after performing the inspection. With the generation of the image for review by others, the scan will show discontinuity to help in flaw detection, and identification (ie. slag inclusion, lack of fusion, or porosity).



The GPT ElectroStop® utilizes high temperature chemically resistant O-ring Seals (400°F/204°C or higher continuous operating temperature) to avoid damage in the manufacturing process.



O-RING ELASTOMER OPTIONS

- » As a standard, Redundant FKM 'GF' type seal with an allowable temperature range of (-20°F/-29°C) to 400°F (204°C). Compressibility is 75 durometer (Shore A), and excellent chemical compatibility with fuels, and other media.
- » Also available is the Redundant Low Temperature FKM 'GF' type seal with an allowable temperature range of (-65°F/-54°C) to 400°F (204°C). Suitable for extreme climates, offering a compressibility of 75 durometer (Shore A), and excellent chemical compatibility with fuels, and other media.
- » Also available is the Redundant H₂S Resistant FFKM seal with an allowable temperature range of (-40°F/-40°C) to 527°F (275°C). 80 durometer (Shore A) seals provide excellent resistance to explosive decompression, or rapid gas decompression.



Monolithic Isolation Joints

ELECTROSTOP®

NPS	150#			300/400#			600#		
	Pipe Grade	WT	Length	Pipe Grade	WT	Length	Pipe Grade	WT	Length
10"	API 5L X52	0.365	34-1/4"	API 5L X52	0.365	35"	API 5L X52	0.365	36"
12"	API 5L X52	0.375	37"	API 5L X52	0.375	38"	API 5L X52	0.375	39-1/4"
14"	API 5L X52	0.375	38-1/8"	API 5L X52	0.375	39-1/4"	API 5L X52	0.438	40-3/8"
16"	API 5L X52	0.375	39-1/4"	API 5L X52	0.375	40-3/4"	API 5L X65	0.375	42"
18"	API 5L X52	0.375	41-5/8"	API 5L X65	0.375	43"	API 5L X65	0.438	45-1/4"
20"	API 5L X52	0.375	42-5/8"	API 5L X65	0.375	44-3/4"	API 5L X65	0.5	48-1/8"
22"	API 5L X42	0.375	39-3/4"	API 5L X65	0.375	45"	API 5L X65	0.5	44-3/4"
24"	API 5L X52	0.375	43-7/8"	API 5L X65	0.375	46-5/8"	API 5L X65	0.562	52-1/8"
26"	API 5L X42	0.375	40-3/4"	API 5L X65	0.5	43-3/4"	API 5L X65	0.75	46-3/8"
28"	API 5L X42	0.375	40-3/4"	API 5L X65	0.5	44-1/4"	API 5L X65	0.75	47-3/8"
30"	API 5L X42	0.375	40-3/4"	API 5L X65	0.5	45-1/4"	API 5L X65	0.75	48-1/4"
32"	API 5L X42	0.375	41-7/8"	API 5L X65	0.5	46"	API 5L X65	0.75	49-1/4"
34"	API 5L X42	0.375	42-1/4"	API 5L X65	0.625	46-7/8"	API 5L X65	0.75	50-1/8"
36"	API 5L X42	0.375	44-1/8"	API 5L X70	0.625	48-5/8"	API 5L X70	0.75	50-7/8"
42"	API 5L X42	0.375	45-3/4"	API 5L X70	0.75	50-3/4"	API 5L X70	0.875	53-5/8"
48"	API 5L X42	0.375	47-3/4"	API 5L X70	0.75	53"	API 5L X70	1	56"

ELECTROJOINT™

NPS	150#			300/600#		
	Pipe Grade	WT	Length	Pipe Grade	WT	Length
3/4"	API 5L B	0.125	9"	API 5L B	0.154	9-3/4"
1"	API 5L B	0.125	9-3/4"	API 5L B	0.133	9-3/4"
1-1/4"	API 5L B	0.141	11"	API 5L B	0.14	11-3/4"
1-1/2"	API 5L B	0.141	11-1/2"	API 5L B	0.144	11-3/4"
2"	API 5L B	0.154	11-3/4"	API 5L B	0.154	13-3/4"
3"	API 5L B	0.216	15-3/4"	API 5L B	0.216	19-1/2"
4"	API 5L B	0.237	15-3/4"	API 5L B	0.237	19-1/2"
6"	API 5L B	0.28	19-1/2"	API 5L X52	0.28	23-1/2"
8"	API 5L B	0.322	19-1/2"	API 5L X52	0.322	23-1/2"



Monolithic Isolation Joints

ElectroJoint™

Replaces small diameter flanged connections

The ElectroJoint™ monolithic isolation joints are a leak-proof, maintenance-free and long lasting block against the flow of electric current in all piping systems. The ElectroJoint™ eliminates short circuits and field assembly. The ElectroJoint™ is coated internally and externally to prevent corrosion and is 100% hydrostatically, electrically and weld tested. All ElectroJoint™ monolithic isolation joints are manufactured under an ISO Quality Management System.



FEATURES AND BENEFITS:

- » Eliminates short circuits
- » Eliminates field assembly
- » Eliminates maintenance
- » Coated both internally & externally
- » 100% electrically tested
- » 100% pressure tested
- » Completely weld inspected verified by Magnetic Particle Inspection
- » Manufactured under an ISO Quality Management System

AVAILABLE SIZES:

- » Up to 8 inch, ANSI class 150#, 300# and 600#

Factory assembled, permanent and maintenance-free weld-in electrical isolation joint. Replaces flanged connections.

SPECIFICATIONS:

	150# ANSI CLASS (PN or DP 25)	300/600# ANSI CLASS (PN or DP 100)
Pressure Rating	285psi	1,480psi (600#)
Continuous Operating Pressure	300psi	1,500psi
Test Pressure	450psi	2,225psi
Working Temperature:	1°F to 158°F (-17°C - 70°C)	1°F to 158°F (-17°C - 70°C)
Electrical Resistance (Dry Air):	≥ 10 MΩ at 1000 V DC	≥ 10 MΩ at 1000 V DC
Breakdown Voltage (Dry Air):	3 kV AC, 50 Hz for 1 minute	3 kV AC, 50 Hz for 1 minute

NOTE:

All data supplied is for standard joints. Please contact factory for non-standard temperature, materials, or other custom requirements.

ElectroFlange™

Pre-Fabricated Isolating Flanges

ElectroFlange™ Joints provide electrical isolation for gas, water and petroleum pipelines; providing operation and maintenance cost savings. They do not require maintenance and can eliminate vault expense. GPT offers the best solutions for preventing corrosion in all industries including: onshore and offshore mains, petroleum refinery complex, chemical plants, waterworks, wastewater, gas transmission and gas distribution systems.



FEATURES AND BENEFITS:

- » Pre-Installed Isolation Gasket - Proper gasket compression and bolt load consistency are achieved along with the use of proper non-conductive lubricant
- » Pre-Installed Isolation Washers - Improper installation is avoided preventing short circuit via operator error
- » Outstanding electrical isolation properties for cathodic protection
- » Coated Bolts - Redundant corrosion protection for bolted assembly
- » Pre-Wrapped Joint - Encapsulates entire flange including bolt assembly providing corrosion protection to all critical parts

EXTRA CORROSION PROTECTION

All ElectroFlange™ Joints are wrapped with an impermeable barrier protecting nuts, bolts, washers and the flange cavity. The cavity is filled with wax to prevent fill intrusion and damage to the isolation gasket

SPECIFICATIONS:

	AWWA	ANSI B16.5 & B16.47
Flange Class	C207 D, C207 E, or C207 F (<48")	ANSI B16.5 & B16.47
Pipe Material	ASTM A53, API 5L, AWWA C200, or rolled ASME stamp	ASTM A106B, API 5L, X42, X52, X60, X65 or X70
Weld Procedures	ASME Section IX or AWS D1.1	API 1104 (21st Edition) or ASME Section IX
Coating or Wrapping	AWWA C222 (below grade), epoxy primer (above grade), cement lining, or tape/wax per customer specification	Per customer coating specification
Connection Ends	Butt straps or bevel (standard options)	Beveled ends to 30° standard (compound or other angle bevels available)
NDT	UT & dye penetration (standard). Hydrostatic test @ 150psi (standard). Also available: MT & RT	Hydrostatic test @ 1.5X MAOP; PAUT, VT, & MP standard (RT also available)
Certification	EN10204 3.1 or 3.2 (available; non-standard)	

ELIMINATE FIELD ASSEMBLY

The ElectroFlange™ Isolation fitting is completely factory assembled and tested. There are no gaskets, nuts, bolts, sleeves or washers to handle during installation and consequently no fluid leaks or electrical short circuits due to improper field assembly.

Standard Tests Include:

- » 100% Hydrostatic Pressure & Electrical Tests
- » 100% Ultrasonic of Welds
- » 100% Magnetic Particle of Welds

Monolithic & Pre-Fabricated Isolation Joints



HYRDO-BENDING TEST - SOUTHWEST RESEARCH INSTITUTE



NPS 42 ANSI 900# ELECTROFLANGE



POLYURETHANE TOP COAT APPLICATION



SUB-ARC WELDING MACHINE



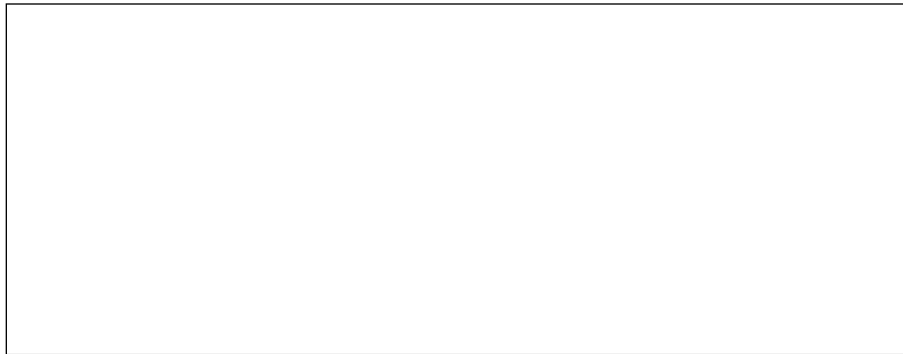
GPT TEAM WITH LARGE PRESS

Monolithic & Pre-Fabricated Isolation Joints

RFQ FORM

ElectroStop™ Fitting	“DUAL” O-RING SEAL ISOLATION FITTING		
Quantity			
Size - inch or DN			
ANSI/ASME Class			
Pipe Thickness - Inch (mm)			
Pups API 5L Specify Grade B, X-52, X-60, x-70 etc.			
Body ASTM A105 / EN10297-1 Body ASTM A216/A105/A694 Grade F42, F46, F52			
Fitting Length - Inch (mm)	<input type="checkbox"/> Std Per Literature <input type="checkbox"/> Other - Specify		
Specification	If different from GPT standard, please provide as attachment		
Media - Specify			
Design Factor	Standard = 0.5 - Specify if other required		
Design Pressure psig or (Barg)	<input type="checkbox"/> psig <input type="checkbox"/> Barg	<input type="checkbox"/> psig <input type="checkbox"/> Barg	<input type="checkbox"/> psig <input type="checkbox"/> Barg
Design Temperature -20° to 212°F (-28° to 100°C)	<input type="checkbox"/> Std -20°F (-28°C) to +212°F (100°C) <input type="checkbox"/> Other - Specify	<input type="checkbox"/> Std -20°F (-28°C) to +212°F (100°C) <input type="checkbox"/> Other - Specify	<input type="checkbox"/> Std -20°F (-28°C) to +212°F (100°C) <input type="checkbox"/> Other - Specify
Coating - External	<input type="checkbox"/> Epoxy .012-.019" (.30 to .48mm) <input type="checkbox"/> Other - Specify	<input type="checkbox"/> Epoxy .012-.019" (.30 to .48mm) <input type="checkbox"/> Other - Specify	<input type="checkbox"/> Epoxy .012-.019" (.30 to .48mm) <input type="checkbox"/> Other - Specify
Lining - Internal	<input type="checkbox"/> Epoxy .010-.016" (.25 to .40mm) <input type="checkbox"/> Other - Specify	<input type="checkbox"/> Epoxy .010-.016" (.25 to .40mm) <input type="checkbox"/> Other - Specify	<input type="checkbox"/> Epoxy .010-.016" (.25 to .40mm) <input type="checkbox"/> Other - Specify
Lifting Lugs Specify if Required	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
NDT Data Sheet			
NDE W3 Closure weld	<input type="checkbox"/> MT <input type="checkbox"/> UT - ASME Sec. V & ASME BPV Sec. VIII API 1104		
NDE W1/W2 weld	<input type="checkbox"/> MT <input type="checkbox"/> UT <input type="checkbox"/> RT - ASME Sec. V & ASME BPV Sec. VIII API 1104		
Pneumatic Air Test psi or (Barg)	<input type="checkbox"/> Std = 87 psi for 10 minute <input type="checkbox"/> Other - Specify	<input type="checkbox"/> Std = 87 psi for 10 minute <input type="checkbox"/> Other - Specify	<input type="checkbox"/> Std = 87 psi for 10 minute <input type="checkbox"/> Other - Specify
Hydrostatic Test psi or (Barg)	<input type="checkbox"/> Std = 1.5 x Operating Pressure <input type="checkbox"/> Other - Specify	<input type="checkbox"/> Std = 1.5 x Operating Pressure <input type="checkbox"/> Other - Specify	<input type="checkbox"/> Std = 1.5 x Operating Pressure <input type="checkbox"/> Other - Specify
Electric Insulation Resistance	<input type="checkbox"/> Std = >25 MΩ @ 1000 V DC <input type="checkbox"/> Other - Specify		
Dielectric Strength Test	<input type="checkbox"/> Std = 5kV A.C. 60 Hz (max leakage 3mA) (Note: Average dielectric strength > 15kV) <input type="checkbox"/> Other - Specify		
Issued By:	Company: Name: E-mail: Phone:	Date Sent: Date Required:	

GPT is dedicated to innovating and introducing the best products for sealing, connecting and protecting the world's pipelines. Our desire to be the supplier of choice for the pipeline industry is exhibited through our commitment to employing a technically proficient sales force, our large staff of R&D, process and application engineers, and our solid network of distributors that maintain commonly purchased stock.



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