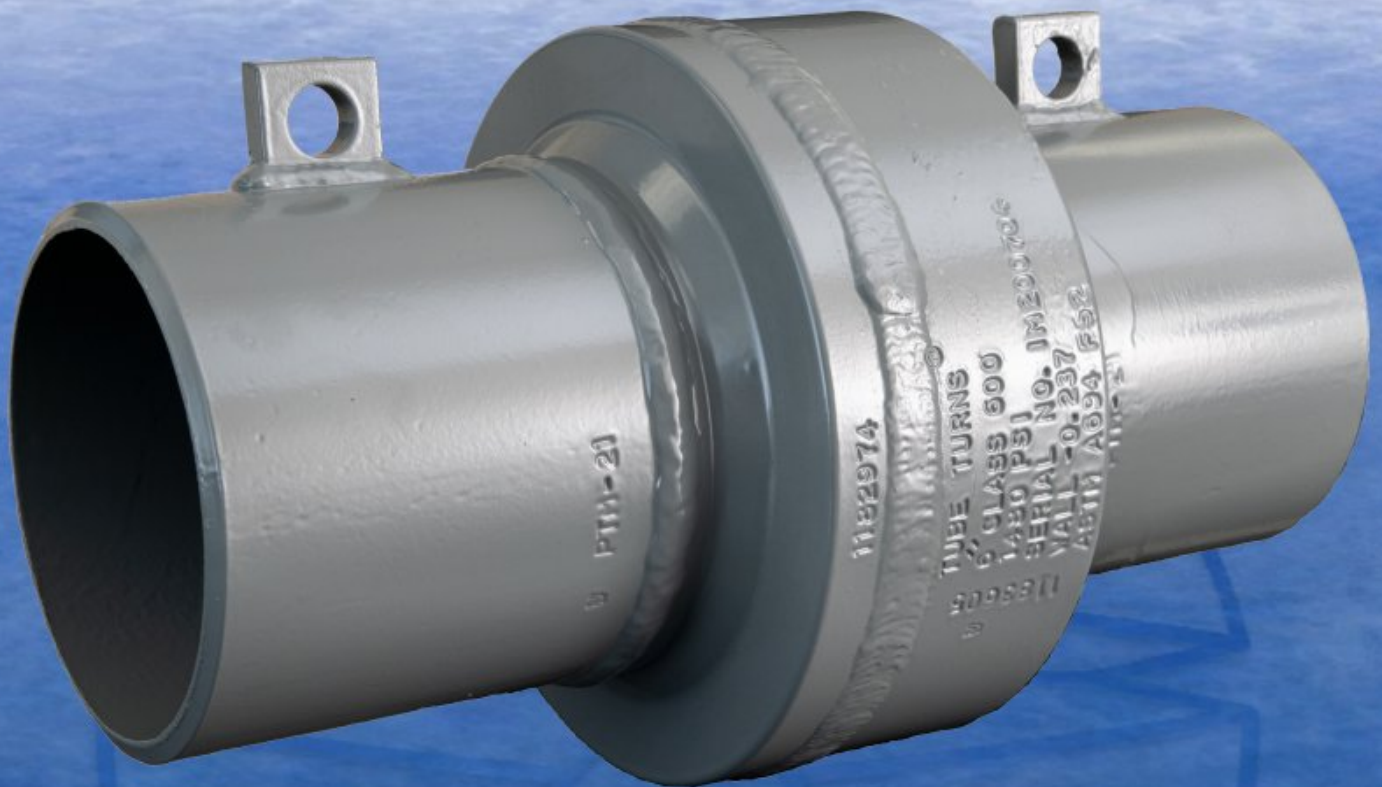




SYPRIS[®]
TECHNOLOGIES

Tube Turns Products



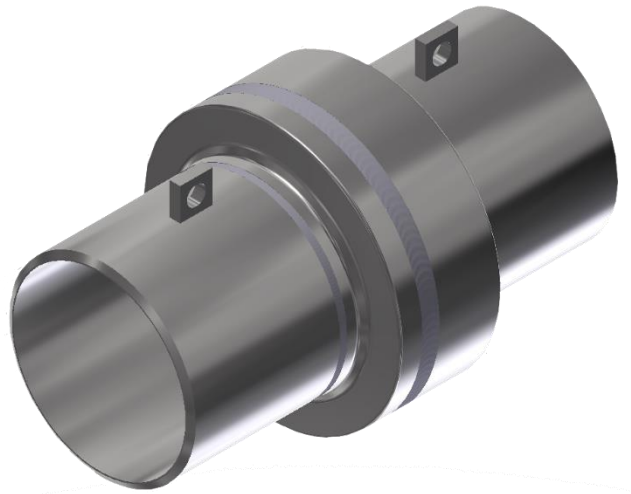
Tube Turns[®] Pipe-Type Insulated Joints

Tube Turns® Pipe-Type Insulated Joints

Tube Turns® Pipe-Type Insulated Joints are monolithic, boltless, nonseparable, pre-assembled and pre-tested units used to electrically isolate piping or pipeline segments and adjacent equipment.

Selective cathodic corrosion, risk to metering or monitoring equipment, and other unpredictable damage can result from introduction of stray electrical currents, which can come from a number of sources – adjacent electrical transmission lines, parallel pipelines, geomagnetic fields, flow-induced static charges, etc. The propagation of current flow along the length of the piping or into attached equipment can be prevented by use of electrical isolation devices, such as monolithic insulated joints.

A key feature of Tube Turns Pipe-Type Insulated Joints is the inclusion of ready-to-weld pipe ends matched to the customer's pipeline outside diameter, internal bore, wall thickness, and material.



The Tube Turns® Advantage

Compact Design

Boltless Construction

Factory-Assembled

Multiple Levels of Protection

Full-Scale In-House Testing

Factory-Inspected

Ready for Installation

No Maintenance or Adjustment

General Information

Applications: Designed for use with almost any fluid, including oil, gas, water, etc., not exceeding an operating temperature of 250°F. Suitable for onshore, underground, aboveground, exposed, sweet (non-corrosive), and sour (corrosive) installation and use.

Codes & Standards: All Pipe-Type Insulated Joints are manufactured under ISO 9001:2015 certification and comply with the following standards (as applicable):

- API 1104.....Welding Pipelines and Related Facilities Process Piping
- ANSI/ASME B31.3, B31.4, and B31.8.....Liquid Petroleum Transportation Piping Systems Gas Transmissions and Distribution Piping Systems
- ASME Section V.....Nondestructive Examination
- ASME Section VIII Div 1.....Rules for Construction of Pressure Vessels
- ASME Section IX.....Welding and Brazing Qualifications
- ASTM.....Material Standards
- AWS.....Welding and Material Standards

Installation, Operation, and Maintenance Instructions:

1. Tube Turns Pipe Type Insulated Joints are completely assembled and sealed at the factory and are not to be disassembled for installation.
2. Install by groove-welding each end of the factory-assembled Insulated Joint to the attaching pipe or fitting.
3. Each Tube Turns Pipe-Type Insulated Joint is coated with a nonconductive epoxy paint. This coating should remain to help ensure the insulating capability of the joint.
4. Each Tube Turns Pipe-Type Insulated Joint is factory tested for electrical resistance prior to shipment. If the original coating is removed or if an additional coating is to be applied, it is the responsibility of the user to assure that the joint remains nonconductive.

Caution: As received, this item should operate as an Insulated Joint. If during installation any conducting path is created, it will cease to operate as an Insulated Joint.

1. **DO NOT:** Remove the Insulated Joint's original coating with solvent, abrasion, etc. This may damage the insulating gaskets or create a conductive residue.
2. **DO NOT:** Coat across the Insulated Joint with paints or other materials that are proven conductors. Primers, such as Zinc Oxide, are particularly harmful.
3. **DO NOT:** Coat Insulated Joint with Hygroscopic materials that will absorb moisture and create a conductive path between terminals or across the Insulated Joint.
4. **DO NOT:** Weld on Insulated Joint if welding equipment is grounded on opposite side of the Insulated Joint.
5. **DO NOT:** Attempt to disassemble the Insulated Joint at any time. This will destroy its electrical integrity and may impair its mechanical strength.



Pipe-Type Insulated Joint Specifications

Scope: Tube Turns Pipe-Type Insulated Joints are designed with multiple levels of protection:

- Insulated gaskets prevent metal-to-metal contact across the Insulated Joint.
- Epoxy resin fills the retaining ring-to-hub gap, providing an additional electrical barrier and preventing foreign material/water intrusion.
- Two coats of Epoxy-based paint individually applied to each metal component, internally, and externally.

Design:

- Each Tube Turns Pipe-Type Insulated Joint sustains an internal pressure of 1480 psi.
- **Through Bore:** Each Insulated Joint will have a smooth, clear bore suitable for the uninterrupted passage of Pigs, Spheres, and On-Line Inspection Tools (Intelligent Pigs).
- **Weld End Preparation:** Internal diameter to match that of the attached pipe. Weld end shall be beveled to an angle of 30°, +5°/-0°, 1/16" Land.

Sizes & Dimensions: Available in nominal sizes from 2" through 16", with bore sizes, wall thicknesses, and metallurgical properties to match the piping system the insulated joint will be installed in.

- Special sizes available upon request.

Testing: Each Insulated Joint is hydrostatically pressure tested to 2225 psi for a minimum of 15 minutes. Each Insulated Joint is required to pass an electrical resistance test of 25 megohms minimum at 1000 VDC.

- Electrical resistance testing across the insulated joint is conducted at 1000 volts DC. Dielectric strength is measured to be within 5,000 to 15,000 volts.
- Nondestructive examination includes ultrasonic examination (UT) of retaining ring groove weld, radiographic examination (RT) of hub-to-pipe groove welds, and hydrostatic testing of the completed insulated joint to 1.5 times the design pressure.
- Other methods are available, including cyclic hydrostatic, Magnetic Particle (MT), and Liquid Dye Penetrant (PT) tests.

Material Test Reports: Tube Turns will provide Certified Material Test Reports of the Physical and Chemical Properties for each heat of steel used in the manufacture of the hubs and retaining ring.

Ratings: ANSI Class 600.

Other rating classes available upon request.

Materials: Standard designs consist of Carbon steel metallurgy.

- **O-ring Gaskets:** Nonconductive FKM per Mil-R-83248 Type I.
- **Insulating Gasket:** Epoxy Base/Glass Fiber Reinforced capable of meeting a minimum electrical strength of 15,000 Volts.
- **Coating:** Blast-cleaned and coated with a Prime Coat and Top Coat of Epoxy-based paint.
- **Hub & Retaining Ring Options:** ASTM A105, A106 or A694 with 52,000 psi Minimum Yield Strength.
- **Pipe:** SA-106 Gr. B, API SLX52
- Other materials available upon request.

Markings: Each Insulated Joint will be marked by low stress steel stencil on the outside of the retaining ring with the following:

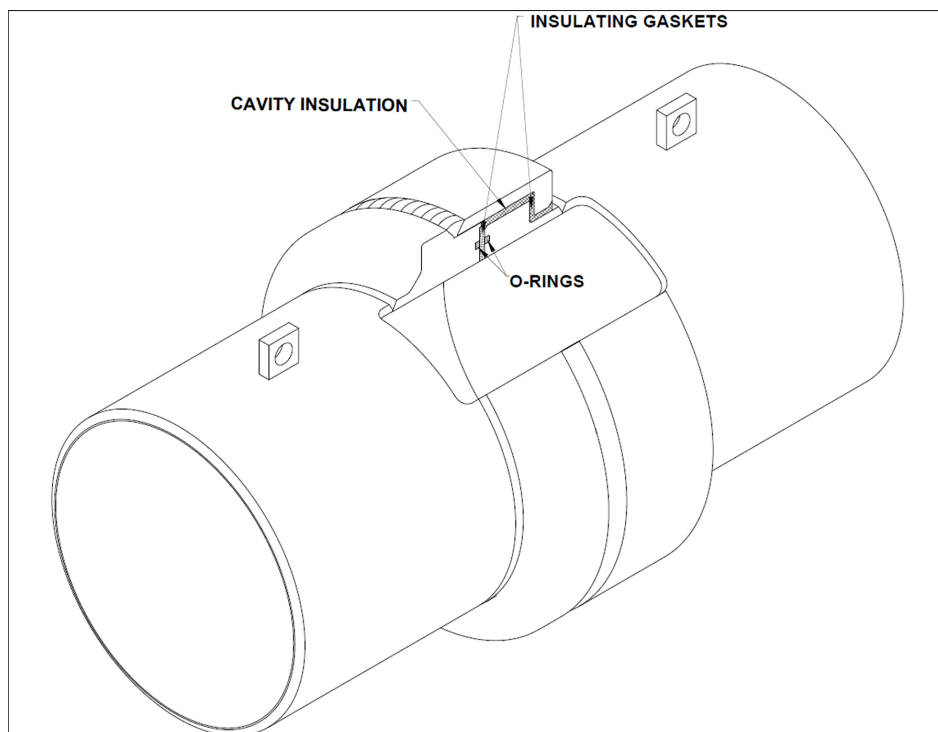
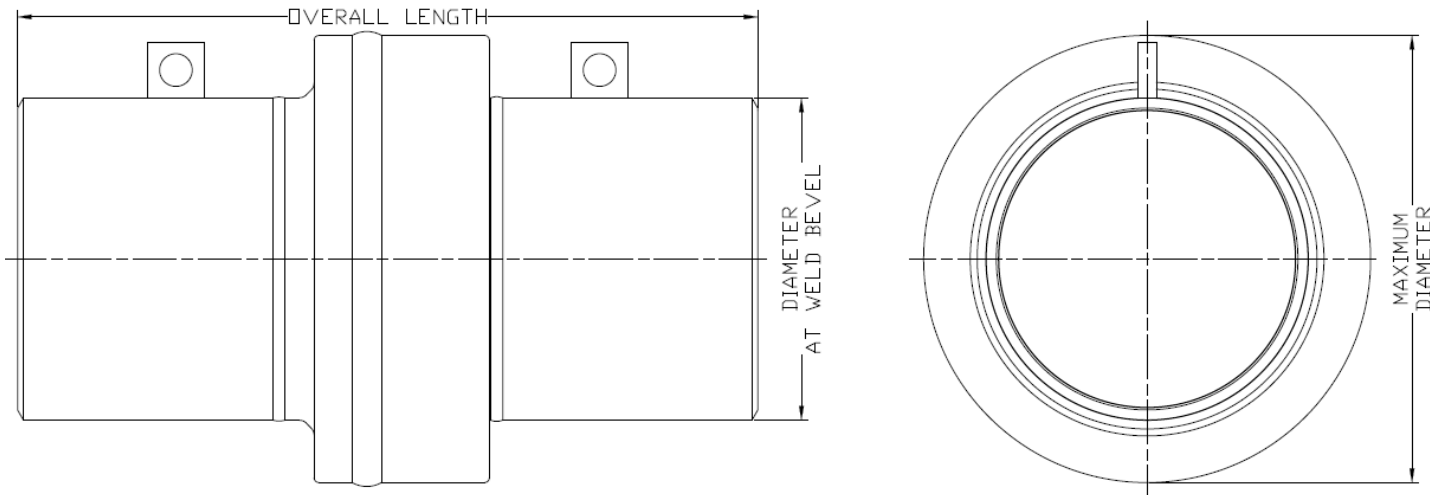
- Manufacturer's Name or Trademark
- Serial Number (assigned at order entry)
- Pressure Class
- Material Heat Numbers

Pipe-Type Insulated Joint Options

Nominal Pipe Size	Wall*	Diameter @ Weld Bevel	Overall Length (OAL)	Maximum Diameter	Weight (lbs)
2"	.154"	2.37	11.08	4.57	11
2"	.218"	2.37	11.15	4.57	11
4"	.237"	4.50	14.36	7.50	35
6"	.280"	6.62	17.58	10.00	77
8"	.322"	8.62	17.88	12.00	110
10"	.365"	10.75	27.26	14.69	212
12"	.375"	12.75	28.55	16.38	262
16"	.375"	16.00	30.37	20.32	412

All measurements are in inches.

* Other wall thicknesses can be quoted if required.



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