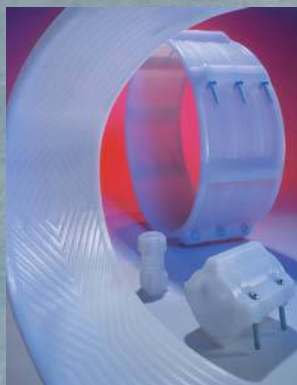
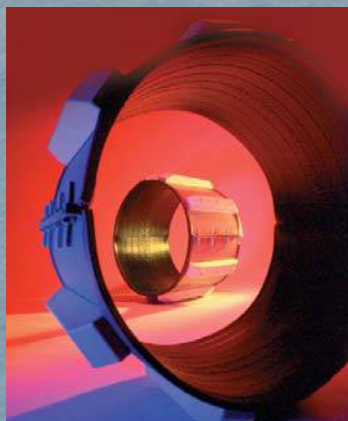


Casing Isolators/Spacers designed specifically for critical energy industry applications - worldwide.

PSI - a world leader in the design and manufacture of energy industry products.

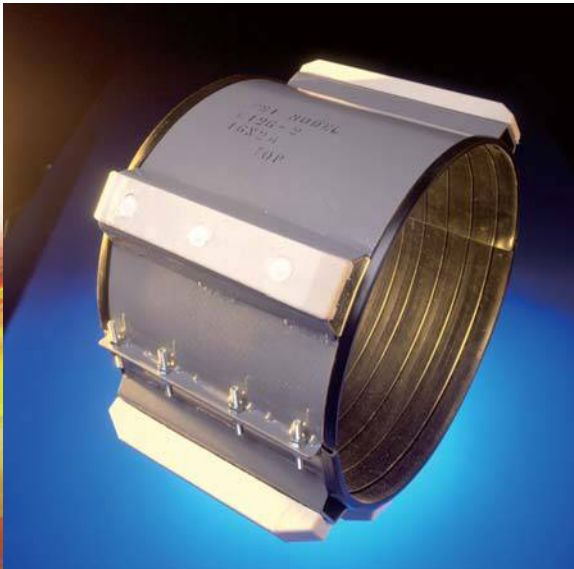
With over thirty-five years experience in designing and manufacturing a wide variety of products for the energy industry, PSI is uniquely positioned to provide a vast knowledge base of "real-world" solutions for the most critical of applications located in the most rigorous environments on earth.



Coated Steel

PSI polyvinyl chloride coated (PVC) casing isolators are often selected due to their strength and excellent corrosion resistance.

An extremely tough and durable heat fused plastic coating is offered on steel casing isolators 4" and larger, with 8" and 12" band widths. The cold formed steel casing isolator band, complete with runner studs installed, is vapor degreased, primed, heated and fusion coated with plastic, providing a minimum .010" (.254mm) thick coating over the entire band and runner studs. A post cured cycle strengthens the bond and provides an even more uniform coating. Polyvinyl chloride is available as a standard. Other heat



fused plastic coatings are also available for custom orders and applications.

The runners are attached with 3/8" diameter studs, which are fusion welded to the band before it is PVC coated. They are recessed far below the wearing surface of the runner. After the runner is anchored to the band, the stud counter-bore is filled to assure a water tight seal for the stud and the lock fastener.

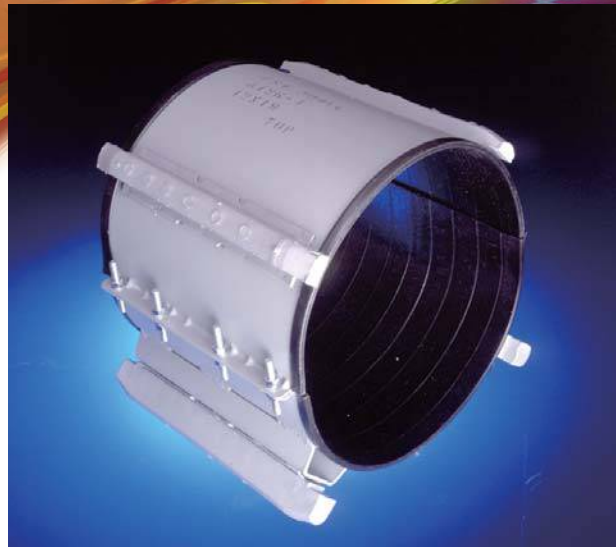
Model Options:

Model C8G-2

Coated Steel casing isolator with an 8" (203mm) wide steel band and 2" (50.8mm) wide glass reinforced runners.

Model C12G-2

Coated Steel casing isolator with a 12" (305mm) wide steel band and 2" (50.8mm) wide glass reinforced runners.



Painted Steel

PSI painted steel casing isolators are selected when strength and economy are your most important concerns. A rust inhibiting paint is applied over 14 gauge (0.074"/1.88mm) hot rolled and pickled mild steel for casing isolators 4" (101.6mm) diameter and up, in either 8" (203mm) or 12" (305mm) bands. The flanges of the spacer are deep embossed and the corners are chamfered. The G-2 runners are attached with 3/8" (9.5mm) diameter studs, which are fusion welded to the band before it is painted. They are recessed far below the wearing surface of the runner and, after the runner is anchored to the band, the stud counter-bore is filled to insure a water tight seal for the stud and the lock fastener. G-1 runners are attached by projection welded method.

Model Options:

Model A8G-1 or A8G-2

Painted Steel casing isolator with an 8" (203mm) wide steel band and 1" (25.4mm) or 2" (50.8mm) wide glass reinforced runners.

Model A12G-1 or A12G-2

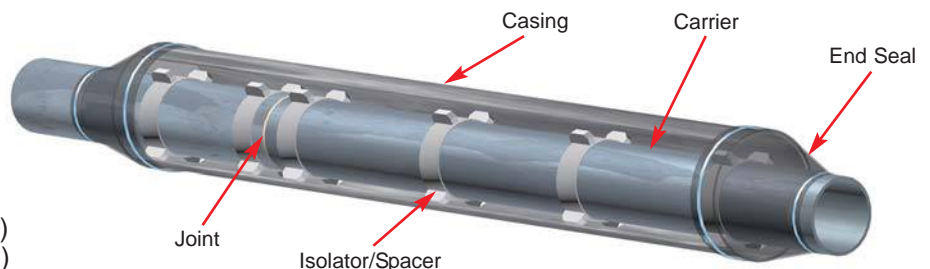
Painted Steel casing isolator with a 12" (305mm) wide steel band and 1" (25.4mm) or 2" (50.8mm) wide glass reinforced runners.

Typical spacing for all PSI metallic casing isolators/spacers.

A8/C8/S8 = 7' (2.1M) to 10' (3.0M)

A12/C12/S12 = 8' (2.4M) to 12' (3.7M)

An isolator/spacer should be placed within 2' (0.6M) on each side of a coupling or joint and within 1' (0.3M) of each end of the casing.



Stainless Steel

Tough, heavy duty 14 gauge (0.74"/1.88mm) 304 stainless steel isolators/spacers are available for use in highly corrosive environments. They offer maximum corrosion resistance while providing support for large diameter pipe, unusually heavy pipe or for long casing pulls.

The flanges of the spacer are deep embossed and the corners are chamfered.

The runners are attached with 3/8" (9.5mm) diameter studs, which are fusion welded to the band. The studs are recessed far below the wearing surface of the runner and, after the runner is anchored to the band, the stud counter-bore is filled to insure a water tight seal for the stud and the lock fastener.

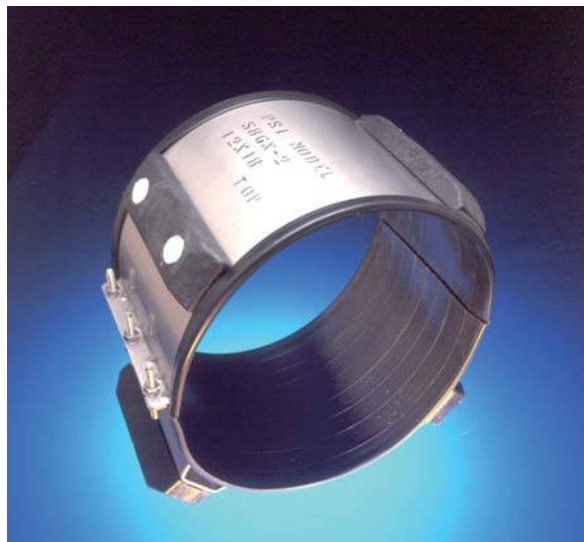
Model Options:

Model S8G-2

Stainless Steel casing isolator with an 8" (203mm) wide steel band and 2" (50.8mm) wide glass reinforced runners.

Model S12G-2

Stainless Steel casing isolator with a 12" (305mm) wide steel band and 2" (50.8mm) wide glass reinforced runners.



Runners



Runner material compositions for PSI isolators/spacers are optimized to insure a smooth, low resistance ride even for the heaviest and longest pull applications. While providing resistance to the abrasive action, PSI runners are optimized for maximum compressive strength and hardness.

Glass reinforced polymer runners are standard in 1" (25.4mm) or 2" (50.8mm) widths for A (painted).

C (coated) and S (stainless steel) models are available in 2" (50.8mm) only.

PSI glass reinforced runners have 5 times the compressive strength of polyethylene runners. Our 2" wide runners are particularly designed for heavier pipes and longer pulls.

Note: For high temperature applications exceeding 400°F (204°C), please contact PSI.

Effective Runner Heights and Lengths

Sizing carrier pipe O.D. and casing I.D. can be misleading at times due to a difference between nominal and effective dimensions. When sizing, make sure to consider effective runner height. Two heights are available/used; custom positioning in the casing can be achieved with riser heights.

Heights - Nominal versus Effective

1" and 2" Wide Glass Reinforced Polymer Runners

Nominal 1.0" (25.4mm) - 1.5" (38.1mm)
Effective 1.07" (27.2mm) - 1.70" (43.2mm)

Lengths - Effective

1" Wide Glass Reinforced Polymer Runners

8.5" (215.9mm) - 12.5" (317.5mm)

2" Wide Glass Reinforced Polymer Runners

7.0" (177.8mm) - 11.0" (279.4mm)

Ranger II[®], All Non-metallic

An all non-metallic spacer system designed to ease carrier pipe insertion, reduce inventory costs, make installation quick and easy to last for the life of the piping system.

Features

- All non-metallic. No nuts, bolts, washers or any other metal parts to corrode or degrade over time.
- Segmented pieces - small inventory may be used to accommodate a large variety of pipe styles, types and diameters. No extra trips from job site to warehouse for additional parts.
- Easy assembly. Simply slide the segments together and ratchet tight with the patented

Slide-Lock connecting system.

- Wide variety of runner heights to allow numerous options for pipe positioning within the casing.
- Manufactured from UV resistant polypropylene.
- No special tools required for installation.
- Accommodates plastic, ductile iron and steel carrier pipe. (Not suitable for concrete pipe.)



Model Options:

For carrier pipe diameters from 0.83" (21mm) to 37.60" (955mm) in diameter. See Ranger II literature for runner heights, configuration options and ordering information - or visit www.ranger2.com for PDF literature and installation instructions.

Band/Runner Segments

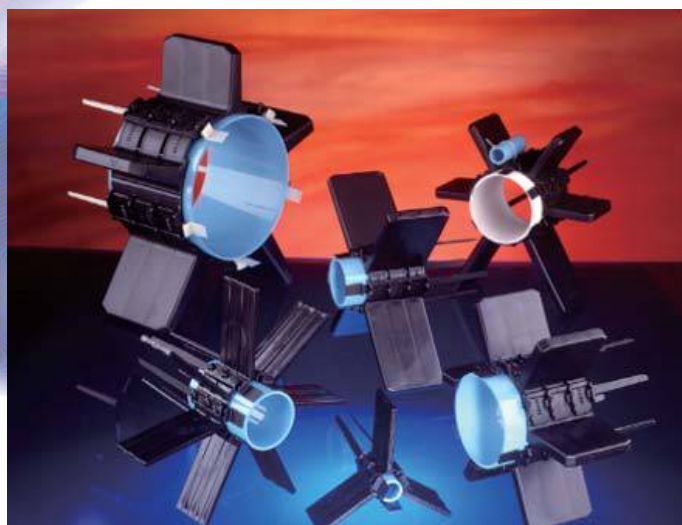
UV resistant polypropylene.

Specifications

| Specifications | Value |
|----------------------|---|
| Compressive Strength | 3,000 lbs./sq. in. (211 kg/sq. cm) |
| Temperature | -40°F. to +180°F. (-40°C. to +82°C.) |
| Impact Strength | 1.5 ft. lb/sq. in. (10.34kPa) |
| Dielectric Strength | 800 Volts/mil. min. |
| Color | Black |

Liner

None



Typical Specification

Casing spacers shall be all non-metallic (polypropylene), molded in segments for field assembly without any special tools. Spacer segments shall be secured around carrier pipe by insertion of a cinching spline. The casing spacer polymer shall contain ultraviolet inhibitors and shall have a minimum compressive strength of 3,000 psi, an 800 Volts/mil dielectric strength and impact strength of 1.5 ft-lbs./inch. Each casing spacer shall have full length, integrally molded skids extending beyond the bell or mechanical joint of the carrier pipe.

Each casing spacer shall be manufactured at a facility that has a Registered ISO 9001:2000 Quality Management System. Copy of current ISO 9001:2000 Registration shall be provided with material submittal.

Approved manufacturer: Pipeline Seal and Insulator, Inc.

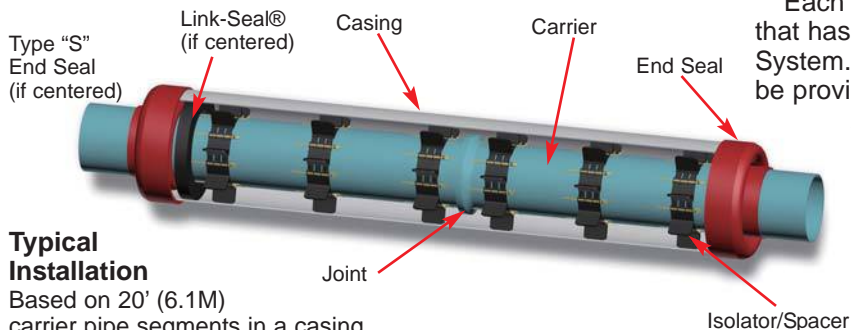
Recommended Maximum Spacing

All Ranger II[®] Isolators/Spacers should not exceed 8' (2.4M) center to center.

An isolator/spacer should be placed within 2' (0.6M) on each side of a coupling or joint and within 1' (0.3M) of each end of the casing. For more details on spacing see Ranger II[®] brochure at www.pipeline.seal.com

Typical Installation

Based on 20' (6.1M) carrier pipe segments in a casing of not more than 300' (91.5M). Consult PSI for longer casings and for concrete pipe.



Model PE

High density (linear), injection molded virgin polyethylene casing isolators/spacers provide positive insulation, high abrasion resistance and low coefficient of friction for a wide variety of energy industry double containment carrier/casing pipe applications. They are extremely light in weight and easy to handle during installation.

A ribbed inner surface prevents slippage and guards against carrier pipe coating damage while the outer surface may include any one of several molded runners to accommodate 2" (50.8mm) x 4" (101.6mm) or larger carrier/casing differentials.

One piece solid molded segments provide for maximum load bearing.

Hardware includes cadmium plated steel studs, nuts and washers. A screwdriver is the only tool needed for installation.

Model Options:

Model PE

3/4" (19mm) through 12" (305mm) = 2 segments, top/bottom.

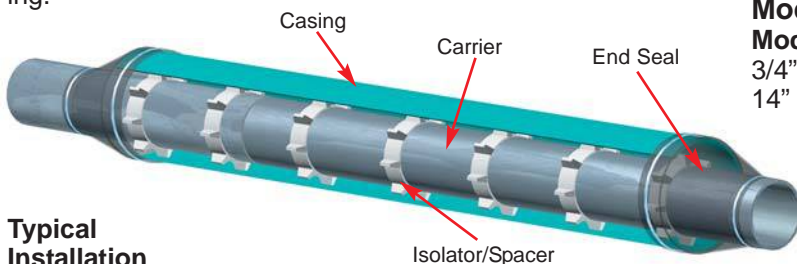
14" (356mm) through 48" (1,219mm) and larger = multiple segments.



Model HT

A unique formulation of polymers is used in the manufacture of the Hi-Temp isolators/spacers giving them the capability of being used for applications that may reach 280-degrees F. (138° C.).

A high-temp plastic liner improves friction with the carrier pipe while protecting it from damage to either pipe or coating.



Typical Installation

Based on 20' (6.0M) carrier pipe segments in a casing of not more than 300' (91.5M). Consult PSI for longer casings and for concrete pipe.

Model Options:

Model HT

3/4" (19mm) through 12" (305mm) = 2 segments, top/bottom
14" (356mm) and above = contact factory for availability.

Recommended Maximum Spacing

All model PE and Hi-Temp Polymer Isolators/Spacers should not exceed 5' (1.5M) to 8' (2.4M) center to center. An isolator/spacer should be placed within 2' (0.6M) on each side of a coupling or joint and within 1' (0.3M) of each end of the casing.

Material Specifications

Model PE Plastic Casing Isolators/Spacers

Band/Runner Segments

Model PE

Injection molded virgin polyethylene.

| Specifications | ASTM Test | Value |
|----------------------|------------|---|
| Tensile Strength | D638, D651 | 3,100 - 5,500 psi 218 - 387 kg/cm ² |
| Compressive Strength | D693 | 3,200psi (225kg/cm ²) |
| Water Absorption | D570 | 0.1% |
| Temperature | | 180° F. Max. (82° C.) |
| Impact Strength | D256 | 1.5 - 2.0 ft. lb/in. (0.8 -1.07 newton-meter/cm) |
| Dielectric Strength | D149 | 450 Volts/mil. |
| Color | | Natural |

Liner

None

Runners

Sizes and Configurations

3/4" (19mm) through 12" (305mm) = 2-piece with molded-in runners.
14" (356mm) and larger = Multiple segments with molded-in runners.

Hardware

Metallic

Bolts and Square Nuts = Plated Steel

Non-metallic

Bolts and Nuts = High Temp Plastic

Note

Model PE Casing Isolators/Spacers are designed primarily for smaller diameter steel or polyethylene carrier pipes (ANSI O.D. pipe without a bell or mechanical joint). We do not recommend that they be used on any carrier pipe over 24" (610mm) in diameter or for installation over 200 feet (61M) long without consulting with PSI. PE isolators/spacers should not be used on concrete carrier pipe.

Typical Specification

Casing isolators/spacers shall be PSI Model PE molded from high density polyethylene plastic in two segments. Each spacer segment shall be a solid, non-welded molded piece designed for accommodating specific size pipe O.D.'s.

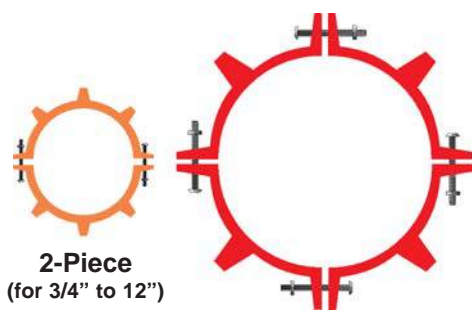
Each casing spacer shall be manufactured at a facility that has a Registered ISO 9001:2000 Quality Management System. Copy of current ISO 9001:2000 registration shall be provided with material submittal.

Approved manufacturer: Pipeline Seal and Insulator, Inc.

For 3/4" (19mm) through 12" (305mm) nominal diameter carrier pipe use 2-piece model PE. For 14" (356mm) and larger nominal diameter carrier pipe, use multi-segment Model PE.

How to Order Plastic Casing Isolators/Spacers

- Quantity
- Model Number
- Carrier Pipe O.D.
- Coating Thickness
- Casing O.D. and Wall Thickness
- Contact your local distributor or Pipeline Seal and Insulator, Inc.



2-Piece
(for 3/4" to 12")

Multi-segment
(for 14" and above)

Material Specifications

Metal Casing Isolators/Spacers

Band

Painted & Coated

14 Gauge (0.074" [1.88mm]) hot rolled and pickled mild steel. Flanges of the spacer are deep embossed and the corners are chamfered.

Stainless Steel

14 Gauge (0.074" [1.88mm]) 304 stainless steel. Flanges of the spacer are deep embossed and the corners are chamfered.

Configurations

4" (101.6mm) through 36" (914mm) = 2 Piece
36" (914mm) through 48" (1,219mm) = 3 Piece
48" (1,219mm) and over = Consult Factory

Finishes Available

Stainless Steel: None

Coated Mild Steel: 10 to 16 mil. fusion bonded PVC coating (others available)

Painted Mild Steel: Rust inhibiting paint

Fusion Bonded PVC Coating

| | |
|--|------------------|
| Durometer - shore A2 (10 sec.) (ASTM D1706-61T) | 80 |
| Max. Operating Temp. (constant) | 150° F. (65° C.) |
| Aging Properties | Excellent |
| Electrical Properties (ASTM D149-61) (short time .010") | 1,380 V/mil. |
| Resistance: | |
| Salt Spray (ASTM B117) | Excellent |
| Acids | Good |
| Alkalies | Good |

Liner

| | |
|--------------------------|-------------------------|
| Material | Polyvinyl Chloride |
| Thickness | 0.090" (2.29mm) minimum |
| Hardness | Durometer "A" 85-90 |
| Dielectric Strength | |
| 1/8" (3.18mm) Surge Test | 60,000 V min. |
| Step-by-step Test | 58,000 V min. |
| Water Absorption | 1% max. |

Risers

Stainless Steel

10 gauge (0.135mm) 304 stainless steel MIG welded to band.

Coated & Painted Mild Steel

10 gauge (0.135mm) steel MIG welded to band.

Runners (see page 3 for effective dimensions)

Sizes and Configurations

Stainless Steel & Coated - 2" (51mm) Wide Glass Reinforced Polymer Runners
Painted - 1" (25.4mm) or 2" (51mm) Wide Glass Reinforced Polymer Runners
4" (101.6mm) thru 12" (305mm) = 2 top & 2 bottom
14" (356mm) thru 36" (914mm) = 2 top & 4 bottom

Runner Specifications

| | | |
|--|---------------|---|
| Tensile Strength, (ASTM D638) | 17,600 psi | 1,237 kg/cm ² |
| Flexural Strength, (ASTM D790) | 25,300 psi | 1,779 kg/cm ² |
| Compression Strength, (ASTM D695) | 18,000 psi | 1,266 kg/cm ² (10% Deformation) |
| Deflection Temp. @ 264 psi - (ASTM D648) | 405°F (205°C) | |
| Deformation Under Load: @ 122°F (50°C) | | |
| 2000 lb. load - (ASTM D621) | 1.2% | |

Studs, Nuts and Washers

Studs = 5/16" - 18 x 2 1/2" 304 stainless steel or plated

Hex Nuts = 5/16"

Washers = 5/16" SAE 2330

Configurations

8" (203.2mm) Band = 6 studs, 12 nuts and washers
12" (305mm) Band = 8 studs, 16 nuts and washers

Note: For higher temperature applications not published contact PSI.

How to Order Metal Casing Isolators/Spacers

1. Quantity
2. Type Finish
3. Band Width
4. Runner Width
5. Carrier Pipe O.D. (Type and coating thickness if applicable)
6. Casing Pipe I.D. (Type and coating thickness if applicable).
7. Carrier Pipe Joint O.D.
8. Carrier pipe position within casing
9. Length of crossing
10. Contact your local distributor or Pipeline Seal and Insulator, Inc.

Example

Coated 12" (305mm) wide steel band casing spacer with 2" (50.8mm) wide glass reinforced polymer runners for a 16" (400mm) steel pipe with a 16.00" (400mm) outside diameter within a casing pipe with a 23.25" (590mm) inside diameter, standard position.

Type Finish

- A = Painted
- C = Coated
- S = 304 Stainless Steel

Band Width

- 8 = 8" Band
- 12 = 12" Band

Runner Width

- G-1 = 1" Wide Glass Reinforced Runners*
- G-2 = 2" Wide Glass Reinforced Runners

Carrier Pipe O.D.

Indicate actual O.D. including coating.

Casing Pipe I.D.

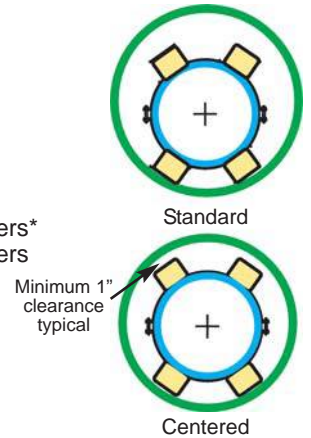
Indicate actual I.D. including coating.

Carrier Pipe Joint O.D. (if applicable)

Indicate actual O.D. including coating.

Position within Casing

- S = Standard
- C = Centered



C 12 G-2 16.00 x 23.25 - (none) S

* = G-1 Runners Available on Painted Models Only.

Factory made casing isolators/spacers of the following description shall be installed on any carrier pipe passing through a pipe casing. They are designed to protect the carrier pipe corrosion coating and electrically isolate the carrier pipe from the casing.

Typical Steel Casing Isolator/Spacer Specification

Casing Isolators/spacers shall be PSI Model C8G-2 for carrier pipes up to 24-inch diameters and Model C12G-2 for larger pipe sizes as manufactured by Pipeline Seal and Insulator, Inc., Houston, TX.

Casing isolators/spacers shall have a minimum 14 gauge steel band and where required, 10 gauge risers. The band, risers and connecting studs shall be welded and cleaned at the factory before the application of a fluidized bed fusion bonded PVC coating of between 10-16 mils thickness. The PVC coating shall provide good resistance to acids and alkalis and excellent resist-

ance under ASTM B117 salt spray tests. (Epoxy coatings are not an acceptable alternative).

The isolators/spacers shall have a flexible PVC inner liner of 0.09 inch thickness with a durometer "A" 85-90 hardness and a minimum 58,000 volt dielectric strength.

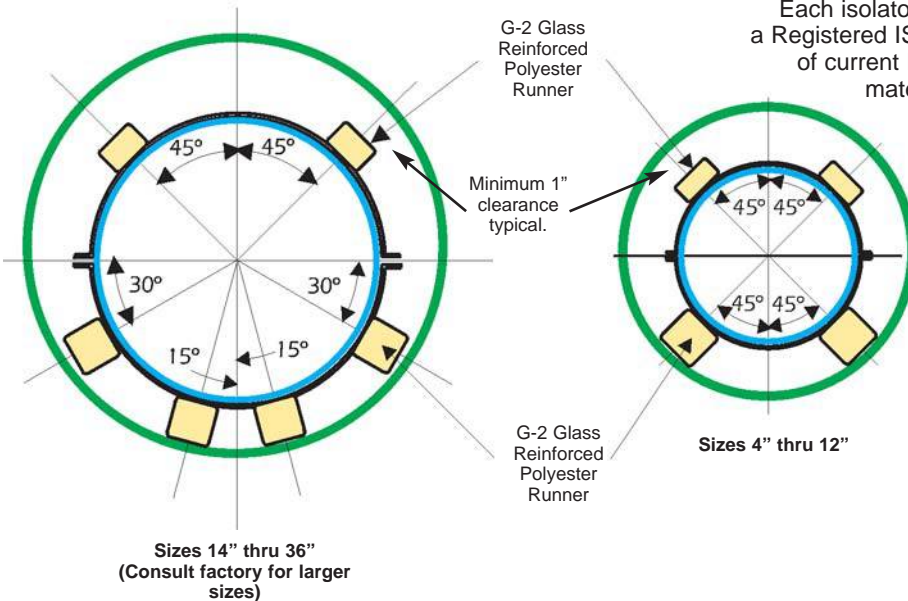
The runners shall be high pressure molded glass reinforced polymer with a minimum compressive strength of 18,000 psi per ASTM D638. The runners shall be 2.0 inch in width and a minimum of 7.0 inches long for C8G-2 models and 11" for C12G-2 models (polyethylene runners are not an acceptable alternative). The runners shall be attached to the band or riser by 3/8" welded steel studs and lock nuts which shall be recessed far below the wearing surface on the runner. The recess shall be filled with a corrosion inhibiting filler. The band section shall be bolted together with cadmium plated studs, nuts and washers.

Quality Assurance

Each isolator/spacer shall be manufactured at a facility that has a Registered ISO 9001:2000 Quality Management System. Copy of current ISO 9001:2000 registration shall be provided with material submittal.

Considerations

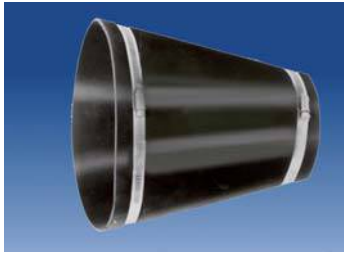
The above specification is considered sufficient for most pipe sizes and types up to 36-inches and casing lengths up to 300 feet. For larger size pipes or longer or unusual casings, please contact Pipeline Seal and Insulator, Inc. For higher temperature applications not published, please contact Pipeline Seal and Insulator, Inc.



End Seals

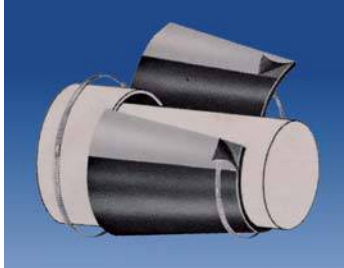
Model "C" Custom Pull-on

Individually designed to accommodate custom carrier/casing combinations. Made of 1/8" thick, specially compounded synthetic rubber for long life and easy installation.



Model "W" Wrap Around

Specifically designed for existing installations. Simply remove plastic backing from self-curing rubber and press exposed surfaces together. Available for all carrier/casing differentials.



Custom Insulators

Pipeline Seal and Insulator is the industry leader in the design and fabrication of multiple carrier spacers used for inserting different size pipes, conduits and wires into casings. Projects have ranged from simple dual pipe configurations to complex pipe/conduit arrangements, designed for maximum strength and efficiency within all pipe specifications. Customized spacers are also available with electrically isolated rollers to ease installation of unusually heavy carrier pipes or for extremely long casing pipe runs.

PSI Models A (painted), C (coated) or S (stainless steel) may be designed and fabricated to meet the needs of your custom project.



Pipeline Seal and Insulator, Inc.

6525 Goforth Street, Houston, TX 77021 U.S.A.
Telephone: 713-747-6948, Fax: 713-747-6029
Toll Free: 800-423-2410
www.pipeline-seal.com, e-mail: info@psipsi.com

Model "S" Standard Pull-on

Made of special synthetic rubber for long life and easy installation, the highly flexible "S"-shaped seal is available for ANSI steel pipe specifications. Band locating ribs are on the outside, with special sealing ribs on the inside under the band to prevent leakage.



Model "FW" Fire Resistant

This model has been developed exclusively for situations involving a need for fire retention. They are applicable to casing through dikes in tank farms, fire walls or wherever a casing may be in a fire prone area.



LinkSeal® Modular Seals...

may be used to seal the ends of casings when the carrier pipe is centered. In fact, double protection may be achieved by using a Link-Seal Modular Seal in combination with any of the End Seals above.



Warranty

All products are warranted against failure caused by manufacturing defects for a period of one year. Any product found to be so defective and returned within one year from date of shipment will be replaced without charge. The above warranty is made in lieu of, and we disclaim, any and all other warranties, expressed or implied, including the warranties of merchantability and fitness for a particular purpose, and buyer agrees to accept the products without any such warranties. We hereby disclaim any obligation or liability for consequential damages, labor costs or any other claims or liabilities of any kind whatsoever.

