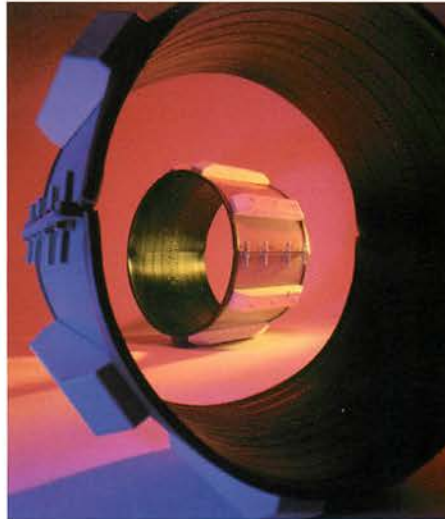


E X P E R I E N C E C O U N T S



**Metallic Casing
Spacers/Isolators**
Designed Especially
for Water and Sewer
Cased Pipelines.



PSI...the respected leader in piping system technology.

Time tested and proven reliable casing spacers and end seals from Pipeline Seal and Insulator, Inc. will simplify assembly and speed installation to drastically reduce the overall cost of inserting water and sewer lines into casings. In addition, these engineered products will provide long term corrosion protection to reduce maintenance costs and

improve the longevity of your piping system.

With over thirty-five years of experience in providing products used to positively position and electrically isolate carrier pipe from casings, PSI is uniquely qualified to offer a complete compliment of products for all your water and sewer cased piping needs.

A comparison...PSI casing spacers versus banded wood skids.

PSI Casing Spacer	Banded Wood Skids
Low Labor Cost - Installed By One Person	Labor Intensive, High Labor Costs
Easily Secured In Place	Easily Dislodged
Quick Installation	Hard to Field Construct
Supports Pipe and Protects Coating	Rots and Allows Settlement
Assured Electrical Insulation	Non-Insulating - Allows Corrosion
Strength for Jack and Bore	Swells and Breaks Pipe Joints
Resists Weight of Pipe and Product	Uneven Load on Pipe
Long Term Corrosion Protection	Allows Bacteria & Differential Oxygen Concentration Corrosion
Slides Easily (Coefficient of Friction = 0.1 to 0.6)	Friction Varies According to Wood Hardness
Easily Field Adjustable for Gravity Sewer Applications	Adjustable but Extremely Time Consuming
Eliminates Blown Sand or Pea Gravel	Requires Annulus Space Filler
35 Years of In-Field Proven Reliability	High Failure Rate
Engineered for the Project	At Discretion of Job Site Laborer

As you can see, there is no comparison. PSI casing spacers are quicker and easier to install, which translates into overall costs savings for the job.

Features abound with PSI's line of pipeline products.

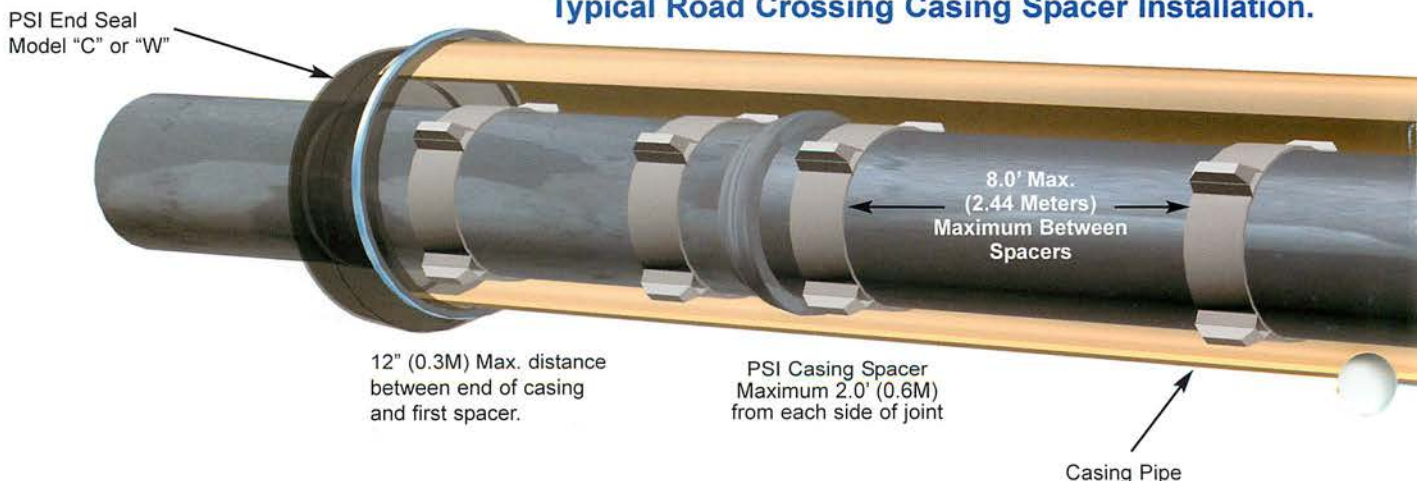
To maintain the position as an industry leader, a number of unique design improvements have been engineered into PSI's line of casing spacers.

For example, PSI was the first to offer:

- Heat fused PVC coating for superior corrosion protection or economical corrosion resistant paint.

- Stud mounted and/or projection welded glass reinforced polymer runners molded under high pressure - 18,000 psi compressive strength (1,265 kg/cm²)
- Deeply embossed flanges for added strength during tightening of flange bolts.
- Heavy duty PVC inner liner as back up insulation and protection of pipe or coating.

Typical Road Crossing Casing Spacer Installation.



Painted Mild Steel or Stainless Steel Casing Spacers for 4" to 120" pipe diameters and above.

Tough, heavy duty painted steel (Model A) or 304 stainless steel (Model S) spacers are available for large diameter pipe, or unusually heavy pipe, for long casings or wherever maximum strength and toughness are required. Standard models include diameters of 4" (100mm) through 120" (3,048mm) with 8" (200mm) or 12" (300mm) band widths. Runner configurations may be specified to match application and carrier/casing differential.

PVC Fusion Coated Spacers for added corrosion resistance.

In addition, fusion coated steel (Model C) casing spacers may be ordered for the ultimate in strength, toughness and extended life. They also are available in diameters of 4" (100mm) through 120" (3,048mm) and larger.

Applications

Rugged, heavy duty steel casing spacers with tough glass reinforced polymer insulating runners are designed for ease of installation on:

- Concrete Pipe
- Ductile Iron Pipe
- Plastic Pipe
- Steel Pipe

Spacers Accommodate:

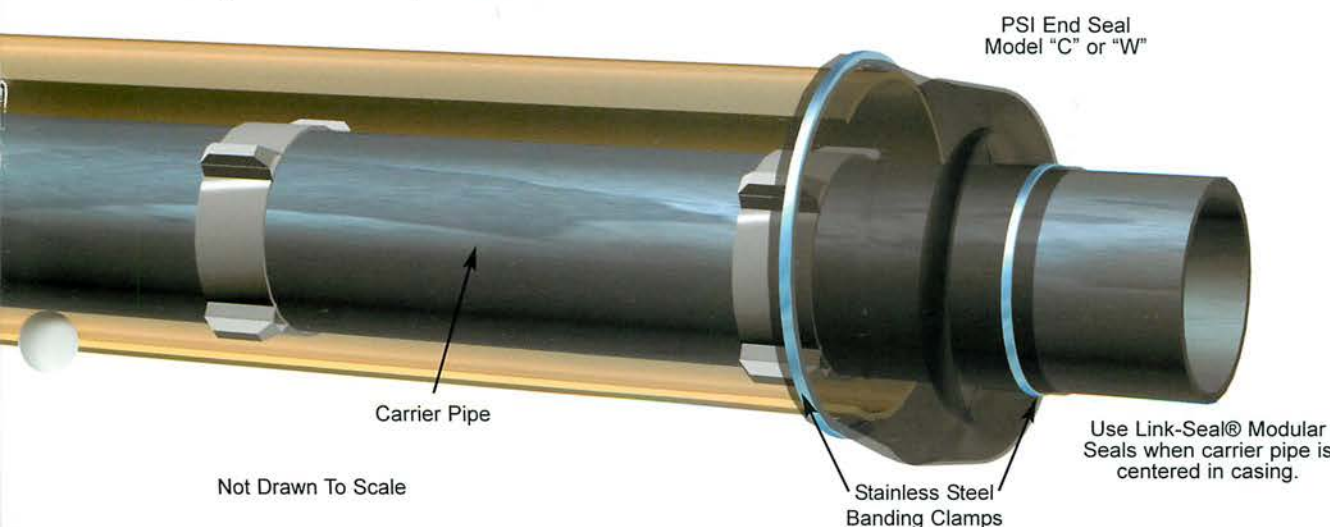
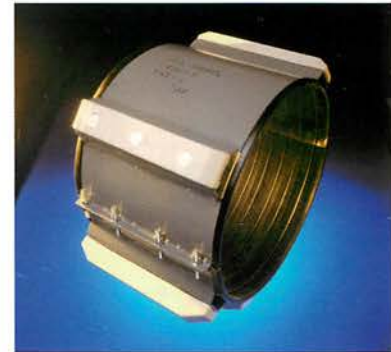
- Mechanical Joints
- Push-on
- Restrained
- Welded Joint Pipe

Sized For Pipes:

- 4" (100mm) dia. to 120" (3,048mm) and larger.
- Standard position, centered or restrained.
- Small or large carrier/casing differentials.
- Electrical isolation of carrier pipe from casing for corrosion protection.

Casing End Seals for protecting the annular space. (See back page.)

To complete the line, PSI end seals (Models C, S & W) may be manufactured for any carrier/casing differential. They are used to create a seal or barrier between the carrier pipe and casing. To insure filling material is maintained within or foreign objects kept out of the annular space Link-Seal® Modular Seals may be used to positively seal the carrier pipe in the casing. For more information on Link-Seal® Modular Seals, visit www.linkseal.com.



PSI Metal Casing Spacer Options

A8G-1	Painted steel casing isolator with an 8" (203mm) wide steel band with 1" (25.4mm) glass reinforced runners.
A8G-2	Painted steel casing isolator with an 8" (203mm) wide steel band with 2" (50.8mm) glass reinforced runners.
A12G-1	Painted steel casing isolator with a 12" (305mm) wide steel band with 1" (25.4mm) glass reinforced runners.
A12G-2	Painted steel casing isolator with a 12" (305mm) wide steel band with 2" (50.8mm) glass reinforced runners.
C8G-2	Coated steel casing isolator with an 8" (208mm) wide steel band with 2" (50.8mm) glass reinforced runners.
C12G-2	Coated steel casing isolator with a 12" (305mm) wide steel band with 2" (50.8mm) glass reinforced runners.
S8G-2	Stainless steel casing isolator with an 8" (208mm) wide band with 2" (50.8mm) glass reinforced runners.
S12G-2	Stainless steel casing isolator with a 12" (305mm) wide band with 2" (50.8mm) glass reinforced runners.

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.

Stainless Steel (S8G-2, 12x18)



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

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) kg/cm ²	17,600 psi	1,237
Flexural Strength, (ASTM D790) kg/cm ²	25,300 psi	1,779
Compression Strength, (ASTM D648) kg/cm ²	18,000 psi	1,266
		(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



Glass Reinforced Polymer Runners



Painted Metal (A12G-1, 12x18)

How to Order Metal Casing Isolators/Spacers

- Quantity
- Type Finish
- Band Width
- Runner Width
- Carrier Pipe O.D. (Type and coating thickness if applicable)
- Casing Pipe I.D. (Type and coating thickness if applicable)
- Carrier Pipe Joint O.D. (If applicable)
- Carrier pipe position within casing
- Length of crossing
- 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) ductile iron pipe with a 17.40" (400mm) outside diameter within a casing pipe with a 23.25" (590mm) inside diameter, carrier pipe joint O.D. 20.00" (508mm), standard position.

C 12 G-2 17.40 x 23.25 - 20.00" - S

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.

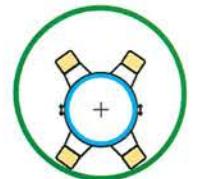
Carrier Pipe Joint/Bell O.D. (if applicable)

Indicate actual O.D. including coating.

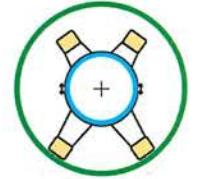
Position within Casing

- S = Standard
- C = Centered
- CR = Centered/Restrained
- NCR = Non-centered/Restrained

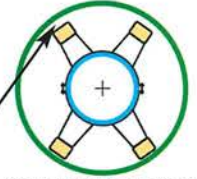
Min. 1" (25.4mm) clearance typical



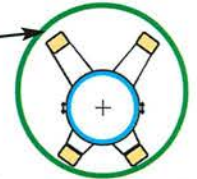
Standard



Centered



Centered/Restrained



Non-centered/Restrained

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

Stainless Steel Casing Spacer/Isolator Specification

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

Stainless Steel Casing Spacers/Isolators with risers shall be Model S8G-2 for pipes up to 24 inch diameters and Model S12G-2 for larger pipe sizes as manufactured by Pipeline Seal & Insulator, Inc., Houston, TX., or Engineer approved equal, provided and installed where shown on drawings and in accordance with these specifications. Alternate considerations shall be submitted to Engineer 14 days prior to bid opening for consideration of other manufacturers of casing spacers. The spacer insulator "system" shall be designed and fabricated for the specific project and application for which they are furnished. The casing spacer/isolator system manufacturer must have a current ISO 9001:2000 Registered Quality Assurance Program.

1. Stainless Steel Casing Spacer/Isolator Specification

A. Band - shall have a minimum 14 gauge 304 stainless steel band. Bands shall be two segment, 8-inch wide for Model S8G-2 and 12-inch wide for Model S12G-2. For carrier pipes 42-inch diameter and larger, bands shall be three or more segments and 12 gauge steel.

B. Steel Risers - high grade 304 stainless steel, minimum 10 gauge thickness shall be fabricated to support the carrier pipe and its liquid load. Risers shall be sized to position the carrier pipe in the casing, support all loads and provide proper contact for the isolation function.

C. Liner - The casing spacers/isolators shall have a flexible PVC liner of 0.09 inch thickness with a Durometer "A" 85-90 hardness and a min. 58,000 volt dielectric strength.

D. Runners - The runners shall be of high pressure molded Glass Reinforced Polymer with a minimum compressive strength of 18,000 psi, 2-inch in width and a minimum of 8 inches long (11-inch for S12G-2). Polyethylene runners are not an acceptable alternative. The runners shall be attached to the band or riser by 3/8 inch welded stainless 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.

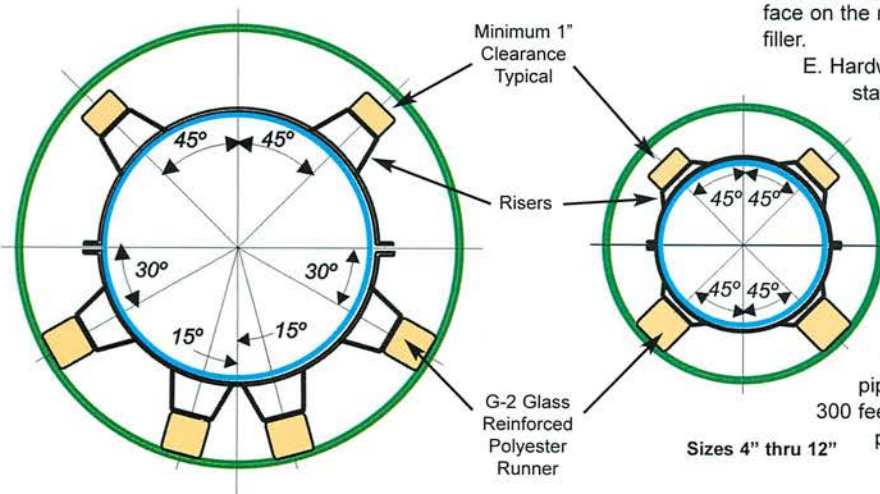
E. Hardware - The band section shall be bolted together with 304 stainless steel studs, nuts and washers. Hardware shall be 5/16-inch for pipes up to 42-inch diameter and 3/8-inch for carrier pipes 42-inch and larger.

Quality Assurance

Each spacer/isolator 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.



Sizes 14" thru 36"
(Consult factory for larger sizes)

Sizes 4" thru 12"

Custom Multiple Carrier Spacers/Isolators

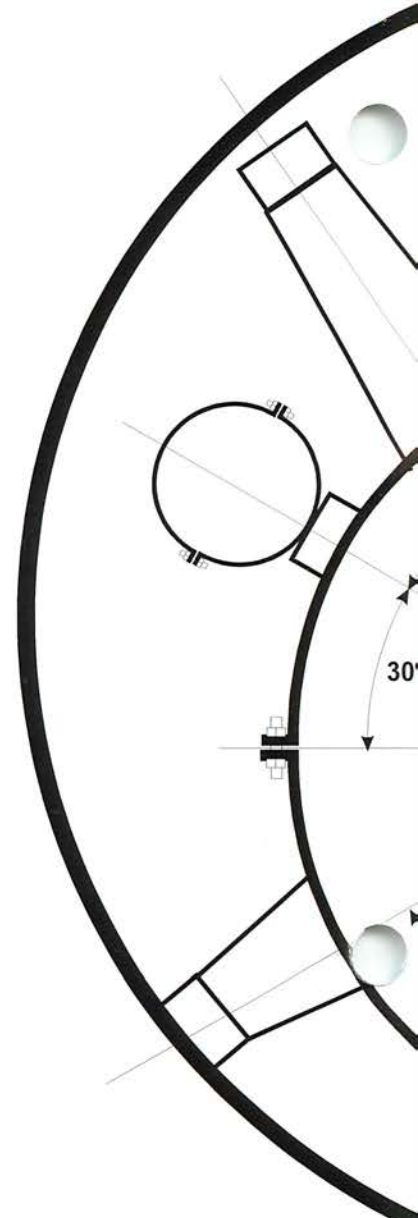
Pipeline Seal and Insulator is the industry leader in the design and fabrication of multiple carrier spacers used for inserting different size pipes, conduits and wires into casings. Projects have ranged from simple dual pipe configurations to complex pipe/conduit arrangements, designed for maximum strength 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.

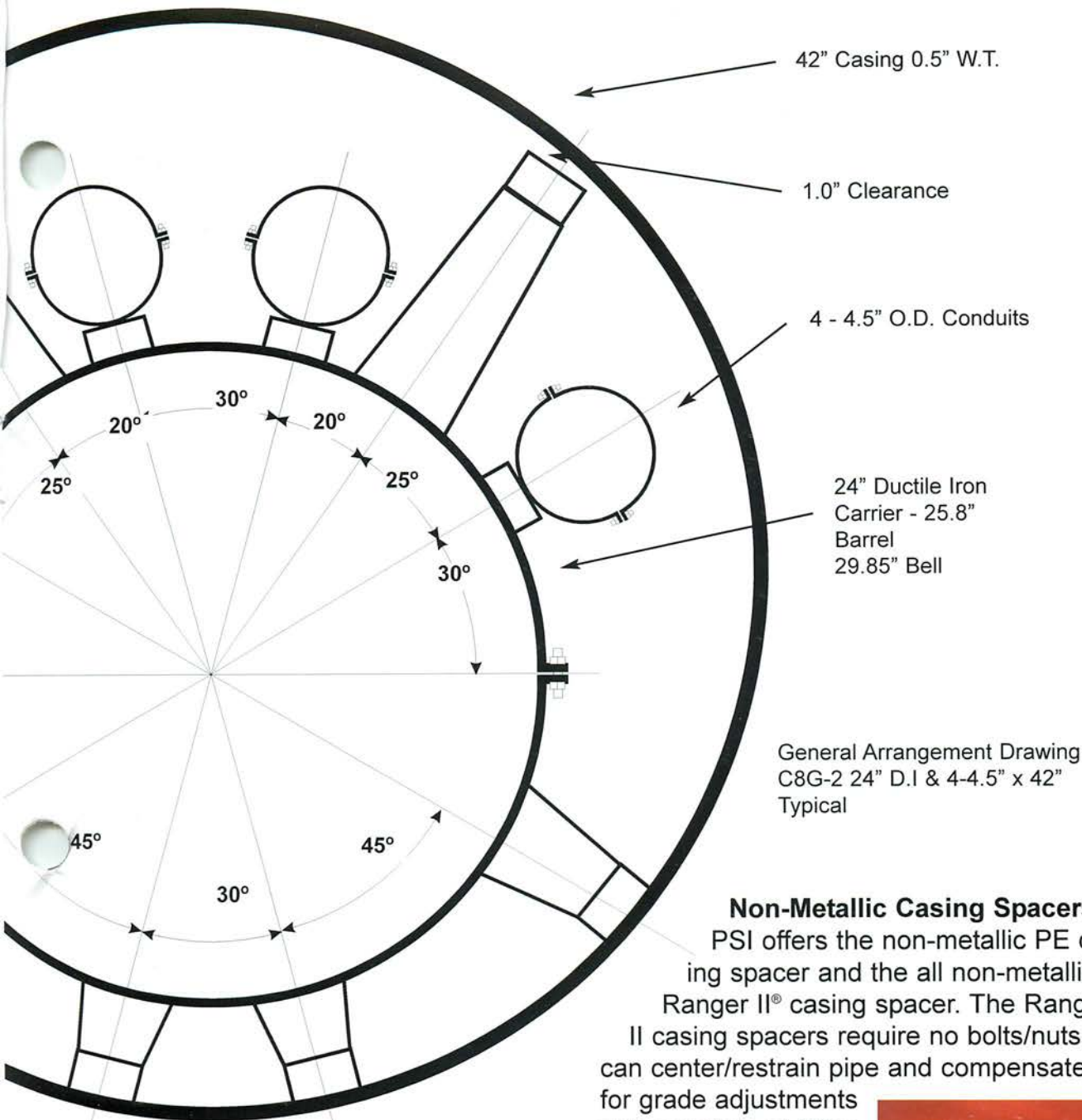
PSI Models A (painted), C (coated) or S (stainless steel) may be designed and fabricated to meet the needs of your custom project.

All custom multiple carrier spacers share the same features as our single carrier spacers described throughout this brochure. However, the multiple carrier spacers are considerably more complex and therefore require more detailed design considerations.

Please contact PSI during your design phase. We have over thirty-five years experience with custom casing spacers and can provide you with insights into design criteria based on "real world" applications in the water and wastewater industry.

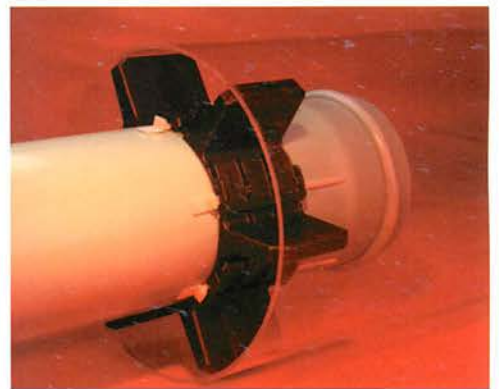
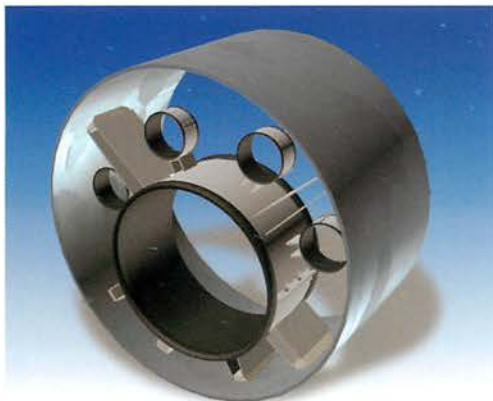


Tunnel Liner Plate Construction
with Grout Invert.



Non-Metallic Casing Spacers

PSI offers the non-metallic PE casing spacer and the all non-metallic Ranger II® casing spacer. The Ranger II casing spacers require no bolts/nuts, can center/restrain pipe and compensates for grade adjustments with a variety of different runner heights. Visit www.pipeline-seal.com or contact PSI for more information.



Ranger II Casing Spacers are designed for carrier pipe diameters from 0.83" (21mm) to 37.60" (955mm) in diameter.