EXPERIENCE COUNTS



An all non-metallic casing spacer system designed to ease carrier pipe insertion, reduce inventory costs, make installation quick and easy and 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.
- Designed for carrier pipe diameters from 0.83 (21mm) to 37.60" (955mm) in diameter.
- 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.
- Runner variations may be used to adjust for grade.
- Manufactured from UV resistant polypropylene.
- High impact strength, 1.5 ft. lbs./inch (0.8 joules/cm)
- Excellent compressive strength, 3,000 psi (211 /square cm)
- 800 Volts/Mil. Dielectric Strength.
- Wide temperature range, -40° to +180° F. (-40° to +82° C.)
- Eliminates sand or grout fill.
- No special tools required for installation.
- Low coefficient of friction for ease of installation.
- Will accommodate small conduit attachment for communications or electrical cable.



Ranger II® Field Installation, Midi segments on ductile iron pipe.

PSI Model "C" or

"W" End Seal

Typical Installation

Based on 20' (6.1M) carrier pipe segments in a casing





Component Parts - Installation

Separate segments are connected by inserting the buckles into slots on the adjacent segment.

Slide-Lock is used to tension the segments together after installation on pipe. Channels face up during insertion while the correct size Slide-Lock (micro, mini, midi, maxi) is molded on the flat (bottom) side.

Slot accepts Slide-Lock. Arrow molded on segment indicates correct insertion direction.



Runners are available in a variety of heights to allow for desired carrier pipe placement in casing.

Slide-Lock is inserted into channel to close and lock the segments together. Slide-Lock removal and re-insertion will ratchet the segments together for final tightening against carrier pipe.

Slots accept buckles and hold segment in position around pipe in preparation for final tightening.

Buckle with angled ratchet nubs.

Installation Tips

- As with any installation process, it is important to wear appropriate eye and personal protection. This is even more important if installation work must be done at low temperatures.
- It can be beneficial to place the Ranger II[®] Casing Spacer segments and Slide-Locks in a warm environment while awaiting installation in colder climates.
- During the installation process, no matter what the temperature, it is essential that the Slide-Locks be supported by the carrier pipe to eliminate the possibility of bending the Slide-Locks during insertion.
- Under hot installation conditions, it is better to allow the product to age a couple of hours at ambient temperature prior to assembly.

Detailed Ranger II® Casing Spacer Weight and Spacing Guidelines

Ranger II Casing Spacers Skid Height Spacing:

(Maximum Distance Between Casing Spacer.)

Skid Skid Skid Skid Skid

| Skid Height 1.50" (38mm) to 1.97" (50mm) | 8' (Feet) |
|--|-----------|
| Skid Height 2.56" (65mm) to 3.54" (90mm) | 6' (Feet) |
| Skid Height 3.94" (100mm) and up | 5' (Feet) |

Ranger II Casing Spacers Skid Height Max Load Per Spacer:

| Height 1.50" (38mm) to 1.97 Height 2.56" (65mm) to 2.98 Height 3.54"(90mm) to 3.94 Height 4.92" (125mm) to 5.8 Height 6.89" (175mm) | m) | MICRO 175 lb. 135 lb. 120 lb. | MINI 500 lb. 400 lb. 350 lb. 250 lb. | | MIDI 1,250 lb. 1,000 lb. 875 lb. 625 lb. 550 lb. | | MAXI 5,000 lb. 4,000 lb. 3,500 lb. 2,500 lb. 2,300 lb. | |
|---|------|--|--|-------|---|-------|---|-----|
| 1.50 1.75 1.97 | 2.56 | 2.95 | 3.54 | 3.94 | 4.92 | 5.91 | 6.89 | Pag |
| (38) (44) (50) | (65) | (75) | (90) | (100) | (125) | (150) | (175) | |

Ranger II - Micro for 0.83 to 3.07" (21 to 78mm) Diameter Carrier Pipe Band Width = 2.13" (54mm)



| Carrier Pipe O.D. Range Inches (mm) | No Se | . of gments | Runner Inches (| Height Opt mm) | ions | | |
|--|----------|----------------|--------------------|-------------------|------|------|-------|
| 0.83 to 1.14 (21 to 29) | 3 | | | | | | |
| 1.14 to 1.54 (29 to 39) | 4 | _ | | | | | |
| 1.54 to 1.85 (39 to 47) | 5 | | | | | | |
| 1.85 to 2.24 (47 to 57) | 6 | 1.50 | 1.97 | 2.56 | 2.95 | 3.54 | 3.94 |
| 2.24 to 2.48 (57 to 63) | 7 | (38) | (50) | (65) | (75) | (90) | (100) |
| 2.48 to 3.07 (63 to 78) | 8 | | | | | | |

Verify that Slide-Locks match segment size by checking to ensure the segment name (Mini)

matches the name molded on the bottom of the Slide-Lock. Note: Micro & Mini segments both use the Mini Slide-Lock.

Ranger II - Mini for 2.48 to 5.51" (63 to 140mm) Diameter Carrier Pipe Band Width = 3.15" (80mm)

| Band Width = 3.15 (80mm) | | | | | | | | | |
|--|----------|----------------|------------------|--------------------|-------|------|-------|-------|---|
| Carrier Pipe O.D. Range Inches (mm) | No Se | . of gments | Runner Inches | Height Opt (mm) | tions | | | | _ |
| 2.48 to 3.07 (63 to 78) | 4 | | | _ | | | | | _ |
| 3.07 to 3.86 (78 to 98) | 5 | | | | | | | | |
| 3.86 to 4.49 (98 to 114) | 6 | 1.50 | 1.97 | 2.56 | 2.95 | 3.54 | 3.94 | 4.92 | |
| 4.49 to 5.51 (114 to 140) | 7 | (38) | (50) | (65) | (75) | (90) | (100) | (125) | |

Verify that Slide-Locks match segment size by checking to ensure the segment name (Mini) matches the name molded on the bottom of the Slide-Lock.

Ranger II - Midi for 5.51 to 16.65" (140 to 423mm) Diameter Carrier Pipe Band Width = 5.12" (130mm)

| Carrier Pipe O.D. Range Inches (mm) | No. Seg | of gments | Run Inch | ner Heig es (mm) | ht Optic | ons | | | _ | _ | |
|--|------------|--------------|-------------|---------------------|----------|------|------|-------|-------|-------|-------|
| 5.51 to 6.89 (140 to 175) | 4 | | | | _ | | | | | | |
| 6.89 to 8.70 (175 to 221) | 5 | | | | | | | | | | |
| 8.70 to 10.31 (221 to 262) | 6 | 1.50 | 1.75 | 1.97 | 2.56 | 2.95 | 3.54 | 3.94 | 4.92 | 5.91 | 6.89 |
| 10.31 to 12.87 (262 to 327) | 7 | (38) | (44) | (50) | (65) | (75) | (90) | (100) | (125) | (150) | (175) |
| 12.87 to 14.41 (327 to 366) | 8 | | | | | | | | | | |
| 14.41 to 16.65 (366 to 423) | 10 | | | | | | | | | | |

Verify that Slide-Locks match segment size by checking to ensure the segment name (Midi) matches the name molded on the bottom of the Slide-Lock.

Ranger II - Maxi for 16.77 to 37.60" (426 to 955mm) Diameter Carrier Pipe Band Width = 8.86" (225mm)

| - | | ····/ | | | | | | | | | |
|---|--|------------|-------------|-----------------------|------------------|--------|------|-------|-------|-------|-------|
| _ | Carrier Pipe O.D. Range Inches (mm) | No. Seg | of ments | Runner I Inches (I | Height Op mm) | otions | | | | _ | _ |
| | 16.77 to 21.22 (426 to 539) | 4 | | _ | _ | | | | | | |
| | 21.22 to 25.98 (539 to 660) | 5 | | | | | | | | | |
| | 25.98 to 30.79 (660 to 782) | 6 | 1.50 | 1.97 | 2.56 | 2.95 | 3.54 | 3.94 | 4.92 | 5.91 | 6.89 |
| | 30.79 to 37.60 (782 to 955) | 7 | (38) | (50) | (65) | (75) | (90) | (100) | (125) | (150) | (175) |

Verify that Slide-Locks match segment size by checking to ensure the segment name (Maxi) matches the name molded on the bottom of the Slide-Lock.

Note: Detailed Ranger II[®] casing spacers weight & spacing guidelines on page 3.

Size your Installation Application

All Ranger II® Casing Spacers require more than one segment to complete a spacer. In addition, all Ranger II Casing Spacers are available with a number of different runner height options which are used to guarantee clearance of the mechanical joint, provide for options in carrier pipe positioning within the casing or to compensate for grade elevation adjustments. Following are examples on how to size Ranger II Casing Spacers for various applications. **Detailed RangerII casing spacers weight & spacing guidelines on page 3.** For exact centering and adjusting for grade elevation changes contact PSI.

Examples

Centered & Restrained with Equal Length Runners

20" Ductile Iron pipe (21.60" O.D. barrel & 28.63" O.D. bell) inside a 36" casing with a 0.375" wall thickness. **A.** Find carrier pipe O.D. (21.60") from adjacent chart and choose the proper size and number of segments. One spacer would require 5 - Maxi segments.

B. Determine maximum runner height with equal length runners.

| Casing I.D. | 35.25" |
|------------------------|----------------|
| Less Carrier Pipe O.D. | <u>-21.60"</u> |
| | 13.65" |
| Less Space Allowance | <u>-1.00"</u> |
| | 12.65" |

Divide this number (12.65") by 2 to obtain the total allowable runner height = 6.325"

C. Choose a runner height of this value or less.

Solution: Use 5 - Maxi (150) segments with runner heights of 5.91".

Ordering Codes: See Back Page for Ordering Code Sequence.

Note: This combination will restrain the pipe from flotation within the casing pipe by allowing only about 1.8" of clearance between the top runners and the casing I.D. This will center the carrier pipe within approximately 0.9" of exact center.

To Clear the Bell (suggested minimum clearance is at least 0.8" (0.4" on both sides)

20" Ductile Iron pipe (21.60" O.D. barrel & 28.63" O.D. bell) inside a 36" casing with a 0.375" wall thickness.

| Determine runner heig | ght. | |
|-----------------------|--------------------|----------------|
| (Just to Clear Bell.) | Bell O.D. | 28.63" |
| | Add 0.8" Clearance | +0.80" |
| | | 29.43" |
| | Less Barrel O.D. | <u>-21.60"</u> |
| | | 7.83" |
| | | |

Divide this number (7.83") by 2 to obtain the minimum runner height to just clear the bell = 3.92"Choose a runner height between 3.92" and the maximum allowable runner height (6.32") determined in the above example.

Solution: Use 5 - Maxi (100) segments with runner heights of 3.94".

Ordering Codes: See Back Page for Ordering Code Sequence.

Contact PSI (800-423-2410, 713-747-6948 or info@psipsi.com) For Sizing Applications to Exactly Center or Adjust for Grade Elevation Changes. Sizing and Quotation Program, Visit www.ranger2.com

Please contact PSI if you are uncertain of the fit for a particular application.

Non-Metalic Casing Spacer & End Seal Specification for Carrier Pipe to 37.60 O.D.

A. Casing Spacers

Upon completion of the installation of the steel pipe encasement, the contractor shall furnish and install a Ranger II® boltless casing spacer on the carrier pipe as described below.

Casing spacers shall be spaced a maximum of eight (8) feet apart along the length of the carrier pipe with one casing spacer within two (2) feet of each side of a pipe joint and the rest evenly spaced. Wood skids are not an acceptable method of supporting the carrier pipe.



1. 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 Slide-Lock. 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.

2. Spacers shall be at least as wide as listed below.

| Carrier Pipe Diameter | Ranger II | Length |
|------------------------------|-----------|-------------|
| Inches (mm) | Model | Inches (mm) |
| 0.83 to 3.07" (21 to 78) | Micro | 2.13" (54) |
| 2.48 to 5.51" (63 to 140) | Mini | 3.15" (80) |
| 5.51 to 16.65" (140 to 423) | Midi | 5.12" (130) |
| 16.77 to 37.60" (426 to 955) | Maxi | 8.86" (225) |

3. The casing spacers shall be the PSI Ranger II® Casing Spacers as manufactured by Pipeline Seal and Insulator, Inc., Houston, Texas.

B. End Seals

After insertion of the carrier pipe into the casing, the ends of the casing shall be closed by installing 1/8" thick synthetic rubber end seals equal to the PSI Model "C" end seal as manufactured by Pipeline Seal and Insulator, Inc., Houston, Texas.

ISO 9001:2000 Registration

Each casing spacer and end seal 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.

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.

Basic Installation Procedure



1. Size the Ranger II[®] casing spacer to make sure you have all the segments and Slide-Locks.



2. Take the segments and align the buckles. Insert the buckles 1/4 of the way into the slots.



3. Locate directional arrow on segment and insert Slide-Lock until it tips out the end of the segment.



4. Continue the process from the previous step until all segments are put together. You are now ready to wrap the Ranger II casing spacer around the pipe.



5. Align the buckles and lock into place. Take the final Slide-Lock and slide completely into place.



6. Insert all Slide-Locks as far as possible by hand. Complete tightening by lightly tapping each Slide-Lock with a light rubber headed hammer.



7A. To tighten Ranger II casing spacer, back the Slide-Lock completely out of slot and, if needed, push segments together by hand. Ratchet the Slide-Lock in and out to apply tension as the casing spacer assembly tightens down on the pipe.



7B. Re-insert Slide-Locks completely into segment by lightly tapping Slide-Lock back into position.



8. Continue steps 7A and 7B until Ranger II Casing Spacer is secure against carrier pipe.

Always Wear and Use Safety Equipment!

End Seals





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.

Link-Seal[®] Modular Seals

For a water tight seal (up to 20 psig [40 feet of head]) when the carrier pipe is already centered inside a casing. For added protection a model "C" endseal may be used in conjunction with Link-Seal® Modular Seals.





To Order Ranger II Casing Spacers Please

- Indicate:
 - 1. Total Quantity of Spacers

Model "C" Custom

easy installation.

Individually designed to

accommodate custom car-

Model "W" Wrap Around

Specifically designed for

existing installations.

surfaces together.

ing differential.

Simply remove plastic

backing from self-curing

rubber and press exposed

Available for all carrier/cas-

rier/casing combinations. Made of 1/8" thick, specially compounded synthetic rubber for long life and

Pull-on

- 2. Model No. (Ranger II)
- 3. Carrier Pipe O.D.
- 4. Casing Pipe I.D.
- Bell O.D. 5.
- 6. Runner Configuration
 - E = Equal Length Runners (Maximum Allowable Height) S = Standard Bell Clearance Only
 - C = Centered
- 7. Segment Size (Micro, Mini, Midi or Maxi)
- 8. Runner Lengths
- 9. No. of Segments/Spacer
- 10. Contact your local distributor or Pipeline Seal and Insulator, Inc.





Pipeline Seal and Insulator, Inc.

6525 Goforth Street, Houston, TX 77021 Telephone: 713-747-6948, Facsimile: 713-747-6029 Toll Free: 800-423-2410 www.pipelineseal.com, www.ranger2.com, e-mail: info@psipsi.com

Ranger II® is a registered trademark of PSI.

©2005, Pipeline Seal and Insulator, Inc. PSI-RII-07/05



Specification Material Chart:

Value

3,000 psi

1.5 ft. lb/in. (0.8 joules/cm)

Black

(211 kg/sq. cm)

-40°F. to +180°F.

(-40°C to +82°C)

800 Volts/mil. min.

Band/Runner Segments

Compressive Strength

Specifications

Temperature

Color

Liner None

Impact Strength

Dielectric Strength

UV resistant polypropylene



Certificate No. 10125

Certificate No. NACB7895