

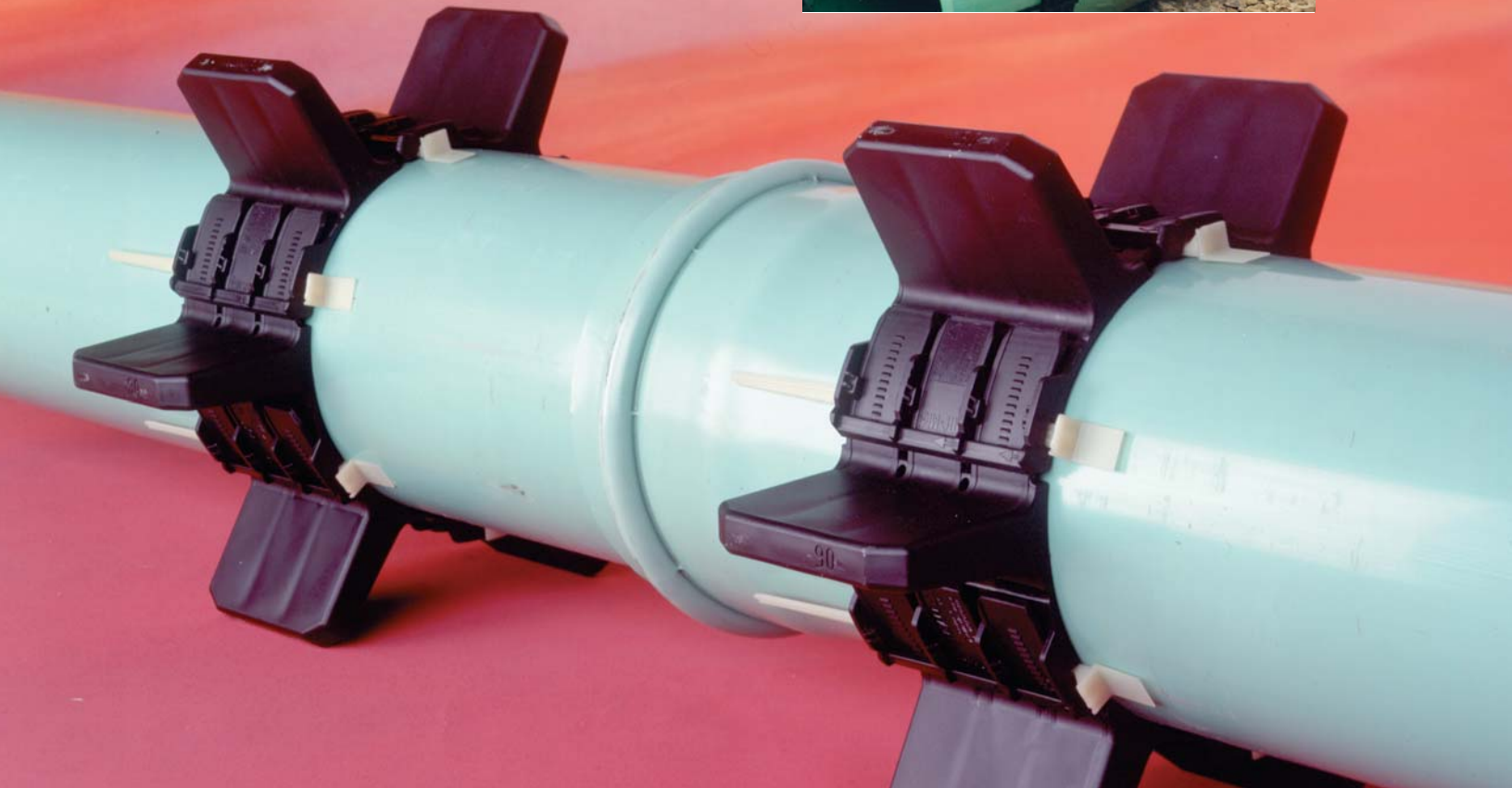
EXPERIENCE COUNTS



Casing Spacers

*An engineered equal
to stainless steel
casing spacers.*

*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 cinch 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.
- Will accommodate small conduit attachment for communications or electrical cable.
- Medi and Maxi segments, 2 molded runners per segment.
- Segment band and runners molded as one piece.
- Manufactured from UV resistant polypropylene.
- High impact strength, 1.5 ft. lbs./inch (0.8 joules/cm)
- Excellent compressive strength, 3,000 psi (211 kg/square cm)
- 800 Volts/Mil. Dielectric Strength.
- Wide temperature range, -22° to +212° F. (-30° to +100° C.)
- Eliminates sand or grout fill.
- No special tools required for installation.
- Low coefficient of friction for ease of installation.



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

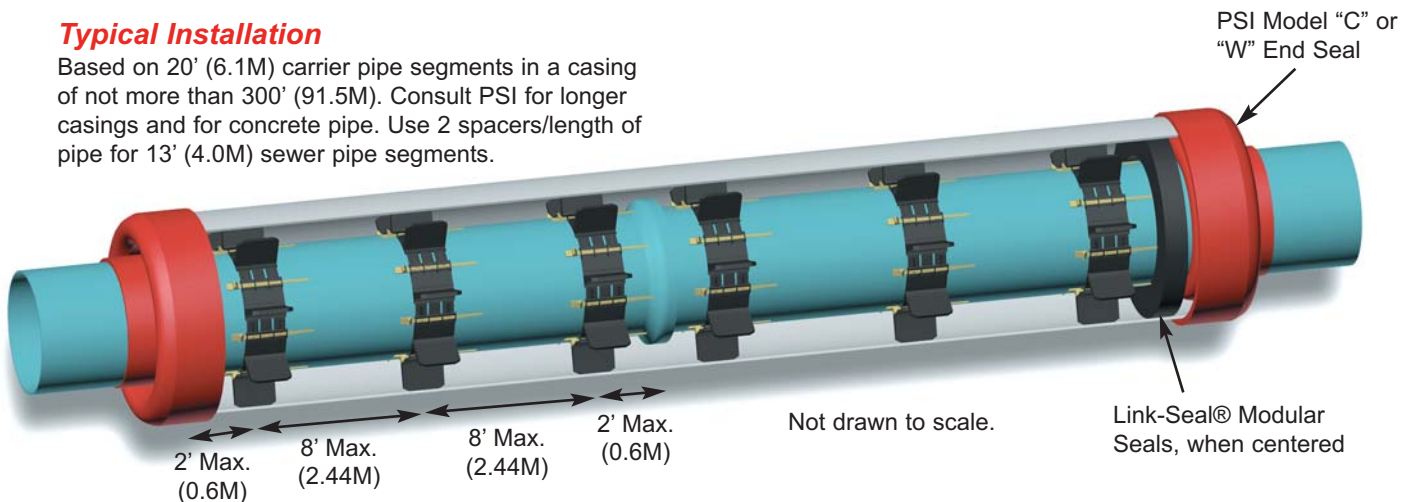
Weight Comparison 9.05" x 17.25" CR Application

Ranger II Non-Metallic 2.79 lbs.	Model S8G-2 StainlessSteel 15 lbs.
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Ranger II Advantage Installer and Shipping Costs

Typical Installation

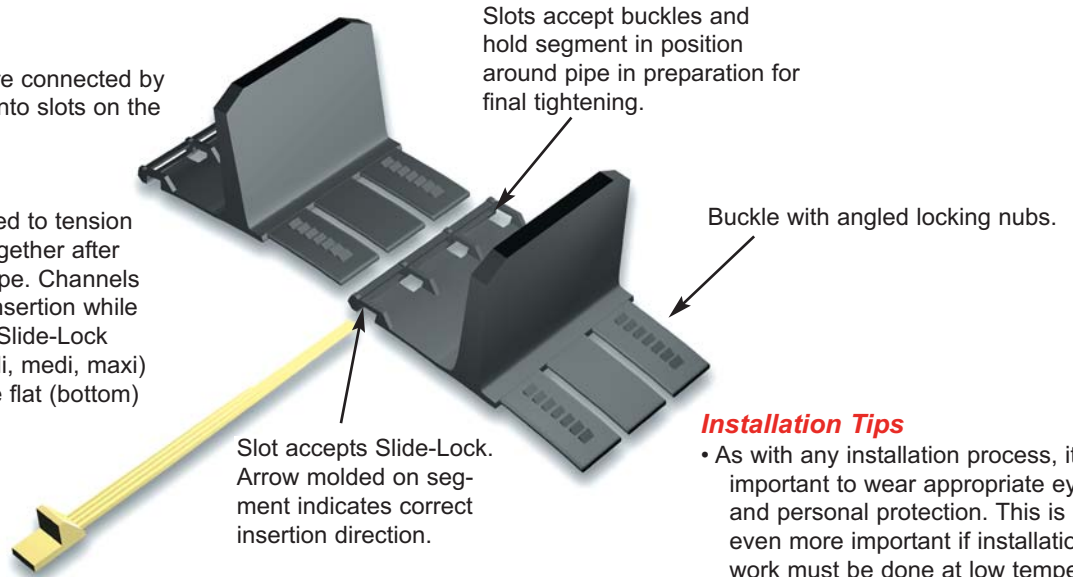
Based on 20' (6.1M) carrier pipe segments in a casing of not more than 300' (91.5M). Consult PSI for longer casings and for concrete pipe. Use 2 spacers/length of pipe for 13' (4.0M) sewer pipe segments.



Component Parts - Installation

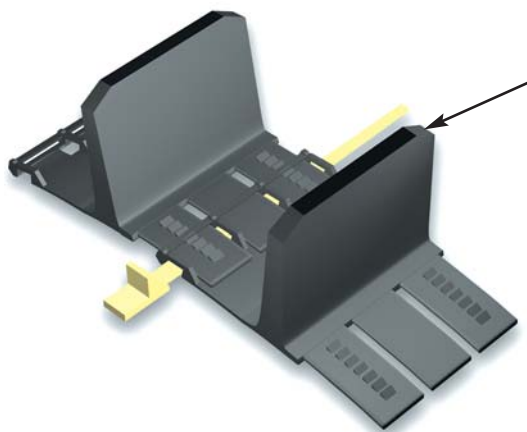
Separate segments are connected by inserting the buckles into slots on the adjacent segment.

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, medi, maxi) is molded on the flat (bottom) side.



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.



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 cinch the segments together for final tightening against carrier pipe.

Weight and Spacing Guidelines

Ranger II® Casing Spacers Skid Height Spacing: (Maximum Distance Between Casing Spacer.)

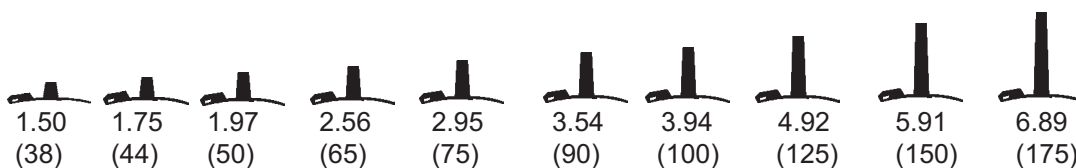
Skid Height 1.50" (38mm) to 1.97" (50mm) 8' (Feet)
 Skid Height 2.56" (65mm) to 3.54" (90mm) 6' (Feet)
 Skid Height 3.94" (100mm) and up 5' (Feet)

Installed On Various Pipe Types, Such As:

PVC Water, PVC Sewer, HDPE
 Steel, Ductile Iron...etc.













Ranger II Casing Spacers Skid Height Max Load Per Spacer:

	MICRO	MINI	MIDI	MEDI	MAXI
Skid Height 1.50" (38mm) to 1.97" (50mm)	175 lb.	500 lb.	1,250 lb.	3,300 lb.	5,000 lb.
Skid Height 2.56" (65mm) to 2.95" (75mm)	135 lb.	400 lb.	1,000 lb.	2,600 lb.	4,000 lb.
Skid Height 3.54" (90mm) to 3.94" (100mm)	120 lb.	350 lb.	875 lb.	2,300 lb.	3,500 lb.
Skid Height 4.92" (125mm) to 5.91" (150mm)		250 lb.	625 lb.	1,650 lb.	2,500 lb.
Skid Height 6.89" (175mm)			550 lb.	1,400 lb.	2,300 lb.

















**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. of Segments	Runner Height Options Inches (mm)					
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	1.50	1.97	2.56	2.95	3.54	3.94
1.85 to 2.24 (47 to 57)	6	(38)	(50)	(65)	(75)	(90)	(100)
2.24 to 2.48 (57 to 63)	7	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.					
2.48 to 3.07 (63 to 78)	8						

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

Carrier Pipe O.D. Range Inches (mm)	No. of Segments	Runner Height Options Inches (mm)					
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
4.49 to 5.51 (114 to 140)	7	(38)	(50)	(65)	(75)	(90)	(100)



















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 - 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. of Segments	Runner Height Options Inches (mm)									
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 - Medi for 16.77 to 25.98" (426 to 660mm) Diameter Carrier Pipe
Band Width = 6.87" (174 mm)**

Carrier Pipe O.D. Range Inches (mm)	No. of Segments	Runner Height Options Inches (mm)								
16.77 to 21.22 (426 to 539)	4									
21.22 to 25.98 (539 to 660)	5									
		1.50	1.97	2.56	2.95	3.54	3.94	4.92	5.91	6.89
		(38)	(50)	(65)	(75)	(90)	(100)	(125)	(150)	(175)

Verify that Slide-Locks match segment size by checking to ensure the segment name (Medi) matches the name molded on the bottom of the Slide-Lock. Note: Medi & Maxi segments both use the Maxi Slide-Lock.

**Ranger II - Maxi for 25.98 to 37.60" (660 to 955mm) Diameter Carrier Pipe
Band Width = 8.86" (225mm)**

Carrier Pipe O.D. Range Inches (mm)	No. of Segments	Runner Height Options Inches (mm)								
25.98 to 30.79 (660 to 782)	6									
30.79 to 37.60 (782 to 955)	7									
		1.50	1.97	2.56	2.95	3.54	3.94	4.92	5.91	6.89
		(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: Medi & Maxi segments both use the Maxi 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 Ranger II 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 - Medi 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 maximum runner height = 6.325"

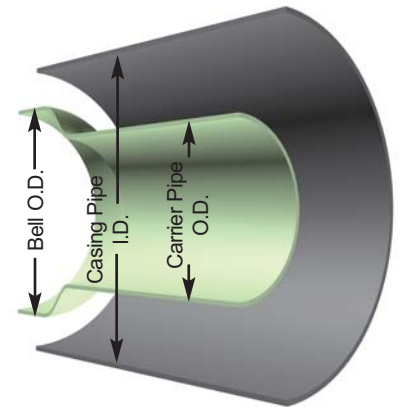
C. Choose a runner height of this value or less.

Solution: Use 5 - Medi (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 height.

(Clear Bell)	Bell O.D.	28.63"
	Add 0.8" Clearance	<u>+0.80"</u>
		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 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 - Medi (100) segments with runner heights of 3.94".

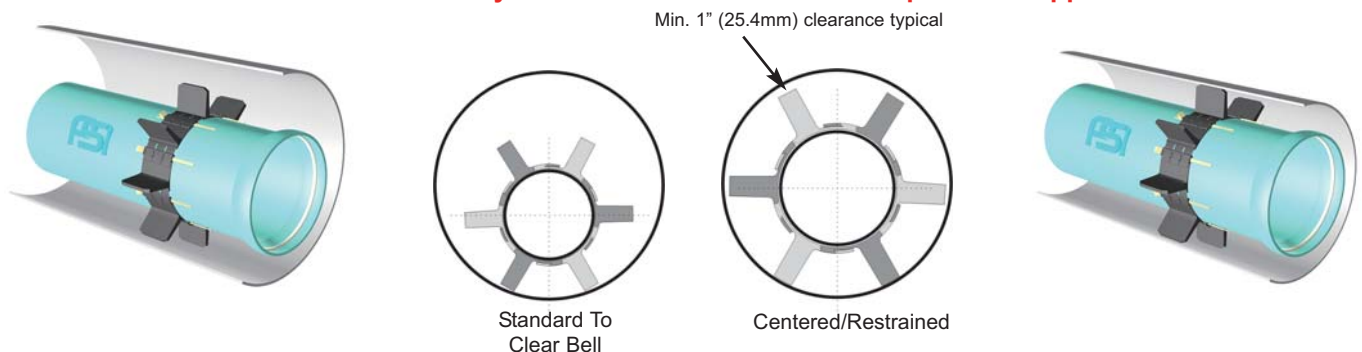
Ordering Codes: See Back Page for Ordering Code Sequence.

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-Metallic Casing Spacer & End Seal Specification for Carrier Pipe to 37.60 O.D.
Molded non-metallic technology enables Ranger II® casing spacers to replace existing specified stainless steel casing spacers.

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 Inches (mm)	Ranger II Model	Width 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 25.98" (426 to 660)	Medi	6.87" (174)
25.98 to 37.60" (660 to 955)	Maxi	8.86" (225)

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

Specification Material Chart:

Band/Runner Segments	
UV resistant polypropylene	
Specifications	Value
Compressive Strength	3,000 psi (211 kg/sq. cm)
Temperature	-22°F. to +212°F. (-30°C to +100°C)
Impact Strength	1.5 ft. lb/in. (0.8 joules/cm)
Dielectric Strength	800 Volts/mil. min.
Color	Black
Liner	
None	

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, PSI Model "C" end seal as manufactured by Pipeline Seal and Insulator, Inc., Houston, Texas.

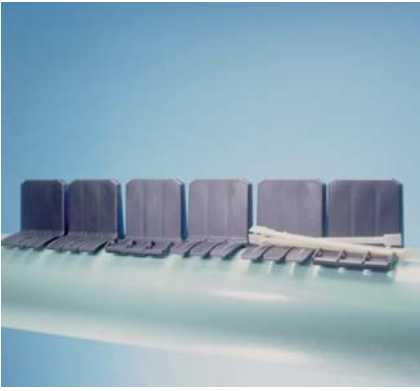
ISO 9001:2000 Registration

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



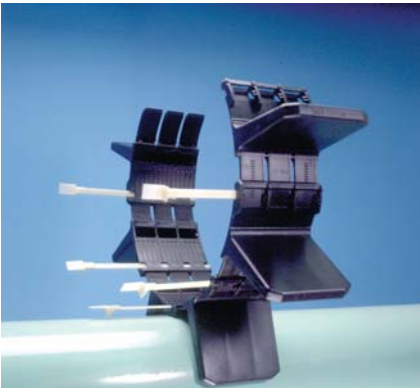
1. Size the Ranger II® casing spacer to make sure you have all the segments and Slide-Locks.



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. **Note:** Make sure buckles are uniformly aligned and inserted into slots.



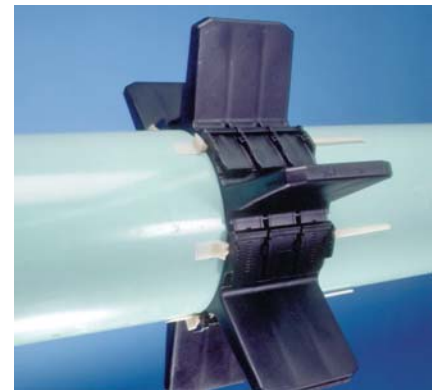
6. Insert all Slide-Locks as far as possible by hand. Complete tightening by lightly tapping each Slide-Lock with a light rubber headed hammer.



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. **Note:** Make sure buckles are uniformly aligned and inserted into slots.



8. Continue steps 7A and 7B until Ranger II Casing Spacer is secure against carrier pipe making certain segment engagement is uniform.

Always Wear and Use Safety Equipment!