

# Rovanco® Piping Systems

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## Insul-800 High Temp Conduit Installation Instructions

**INS-HTC-AC** (Options: RhinoJoint and Pull Rope)

Revised 03/13/24

This instruction manual will give you all the information needed in terms of techniques, tools, and accessories required to install ROVANCO Insul-800 High Temp Conduit. If you follow the instructions carefully, the end result will be a high quality, pressure testable conduit piping system. Thank you for showing your confidence in ROVANCO by purchasing its products. We sincerely appreciate your business and we will provide you with quality products with a fair price and “great” service to deserve your future business. Please consult your local ROVANCO Manufacturer’s Representative for information about all of the products provided by ROVANCO.

### **INSPECTION**

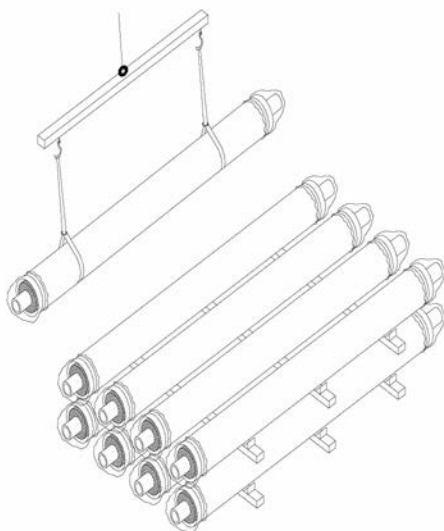
Inspect all shipments on receipt. Examine all pipe and accessories as they are unloaded. Check to insure that every item on the packing list is received. Check the contents of the cartons to insure that the materials have arrived safely. Do not throw the cartons from the vehicle. Handle all materials carefully. Have the freight carrier make out a damage or short receipt if any discrepancies are found. Keep a signed copy of this receipt and notify ROVANCO immediately. All spool pieces shipped have individual part numbers labeled on each end. Refer to your packing list to be sure you have all spool pieces shown. With your paperwork, you will receive two copies of the installation drawings. These drawings will show the location of each piece of ROVANCO Insul-800 High Temp Conduit.

### **UNLOADING**

ROVANCO Insul-800 systems are manufactured to withstand normal field handling but, like any piping material, damage can occur from careless handling. The spool pieces should be unloaded from the truck using a cherry picker or other suitable equipment. Lift the pieces with nylon slings and spreader bars so as not to damage the polyethylene jacket. Do not use chains or chokers in direct contact with the polyethylene jacket. Do not drop spool pieces because this can damage the insulation or the polyethylene jacket.

### **STORAGE**

Use dunnage material under the pipe and between successive layers to protect the casing from foreign objects. Do not stack more than four layers high to avoid excessive weight on the bottom layer. Prior to installation cover the pipe ends with a white tarp or white visqueen to keep out water, excessive dust and debris. If the pipe will be stockpiled in direct sunlight or at temperatures exceeding 90°F, cover the entire system with a white tarp or white visqueen. Do not use opaque, clear or any other color other than white. If these steps are not taken, warranty will be void. There should be a layer of wood dunnage between the pipe and visqueen. Cartons of material (i.e. glue, foam kits, fiberglass adhesives, etc.) should be stored in a dry area at 60° to 80°F. Liquid foam has a shelf life of 6 months after delivery. Freezing or high temperatures may affect the product’s ability to perform their functions. IF these steps are not taken, warranty will be void.



### **TESTING**

All carrier pipe must either be air or hydro tested per specifications prior to insulating and pouring thrust blocks around anchors or backfilling the system. Failure to comply with testing procedures will void warranty. Plastic carrier pipe must be hydro tested only, do not air test.

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## Testing

All carrier pipe must either be air or hydro tested per specifications prior to insulating, pouring thrust blocks around anchors or backfilling the system. Failure to comply with testing procedures will void warranty. Plastic carrier pipe must be hydro tested only, do not air test.

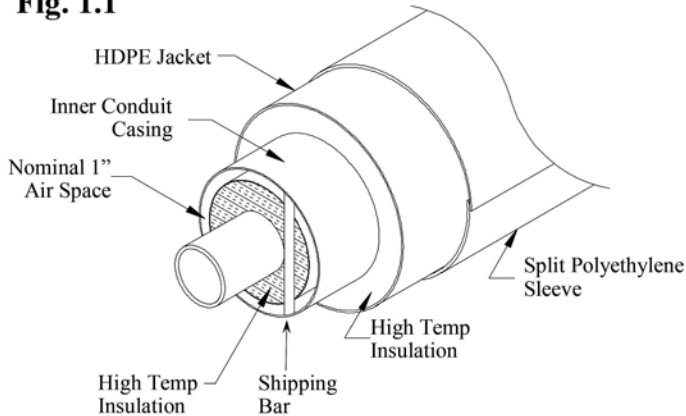
ROVANCO's products and processes are covered under various US patents, including, but not limited to 4,084,842 - 4,484,386 - 4,221,405 - 3,793,411.

Insul-8 and ROVANCO are Federally Registered trademarks of ROVANCO Piping Systems, Inc.

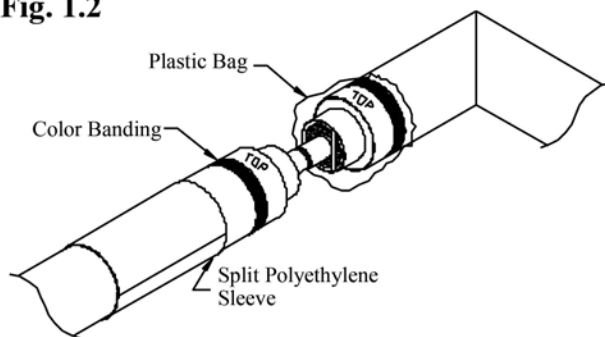
**For Leak Detection Installation Instructions, contact Rovanco for INS-RAT**

## Section 1: Installation of Spool Pieces

**Fig. 1.1**



**Fig. 1.2**



**Fig. 1.3**



**Fig. 1.4**

**ROVANCO**  
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-- THE LEADER IN PRE-INSULATED PIPING SYSTEMS --

SHOP ORDER NUMBER:	
PART NUMBER:	INSPECTED BY:
MATCH THIS END TO PART NUMBER:	

After the ditch has been opened, the spool pieces should be installed in accordance with the installation drawings bearing the latest revision number. Each spool piece has its own part number which will match the drawing showing its approximate length.

If the conduit is not going to be installed immediately, leave the plastic bag over the end of the pipe. Plastic bags with the bottoms cut out or plastic sheeting can be taped over the polyethylene sleeve to help prevent water from entering the system should the trench flood (**this is the contractor's responsibility**). Test cans can be used at the open ends of the systems to prevent water from entering the system. It is very important that the insulation is kept dry during installation! **See Figure 1.1**

ROVANCO suggests that you dig bell holes for field welding before lowering the pieces in the ditch. Lower the conduit into the trench, using a spreader bar and nylon slings. As pieces are lowered into the ditch, make sure that the trench bottom is free of sharp objects or rocks. ROVANCO recommends the use of clean backfill material without sharp stones. If the project specifications require a specific backfill material, we recommend the installer follow the specifications.

Check the drawings for possible cold spring locations. Notice that there are colored bands located on the end of some spool pieces. This band is to match an identical colored band of the adjacent piece at the field joint location. **See Figure 1.2**

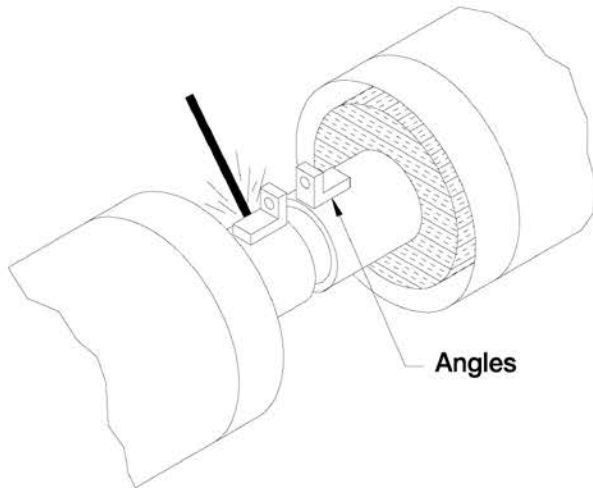
This is to insure that expansion pipe supports are located in the proper areas. Also note that straight lengths coming off an expansion loop or elbow have a ROVANCO label marked TOP on the conduit end. **See Figure 1.3**

This designates that these spool pieces have a top. This must be at the 12 o'clock position before the pipe is welded. This insures that the service pipe can move laterally within this special support.

**See Figure 1.4** for a label example.

## Section 2A: Pipe Cold Springing Requirements

Fig. 2.1



**Shipping bar must be removed before cold springing procedures can be performed.**

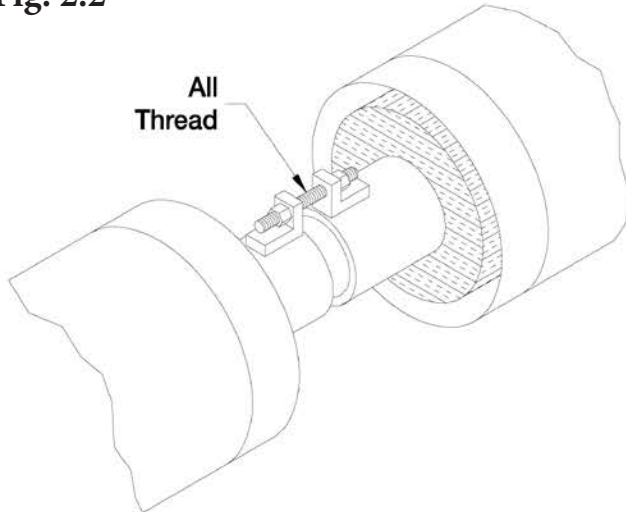
**If cold springing is not required, move on to Section 3.**

All systems do not require cold springing, refer to your ROVANCO site drawing to determine if the system you are installing requires cold springing. If so follow the instructions below, if not, go onto Section 3.

Refer to the ROVANCO installation drawings since an expansion elbow or a loop may require cold springing. The drawings will show you the amounts to cold spring at each leg. If the concrete anchor blocks can be poured before cold springing, use this method. When project scheduling requires that the cold-springing be completed prior to pouring concrete anchor blocks, the "Bridge Method" can be used. See Section 2B.

Be sure that all spool pieces except the cold spring locations are welded up first. Concrete anchor plates must be poured prior to this method of cold springing. When you skip the joint to be cold sprung, leave the cold spring amount gaped between the two pipes.

Fig. 2.2



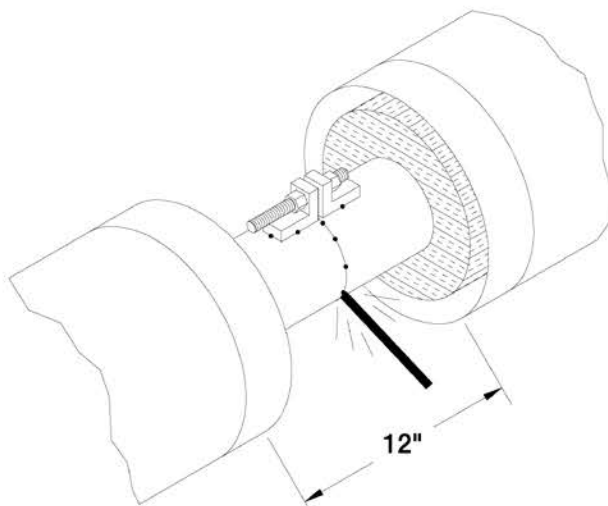
1. Weld angles with a bolt hole in it on each end of the carrier pipes. **See Figure 2.1**

**NOTE: Angles & rods NOT supplied by ROVANCO.**

2. Run a piece of all-thread rod through the holes and tighten until the two pipes meet. **See Figure 2.2**

3. Tack weld the joint and remove the angles. Then complete the welding of this joint. **See Figure 2.3**

Fig. 2.3



## Section 2B: Bridge Cold Springing

Fig. 2.4

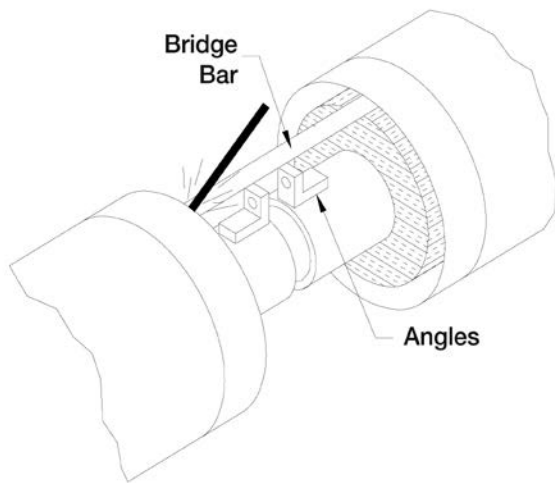


Fig. 2.5

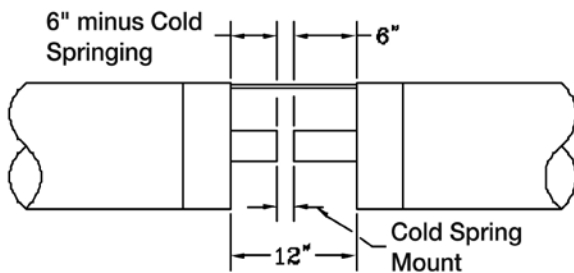
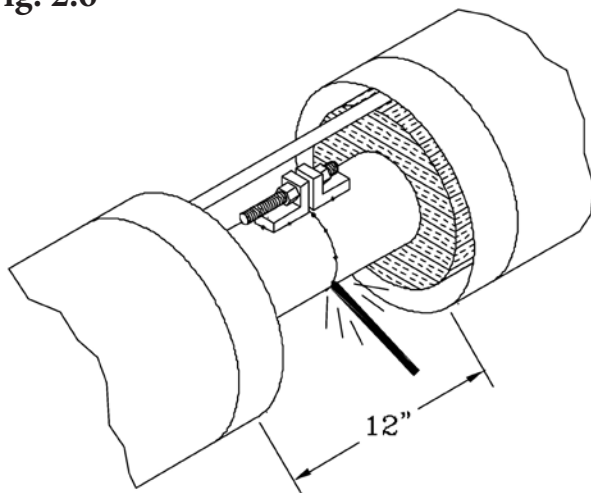


Fig. 2.6



This method of cold springing allows cold springing to be done before anchors are poured in concrete.

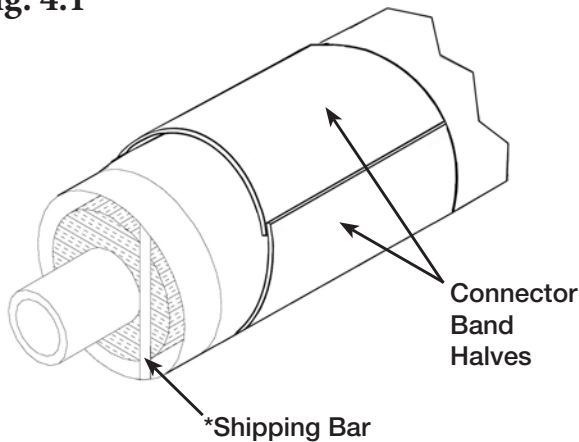
1. Make sure that exactly 12" is maintained between the ends of the conduit.
2. Weld an angle iron "Bridge" between the conduit ends. The bridge should be welded on the inside of the conduit at 12 o'clock. This is to prevent interference while installing the connector band and yet maintain drainage of the conduit system. Make sure that a 12" gap is maintained between all conduit ends. Also make sure that the distance to be cold sprung is left between the pipe ends. **See Figures 2.4 and 2.5**
3. Install a "bridge" at every field joint in the run of pipe including the joint to be cold sprung, i.e. anchor to end seal or gland seal, and anchor to anchor.
4. Weld angles with holes and run a piece of threaded rod through the holes and tighten. Weld the carrier pipe as with the standard cold springing instructions in Section 2A. **See Figure 2.6**
5. Leave the bridges in place. Insulate joints and install connector bands per Section 6.
6. For conduit sizes 12 $\frac{3}{4}$ " and larger, put two bridges, one at 3 o'clock, and one at 9 o'clock.

### Section 3: Field Alteration of Spool Pieces

Although the ROVANCO spool pieces have been fabricated in accordance with contractor field measurements, sometimes obstructions or errors can require field alteration. Prior to making any field alterations, contact ROVANCO's Customer Service Department in Joliet, Illinois (815) 741-6700, so that we can instruct you in this process and insure that the resulting layout will function properly. This prior notification will also maintain the ROVANCO warranty.

### Section 4: Welding of Carrier Pipe

Fig. 4.1



\* Note: Shipping bar needs to be removed prior to installation

Fig. 4.2

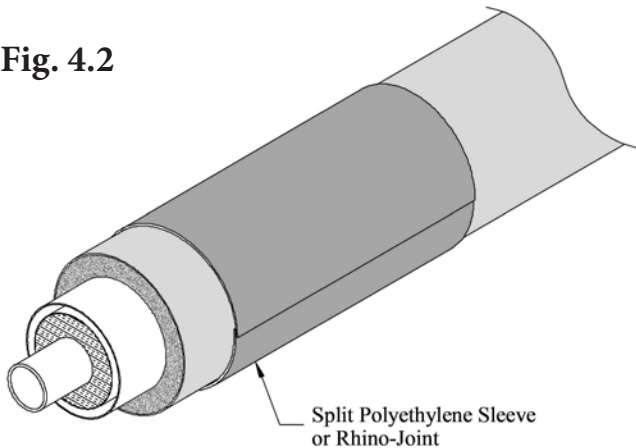
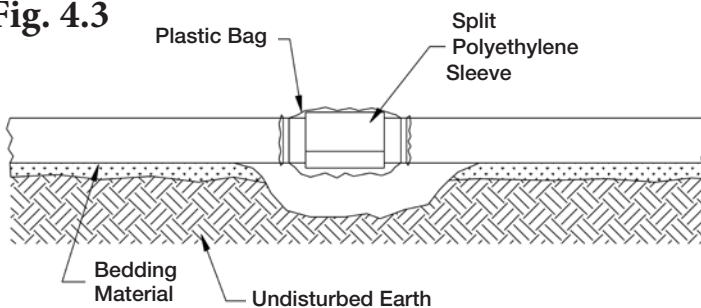


Fig. 4.3



**NOTE: Prior to any carrier field welds, pipe ends must be prepped in the field by contractor.**

**NOTE: During the welding process do NOT use anti-splatter or any type of lubricant IF your system has leak detection. These materials can cause the leak detection to fail.**

If cold springing is required, perform steps in Section 2 before starting the welding of the carrier pipe process.

Prior to the welding of the carrier pipe, remove the shipping bar attached between the carrier pipe and outer conduit and clean up any remaining weld debris on the conduit. **The shipping bars have been put there to keep the pipe from sliding out of the conduit during transit, unloading, and lowering into the trench. These bars must be removed to allow the service pipe to expand during operation. See Figure 4.1**

After removing the shipping bar, you will find it easier to align the inner pipe. If cold springing is required, see Section 3. Align and weld the carrier pipe. If the carrier pipe is not welded immediately, slide the polyethylene sleeve or RhinoJoint (**see figure 4.2**) over the joint, and cover the entire joint with a plastic bag or sheeting as described in Section 1. **See Figure 4.3**

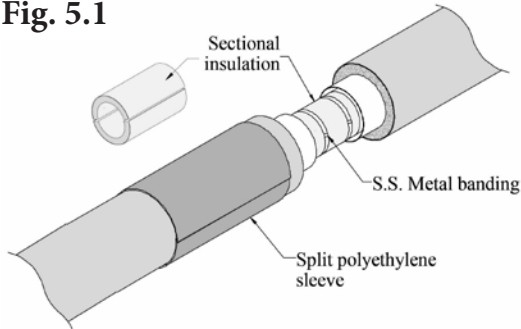
**All RhinoJoints will need to be signed-off on by the installer(s) and kept track of per warranty requirements.**

**See page 17-20 for RhinoJoint installation instructions.**

If a hydrostatic test of the carrier pipe is not specified in the contract, ROVANCO recommends that a hydrostatic test be run on the internal pipe at 1½ times the job working pressure, not to exceed 250 psig without prior approval from ROVANCO. This test should be done prior to insulating the field joints and welding the connector bands closed, to allow inspection and repair of welds if necessary.

## Section 5: Insulating Field Joints

Fig. 5.1



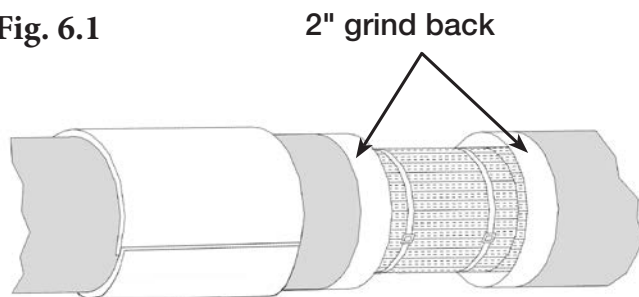
After the hydrostatic test has been completed, insulate the field joints. Sectional insulation has been provided in the cartons. Cut this insulation to length plus a 1/2" as required for each field joint and fasten with two stainless steel bands and clips, which have been provided by ROVANCO.

**See Figure 5.1**

**NOTE: See pages 24-26 for Pull Rope option for high temp leak detection.**

## Section 6: Welding & Air Testing of Connector Bands

Fig. 6.1

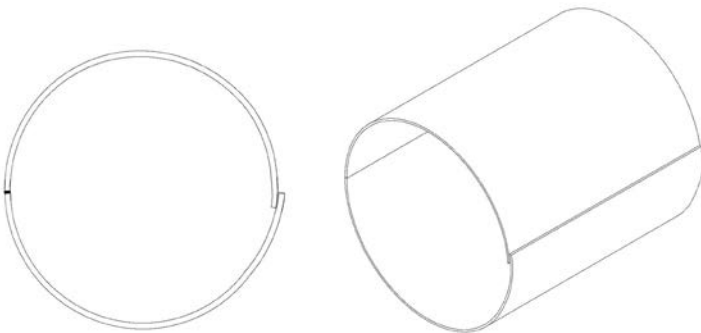


**NOTE: It is the responsibility of the contractor to grind back both ends of the joint by 2" before installing the connector bands.**

Ends should be ground to clean, bare metal that is free of any coatings to allow the welding of the connector bands.

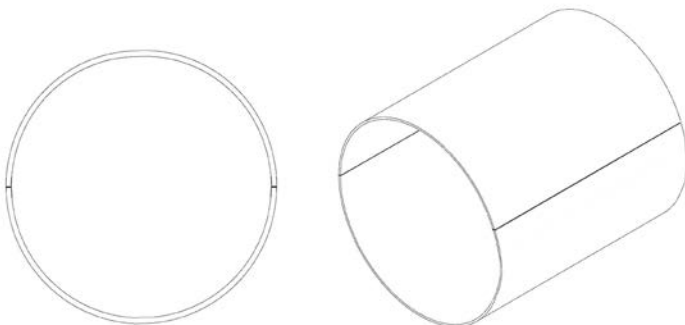
**It is suggested the grinding of the ends be done BEFORE lowering pipe into trench. See Figure 6.1**

Fig. 6.2



The length of each connector band is 15" to allow an overlap on your 12" joint area. The connector band is supplied in 2 equal length halves so there is no top or bottom half. Once the two bands are in place, centered over the joint, please note that one seam will be a butt fit and the other seam will be an overlap fit. This is the intended fit of the connector band. **See Figure 6.2**

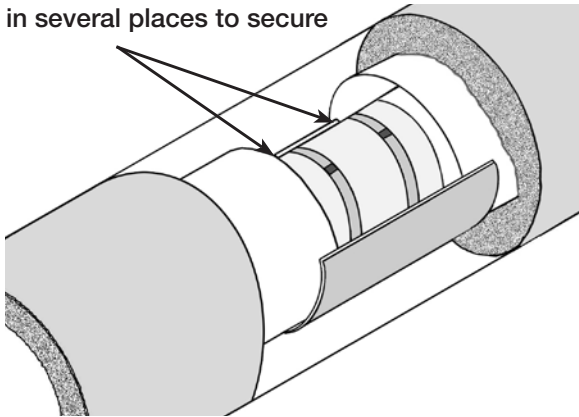
Fig. 6.3



**NOTE: If the system is 4" or 6" conduit, you will receive a 2-piece connector band. Both halves will be the same size. Connector band halves will have 2 butt weld seams that do NOT overlap. See Figure 6.3**

**Fig. 6.4**

Tack bottom half of connector band in several places to secure



**NOTE: During the welding process do NOT use anti-splatter or any type of lubricant IF your system has leak detection. These materials can cause the leak detection to fail.**

To start, center one half over the bottom of the joint area. Tack that half in place with a couple quick tacks on each side of the connector band half along the same edge so it is semi-secured to the conduit. **See Figure 6.4**

Center and place the other half of the connector band on the top. **When the connector bands meet, one edge will butt fit and the other edge will overlap.** **See Figure 6.5**

Apply a ratchet tool or chain grips and tighten both halves of the connector band at once until they are pulled tight against the outer jacket. **See Figure 6.6**

Tack in place with welds until the whole connector band is secure and will not move. Now fully weld the butt fit and overlap seams on the connector band as well as the full perimeter on both ends of the connector band where it meets the conduit. When done welding, joint should be air tight. **See Figure 6.7**

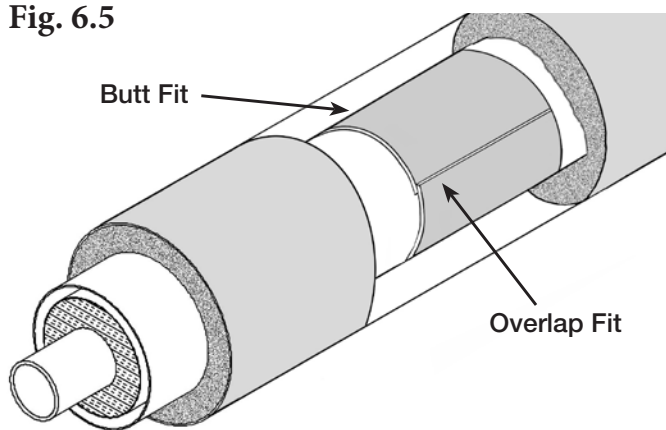
If it is a 4" or 6" system with 2-piece split mechanical tubes, follow the steps above in regards to attaching one half, securing in place with tack welds, placing second half in place, ratcheting down and securing with tack welds. With this connector band system, you will have two seams that butt fit. Both these seams as well as the full perimeter on both ends of the connector band will need to be welded.

**After all connector bands are fully welded, a 15 psi air test should be put on the inner casing prior to pouring thrust blocks or backfilling the system.** Each connector band, gland seal, and testing apparatus should be checked for leaks with a soap and water test. If bubbles appear, a leak exists. **NOTE: Depressurize prior to repairing leak. If you try to repair with the pressure still on the system, you could blow a larger hole in the leak area.** After leak is repaired, retest as described above and re-soap the repaired joint to ensure the leak has been completely fixed.

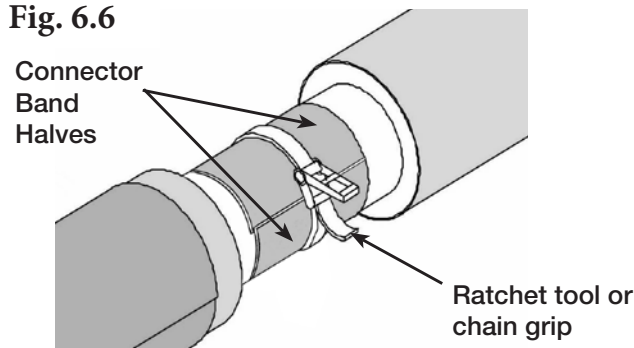
If possible, air test system as you install. ROVANCO can provide test cans in case you need to do an air test on only part of the system or on a watershed.

**NOTE: Connector bands DO NOT come coated.** They are sent bare unless otherwise stated in specifications. Foam and shrink will serve as protective coating for the connector bands on this system.

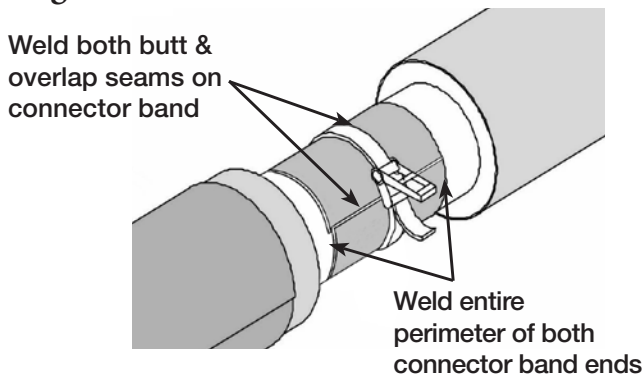
**Fig. 6.5**



**Fig. 6.6**



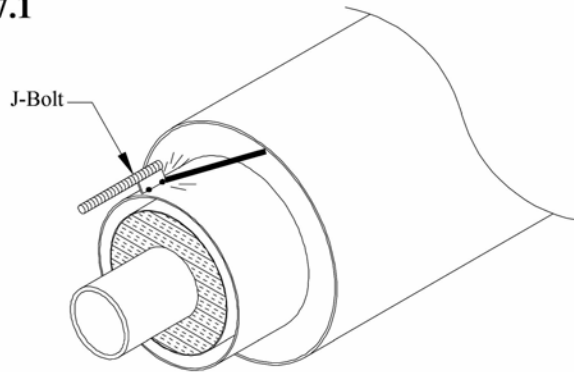
**Fig. 6.7**





## Section 7: Test Can Applications

**Fig. 7.1**



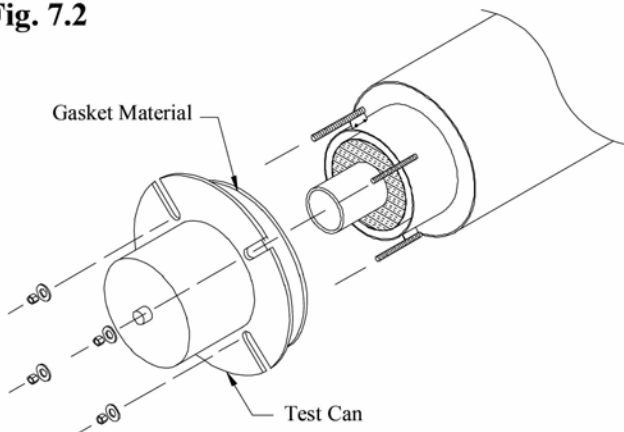
After Rovanco receives a release to manufacture, Rovanco's customer service will email test can purchase form to customer. Test cans need to be ordered before the first truck ships so they can ship with the job to save on freight cost.

Remove any burrs on conduit ends that may have been caused by removing the shipping bar to ensure a proper seal. J bolts are then welded to the outer edge of the conduit. **See Figure 7.1**

The test can butts up to an open end unit, is sealed with a gasket, and tightened down with bolts. Attach a safety chain around the test can and to other end of conduit. **See Figures 7.2 and 7.3**

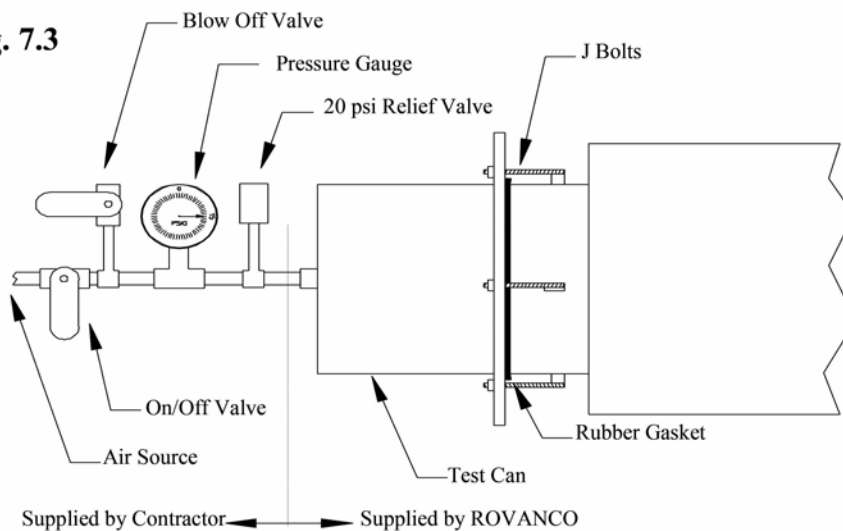
**CAUTION: No one in the area is to step in front of the test can during pressurization.**

**Fig. 7.2**



After testing is complete, remove the test can and gasket and cut the J bolts off of conduit and grind or file down any burrs.

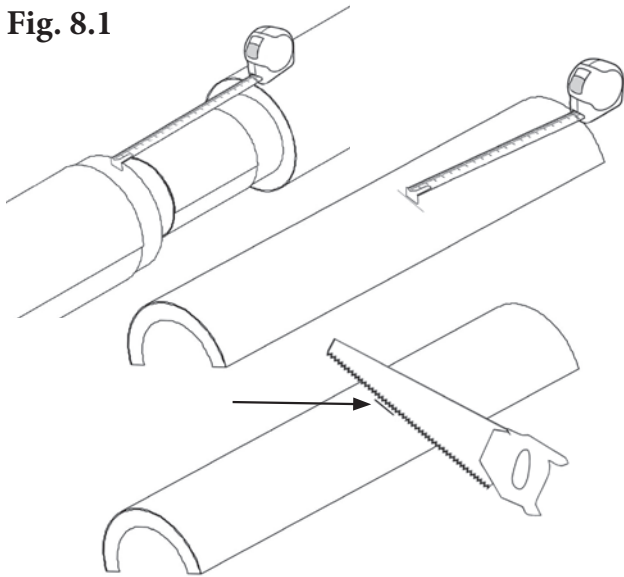
**Fig. 7.3**



## Section 8: Sectional Insulating of the Inner Conduit Casing

The carrier pipe must be fully tested before insulating the joint. If you are insulating with poured in place foam, go to Section 9. **If your system has RhinoJoints, go to pages 17-20 now for those installation instructions.**

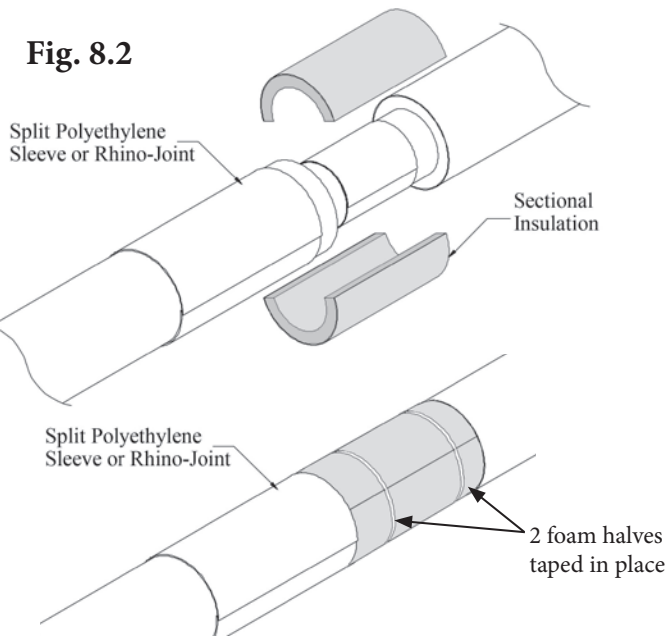
**Fig. 8.1**



For sectional insulation, measure each joint area width. Then measure the insulation and mark the width of the joint on the insulation. Cut the insulation to the same size as the joint with a hand saw. **See Figure 8.1**

Prepare the joint to be insulated following the procedures outlined in the piping system installation instructions included with your shipment. Air test must be done and passed before placing & securing the sectional insulation.

**Fig. 8.2**

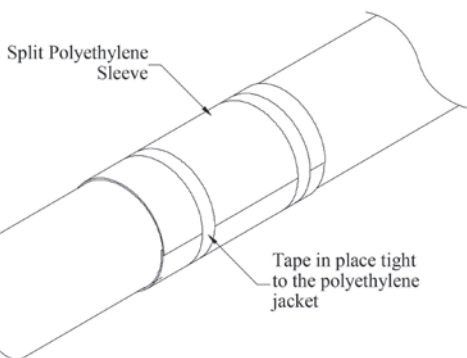


Put the two insulation halves in place and band or tape the them together to secure them in place. **See Figure 8.2**

Slide the provided polyethylene sleeve into place so it is centered over the joint. Cinch it up as tightly as possible around the HDPE jacket and tape in place to secure. **See Fig 8.3**

Next, the shrink wrap will be applied over the insulated field joint. Go to Section 10 on page 14 for those instructions.

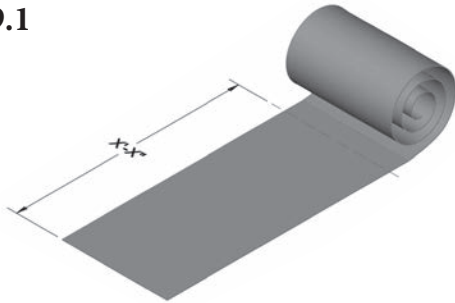
**Fig. 8.3**



## Section 9: Poured In Place Insulating of the Inner Conduit Casing

The carrier pipe must be fully tested before insulating the joint. If you are insulating with sectional foam, go back to Section 8. **If your system has RhinoJoints, go to pages 17-20 now for those installation instructions.**

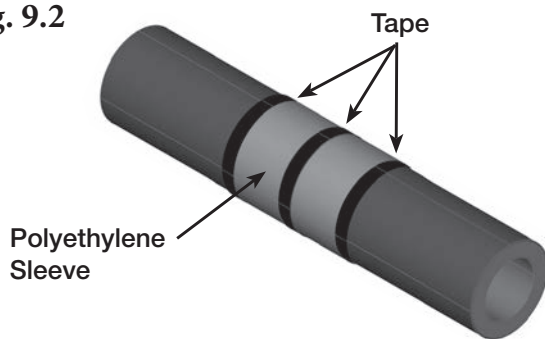
**Fig. 9.1**



Cut the polyethylene sleeve to length. Refer to page 14 of these installation instructions for sleeve lengths for each jacket size.

Depending on the outer jacket size, cut the polyethylene sleeve to length so edge overlaps the other edge of the sleeve by 2" and tape down as shown in figure 9.2 below. **See Fig 9.1**

**Fig. 9.2**

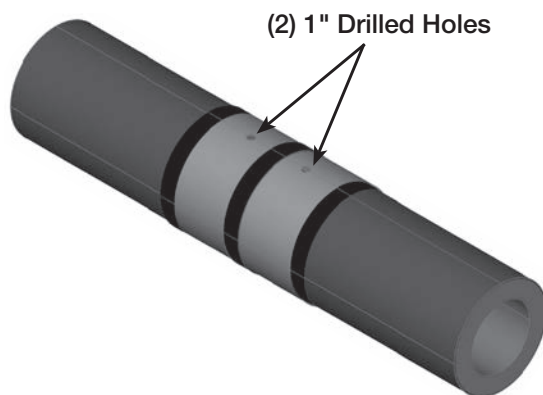


Slide the provided polyethylene sleeve into place so it is centered over the joint. Cinch it up as tightly as possible around the HDPE jacket using tape to secure it in place.

**See Fig 9.2**

Drill (2) 1" holes in the polyethylene sleeve at opposite ends as shown. **See Fig 9.3**

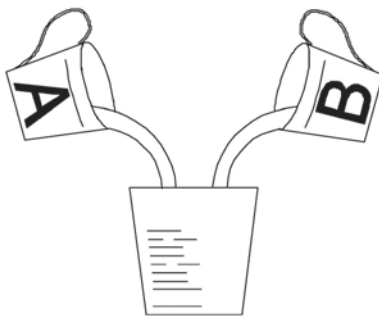
**Fig. 9.3**



Do not begin the foaming process until you have read and understand the associated steps. Prepare the joint to be insulated following the procedures outlined in the piping system installation instructions included with your shipment. Air test must be done and passed before beginning the foaming process.

Label your measuring cups with the letters A & B to prevent a mix-up later on. Examine the mixing charts on page 13, then pour the correct amount of A & B agents into the separate measuring cups. Make sure to have the right size joint from the table. Some larger sizes require two or three separate pours.

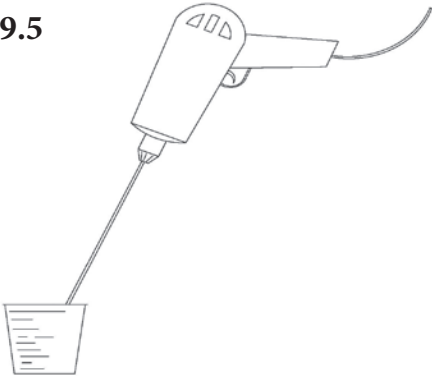
**Fig. 9.4**



Pour the measured amounts of A & B material into a 3rd mixing cup to combine. **See figure 9.4**

300 Degree foam is mixed (2) parts "A" to (1) part "B"

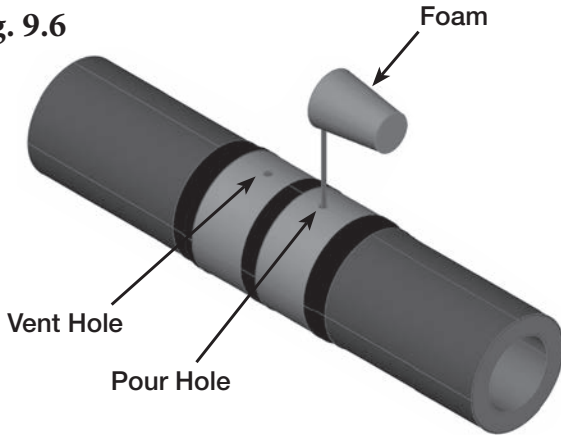
**Fig. 9.5**



Using an electric drill with the mixer head attachment provided, mix the components for twenty seconds. In temperatures above 70 degrees mix for 12-15 seconds. **See figure 9.5**

The cream time is shown on the graph on page 13.

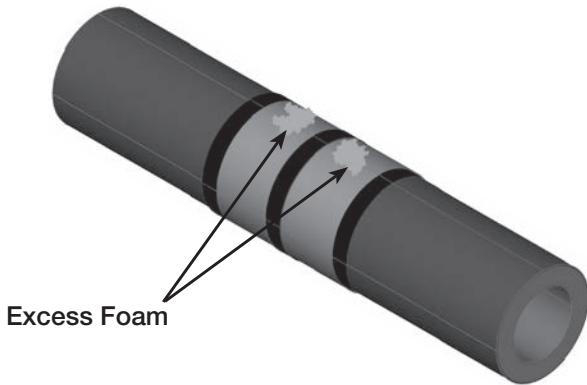
**Fig. 9.6**



Pour the mixed foam into (1) of the 1" holes in the mold for the joint you are insulating. The hole not used for pouring will serve as a vent hole which allows the insulation to flow out evenly within the joint when it starts expanding. **See figure 9.6**

Spin the mixing bit clean in an empty cup or box. If foam build up occurs it can be cleaned off with a utility knife or similar tool after it has cured.

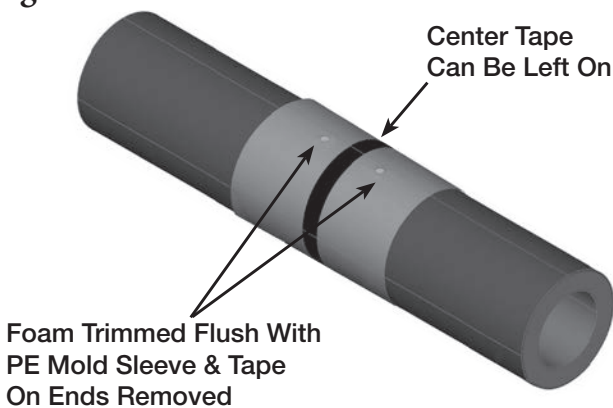
**Fig. 9.7**



After the poured foam stops rising and is dry to the touch, foam should be sufficiently cured. Cut any excess foam off with a knife or sharp object so it is as level with the polyethylene mold sleeve as possible. Remove the tape from both ends of the polyethylene sleeve before applying shrink wrap. The center piece of tape can stay on the sleeve during the shrink wrap process.

**See figures 9.7 & 9.8**

**Fig. 9.8**



A wrap around shrink sleeve must be heated and shrunk over the split polyethylene sleeve, this material is 24" or 36" wide and should be centered over the joint area. This is necessary to protect the joint, and ensure a water tight system. A closure strip will be shrunk over the longitudinal seam. These steps are shown in the next section.

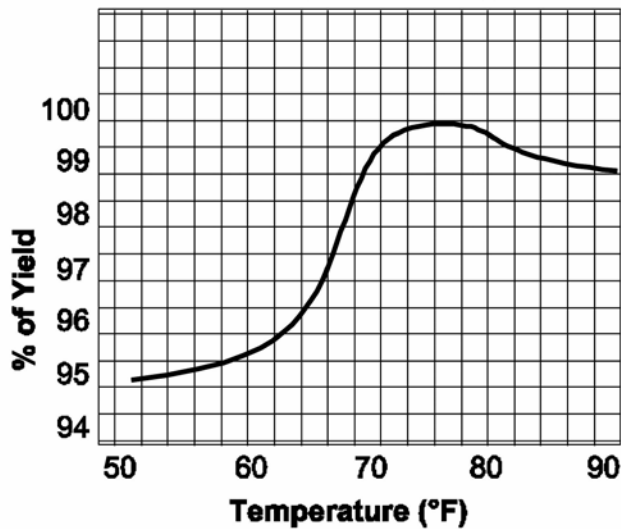
**Note:** For best results, store and maintain A & B components as close to 70 degrees (f) as possible. In temperatures below 70° F, for best performance, pre-heat pipe and molds. Read S.D.S thoroughly, you are using chemicals which could present a hazard if used improperly. This page illustrates the proper mixing quantities for Parts A & B of the 300° F Hi-Temp Foam Kits. Please use these charts when mixing your quantities of foam.

**NOTE: Mixing Ratio Is NOT 50/50**

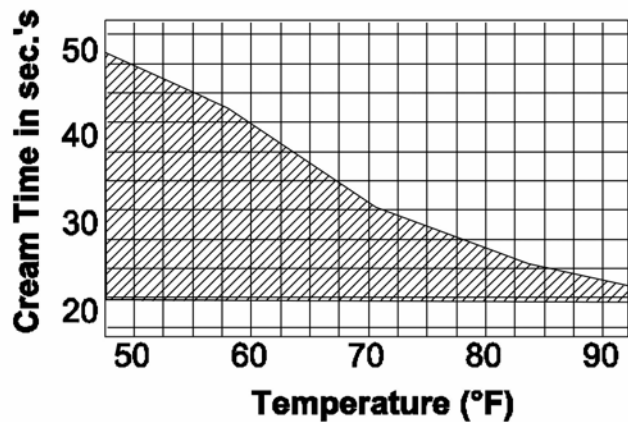
Mixing Table for 300° F Hi-Temp Foam

Cross Section		Straight Joint	
Inner Conduit	Jacket	8 oz Cups "A"	8 oz Cups "B"
4"	8"	3	1 1/2
6"	10"	4	2
8"	12"	4 3/4	2 3/8
10"	14"	5 1/2	2 3/4
12"	16"	7	3 1/2
14"	18"	8 3/4	4 3/8
16"	20"	10	5
18"	22"	11	5 1/2
20"	24"	12	6
22"	28"	13	6 1/2
24"	28"	14	7

**Yield vs. Temperature Graph**



**Cream Time vs. Temperature Graph**



## Section 10: Applying Heat Activated Shrink Wrap

### Description:

Shrink wrap is shipped in predetermined bulk rolls 24" or 36" in width. It is to be applied over the insulated joint that has been enclosed in a polyethylene wrap or sleeve. The shrink wrap is necessary to protect the joint, and ensure a water tight system. A closure strip will be shrunk over the horizontal seam. The adhesive is built into the wrap, and only becomes apparent upon heat activation, protecting it from environmental factors. Closure strips are supplied as a separate component, and come in various lengths to match the width of respective wrap being installed. The table below serves as a guide as to what length you should cut the shrink wrap relative to the jacket size.

Shrink Wrap Cut Length Chart			
Jacket Pipe Size	Cut Length	Jacket Pipe Size	Cut Length
6"	2' - 1"	22"	6' - 3"
8"	2' - 7"	24"	6' - 10"
10"	3' - 2"	26"	7' - 4"
12"	3' - 8"	28"	7' - 10"
14"	4' - 2"	30"	8' - 4"
16"	4' - 8"	32"	9' - 0"
18"	5' - 3"	34"	9' - 5"
20"	5' - 9"	36"	10' - 0"

### Suggested Equipment Necessary:

Propane tank, hose, torch with regulator (minimum torch size to be 150,000 BTU/hr.), surface prep tools to scuff the area, knife, roller, rags and cleanser, digital thermometer with probe, and necessary safety equipment (gloves, goggles, hard hat, steel toe boots, etc.).

### General Product Guidelines:

- Overlap – each section should be cut to provide for a minimum of 4" overlap around the pipe.
- Closure Strip – Closure strip should be sized appropriately to match the width of shrink wrap being installed.
- It is important to make sure the shrink wrap and closure have no visible damage or contamination.
- **IMPORTANT** – Shrink wrap must be wrapped on the pipe around in the direction as it is spooled off the roll, failure to do so will inhibit the shrinking process from working properly.

### Storage of Product:

It is important to understand that this shrink wrap product contains a built in adhesive that is activated by heat. Precautions should be taken to ensure proper storage where temperature is sufficiently below product adhesive activation temperature. Additional information about this product can be on its data sheet. Temperature considerations should take radiant heat from direct sunlight into account. In addition, extreme cold can cause damage to shrink wrap. Shrink wrap must be stored out of the sun or other harsh weather conditions, and at temperatures above -4 °F (20°C) and below 95 °F (65°C).

### Surface Preparation:

1. Using some type of abrasive, such as a wire brush or sandpaper, scuff up the HDPE jacket area at least 2" beyond where the shrink wrap ends to ST3/SP3. This will assure ends of shrink wrap will have a strong seal to the HDPE jacket. Also remove any burrs or loose pieces that may be present and that should effect shrink wrap material.
2. Wipe area with a clean cloth and rubbing alcohol or solvent cleaner to remove any debris or contaminants before applying shrink wrap.
3. Pipe needs to be totally dry before shrink wrap can be applied.

### Applying the Shrink Wrap:

4. Pre-heat the joint area to a minimum of 150 °F (65°C). Confirm temperature reached using digital thermometer with probe.
5. After centering the wrap over the joint, gently heat first 6 inches of wrap to activate the adhesive. A visual sign the adhesive has been activated is when it becomes shiny & looks to be wet. Position the starting edge you heated between 10 & 2 o'clock position on the pipe. This will assure the seam and the applying of the closure strip is in an area that will make it easier to accomplish. Press down firmly so starting edge is secured in place.
6. To assure wrap has been cut to the proper length, do a test fit by firmly pulling shrink wrap material around the joint so the closing end overlaps the starting end by at least 4". **Note** – if length measured properly, the closing edge of the wrap should overlap the starting edge and seam will end up somewhere near the top half of the pipe. Be sure you keep the edges of the wrap aligned as close as possible as you wrap the shrink around the pipe.
7. Once wrap length is confirmed as adequate, unwrap enough so you can heat the closing edge of the shrink wrap. Again pull wrap firmly and secure the heated closing edge in place by pressing down with a gloved hand.

### Applying the Closure Strip:

8. Pre-heat one end of the closure strip to activate adhesive. Position closure strip so it is centered over the seam and edge is aligned with shrink wrap edge. Press down firmly with a gloved hand to secure in place.
9. Continue heating closure strip as you work toward the other end, pressing down with a gloved hand as you go. Be sure to keep the closure strip in alignment so it remains centered on seam.
10. You can use a gloved hand or gentle pressure from a roller to work out any wrinkles or air pockets. This must be done after closure strip has been heated enough to activate the adhesive.

### Shrinking Down Wrap & Finishing Closure Strip:

11. Starting in the center, heat the shrink wrap with the torch using long continual passes up and down the shrink wrap working around the full diameter of the pipe. Start in the middle and work toward one end of the shrink wrap. Repeat again working from the middle to the other end, again working the full diameter of the shrink wrap and pipe. If closure strip requires additional heat for areas not totally shrunk down, you can do that as you heat the shrink wrap.  
**It is important to remain patient when shrinking down the wrap. DO NOT keep torch concentrated on a single area of the wrap. Keep the torch moving in a circular motion around the circumference of the shrink wrap until the wrap is fully shrunk down everywhere.**
12. As the wrap shrinks down to the pipe, pressing down with a gloved hand or gently using a roller over entire surface will help work out air bubbles and wrinkles if they appear. This must be done while the shrink wrap is still hot and/or after it has been heated enough to activate the adhesive, but do not attempt when actively using the torch of you could get burned. It may be necessary to re-heat areas and pressing down again to fully complete this step.
13. The process will be complete when the wrap & closure strip are totally shrunk down on the pipe and adhesive is seen coming out the edges of shrink wrap, all the way around the full circumference of the pipe and on both ends.

### Completion and Verification Measures:

14. Ensure the area is free from visual flaws. Be sure the shrink wrap is in full contact in all areas & totally shrunk down. Adhesive has flowed out of both edges of the shrink wrap all the way around the diameter of the pipe. There are no cracks or holes in the shrink wrap from over heating, sharp objects or mishandling.
15. Inspect closure strip to be sure it is fully shrunk down and has totally sealed the shrink wrap seam.
16. Allow shrink wrap to cool a minimum of 2 hours prior to backfilling and burying pipe.
17. Certain backfill material may damage shrink wrap and reduce corrosion protection provided by the shrink wrap. Make sure backfill material is free from sharp stones or other large particles. If this cannot be achieved, further protection of the shrink wrap may be necessary.

**NOTE:** The application of the shrink wrap & closure strip instructions above are repeated on page 16 in a Step-By-Step process and supported with pictures that might lend some additional visual guidance.

## Step-By-Step

### Step 1. Preparation

- Ensure joint area is free of debris and contaminants to ensure proper bonding. See “Suggested Surface Preparation” on Page 14 for optimal results.
- Cut shrink wrap to desired length to properly overlap a minimum of 4” (10 cm). The table on page 14 shows the wrap length relative to the jacket size.
- Cut closure strip should properly span entire seam. Check this before apply closure strip and trim as necessary if it is not.

### Step 2. Tack Shrink Wrap To Surface

- Pre-heat the joint area to a minimum of 150° F (65° C)
- Gently heat first 6 inches (15 cm) of wrap and for the full width to activate adhesive and tack it to the pipe at the 2 o'clock position
- Center wrap over the joint and wrap from backside under the joint then up and back over the front so closing end finishes at approximately 12 o'clock.
- Firmly wrap the pipe joint to ensure the proper overlap. Confirm the ending seam is at approximately the 12 o'clock position, or close to it.
- Use same gentle heating technique the full width of the wrap's closing end until adhesive is activated. Tack overlap into place. You may have to heat more of the shrink wrap in colder conditions to hold it in place before applying closure strip and fully shrinking it down.

### Step 3. Apply The Closure Strip

- Pre-heat closure strip on one end to activate adhesive. Center closure strip on the seam/overlap and align closure strip end with end of shrink wrap. Press firmly to ensure closure strip holds.
- Heat closure strip as you go to fully activate adhesive, patting it down periodically with a gloved hand. Be sure closure strip remains centered on the seam.
- Continue process moving from one end to the other until closure strip is fully bonded. Closure strip should end aligned with the other end of the shrink wrap.
- While closure strip is still hot, press down or use a roller to remove air bubbles or wrinkles.

### Step 4. Shrink The Wrap

- As you shrink down the wrap, you can additional heat to the closure strip if there are areas that have not fully shrunk down.
- Starting from the center and working toward one end, begin heating the shrink wrap in the center, using long continual passes up and down the wrap applying heat around the full diameter of the pipe. The shrink wrap should settle into place snug to the pipe with no bubbles or wrinkles. Smooth out with a gloved hand or apply gentle pressure with a roller to remove any bubbles or wrinkles while wrap is still hot but you are not actively heating it with the torch so you don't get burned.
- Repeat previous process beginning back in the center and working toward other end of shrink wrap not yet shrunk down.

**It is important to remain patient when shrinking down the wrap. DO NOT keep torch concentrated on a single area of the wrap. Keep the torch moving back and forth over the full area of the shrink wrap until the wrap is fully shrunk down everywhere.**

- Process is complete when adhesive is seen coming out the edges of the wrap, all the way around the full circumference of the pipe, and on both ends. Failure to continue heating until adhesive can be visually seen flowing out edges as described will void warranty.
- To work out any pockets of glue build up, continue heating from side to side around entire area. See “Completion and Verification Measures” on page 15 for some practices that will confirm the process has been finalized.

### Step 1



### Step 2



### Step 3



### Step 4





## Section 11: RhinoJoint Installation

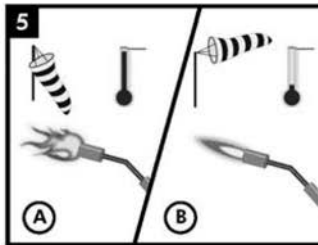
**Note:** RhinoJoints are optional, so your system may or may not have RhinoJoints. If you do have RhinoJoints but are not air testing, please skip instructions #15, #16, #17, #18, #19, #22, #28, #29, and #41 on the following pages.

### Product Description



The fully shrinkable Rovanco RhinoJoint is a crosslinked, heat shrinkable casing system for half shell joint protection of pre-insulated pipes. The RhinoJoint uses an inner shrink film, adhesive strips, rock shield and a tubular casing to seal the joint.

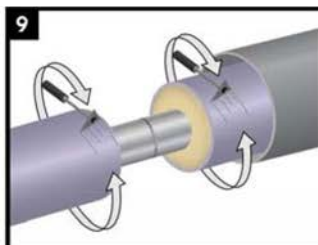
### Flame Intensity



Adjust the flame according to outside conditions.  
 a. Use weak yellowish-orange flame for low wind, higher temps.  
 b. Use moderate bluish-yellow flame for high wind, lower temps.

Always aim the torch perpendicular to the casing shrink film and RhinoJoint and move in a circumferential direction quickly around the jacket pipe.

**Do not overheat the jacket pipe as it will burn with excessive heating.**



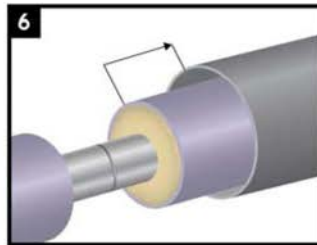
Using a triangular scraper, clean edges of the jacket pipe to remove any burrs and dirt from the sealing area.

### General Information



These installation instructions are intended as a guide for standard products. Consult your Rovanco representative for specific projects or unique applications.

### Casing Preparation

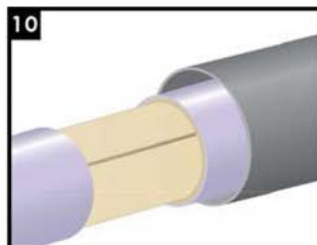


**Check the RhinoJoint to assure it is not damaged.** Before welding together the carrier pipes, slide the tubular casing as far away from the joint as possible.

**NOTE:** Prior to any carrier field welds, pipe ends must be prepped in the field by contractor.

**NOTE:** During the welding process do NOT use anti-splatter or any type of lubricant IF your system has leak detection. These materials can cause the leak detection to fail.

### Insulation Instructions



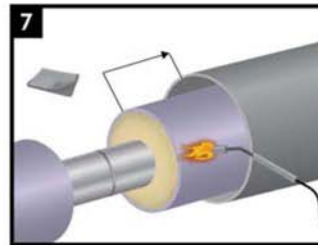
Install the foam half-shells per Section 8 in these installation instructions. see page 10

### Equipment



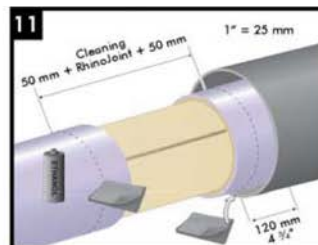
Propane tank, hose, torch & regulator, sandpaper (40-60 grade) or wire brush, knife, roller, rags & solvent cleanser, temperature measuring device, triangular scraper, marking pencil, grater, drill, standard safety equipment, gloves, goggles, hard hat, etc.

### General Drying & Cleaning



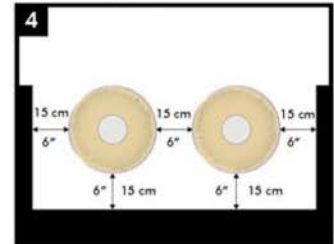
Use a torch with a low flame to dry the jacket pipe, carrier pipe and RhinoJoint. Use a dry, grease and lint-free rag to wipe clean the jacket pipe, carrier pipe and the tubular casing.

### Surface Preparation



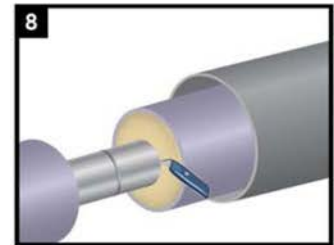
Clean the surface of the jacket pipe and the inside of the thin end zone of the casing with a rag to remove dirt. Degrease the surface of the jacket pipe and the inside of the RhinoJoint using a grease and lint-free rag soaked in solvent.

### Backfilling Trench



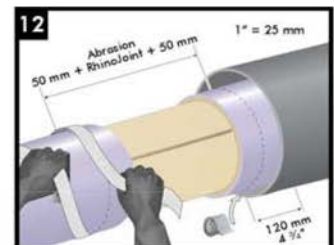
Ensure there is adequate work space area around the pipe in the backfilling trench.

### Pipe Preparation



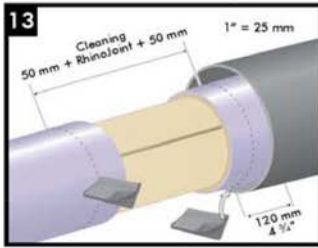
**Remove any wet foam** from end of the pre-insulated pipe.

### Surface Abrasion



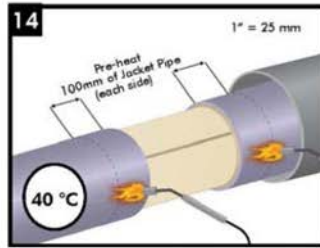
Roughen the surface of the jacket pipe on both sides of the cutback and the inside of the RhinoJoint using sandpaper (40-60 grade).

### Final Surface Cleaning



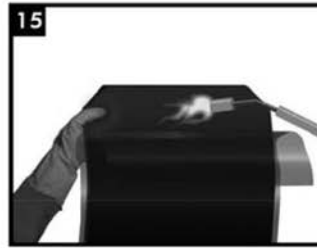
Using a dry, grease and lint-free rag, clean the roughened surface to remove any polyethylene or sand particles.

### Pre-Heat

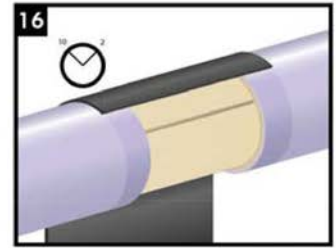


Using a propane torch and a low-yellow flame, warm 100mm (4") of the jacket pipe surface on each side of the cutback to 40°C (104°F). Ensure that foam has set up prior to casing shrink film installation.

### Installation

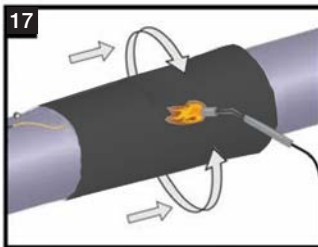


Partially remove the release liner and **gently** heat the underlap approximately 150mm (6") from the edge.



Beginning between the 10 and 2 o'clock positions, center the film over the joint so that it will cover the foam and overlap both ends of the jacket pipe. Remove the remaining release film.

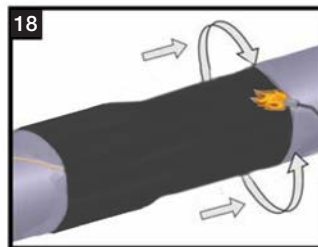
### Shrinking Down Liner



Tightly wrap the film around the pipe ensuring the overlap is sufficient. Visually inspect the wrapped film for the following:

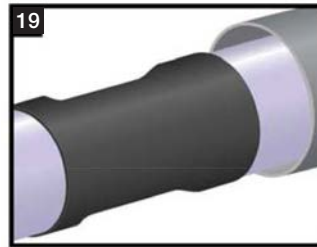
- Film is in full contact with the foamed joint and jacket pipe.
- No cracks or holes in film backing.

Heat film starting in the middle using a continual circular motion around the complete diameter of the pipe as you move to one end.



This will secure the liner to the half-shell profile and secure it in place.

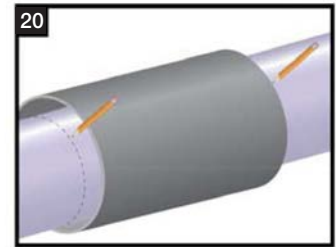
Repeat the same process starting in the middle and working toward the opposite end until the whole liner is shrunk down.



Once fully shrunk down, inspect the shrink again to be sure of the following:

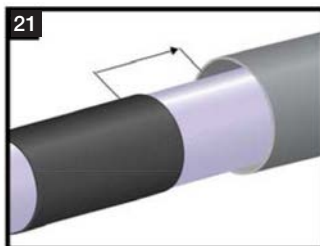
- Film is in full contact with the foamed joint and jacket pipe in all places.
- Film conforms fully to the half-shell profile.
- No cracks or holes in film backing.

### RhinoJoint Position Marking



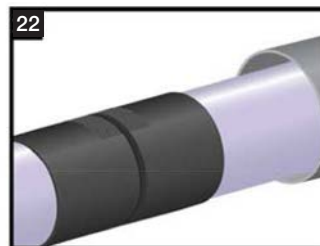
For convenience, center the RhinoJoint over the joint and mark out two reference lines circumferentially on the jacket pipe (this will assist in preparation and positioning of the RhinoJoint).

### RhinoJoint Position



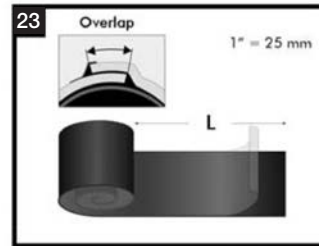
Slide the RhinoJoint away from the jacket pipe edge.

### Waffle Sheet Installation



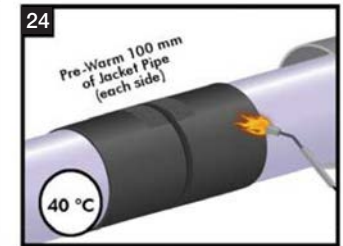
Install the 6" x 6" waffle sheet directly over the inner shrink film at the 12 o'clock position on the pipe. Secure in place with tape.

### Adhesive Length (w/Bulk Roll)



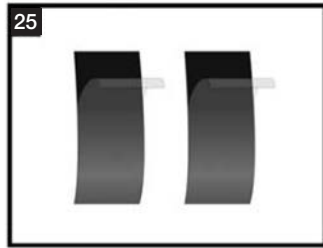
If not using the pre-cut adhesive from a kit, measure the circumference of the jacket pipe and cut two sealing strips long enough to allow for overlap.

### Pre-Warming



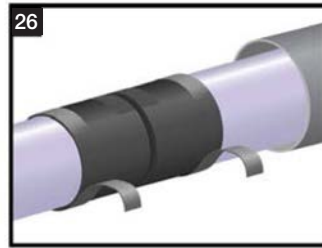
Pre-warm the pipe to 40°-50°C (104°-122°F). **Ensure the correct temperature with a temperature measuring device.** Do not exceed 50°C (122°F) as this makes removal of release liner difficult.

### Release Liner



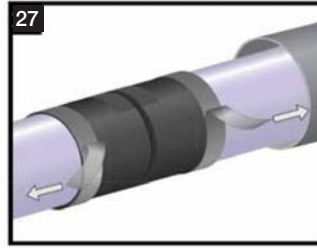
Remove the thinner release liner (opposite the mesh side) from both adhesive strips and...

### Adhesive Application

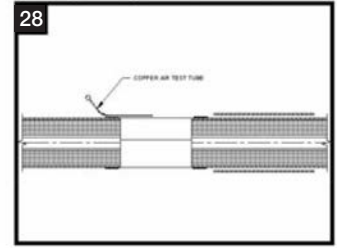


...apply the adhesive strips lightly around the jacket pipe with the mesh side facing up. The strips should be applied so that they are placed approximately 10mm (0.4") inside the marks. Partially peel back the release liner on the underlap and wrap the strips around the jacket pipe so that it overlaps.

### Air Test Tube Installation (If Required)

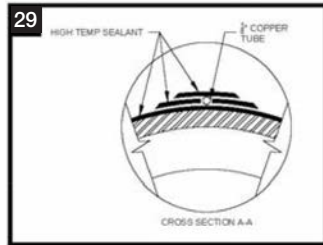


Fold the release liner outwards to allow for easy removal after positioning the casing.



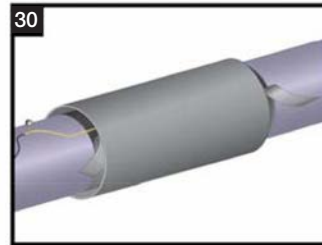
Extend the 1/8" x 16" copper tube from the waffle sheet, beyond the adhesive strips and out to the end of the casing. Secure in place with tape.

### RhinoJoint Placement



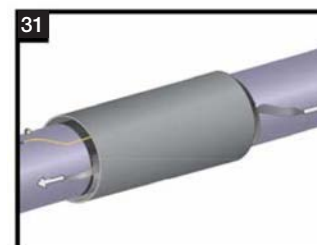
Using the 4" wide high temp sealant strips provided, place a strip on each side and on the top of the copper air test tube. Press adhesive into place to ensure there are no air pockets or voids.

### RhinoJoint Installation

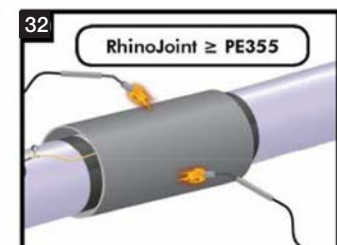


Carefully slide the RhinoJoint over the joint so that the edges are centered over the edge of the adhesive strips.

### RhinoJoint Installation

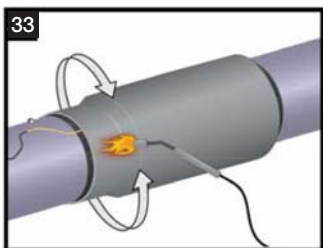


Completely remove the release liners from the adhesive strips.

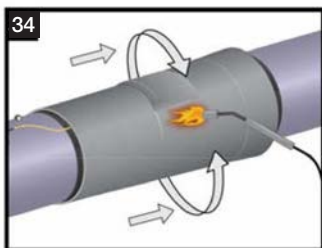


**For RhinoJoint sizes 355mm and greater, it is recommended to use two installers working on opposite sides of the pipe.** Using broad strokes and a medium flame, begin shrinking at the center of the RhinoJoint and work out to the ends.

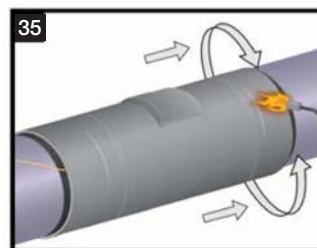
### Shrinking The RhinoJoint



Shrink one end of the RhinoJoint evenly all the way around the pipe circumference. Keep the torches moving to avoid overheating any spots. Ensure sufficient heat is applied at the bottom.

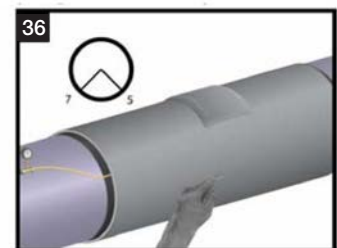


Use a broad circumferential strokes and continue shrinking by moving horizontally...

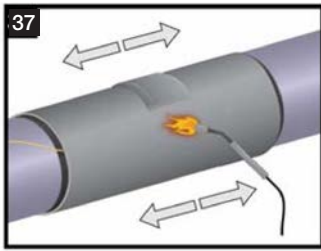


...towards the opposite end of the RhinoJoint.

### Quality Check (Finger Probe Test)

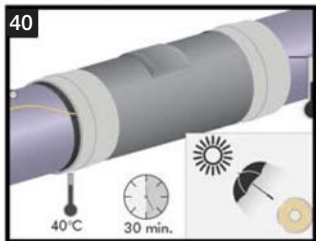


With a gloved finger, press down on the shrunk area to ensure the backing and adhesive are soft. Also, use a gloved hand to check parts of the shrunk area between the 5 and 7 o'clock positions. If there are cool spots, the RhinoJoint should be re-worked with additional heat.



Shrinking the RhinoJoint has been completed when the casing system (film + RhinoJoint) has fully conformed to the pre-insulated pipe joint. Adhesive may ooze from the ends of the casing. Ensure that the adhesive and casing conform to the copper air test tube.

### Cool RhinoJoint to < 40°C (104°F)

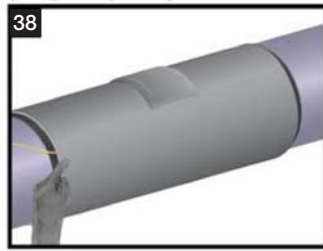


Allow the RhinoJoint to cool for 30 minutes. After 30 minutes measure the surface temperature of the casing. If the surface temperature of the casing is still above 40°C (104°F), use shading and/or a damp towels to speed the cooling time.

### Backfilling Guidelines

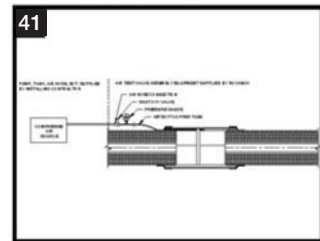
After shrinking is complete, the RhinoJoint should be left for as much time as possible prior to backfilling (minimum 30 minutes to 1 hour). This ensures that the adhesive has cooled enough and that sealing is achieved. To prevent damage to RhinoJoint, use selected backfill material (no sharp stones or large particles).

### Quality Check (Finger Tip Test)



As a final check, ensure that the entire RhinoJoint conforms to the entire pipe surface (360° around the pipe). This can be checked by feeling the edges all around the circumference of the casing. A visual check should be done at the 6 o'clock position of the joint.

### Quality Check (Air Pressure Test)



Air test the joint to 3 psi by using the 1/8" copper tube. After complete, trim back the air test tube and seal the exposed end with flux and solder or high temp sealant. (not required if RhinoWrap is used) Air test valve assembly provided by Rovanco.

### Tension Tape Application



For casing sizes PE355 and above, wrap the supplied tension tape around both edges immediately after shrinking, while the casing is still soft (if the casing has cooled down; reheat it).

**This ensures cooling and conformance of the edges.**

### Storage & Safety Guidelines

To ensure maximum performance, store Rovanco products in a dry, ventilated area. Keep products sealed in original cartons and avoid exposure to direct sunlight, rain, snow, dust or other environmental elements. Avoid storage at temperatures above 80°C (or below -20°C). Product installation should be done in accordance with local health and safety regulations.

**These installation instructions are intended as a guide for standard products. Consult Rovanco representative for specific projects or unique applications.**

Rovanco warrants that the product conforms to its chemical and physical description and is appropriate for the use stated on the installation guide when used in compliance with Rovanco's written instructions. Since many installation factors are beyond our control, the user shall determine the suitability of the products for the intended use and assume all risks and liabilities in connection therewith. Rovanco's liability is stated in the standard terms and conditions of sale. Rovanco makes no other warranty either expressed or implied. All information contained in this installation guide is to be used as a guide and is subject to change without notice. The installation guide supersedes all previous installation guides on this product. E&OE

Part No. TBD

IG\_RhinoJoint(Air-Testable\_rev010)

## Section 12: Pull Rope Instructions

Fig. 12.1



Fig. 12.2

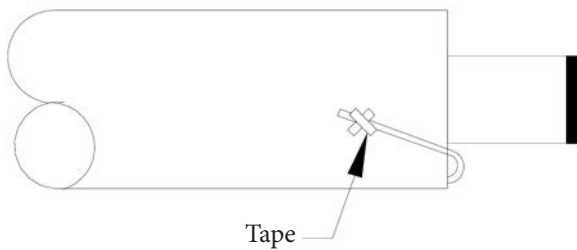


Fig. 12.3

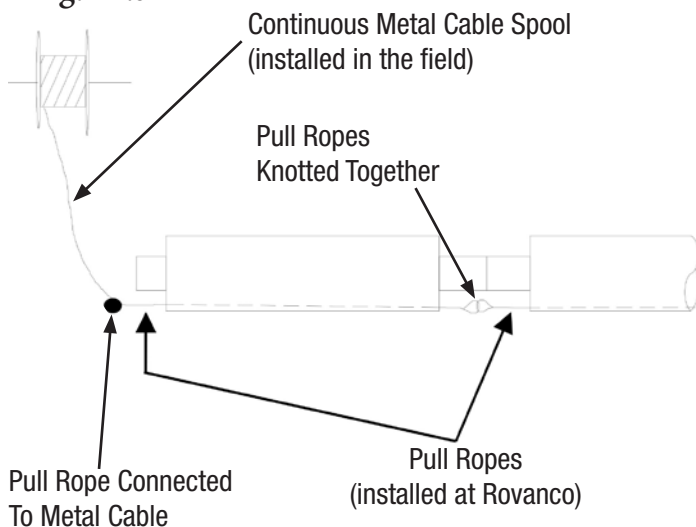
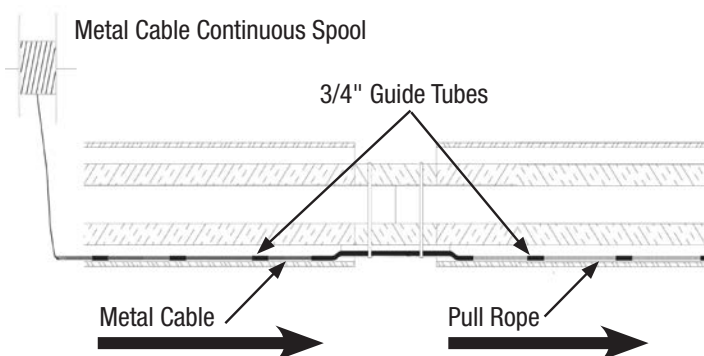


Fig. 12.4



### Preparation – Before Carrier Pipe Welding

1. Each piece of pipe will be supplied with its own pull rope which has been threaded through a series of semi-flexible 3/4" guide tubes that are positioned at intervals inside the length of pipe. The end of the rope is taped to the carrier pipe at both ends. Do not cut the rope loose until the pipe is in the trench and carrier pipe is ready to be joined.

**See Figure 12.1**

2. Once the pipe is in the trench and carrier is ready to be joined, carefully cut the tape loose and tape the rope back to the jacket so the rope does not get burned when welding and free of glue, epoxy or resin on PVC or fiberglass systems. **See Figure 12.2**

Proceed with joining the carrier pipe. If the joints are to be exposed overnight or for any period of time, use a white tarp or white visqueen to seal the joints.

### Preparation – Before Pulling Metal Cable

3. Once all of the carrier pipe joints are welded and tested, you are ready to connect the pull rope from one pipe length to the pull rope of another. Use a loop or slip knot to connect pull ropes. Use electrical tape to flatten down any loose ends and to secure knot so the two rope do not pull apart during pulling process.
4. Set up the spool of metal cable at one end of the system. Then connect the pull rope end to the cable. **See Figure 12.3**

The pipe has centering supports with sections of 3/4" conduit guides for the pull ropes and metal cable to run through. Make sure the pull rope/metal cable connection does not get bound up in these guides, **it is strongly recommended to tie the pull rope end to the continuous metal cable using the procedure shown on page 22.** This method will minimize issues during the pulling process.

5. Once rope and cable are connected at one end, pull the opposite, loose end of the rope so the continuous metal cable is pulled the full length of the pipe section and follows the rope through the 3/4" guide tubes. The continuous metal cable needs to be pulled enough to move the rope out of the joint area prior to welding conduit connector bands. **See Figure 12.4**

## TT-Aircraft to TT-PR (Pull Rope) Connection Installation Instructions



Wrap approximately 4 inch end of TT-PR with electrical tape forming a point.



Open up hollow braid approximately 12-14 inches from end to insert taped point into the braiding.



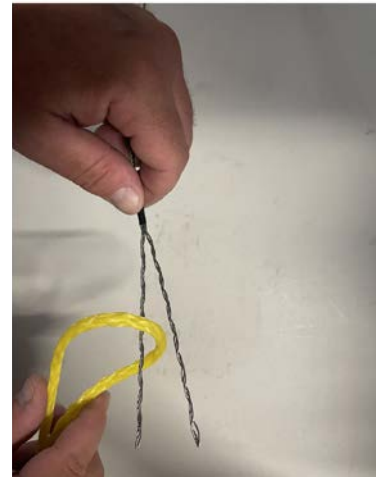
Insert entire taped portion of pull rope end into the braiding.



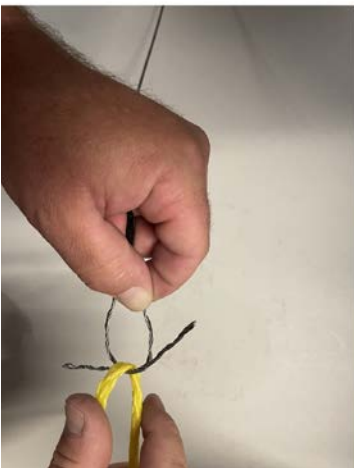
Loop should look like this.



Use Scotch 33+ electrical tape to wrap section where point was inserted into the braid tightly.



Uncoil steel aircraft cable into 2 halves approximately 5 inches long and tape at base of this "V" with electrical tape ("V" hidden under top thumb in this photo). Insert braided loop between these sections.



Loop steel cable around braided cable from each end in opposite directions twisting steel cable end around itself at least 2 times on each side forming a steel cable loop.



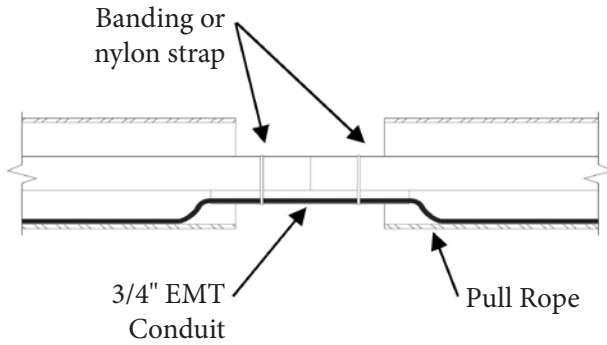
Use pliers to pinch steel cable loop.



Stretch both cables and apply electrical tape from one end to the other, then back to starting point. Note: While wrapping electrical tape, pull to make this tight in order to lower the profile of the section for ease of pulling.

**NOTE: Steel aircraft cable to be pulled prior to welding 10 gauge. After 10 gauge has been welded and tested per spec, then the leak detection cable can be pulled.**

Fig. 12.5



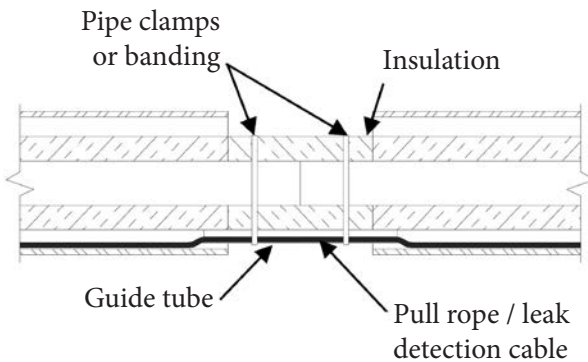
6. The center 15" of the guide tube is flexible. Use banding or nylon strap to position that portion of the guide tube system away from the edges of where the connector bands will be welded. **See Figure 12.5**

Make sure the cable is not stuck or bound up by pulling it in each direction at least 20-ft. If the cable does not move freely check all guide tubes to see if you can find where the issue is and make necessary adjustments.

**NOTE:** Do not pull the actual Leak Detection Cable through until the connector band welding is complete and system has been tested. This is to prevent the possibility of damage or contamination to the leak detection cable.

**Preparation – Before Pulling Leak Detection Cable**

Fig. 12.6



7. After the continuous cable is pulled and properly positioned in the joint area, begin the conduit connector bands process.

**See Figure 12.6**

**NOTE:** Refer to the pipe installation instruction section for details associated with that procedure. Any other procedures such as fitting, end seal and outer jacket insulating & coupling are covered in their respective sections in the instructions.

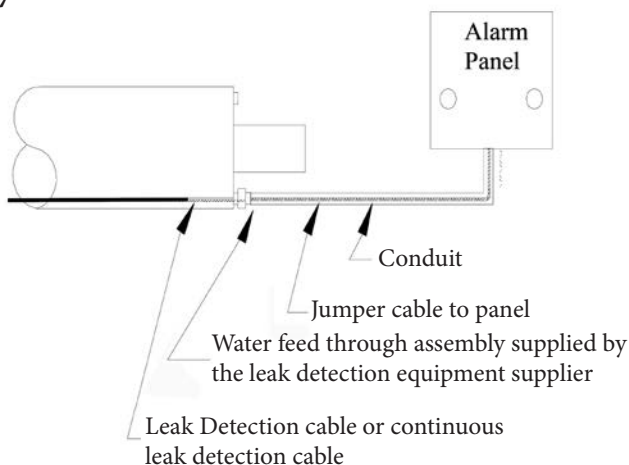
8. After conduit connector bands are fully welded and tested, move cable back & forth again to be sure it is still free. Then connect end of metal cable to leak detection cable. You can utilize the same connection process suggested for connecting pull rope to metal cable on **page 22**.

Pull metal cable, now attached to leak detection cable, through the system. This is to be done before insulating and making the outer jacketing joints.

It will depend on the pipe run as to whether you pull leak detection the entire length of a straight pipe run or to a pull port. See specs for details.

**It is extremely important to pull the Leak Detection cable and test it prior to backfilling! See Figure 12.7**

Fig. 12.7



## Section 13: Drying Inner Conduit Casing

If the insulation in any section of the conduit should get wet, make note of the location. After the line is put in service and the internal pipe is heated from the boiler, force air through the air space with a portable compressor at not less than 3 cfm. Pump the air in through the vent at the high end of the system, and force it out of the drain at the low end, any water should come out first. Vent and drain plugs are located at end seals and gland seals. This will push out any water and force moisture out of the system.

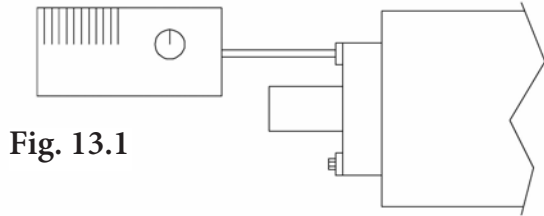


Fig. 13.1

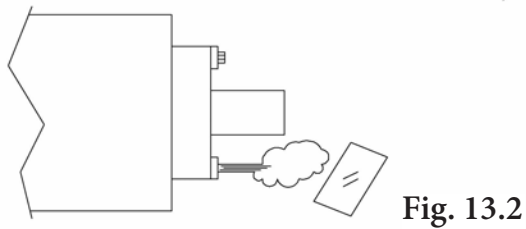


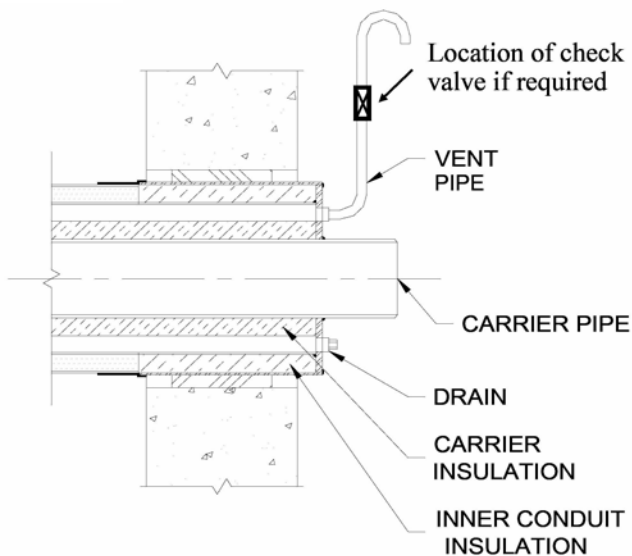
Fig. 13.2

**CAUTION: personnel should not stand in front of the drain during the drying process to avoid the possibility of scalding.**

The line is dry when you can not fog a cool mirror with the air coming out of the conduit at the low end drain plug. Drying time of insulation will vary with the amount of saturation, and the type, size, and thickness of the insulation. After the system is dry, pipe up the vents at the ends of the system with a goose neck and leave open for venting. Close the drain plugs at all ends of the pipe system. **See Figures 13.1 & 13.2**

## Section 14: Manhole & Building Entries

Fig. 14.1



**See Figure 14.1** for the proper building entry or manhole entry detail. Also, as mentioned in the previous section, be sure before turning the job over to the owner that the vent on each end of the system is piped up above any potential water level and goose necked for venting. This is done so that water can not get high enough to enter the system. The vent piping and check valve are not supplied by ROVANCO. The drains should remain closed. It is recommended that at least 3" of the polyethylene jacket enter through the wall before our system ends.

**NOTE:** If the gooseneck cannot be installed above the potential high water mark, then a check valve must be installed in the vertical riser of the vent pipe.



It is mandatory all carrier pipe either be air or hydro tested per specifications prior to insulating and pouring thrust blocks around anchors or backfilling the system. Failure to comply with testing procedures will void warranty. Plastic carrier pipe must be hydro tested only, do not air test.

## Section 15: Pouring Concrete Anchors

ROVANCO recommends that the forms for the concrete anchor plates be done with sandbags or wood. These forms do not need to be stripped. The block should be 10" larger than the anchor plate, and 3' thick.

See Figure 15.1

Make sure that the block is large enough to anchor it to undisturbed earth. **AT NO TIME** should wood be touching the steel anchor. Contractor must make sure to have concrete completely encapsulate the anchor, especially underneath.

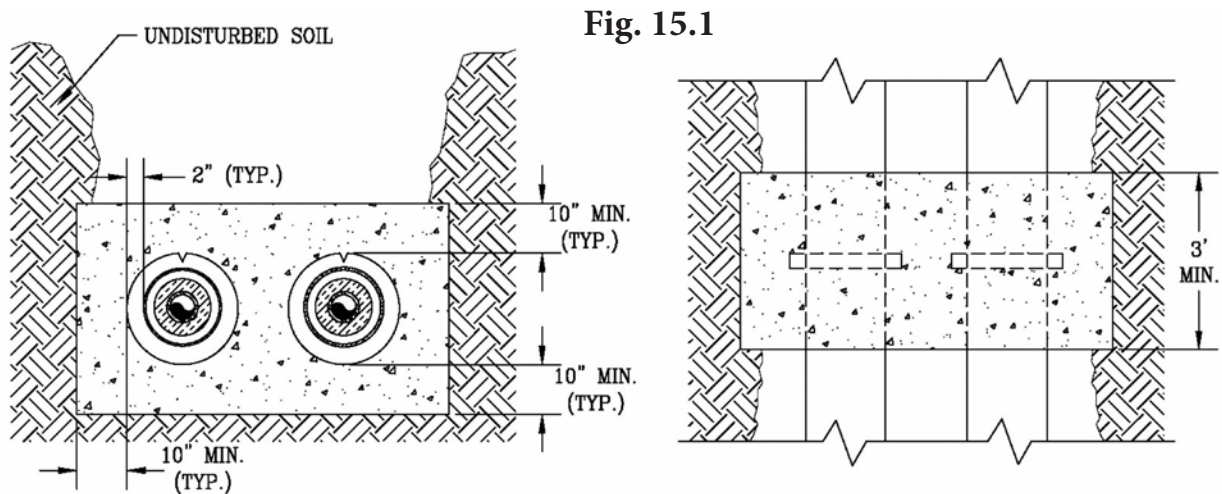


Fig. 15.1

## Section 16: Backfilling The System

The first foot of backfill must be free of frozen soil, rocks, or other debris. ROVANCO recommends the use of clean backfill material without sharp stones. If the project specifications require a specific backfill material, we recommend the installer follow the specification. Hand tamp in 6" layers to one foot above the conduit. After this, a mechanical tamper may be used. See Figure 16.1

**Note:** that you need 24" of cover tamped to 95% compaction to obtain H-20 traffic load conditions. However, this is not adequate for railroad crossings. In that case, contact our Engineering Department in Joliet, Illinois. If 24" is not obtainable, put 6" of 95% compacted sand above the pipe, and then a 4" to 6" reinforced concrete pad. The pad should overlap the edges of the trench by 1'. Then continue the backfilling to grade as usual.

See Figure 16.2

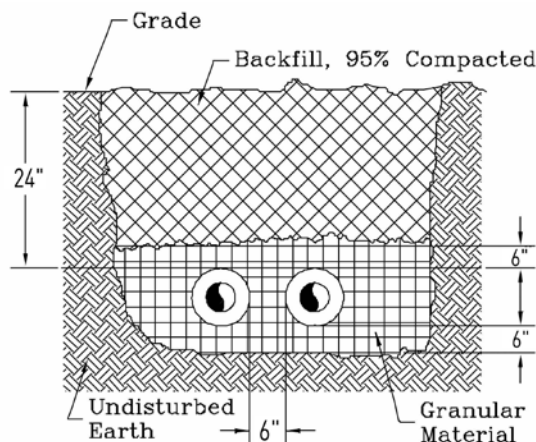


Fig. 16.1

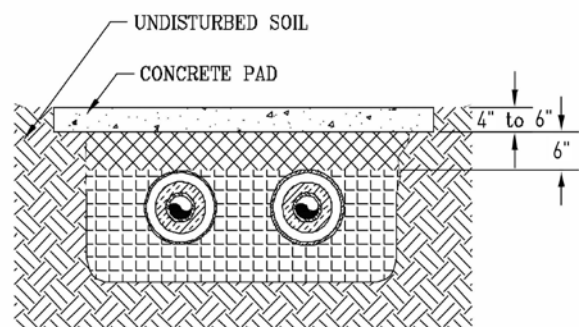


Fig. 16.2

## Section 17: Operation & Maintenance for Steam Conduit

**Annual:** Remove the drain plugs to check for the presence of water in the air space yearly. When removing the drain plug, be alert for a possible steam flash. If water is found follow the repair procedure outlined below. The drain plugs must be replaced after the inspection to insure water does not inadvertently enter the air space from a flooded manhole or mechanical room.

**CAUTION:** Extreme caution must be exercised when entering steam manholes and opening vents and drains.

Also do an air test of the conduit yearly. Using an air compressor, pressurize the air space to 15 psig and hold for one (1) hour. If the pressure can not be maintained, see the repair procedure below. Warranty will void if this is not done and logged year to year.

**Repair:** If a leak in the casing is found, it should be repaired, tested, coated, and backfilled as it was originally installed.

If a leak in the carrier pipe is found, at least a 2' section of pipe should be removed and replaced. The carrier pipe should then be hydrostatically tested at 1½ times it's operating pressure, not to exceed 500 psig. Re-insulate the carrier pipe as specified. Repair the inner conduit casing using a split sleeve, similar to the connector band used in assembling the field joints. Air test the inner conduit casing, then insulate as specified. Cover with a polyethylene sleeve and seal with a wrap around shrink sleeve.

**Insulation:** If insulation within the conduit becomes wet, then force ventilate the air space in the system at a rate of not less than 3 cubic feet per minute, and apply heat through the internal piping. Introduce the air through the system's high point vent, and force out the low point drain. Caution personnel regarding the possibility of a steam flash out of the low point drain while air is being forced through the system. Place a cool mirror at the exhaust point for a short time at appropriate intervals and position to indicate maximum fogging due to moisture. Continue ventilation until the mirror exhibits no visible fogging.

**System Shutdown:** If the system is shut down for any length of time, seal the system vents by plugging the goose neck or removing it and installing a plug. Purge with dry nitrogen before sealing system. The vents must be opened and the goose neck replaced before the system is turned on again. This will prevent moisture entry during shutdown.

**Manholes:** Automatic sump pumps, if any, should be thoroughly inspected for proper operation annually. Steam traps, if any, should be routinely inspected and/or replaced, based upon the recommendations of the manufacturer. All flanges should be checked for leakage and tightened if necessary. Any evidence of groundwater leakage should be investigated and repaired. Gland seals, end seals, and the inside wall of prefabricated steel manholes should be routinely inspected for leaks and/or corrosion. Sand and repaint any corrosion to match the existing coating. Check valves routinely for leaks and repack when necessary. Insulation and jacketing of internal piping and equipment should routinely be checked and replaced when necessary. Warranty will void if manholes flood over Rovanco's piping systems.

*If you have any questions about anything in this instruction manual, or have any difficulty in completing the work please feel free to contact ROVANCO's Customer Service Department at our main office in Joliet, Illinois (815) 741-6700.*

*Thank you once again for showing your confidence in ROVANCO by purchasing our Hi-Temp Insul-8 products. We want you to know that we have a full line of pre-insulated and pre-fabricated piping systems for almost any temperature, pressure, or site condition.*

*If you are not familiar with our complete product line and you would like to know more about our product or would like to have our local Manufacturer's Representative call on you, call ROVANCO at (815) 741-6700, at rovanco.com, or email us at marketing@rovanco.com*

## Section 18: Parameters For Properly Installing & Operating Systems

Rovanco's pre-insulated and pre-fabricated products are carefully engineered to function as intended. If these products are properly installed, fully-tested, maintained and operated within the parameters for which they were designed, these systems should provide the user with years of trouble-free, efficient operation.

Refer to Rovanco's Installation Instruction(s) and the associated documentation from Rovanco's Engineering Department for important information and instructions that will carefully detail installation, testing, operating, and maintenance procedures. If needed, you are always welcome to contact Rovanco for assistance.

Failure to comply with the procedures as outlined in the Installation Instructions and Engineering support documentation could result in product damage, reduced product service life, costly repairs due to product failure, hazardous conditions which could result in injury to people, property and/or equipment. In addition, it will void Rovanco's warranty.

**If any Rovanco product does not perform as it is intended to, please inform Rovanco immediately.**

Some problems and their potential causes are listed below. Although this list is not all-inclusive, you may be able to find additional information in Rovanco's Installation Instruction(s) and/or the Engineering Department documentation.

### General Piping System Care:

- Wet insulation does not perform as intended and causes the premature failure of the system. Therefore, it is important the system's insulation is kept dry at all times. This includes during storage, installation and when system is operating.
- Our systems have been engineered to operate within a specific temperature & pressure range and under appropriate environmental conditions. Therefore, do not install or put our systems into service if these parameters are not within the product's specifications.
- If you find it is necessary to alter a Rovanco piping system, review the planned alterations with Rovanco or a qualified piping system designer before making any changes.
- Maintenance plays an important role in assuring you get the full service-life out of the system. Rovanco systems are designed to provide years of trouble-free operation, but changing conditions can affect that. So, systems should be inspected regularly to verify they are in good operating condition and functioning as intended. If repairs are required, make them promptly.

### Pre-Insulated Foam Systems:

- Piping systems must be kept dry. Moisture of any amount can corrode carrier pipe and prematurely breakdown insulation. This will shorten piping system service-life and/or prevent it from operating properly. Keep all piping system dry during storage, installation and when it is operating.
- Assure field joints are completed correctly. This includes the proper field insulating and enclosing the outer jacket in the joint area. Improper completion of field joints could result in water ingress effecting carrier pipe and/or insulation.
- Damage to jacketing must be repaired immediately. Failure to do so could allow moisture to reach the insulations and/or carrier pipe.
- When installing piping systems designed for underground use that require external expansion pads, you must assure these expansion pads are properly installed according to specifications. Proper installation will allow for associated thermal expansion. Improperly installed expansion pads will put unwanted stress on a piping system that could damage it.

## **Conduit & Containment Systems:**

- Moisture negatively affects a systems functionality and shortens its service-life. Moisture will corrode carrier, conduit & containment piping, leak detection or pull cables and it will degrade insulation. It is important that the air space in these systems is kept dry. If any type of moisture is detected, it must be dried immediately so system is returned to a dry state during installation and operation.
- A combination of moisture in the air space and high operating temperatures will accelerate the destruction of piping, its coating and any insulation. This can result in costly repairs, system damage and possibly system failure. Therefore, do not ever operate these systems under the negative conditions of moisture presence and high temperatures.
- Gland seals provide a seal against a service pipe while still allowing that service pipe to have axial movement. Therefore, it is important all gland seals are adjusted properly to these conditions are met and there is no binding of the service pipe.
- End seal vents and drain piping play an important role in keeping the air space dry. They allow the annular air space to vent and drain as well as prevent moisture ingress. So it is important end seal vents and drain piping is installed properly. This will allow them to function as intended.
- One important detail that will help keep the air space dry and drainable is to assure the piping system is installed with the proper slope so any moisture can drain as intended.

## **Systems Intended For Underground Installation:**

- Plan for adverse weather conditions prior to installation. If trenches gather water, they must be drained prior to the installation of the piping.
- Inspect all steel piping that will be buried prior to backfilling using a Holiday tester. Any holidays or damage to coating must be repaired in accordance with Rovanco's installation instructions prior to backfilling. Failure to repair voids or damage to coating will promote premature corrosion and effect system performance and length of service.
- Prior to backfilling, all carrier pipe, conduit and containment piping must be tested. If piping system integrity is not tested prior to backfilling, it will result in costly excavating and will not be Rovanco's responsibility.
- Cathodic protection system must be installed with thin-coated steel conduit or containment that will be direct buried. The cathodic protection will prevent the premature corrosion of thin-coated steel piping system.
- Line trench accordingly before piping installation. Backfill and compact post-installation in accordance with Rovanco's installation instructions. If these procedures are performed properly, it will help prevent damage to the system when the ground settles.
- Manholes must be kept dry at all times. Installing sump pumps, keeping end seals above water levels and not installing manholes in low points will help prevent water from draining into them.