

Rovanco® Piping Systems

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Insul-8® Pre-Insulated Below Ground Foam Installation Instructions

INS-SO1

Revised 07/01/26

This instruction manual will give you all the information needed in terms of techniques, tools, and accessories required to install ROVANCO Insul-8 Below Ground Foam system. 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-8 Below Ground Foam system.

UNLOADING

ROVANCO Insul-8 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 as shown in illustration below** 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 to the piping, insulation, conduit or coating.**

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 6-12 months after delivery. Freezing or high temperatures may affect the product’s ability to perform their functions. If you are expecting or experiencing cold or freezing temperatures, move foam kits to a more suitable environment between 60°-80°F. 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.

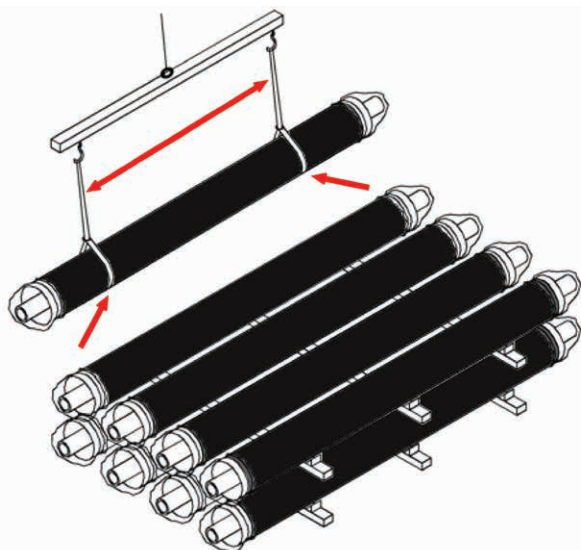


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NOTE:

Do not start until you have read and understand the instructions from beginning to end.

Testing

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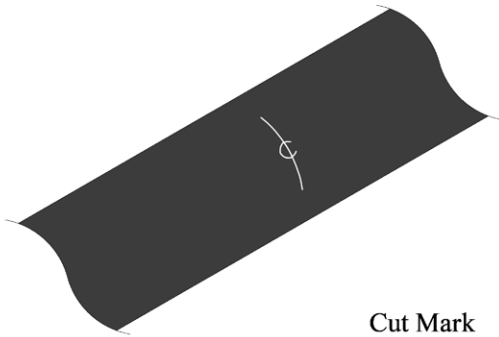
ROVANCO's products and processes are covered under various US patents, including, but not limited to 4,084,842 - 4,484,386 - 4,221,405 - 3,793,411.

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

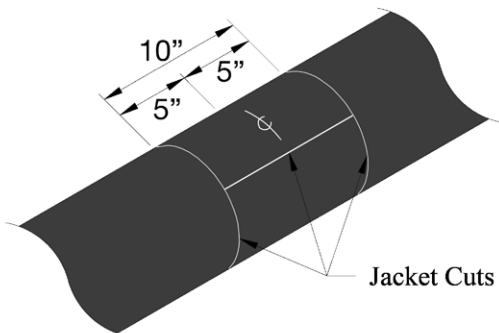
Section 1: Pipe Cutting Instructions

Fig. 1.1



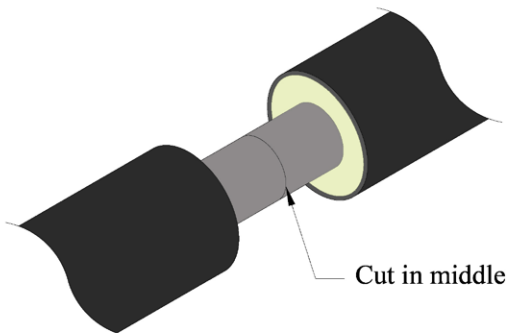
1. Select the point at which the pipe is to be cut and mark it on the casing. **See Figure 1.1**

Fig. 1.2



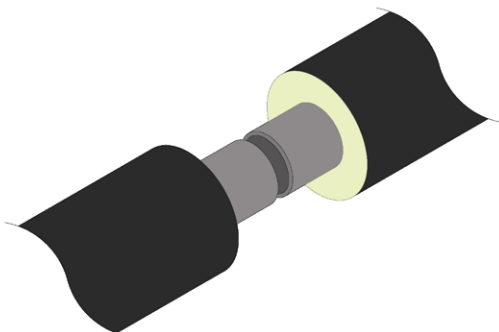
2. Measure the distance, 6" or 8" back each way from the cut mark and draw lines using a wrap around. **See Figure 1.2.** Measure a factory end for appropriate distance. Using a saber saw, hand saw or similar tool, make the two circumferential cuts, taking care not to cut into the carrier pipe. Make a longitudinal cut on one side of the jacket. The jacket and foam can now be easily removed. **See Figure 1.3**

Fig. 1.3



3. Use a wire brush or scraper, to remove the foam residue from the carrier pipe. Cut the pipe and dress the ends appropriately. **NOTE: Prior to any carrier field welds, pipe ends must be prepped in the field by contractor.** **See Figure 1.4**

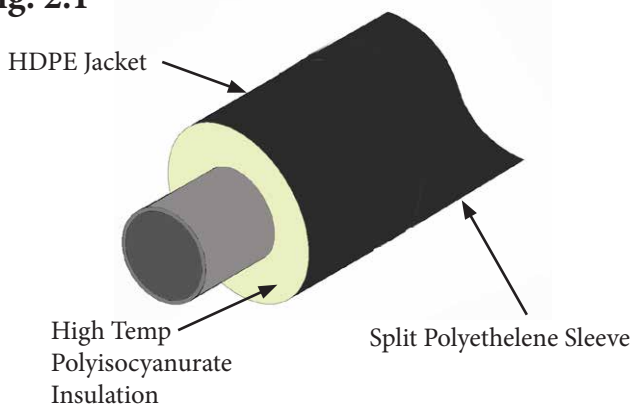
Fig. 1.4



4. Weld or otherwise connect the fitting into place. Take the piece that you have cut off to start your change of direction so that you don't end up with too many short lengths of pipe.
5. Rovanco recommends that all carrier pipes be tested per the projects specifications prior to insulating, pouring thrust blocks, or backfilling the system.

Section 2: Installation of Spool Pieces

Fig. 2.1



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. Understanding how this system is configured will help during installation. **See Figure 2.1**

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. See Figure 2.2**

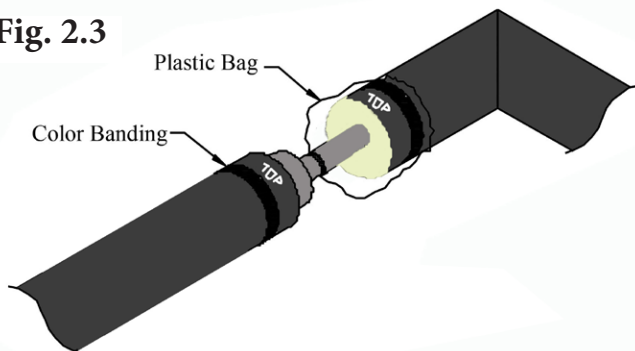
Test cans can be used at the open ends of the systems to prevent water from entering the system. It is very important that the insulation is kept dry during installation!

Fig. 2.2



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.

Fig. 2.3



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 2.3**

Fig. 2.4



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 2.4**

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.

Fig. 2.5

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Piping systems, Inc.

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

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

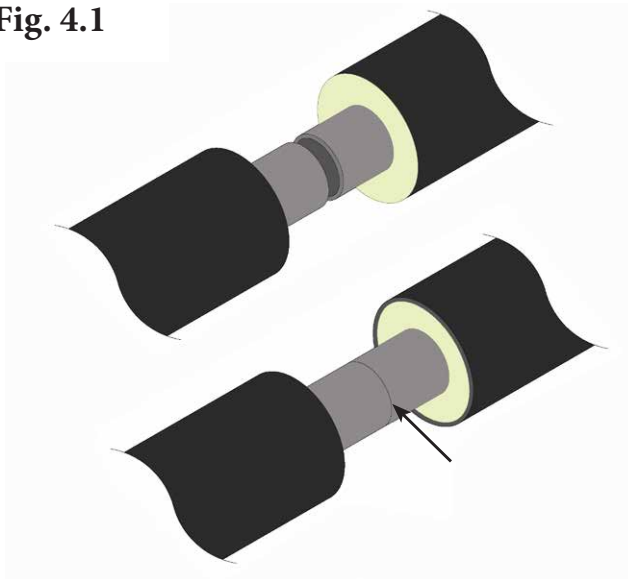
See Figure 2.5 for a label example.

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: 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.

Align carrier pipes and weld entire perimeter of carrier pipe joining. Be sure both ends of carrier pipes are clean of any debris before welding. **See Figure 4.1**

Fig. 4.2



Wrap joints similar to this example

If the carrier pipe is not welded immediately, the field joint should be wrapped with plastic to prevent moisture & debris from getting into the system. **See Figure 4.2**

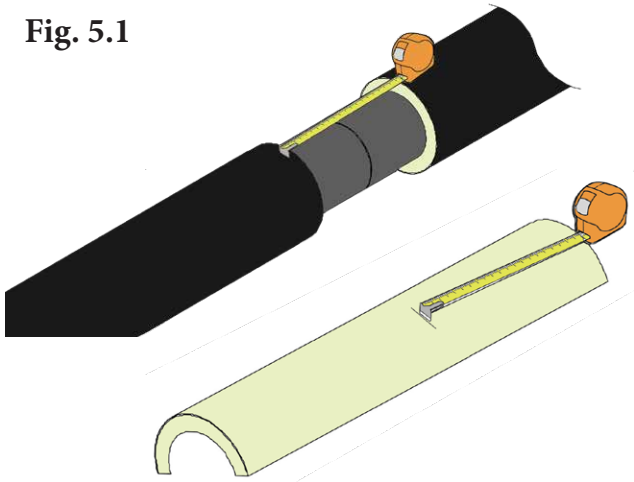
If your system has RhinoJoints or full round HDPE wraps (both optional), you can slide those over joint before covering with plastic to provide added protection.

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: Sectional Insulating of the Field Joint

If your systems has RhinoJoints, see Rovanco Installation Instructions INS-RJAT. If you are insulating with poured in place foam, go to Section 6.

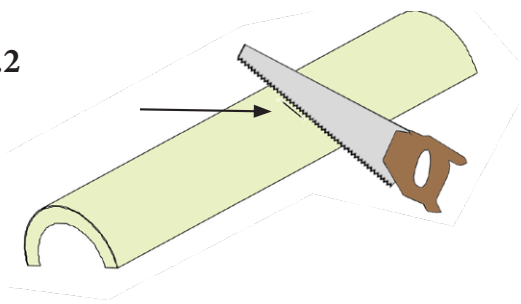
Fig. 5.1



The carrier pipe must be fully tested before insulating the joint.

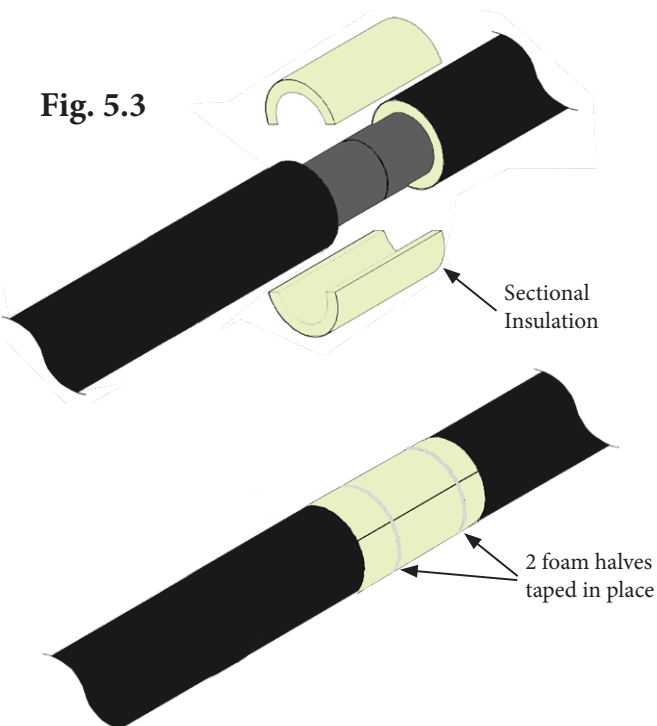
For sectional insulation, measure each joint area width. Then measure the insulation and mark the width of the joint on the insulation. **See Figure 5.1**

Fig. 5.2



Cut the insulation to the same size as the joint with a hand saw. **See Figure 5.2**

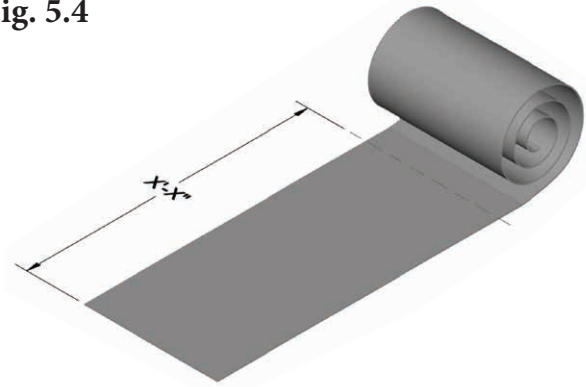
Fig. 5.3



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.

Put the two insulation halves in place so the edges of the foam meet and secure them in place by banding or taping them together as shown. **See Figure 5.3**

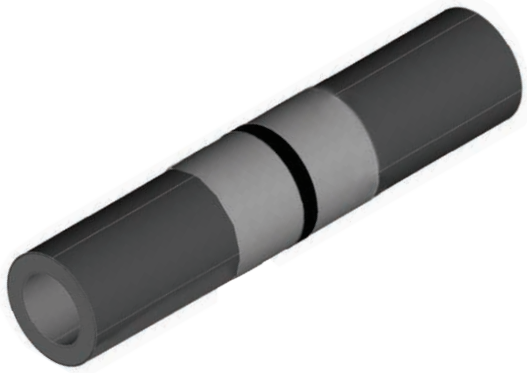
Fig. 5.4



Cut the polyethylene sleeve to length. Refer to page 11 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". **See Figure 5.4**

After cutting polyethylene wrap to length, wrap it around the center of the foam and joint. Pull it tight so it fits snugly around HDPE jacket and joint. Secure polyethylene wrap in place with a piece of tape in the center of the wrap. **DO NOT** wrap tape around the ends of the polyethylene wrap. **See Figure 5.5**

Fig. 5.5

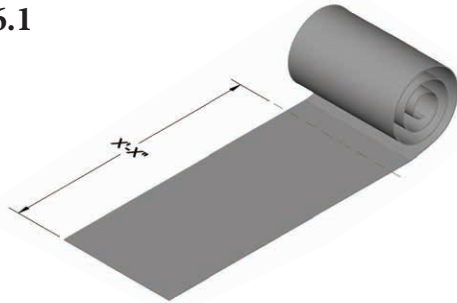


Next, the shrink wrap will be applied over the joint and polyethylene wrap. Go to Section 7 on page 11 for those instructions.

Section 6: Pour In Place Insulating of the Field Joint

If your system has RhinoJoints, see Rovanco Installation Instructions INS-RJAT. If you are insulating with sectional foam, go back to Section 5.

Fig. 6.1



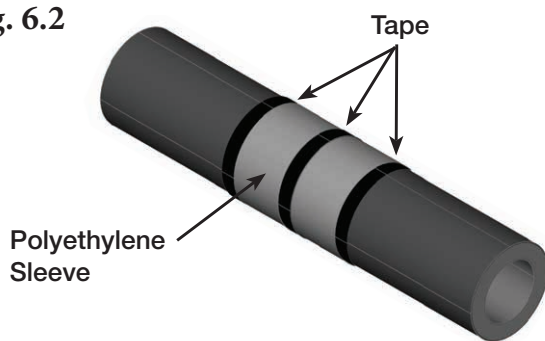
The carrier pipe must be fully tested before insulating the joint.

Cut the polyethylene sleeve to length. Refer to page 11 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".

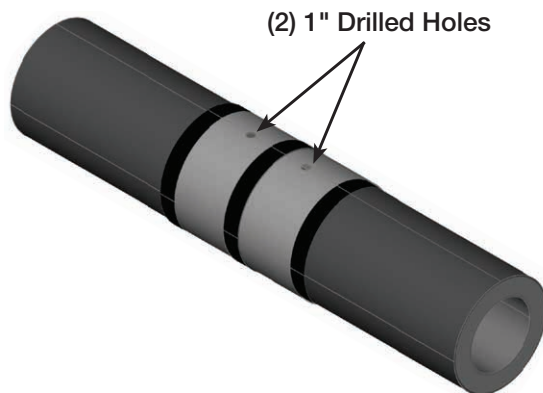
See Figure 6.1

Fig. 6.2



Wrap the provided polyethylene sleeve around the joint 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 in the middle as well as both ends. **See Figure 6.2**

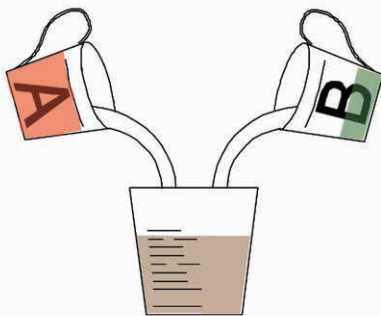
Fig. 6.3



Drill (2) 1" holes in the polyethylene sleeve at opposite ends as shown. **See Figure 6.3**

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.

Fig. 6.4

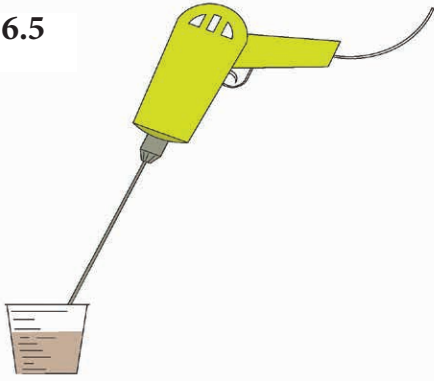


Label your measuring cups with the letters A & B to prevent a mix-up later on. Examine the mixing charts on page 9, then pour the correct amount of A & B agents into the separate measuring cups. Make sure to have the right size joint from the table. Some larger sizes require two or three separate pours.

Pour the measured amounts of A & B material into a 3rd mixing cup to combine. **See Figure 6.4**

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

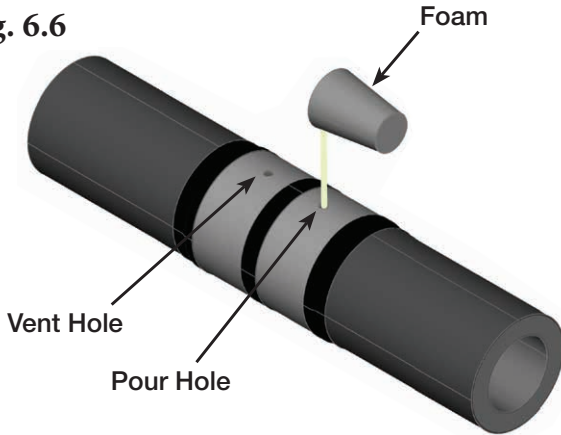
Fig. 6.5



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 6.5**

The cream time is shown on the graph on page 10.

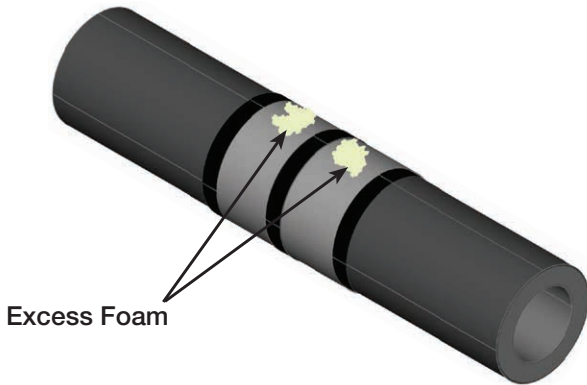
Fig. 6.6



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 6.6**

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. 6.7

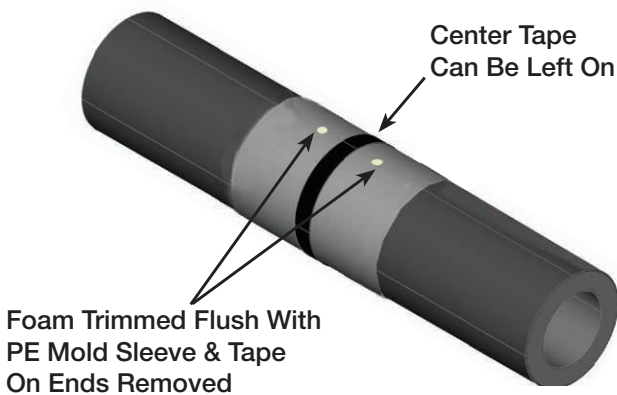


After the poured foam stops rising and is dry to the touch, foam should be sufficiently cured. Cut any excess foam off with a knife or sharp object so it is as level with the polyethylene mold sleeve as possible.

IMPORTANT: 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 6.7 & 6.8

Fig. 6.8



A wrap around shrink sleeve must be heated and shrunk over the polyethylene wrap, the shrink material is 24" or 36" wide and should be centered over the polyethylene wrap. 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 Section 7 starting on Page 11.

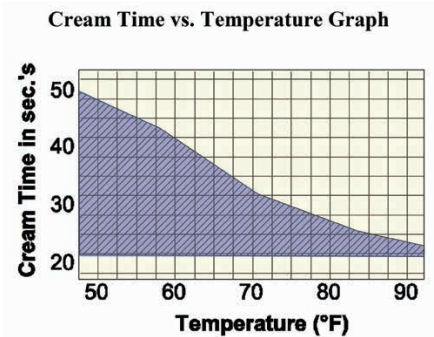
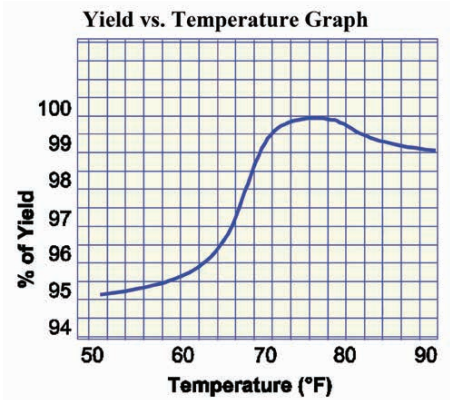
Note: For best results, store and maintain A & B components as close to 70 degrees (f) as possible. In temperatures below 70° F, for best performance, pre-heat pipe and molds. Read S.D.S thoroughly, you are using chemicals which could present a hazard if used improperly. This page illustrates the proper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

Insul-8 POLYISOCYANURATE Mixing Table — In OUNCES —

Parts “A” & “B” Are NOT a 50/50 Mix Ratio (see table below)

NOTE: Depending on outside conditions when installing, slightly more/less foam may be required.

Carrier	Cross Section	Straight Joint		Elbow		Tee	
	Jacket	Ounces “A”	Ounces “B”	Ounces “A”	Ounces “B”	Ounces “A”	Ounces “B”
1"	4	4	2	4	2	6	3
	6	8	4	10	5	16	8
	8	16	8	20	10	28	14
1 1/4"	4	4	2	4	2	6	3
	6	8	4	10	5	16	8
	8	16	8	20	10	28	14
1 1/2"	4	4	2	4	2	6	3
	6	8	4	10	5	14	7
	8	16	8	20	10	28	14
2"	6	8	4	10	5	14	7
	8	16	8	20	10	28	14
	10	28	14	28	14	44	22
2 1/2"	6	8	4	8	4	14	7
	8	16	8	16	8	28	14
	10	24	12	28	14	44	22
3"	6	8	4	8	4	12	6
	8	16	8	16	8	24	12
	10	24	12	28	14	42	21
4"	8	12	6	16	8	22	11
	10	22	11	28	14	40	15
	12	32	16	44	22	62	31
5"	10	20	10	24	12	36	18
	12	32	16	40	20	58	29
6"	10	16	8	20	10	28	14
	12	28	14	36	18	54	27
8"	12	20	10	28	14	40	20
	14	32	16	48	24	72	36
10"	14	22	11	32	16	48	24
	16	40	20	60	30	88	44
12"	16	28	14	44	22	60	30
	18	44	22	72	36	106	53
	20	64	48	106	53	160	80
14"	18	36	18	60	30	88	44
	20	56	28	96	48	144	72
16"	20	40	20	70	36	104	52
	22	64	32	112	84	166	83
18"	22	44	22	82	41	124	62
	24	68	34	128	64	194	97
20"	24	48	24	96	48	144	72
	26	76	38	148	74	224	112
22"	26	52	26	110	55	162	81
	28	82	41	170	85	256	128
24"	28	56	28	124	62	186	93
	30	88	44	192	96	288	144



rev 07/01/26

Section 7: 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 of shrink wrap should be cut to provide for a **minimum of 4" overlap** when wrapped around the joint.
- 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 burs 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 11 for optimal results.
- **Cut shrink wrap to desired length to properly overlap a minimum of 4" (10 cm).** The table on page 11 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 8: 90 and 45 Elbow Instructions

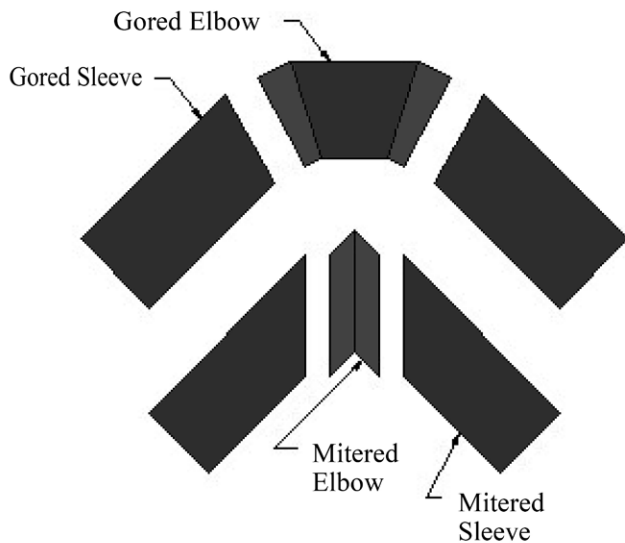


Fig. 8.1

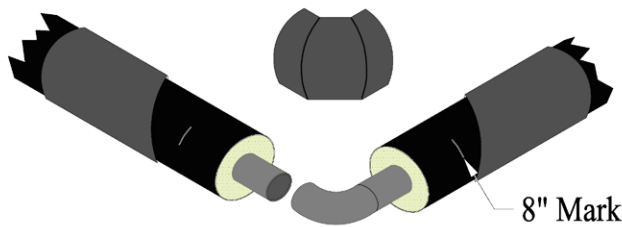
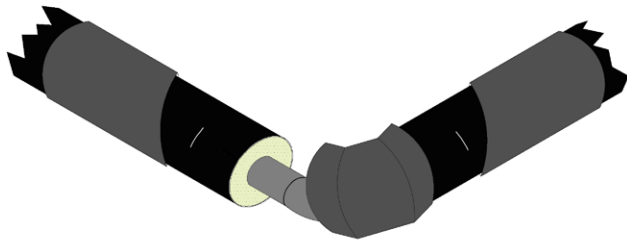


Fig. 8.2



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.

Depending on the radius of the 90° elbow, you will receive a single miter fitting cover kit or a double miter (gored) fitting cover kit.

Prior to joining the carrier pipes to the fitting you will need the fitting cover, and two matching sleeves.

Note: Polyethylene sleeves are provided with a split down the length of the sleeve. The split must be overlapped prior to taping the sleeves in place.

1. Slide the sleeves and the fitting cover over the jacket. Join the fitting to one end of the carrier pipe. Make reference marks on jackets 8" from end of insulation. This will tell you where to drill the holes when you foam the joint.

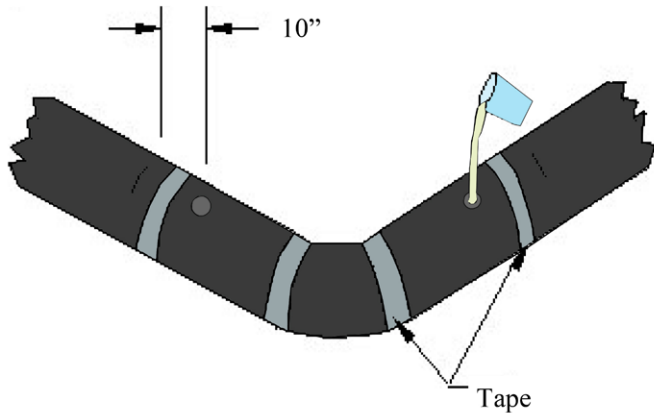
See Figure 8.1

2. Slide the fitting cover over the fitting and pipe and slide them out of the way so you can join the carrier pipe fitting to the second pipe. Weld the other pipe, and test pipe per specifications.

See Figure 8.2

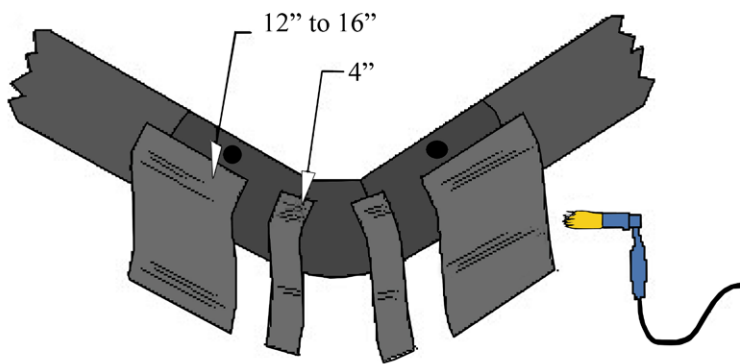
Note: Often the center gore piece cannot be slide far enough out of the way to weld pipes together. If this happens, center gore may have to be split in half and re-installed back together by securing with duct tape before pouring foam. Any questions, please consult factory.

Fig. 8.3



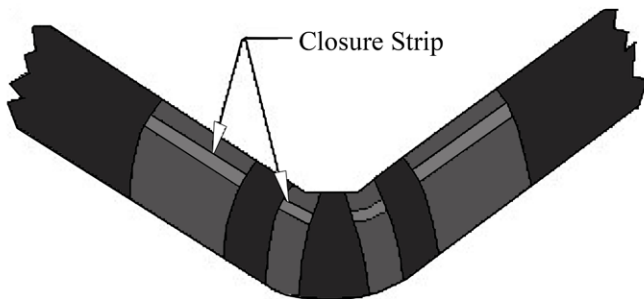
3. Slide the mitered sleeves into position over the fitting cover. Tape the seams on each sleeve using duct tape. Drill a 1" hole at 1 or 2 o'clock on each side 10 inches from your reference marks. The hole may need to be larger for jacket sizes larger than 10". On large diameter fittings, one or more holes can be drilled in the middle either inside or outside of the elbow. Insulate the joint using the General Foaming Instructions in Section 6. **See figure 8.3**

Fig. 8.4



4. After the foam has set up, clean off the excess foam and tape from the jacket. Refer to "Wrap Around Shrink Instructions" chart in **Section 7** for the required length of shrink material. Cut the shrink to the width needed to cover the seams, holes, and miters. **See figure 8.4**

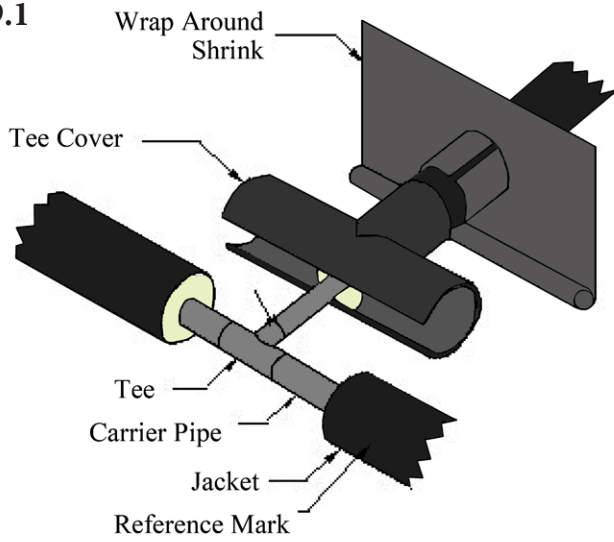
Fig. 8.5



5. Apply the shrink wrap and closure strip using the shrink wrap instructions in **Section 7**. **See figure 8.5**

Section 9: Tee Instructions

Fig. 9.1



NOTE: Prior to any carrier field welds, pipe ends must be prepped in the field by contractor. Once welded, test carrier pipe per job specifications.

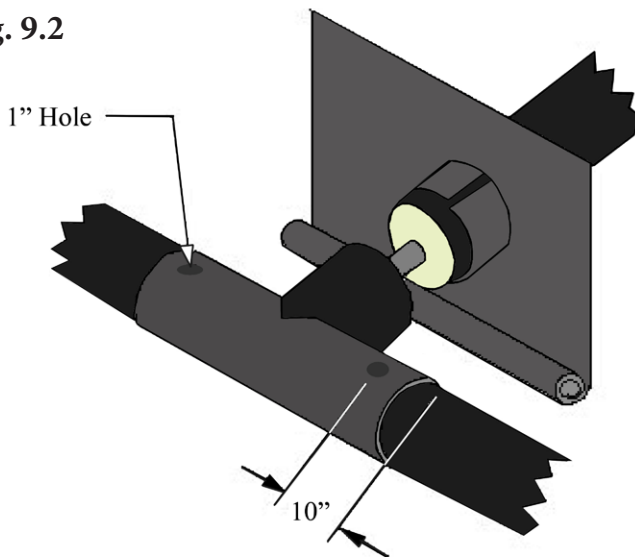
NOTE: During the welding process do NOT use anti-splatter or any type of lubricant IF your system has leak detection. These materials can cause the leak detection to fail.

1. Rovanco has provided 24" wide shrink wrap material for sealing seams on all field joints. Refer to the chart in Section 7 for the shrink wrap cut lengths. Cut a hole in one piece of shrink wrap using a sleeve as a pattern. Slide the piece of shrink and the tee cover over the branch line prior to making the tee connections.

See figure 9.1

Join the carrier pipe and test per job specifications.

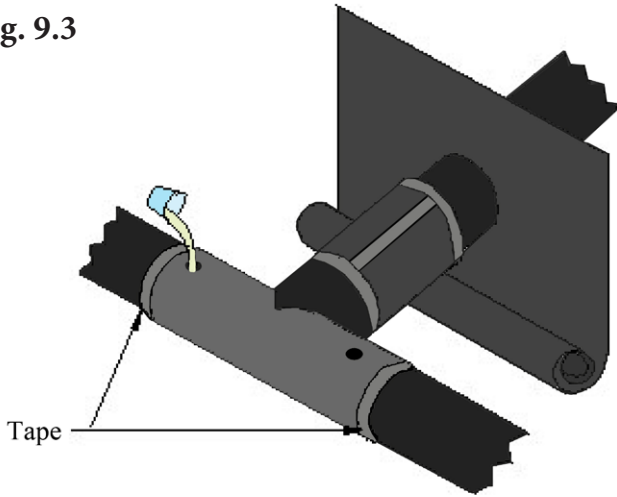
Fig. 9.2



2. Slide the tee cover over the jacket. Measure 10 inches back from your reference marks and drill two 1" holes on each side of the tee.

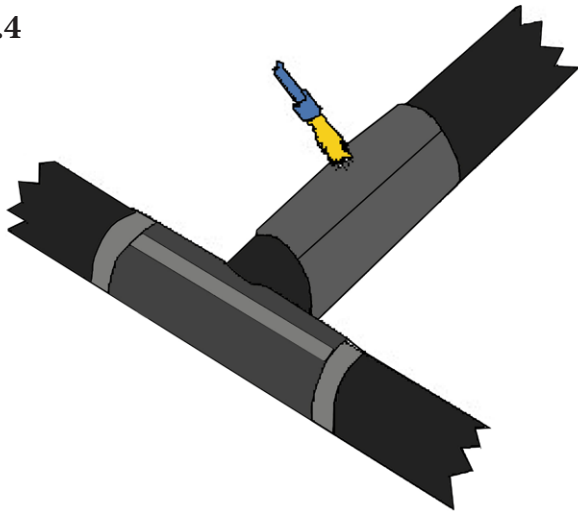
See figure 9.2

Fig. 9.3



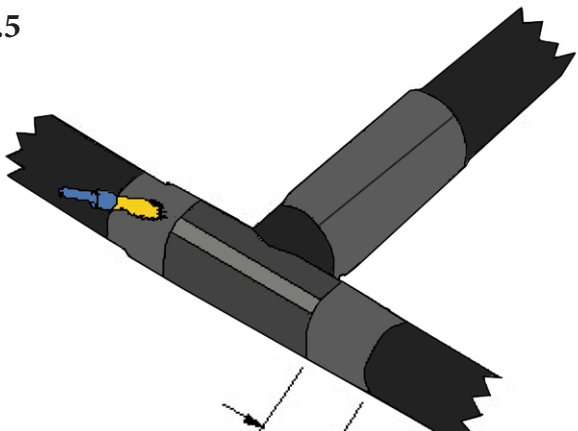
3. Apply the split mold to the branch about 1" away from the tee cover. Tape all circumferential seams and insulate per "General Foaming Instructions" in **Section 6**. See **Figure 9.3**

Fig. 9.4



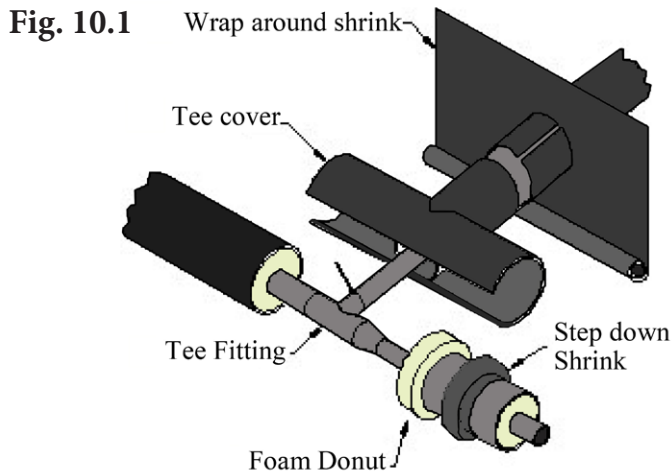
4. Remove the tape from all seams. Clean off excess foam from the pour areas. Slide the pre-cut shrink wrap over the tee. Shrink this portion and the split sleeve closure first. Refer to **Section 7** for detailed shrinking instructions. See **Figure 9.4**

Fig. 9.5



5. Next use two 12" wide pieces of shrink to cover the rest of the tee on each side. See **Figure 9.5**

Section 10: Jacket Decreaser Instructions

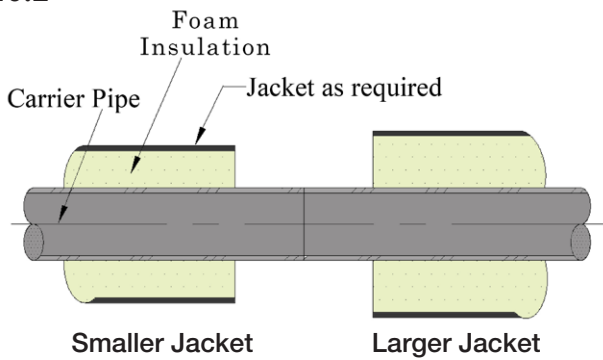


This kit is used when the jacket diameter decreases at a tee.

1. Slide the step down shrink and foam donut over smaller diameter jacket. Join and test carrier fitting. **See Figure 10.1**

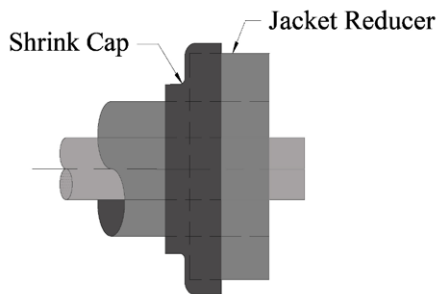
2. Proceed with steps 2 thru 5, of **Section 9**.

Fig. 10.2



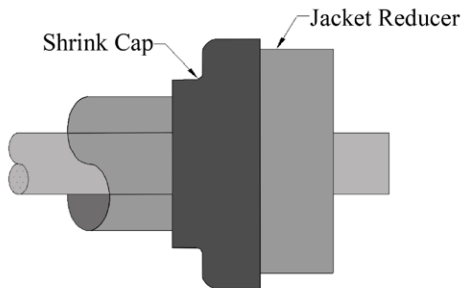
3. Slide the foam donut onto end of smaller jacket. Apply step down shrink over the end of the tee cover. Slide the shrink end cap onto the smaller pipe (small end first), before welding the carrier pipe. Heat large diameter side first. Let cool. Shrink smaller diameter side down. Similar to "Shrink End Seal Instructions" in **Section 12**. **See Figure 10.2**

Fig. 10.3



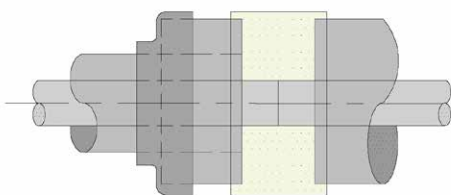
4. Then slide the insulated jacket reducer over smaller pipe flush with the insulation. **See Figure 10.3**

Fig. 10.4



5. Heat the shrink wrap to the existing jacket and up over the jacket reducer. **See Figure 10.4**

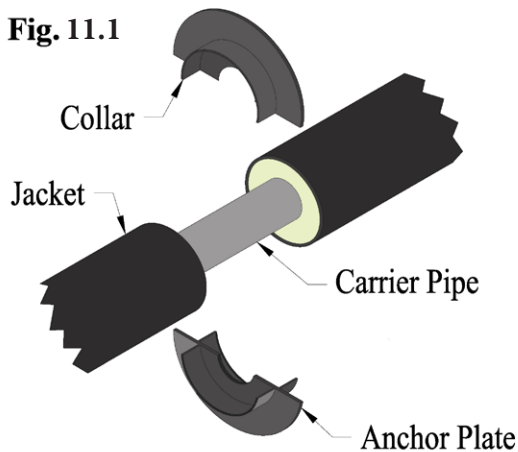
Fig. 10.5



6. Now foam the joint per the installation instructions and seal with a shrink sleeve the same as for all the other joints. **See Figure 10.5**

Section 11: Anchor Instructions

Fig. 11.1



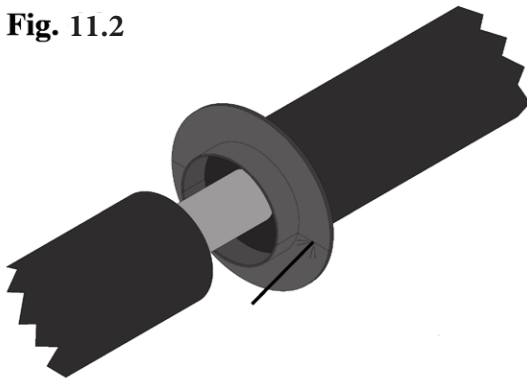
NOTE: During the welding process do NOT use anti-splatter or any type of lubricant IF your system has leak detection. These materials can cause the leak detection to fail.

If an anchor location occurs in the middle of a length of Insul-8 pre-insulated pipe, refer to **Section 11A**. If the anchor point occurs at a field joint, refer to **Section 11B**. The foaming procedures for both types are the same, explained in **Section 6**.

The anchor plate has a ring welded on both sides. The smaller ring is the same size as the jacket. The larger ring fits over the jacket.

See **Figure 11.3**

Fig. 11.2

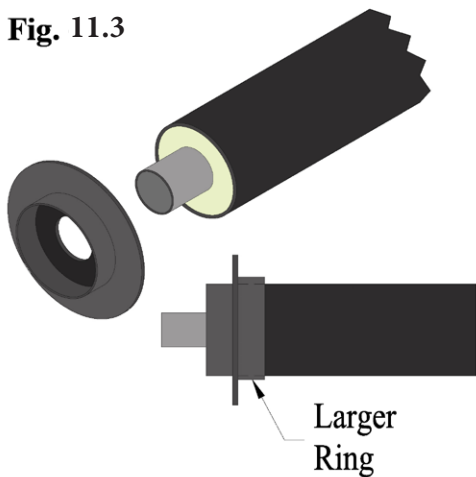


Section 11A: Anchor in the Middle of the Length

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.

1. Determine desired anchor location and mark jacket. Remove 10" of PVC jacket and insulation from one side of mark, as described in "Pipe Cutting Instructions" in **Section 1**. Split the pre-fabricated anchor assembly with a torch or a band saw. See **Figure 11.1**

Fig. 11.3



2. Center the anchor plate on pipe, and weld the two halves back together.

See **Figure 11.2**

Slide the anchor on the carrier pipe, with the larger ring toward the jacket.

See **Figure 11.3**

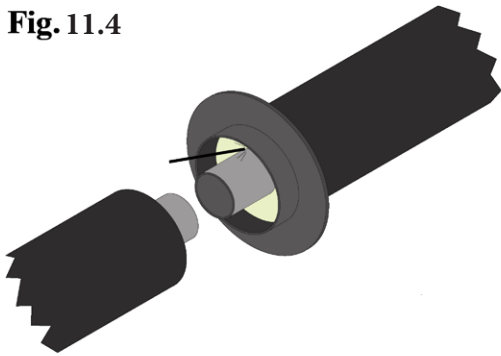
The anchor plate should be against the end of the jacket with the larger ring over the jacket. Weld the anchor plate to the carrier pipe.

See **Figure 11.4**

Go back to **Section 6** for foaming instructions.

Section 11B: Anchor at a Field Joint

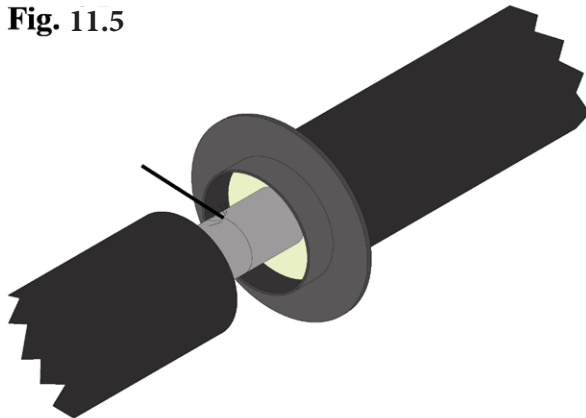
Fig. 11.4



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.

1. Slide the anchor on the carrier pipe, with the larger ring toward the jacket. The anchor plate should be against the end of the jacket with the larger ring over the jacket. Weld the anchor plate to the carrier pipe. **See Figure 11.4**

Fig. 11.5

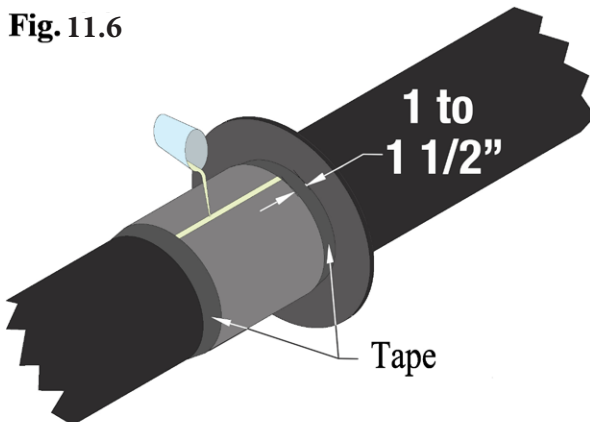


2. Weld joint and test per specifications before foaming joint. **See Figure 11.5.** Continue to **Section 6** for foaming instructions.

Section 11C:

Note: Foam insulation to insulate this joint the same as a straight joint in **Section 6**.

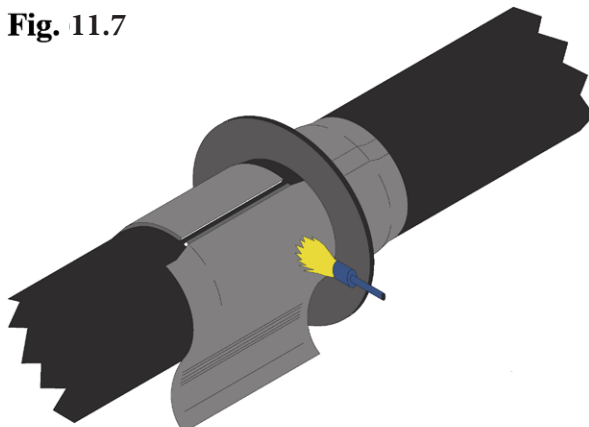
Fig. 11.6



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.

1. Center the split mold over the opening so that the seam is at about 1 o'clock. Make sure to leave between 1" and 1½" from the anchor plate to the edge of each mold. Tape in place and insulate per "General Foaming Instructions" in **Section 6**. **See Figure 11.6**

Fig. 11.7

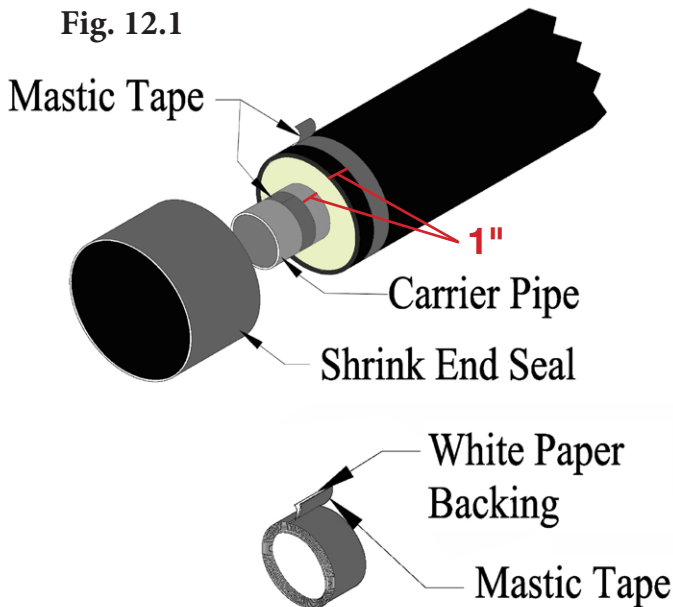


2. Once you have filled the split mold, allow the foam to set for approximately 10 minutes. Then remove the tape and apply wrap around shrink to the sleeve. Refer to shrink instructions in **Section 7**. **See Figure 11.7**

Cut another piece of shrink material to fit around the jacket. Cut the 24" wide piece into (3) 8" pieces. Cut (3) 8" pieces of closure material also. Apply one of the 8" pieces to the other side of the anchor per the shrink instructions.

Section 12: Shrink End Seal Instructions

Fig. 12.1



Where field cuts are required to have shrink end seals, ROVANCO will provide field applied shrink end seal sleeves. These can also be used for end terminations or anchors.

1. Check the jacket at the end of the pipe where the end seal is to be applied. Remove any burrs or sharp edges with a file. Locate the proper size end seal and slide it over the jacket prior to joining carrier pipe.

2. Mastic tape is supplied and must be installed on both the carrier pipe and the jacket prior to installing the shrink end seal. The mastic tape on the carrier should be about 1" from the foam and the mastic tape on the HDPE jacket should be about 1" from the end of the jacket.

See Figure 12.1

3. Center the end seal so that an equal amount of the end seal is overlapping the carrier pipe and jacket.

4. Start from the end of the shrink seal that is on the HDPE jacket working your way toward the carrier pipe end. Use a propane turbo torch to heat the end seal around the circumference of the jacket until it is completely shrunk. Be careful not to apply direct heat to the jacket. **See Figure 12.2.**

Note: Excessive heat in one area can burn the end seal. Be sure to distribute heat evenly & thoroughly.

5. Continue heating the shrink down toward the carrier pipe by aiming flame at an angle where carrier pipe meets insulation. **See Figure 12.3**

4. Check circumferential seams for voids and repeat process where applicable. If no voids are found the shrink end seal is complete. **See Figure 12.4**

Fig. 12.2

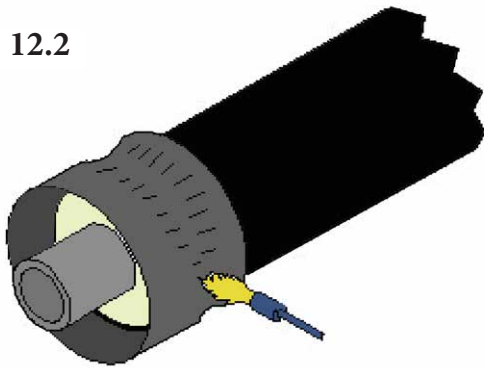


Fig. 12.3

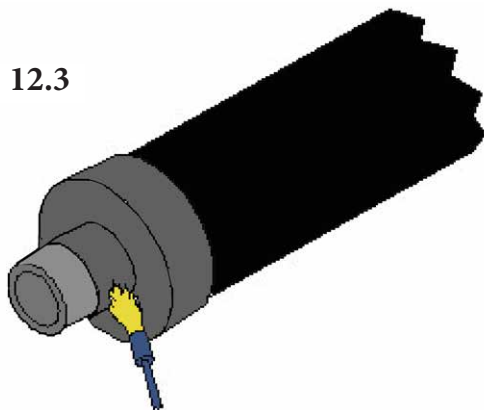
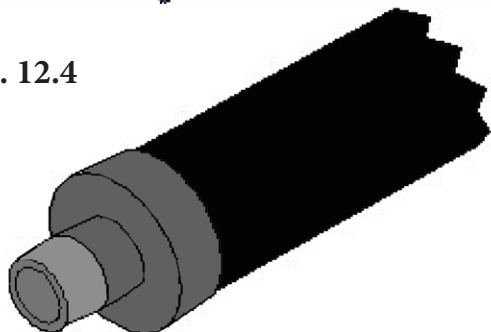
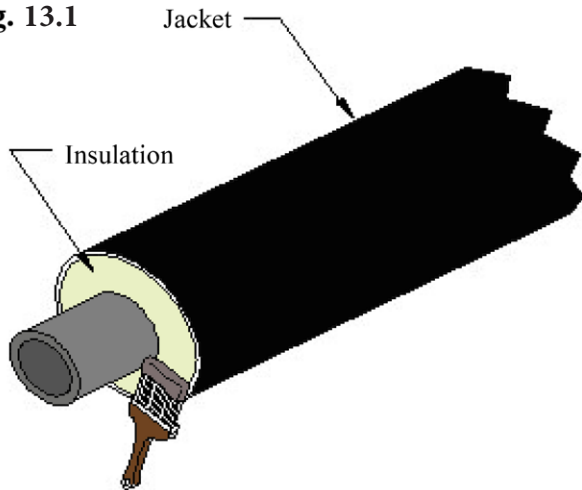


Fig. 12.4



Section 13: Mastic Type Water Tight End Seal Instructions

Fig. 13.1

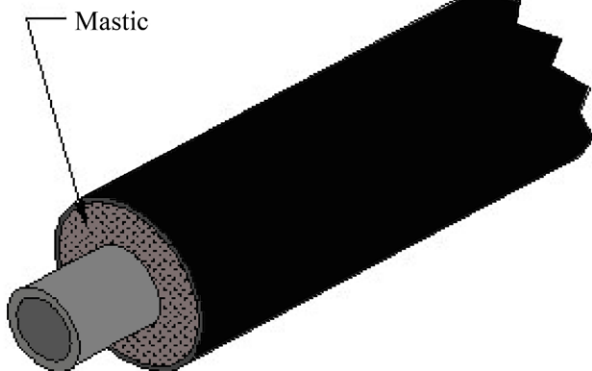


When watertight end seals are required, ROVANCO has provided mastic in one gallon containers. Insulation must be sealed where exposed to backfill or concrete anchors.

1. Stir the mastic prior to using. Apply the mastic to the insulation from the carrier pipe to the jacket using an 1½" or 2" wide paint brush.

See Figure 13.1

Fig. 13.2



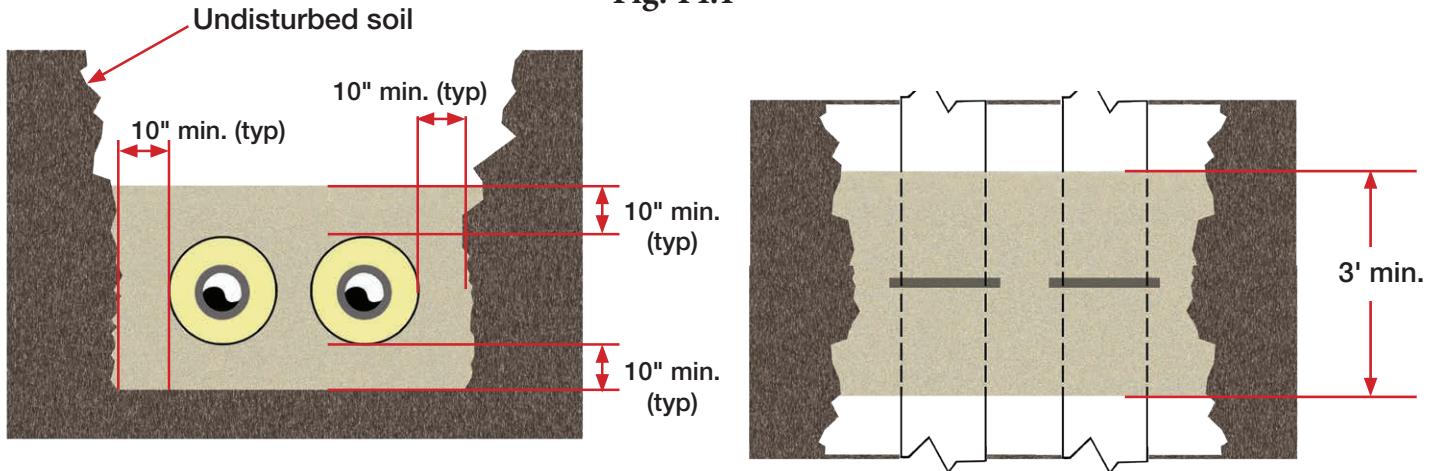
2. Inspect the mastic for voids. Apply more mastic if necessary. **See Figure 13.2**

Section 14: Pouring Concrete Anchors

ROVANCO recommends that the forms for the concrete anchor blocks 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 14.1

Make sure that the block is large enough to anchor it to the undisturbed earth.

Fig. 14.1



Section 15: Backfilling The System

The first foot of backfill must be free of frozen soil, rocks or other debris. ROVANCO recommends the use of sand backfill if not required in specifications. Hand tamp in 6" layers to one foot above the conduit. After this, a mechanical tamper may be used. See Figure 15.1

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 15.2

Fig. 15.1

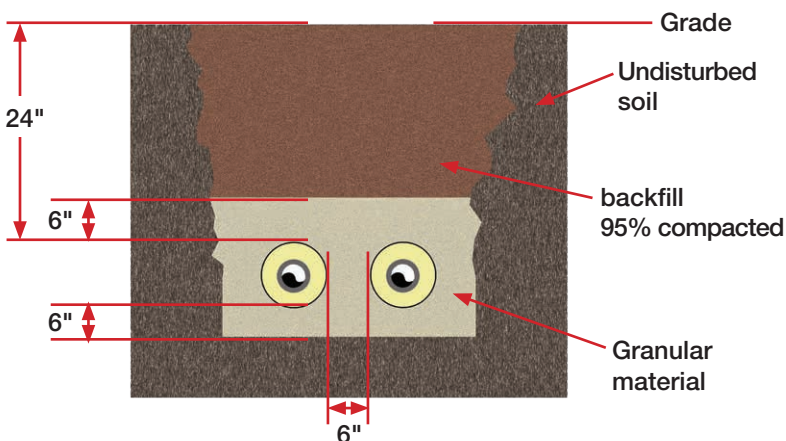
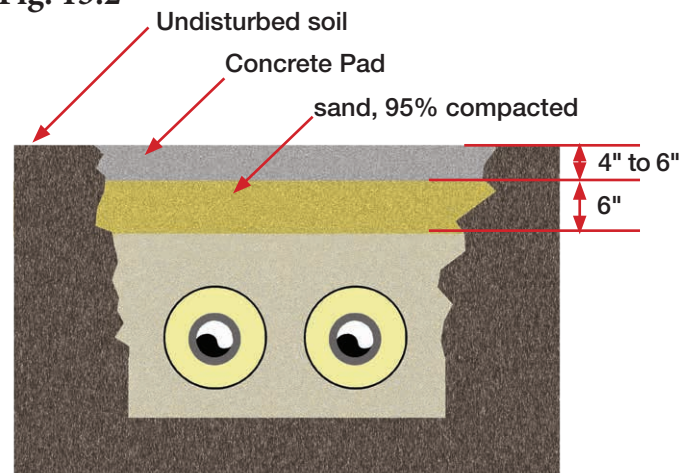
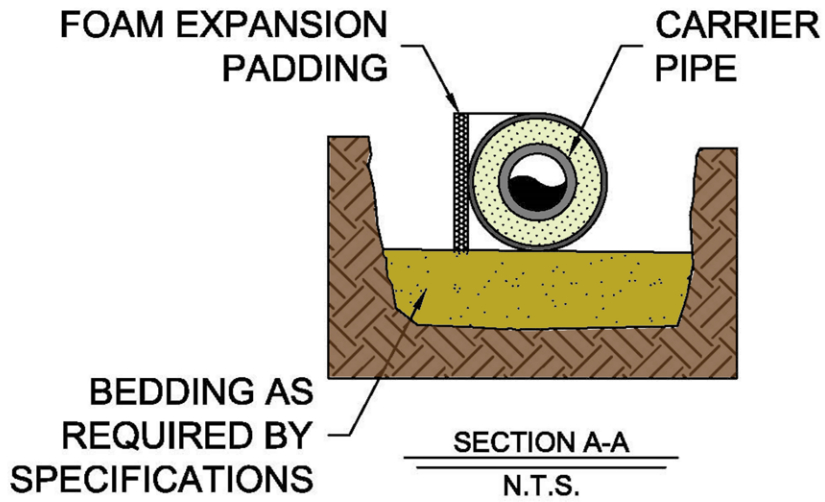
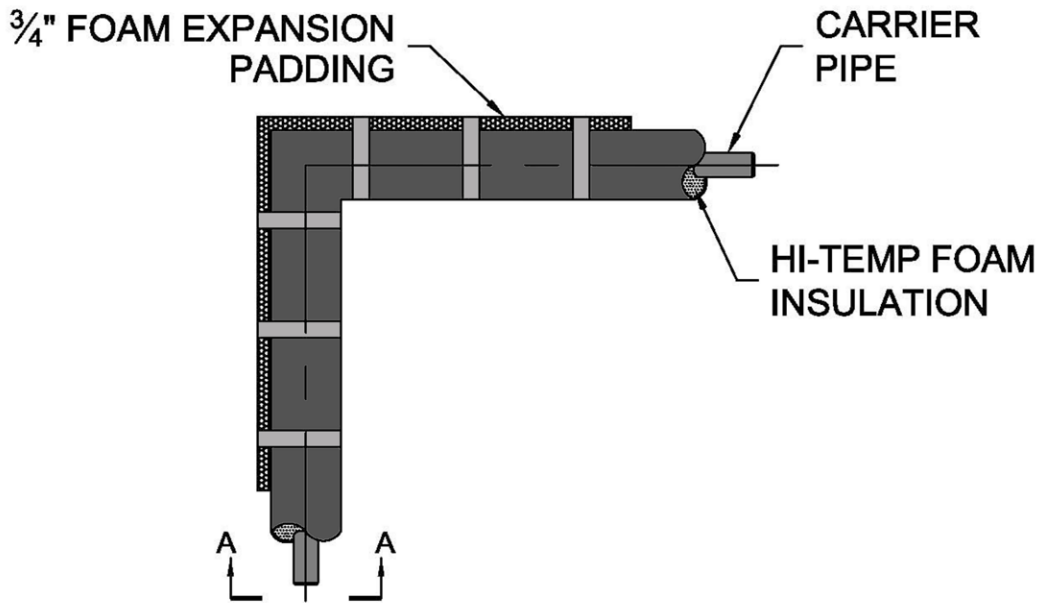


Fig. 15.2



Section 16: Expansion Padding



90° ELBOW W/ EXPANSION PAD
N.T.S.

Rovanco
Piping Systems

NAME: 90° ELBOW W/ EXPANSION PAD

APPR BY:
DK

DRAWN BY:
RMT

DATE/REV:
04/16/10

DWG NO:
FMP-EP-01

Section 17: Operation & Maintenance for Foam System

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.