

Rovanco® Piping Systems

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Rhinoflex Installation Instructions

INS-RCR

Revised 08/08/23

This instruction manual will give you all the information needed in terms of techniques, tools, and accessories required to install ROVANCO's Rhinoflex flexible pre-insulated piping system. If you follow the instructions carefully, the end result will be a high quality, Rhinoflex 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 contact your local ROVANCO Manufacturer's Representative for information about all of the products provided by ROVANCO.

INSPECTION

Inspect all shipments upon receipt. Examine all pipe and accessories as they are unloaded. Check to insure every item on the packing list is received. Check the contents of the cartons and crates to insure that the materials have arrived safely. Handle all materials carefully at all times. 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 Customer Service Department immediately of any shipping damage, shortages, overages or incorrect materials, at 815-741-6700. Do not remove the factory-applied packaging materials before beginning the installation.

UNLOADING

ROVANCO Rhinoflex systems are manufactured to withstand normal field handling but, like any piping material, damage can occur from careless handling. If using a mechanical means for unloading, use nylon slings or padded fork lifts to unload the pipe. Do not use chains or chokers. If the pipe is to be unloaded by hand, it should be lifted to avoid damage to the casing from sliding on a rough surface. **Do not drop the coils onto the ground off the truck bed. Do not cut any bands on the coil prior to thoroughly reading the instructions.**

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 be hydro tested prior to insulating, pouring thrust blocks or backfilling the system. Failure to comply with testing procedures will void warranty.

REPAIR

If the jacket becomes damaged, it must be repaired so that it is watertight. Heat shrink material by Corroshrink, or a high quality tape with elastomeric adhesive backing used for sealing below ground pipe can be used. The use of a primer is not required. Tape to be Polyguard 610 Tape, Tapecoat H-50 Tape or equal. All of these repair materials are non-stock at Rovanco. We recommend you contact the supplier at their offices or via their web site for the closest distributor. Polyguard Products 800-541-4994 or at www.polyguardproducts.com, The Tapecoat Company 800-332-8273 or at www.tapecoat.com,

COLD WEATHER INSTALLATIONS OF PEX OR POLYETHYLENE (PE)

Rhinoflex is made with Pex or Polyethylene (PE) pipe, foam insulation, and polyethylene jacketing. All of these materials are flexible, just not as flexible as rubber hose, more like a coil of polyethylene pipe. The colder the temperature the stiffer the pipe becomes. To make handling and bending the pipe easier we recommend storing the pipe in a heated building at minimum of 72° F for at least 24 hours prior to unrolling. If a heated building is not available, a fan blowing warm air into one end of the carrier and a fan pulling from the other end can be used. In extreme or emergency cases, it is also possible to circulate warm water thru the carrier pipe to make it more flexible prior to installation. Contact Rovanco for rental information on our Patented Rhino-Roller. Rovanco does not suggest installing Rhinoflex in under 40° F unless the above is considered.

Table of Contents

Page

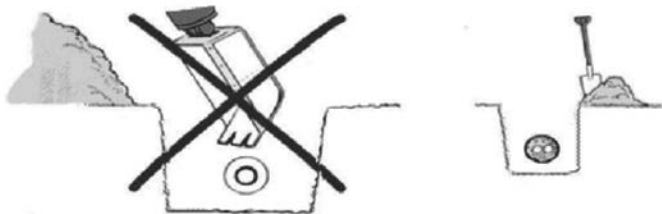
| | | |
|------------|--|-------|
| Section 1 | Trench Preparation | 3 |
| Section 2 | Traffic Load | 3 |
| Section 3 | Backfilling and Bedding | 3 |
| Section 4 | Notice | 4 |
| Section 5 | Warranty | 4 |
| Section 6 | Uncoiling and Laying of Rhinoflex Pipes | 4-5 |
| Section 7 | Bending and Straightening | 5 |
| Section 8 | Pipe Cutting | 6 |
| Section 9 | Rhinoflex Brass Compression Couplings and Fittings | 7 |
| Section 10 | Installation of Rhinoflex Adapter Couplings & Fittings | 8-9 |
| Section 11 | PEX Pipe Connectors, Heating and Sanitary | 10 |
| Section 12 | SharkBite Connection and Disconnection | 11 |
| Section 13 | Press Fit Fittings | 12-15 |
| Section 14 | Applying CorroShrink Wrap | 16-17 |
| Section 15 | Field Insulation of Straight Joints | 18 |
| Section 16 | Field Insulation of 90° & 45° Elbows | 19-20 |
| Section 17 | Field Insulation of Tees & Reducing Tees | 21-22 |
| Section 18 | Installing Shrink End Seals | 23 |
| Section 19 | Testing | 24 |
| Section 20 | Operation and Maintenance | 24 |
| Section 21 | Parameters for Properly Installing & Operating Systems | 25-26 |

Tools & Other Materials That May Be Required For Installation *(not provided by Rovanco)*

1. Hack saw or fine toothed hand saw
2. Burring reamer
3. Utility knife
4. Pipe wrenches
5. Propane torch
6. Pipe cutter
7. Duct tape
8. Crow Foot Wrench
9. Ratchet & Socket Set
10. Rubber or plastic hammer
11. Hot air gun or large hair dryer
12. Ratchet Straps
13. Cable Winch

Section 1: Trench Preparation

During normal installation, the installers some times work with the Rhinoflex coil from one side of the trench. Before excavating, review the jobsite layout so that the excavated soil can be placed on the side of the trench where it will not interfere with the installation. The pipe trench should be prepared so that there will be a minimum of 2" between each pipe and 6" between the pipe and the trench wall.



Avoid the use of sharp edged tools and equipment. As with any buried piping system keep all heavy equipment from damaging the pipe jacket.

Section 2: Traffic Load

Do not install Rhinoflex in soil or groundwater conditions which are thought or known to be contaminated with fuels, organic compound, solvents or other possible hazards, as these substances could permeate the pipe and contaminate the water or damage the integrity of the pipe. If contamination is suspected, a chemical analysis of the soil or groundwater must be performed to determine the contaminant and its compatibility with Rhinoflex.

A minimum of 4" (10 cm) of sand should surround Rhinoflex in the trench. The sand protects the Rhinoflex from sharp objects and is crucial to the thermal compensation of the system.

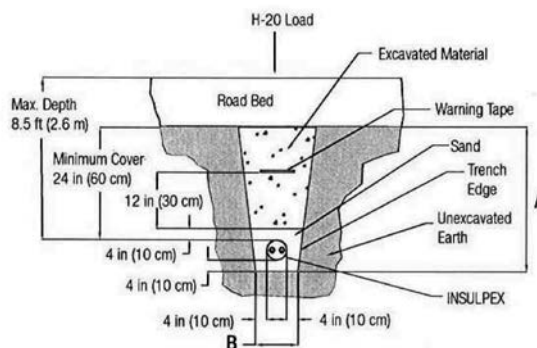
Native soil can be used for the remaining fill, as long as there are no large (greater than 1-1/2" [4 cm]), frozen or sharp objects such as rocks or debris. Compact the fill material by hand to a height of at least 6" (15 cm) above the Rhinoflex. Above the hand compacted fill, a mechanical device can be used to compact the soil.

Rhinoflex is suitable for H-20 loading at depths ranging from 2' (60 cm) from the roadbed to a maximum of 8.5 ft (260 cm). See figs. 5.1 and 5.2 for H-20 trench dimensions.

Section 3: Backfill and Bedding

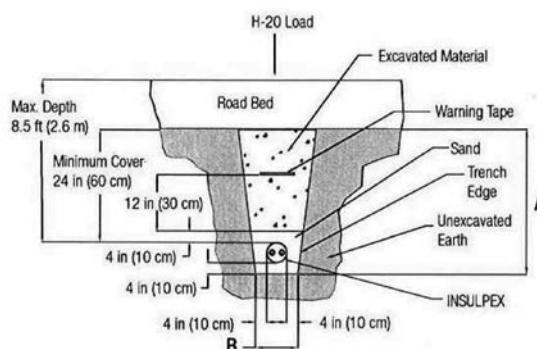
Rovanco recommends all piping systems be pressure tested with water before backfilling. It is acceptable to do partial backfilling prior

Table 5.1: One-pipe Trench Dimensions



| Jacket OD (mm) | Depth A inches (cm) | Width B inches (cm) |
|----------------|---------------------|---------------------|
| 91 | 31 (80) | 12 (30) |
| 111 | 33 (85) | 12 (30) |
| 126 | 33 (85) | 14 (36) |
| 142 | 33 (85) | 14 (36) |
| 162 | 35 (90) | 14 (36) |
| 182 | 39 (99) | 15 (38) |

Table 5.2: Two-pipe Trench Dimensions



| Jacket OD (mm) | Depth A inches (cm) | Width B inches (cm) |
|----------------|---------------------|---------------------|
| 91 | 31 (80) | 20 (50) |
| 111 | 33 (85) | 22 (55) |
| 128 | 33 (85) | 22 (55) |
| 142 | 33 (85) | 24 (60) |
| 162 | 35 (90) | 26 (65) |
| 182 | 39 (99) | 26 (65) |

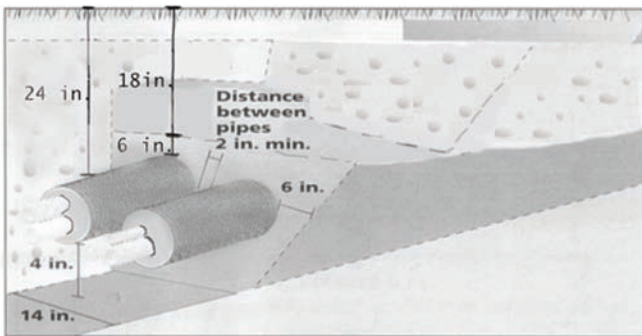
For applications where loading is not a concern, the trench depth should be a minimum of 16" (40 cm). For better thermal performance, an increased burial depth is recommended. Burying the pipe below the frost line can prevent heaving and improve thermal performance.

to pressure testing to hold the Rhinoflex in position in the trench. The pipe trench should have a minimum 4" bed of sand, fine crushed stone, or other similar material. Backfilling of the trench should be completed by applying the material in layers. We recommend that the first 6" above the pipe also be backfilled with the same type of fine material. The material used for the rest of the backfilling must be free of sharp rocks, frozen lumps, or any object that could damage the outer jacket. Do not use any mechanical means of compaction until 6" of backfill has covered the piping.

The backfill should be compacted. For non-load areas, a minimum of 24" depth of bury is recommended.

Section 4: Notice

This installation manual and its recommendations are believed to be accurate and reliable. However, due to such factors as variations in environment,



application or installation, and because the conditions of use are beyond our control, the user of this manual assumes all risk connected with their field work.

The installer of these piping products is ultimately responsible for his own work and thus the integrity of the system.

Section 5: Warranty

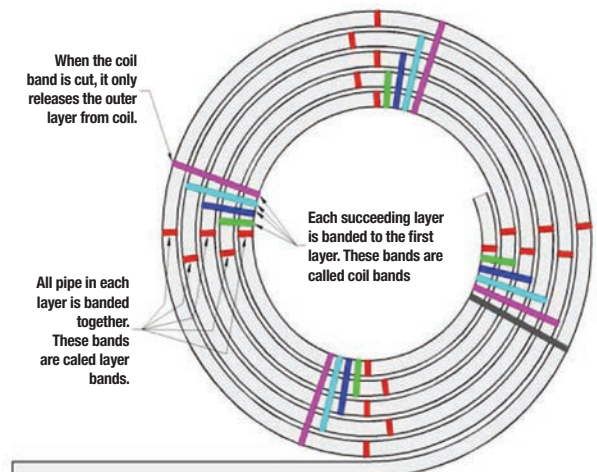
Rovanco Piping Systems Inc. is proud of its products and for this reason alone, extra care is taken when inspecting for manufacturing defects. It may be possible however, that a defect could be hidden from our quality control procedures. Rovanco Piping Systems Inc. warrants its products only to the extent that we will replace products that are proven to have manufacturing defects, within a (12) month period from the date of delivery thereof. Rovanco must be given the opportunity to inspect the alleged defective product and the installation

and use thereof as soon as reason-able after an incident occurs for a warranty claim to be considered valid.

This warranty does not provide for the removal, re-installation or consequential damages which may arise from defective material. Our products are in-stalled and used in a wide variety of conditions. There are no warranties, nor is anyone authorized to issue any warranties of any kind which surpass the undertaking in the aforementioned sentences.

Section 6: Uncoiling and Laying of Rhinoflex Pipes

It is important to understand how the coils are banded together, so they can be unwound in the most efficient manner. The illustrations below indicate the placement of the bands on the coil and their function. Rhinoflex is uniquely packaged to make it easier for the installing contractor to handle the coils as they install the pipe. As the pipe is manufactured it is put onto drums in tight layers. Each individual layer is banded together. These are called layer bands. As successive layers are added, they are individually banded as well as banded to the overall coil. These are called coil bands. In the unrolling process, the bands holding the outer layer to the coil are cut to release that layer from the coil. The next step is cutting the bands holding the outer layer so that layer can be unrolled. The coil of Rhinoflex is still tight and intact because the inner layers have not been unbanded. As the Rhinoflex is unrolled, all bands on the outer layer are cut as they are encountered. This process is continued until the complete coil is installed or the pipe must be cut. This unique banding approach keeps the coil intact throughout the unrolling process.

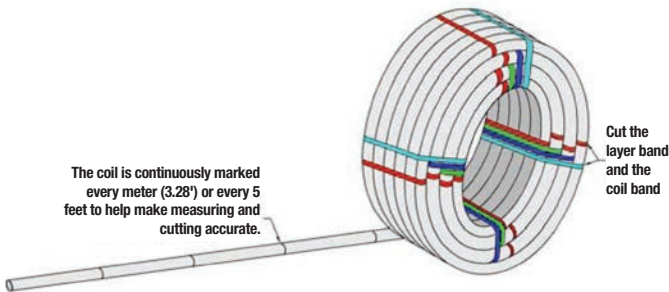


Rhinoflex Coil Banding Drawing

Section 6: Uncoiling and Laying of Rhinoflex Pipes *(continued)*

It's extremely important to firmly position the Rhinoflex end where the piping system is to be started, before un-rolling. That can be done by weighting the end with sand bags, tying the end of the Rhinoflex off with a rope, pulling it into the building wall to keep it firmly positioned, sliding in under something heavy such as a backhoe, pick-up truck, etc. Since the Rhinoflex is made of all plastic materials, those plastic materials will give, bend and relax as the pipe is coiled out. If the trench is wide enough, this process can take place in the trench, but in most cases the pipe is unrolled above the ditch, stretched out, and then lowered into the ditch by hand. No equipment is necessary for that process. We do not intend to over simplify the work that is involved in getting the Rhinoflex project started correctly. It is not a simple matter but if these steps are followed the installation will go smoothly.

Avoid dragging the pipe coil over sharp-edged rocks or debris, as this may damage the outer jacket. Should the jacket become damaged, repair it with Tapecoat or heat shrink material as described on page 1 — *Repairs*.



Section 7: Bending and Straightening

In cold weather or if the pipe is stiff, it is possible to use mechanical means to assist the bending process, or to straighten out the Rhinoflex for a building entry. We also suggest the installer follow Cold Weather Installation instructions on Page 1.

A. Bending:

A cable winch or ratchet strap can be used to make a bend. It is important to take care not to damage the jacket material. Rubber pads or sections of polyethylene should be applied under any clamps used to bend the pipe.

B. Bending:

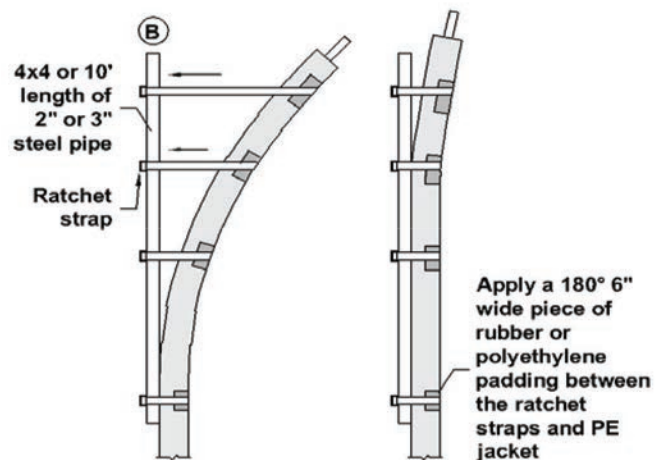
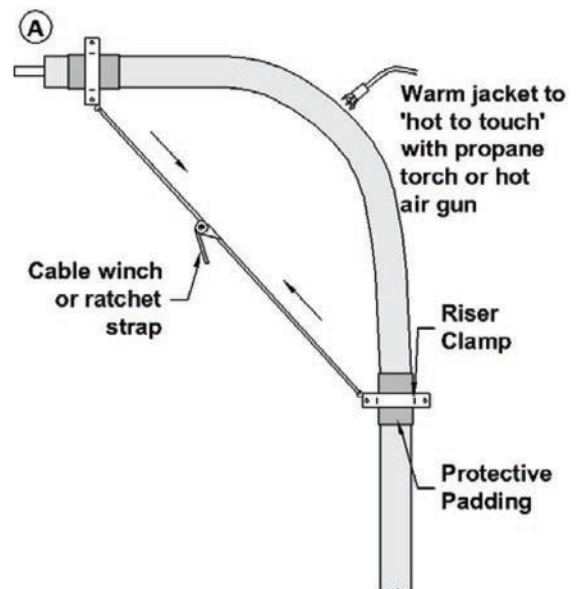
Remove insulation and jacket and bend carrier pipe only being careful not to kink Pex. Re-insulate after project completion.

C. Straightening:

Since the Rhinoflex has been shipped as a coil, it has a tendency to try to re-coil itself. The use of ratchet straps and a stiff back as shown below will straighten out the pipe allowing for a straight building entry.

D. Removing Insulation:

In certain situations one could remove jacket and foam of Rhinoflex and just bend the carrier pipe. Please contact engineer and Rovanco before doing so.



Section 8: Pipe Cutting

Step 1 Determine the length of pipe required, and mark the pipe accordingly.

Cut all the way through the jacket, insulation and pipe with a hacksaw or other fine toothed saw.

Step 2 Using the pipe wraparound, mark 6" back from the cut end of the pipe. Using a utility knife or equal, cut through the outer jacket and remove it.

Using a scraper, butcher knife, etc., cut through the insulation and remove it. Take care not to damage the carrier pipe.

Step 3 If the cut end of the carrier pipe is not square (less than 5 deg.), use a pipe cutter or saw to square up the end.

Step 4 Deburr the I.D. & O.D. of the carrier pipe with a deburring tool, reamer or short knife so that you chamfer the inside of the carrier pipe making it easier to slide up over fitting insert.

Continued on the next page.

Compression Fittings

Section 9: Rhinoflex Brass Compression Coupling and Fittings



Rhinoflex adapter couplings are used to connect Rhinoflex (PEX or PE) to Female NPT fittings. They have a male threaded end, which is the same size as the Rhinoflex carrier pipe.

Note: Use Teflon pipe thread tape on all threaded pressure connections. The compression nut does not require Teflon tape. **Do Not** use Teflon tape or pipe dope on the compression nut.

Rhinoflex pipe to pipe couplings are used to connect Rhinoflex (PEX or PE) to a second Rhinoflex (PEX or PE) pipe. The installation is the same as the Rhinoflex adapter coupling, with the exception that there will be Rhinoflex pipe connections on both sides of the coupling.



Rhinoflex pipe to pipe reducing couplings are used for in line reductions. The installation is the same as the pipe to pipe coupling.

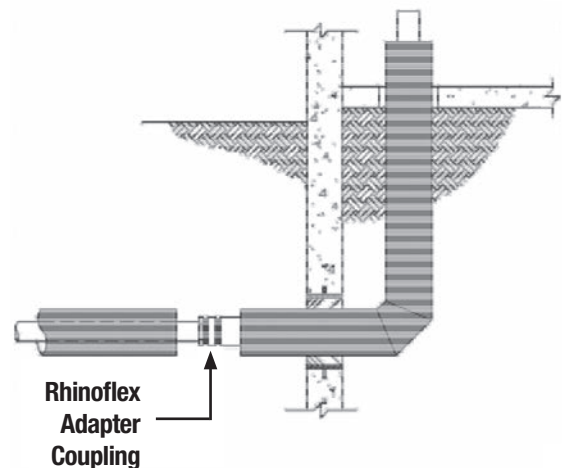


Rhinoflex tee and reducing tees are used to connect branch runs of Rhinoflex (PEX or PE) to Rhinoflex (PEX or PE) runs. The Rhinoflex tees and reducing tees have compression connections the same as Rhinoflex adapter couplings. Additional fittings are not required to tie in the tees. The **reducing tees** eliminate the need for most reducers.



In some cases it is more efficient to install the threaded adapter into the threaded steel or brass fitting before inserting or tightening the compression portion of the fitting. This is best illustrated by the drawing, to the right, of a pre-fab riser with a threaded connection. It is obvious that it would not be possible to thread the pre-fab riser onto the Pex-to-steel adapter because the riser is set into the wall and floor openings. In this case, the adapter coupling must be threaded into the riser before tightening up the compression nut.

1. Insert the Rhinoflex pipe into the adapter coupling.
Do not tighten compression nut.
2. Insert the threaded adapter in to the threaded fitting or coupling. Tighten the threaded end.
3. With a hot air gun , warm the first 3” of the end of the PEX pipe and the adapter coupling to “hot to the touch.”
4. Tighten the compression nut on the adapter coupling.
5. 15 minutes after tightening, repeat heating and retighten.



Section 10: Installation of Rhinoflex Adapter Couplings

Clean the carrier pipe and coupling.



For 3/4" through 2 (25 to 63 mm) couplings, loosen the threaded compression nut two turns.

For the 2-1/2", 3" and 4" (75, 90, 110 & 125 mm) loosen the bolts as much as possible without taking the fitting apart.



Do not dismantle the coupling and put its single components onto the carrier pipe!!



Mark insertion depth on the carrier pipe (See table below for values).
Note: For Pex pipe only, heat 3" of the end of the pipe to "hot to the touch" before applying adapter or coupling fittings. Do not use an open flame, only a hot air gun or hair dryer should be used.

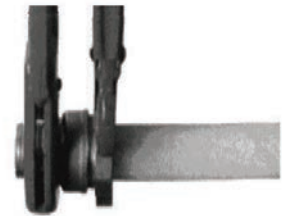
Now push the carrier pipe into the fitting to the end-stop.

75mm, 90mm, 110mm & 125mm pipe to pipe couplings come with a separate sleeve. Insert the beveled edge brass insertion sleeve into the square cut Pex or HDPE. Insert into pipe up to last ring, do not insert flush.



Tighten the threaded compression nut on.

3/4" through 2 (25 to 63mm) couplings. Tighten the bolts on 2-1/2", 3" and 4" couplings (75, 90 & 110 mm) in a cross-ing pattern to specified torque below.



Note: For Pex pipe only, 15 minutes after tightening, repeat heating and retighten.



Note: Adapter couplings and Pipe to Pipe fittings have different insertion depths. See table below for the proper insertion depths.

| Rhinoflex Pipe Bending Radius and Fitting Insertion Depths | | | | | | | | |
|--|-----------------------|--------|-----------------------|---|--|--|------------------------|-----------------------------|
| Nominal Pipe Size inches | Service Pipe Diameter | | Wall Thickness inches | Flexible Pipe to Flexible Pipe Coupling, Tees & 90° El's Insertion Depth inches | Adapter Coupling *Insertion Depth inches | Adapter Coupling Male Pipe Thread Size | Minimum Bending Radius | Tightening Torque Nm (+10%) |
| | mm | inches | | | | | | |
| 2" | 63 | 2.125" | .236" | 1" | 2.32" | 2" | 3'-0" | 250 |
| 2-1/2" | 75 | 2.95" | .268" | 1-1/8" | 2.68" | 2-1/2" | 3'-2" | 50 on bolts |
| 3" | 90 | 3.54" | .323" | 1-3/4" | 3.07" | 3" | 3'-7" | 50 on bolts |
| 4" | 110 | 4.33" | .394" | 2-1/8" | 3.86" | 4" | 4'-0" | 50 on bolts |
| 5" | 125 | 4.94" | .449" | consult factory | consult factory | 5" | 4'-6" | 50 on bolts |

Rhinoflex pipe is metric size and this chart provides the dimensional information regarding the pipe and Rhinoflex fittings.

* **Note:** Rhinoflex Adapter Couplings are similar in appearance and dimension to adapter couplings supplied with previous brand of Rovanco supplied flexible pipe.

ASTM 1" - 2" DO HAVE O-RINGS

Section 10: Installation *(continued)*

Important: Read this instruction sheet completely before beginning installation. If you have any questions about these instructions, please contact your Rovanco sales representative or distributor for assistance.

1. Cut the tubing with an appropriate plastic-pipe cutter. If using another method for cutting the tubing, ensure the shavings inside the tube are removed prior to installing the fitting to avoid blocking valves.



Cut the Tubing



Chamfer the Tubing

2. Chamfer the tubing bore with a de-burring tool or knife, and remove any external burrs.



Dismounting Outer Sleeve

3. Use a suitable pair of pliers to dismount the outer sleeve.



Example of Suitable Pliers

4. Place a bolt head between the pads, and remove the outer sleeve.

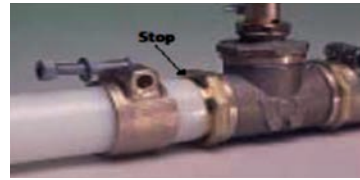


Insert Bolt Head



Mount the Outer Sleeve

6. To ensure easy mounting of the pipe onto the inner sleeve, lubricate the o-ring, preferably with an environmentally friendly silicone spray or soap.



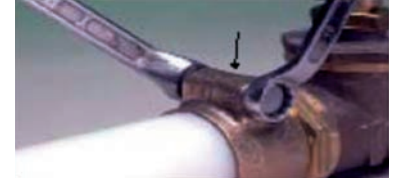
Push Outer Sleeve to Stop Support

7. Mount the pipe on the insert sleeve and push the outer sleeve until it reaches the stop support for the tubing.

Important: Lubricate the bolt threads and washer with suitable low-friction lubrication (MoS2) before tightening.

8. Tighten the Wipex fitting.

Note: Tighten slowly by hand to avoid thread problems when assembling acid-resistant, stainless steel bolts in a screw joint. If using a tightening machine, only use a low number of revolutions. Use open-ended or ring spanners and slowly tighten until the pads of the clamping sleeve are in contact with one another.



Tighten the Fitting

3/4" size 50 ft-lbs
1" size 55 ft-lbs
1-1/4" size 65 ft-lbs
1-1/2" size 85 ft-lbs
2" size 100 ft-lbs

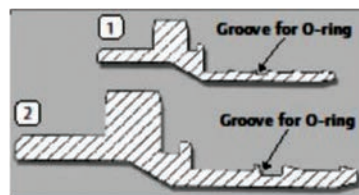


Grip & Seal Between Fitting & Pipe

Caution: If the pads do not come in contact, wait 30 minutes and then try tightening again until the pads are in contact with one another.

9. Perform pressure testing according to current standards. If standards are not available, refer to the following instructions:

- Vent all air from the system and apply one-and-a-half times the normal operating pressure.
- Maintain this pressure for 30 minutes, and visually inspect the joints.
- Quickly drain off water until the pressure falls to one-half the normal operating pressure, and close the drain valve.
- If the pressure rises to a constant level higher than one-half the normal operating pressure, the system is tight.
- Maintain this pressure for 90 minutes, and visually inspect the fittings during this time. A drop in pressure indicates a leak in the system.



Specifications

| Style | Profile Dimensions | Pressure Class |
|-------|--------------------|-----------------|
| 1 | 2-1/2" to 4" | 87 psi at 203°F |
| 2 | 1" to 2" | 97 psi at 203°F |

Section 11: PEX Pipe Connectors, Heating and Sanitary

50mm — 140mm
HAS NO O-RINGS

PEX pipe connectors, heating and sanitary

HELA PEX pipe connectors are suitable for sanitary, heating, irrigation, boreholes and snow melting systems.

Purpose of use and applicability

The connectors can be used in all PEX pipes as long as their outer diameter and wall thickness are suitable for the connectors. In general, the connectors are suitable for all applications and in all circumstances where PEX pipes can be used. In addition to water, the connectors are suitable for glycol-water in snow melting systems. Suitability should always be confirmed when liquids other than water or glycol-water are used.

Whole pipeline and all joints must be properly pressure tested and checked for leaks before taking the system into use.

The installation procedures must always comply with local authorities' rules and regulations as well as any additional instructions and guidelines by the provider of the pipe system and/or other systems related.

Assembly Instructions 50-140mm connectors

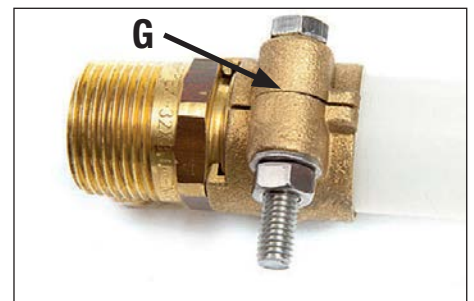
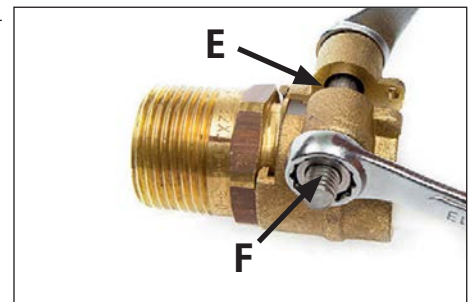
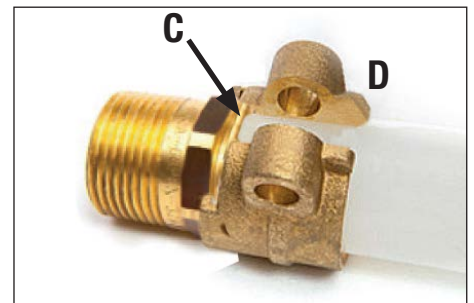
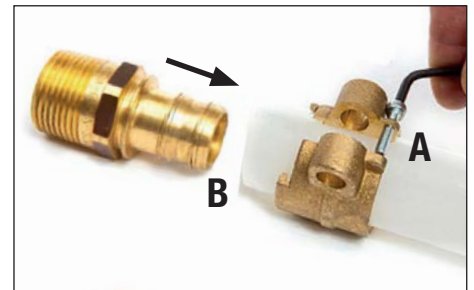
BOLT TYPE CONNECTOR

1. Cut the pipe straight with proper tools and clean it so that it is free of any burrs or debris.
2. Put the clamping sleeve on the pipe and tighten the small screw to expand the clamp. You can use all the length of the small screw. **(A)**
3. Slide the pipe insert inside the pipe. Use proper lubricant such as soap & water, etc. **(B)**
4. Make sure the fitting insert is pushed inside until it stops at the collar **(C)**.
5. Start opening the small expanding screw making sure the fitting does not slide out of position. Remove the small screw completely from the clamp **(D)**. This screw is for one-time use only and if clamp needs to be re-opened is better to use a new screw.
6. Put the tightening bolt in place and start tightening it with the properly-sized wrench **(E)**. Bolt thread is pre-lubricated at the factory. But in case of extended storing time or other conditions such as wetness, some additional lubrication such as vaselin may be required to prevent the threads from cold welding **(F)**. Use a lubricant that is suitable for thread lubrication and do not put the lubricant on the pipe itself.
7. Tighten the bolt until clamp until it is completely closed **(G)**. In some cases, such as colder climates, it is suggested you pause occasional when tightening rotations to allow pipe to slowly modify under the pressure of the clamp.

HELA connectors are safe choices for all applications. The external threads of HELA PEX connectors are ISO7-1 compliant tapered threads. The thread is compatible with the internal threads that comply with the ISO228 (cylindrical pipe thread) and ISO7 threads. NPT-threaded connectors are also available by order. HELA Operation and Safety Instructions as well as the assembly instructions contain more information on threads, their compatibility and sealing.

In addition to connectors made from special brass, we manufacture weldable steel frame PEX connectors and AISI 316 connectors in size categories 50–140 mm.

Applications: PEX pipe connectors according to ISO 15875-5
Pressure rating: PN6 and PN10 (unless mentioned otherwise)
Materials: CC752S / CW602N / CW617N (CEN/TS 13388)
Clamping bolts: AISI316, O-rings: EPDM TIMO 3/70
Threads: ISO228-1 (SFS-EN 1254-4) / ISO7-1
Dezincification resistance: SFS-EN ISO 6509
Stress corrosion: ISO 6957/2
Tensile strength: EN712, EN ISO 15875-5:4.4
Pressure strength: EN921, EN ISO 15875-5: 4.2
Negative pressure test: EN12294, EN ISO 15875-5:4.7
Pressure variation test: EN12295, EN ISO 15875-5:4.6
Temperature variation test: EN12293, EN ISO 15875-5:4.5





Connection and Disconnection

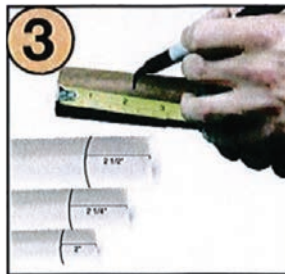
Connection



Make sure you have all tools required.



Cut COPPER, CPVC or PEX using a quality Tuber or Pipe Cutter with a sharp blade.



Remove BURRS and ensure pipe surface is free of scratches and any debris. It is CRITICAL that pipe be marked with the correct insertion depth as listed below;

- 1-1/4" Pipe Insertion Depth = 2"
- 1-1/2" Pipe Insertion Depth = 2-1/4"
- 2" Pipe Insertion Depth = 2-1/2"



Align pipe with the fitting, insert pipe while rotating either pipe or fitting.

SharkBite 2XL PEX Stiffener must be inserted into PEX pipe prior to fitting.



Connection is complete when pipe is fully inserted with depth insertion marked on pipe is still visible at the head of the fitting.

Disconnection



Shark Shifter De-Mount Tool to pipe just above the connection then slide down to engage lugs on the head of the fitting.

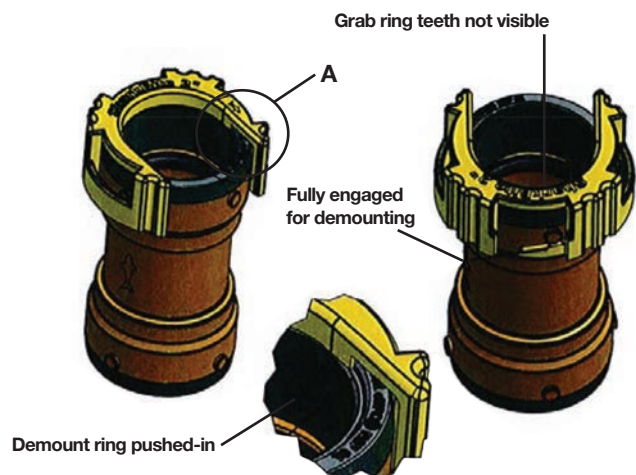


Rotate Shark Shifter De-Mount Tool clockwise to locate on lugs, rotate a further 1/2" to disconnect.



Withdraw pipe from fitting then rotate Shark Shifter De-Mount Tool anti-clockwise to remove from fitting.

Quality engineering. Recessed release collar guarantees NO accidental disconnection; connection can only be released with Shark Shifter De-Mount Tool.



Section 13: Press Fit Fittings

Introduction

The purpose of this installation guide is to provide detailed information regarding the installation of Rovanco Press Fit Fittings for use with Rovanco PEX Systems, Rhinoflex Flexible Pre-Insulated Piping, 20 DW Potable ASTM Sticks, and CDW Coiled Domestic ASTM Flexible Pre-Insulated Piping.

13.1 Tools

Rovanco offers a variety of tools to assemble Press-Fit fittings. The tools required depend on the size of the Press-Fit fitting to be assembled. Rovanco compression nut fittings do not require specialized tools: standard wrenches or pipe wrenches will suffice



Tool Kit

Small Diameter for Sizes up to 1-1/4"

This tool kit is designed for use with ASTM 3/4", 1" and 1-1/4" Press-Fit fittings. It comes complete with:

- Compression Tool
- Pipe expander
- 1" and 1-1/4" Expander heads
- 1" and 1-1/4" Compression jaws
- Ratchet cutter
- Plastic Case



Tool Kit

Large Diameter

This tool kit offers a hydraulically actuated tool specifically designed for assembling large diameter Press-Fit fittings. It comes complete with:

- Base tool (hydraulic cylinder and foot pump)
- 1-1/2" and 2" Expander heads
- 63, 75, 90 and 110mm Expander heads
- 1-1/2" and 2" Compression jaws
- 63, 75, 90 and 110mm Compression jaws
- Large ratchet cutter for pipes up to 2"
- Ring cutter for pipes up to 110mm
- Aluminum Case

40 and 50mm expander heads and compression jaws are also available

Note: Observe the flowing warning label placed on the tool and in the tool case:

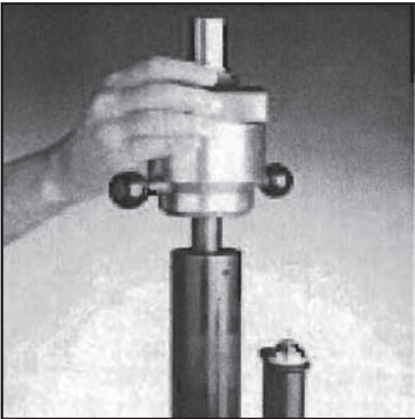
WARNING!

Hydraulic fluid injection through skin possibly from pinhole leaks in hose. Check hose using only approved methods according to operator's manual. Wear safety glasses when using tool. Compression jaws can pinch. Do not place fingers between jaws

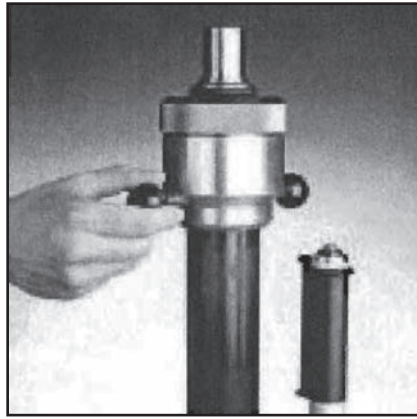
Section 13.2: Preparing The Tool

The tool is used for expanding and clamping. The tool conversation for this is as follows:

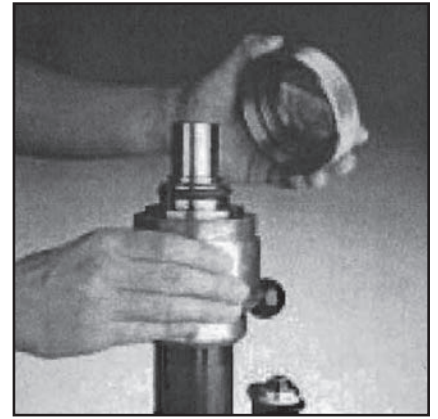
Expanding function



Insert expander set into the clamping cylinder

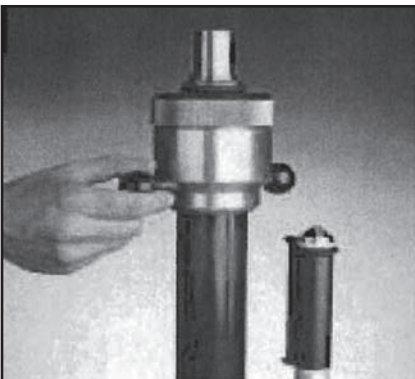


Insert the two short pins as well as one long pin in completely

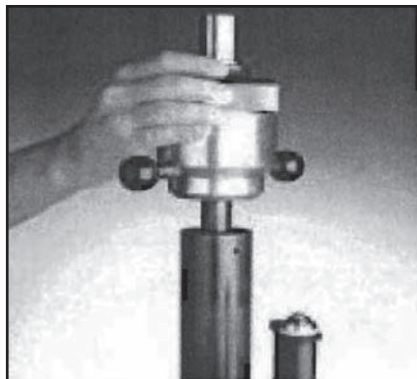


To exchange expander heads, remove fixing nut, position expander head correctly, and screw fixing nut completely on. From dimension 75mm, expander heads are screwed on directly (without fixing nut).

Clamping function



Remove long pin, pull out short pins up to the stop

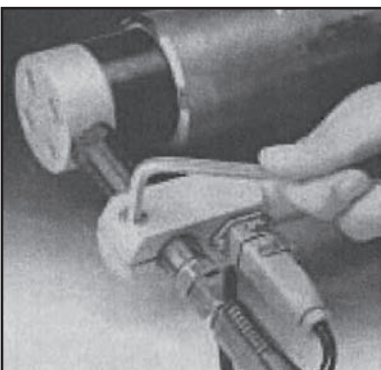


Remove expander set



Push on the long clamping jaw first and then the short jaw and insert long pins completely

Section 13.3: Using The Tool



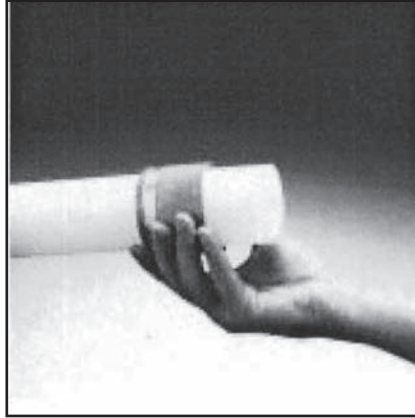
When space is restricted an Allen key can be used to release the tool handle enabling it to be rotated

Section 13.3: Assembly Procedure

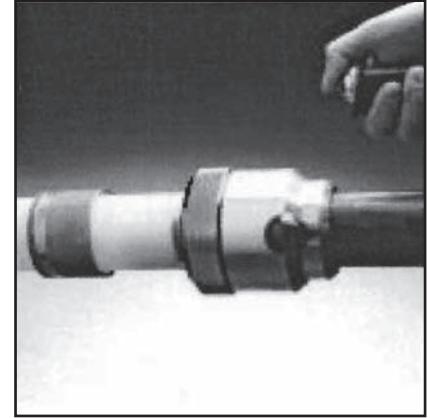
Failure to observe these instructions may result in damage to the jointing system, to the tool, and cause personal injury.



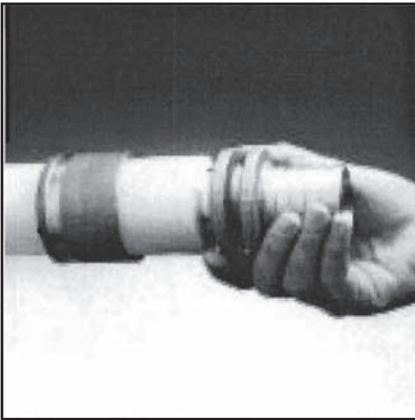
1. Using pipe cutters, cut pipe to required length at right angles and without leaving burrs. Caution! Keep your hand at a safe distance from the tool.



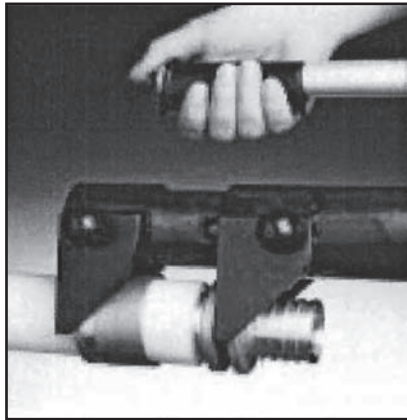
2. Slide compression sleeve onto pipe, ensuring that the inside taper points towards joint.



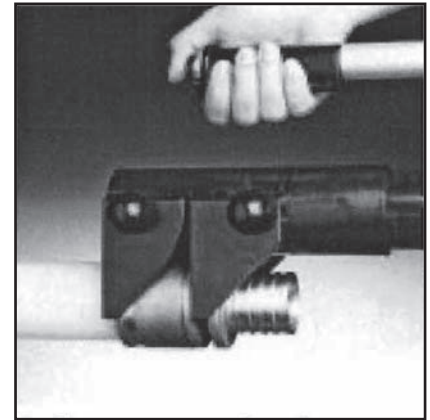
3. Expand pipe, rotate 30°, and repeat. The min. distance between expander head and compression sleeve must be one compression sleeve length.



4. After the expander head is removed, immediately insert fitting into pipe, pushing on as far as possible. After a brief period the fitting will sit tightly in the pipe (memory effect).

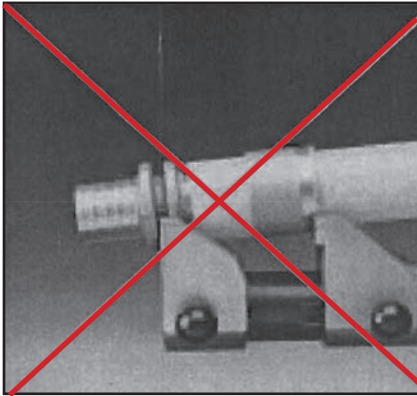


5. Insert joint fully into clamping tool. Do not tilt. Tool must be applied over full surface and at right angles.

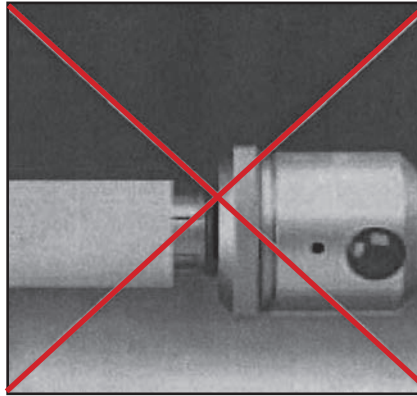


6. Clamp compression sleeve onto fitting by depressing the pressure switch (hydraulic unit) or movements with the foot pump lever.

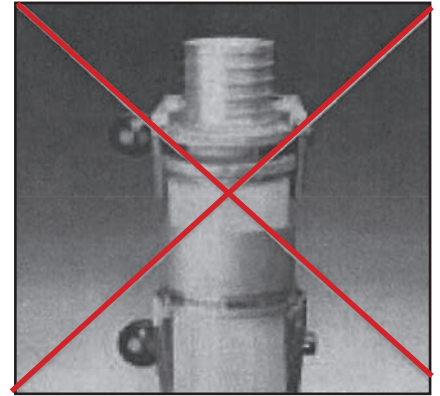
Section 13.4: Important Notes



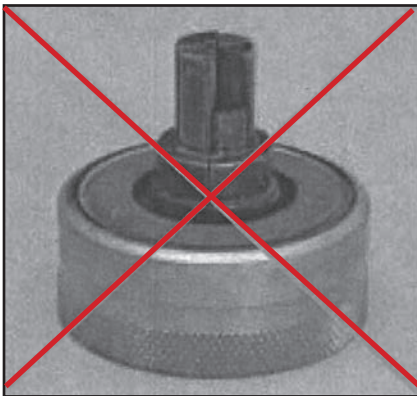
Always apply clamping tool at right angles, making sure it completely contacts entire surface.



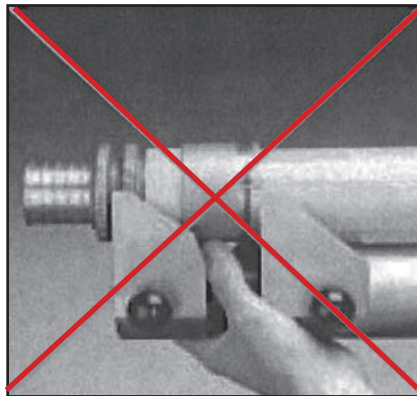
Always insert expanding tool into pipe as far as it will go.



Make sure fitting is correctly seated in tool. Applying the tool to the wrong fitting coiler will over-compress the joint.



Always apply clamping tool at right angles, making sure it completely contacts entire surface.



Always insert expanding tool into pipe as far as it will go.

Section 14: Applying CorroShrink Wrap

CS-60 Series Heat Activated Shrink Wrap

Description:

CorroShrink CS Series shrink wrap is shipped in predetermined bulk rolls depending on the width. 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.

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 CS-60 is a product containing built in adhesive that is activated by heat. Pre-cautions should be taken to ensure proper storage temperature above temperatures noted on product datasheet that will activate the adhesive. This includes radiant heat from direct sunlight. In addition, extreme cold can cause damage to shrink wrap. CS-60 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).

Installation Process:

Surface Preparation:

1. Make sure coating edges are beveled at least 30°. If any presence of surface contaminants, entire area must be cleaned with a solvent cleaner.
2. Pipe must be dry before next step. Using abrasion tool (ex. Wire brush, sand paper, etc.), scuff up the pipe to a minimum of St3/SP3. Lightly scuff area adjacent to the cutback area at least 2” beyond each shrink wrap end.
3. Wipe area to remove any remaining debris.

Pre-Heating & Attaching Shrink Wrap/Closure Strip to the Pipe:

4. Pre-heat the joint area to a minimum of 150 °F (65°C). Confirm temperature reached using digital thermometer with probe.
5. Gently heat first 6 inches of wrap to activate the adhesive.
6. After centering the wrap over the joint, wrapping from backside under the joint and back over the front, place pre-heated area of wrap at the 2 o'clock position of the pipe. Ensure wrap bonds for the full width.
7. Loosely wrap the pipe joint, while ensuring the proper overlap. Pre-heat end of shrink wrap a minimum of 6 inches from the edge to activate adhesive and gentle press into place. **Note** – if measured properly, the overlap should extend over the top of the pipe and to the 10 o'clock position.
8. Applying the closure strip – Pre-heat closure strip to activate adhesive, then center the closure strip on the overlapping shrink wrap. Press firmly to ensure closure strip holds.
9. Heat the closure strip to fully activate adhesive, patting it down periodically with a gloved hand. Continue process moving from one end to the other until closure strip has fully bonded. It is a best practice to begin heating closure strip in the middle, and work your way toward the edges to work out any wrinkle or air pockets.

Shrinking the Wrap:

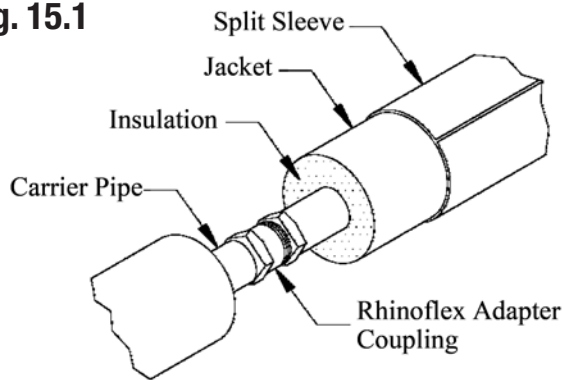
10. Begin heating the shrink wrap in the center, using long gradual passes up and down. You should observe the shrink wrap settling into place snug to the pipe with no bubbles. Do this process all the way around the pipe, remaining in the center.
11. Once center is shrunk and snug to the pipe, continue heating in same process toward one end of the shrink wrap. Once the wrap has shrunk snug to the pipe, go back the center point and follow same process, achieving same results to the other end.
12. The process will be complete when adhesive is seen coming out the edges of wrap, all the way around the full circumference of the pipe, and on both ends.
13. To work out any pockets of air, continue heating from side to side around entire area.

Completion and Verification Measures:

14. Use hand roller to gently roll over entire surface to help work out remaining air bubbles. This must be done while the shrink wrap is still hot, immediately following horizontal strokes in previous step. It may be necessary to re-heat areas to fully complete this step.
15. For added assurance, it is recommended to perform roller process on the closure strip area, from the center working toward edges with firm press.
16. Ensure the area is free from visual flaws, such as; sleeve is in full contact in all areas, adhesive flows out of edges on all edges, there are no cracks or holes in the sleeve backing.
17. Allow shrink wrap to cool a minimum of 2 hours prior to backfilling and burying pipe.
18. Certain backfill material may damage shrink wrap, and reduce corrosion protection provided by CorroShrink. 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.

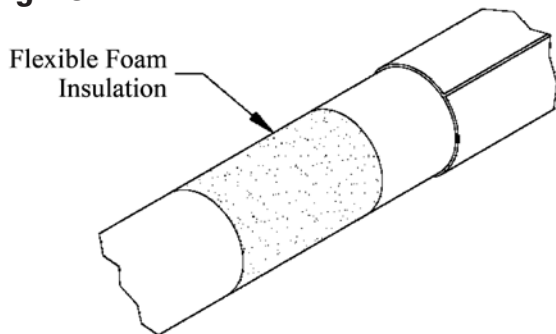
Section 15: Field Insulation of Straight Joint

Fig. 15.1



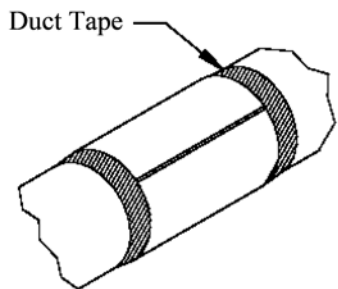
1. Spread the split overlapping sleeve and slide it over the jacket at the joint area. Then make the specified carrier joint and test per specifications. See Figure 14.1

Fig. 15.2



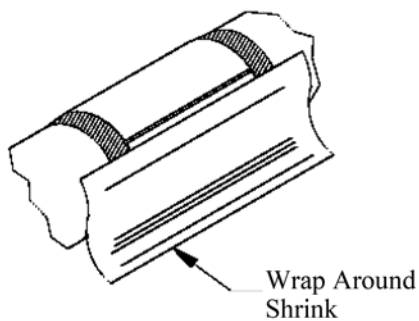
2. Insulate the joint area with flexible foam insulation. See Figure 14.2

Fig. 15.3



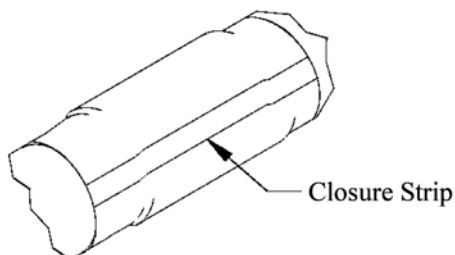
3. Center the sleeve over the joint area and secure it in place with one or two wraps of duct tape at each end. Note: Tape is not provided by ROVANCO. See Figure 14.3

Fig. 15.4



4. Apply shrink wrap and a closure strip with a propane turbo torch using the “Wrap Around Shrink Instructions” in Section 18. See Figures 14.4. & 14.5

Fig. 15.5



Section 16: Field Insulation of 90° and 45° Elbows

Rovanco has supplied you with a pair of Split HDPE mitered fitting covers.

Fig. 16.1

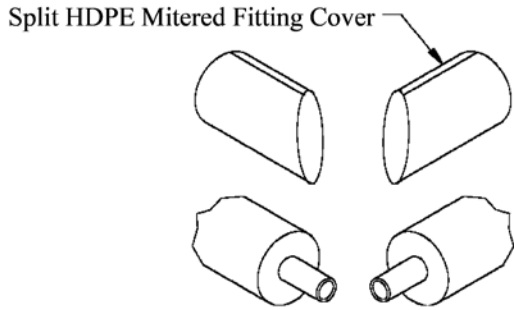


Fig. 16.2

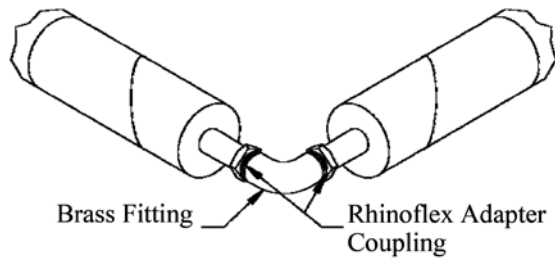


Fig. 16.3

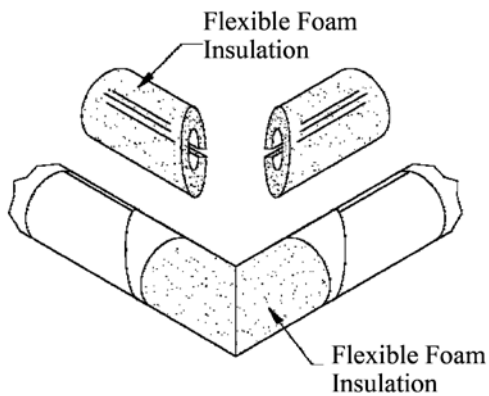
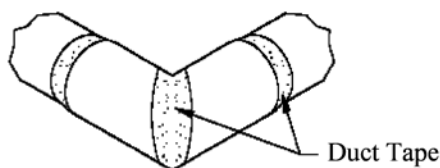


Fig. 16.4

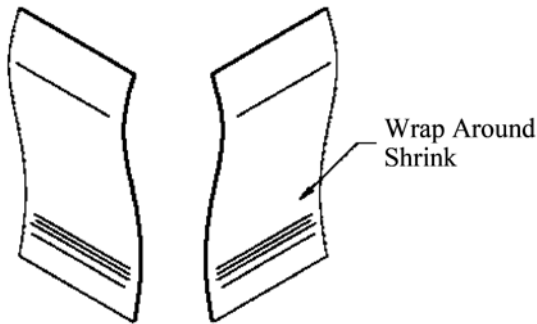


1. Spread the Split HDPE Mitered Fitting Covers and slide them over the jacket on each side of where the elbow is to be made. Then Join the brass fitting to the carrier pipe and test per specifications. See Figure 15.1 and 15.2

2. Insulate the joint area with flexible foam insulation. See Figure 15.3

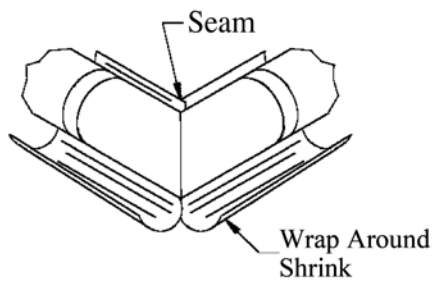
3. Slide the Split HDPE Mitered Fitting Covers together making sure to overlap them. Then duct tape them tightly around the Mitered seam and Rhinoflex jackets. Make sure not to over tighten at the miter, this will cause it to look deformed. **Note:** Tape is not provided by ROVANCO. See Figure 15.4

Fig. 16.5



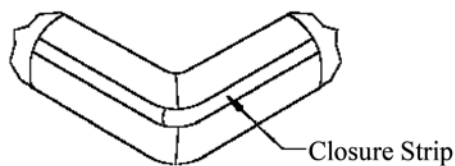
4. Cut 2 pieces of the wrap around shrink material to cover each of the Split HDPE Fitting covers. See Figure 15.5

Fig. 16.6



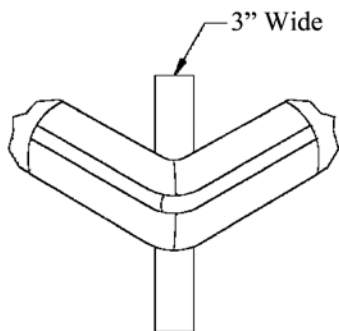
5. The installer will now need to do a dry fit with the shrinkable material. Wrap both pieces around the fitting covers cutting some material away in the “Seam” of the miter to avoid it bunching up, giving it a clean look. See Figure 15.6

Fig. 16.7



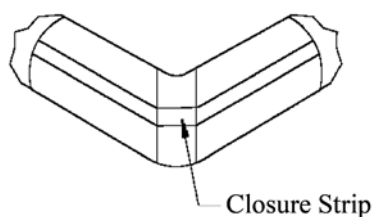
6. Apply shrink wrap and closure strip with a propane turbo torch using the “Wrap Around Shrink Instructions” in Section 18. See Figures 15.7

Fig. 16.8



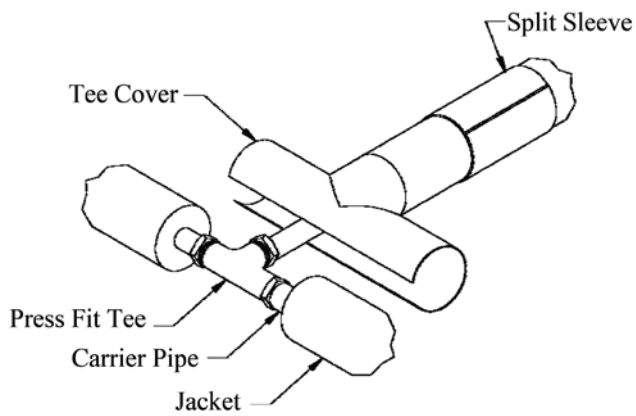
7. Cut a 3” wide piece of the shrinkable material to wrap around the circumference of the crotch plus 4” to overlap on to itself. Then cut a 3” piece of closure strip and apply the shrink wrap and closure strip the same as the previous step. See Figures 15.8. and 15.9

Fig. 16.9



Section 17: Field Insulation of Tees & Reducing Tees

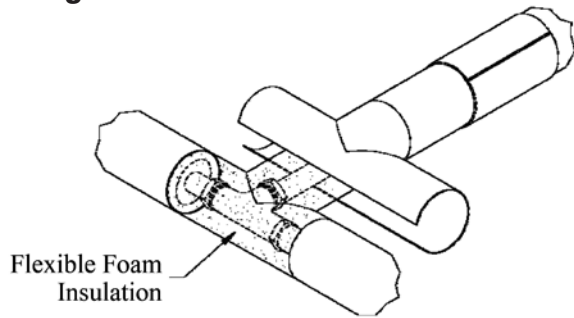
Fig. 17.1



1. Slide the tee cover over the branch line prior to making the tee connections. Join the carrier pipe and test per job specifications. See figure 16.1.

2. Use the supplied flexible insulation to insulate the pipe and fitting. See figure 16.2.

Fig. 17.2



3. Slide the tee cover over the Rhinoflex jackets and secure it in place with one or two wraps of duct tape at each end. Note: Tape is not provided by ROVANCO. See Figure 16.3

Fig. 17.3

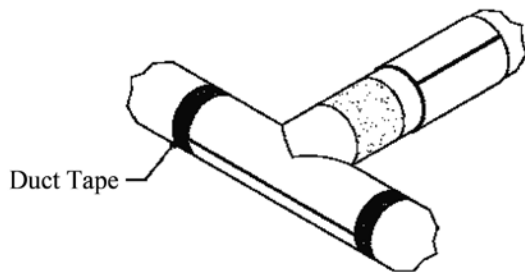
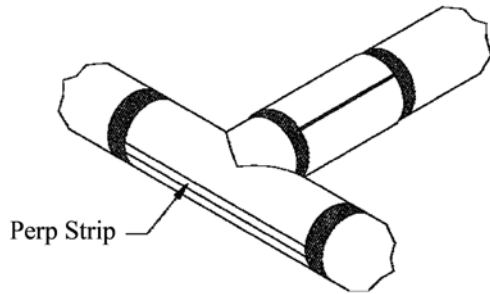
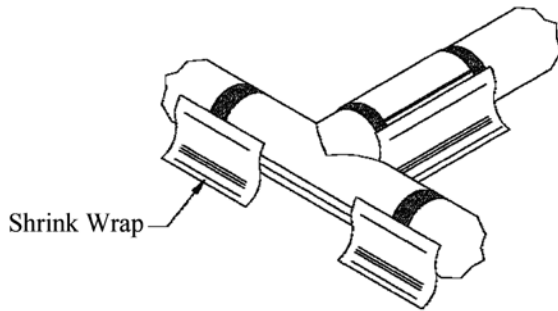


Fig. 17.4



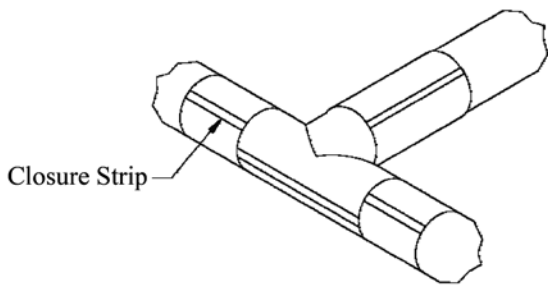
4. Take the provided Perp Strip and apply it over the seam along the back side of the tee cover. Then slide the split sleeve over the tee cover and Rhinoflex jacket. Secure it in place with one or two wraps of duct tape at each end. Note: Tape is not provided by ROVANCO. See Figure 16.4

Fig. 17.5



5. Wrap the shrink wrap over each end of the tee cover on the main. Then wrap another piece of shrink wrap over the split sleeve on the branch.
See figure 16.5

Fig. 17.6



6. Shrink the shrink wraps into place and center the closure strip over the overlap and press down firmly. Heat until well bonded. Refer to section 18 for detailed shrinking instructions.
See figure 16.6

Section 18: Installing Shrink End Seals

Fig. 18.1

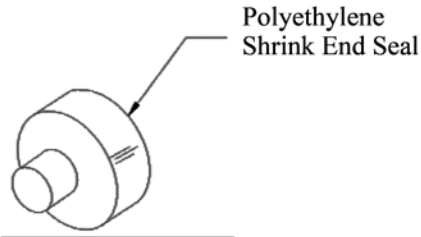
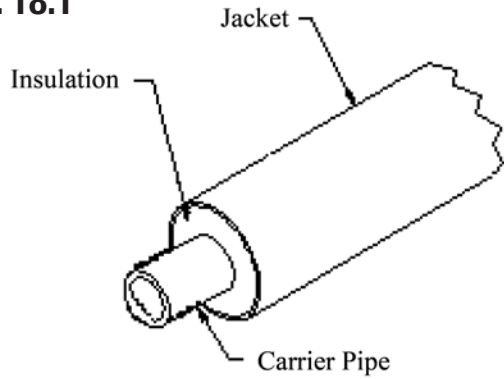


Fig. 18.2

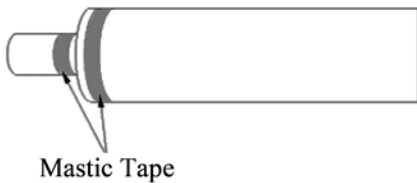


Fig. 18.3

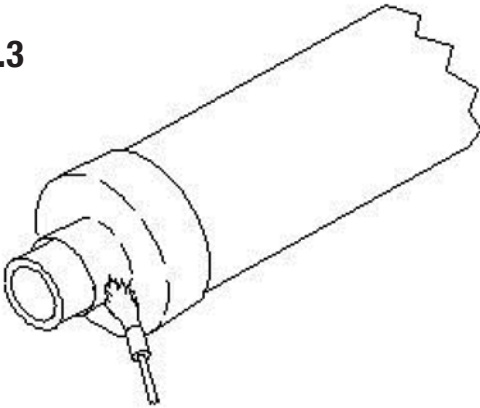
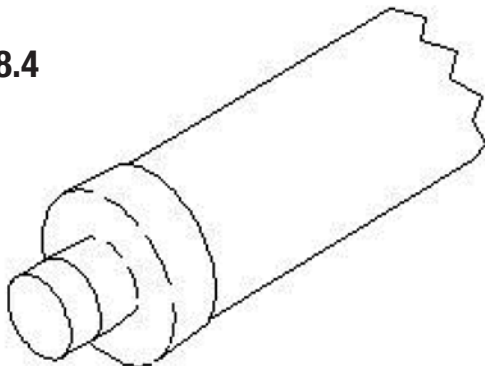


Fig. 18.4



Tools needed: (Not supplied by ROVANCO)

- Propane Turbo Torch or Hot Air Gun
- Gloves
- Utility Knife

Where field cuts are required and the insulation is unprotected from the elements, such as if the end of the pipe will be direct buried.

ROVANCO will provide Polyethylene Shrink End Seals to seal the ends water tight. If fittings are insulated or Rhinoflex pipe ends in a dry area, no end seal is required.

Each End Seal Kit consists of:

- Polyethylene Shrink End Seal
- Strips of Mastic Tape (length as required)

The shrink end seals require a strip of mastic tape be applied to the casing and the carrier before shrinking begins.

1. Locate the proper size end seal and slide it over the jacket prior to the installation of the Rhinoflex coupling. Be sure there is enough carrier pipe exposed to insert into the Rhinoflex coupling. Refer to the chart on page 7 for insertion depth. The End Seal will fit loose over the carrier pipe.
See Figure 17.1.
2. Apply mastic tape to secure the step down cap to the carrier and the jacket.
See Figure 17.2.
3. Using the turbo torch, heat the end seal around the circumference. Keep the torch moving.
See Figure 17.3.
4. Continue heating until the end seal is completely shrunk, taking care not to burn the jacket or carrier pipe.
See Figure 17.4.

Section 19: Testing

Leak Testing Procedures: Read all of this publication and observe all safety precautions before conducting any leak test.

Hydrostatic Leak Testing: This hydrostatic leak test procedure consists of filling, and initial expansion phase, a test phase, and depressurizing.

Filling: Fill the restrained test section completely with test liquid.

WARNING: *Ensure that there is no air trapped in the test section. Failure with entrapped air can result in explosive release and result in death or serious bodily injury. Use equipment vents at high points to remove air. Testing with 100% air voids warranty.*

Initial Expansion Phase: Gradually pressurize the test section to test pressure (1-1/2" times the operating pressure), and maintain test pressure for two (2) hours. During the initial expansion phase, polyethylene pipe will expand slightly. Additional test liquid will be required to maintain pressure. It is not necessary to monitor the amount of water added during the initial expansion phase.

Test Phase—Alternate 1: Immediately following the initial expansion phase, reduce test pressure by 10 psi and stop adding test liquid. If test pressure remains steady (within 5% of the target value) for one (1) hour, no leakage is indicated.

Section 20: Operation and Maintenance

General: RHINOFLEX pipe systems are comprised of Pex or HDPE carrier pipe, Pex (cross linked polyethylene) insulation, and a polyethylene jacket and a variety of field insulation kits, fittings and adapters. Although these parts do not require periodic lubrication or maintenance as do other mechanical parts, (i.e. pumps, compressors) an understanding of how these parts work will help you prolong the life of the system.

Jacket: The jacket is a critical part of the pre-insulated pipe system. The jacket's function is to provide mechanical protection and a moisture barrier for the insulation. This moisture barrier must be maintained at all times. If the jacket is damaged it can easily be repaired, however, the repairs will depend on the nature and extent of the damage. See page 1 Repair and page 20, Section 18 for the Wrap Around Shrink process

Insulation: The insulation is closed cell urethane foam. Should the insulation become wet, it will lose some of its thermal efficiency. The upper temperature limit for the insulation is 225° F.

Carrier Pipe: The carrier pipe supplied is described in ROVANCO's submittal package. The piping should be maintained, consistent with good piping practice for application, service and other project conditions, as determined by the owner or the consulting engineer.

Other: Do not modify the system with out consulting with ROVANCO. When excavating near the pre-insulated pipe, be careful not to damage the jacket.

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 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, write us at 20535 S. E. Frontage Road, Joliet, Illinois 60431 or find us at www.rovanco.com or email us at marketing@rovanco.com

Section 21: 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.