Rovanco® Piping Systems
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INS-RJAT

RhinoJoint Air Testable Two-Piece, Air Testable Casing for Pre-Foamed, Pre-insulated Pipe Joints Installation Instructions

Revised 02/03/25

NOTE

If not air testing the RhinoJoint sleeve, please disregard instructions #15, #16, #17, #18, #19, #22, #28, #29 and #41 on the following pages.

NOTE

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

See Page 7 for form used to record RhinoJoint testing results

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Testing

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

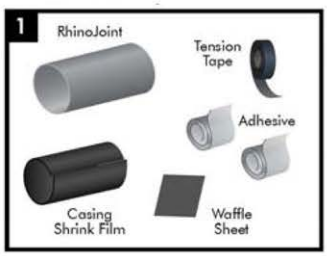
ROVANCO's products and processes are covered under various US patents, including, but not limited to 4,084,842 - 4,484,386 - 4,221,405 - 3,793,411.

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

Section 1: RhinoJoint Installation

Note: If not air testing, please disregard instructions #15, #16, #17, #18, #19, #22, #28, #29, and #41 on the following pages.

Product Description



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

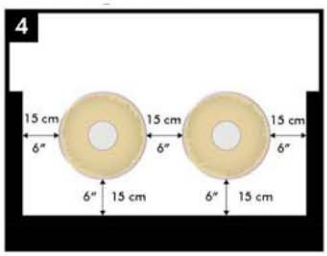
General Information

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

Equipment

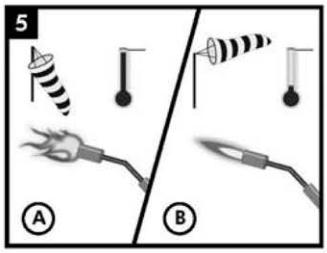
Propane tank, hose, torch & regulator, sandpaper (40-60 grade) or wire brush, knife, roller, rags & solvent cleanser, temperature measuring device, triangular scraper, marking pencil, grater, drill, standard safety equipment, gloves, goggles, hard hat, etc.

Backfilling Trench



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

Flame Intensity



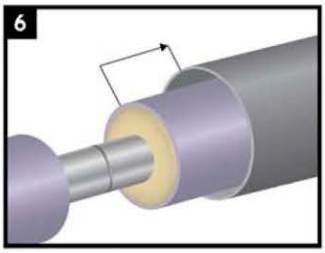
Adjust the flame according to outside conditions.

a. Use weak yellowish-orange flame for low wind, higher temps.
b. Use moderate bluish-yellow flame for high wind, lower temps.

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

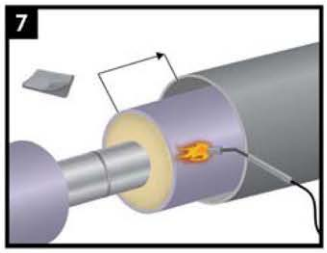
Do not overheat the jacket pipe as it will burn with excessive heating.

Casing Preparation



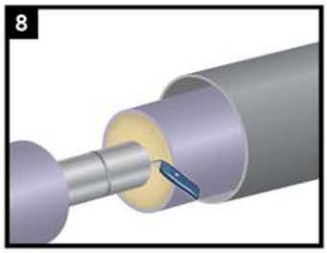
Check the RhinoJoint to assure it is not damaged. Before welding together the carrier pipes, slide the tubular casing as far away from the joint as possible.

General Drying & Cleaning



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

Pipe Preparation

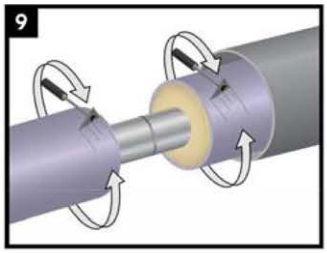


Remove any wet foam from end of the pre-insulated pipe.

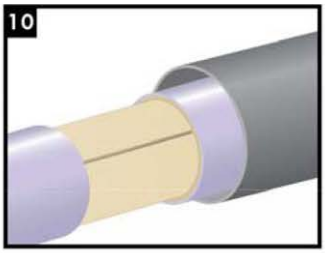
NOTE: ***Prior to any carrier field welds, pipe ends must be prepped in the field by contractor.***

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

Insulation Instructions

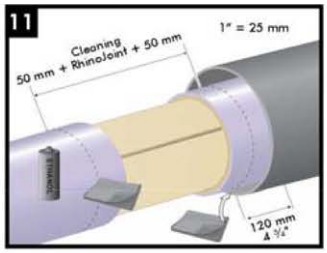


Using a triangular scraper, clean edges of the jacket pipe to remove any burrs and dirt from the sealing area.



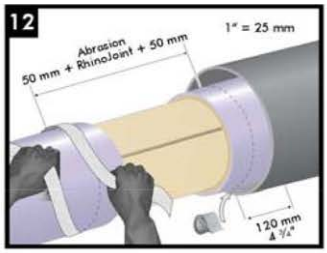
Install the foam half-shells per Section 8 in these installation instructions.
see page 10

Surface Preparation



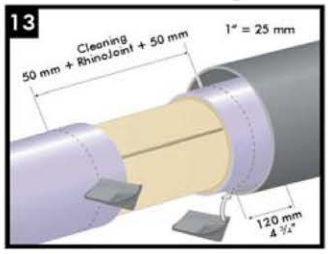
Clean the surface of the jacket pipe and the inside of the thin end zone of the casing with a rag to remove dirt. Degrease the surface of the jacket pipe and the inside of the RhinoJoint using a grease and lint-free rag soaked in solvent.

Surface Abrasion



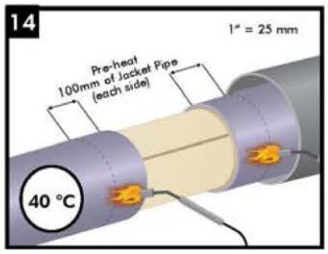
Roughen the surface of the jacket pipe on both sides of the cutback and the inside of the RhinoJoint using sandpaper (40-60 grade).

Final Surface Cleaning



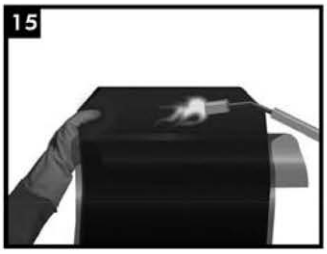
Using a dry, grease and lint-free rag, clean the roughened surface to remove any poly-ethylene or sand particles.

Pre-Heat

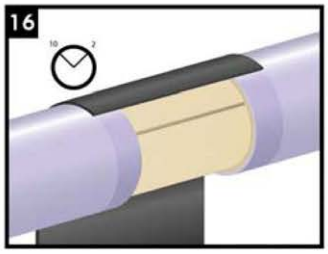


Using a propane torch and a low-yellow flame, warm 100mm (4") of the jacket pipe surface on each side of the cutback to 40˚C (104˚F). Ensure that foam has set up prior to casing shrink film installation.

Installation

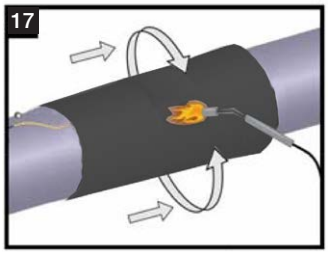


Partially remove the release liner and **gently** heat the underlap approximately 150mm (6") from the edge.



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

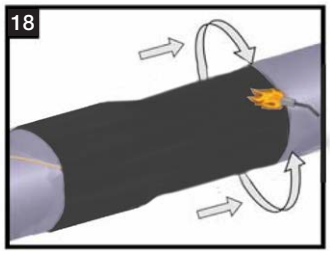
Shrinking Down Liner



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

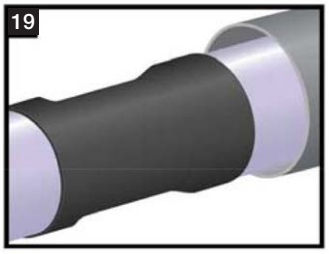
- Film is in full contact with the foamed joint and jacket pipe.
- No cracks or holes in film backing.

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



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

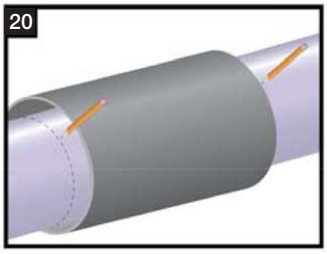
Repeat the same process starting in the middle and working toward the opposite end until the whole liner is shrunk down.



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

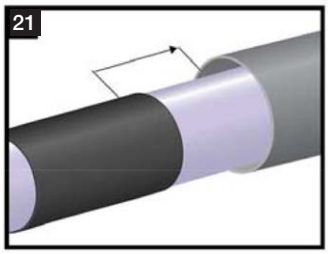
- Film is in full contact with the foamed joint and jacket pipe in all places.
- Film conforms fully to the half-shell profile.
- No cracks or holes in film backing.

RhinoJoint Position Marking



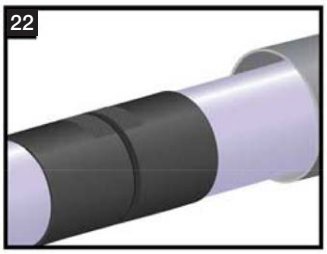
For convenience, center the RhinoJoint over the joint and mark out two reference lines circumferentially on the jacket pipe (this will assist in preparation and positioning of the RhinoJoint).

RhinoJoint Position



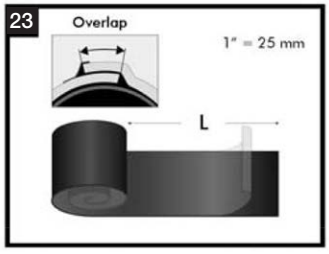
Slide the RhinoJoint away from the jacket pipe edge.

Waffle Sheet Installation



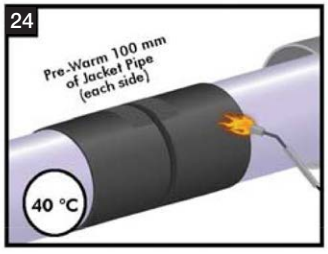
Install the 6" x 6" waffle sheet directly over the inner shrink film at the 12 o'clock position on the pipe. Secure in place with tape.

Adhesive Length *(w/Bulk Roll)*



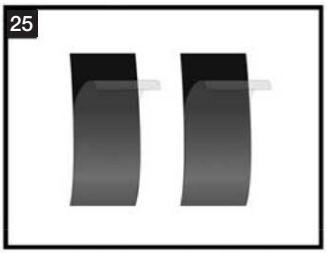
If not using the pre-cut adhesive from a kit, measure the circumference of the jacket pipe and cut two sealing strips long enough to allow for overlap.

Pre-Warming



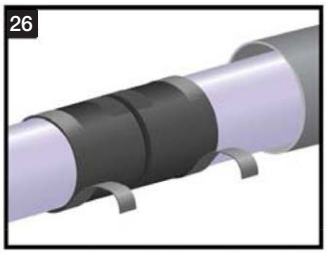
Pre-warm the pipe to 40˚-50˚C (104˚-122˚F). **Ensure the correct temperature with a temperature measuring device.** Do not exceed 50˚C (122˚F) as this makes removal of release liner difficult.

Release Liner

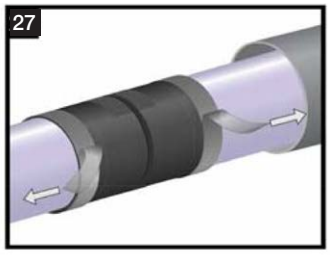


Remove the thinner release liner (opposite the mesh side) from both adhesive strips and...

Adhesive Application

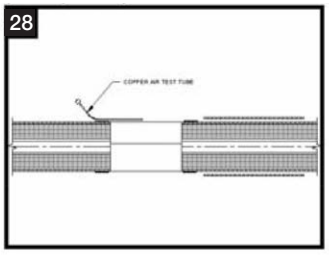


...apply the adhesive strips lightly around the jacket pipe with the mesh side facing up. The strips should be applied so that they are placed approximately 10mm (0.4") inside the marks. Partially peel back the release liner on the underlap and wrap the strips around the jacket pipe so that it overlaps.

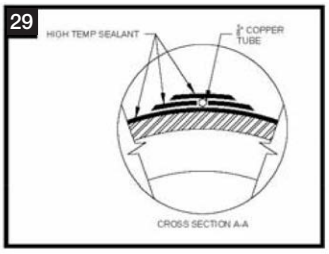


Fold the release liner outwards to allow for easy removal after positioning the casing.

Air Test Tube Installation *(If Required)*

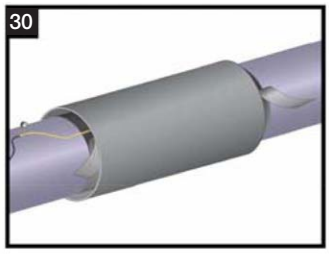


Extend the 1/8" x 16" copper tube from the waffle sheet, beyond the adhesive strips and out to the end of the casing. Secure in place with tape.



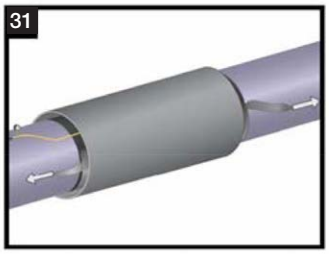
Using the 4" wide high temp sealant strips provided, place a strip on each side and on the top of the copper air test tube. Press adhesive into place to ensure there are no air pockets or voids.

RhinoJoint Placement

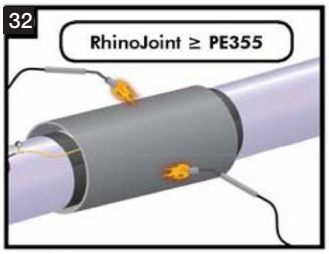


Carefully slide the RhinoJoint over the joint so that the edges are centered over the edge of the adhesive strips.

RhinoJoint Installation

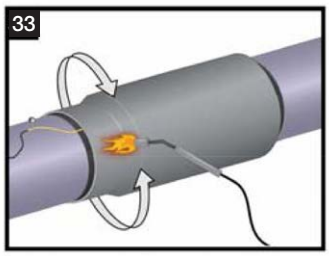


Completely remove the release liners from the adhesive strips.

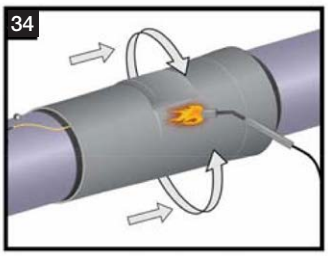


For RhinoJoint sizes 355mm and greater, it is recommended to use two installers working on opposite sides of the pipe. Using broad strokes and a medium flame, begin shrinking at the center of the RhinoJoint and work out to the ends.

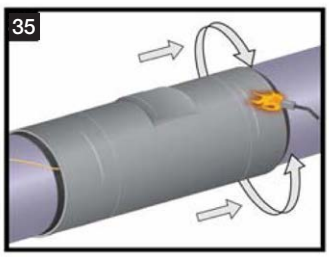
Shrinking The RhinoJoint



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

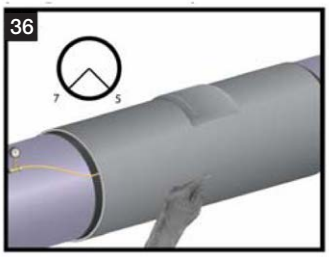


Use a broad circumferential strokes and continue shrinking by moving horizontally...

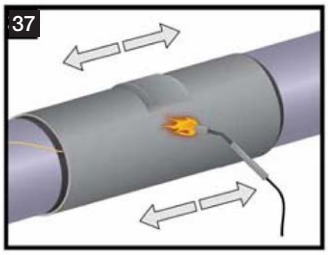


...towards the opposite end of the RhinoJoint.

Quality Check *(Finger Probe Test)*

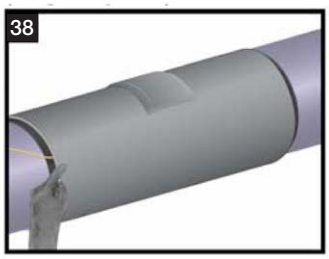


With a gloved finger, press down on the shrunk area to ensure the backing and adhesive are soft. Also, use a gloved hand to check parts of the shrunk area between the 5 and 7 o'clock positions.
If there are cool spots, the RhinoJoint should be re-worked with additional heat.



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

Quality Check *(Finger Tip Test)*

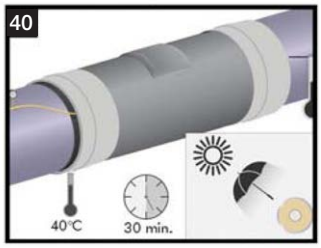


As a final check, ensure that the entire RhinoJoint conforms to the entire pipe surface (360˚ around the pipe). This can be checked by feeling the edges all around the circumference of the casing. A visual check should be done at the 6 o'clock position of the joint.

Tension Tape Application

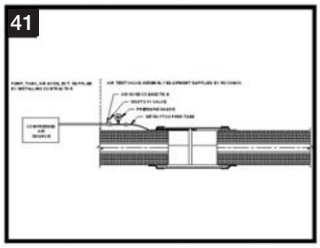
Foe casing sizes PE355 and above, wrap the supplied tension tape around both edges immediately after shrinking, while the casing is still soft (if the casing has cooled down; reheat it). **This ensures cooling and conformance of the edges.**

Cool RhinoJoint to < 40˚C (104˚F)



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

Quality Check *(Air Pressure Test)*



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

Backfilling Guidelines

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

Storage & Safety Guidelines

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

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

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

Part No. TBD

IG_RhinoJoint(Air-Testable_rev010

EN 489 Joint and/or Leak Detection Continuity Check List

Project: _____

Order No.: _____

Note: This check list is to ensure items are reviewed during the process of the field joint completion. **Reminder FULL ROUND SLEEVES (if RhinoJoints) MUST BE SLID ON PRIOR TO WELDING CARRIER PIPE**. This list only highlights set points IN the process. Please review and follow complete installation instructions for the field joint. Please have installer initial each step and return a copy to Rovanco at project completion.

Joint # / Size	Date	Continuity of Spool Pre-install*	Continuity Pre-Shrink*	Liner – Shrink Complete**	Continuity – Post Shrink* (Record)	Outer Sleeve Shrink***	Tension Tape Applied**

* Not necessary if piping system does NOT have Leak Detection.
** Not Necessary if piping system does NOT have RhinoJoints.
*** Not Necessary if piping system is above ground with metal jacket.

Section 3: Operation & Maintenance for Steam Conduit

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

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

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

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

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

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

System Shutdown: If the system is shut down for any length of time, seal the system vents by plugging the goose neck or removing it and installing a plug. Purge with dry nitrogen be fore 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 4: 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 filed 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.