GENERAL

Perma-Pipe’s SLEEVE-GARD®80 is a wraparound heat shrink sleeve with a separate closure designed for field joint and corrosion protection of both buried and aboveground pipelines with operating temperatures up to 176°F (80°C). SLEEVE-GARD®80 forms a water tight seal between the sleeve and the surface(s) it is applied to. Heating causes the adhesive backing to soften and the sleeve to shrink and recover, compressing the adhesive and forming a seal.

SLEEVE-GARD®80 heat shrink sleeves are field installed on insulated and jacketed piping systems to seal the insulation jacket at the field joints and jacket repair locations and on conduit / containment systems to seal the coating system at the field joints and coating repair locations.

Proper installation of SLEEVE-GARD®80 heat shrink sleeves is critical to maintaining the insulation or conduit / containment pipe surface dry. Wet insulation or bare metal will degrade and corrode resulting in reduced service life, costly repairs or irreparable damage to the piping system.

When cold or wet weather conditions are present, tenting and / or heating may be required to enable the proper installation of the SLEEVE-GARD®80. Refer to the Perma-Pipe Installation Manual Supplement for Cold / Wet Weather Conditions.

Refer to the appropriate PERMA-PIPE product Installation Manual for complete installation recommendations.

STORAGE

- Store SLEEVE-GARD®80 heat shrink sleeves indoors and in a dry, ventilated area.
- Keep the materials in their original shipping cartons. The recommended storage temperature range 60° - 95° F (18° - 35°C).
- Refer to the Material Safety Data Sheets (MSDS Sheets) for proper handling, storage and use.
- Contact PERMA-PIPE if additional MSDS Sheets are needed.

MATERIALS & EQUIPMENT

All materials, equipment, and tools should be made readily available before starting.

Do Not attempt applying heat shrink sleeves in wet bell holes or wet conditions. If the bell hole is wet, pump it dry before insulating the field joint.

PERMA-PIPE provides the following materials for heat shrink sleeve application;
- Heat shrink sleeve bulk roll material
- Closure seals
- Propane torch head - high capacity flame nozzle. For outside diameters less than 18 inches, the minimum, torch size is 150,000 BTU/hr. For outside diameters greater than 18 inches, the minimum torch size is 300,000 BTU/hr. Only use the torch provided or one that is equivalent.
- J-Roller

The installer will need to furnish the following:
- Propane tank, hose, fittings, valves, and regulators.
- Knife
- Tape measure
- Digital handheld infrared thermometer
- 40-60 grit sandpaper or appropriate tools for surface abrasion
- Heat resistant gloves

INSTALLATION

SLEEVE PREPARATION

PERMA-PIPE provides heat shrink sleeve material in bulk roll. For each field joint, measure the field joint and cut the SLEEVE-GARD®80 heat shrink sleeve length in the following manner;

- Measure the circumference of the largest outside diameter of the insulation jacket or conduit / containment pipe in the area the heat shrink sleeve will cover.
  Note: It is not uncommon for there to be differences in insulation jacket outside diameters at fittings and special components. A slight taper in the field joint will compensate for this.
- For circumferences of 57” or less, cut the sleeve to a length equal to the circumference + 4” (overlap) + 2” (slack).
- For circumferences of 57” or more cut the sleeve to a length equal to the circumference + 6” (overlap) + 2” (slack).
- Cut ½” triangles from both corners of the SLEEVE-GARD®80 heat shrink sleeve for what will be on the underlap. See below instruction for Application.
SURFACE PREPARATION

For proper adhesion of the SLEEVE-GARD®80 heat shrink sleeve, it is important to properly prepare the surface it is being applied to.

- Remove all contaminants such as dirt, oil, grease, etc. with a solvent.
- Ensure that the surface is dry.
- Lightly abrade the surface with 40-60 grit sandpaper or appropriate tools. Abrade the surface the width of the sleeve, plus two inches past where each of the sleeve circumferential ends will be located.
- With a clean rag, wipe the abraded surface clean of all dust and contaminants.
- Pre-heat the abraded surface to 195°F (90°C). Use the infrared thermometer to confirm correct preheat temperature.

HEAT SHRINKING TECHNIQUE

Before starting the heat shrink sleeve application, become familiar with the following:

- Wear heat resistant gloves whenever working with the propane torch and hot surfaces.
- Use two (2) people and two (2) torches for outside diameters larger than 18 inches.
- The propane torch flame should be kept at least 6 inches away from the heat shrink sleeve and at an angle to the surface. Holding the propane torch at an angle allows the flame to bounce off the heat shrink sleeve and decreases the local intensity of the heat. If the flame is held too close to the surface, the heat shrink sleeve will burn and may tear around the burned areas.
- Use your body as a shield to protect the flame from the wind. Keep the propane torch at an angle to the sleeve and pointed in the direction the wind is blowing to maintain a fairly even flame. Do Not increase the size of the flame, this could overheat and burn the heat shrink sleeve.
- Keep the propane torch in constant motion. Do Not burn any surfaces.

APPLICATION

Apply the SLEEVE-GARD®80 heat shrink sleeve in the following manner;

- Remove the first 6-10 inches of backing material from the SLEEVE-GARD®80 heat shrink sleeve mastic.
- Centering the SLEEVE-GARD®80 heat shrink sleeve at the joint, press the top edge just below the top of the field joint. This is the underlap.
- Note: The SLEEVE-GARD®80 heat shrink sleeve stenciling must run circumferentially around the field joint.
- Heat the top 2 inches of the SLEEVE-GARD®80 heat shrink sleeve with the propane torch until it becomes soft and adheres to the insulation and insulation jacket or conduit / containment pipe coating.
- Remove the remaining backing material from the SLEEVE-GARD®80 heat shrink sleeve, being careful not to get dirt or water on the sleeve mastic. Continue to wrap the shrink sleeve around the joint, leaving about a 2" gap at the bottom. Reheat the top 2 inches of the heat shrink sleeve before overlapping. Be sure to overlap downward.
- Preheat the closure strip for approximately 10 - 20 seconds until it becomes soft. The closure strip will be at the correct temperature when its edges just begin to curl.
- Center the closure strip over the longitudinal seam of the SLEEVE-GARD®80 heat shrink sleeve. While continuing to apply heat, use a gloved hand to pat the closure strip into place. Using the provided J-Roller, smooth wrinkles and remove any trapped air.
NOTE: Sufficient heat and uniform pressure from the J-Roller is required to completely fuse the closure strip to the heat shrink sleeve seam. The closure strip is necessary to fuse the overlap to the underlap of the heat shrink sleeve.

Once the closure strip application is complete, heat the center section of the SLEEVE-GARD®80 heat shrink sleeve all the way around until it shrinks.

When the center of the heat shrink sleeve has shrunk, begin to move the propane torch with an up and down spiral motion around the shrink sleeve toward one end.

When that side has fully recovered, heat the other side with the same up-and-down spiral motion.

Reduce the flame slightly and shrink the edges of the SLEEVE-GARD®80 heat shrink sleeve onto the insulation jacket or conduit / containment pipe. Black adhesive escaping evenly at the edges of the heat shrink sleeve indicates a good bond and shrinkage.

If the heat shrink sleeve edge rises up, reheat and press down firmly.

While the heat shrink sleeve is still hot and soft, use the J-Roller to gently roll the sleeve surface and push any trapped air up and out of the sleeve. Reheat, if necessary.

**FINAL INSPECTION**

After installation, visually inspect the heat shrink sleeve to verify it has been properly installed and is completely sealed onto the insulation jacket or conduit / containment pipe coating. There should be a visible indication of mastic extruding out from under the heat shrink sleeve along the circumferential seams of the heat shrink sleeve. There should be no bubbles or air pockets under the heat shrink sleeve.

Re-heat and re-shrink the heat shrink sleeve if there are any signs the heat shrink sleeve is not completely sealed to the insulation jacket or conduit / containment pipe coating.

**BACKFILL**

Allow the SLEEVE-GARD®80 heat shrink sleeves to become cool to the touch (about 2 hours) prior to backfilling. Refer the appropriate Perma-Pipe Installation Manual for bedding and backfill recommendations to avoid damage to the SLEEVE-GARD®80 heat shrink sleeve.
WARRANTY

Seller warrants to the original Buyer only that the products sold hereunder will substantially comply with the above referenced technical specifications for the products and that no product will have any defect in Seller's workmanship or material. Seller shall not be responsible for and does not warrant the installation of the products. Seller agrees to provide field services as provided herein and warrants only that the information provided to Seller during such field service visits will be consistent with Seller's recommendations for installation. Seller specifically rejects all other warranties in the contract documents for the project, which may apply to Seller's products. The foregoing warranty shall be in effect with respect to each product sold hereunder only for a period of fifteen (15) months from the date of completion of testing of such product, but in no event more than eighteen (18) months from the date of shipment by Seller of such product; provided, however, no claim shall be permitted under the warranties contained herein unless Buyer shall give to Seller written notice of all respects in which Buyer claims the product to be defective or at a variance with specifications within ten (10) days from the date Buyer discovers or should have discovered a defect or variance from specifications, but in no event later than eighteen (18) months after shipment of such product, and unless Buyer shall afford Seller a reasonable opportunity to inspect such product after notice has been given. The foregoing warranties shall not apply to any products or components thereof, which have been subject to abnormal or improper use, negligence or accident or which have been altered or repaired by someone other than Seller or Seller's authorized representative. No product shall be returned without Seller's prior written consent. Buyer shall accept minor variations in dimensions or other variance from specifications provided that there is no impairment of function or useful life of the product. Seller warrants that its title to the product sold hereunder is good, and that the transfer thereof to Buyer is rightful.

Seller's obligations under the warranties contained herein and any other provision of the Agreement determined to constitute a warranty by the Seller of the products to be sold pursuant hereto, and Buyer's remedies for any defective or non-conforming products shall be limited solely to the repair or replacement, as elected by Seller of defective or non-conforming materials. Buyer is responsible for returning all the defective or non-conforming products to Seller's factory or any other place as mentioned by Seller without being damaged at Buyer's expense.

To the maximum extent permitted by law, Buyer irrevocably waives all claims against Seller for money damages relating to the condition, use and performance of the goods sold pursuant hereto, including claims based upon tort, strict liability, negligence and product liability. Notwithstanding the provisions of the preceding sentence, if money damages are assessed against the Seller, in no event shall Seller's liability for such damages exceed the purchase price of products sold by Seller.

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