




**INSULPEX® PRE-INSULATED PEXa PIPING
INSTALLATION GUIDE**

Table of Contents

1. Scope 3
2. Installation Considerations 4
3. Preparing Installation 5
4. Handling INSULPEX 8
5. Preparing Trench 9
6. Entering Building 11
7. Placing INSULPEX 13
8. Making Fitting Connections 16
9. Performing Pressure Test 18
10. Protecting Buried Connections 20
11. Backfilling Trench 24
12. Starting the System 25

 This symbol and the signal words DANGER, WARNING or CAUTION alert you to personal injury hazards. If you don't avoid the hazardous situation:

- DANGER! Will result in death or serious injury
- WARNING! Could result in death or serious injury
- CAUTION! Can result in minor or moderate injury

The signal word NOTICE is used to help you avoid property damage. We cannot warn of all hazards; you must also use your own good judgment.

For updates to this publication and the most current technical instructions, safety information and manufacturer's recommendations, visit na.rehau.com/resourcecenter

1. SCOPE

This technical information applies to the installation of REHAU INSULPEX pre-insulated PEXa piping systems.

Persons using this guide must be experienced and appropriately licensed installers, with a working knowledge of local codes, principles and practices for installation of flexible distribution piping systems.

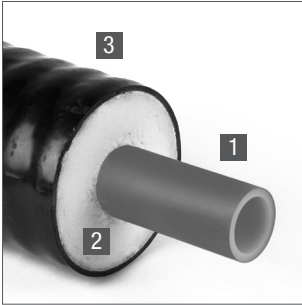


Fig. 1:1 INSULPEX main components PEXa carrier pipe (1), insulation (2) and jacket (3)

The information presented in this guide is intended to demonstrate general methods and is not specific to your project conditions. It is the responsibility of the installer to check the prevailing local codes and to verify that technical information presented in this guide is appropriate for a particular installation. This guide does not supersede the recommendations of other manufacturers. If there is conflicting information, the installer must consult with the other manufacturer's representative prior to planning, install-

ing and connecting the INSULPEX system. It is the responsibility of the installer to discuss any variation with your regional REHAU sales representative to ensure that it will not adversely affect the performance, operation or life expectancy of the INSULPEX system.

The installation of INSULPEX used in energy transfer piping systems must be in accordance with this installation guide.

This guide should be used in conjunction with the pertinent REHAU *Product Instructions* and REHAU *Operating Instructions* which provide a detailed description for the selected system components.

The installer should review the pertinent supplemental REHAU *Technical Bulletins* before beginning to install an energy transfer piping system. Installers should also periodically check the *REHAU Resource Center* na.rehau.com/resourcecenter for the latest updates.

2. INSTALLATION CONSIDERATIONS

⚠ WARNING!

- INSULPEX coils are heavy, 300 to 1200 lbs (136 to 544 kg), and should be kept stable at all times. Most sizes of INSULPEX require at least two people to handle. Plan accordingly and exercise caution when maneuvering coils by hand. A falling coil can cause serious injury or death.
- To reduce the risk of permanent injury to your fingers, hands and all parts of your body, wear protective clothing such as steel toe boots and leather gloves when handling INSULPEX coils.

NOTICE:

- Prevent UV radiation exposure of the PEXa carrier pipe(s). Do not remove the protective caps or bags placed on the ends of the INSULPEX until ready to install.
- Below 32°F (0°C) any sudden or extreme change of position (e.g., unrolling) can crack the INSULPEX. Warm up INSULPEX to 40°F (5°C) if possible.
- Lift or roll coils; do not drag them. When using a forklift, support the entire width of the coil with the forks. If a coil must be lifted with a crane, use a nylon sling to hold the coil.

3. PREPARING INSTALLATION

3.1 Reviewing Local Codes

The installer is responsible for checking with applicable code authorities to determine specific local requirements.

RAUTHERM™ is REHAU's tradename for metric-sized SDR11 carrier pipes in accordance to ISO 15875 and DIN 16892. SDR11 compression-sleeve fittings are in accordance with ISO 15875.

3.2 Checking the Design

The piping system design should be complete before attempting installation. Relevant technical data on the INSULPEX pipes are in Table 3.1. Refer to the REHAU *INSULPEX Pre-insulated PEXa Piping Design Guide* for additional INSULPEX information not found in this table.

Inspect the job site checking for possible hazards and to confirm the site matches the plans. It is the full responsibility of the installer to thoroughly review the design documents and determine the suitability of the plans for the installer's intended use prior to ordering materials or installing the system. If there are potential problems with the design that could affect the quality of the installation or the system performance, notify the designer, builder or owner immediately.

1. Check the planned building penetrations are in the preferred location.
2. Check the building drawings to verify there are no discrepancies in the planned connection to the building service piping.

3.3 Organizing Tools

To assemble joints comprising RAUTHERM carrier pipes to SDR11 compression-sleeve fittings, there are various REHAU manual and battery-hydraulic tools available. REHAU carrier pipe cutters are included in these kits.



RAUTOOL M1

Manual tools for expansion and compression in dimensions 25 to 40 mm.



RAUTOOL G2

Hydraulic cylinder for expansion and compression in dimensions 40 to 110 mm. Cylinder is driven via a battery-hydraulic pump.



RAUTOOL G2 125 to 160

Hydraulic cylinder for expansion and a crossbar with two hydraulic cylinders for compression in dimensions 125 to 160 mm. Cylinders are driven via a battery-hydraulic pump.

Additional Tools

Additional tools required for INSULPEX installations are:

- Saw for cutting INSULPEX to exact length on job site
- Knife for cutting away jacket
- Hammer and sandpaper for removing insulation
- Polyurethane foam insulation to fill void after assembling insulation kits

The following tools may be needed if shroud + heat shrink insulation kits are used (see Section 10):

- Torch for heat shrinking sleeves
- Sandpaper for abrading the shell and jacket
- Cleaning agent and cloth for cleaning jacket prior to applying heat shrink sleeves

Table 3.1: INSULPEX with Metric-sized RAUTHERM SDR11 Carrier Pipe

| Nominal Size mm | Jacket OD in. (mm) | Weight lb/ft (kg/m) | Capacity gal/ft (l/m) | Minimum Bend Radius ft (m) |
|------------------------|-----------------------|------------------------|---------------------------|-------------------------------|
| One-pipe system | | | | |
| 25 | 3.6 (91) | 0.8 (1.2) | 0.0263 (0.327) | 2.6 (0.8) |
| 32 | 3.6 (91) | 0.9 (1.4) | 0.434 (0.539) | 2.6 (0.8) |
| 40 | 3.6 (91) | 0.9 (1.4) | 0.0672 (0.835) | 2.6 (0.8) |
| 50 | 4.4 (111) | 1.3 (2.0) | 0.1052 (1.307) | 3.0 (0.9) |
| 63 | 5.0 (126) | 1.7 (2.6) | 0.1683 (2.091) | 3.3 (1.0) |
| 75 | 5.6 (142) | 2.3 (3.4) | 0.2384 (2.961) | 3.5 (1.1) |
| 90 | 6.4 (162) | 3.1 (4.6) | 0.3425 (4.254) | 4.0 (1.2) |
| 110 | 6.4 (162) | 3.8 (5.7) | 0.5123 (8.120) | 4.0 (1.4) |
| 125 | 7.2 (182) | 4.8 (7.2) | 0.6537 (8.120) | 4.5 (1.4) |
| 140 | 8.0 (202) | 5.6 (8.4) | 0.8300 (10.31) | 4.5 (1.4) |
| Two-pipe system | | | | |
| 25 + 25 | 4.4 (111) | 1.1 (1.6) | 2 x 0.0263 (2. 0.0327) | 3.0 (0.9) |
| 32 + 32 | 4.4 (111) | 1.3 (1.9) | 2 x 0.0434 (2 x 0.539) | 3.0 (0.9) |
| 40 + 40 | 5.0 (126) | 1.7 (2.5) | 2 x 0.0672 (2 x 0.835) | 3.9 (1.2) |
| 50 + 50 | 6.4 (162) | 2.7 (4.0) | 2 x 0.1052 (2x 1.307) | 4.5 (1.4) |
| 63 + 63 | 7.2 (182) | 3.6 (5.3) | 2 x 0.1683 (2 x 2.091) | 4.5 (1.4) |

4. HANDLING INSULPEX

4.1 Storage

- Store coils upright in a dry location with minimal traffic. Keep ends covered.
- INSULPEX may be stored outside for a period of up to two years accumulated only.
- Brace and chock coils to prevent rolling or tipping.

4.2 Transporting

- INSULPEX coils vary in size and weight. Mechanized equipment may be required to move coils. A nylon strap or sling should be used to lift coils.
- INSULPEX coils are heavy, 300 to 1200 lbs (136 to 544 kg), and should be kept stable at all times.
- Wear protective clothing such as steel toe boots and leather gloves when handling INSULPEX coils.
- Lift or roll coils; do not drag them.
- When using a forklift, support the entire width of the coil with the forks.
- Do not pull INSULPEX coils with ropes.



Fig. 4.1: Unloading INSULPEX with forklift

⚠ WARNING! Keep coils stable at all times. A falling coil can cause serious injury or death.

5. PREPARING TRENCH

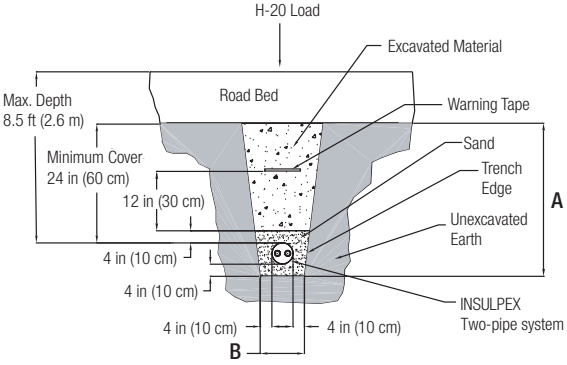


Fig. 5.1: Preparing the trench

INSULPEX is suitable for H-20 loading at depths ranging from 2 ft (60 cm) from the roadbed, to a maximum 8.5 ft (260 cm). See Fig. 5.2 and 5.3 and Table 5.1 and 5.2 for H-20 trench dimensions. Mark the intended route for the INSULPEX and check with utility companies and other trades to ensure the path is clear. Identify the side of the trench where the INSULPEX will be handled. Remove earth to the opposite side of the trench.

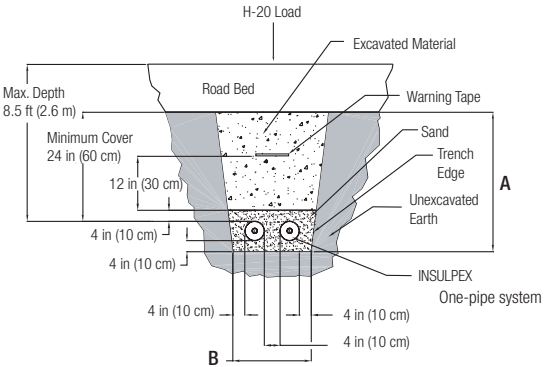
For applications where loading is not a concern, the trench depth should be a minimum of 16 in (40 cm) to the top of the INSULPEX. For better thermal performance, an increased burial depth is recommended. Burying the pipe below the frost line can prevent heaving and improve thermal performance.

Table 5.1: One-pipe trench dimensions



| Jacket OD (mm) | Depth A in (cm) | Width B in (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 | 35 (90) | 15 (38) |
| 202 | 38 (95) | 16 (40) |

Table 5.2: Two-pipe trench dimensions



| Jacket OD (mm) | Depth A in (cm) | Width B in (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 | 35 (90) | 26 (65) |
| 202 | 38 (95) | 28 (70) |

6. ENTERING BUILDING

6.1 Penetrating the Exterior Wall

When penetrating through an exterior wall two options are bored hole and wall breakthrough. Both options require the use of the wall sealing ring and require filling the hole with concrete or mortar. REHAU recommends sealing the bored hole over the entire inner surface with a sealant.

Slide the wall sealing ring onto the pipe. The small end of the ring should face the exterior of the wall. It may be necessary to lubricate the inside of the wall sealing ring with liquid dish soap. Fill the void around the sealing ring after the system pressure testing is complete.

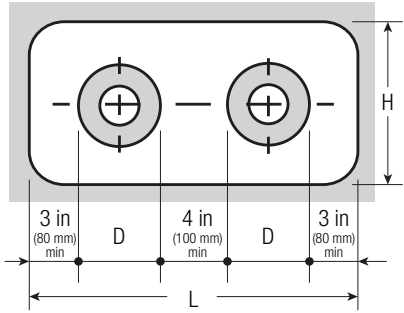


Table 6.1:
Opening Dimensions
Wall Breakthrough

| Jacket OD mm | L min in (cm) | H in (cm) |
|-----------------|------------------|--------------|
| 91 | 20 (50) | 10 (25) |
| 111 | 20 (50) | 12 (30) |
| 126 | 21 3/4 (55) | 12 (30) |
| 142 | 23 3/4 (60) | 13 3/4 (35) |
| 162 | 25 1/2 (65) | 13 3/4 (35) |
| 182 | 25 1/2 (65) | 13 3/4 (35) |
| 202 | 27 1/2 (70) | 15 3/4 (40) |

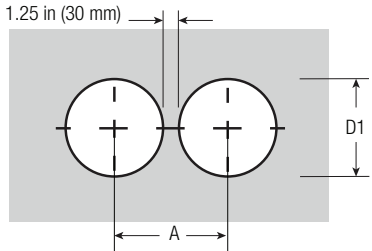


Table 6.2:
Bored Hole Dimensions

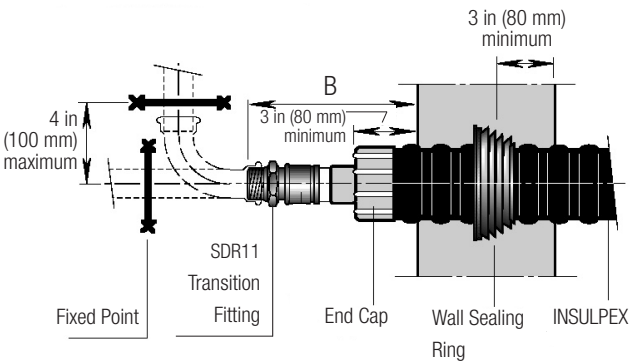
| Jacket OD mm | A min in (cm) | D1 in (cm) |
|-----------------|------------------|---------------|
| 91 | 9 (23) | 8 (20) |
| 111 | 10 (25) | 9 (22) |
| 126 | 10 3/4 (27) | 9 1/2 (24) |
| 142 | 11 1/2 (29) | 10 1/4 (26) |
| 162 | 12 1/4 (31) | 11 (28) |
| 182 | 12 3/4 (32) | 11 1/2 (29) |
| 202 | 13 3/4 (35) | 12 1/2 (32) |

Linked-type sealing rings and compression wall seals suitable for polymer pipes can also be used when following manufacturer's instructions. These sealing systems do not use mortar and do not require a wall sealing ring, however since hairline cracks can exist in concrete or can arise as a result of the boring, REHAU recommends sealing the bored hole over the entire inner surface with a sealant.

6.2 Transitioning From INSULPEX to Building Service Piping

To keep the thermal expansion within acceptable limits when connecting to a building, INSULPEX pipes should not extend beyond the exterior wall into the building more than the distances specified in Table 6.3. If the end caps are fully inside the wall, these distances can be reduced by 2.3 in (60 mm). The PEXa carrier pipe requires properly designed and installed fixed brackets inside the building suitable for the thermal expansion forces. Fixed brackets may be attached to the fitting body, but not to the SDR11 compression sleeve.

Table 6.3: Allowed Length of INSULPEX Inside Building



| PEXa Carrier Pipe Nominal Size | B in (cm) |
|--------------------------------------|--------------|
| 25 mm | 10 3/4 (27) |
| 32 mm | 10 3/4 (27) |
| 40 mm | 10 3/4 (27) |
| 50 mm | 10 3/4 (27) |
| 63 mm | 11 3/4 (30) |
| 75 mm | 11 3/4 (30) |
| 90 mm | 11 3/4 (30) |
| 110 mm | 11 3/4 (30) |
| 125 mm | 13 3/4 (35) |
| 140 mm | 13 3/4 (35) |

7. PLACING INSULPEX

7.1 Uncoiling the INSULPEX

1. Position the INSULPEX coil at the installation location using the appropriate handling procedures.
2. Lay the loose end of the coil in the installation area and unroll the coil in the direction of the route. Two or more people should guide the roll. Exercise caution as the end of the INSULPEX may spring back up. It may be helpful to:
 - Make the fitting connection of the loose end of INSULPEX **before** unrolling the coil.
 - Unroll and layout the INSULPEX on the ground beside the trench for a few hours to let it flatten out, before placing it in the trench.
3. As the coil is unrolled, cut coil straps one at a time to prevent unwanted expansion of the INSULPEX coil.

⚠ WARNING! Stand clear when coil straps are cut. Coil can suddenly expand with force that can cause injury.

NOTICE: Below 32°F (0°C) any sudden or extreme change of position (e.g., unrolling) can crack the INSULPEX. Warm up INSULPEX to 40°F (5°C) if possible.

7.2 Installing Sequence of Accessories and Components

INSULPEX installation accessories must be installed in the proper order.

- For shroud + heat shrink insulation kits: 1) slide the heat shrink sleeves and shell down the INSULPEX, 2) assemble the fitting.
- For shell assembly insulation kits: 1) slide the gaskets down the INSULPEX, 2) assemble the fitting.
- For building penetrations, 1) install the wall sealing ring onto the INSULPEX, 2) install the heat shrink or slip-on end cap (if being used), 3) assemble the fitting.

Note: REHAU recommends that the system pressure test be performed before the insulation kits are assembled and filled with insulation and before the building penetration is filled with concrete or mortar.

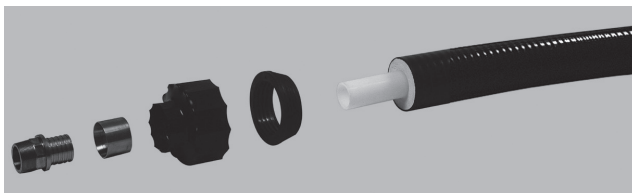


Fig. 7.1: Correct assembly sequence for building penetrations

7.3 Cutting Away the Jacket and the Insulation

1. Cut the INSULPEX squarely with a saw at approximately the point where the connecting fitting will be placed on the pipe. REHAU suggests using a 32T fine tooth saw.

⚠ WARNING! Sharp blades can cut fingers. Exercise caution when using a knife or other sharp instrument.

2. Mark the jacket at a distance from the end, as determined from Table 7.1. Note that the cut length is longer for transition fittings than coupling fittings.

Table 7.1: Insulation Removal Length



| SDR11 compression-sleeve fittings | | |
|-----------------------------------|----------------------|------------|
| PEXa carrier pipe | coupling, tee, elbow | transition |
| | $X=Y=Z$ | $X=Y=Z$ |
| | in (mm) | in (mm) |
| 63 to 110 mm | 5 1/2 (140) | 7 (180) |
| 125 to 160 mm | 6 1/2 (165) | 8 (205) |

3. Cut around the jacket on the mark with a pipe cutter or knife and remove jacket.



4. With a hammer, remove the insulation. Be careful not to remove any of the oxygen diffusion barrier on the outside of the PEXa carrier pipe.

5. Use sandpaper to remove the remaining insulation from the PEXa carrier pipe. It may be helpful to slide a SDR11 sleeve or a compression nut up and down the exposed PEXa carrier pipe to remove the fine bits of insulation. Be sure to clean out the sleeve or nut afterward.



6. Cut off up to a 1/2 in (12 mm) in length of PEXa carrier pipe with a REHAU cutter to give the pipe a clean, square cut.

7.4 Installing a Heat-shrink End Cap

1. Cut away the jacket and the insulation.
2. Rough up the heat-shrink area with sandpaper and preheat it to more than 140°F (60°C) with a soft flame. Use temperature indicator strips to check the preheating temperature.



3. Slide on heat-shrink end cap and shrink on using a soft flame.
4. Complete the joint for the transition fitting.

Note: If the shrink accessory has any cuts or nicks, do not use it, as correct installation will be more difficult. Use a new shrink sleeve or endcap free of defects.

7.5 Installing Push-on End Caps

1. Cut away the jacket and the insulation.
2. Push-on end cap.
3. Complete the joint for the transition fitting.

7.6 Repairing INSULPEX

Damaged or perforated INSULPEX may be repaired by using INSULPEX repair tape or a coupling insulation kit.

For small damaged areas, simply wrap the INSULPEX with the repair tape, filling in with canned spray polyurethane foam, if desired. Follow instructions on can.

If you suspect that the PEXa carrier pipe has been nicked or damaged in any way, then cut out the damaged section of PEXa carrier pipe and repair with a SDR11 coupling and a coupling insulation kit.

8. MAKING FITTING CONNECTIONS

When assembling a fitting, it is important to remove enough insulation to expose the sufficient length of PEXa carrier pipe. Before proceeding with the fitting assembly, check that you are following the proper sequence of installing accessories and components.

8.1 Assembly of SDR11 Compression-Sleeve Fitting

Refer to REHAU *Operating Instructions* for detailed instructions on the specific tool being used.

1. Check that the proper tool, fitting and sleeve is available on site based on the size of the PEXa carrier pipe.



2. Place the SDR11 compression sleeve on the pipe. The flat end of the sleeve goes on first with the tapered end facing the fitting. Move the sleeve far enough back from the end of the pipe so that it will not interfere with the expansion.



3. Thread an appropriately sized expander head onto the expander tool. Expand the pipe and hold it for 2-5 seconds. Release the expander, rotate the tool 30 degrees and repeat the expansion. This ensures even expansion of the pipe. For two-pipe INSULPEX, expand both pipes in quick succession. Hold the second expansion of the first pipe longer than normal, 5-10 seconds. This will ensure that the fittings can be placed into both pipes at the same time, preventing damage to one of the fittings from the expansion tool.



4. Insert the fitting into the pipe and line it up straight with the pipe. For two-pipe INSULPEX, insert both fittings into the pipes at the same time.



It may be helpful for large diameter fittings to apply SDR11 Sleeve Lubricant to the pipe before compressing the sleeve.



5. Place the compression tool jaws over the fitting and sleeve. Be sure to place the jaws straight onto the fitting. Do not tilt. Compress the sleeve onto the fitting. Visually inspect the fitting to ensure that there is no gap between the sleeve and the fitting.

9. PERFORMING PRESSURE TEST

REHAU only provides the general guidelines for performing a pressure test on a REHAU pre-insulated PEXa piping system as set forth below.

WARNING!

- Failure to follow proper safety precautions for an air pressure test could result in dangerous separation of the material, leading to serious injury or death.
- Use personal protective equipment. To reduce the risk of eye injury, always wear close-fitting protective eyewear with sideprotection. Eyewear must be impact-rated and marked as complying with ANSI Z87.1.
- Never use a torch, open flame or heat gun on a pressurized system. Exceeding the temperature pressure ratings will result in dangerous separation of materials leading to serious injury or death.
- Never rework a connection that is under pressure. Depressurize the system, cut out connection and replace.
- To reduce the risk of personal injury, only qualified persons conducting and/or inspecting the pressure test should be present.

General Recommendations

- A pressure test must always be performed prior to closing in the system.
- Perform test using water or air at ambient temperature. Do not exceed 150 psi (1030 kPa) for the piping system. Verify maximum pressure limits are not exceeded for all system components prior to performing the pressure test.
- A pressure test must be always be performed on the system prior to and during the filling of the trench to ensure the pipe and connections are leak free.
- Tests shall comply with local codes where applicable and, where required, shall be witnessed by the local Authority Having Jurisdiction (AHJ).

Pressure Testing with Air

Air can store a high amount of energy as compared to water during a pressure test. Due to this higher energy, different failure modes of

system materials must be understood by persons conducting the pressure test.

- If a thermoset polymer (e.g., PEXa pipe) is over-pressurized and fails (bursts), it does so in a ductile mode, meaning that the pipe will swell and then split with no separation of fragments.

REHAU Pressure Test Procedure:

- Use an air test if conditions do not permit a water test (e.g., freezing conditions, insufficient water supply/pressure).
- Air temperature will affect the gauge pressure. Perform all pressure tests at a constant temperature. Verify maximum pressure requirements for other systems prior to performing the test.
- Conduct a visual inspection of the piping system, to ensure all connections have been properly made and all piping has been properly secured prior to pressurization.
- Perform a preliminary pressure test pressurizing the system to 1.5 times the maximum operating pressure not to exceed the maximum pressures defined above for 30 minutes.

- As the piping expands, restore pressure, first at 10 minutes into the test and again at 20 minutes.
- At the end of the 30-minute preliminary test, pressure must not fall by more than 5 psi from the maximum, and there shall be no leakage.
- After performing the preliminary test, perform the main pressure test immediately. The main pressure test shall last at least 2 hours. The test pressure should be restored and must not fall more than 3 psi after 2 hours. No leakage should be detected.
- It is recommended to maintain pressure on the system during further construction, where practical, to immediately identify any damage. If a water (hydrostatic) test is used, protect the water from freezing or drain water from pipes.
- If any repairs or corrections are necessary, depressurize the system before proceeding.

NOTICE:

- When thermoplastic piping materials (e.g., PPSU, CPVC, PP-R) are present in the piping system, these sections of piping must be isolated from the REHAU pre-insulated PEXa piping system during the pressure test. The installer must consult the component manufacturer's installation instructions for pressure testing those sections of the system.
- Always refer to the local codes for pressure testing requirements and use air testing only if approved by the local AHJ.
- REHAU only provides the general guidelines for performing a pressure test, which by no means supersede or are intended to contradict safety requirements. It is the responsibility of the installing contractor to ensure a proper and safe pressure test is performed on site.
- All other trades must be notified that the pressure test will be conducted on the piping system.

10. PROTECTING BURIED CONNECTIONS

After pressure testing the system, cover the exposed fittings and PEXa carrier pipes immediately. Fill the void in the insulation kits with polyurethane foam (provided by customer).

10.1 Shroud + Heat Shrink Insulation Kits

1. Sand about 2 in (50 mm) of the ends of the jacket on both sides of the coupling. Wipe off the dust.
2. Sand and clean approximately 6 in (15 cm) of each end of the shroud.
3. Place the shroud over the center of the completed connection.
4. Fill the shroud with polyurethane foam. Use canned polyurethane foam insulation with medium to high expansion. Carefully follow the foam instructions. Fill the shroud through the 1 in (25 mm) hole. Carefully work the foam into as much of the shroud as possible. Push the plastic plug into the hole, leaving the small hole in the plug exposed to air. When the foam has cured, push the plug all the way in the hole.
5. Slide the heat shrink sleeves over the ends of the rigid shroud. Position them so that 60% of the sleeve is over the shroud and 40% is over the jacket.

Note: If the shrink accessory has any cuts or nicks, do not use it, as correct installation will be more difficult. Use a new shrink sleeve or end cap free of defects.



6. Return the shrink sleeve over the INSULPEX by sliding it down a few feet from where it will be applied.

7. Wipe off any dirt or sand around the surface of the jacket or insulation kit with the sanding strip provided. Wipe off sanding dust. Sanding is required for correct bonding of the shrink sleeve adhesive with the jacket.
8. Clean the surface of the jacket or insulation kit with the cleaning agent and a cloth. Use caution when handling flammable liquids. Do not use gasoline or kerosene.
9. Pre-heat the jacket or insulation kit surface to 140°F (60°C) with propane burner/torch. Be careful not to overheat it. Use the temperature measuring strip included with the sleeve. It will immediately change color from green to black at 140°F (60°C).

10. Position the shrink sleeve over the area where it will be applied. Carefully remove the inner liner. Apply the shrink sleeve. The exact position of the sleeve depends on the accessory being installed.

⚠ WARNING! Flame and hot surfaces can cause burns or other injury. Exercise caution when handling burner. Wear gloves and eye protection. Remove cleaning solvents and flammable liquids from area where propane burner/torch will be operated.

11. Using a soft flame, apply heat starting in the middle and constantly rotating the flame around the shrink sleeve for even heating. Heat to 140°F (60°C). Use the temperature measuring strip or use the “push test.” To perform the push test, push on the sleeve with a gloved finger. If it is at the proper temperature, it will move and form ridges, and then move back after finger pressure is removed.



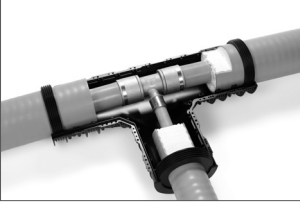
12. When the middle of the sleeve has shrunk, move the flame toward one end and then the other, heating evenly around the pipe.

13. Adhesive should run out slightly from under the shrink sleeve, all around the sleeve.

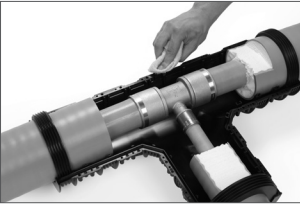
14. Check that shrink sleeve is sealed at both ends. The sleeve should be completely shrunk all the way around.

10.2 Shell Assembly Insulation Kits

Refer to REHAU *Product Instructions* for detailed instructions on the specific tee, elbow or coupling kit being used.



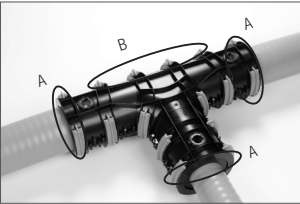
1. Adjust the lower half-shell (without plug holes) and position the sealing rings. Check the positioning of the sealing rings along the entire circumference when the upper half-shell is placed on top.



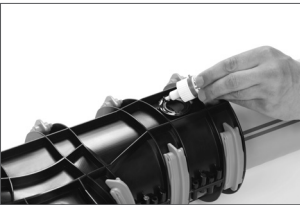
2. Clean the bonding surfaces so that they are free from dirt and grease. Then apply the fast set adhesive supplied to the bonding surfaces of the shell, ensuring complete coverage.



3. Place the upper shell (with plug holes) on top and press on.



4. Mount the holding clips at the ends of the shells (see marking A). Next, do the same with the rest of the clips, starting with the long side of the T-piece (see marking B).



5. Apply adhesive generously to the two deeper-set plug holes of the T-coupling kit.

Note: The remaining highest-set plug hole is to be used later to fill the coupling with foam and to expel any air.

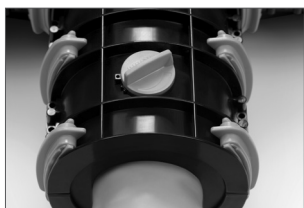


6. Insert the plug. Turn the bayonet fitting until it is vertical (i.e., second notch and setting position). Use pliers if necessary. Wait 20 minutes until the adhesive has set.

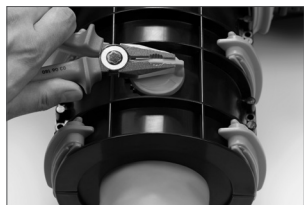


7. Prepare the foam according to the manufacturer's instructions.

8. Fill the kit through the remaining plug hole. Then cover or fill the sealing groove with the fast adhesive. Ensure that the bonding surface is clean.



9. Turn the highest-set plug to the vent position (approximately 45 degrees, first notch).



10. Vent for a maximum of 4 minutes after filling with foam, then turn the plug to the closed position. Use pliers if the plug is stuck. Assembly is complete.

11. BACKFILLING TRENCH

After pressure testing the system, cover the INSULPEX installation with backfill as soon as possible to protect the pipe from flooding, shifting, UV exposure, vandalism or damage due to temperature extremes.

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

Native soil can be used for the remaining fill, as long as there are no large, frozen or sharp objects such as rocks or debris greater than 1 1/2 in (38 mm). Compact the fill material by hand to a height of at least 6 in (15 cm) above the INSULPEX. Above the 6 in (15 cm) of hand-compacted fill, a mechanical device can be used to compact the soil.

No expansion bellows or compensators are required for INSULPEX when installed in trenches, as the friction between the pipe and the soil is greater than the expansion forces of the plastic pipe.

12. STARTING THE SYSTEM

Flush the piping system with water. Fill the system with the appropriate heating fluid. Purge air from the system.

All air must be removed from the piping system and the heating water composition must be properly selected to ensure proper operation.

The installer must have an understanding of local water conditions and how the makeup of the heating fluid can impact the lifetime and performance of the system components. The heating fluid has a major impact on the potential for corrosion within the complete system. The likelihood of corrosion and failure of system components can be greatly reduced by using suitable water quality, ensuring that the additives to the system including antifreeze, corrosion inhibitors and system flushing chemicals do not lead to corrosion of the system components and ensuring proper system operation.

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