



MUNICIPEX® WATER SERVICE LINE

INSTALLATION GUIDE FOR PEXa PIPE

MEETING STANDARD ANSI/AWWA C904

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 This symbol and the signal words DANGER, WARNING or CAUTION alert you to personal injury hazards. If you don't follow the safety messages:

- DANGER! You will be killed or seriously injured
- WARNING! You can be killed or seriously injured
- CAUTION! You can be injured

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

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1. SCOPE

This technical information applies to the selection, installation and maintenance of MUNICIPEX water service line.

This guide gives technical information about MUNICIPEX pipe to specifiers who are selecting the appropriate piping material for new or replacement service line installations.

This guide gives direction to appropriately licensed installers who have a working knowledge of federal, state/provincial and local regulations. Persons using this guide must have an understanding of the principles and practices for installation of underground plastic piping systems.

This guide gives technical information about MUNICIPEX pipe to utility managers who are responsible to maintain or modify water service lines.

It is the responsibility of the designer, the specifier and the installer to check the prevailing local codes and to verify that the technical information provided within this guide is appropriate for a particular installation.

2. UNDERSTANDING MUNICIPEX

MUNICIPEX is REHAU's trade name for our specially formulated crosslinked polyethylene pipe, also referred to as PEXa pipe. REHAU manufactures MUNICIPEX in a state-of-the-art North American plant using a high-pressure peroxide extrusion method, which enhances temperature and pressure capabilities, as well as long-term strength.



Fig. 1: MUNICIPEX pipe

The high degree of crosslinking in the REHAU PEXa process results in a durable, yet flexible, pipe with enhanced temperature and pressure capabilities, including long-term hydrostatic strength and improved resistance to slow crack growth.

The capabilities of MUNICIPEX pipe make it superior for water service applications.

Refer to AWWA Committee Report *Design and Installation of Crosslinked Polyethylene (PEX) Pipe Made in Accordance With AWWA C904* for additional information on design and installation of PEX service lines.

2.1 Industry Standards

MUNICIPEX pipe meets or exceeds the following industry standards:

- Manufactured to SDR9 copper tube sizes (CTS) according to ASTM F876, AWWA C904 and CSA B137.5
- Certified to AWWA C904 *Crosslinked Polyethylene (PEX) Pressure Pipe, 1/2 in. (13 mm) Through 3 in. (76 mm), for Water Service*
- Certified to CSA B137.5 *Crosslinked Polyethylene (PEX) Tubing for Pressure Applications*
- Certified to NSF/ANSI Standards 14 and 61 (NSF-pw-g) for potable water applications
- Certified to PPI TR-3 Category 3306 for long-term hydrostatic strength, chlorine and UV resistance
- Tested in accordance with ASTM F2023 for chlorine resistance
- Tested in accordance with ASTM F2657 for UV resistance; provides superior UV resistance

2.2 Pressure Ratings

MUNICIPEX is pressure-rated for continuous use at:

- 160 psi @ 73.4°F (1,100 kPa @ 23°C)
- 100 psi @ 180°F (690 kPa @ 82°C)
- 200 psi @ 73.4°F (1,380 kPa @ 23°C) based on a 0.63 design factor*

These temperature/pressure ratings are based on an extrapolated time-to-failure prediction as defined in ASTM D2837, *Standard Test Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials*. See PPI TR-3 for further explanation of these continuous-use pressure ratings.

*See REHAU Technical Bulletin 239 (TB239) for clarification.

2.3 Corrosion Resistance

MUNICIPEX pipe is non-metallic. As a polymer pipe it resists corrosion in soil or aggressive water conditions. PEX pipes have been tested extensively with aggressive potable water conditions (pH as low as 6.5) and have been found to be resistant to corrosion over decades of service. In addition, MUNICIPEX resists scaling and internal deposits. The corrosion of metal fittings is dependent on the conditions of the soil and water. Therefore, the appropriate fitting material should be selected based on environmental conditions and the application.



Fig. 2: Corrosion build-up in metal pipes



Fig. 3: No internal deposits in PEXa pipes

2.4 Erosion Resistance

PEX pipes have been tested with water velocities greater than 12 feet per second (3.65 m/s) without erosional effect on the pipes. If flow velocities greater than 12 feet per second are necessary, contact REHAU for further information.

2.5 Chlorine Resistance

MUNICIPEX pipe has been proven through decades of use to be resistant to free chlorine used in municipal drinking water distribution systems.

MUNICIPEX can be used for chlorinated potable water subject to the following conditions:

- The pH of the water is 7.0 or higher
- The concentration of free chlorine is 4.0 parts per million (PPM) or lower
- Water temperature is 140°F (60°C) or lower
- Water pressure is 80 psi (550 kPa) or lower

Most municipal water distribution systems will use higher pressures and much lower water temperatures. In these municipal applications, REHAU has not seen chlorine-related failures of PEXa pipes. According to F2023 the extrapolated time-to-failure of MUNICIPEX pipes at 73.4°F (23°C) far exceeds the requirements within the standard. Please contact REHAU for further information on chlorine resistance.

Additionally, according to Statement A from the Plastics Pipe Institute (PPI), PEX pipes are also resistant to chloramines, which are found to be less aggressive to PEX pipes than free chlorine. According to PPI Statement A, "...it is the position of PPI BCD that chloramines are less aggressive than free chlorine to PEX pipes. Testing of oxidative resistance using free chlorine, in accordance with ASTM F2023, will provide a conservative estimate of the time-to-failure for PEX pipes when used with the disinfectant chloramines."

2.6 Chemical Resistance

MUNICIPEX is resistant to a wide range of chemicals. However, while most chemicals may not harm MUNICIPEX, chemical concentration, temperature, pressure and other parameters can influence the lifetime of a pipe. If you have questions regarding chemical compatibility, contact your REHAU regional sales office.

2.7 Permeation

2.7.1 Buried Pipes

Certain organic (e.g., hydrocarbon) compounds such as fuels, solvents or other possible contaminants may permeate through plastic pipes, contaminating the drinking water and damaging the pipe's integrity. This issue affects all types of buried pipes, whether they be iron, copper, PVC, PE or PEX. Even metal pipes use gaskets made of elastomeric materials which may be susceptible to permeation by light hydrocarbons with smaller molecular sizes. Therefore, piping engineers must take special care when installing potable water lines through contaminated soil, regardless of the type of pipe material. If contamination is suspected, a chemical analysis of the soil or groundwater must be performed to determine the contaminant and its compatibility with MUNICIPEX.

The plastic piping industry provides the following techniques for dealing with suspected contamination of soil or groundwater:

- Surround the pipe with good clean soil of Class I or Class II material to allow the suspected contaminants to dissipate into the envelope of the surrounding soil. The US EPA guidelines prohibit the reuse of excavated hydrocarbon contaminated soil in the envelope of bedding or backfill material.
- Sleeve the pipe in suspected areas.
- Reroute the pipe around the contaminated area

Specifiers, designers and installers are responsible to ensure the safety of drinking water supply through buried pipelines and must take appropriate measures to protect drinking water safety.

⚠ WARNING! Do not install MUNICIPEX pipe in contaminated soil or groundwater conditions. Contaminants may damage the pipe's integrity resulting in pipe failure. Contaminants may also permeate through the pipe affecting drinking water safety and resulting in illness.

2.7.2 Building Penetrations

Some builders and municipalities require water service pipes to be sleeved when entering buildings. When MUNICIPEX pipes are sleeved, the space between the pipe and the sleeving must never be filled with any liquid chemical, including pesticides or termiticides. The annular gap between the pipes at the ends should be filled with silicone, latex or polyurethane expanding foam to help prevent pathways for pests and the mistaken application of harmful chemicals in the space between the pipe and the sleeving. Use only sealants that are compatible with MUNICIPEX pipes. Do not use petroleum-based sealants. See also Technical Note 39 from the Plastics Pipe Institute (PPI).

⚠ WARNING! Applying pesticides or termiticides between MUNICIPEX pipe and sleeving is strictly prohibited. Contaminants may damage the pipe's integrity resulting in pipe failure. Contaminants may also permeate through the pipe affecting drinking water safety and resulting in illness.

2.7.3 Installation Inside Buildings

Where MUNICIPEX pipes are installed inside buildings for water supply, installers must not spray on or allow contact with organic chemicals, petroleum distillates, termiticides or pesticides. Any application that results in pooling or puddling of a liquid chemical on MUNICIPEX pipe is prohibited. Permeation of certain harmful chemicals may occur through the pipe wall.

⚠ WARNING! Applying harmful chemicals to MUNICIPEX pipe is strictly prohibited. Contaminants may damage the pipe's integrity resulting in pipe failure. Contaminants may also permeate through the pipe affecting drinking water safety and resulting in illness.

2.8 UV Resistance

All PEX pipes have specific UV sensitivity and must be protected from excessive UV exposure before, during and after installation. MUNICIPEX has a maximum exposure limit to sunlight of up to one year and must not be permanently installed in direct

sunlight, either outdoors or indoors. If installed where sunlight exposure is possible, MUNICIPEX must be sheathed in an opaque, UV-blocking conduit, such as REHAU flexible convoluted polyethylene (PE) sleeving, for protection.

MUNICIPEX pipe is shipped in protective packaging such as boxes. The pipe must be kept in the original packaging until time of installation, and can not be stored outdoors. Any unused pipe must be stored in UV-blocking packaging, such as the original boxes, to prevent excessive exposure. Follow all installation and storage instructions found on packaging.

NOTICE: Excessive UV exposure may cause MUNICIPEX pipes to fail, resulting in property damage and loss of water pressure.



Fig. 4: MUNICIPEX coil



Fig. 5: Flexible PE sleeving

2.9 Freeze Resistance

Due to the lower thermal conductivity of PEXa compared with metal pipes, heat transfer through MUNICIPEX is reduced. This may delay freezing of the water inside the pipe while the ground around it is below 32°F (0°C). However, water inside a pipe surrounded by frozen earth can eventually freeze. Therefore, it is a good design practice to install all service line pipes, including MUNICIPEX, below the frost line.

If allowed to expand along its entire length, MUNICIPEX will not split when frozen. If portions of the pipe are encased in a solid mass such as concrete or hard-packed clay, then expansion of the pipe evenly along its length may be prevented, and the pipe may break if frozen.

If water in the pipe does freeze, it can be thawed as follows:

1. Thawing can be performed using available hot water injection equipment, which uses hot water to melt ice inside the pipe. This is usually performed at moderately warm temperatures. It is important to remember that the maximum water temperature allowed for thawing is 200°F (93.3°C). After thawing, MUNICIPEX can immediately be put back into service.
2. Thawing can also be performed by applying hot air to the pipe. Use a hot air gun to heat frozen areas of the pipe, ensuring that the temperature of the pipe does not exceed 200°F (93.3°C). Ice should thaw long before this temperature is reached. As an alternative, a hair dryer or a warm rag may be used to thaw ice inside the pipe.

NOTICE: To avoid possible damage to pipe which could result in property damage and loss of water pressure, do not use an open flame or electric resistance thawing device to thaw MUNICIPEX.

3. HANDLING MUNICIPEX ON THE JOBSITE

As a crosslinked high-density polyethylene material utilizing REHAU PEXa technology, MUNICIPEX has greater environmental stress crack resistance than does non-crosslinked polyethylene pipe (such as HDPE). This improves resistance to cracks caused by notches or scratches. While this provides a measure of safety against accidental rock impingement or scratches, REHAU recommends industry-standard installation procedures for polyethylene water pipes. Refer to AWWA Committee Report “Design and Installation of Crosslinked Polyethylene (PEX) Pipe Made in Accordance With AWWA C904” for additional information on design and installation of PEX service lines.

When handling MUNICIPEX on the jobsite, follow these general guidelines:

- MUNICIPEX pipe is shipped in UV-resistant packaging. Keep the pipe in the packaging until time of installation. Store unused pipes in the original packaging to prevent overexposure to direct sunlight.
- Open packaging with care to prevent cutting or nicking the pipes with box cutters or knives.
- When moving coils of pipes, avoid dragging on rough or sharp objects that could cut or notch the pipe. Pipes with notches more than 10% of the pipe wall thickness must be cut out and repaired according to an approved method.
- Avoid contact with petroleum products and other chemicals such as solvents and glues.
- The minimum bend radius for MUNICIPEX pipe is 5 times the pipe OD (outside diameter). To prevent kinking, bend pipes slowly, especially in cold weather.

⚠ CAUTION! Coils of MUNICIPEX pipe are tightly wound and may spring open quickly when straps are cut. To reduce the risk of injury, stand clear when opening coils and cut straps carefully.

4. PREPARING THE TRENCH

Proper preparation of the trench bottom is an important step in laying MUNICIPEX correctly. Ensure the trench bottom is smooth and free of large or sharp stones, rocks, boulders, construction debris or frozen material to avoid damage to the buried pipes.



Fig. 6: Trench bottom

Where suitable soil conditions exist and the trench bottom soil can be graded without difficulty, MUNICIPEX may be installed directly on the prepared trench bottom. The trench bottom must provide continuous support, and be free of hollows, lumps, rocks, debris or other hard materials which could damage or kink the pipe. Any irregularities must be leveled off and/or filled with tamped material.

4.1 Excavation in Loose Rocky Soil

To provide a uniform bed for MUNICIPEX pipe, installers may over-excavate the trench bottom at least 6 in. (15 cm) below grade and restore to grade with USCS Class I or Class II granular material that is tamped to at least 90% Standard Proctor Density. See 4.4 for detail on materials.

4.2 Excavation in Solid Rock

The trench bottom must be graded with Class I or Class II granular material, minimum 90% Proctor Density, to a thickness of at least 6 in. (15 cm).

4.3 Unstable Trenches

Unstable soils such as mud, soft clay or peat should be stabilized in accordance with instructions from the engineer. This may require over-excavation to a depth of 12 in. (30 cm) below pipe grade, followed by refilling the trench bottom with imported granular material that will provide stable support.

4.4 Embedment Materials

Suitable materials based on Unified Soil Classification System (USCS) are:

- Class I: Angular, 1/4" to 1 1/2" (6 - 38 mm) graded stone, including a number of fill materials of regional significance, such as coral, slag, cinders or crushed shells.
- Class II: Coarse sands and naturally occurring gravels with maximum particle size of 1 1/2" (38 mm), including variously graded sands and gravels containing small percentages of fines, generally granular and non-cohesive when wet or dry. Soil types GW, GP, SW and SP are included in this class.

5. MAKING CONNECTIONS

For service line and underground applications, it is the responsibility of the installer to ensure fittings selected meet jurisdictional codes.

5.1 Fittings

MUNICIPEX is a Copper Tube Size (CTS) SDR 9 pipe that can be used with AWWA C800 compression joint brass valves and fittings for underground connections.



Fig. 7: Compression joint valves



Fig. 8: Pipe inserts

These connections must be made with a plastic or stainless steel insert inside the pipe to allow proper compression at the joint. These inserts are available from waterworks wholesalers. By using these inserts, MUNICIPEX can be attached to compression joint connections in the same manner as type 'K' copper or CTS SDR 9 polyethylene tubing.

Before connections are made, inspect pipe and remove all dirt and foreign matter from the interior and ends of the pipe. Follow fitting manufacturer's instructions for assembly of compression joints. See Appendix A.

Ensure there is no angle or misalignment where pipe connects with compression joint connections. MUNICIPEX pipe must connect straight into each joint, and there must be no stress on the connection. Bends in the pipe must be no less than 10 pipe diameters from any fitting or valve.

Alternatively, other approved PEXa fittings, such as the ASTM F2080 cold-expansion compression-sleeve fitting system, may be used for connections to valves, saddles, taps or meter housings (check local codes and approvals). Follow fitting manufacturer's instructions for assembly of compression-sleeve fittings.

⚠ CAUTION! All fittings and valves used with MUNICIPEX pipe for water service must be certified according to NSF/ANSI 61 for drinking water safety to avoid adverse health effects.

5.2 Tools

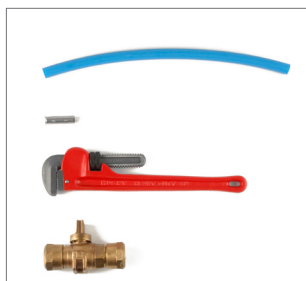


Fig. 9: Standard tool and connections

No special tools are required for MUNICIPEX connections when using AWWA C800 compression joint connections. Standard pipe wrenches may be used with these connections, as per manufacturer's instructions.



Fig. 10: Plastic pipe cutter

5.3 Cutting Pipe

MUNICIPEX pipe must be cut squarely using an approved plastic pipe cutting tool, such as those sold by REHAU. Do not use a hacksaw or knife to cut MUNICIPEX, as a rough cut may prevent a secure connection.

NOTICE: Using a hacksaw or knife to cut MUNICIPEX pipe may cause a rough or jagged cut and an improper connection with the fitting, resulting in a leak, potential property damage or loss of water pressure.

5.4 Gooseneck

At the connection between MUNICIPEX pipe and the water main, MUNICIPEX should leave the main at a 10 to 20° angle above the horizontal, to prevent stress on the connection. This will result in a 'gooseneck' in the pipe that should be at least 4 ft (1.2 m) long. It is not required to use the higher 45° gooseneck common with copper service line.



Fig. 11: Angle MUNICIPEX pipe 10 to 20° above horizontal at connection to water main

6. PLACING MUNICIPEX

Transport and install pipe carefully to prevent damage. Do not drop or dump MUNICIPEX pipe into the trench or drag MUNICIPEX pipe over sharp objects.

6.1 Snaking Pipe

MUNICIPEX should be laid with sufficient slack to accommodate contraction of the pipe due to cooling, or expansion of the pipe if it was colder than normal ambient soil temperature when installed. This is accomplished by snaking MUNICIPEX in the trench, with side-to-side offset of approximately 1% of the length of the pipe between connections for every 18°F (10°C) of expected temperature change. Snaking will also allow the pipe to expand gradually over a larger area if it expands, rather than at one specific point. See Table 1 for recommended offsets.

MUNICIPEX will expand or contract approximately 1 in. per 10°F temperature change per 100 ft pipe length (5 cm per 10°C per 30 m pipe length).

For example:

50 ft length of pipe cools from 90 to 60°F after installation:

Temperature change = $90 - 60 = 30^{\circ}\text{F}$

Contraction = $30^{\circ}\text{F} \times 50 \text{ ft} \times 1 \text{ in.}/10^{\circ} \times 100 \text{ ft} = 1.5 \text{ in.}$ contraction of length

Table 1: Recommended offset for snaking MUNICIPEX to allow for contraction



Pipe Length	Temperature Change							
	9°F	18°F	27°F	36°F	45°F	54°F	63°F	72°F
	5°C	10°C	15°C	20°C	25°C	30°C	35°C	40°C
Recommended Offsets								
20 ft	2.3 in.	3.0 in.	3.75 in.	4.5 in.	5.25 in.	6 in.	6.75 in.	7.5 in.
6 m	5.5 cm	7.5 cm	9.5 cm	11.5 cm	13 cm	5 cm	17 cm	19 cm
50 ft	5.5 in.	7.5 in.	9.0 in.	10.5 in.	12.5 in.	14 in.	16 in.	18 in.
5 m	14 cm	18 cm	22.5 cm	26.5 cm	31 cm	35 cm	40 cm	45 cm
100 ft	12 in.	15 in.	18 in.	22 in.	25 in.	29 in.	32 in.	36 in.
30 m	30 cm	37.5 cm	45 cm	55 cm	62.5 cm	72.5 cm	80 cm	90 cm

6.2 Minimizing Waste

MUNICIPEX has consecutive footage marks printed on the pipe to assist with determining the length of installed pipe and the amount remaining on a coil. With careful planning, this helps to reduce pipe waste and the requirement for couplings.

6.3 Repairing Kinks

MUNICIPEX is more flexible than non-crosslinked HDPE pipes and will resist kinking even at temperatures well below freezing. However, if MUNICIPEX is bent too tightly and kinked, it can be repaired without cutting.

To repair a kink, carefully heat the kinked area with a hot air gun until the kink disappears and the pipe becomes round (approximately 275°F [135°C]). Then re-



Fig. 12: Repair kinks using hot air

move heat and let the pipe cool before moving it. To prevent deformation of the pipe, there must be no pressure or stress on the pipe during heating. Small bubbles or wrinkles may appear on the blue UV shield – this is normal. Kinking can be prevented by bending the pipe more slowly in cold temperatures.

NOTICE: Do not use an open flame such as a torch to repair the kink, as this may overheat the pipe and cause permanent damage. Overheated pipes may fail prematurely resulting in property damage and loss of water pressure.

⚠ WARNING! Do not heat pipe that is under pressure. Pipe that is heated while under pressure can expand and burst resulting in injury.

7. BACKFILLING TRENCH

7.1 Backfill

Cover the installation of MUNICIPEX pipe with backfill as soon as possible to help protect the pipe from shifting, UV exposure, or damage by other construction trades.

Since MUNICIPEX pipe is resistant to impacts, abrasion and cracking, the excavated native material can be reused for the pipe embedment zone as per ASTM D2774 and to backfill the remainder of the trench.

Unless otherwise specified, trenches under pavements, sidewalks or roads should be backfilled and compacted to at least 90% Standard Proctor Density. In traffic areas, MUNICIPEX must be installed per local code requirements. In addition, the installer should follow good installation practices as defined by AWWA, AASHTO, and PPI for underground piping applications.

7.2 External Loads

- The effects of distributed earth loads with MUNICIPEX pipe which is properly installed are negligible.
- Loading caused by construction activities and traffic should be prevented by using a minimum cover of 24 in (60 cm) of proper backfill material, compacted to at least 90% Standard Proctor Density.
- Concentrated loads must be avoided to prevent damage to the pipe and/or reduction in water flow.

8. INSTALLING MUNICIPEX USING HORIZONTAL DIRECTIONAL DRILLING

Horizontal Directional Drilling (HDD) is becoming a more commonplace method of pipe installation. HDD is allowed with MUNICIPEX pipe. Even though it is resistant to scratches, MUNICIPEX pipe must be installed using industry-standard HDD techniques for HDPE polyethylene pipes of the same sizes.

Note: The Typical Safe Pull Stress for MUNICIPEX pipe is approximately 2,000 psi (13.79 MPa) at 73.4°F (23 °C) for 30-minute duration. Exceeding this stress could cause deformation (stretching) of the pipe.

Specifiers and installers are advised to refer to the following publications for recommendations on Horizontal Directional Drilling techniques:

- American Society of Civil Engineers (ASCE), *Manual of Practice 108 Pipeline Design for Installation by Directional Drilling*
- The North American Society for Trenchless Technology (NASTT), *Mini-Horizontal Directional Drilling Manual*
- The Plastics Pipe Institute (PPI), *Handbook of Polyethylene Pipe*, Chapter 12
- American Water Works Association (AWWA), *M55 Manual of Water Supply Practices*, Chapter 8
- The Plastics Pipe Institute (PPI), *TR46 Guidelines for Use of Mini-Horizontal Directional Drilling for Placement of High Density Polyethylene Pipe*

9. WORKING WITH INSTALLED MUNICIPEX

9.1 Disinfecting the Water System

Newly installed MUNICIPEX pipe may be disinfected in accordance with ANSI/AWWA C651, *Standard for Disinfecting Water Mains*.

9.2 Locating Buried MUNICIPEX

Available methods for locating buried MUNICIPEX pipes include metallic detection tape or copper tracing wire, as required by the responsible municipal authority. Tracer wire may be secured to MUNICIPEX with nylon ties. Do not use adhesive tape to attach a tracer wire to the pipe.

NOTICE: Do not use adhesive tapes on MUNICIPEX pipe. Certain adhesives may cause the pipe to fail prematurely, resulting in property damage and loss of water pressure.

9.3 Using Squeeze-Off Technique

The water flow in MUNICIPEX pipe may be stopped using a mechanical line squeeze-off tool designed for PE gas pipes. This technique is safe due to the high degree of crosslinking in MUNICIPEX and the flexibility of the pipe.



Fig. 13: Pipe in squeeze-off tool

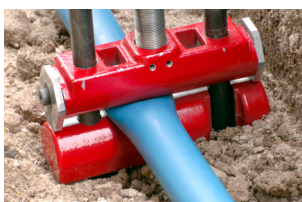


Fig. 14: Closing pipe

Using a squeeze-off tool to temporarily stop the water flow through MUNICIPEX will not cause permanent damage or deformation to the service line, and is the fastest and cleanest way to temporarily stop flow through the pipe, such as when replacing a curb stop or other shut-off valve.

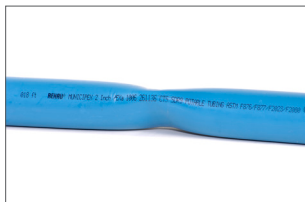


Fig. 15: Pipe after removal of tool

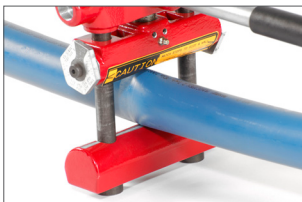


Fig. 16: Re-rounding pipe

The thermal memory of MUNICIPEX allows the pipe to re-round itself almost completely to its original shape, depending on temperature and time. To completely re-round the pipe, simply rotate the same squeeze-off tool 90° and push on the pipe. With less down time, the water line is back in service quickly. MUNICIPEX can withstand this mechanical crimping without permanent damage or deformation.

For questions about these instructions or about MUNICIPEX specifications, contact your regional REHAU sales office.

APPENDIX A

Connecting MUNICIPEX to Compression Joint Brass

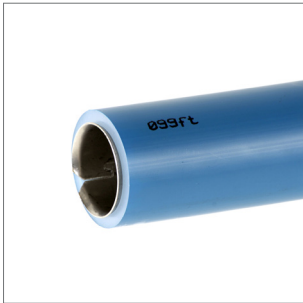
Following are the suggested steps for connecting 3/4 to 2 in. MUNICIPEX pipe to standard AWWA C800 compression joint valves and fittings.



1. Use an approved plastic pipe cutter to cut the pipe to the desired length.



2. Choose the appropriate size stainless steel or plastic insert as approved by the insert manufacturer for CTS, SDR 9 polymer pipe for service line connections.



3. Place the insert into the end of the MUNICIPEX pipe, seating it fully inside the pipe.



Follow all technical instructions and recommendations from fitting and valve manufacturers.

Proper installation of MUNICIPEX pipe into standard compression joint brass fittings should provide a reliable joint for underground services.



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