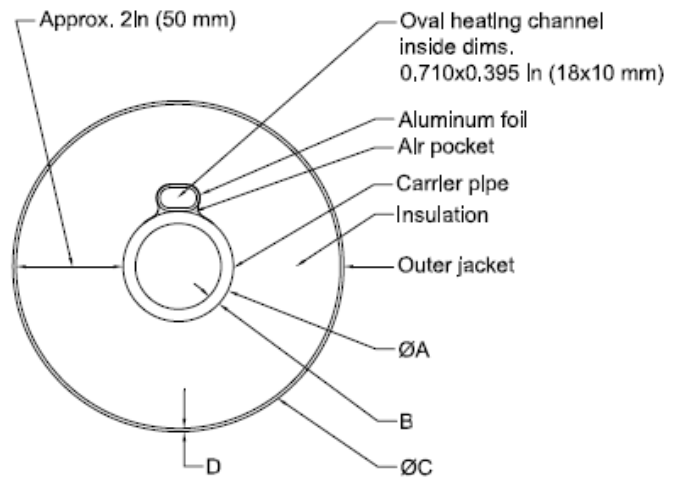


# PRODUCT SUBMITTAL 112

Product: MUNICIPEX<sup>®</sup> Pre-insulated Pipe  
Date: 15 April 2016



Article No.	Nominal Size in	MUNICIPEX Carrier Pipe			Insulation Plane wall R-value	Outer Jacket		MUNICIPEX Pre-insulated	
		Average Outer Diam. A in (mm)	Minimum Wall Thickness B in (mm)	Capacity gal/ft (l/m)		Outer Diameter C in (mm)	Wall Thickness D in (mm)	Weight lb/ft (kg/m)	Minimum Bend Radius ft (m)
209094	1	1.125 (28.6)	0.125 (3.2)	0.0316 (0.394)	R-10	5.6 (142)	0.118 (3.0)	2.3 (3.4)	4.0 (1.2)
281761	2	2.125 (54.0)	0.236 (6.0)	0.1114 (1.391)	R-10	6.4 (162)	0.125 (3.2)	2.7 (4.0)	4.5 (1.2)

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### TECHNICAL DESCRIPTION

Component	Specification	English	SI	Standard
Carrier pipe	Minimum Density	58 lb/ft <sup>3</sup>	926 kg/m <sup>3</sup>	ASTM F876, DIN 53479
Carrier pipe	Degree of Cross-Linking	70 - 89%	70 - 89%	ASTM F876, DIN 16892
Carrier pipe	Thermal Conductivity	0.24 Btu/(hr-ft <sup>2</sup> °F)	0.41 w/(m <sup>2</sup> K)	DIN 52612
Carrier pipe	Linear Exp.	9.33 x 10 <sup>-4</sup> in/ft <sup>2</sup> °F @ 68°F 1.33 x 10 <sup>-3</sup> in/ft <sup>2</sup> °F @ 212°F	0.14 mm/(m <sup>2</sup> °C) @ 20°C 0.2 mm/(m <sup>2</sup> °C) @ 100°C	DIN 42328
Carrier pipe	Modulus of Elasticity	87,000 - 130,500 psi @ 68°F 43,500 - 58,000 psi @ 176°F	600 - 900 N/mm <sup>2</sup> @ 20°C 300 - 400 N/mm <sup>2</sup> @ 80°C	DIN 53457
Carrier pipe	Tensile Strength	4,194 – 4,355 psi @ 68°F 2,610 – 2,900 psi @ 176°F	26 - 30 N/mm <sup>2</sup> @ 20°C 18 - 20 N/mm <sup>2</sup> @ 80°C	DIN 53455
Carrier pipe	IZOD Impact Res.	No Break	No Break	DIN 53453
Carrier pipe	Temperature Working Range	-40°F to 200°F	-40°C to 93°C	N/A
Carrier pipe	Roughness	e=0.00028 in	e=0.007 mm	N/A
Carrier pipe	Max. Short-term Exposure	150 psig @ 210°F (48 hr)	1035 kPa @ 99°C (48 hr)	ASTM F876
Carrier pipe	UV Resistance	One year	One year	ASTM F2657
Insulation	Maximum Thermal Conductivity	0.20 Btu-in/h-ft <sup>2</sup> ·°F @ 122°F	0.029 W/(m K) @ 50°C	EN 253
Insulation	Closed Cellular Structure	>=90 %	>=90 %	--
Insulation	Maximum Water Absorption	<10% (vol)	<10% (vol)	EN 15632
Outer casing	Maximum UV Resistance	2 years	2 years	--

### FUNCTIONAL DESCRIPTION

MUNICIPEX Pre-insulated pipe is a one-pipe system consisting of one MUNICIPEX carrier pipe and one heating channel encased in closed-cell polyurethane (PUR) foam insulation, with a protective low-density polyethylene (PE) outer casing. MUNICIPEX Pre-insulated one-pipe systems are available in MUNICIPEX carrier pipe sizes 1 and 2in.CTS. Design, specification and installation of the heat trace cable in the heating channel is done by others.

MUNICIPEX carrier pipe is manufactured using REHAU's high-pressure peroxide extrusion method for crosslinked polyethylene (PEXa). MUNICIPEX pipe has a co-extruded PE shield that protects the pipe against ultraviolet light (sunlight) for an extended time. MUNICIPEX pipe meets or exceeds the requirements of ASTM F876, F877, CSA B137.5 and PPI TR-3, and is certified to NSF Standards 14/61 and AWWA C904. MUNICIPEX pipe meets the requirements of ASTM F2023 for chlorine resistance. MUNICIPEX pipe is produced in SDR9 copper tube sizes (CTS) so that it is compatible with AWWA C800 valves and fittings when used with manufacturer's recommended insert which is required to stiffen the pipe. MUNICIPEX pipe is also compatible with fittings certified to ASTM F2080 and CSA B137.5. MUNICIPEX Pre-insulated pipe is manufactured by REHAU in a plant using a quality management system that is certified to ISO 9001.

### LONG-TERM STRENGTH

The maximum temperature and pressure ratings of the MUNICIPEX pipe are in accordance to ASTM F876, CSA B137.5 and PPI TR-3. The designer shall determine the actual conditions and apply the appropriate and additional design factors as required for any particular project. The temperature and pressure ratings apply to the application of MUNICIPEX pipe for conveying hot and cold water at the 2.0 safety factor on allowable working pressure according to ASTM and CSA. REHAU confirms a 200 psi (1380 kPa) pressure rating at 73.4°F (23°C) when using a 1.5 safety factor, see REHAU *Technical Bulletin 239 MUNICIPEX Pressure and Temperature Ratings*. According to the REHAU *PEXa Limited Warranty*, the MUNICIPEX pipe warranty period of 25 years is for operating conditions at or below 180°F (82.2°C) in permitted applications when the handling, use, installation and maintenance continually complies with all REHAU technical guidelines.

#### MUNICIPEX carrier pipe SDR9

maximum pressures and temperatures	design factors
200 psi @ 73.4°F (1380 kPa @ 23°C)	0.63 (per CSA B137.0 clause 6.6.3.2.2, REHAU TB239)
160 psi @ 73.4°F (1055 kPa @ 23°C)	0.50 (per ASTM F876, CSA B137.5)
100 psi @ 180°F (690 kPa @ 82.2°C)	0.50 (per ASTM F876, CSA B137.5)