



PPR PIPES AND FITTINGS

Technical Guide

Reliable PPR Piping Systems
for Hot & Cold Water Applications



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Section	Page
Introduction	4
Field of Application	5
Dacta Therm Solid PP-R pipes	6
Dacta Therm fiberglass reinforced PP-R pipes	7
Chemical Resistance	9 - 15
Pressure loss	16 - 19
Testing of Dacta Therm PP-R pipes and fittings	20
Service life	21
Dacta Therm Pipes	22
Dacta Therm Fittings & Accessories	23 - 30
Welding & Installation Guidelines	31 - 32
Linear expansion	33 - 37
Installation in shaft	38
Assembly	39
Storage & Transport	40 - 41
Certificates	42 - 45
Como Pex	46 - 60

Hepworth manufactures and distributes a wide range of innovative and sustainable piping systems for diverse applications, such as buildings, utilities, infrastructure, industrial, irrigation and agriculture. Over the last 40 years it has provided dependable solutions to government agencies, commercial, residential, industrial and educational institutions of all sizes within the Middle East and Africa region.

Hepworth has two major manufacturing sites in the UAE, one in Qatar and another in Oman. It further trades internationally through a wide network of authorized distributors.

Today, the company is established as a leading manufacturer and supplier of piping systems and, despite a constantly changing world, it remains focused on its customers, providing innovative and sustainable solutions. **Hepworth** is part of Green Coast Enterprise, a private family business with a rich business history spanning 40+ years.

As part of its strategy to grow its products portfolio, the company recently launched its own brand under the name of **Dacta**, a locally-manufactured range of Dacta Drainage, solvent weld uPVC above ground drainage system and **Dacta Therm (PPR piping system)** to cater to the civil and building construction sectors. The new range of **Dacta** products is synonymous with quality and availability and allows the company to be present throughout all segments of the building materials industry.

DACTA Therm (PP-R) is suitable for use in central cooling systems and is ideal for transporting both hot and cold water in a variety of building systems as well as industrial and marine applications. The system features high temperature and pressure resistance while being hygienically safe and eligible for use in potable water applications.

PPR Pipes and Fitting



Standard PP-R Pipe Systems



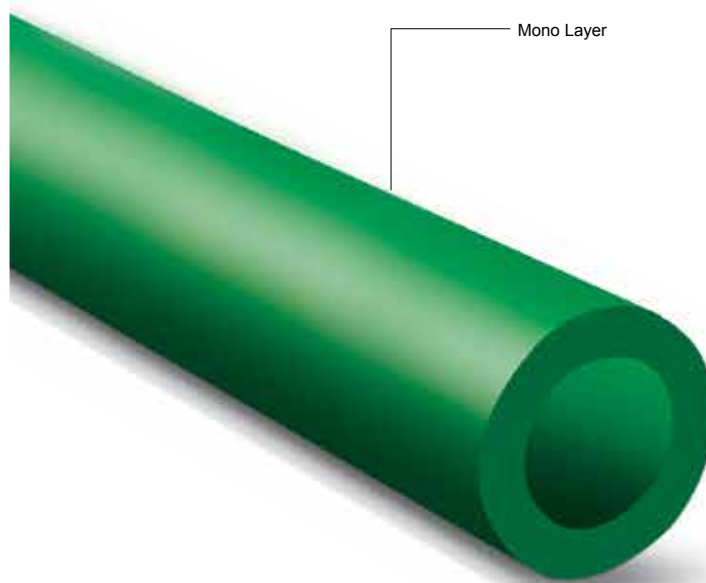
Fiberglass Reinforced Pipe Systems



Plumbing Applications		
Plumbing installations	✓	✓
Mobile System Plumbing	✓	✓
Heating and Cooling Systems		
Boiler Replacement	✗	✓
Mobile System Heating	✓	✓
Underfloor Heating	✗	✗
Mobile System Clean Water	✓	✓
Clima System	✗	✗
Drinking Water Network Applications		
Drinking Water Network	✓	✓
*Exterior Application	✗	✗
Solar Collector	✗	✗
Swimming Pool System	✓	✓
Industrial Clean Water System	✓	✓

* Dacta Therm can be used for exterior applications after insulation

Table 1.0



(Figure 1)

Raw material: PP-R

Diameter: 20 mm - 160 mm

Pressure rating (PN): PN 20

Standard Dimension Ratio (SDR): SDR 6

Standards: DVGW W544, ISO 15874-1, ISO 15874-2,
ISO 15874-3, DIN 8077, DIN 8078

Service life: 50 years

Color: green

Temperature of operating media: 5°C - 70°C

Operation & installation temperature: 5°C - 45°C

Pipe length: 4m

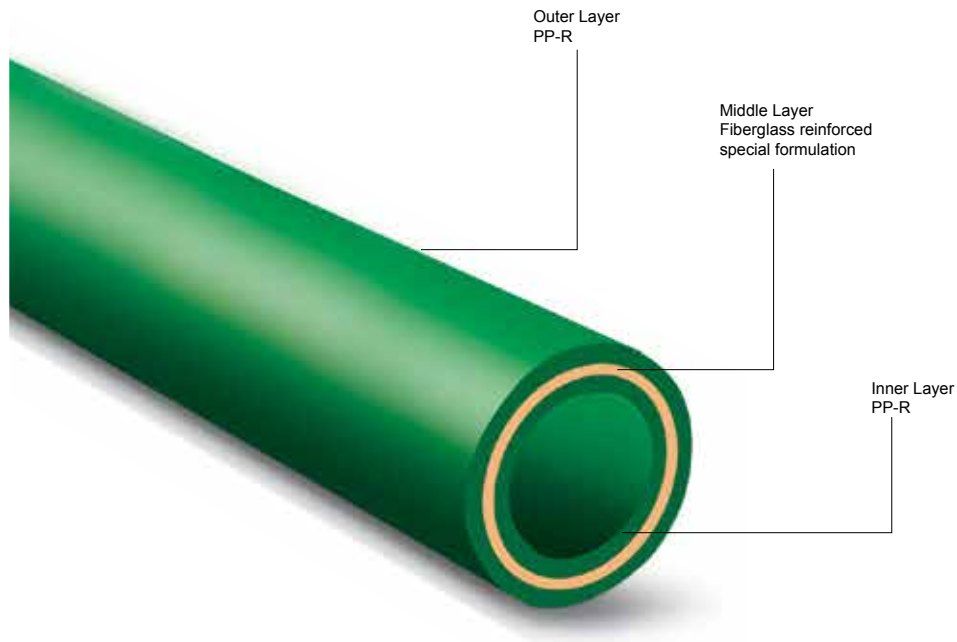
Connections: Fusion welding

Coefficient of thermal expansion: 0.15mm/mK

Coefficient of thermal conductivity: 0.24w/mK

Application Areas

- Plumbing installations
- Mobile System Plumbing
- Mobile System Heating
- Mobile System Clean Water
- Drinking water network
- Swimming pool systems
- Industrial clean water systems



(Figure 2)

Raw material: PP-R

Diameter: 20 mm - 160 mm

Pressure rating (PN): PN 20

Standard Dimension Ratio (SDR): SDR 6

Standards: DIN 8077/78

Service life: 50 years

Color: green

Temperature of operating media: 5°C - 95°C

Operation & installation temperature: 5°C - 45°C

Pipe length: 4m

Connections: Fusion welding

Coefficient of thermal expansion: 0.035mm/mK

Coefficient of thermal conductivity: 1.10w/mK

Application Areas

- Plumbing installations
- Mobile System Plumbing
- Boiler replacement
- Mobile System Heating
- Mobile System Clean Water
- Drinking water network
- Swimming pool systems
- Industrial clean water systems

Standard PP-R Pipe Systems



Fiberglass Reinforced Pipe Systems



Diameter	20 Ø - 160 Ø	20 Ø - 160 Ø
Pressure Nominal (PN)	PN20	PN20
Standard	DVGW W544, ISO 15874-1, ISO 15874-2, ISO 15874-3, DIN 8077, DIN 8078	DIN 8077/78
Service Life (See Table 5)	50 Years	50 Years
Colour	Green	Green
Working Liquid Temperature	5°C - 70°C	5°C - 95°C
Operation & Installation Temperature	5°C - 45°C	5°C - 45°C
*Pipe Length	4 m	4 m
Impact Strength	EN 15874	DIN 8078
Application Class	A Class 1,2,5	A Class 1,2,5
Density	0,09 gr/cm ³	0,98 gr/cm ³
Connections	Fusion welding	Fusion welding
Structure	1 Layer PP-R	3 Layer PP-R / GF** / PP-R **Glassfiber Reinforced Formula
Coefficient of Thermal Expansion	0,15mm/mK	0,035mm/mK
Coefficient of Thermal Conductivity	0,24w/mK	1,10w/mK
Product Quality	Raw Material: (PP-R)	

*Different lengths are available for special orders.

*Different colours are available for special orders.

Table 2.0

The table in this document summarizes the data given in a number of polypropylene chemical resistance tables currently in use in various countries, derived from both practical experience and test results.

Source: ISO/TR 10358

The table contains an evaluation of the chemical resistance to a number of fluids judged to be either aggressive or not towards polypropylene. This evaluation is based on values obtained by immersion of polypropylene test specimens in the fluid concerned at 20, 60 and 100°C and atmospheric pressure, followed in certain cases by the tensile characteristics.

Definitions, symbols and abbreviations

The criteria of classifications, definitions, symbols and abbreviations adopted in this document are as follows:

S = Satisfactory

The chemical resistance of polypropylene exposed to the action of a fluid is classified as “satisfactory” when the test results are acknowledged to be “satisfactory” by the majority of the countries participating in the evaluation.

L = Limited

The chemical resistance of polypropylene exposed to the action of a fluid is classified as “limited” when the test results are acknowledged to be “limited” by the majority of the countries participating in the evaluation.

Also classified as “limited” is the resistance to the action of chemical fluids for which judgements “S” and “NS” or “L” are pronounced to an equal extent.

NS = Not satisfactory

The chemical resistance of polypropylene exposed to the action of a fluid is classified as “not satisfactory” when the test results are acknowledged to be “not satisfactory” by the majority of the countries participating in the evaluation.

Also classified as “not satisfactory” are materials for which judgement “L” and “NS” are pronounced to an equal extent.

Sat.sol Saturated aqueous solution, prepared at 20°C
Sol Aqueous solution at a concentration higher than 10 % but not saturated

Dil.sol Dilute aqueous solution at a concentration equal to or lower than 10 %

Work.sol Aqueous solution having the usual concentration for industrial use

Solution concentrations reported in the text are expressed as a percentage by mass. The aqueous solutions of slightly soluble chemicals are considered, as far as chemical action towards polypropylene is concerned, as saturated solutions.

In general, common chemical names are used in this document

The table serves as a first guideline for users of polypropylene. If a chemical compound is not to be found or if there is an uncertainty regarding the chemical resistance in an application, please contact Technical Department for advice and recommendations on testing.

Chemical resistance table for polypropylene

Chemical resistance of polypropylene, not subjected to mechanical stress, for various media at 20, 60 & 100 ° C

Chemical or Product	Concentration	Temperature ° C		
		20	60	100
Acetic acid	Up to 40 %	S	S	-
Acetic acid	50 %	S	S	L
Acetic acid, glacial	> 96 %	S	L	NS
Acetic anhydride	100 %	S	-	-
Acetone	100 %	S	S	-
Aceprophenone	100 %	S	L	-
Acrylonitrile	100 %	S	-	-
Air		S	S	S
Allyl alcohol	100 %	S	S	-
Almond oil		S	-	-
Alum	Sol	S	S	-
Ammonia, aqueous	Sat. sol	S	S	-
Ammonia, dry gas	100 %	S	-	-
Ammonia, liquid	100 %	S	-	-
Ammonium acetate	Sat. sol	S	S	-
Ammonium chloride	Sat. sol	S	S	-
Ammonium fluorid	Up to 20 %	S	S	-
Ammonium hydrogen carbonate	Sat. sol	S	S	-
Ammonium metaphosphate	Sat. sol	S	S	S
Ammonium nitrate	Sat. sol	S	S	S
Ammonium persulphate	Sat. sol	S	S	-
Ammonium phosphate	Sat. sol	S	-	-
Ammonium sulphate	Sat. sol	S	S	S
Ammonium sulphide	Sat. sol	S	S	-
Amyl acetate	100 %	L	-	-
Amyl alcohol	100 %	S	S	S
Aniline	100 %	S	S	-
Apple juice		S	-	-
Aqua regia	HCl/HNO ₃ = 3/1	NS	NS	NS
Barium bromide	Sat. sol	S	S	S
Barium carbonate	Sat. sol	S	S	S
Barium chloride	Sat. sol	S	S	S
Barium hydroxide	Sat. sol	S	S	S
Barium sulphide	Sat. sol	S	S	S
Beer		S	S	-
Benzene	100 %	L	NS	NS
Benzoic acid	Sat. sol	S	S	-
Benzyl alcohol	100 %	S	L	-
Borax	Sol	S	S	-
Boric acid	Sat. sol	S	-	-
Boron trifluoride	Sat. sol	S	-	-
Bormine, gas		NS	NS	NS
Bromine, liquid	100 %	NS	NS	NS

Table 3.0

Chemical resistance table for polypropylene

Chemical or Product	Concentration	Temperature ° C		
		20	60	100
Butane, gas	100 %	S	-	-
Bromine, liquid	100 %	NS	NS	NS
Butane, gas	100 %	S	-	-
Butanol	100 %	S	L	L
Butyl acetate	100 %	L	NS	NS
Butyl glycol	100 %	S	-	-
Butyl phenols	Sat. sol	S	-	-
Butyl phthalate	100 %	S	L	L
Calcium carbonate	Sat. sol	S	S	S
Calcium chlorate	Sat. sol	S	S	-
Calcium chloride	Sat. sol	S	S	S
Calcium hydroxide	Sat. sol	S	S	S
Calcium hypochlorite	Sol	S	-	-
Camphor oil		NS	NS	NS
Carbon dioxide, dry gas		S	S	-
Carbon dioxide, wet gas		S	S	-
Carbon disulphide	100 %	S	NS	NS
Carbon monoxide, gas		S	S	-
Carbon tetrachloride	100 %	NS	NS	NS
Castor oil	100 %	S	S	-
Caustic soda	Up to 50 %	S	L	L
Chlorine, aqueous	Sat. sol	S	L	-
Chlorine, dry gas	100 %	NS	NS	NS
Chlorine, liquid	100 %	NS	NS	NS
Chloroacetic acid	Sol	S	-	-
Chloroethanol	100 %	S	-	-
Chloroform	100 %	L	NS	NS
Chlorosulphonic acid	100 %	NS	NS	NS
Chrome alum	Sol	S	S	-
Chromic acid	Up to 40 %	S	L	NS
Citric acid	Sat. sol	S	S	S
Coconut oil		S	-	-
Copper (II) chloride	Sat. sol	S	S	-
Copper (II) nitrate	Sat. sol	S	S	S
Copper (II)	Sat. sol	S	S	-
Corn oil		S	L	-
Cottonseed oil		S	S	-
Cresol	Greater than 90%	S	-	-
Cyclohexane		S	-	-
Cyclohexanol		S	L	-
Cyclohexanone		L	NS	NS
Decalin (decahydronaphthalene)	100 %	NS	NS	NS
Dextrin	Sol	S	S	-
Dextrose	Sol	S	S	S
Dibutyl phthalate	100 %	S	L	NS
Dichloroacetic acid	100 %	L	-	-
Dichloroethylene (A and B)	100 %	L	-	-

Table 3.1

Chemical resistance table for polypropylene

Chemical or Product	Concentration	Temperature ° C		
		20	60	100
Diethanolamine	100 %	S	-	-
Diethyl ether	100 %	S	L	-
Diethylene glycol	100 %	S	S	-
Diglycolic acid	Sat. sol	S	-	-
Diisooctyl	100 %	S	L	-
Dimethyl amine, gas		S	-	-
Dimethyl formamide	100 %	S	S	-
Diethyl phthalate	100 %	L	L	-
Dioxane	100 %	L	L	-
Distilled water	100 %	S	S	S
Ethanolamine	100 %	S	-	-
Ethyl acetate	100 %	L	NS	NS
Ethyl alcohol	Up to 95 %	S	S	S
Ethyl chloride, gas		NS	NS	NS
Ethylene chloride (mono and di)		L	L	-
Ethyl ether	100 %	S	L	-
Ethylene glycol	100 %	S	S	S
Ferric chloride	Sat. sol	S	S	S
Formaldehyde	40 %	S	-	-
Formic add	10 %	S	S	L
Formic acid	85 %	S	NS	NS
Formic acid, anhydrous	100 %	S	L	L
Fructose	Sol	S	S	S
Fruit juice		S	S	S
Gasoline, petrol (aliphatic hydrocarbons)		NS	NS	NS
Gelatine		S	S	-
Glucose	20 %	S	S	S
Glycerine	100 %	S	S	S
Glycolic acid	30 %	S	-	-
Heptane	100 %	L	NS	NS
Hexane	100 %	S	L	-
Hydrobromic acid	Up to 48 %	S	L	NS
Hydrochloric acid	Up to 20 %	S	S	S
Hydrochloric acid	30 %	S	L	L
Hydrochloric acid	From 35 to 36 %	S	-	-
Hydrofluoric acid	Dil. sol	S	-	-
Hydrofluoric acid	40 %	S	-	-
Hydrogen	100 %	S	-	-
Hydrogen chloride, dry gas	100 %	S	S	-
Hydrogen peroxide	Up to 10 %	S	-	-
Hydrogen peroxide	Up to 30 %	S	L	-
Hydrogen sulphide, dry gas	100 %	S	S	-
Iodine, in alcohol		S	-	-
Is octane	100 %	L	NS	NS

Table 3.2

Chemical resistance table for polypropylene

Chemical or Product	Concentration	Temperature ° C		
		20	60	100
Isopropyl alcohol	100 %	S	S	S
Isopropyl ether	100 %	L	-	-
Lactic acid	Up to 90 %	S	S	-
Lanoline		S	L	-
Linseed oil		S	S	S
Magnesium carbonate	Sat. sol	S	S	S
Magnesium chloride	Sat. sol	S	S	-
Magnesium hydroxide	Sat. sol	S	S	-
Magnesium sulphate	Sat. sol	S	S	-
Maleic acid	Sat. sol	S	S	-
Mercury (II) chloride	Sat. sol	S	S	-
Mercury (II) cyanide	Sat. sol	S	S	-
Mercury (I) nitrate	Sol	S	S	-
Mercury	100 %	S	S	-
Methyl acetate	100 %	S	S	-
Methyl alcohol	5 %	S	L	L
Methyl amine	Up to 32 %	S	-	-
Methyl bromide	100 %	NS	NS	NS
Methyl ethyl ketone	100 %	S	-	-
Methylene chloride	100 %	L	NS	NS
Milk		S	S	S
Monochloroacetic acid	> 85 %	S	S	-
Naphtha		S	NS	NS
Nickel chloride	Sat. sol	S	S	-
Nickel nitrate	Sat. sol	S	S	-
Nickel sulphate	Sat. sol	S	S	-
Nitric acid	Up to 30 %	S	NS	NS
Nitric acid	From 40 to 50 %	L	NS	NS
Nitric acid, fuming (with nitrogen dioxide)		NS	NS	NS
Nitrobenzene	100 %	S	L	
Oleic acid	100 %	S	L	-
Oleum (sulphuric acid with 60 % of SO ₃)		S	L	-
Olive oil		S	S	L
Oxalic acid	Sat. sol	S	L	NS
Oxygen, gas		S	-	-
Paraffin oil (FL65)		S	L	NS
Peanut oil		S	S	-
Peppermint oil		S	-	-
Perchloric acid	(2N) 20 %	S	-	-
Petroleum ether (ligroine)		L	L	-
Phenol	5 %	S	S	-
Phenol	90 %	S	-	-
Phosphine, gas		S	S	-
Phosphoric acid	Up to 85 %	S	S	S
Phosphorus oxychloride	100 %	L	-	-
Picric acid	Sat. sol	S	-	-

Table 3.3

Chemical resistance table for polypropylene

Chemical or Product	Concentration	Temperature ° C		
		20	60	100
Potassium bicarbonate	Sat. sol	S	S	S
Potassium borate	Sat. sol	S	S	-
Potassium bromate	Up to 10 %	S	S	-
Potassium bromide	Sat. sol	S	S	-
Potassium carbonate	Sat. sol	S	S	-
Potassium chlorate	Sat. sol	S	S	-
Potassium chlorite	Sat. sol	S	S	-
Potassium chromate	Sat. sol	S	S	-
Potassium cyanide	Sol	S	-	-
Potassium dichromate	Sat. sol	S	S	S
Potassium ferricyanide	Sat. sol	S	S	-
Potassium fluoride	Sat. sol	S	S	-
Potassium hydroxide	Up to 50 %	S	S	S
Potassium iodide	Sat. sol	S	-	-
Potassium nitrate	Sat. sol	S	S	-
Potassium perchlorate	10 %	S	S	-
Potassium permanganate	(2N) 30 %	S	-	-
Potassium persulphate	Sat. sol	S	S	-
Potassium sulphate	Sat. sol	S	S	-
Propane, gas	100 %	S	-	-
Propionic acid	> 50 %	S	-	-
Pyridine	100 %	L	-	-
Seawater		S	S	S
Silicon oil		S	S	S
Silver nitrate	Sat. sol	S	S	L
Sodium acetate	Sat. sol	S	S	S
Sodium benzoate	35 %	S	L	-
Sodium bicarbonate	Sat. sol	S	S	S
Sodium carbonate	Up to 50 %	S	S	L
Sodium chlorate	Sat. sol	S	S	-
Sodium chloride	Sat. sol	S	S	-
Sodium chlorite	2 %	S	L	NS
Sodium chlorite	20 %	S	L	NS
Sodium dichromate	Sat. sol	S	S	S
Sodium hydrogen carbonate	Sat. sol	S	S	S
Sodium hydrogen sulphate	Sat. sol	S	S	-
Sodium hydrogen sulphite	Sat. sol	S	-	-
Sodium hydroxide	1%	S	S	S
Sodium hydroxide	From 10 to 60 %	S	S	S
Sodium hydrogen sulphite	Sat. sol	S	-	-
Sodium hydroxide	1%	S	S	S
Sodium hydroxide	From 10 to 60 %	S	S	S
Sodium hypochlorite	5%	S	S	-
Sodium hypochlorite	10% - 15%	S	-	-
Sodium hypochlorite	20%	S	L	-
Sodium metaphosphate	Sol	S	-	-

Table 3.4

Chemical resistance table for polypropylene

Chemical or Product	Concentration	Temperature ° C		
		20	60	100
Sodium nitrate	Sat. sol	S	S	-
Sodium perborate	Sat. sol	S	S	-
Sodium phosphate (neutral)		S	S	S
Sodium silicate	Sol	S	S	-
Sodium sulphate	Sat. sol	S	S	-
Sodium sulphide	Sat. sol	S	-	-
Sodium sulphite	40 %	S	S	S
Sodium thiosulphate (hypo)	Sat. sol	S	-	-
Soybean oil		S	L	-
Succinic acid	Sat. sol	S	S	-
Sulphuric acid	Up to 10 %	S	S	S
Sulphuric dioxide, dry or wet	100 %	S	S	-
Sulphur acid	From 10 to 30 %	S	S	-
Sulphuric acid	50 %	S	L	L
Sulphuric acid	96%	S	L	NS
Sulphuric acid	98 %	L	NS	NS
Sulphurous acid	Up to 30 %	S	-	-
Tartaric acid	Sat. sol	S	S	-
Tetrahydrofuran	100 %	L	NS	NS
Tetralin	100 %	NS	NS	NS
Thiophene	100 %	S	L	-
Tin (IV) chloride	Sol	S	S	-
Tin (II) chloride	Sat. sol	S	S	-
Toluene	100 %	L	NS	NS
Trichloroacetic acid	Up to 50 %	S	S	-
Trichloroethylene	100 %	NS	NS	NS
Triethanolamine	Sol	S	-	-
Turpentine		NS	NS	NS
Urea	Sat. sol	S	S	-
Vinegar		S	S	
Water brackish, mineral, potable		S	S	S
Whiskey		S	S	-
Wines		S	S	-
Xylene	100 %	NS	NS	NS
Yeast	Sol	S	S	S
Zinc chloride	Sat. sol	S	S	-
Zinc sulphate	Sat. sol	S	S	-

Table 3.5

This data is based on multiple sources. You are required to carry out the appropriate tests to ensure the suitability and safety of the products for the envisaged use in accordance with all applicable regulations.

20 mm				25 mm				32 mm						
3,4 mm				4,2 mm				5,4 mm						
13,2 mm				16,6 mm				21,2 mm						
D	Q			J	D	Q			J	D	Q			J
s					s					s				
Di					Di					Di				
V	Q		J	V	Q		J	V	Q		J			
m/s	m³/h	m³/s	m/m	m/s	m³/h	m³/s	m/m	m/s	m³/h	m³/s	m/m			
0.4	0.18	0.00005	0.01555	0.4	0.32	0.00009	0.01512	0.4	0.50	0.00014	0.01042			
0.5	0.25	0.00007	0.02899	0.5	0.40	0.00011	0.02193	0.5	0.65	0.00018	0.01659			
0.6	0.29	0.00008	0.03713	0.6	0.47	0.00013	0.02988	0.6	0.76	0.00021	0.02207			
0.7	0.36	0.00010	0.05613	0.7	0.54	0.00015	0.03895	0.7	0.90	0.00025	0.03048			
0.8	0.40	0.00011	0.06696	0.8	0.61	0.00017	0.04911	0.8	1.01	0.00028	0.03760			
0.9	0.43	0.00012	0.07867	0.9	0.68	0.00019	0.06035	0.9	1.15	0.00032	0.04815			
1.0	0.50	0.00014	0.10467	1.0	0.79	0.00022	0.07917	1.0	1.26	0.00035	0.05684			
1.1	0.54	0.00015	0.11893	1.1	0.86	0.00024	0.09302	1.1	1.40	0.00039	0.06945			
1.2	0.58	0.00016	0.13403	1.2	0.94	0.00026	0.10788	1.2	1.51	0.00042	0.07967			
1.3	0.65	0.00018	0.16670	1.3	1.01	0.00028	0.12375	1.3	1.66	0.00046	0.09429			
1.4	0.68	0.00019	0.18426	1.4	1.08	0.00030	0.14062	1.4	1.76	0.00049	0.10599			
1.5	0.76	0.00021	0.22179	1.5	1.15	0.00032	0.15847	1.5	1.91	0.00053	0.12257			
1.6	0.79	0.00022	0.24174	1.6	1.26	0.00035	0.18708	1.6	2.02	0.00056	0.13573			
1.7	0.83	0.00023	0.26248	1.7	1.33	0.00037	0.20736	1.7	2.16	0.00060	0.15423			
1.8	0.90	0.00025	0.30632	1.8	1.40	0.00039	0.22859	1.8	2.30	0.00064	0.17381			
1.9	0.94	0.00026	0.32939	1.9	1.48	0.00041	0.25078	1.9	2.41	0.00067	0.18920			
2.0	0.97	0.00027	0.35324	2.0	1.55	0.00043	0.27390	2.0	2.56	0.00071	0.21065			
2.1	1.04	0.00029	0.40322	2.1	1.62	0.00045	0.29796	2.1	2.66	0.00074	0.22744			
2.2	1.08	0.00030	0.42935	2.2	1.73	0.00048	0.33579	2.2	2.81	0.00078	0.25073			
2.3	1.12	0.00031	0.45623	2.3	1.80	0.00050	0.36216	2.3	2.92	0.00081	0.26888			
2.4	1.19	0.00033	0.51224	2.4	1.87	0.00052	0.38945	2.4	3.06	0.00085	0.29398			
2.5	1.22	0.00034	0.54136	2.5	1.94	0.00054	0.41764	2.5	3.17	0.00088	0.31349			
2.6	1.30	0.00036	0.60181	2.6	2.02	0.00056	0.44674	2.6	3.31	0.00092	0.34039			
2.7	1.33	0.00037	0.63313	2.7	2.09	0.00058	0.47674	2.7	3.42	0.00095	0.36123			
2.8	1.37	0.00038	0.66519	2.8	2.20	0.00061	0.52341	2.8	3.56	0.00099	0.38990			
2.9	1.44	0.00040	0.73147	2.9	2.27	0.00063	0.55564	2.9	3.67	0.00102	0.41207			
3.0	1.48	0.00041	0.76570	3.0	2.34	0.00065	0.58875	3.0	3.82	0.00106	0.44249			
3.1	1.51	0.00042	0.80065	3.1	2.41	0.00067	0.62273	3.1	3.92	0.00109	0.46597			
3.2	1.58	0.00044	0.87269	3.2	2.48	0.00069	0.65760	3.2	4.07	0.00113	0.49813			
3.3	1.62	0.00045	0.90977	3.3	2.56	0.00071	0.69333	3.3	4.18	0.00116	0.52290			
3.4	1.69	0.00047	0.96607	3.4	2.66	0.00074	0.74857	3.4	4.32	0.00120	0.55678			
3.5	1.73	0.00048	1.02528	3.5	2.74	0.00076	0.78646	3.5	4.46	0.00124	0.59164			
3.6	1.76	0.00049	1.06519	3.6	2.81	0.00078	0.82522	3.6	4.57	0.00127	0.61842			
3.7	1.84	0.00051	1.14711	3.7	2.88	0.00080	0.86484	3.7	4.72	0.00131	0.65498			
3.8	1.87	0.00052	1.18911	3.8	2.95	0.00082	0.90531	3.8	482	0.00134	0.68303			
3.9	1.91	0.00053	1.23181	3.9	3.02	0.00084	0.94662	3.9	4.97	0.00138	0.72127			
4.0	1.98	0.00055	1.31928	4.0	3.13	0.00087	1.01019	4.0	5.08	0.00141	0.75058			
4.1	2.02	0.00056	1.36404	4.1	3.20	0.00089	1.05362	4.1	5.22	0.00145	0.79049			
4.2	2.05	0.00057	1.40950	4.2	3.28	0.00091	1.09789	4.2	5.33	0.00148	0.82104			
4.3	2.12	0.00059	1.50246	4.3	3.35	0.00093	1.14299	4.3	5.47	0.00152	0.86261			
4.4	2.16	0.00060	1.54996	4.4	3.42	0.00095	1.18893	4.4	558	0.00155	0.89441			
4.5	2.23	0.00062	1.64700	4.5	3.49	0.00097	1.23570	4.5	5.72	0.00159	0.93762			
4.6	2.27	0.00063	1.69653	4.6	3.60	0.00100	1.30741	4.6	583	0.00162	0.97065			
4.7	2.30	0.00064	1.74674	4.7	3.67	0.00102	1.35625	4.7	5.98	0.00166	1.01550			
4.8	2.38	0.00066	1.84918	4.8	3.74	0.00104	1.40591	4.8	6.08	0.00169	1.04975			

Table 4.0

40 mm				50 mm				63 mm			
6,7 mm				8,4 mm				10,5 mm			
26,6 mm				33,2 mm				42,0 mm			
D	Q			D	Q			D	Q		
s	J			s	J			s	J		
Di	V			Di	V			Di	V		
V	Q		J	V	Q		J	V	Q		J
m/s	m³/h	m³/s	m/m	m/s	m³/h	m³/s	m/m	m/s	m³/h	m³/s	m/m
0.4	0.79	0.00022	0.00797	0.4	1.26	0.00035	0.00640	0.4	1.98	0.00055	0.00470
0.5	1.01	0.00028	0.01245	0.5	1.55	0.00043	0.00936	0.5	2.48	0.00069	0.00715
0.6	1.19	0.00033	0.01688	0.6	1.87	0.00052	0.01331	0.6	2.99	0.00083	0.01007
0.7	1.40	0.00039	0.02300	0.7	2.20	0.00061	0.01789	0.7	3.49	0.00097	0.01344
0.8	1.58	0.00044	0.02876	0.8	2.48	0.00069	0.02248	0.8	4.00	0.00111	0.01725
0.9	1.80	0.00050	0.03644	0.9	2.81	0.00078	0.02821	0.9	4.50	0.00125	0.02150
1.0	2.02	0.00056	0.04495	1.0	3.13	0.00087	0.03454	1.0	5.00	0.00139	0.02617
1.1	2.20	0.00061	0.05266	1.1	3.42	0.00095	0.04065	1.1	5.47	0.00152	0.03088
1.2	2.41	0.00067	0.06266	1.2	3.74	0.00104	0.04806	1.2	5.98	0.00166	0.03636
1.3	2.59	0.00072	0.07159	1.3	4.07	0.00113	0.05605	1.3	6.48	0.00180	0.04224
1.4	2.81	0.00078	0.08303	1.4	4.36	0.00121	0.06362	1.4	6.98	0.00194	0.04852
1.5	2.99	0.00083	0.09316	1.5	4.68	0.00130	0.07266	1.5	7.49	0.00208	0.05521
1.6	3.20	0.00089	0.10601	1.6	5.00	0.00139	0.08225	1.6	7.99	0.00222	0.06229
1.7	3.38	0.00094	0.11730	1.7	5.29	0.00147	0.09123	1.7	8.50	0.00236	0.06976
1.8	3.60	0.00100	0.13155	1.8	5.62	0.00156	0.10185	1.8	8.96	0.00249	0.07704
1.9	3.82	0.00106	0.14654	1.9	5.90	0.00164	0.11173	1.9	9.47	0.00263	0.08525
2.0	4.00	0.00111	0.15960	2.0	6.23	0.00173	0.12335	2.0	9.97	0.00277	0.09385
2.1	4.21	0.00117	0.17594	2.1	6.55	0.00182	0.13550	2.1	10.48	0.00291	0.10282
2.2	4.39	0.00122	0.19012	2.2	6.84	0.00190	0.14673	2.2	10.98	0.00305	0.11217
2.3	4.61	0.00128	0.20780	2.3	7.16	0.00199	0.15986	2.3	11.48	0.00319	0.12189
2.4	4.79	0.00133	0.22308	2.4	7.49	0.00208	0.17351	2.4	11.99	0.00333	0.13198
2.5	5.00	0.00139	0.24207	2.5	7.78	0.00216	0.18607	2.5	12.46	0.00346	0.14168
2.6	5.18	0.00144	0.25845	2.6	8.10	0.00225	0.20069	2.6	12.96	0.00360	0.15248
2.7	5.40	0.00150	0.27874	2.7	8.42	0.00234	0.21581	2.7	13.46	0.00374	0.16365
2.8	5.62	0.00156	0.29974	2.8	8.71	0.00242	0.22967	2.8	13.97	0.00388	0.17517
2.9	5.80	0.00161	0.31778	2.9	9.04	0.00251	0.24574	2.9	14.47	0.00402	0.18706
3.0	6.01	0.00167	0.34006	3.0	9.36	0.00260	0.26231	3.0	14.98	0.00416	0.19930
3.1	6.19	0.00172	0.35916	3.1	9.65	0.00268	0.27745	3.1	15.44	0.00429	0.21099
3.2	6.41	0.00178	0.38270	3.2	9.97	0.00277	0.29495	3.2	15.95	0.00443	0.22392
3.3	6.59	0.00183	0.40285	3.3	10.30	0.00286	0.31294	3.3	16.45	0.00457	0.23720
3.4	6.80	0.00189	0.42765	3.4	10.58	0.00294	0.32935	3.4	16.96	0.00471	0.25084
3.5	7.02	0.00195	0.45313	3.5	10.91	0.00303	0.34826	3.5	17.46	0.00485	0.26482
3.6	7.20	0.00200	0.47489	3.6	11.23	0.00312	0.36766	3.6	17.96	0.00499	0.27915
3.7	7.42	0.00206	0.50161	3.7	11.52	0.00320	0.38531	3.7	18.47	0.00513	0.29383
3.8	7.60	0.00211	0.52439	3.8	11.84	0.00329	0.40562	3.8	18.94	0.00526	0.30776
3.9	7.81	0.00217	0.55234	3.9	12.17	0.00338	0.42641	3.9	19.44	0.00540	0.32311
4.0	7.99	0.00222	0.57614	4.0	12.46	0.00346	0.44529	4.0	19.94	0.00554	0.33879
4.1	8.21	0.00228	0.60531	4.1	12.78	0.00355	0.46698	4.1	20.45	0.00568	0.35482
4.2	8.39	0.00233	0.63012	4.2	13.10	0.00364	0.48914	4.2	20.95	0.00582	0.37119
4.3	8.60	0.00239	0.66051	4.3	13.39	0.00372	0.50924	4.3	21.46	0.00596	0.38789
4.4	8.82	0.00245	0.69154	4.4	13.72	0.00381	0.53229	4.4	21.96	0.00610	0.40493
4.5	9.00	0.00250	0.71791	4.5	14.04	0.00390	0.55581	4.5	22.43	0.00623	0.42106
4.6	9.22	0.00256	0.75014	4.6	14.33	0.00398	0.57711	4.6	22.93	0.00637	0.43875
4.7	9.40	0.00261	0.77750	4.7	14.65	0.00407	0.60151	4.7	23.44	0.00651	0.45678
4.8	9.61	0.00267	0.81093	4.8	14.98	0.00416	0.62638	4.8	23.94	0.00665	0.47514

Table 4.1

75 mm				90 mm				110 mm			
12,5 mm				15,0 mm				18,4 mm			
50,0 mm				60,0 mm				73,2 mm			
D	Q		J	D	Q		J	D	Q		J
s	m³/h	m³/s	m/m	s	m³/h	m³/s	m/m	s	m³/h	m³/s	m/m
Di	V			Di	V			Di	V		
	m/s				m/s				m/s		
0.4	2.84	0.00079	0.00393	0.4	4.07	0.00113	0.00314	0.4	6.05	0.00168	0.00248
0.5	3.53	0.00098	0.00586	0.5	5.08	0.00141	0.00473	0.5	7.56	0.00210	0.00376
0.6	4.25	0.00118	0.00827	0.6	6.12	0.00170	0.00669	0.6	9.11	0.00253	0.00530
0.7	4.93	0.00137	0.01090	0.7	7.13	0.00198	0.00887	0.7	10.62	0.00295	0.00705
0.8	5.65	0.00157	0.01403	0.8	8.14	0.00226	0.01133	0.8	12.13	0.00337	0.00902
0.9	6.37	0.00177	0.01751	0.9	9.14	0.00254	0.01407	0.9	13.64	0.00379	0.01121
1.0	7.06	0.00196	0.02116	1.0	10.19	0.00283	0.01719	1.0	15.16	0.00421	0.01362
1.1	7.78	0.00216	0.02533	1.1	11.20	0.00311	0.02047	1.1	16.67	0.00463	0.01624
1.2	8.50	0.00236	0.02984	1.2	12.20	0.00339	0.02401	1.2	18.18	0.00505	0.01907
1.3	9.18	0.00255	0.03444	1.3	13.25	0.00368	0.02796	1.3	19.69	0.00547	0.02211
1.4	9.90	0.00275	0.03961	1.4	14.26	0.00396	0.03202	1.4	21.20	0.00589	0.02536
1.5	10.62	0.00295	0.04511	1.5	15.26	0.00424	0.03634	1.5	22.72	0.00631	0.02881
1.6	11.30	0.00314	0.05064	1.6	16.27	0.00452	0.04091	1.6	24.23	0.00673	0.03246
1.7	12.02	0.00334	0.05677	1.7	17.32	0.00481	0.04590	1.7	25.74	0.00715	0.03632
1.8	12.71	0.00353	0.06290	1.8	18.32	0.00509	0.05098	1.8	27.29	0.00758	0.04046
1.9	13.43	0.00373	0.06966	1.9	19.33	0.00537	0.05629	1.9	28.80	0.00800	0.04471
2.0	14.15	0.00393	0.07673	2.0	20.34	0.00565	0.06185	2.0	30.31	0.00842	0.04916
2.1	14.83	0.00412	0.08374	2.1	21.38	0.00594	0.06785	2.1	31.82	0.00884	0.05379
2.2	15.55	0.00432	0.09143	2.2	22.39	0.00622	0.07390	2.2	33.34	0.00926	0.05862
2.3	16.27	0.00452	0.09942	2.3	23.40	0.00650	0.08017	2.3	34.85	0.00968	0.06364
2.4	16.96	0.00471	0.10730	2.4	24.44	0.00679	0.08692	2.4	36.36	0.01010	0.06885
2.5	17.68	0.00491	0.11589	2.5	25.45	0.00707	0.09368	2.5	37.87	0.01052	0.07425
2.6	18.40	0.00511	0.12478	2.6	26.46	0.00735	0.10067	2.6	39.38	0.01094	0.07983
2.7	19.08	0.00530	0.13351	2.7	27.47	0.00763	0.10788	2.7	40.90	0.01136	0.08560
2.8	19.80	0.00550	0.14299	2.8	28.51	0.00792	0.11560	2.8	42.41	0.01178	0.09155
2.9	20.48	0.00569	0.15228	2.9	29.52	0.00820	0.12328	2.9	43.92	0.01220	0.09769
3.0	21.20	0.00589	0.16234	3.0	30.53	0.00848	0.13119	3.0	45.47	0.01263	0.10416
3.1	21.92	0.00609	0.17269	3.1	31.57	0.00877	0.13962	3.1	46.98	0.01305	0.11067
3.2	22.61	0.00628	0.18280	3.2	32.58	0.00905	0.14799	3.2	48.49	0.01347	0.11735
3.3	23.33	0.00648	0.19373	3.3	33.59	0.00933	0.15658	3.3	50.00	0.01389	0.12422
3.4	24.05	0.00668	0.20495	3.4	34.60	0.00961	0.16540	3.4	51.52	0.01431	0.13127
3.5	24.73	0.00687	0.21588	3.5	35.64	0.00990	0.17476	3.5	53.03	0.01473	0.13849
3.6	25.45	0.00707	0.22766	3.6	36.65	0.01018	0.18402	3.6	54.54	0.01515	0.14589
3.7	26.14	0.00726	0.23912	3.7	37.66	0.01046	0.19350	3.7	56.05	0.01557	0.15347
3.8	26.86	0.00746	0.25146	3.8	38.66	0.01074	0.20321	3.8	57.56	0.01599	0.16123
3.9	27.58	0.00766	0.26409	3.9	39.71	0.01103	0.21349	3.9	59.08	0.01641	0.16916
4.0	28.26	0.00785	0.27635	4.0	40.72	0.01131	0.22363	4.0	60.59	0.01683	0.17726
4.1	28.98	0.00805	0.28953	4.1	41.72	0.01159	0.23399	4.1	62.10	0.01725	0.18554
4.2	29.70	0.00825	0.30300	4.2	42.77	0.01188	0.24495	4.2	63.65	0.01768	0.19420
4.3	30.38	0.00844	0.31605	4.3	43.78	0.01216	0.25575	4.3	65.16	0.01810	0.20283
4.4	31.10	0.00864	0.33006	4.4	44.78	0.01244	0.26676	4.4	66.67	0.01852	0.21163
4.5	31.82	0.00884	0.34434	4.5	45.79	0.01272	0.27799	4.5	68.18	0.01894	0.22061
4.6	32.51	0.00903	0.35818	4.6	46.84	0.01301	0.28984	4.6	69.70	0.01936	0.22975
4.7	33.23	0.00923	0.37301	4.7	47.84	0.01329	0.30150	4.7	71.21	0.01978	0.23907
4.8	33.91	0.00942	0.38735	4.8	48.85	0.01357	0.31337	4.8	72.72	0.02020	0.24856

Table 4.2

D 125 mm			D 140 mm			D 160 mm					
s 20,9 mm			s 23,4 mm			s 26,7 mm					
Di 83,2 mm			Di 93,2 mm			Di 106,6 mm					
V	Q		J	V	Q		J	V	Q		J
m/s	m³/h	m³/s	m/m	m/s	m³/h	m³/s	m/m	m/s	m³/h	m³/s	m/m
0.4	7.81	0.00217	0.00214	0.4	9.83	0.00273	0.00188	0.4	12.85	0.00357	0.00161
0.5	9.79	0.00272	0.00325	0.5	12.28	0.00341	0.00284	0.5	16.06	0.00446	0.00243
0.6	11.74	0.00326	0.00455	0.6	14.72	0.00409	0.00398	0.6	19.26	0.00535	0.00340
0.7	13.72	0.00381	0.00607	0.7	17.21	0.00478	0.00531	0.7	22.50	0.00625	0.00454
0.8	15.66	0.00435	0.00775	0.8	19.66	0.00546	0.00680	0.8	25.70	0.00714	0.00581
0.9	17.60	0.00489	0.00963	0.9	22.10	0.00614	0.00845	0.9	28.91	0.00803	0.00722
1.0	19.58	0.00544	0.01173	1.0	24.55	0.00682	0.01026	1.0	32.11	0.00692	0.00677
1.1	21.53	0.00598	0.01398	1.1	27.00	0.00750	0.01223	1.1	35.35	0.00962	0.01048
1.2	23.47	0.00652	0.01641	1.2	29.48	0.00619	0.01440	1.2	38.56	0.01071	0.01230
1.3	25.45	0.00707	0.01906	1.3	31.93	0.00687	0.01669	1.3	41.76	0.01160	0.01426
1.4	27.40	0.00761	0.02185	1.4	34.38	0.00955	0.01914	1.4	44.96	0.01249	0.01636
1.5	29.38	0.00816	0.02486	1.5	36.83	0.01023	0.02174	1.5	48.20	0.01339	0.01861
1.6	31.32	0.00870	0.02799	1.6	39.31	0.01092	0.02453	1.6	51.41	0.01428	0.02096
1.7	33.26	0.00924	0.03130	1.7	41.76	0.01160	0.02744	1.7	54.61	0.01517	0.02344
1.8	35.24	0.00979	0.03483	1.8	44.21	0.01228	0.03049	1.8	57.82	0.01606	0.02605
1.9	37.19	0.01033	0.03847	1.9	46.66	0.01296	0.03369	1.9	61.06	0.01696	0.02882
2.0	39.13	0.01087	0.04228	2.0	49.10	0.01364	0.03704	2.0	64.26	0.01785	0.03169
2.1	41.11	0.01142	0.04633	2.1	51.59	0.01433	0.04058	2.1	67.46	0.01874	0.03467
2.2	43.06	0.01196	0.05047	2.2	54.04	0.01501	0.04422	2.2	70.67	0.01963	0.03779
2.3	45.00	0.01250	0.05477	2.3	56.48	0.01569	0.04800	2.3	73.91	0.02053	0.04106
2.4	46.98	0.01305	0.05932	2.4	58.93	0.01637	0.05193	2.4	77.11	0.02142	0.04441
2.5	48.92	0.01359	0.06394	2.5	61.42	0.01706	0.05605	2.5	80.32	0.02231	0.04789
2.6	50.90	0.01414	0.06882	2.6	63.86	0.01774	0.06026	2.6	83.52	0.02320	0.05149
2.7	52.85	0.01468	0.07376	2.7	66.31	0.01842	0.06461	2.7	86.76	0.02410	0.05525
2.8	54.79	0.01522	0.07887	2.8	68.76	0.01910	0.06910	2.8	89.96	0.02499	0.05909
2.9	56.77	0.01577	0.08423	2.9	71.21	0.01978	0.07372	2.9	93.17	0.02568	0.06304
3.0	58.72	0.01631	0.06964	3.0	73.69	0.02047	0.07856	3.0	96.37	0.02677	0.06712
3.1	60.66	0.01685	0.09522	3.1	76.14	0.02115	0.06346	3.1	99.61	0.02767	0.07136
3.2	62.64	0.01740	0.10105	3.2	78.59	0.02183	0.08649	3.2	102.82	0.02856	0.07567
3.3	64.58	0.01794	0.10694	3.3	81.04	0.02251	0.09367	3.3	106.02	0.02945	0.06009
3.4	66.53	0.01848	0.11298	3.4	83.52	0.02320	0.09905	3.4	109.22	0.03034	0.08463
3.5	68.51	0.01903	0.11928	3.5	85.97	0.02388	0.10450	3.5	112.46	0.03124	0.06934
3.6	70.45	0.01957	0.12563	3.6	88.42	0.02456	0.11007	3.6	115.67	0.03213	0.09411
3.7	72.43	0.02012	0.13224	3.7	90.86	0.02524	0.11579	3.7	118.87	0.03302	0.09900
3.8	74.38	0.02066	0.13889	3.8	93.31	0.02592	0.12163	3.8	122.08	0.03391	0.10399
3.9	76.32	0.02120	0.14569	3.9	95.80	0.02661	0.12769	3.9	125.32	0.03481	0.10916
4.0	78.30	0.02175	0.15277	4.0	98.24	0.02729	0.13380	4.0	128.52	0.03570	0.11439
4.1	80.24	0.02229	0.15987	4.1	100.69	0.02797	0.14004	4.1	131.72	0.03659	0.11973
4.2	82.19	0.02283	0.16711	4.2	103.14	0.02865	0.14641	4.2	134.93	0.03748	0.12517
4.3	84.17	0.02338	0.17465	4.3	105.62	0.02934	0.15301	4.3	138.17	0.03838	0.13080
4.4	86.11	0.02392	0.18219	4.4	108.07	0.03002	0.15964	4.4	141.37	0.03927	0.13647
4.5	88.09	0.02447	0.19002	4.5	110.52	0.03070	0.16640	4.5	144.58	0.04016	0.14225
4.6	90.04	0.02501	0.19786	4.6	112.97	0.03138	0.17329	4.6	147.78	0.04105	0.14815
4.7	91.98	0.02555	0.20585	4.7	115.42	0.03206	0.18031	4.7	151.02	0.04195	0.15422
4.8	93.96	0.02610	0.21413	4.8	117.90	0.03275	0.18757	4.8	154.22	0.04284	0.16033

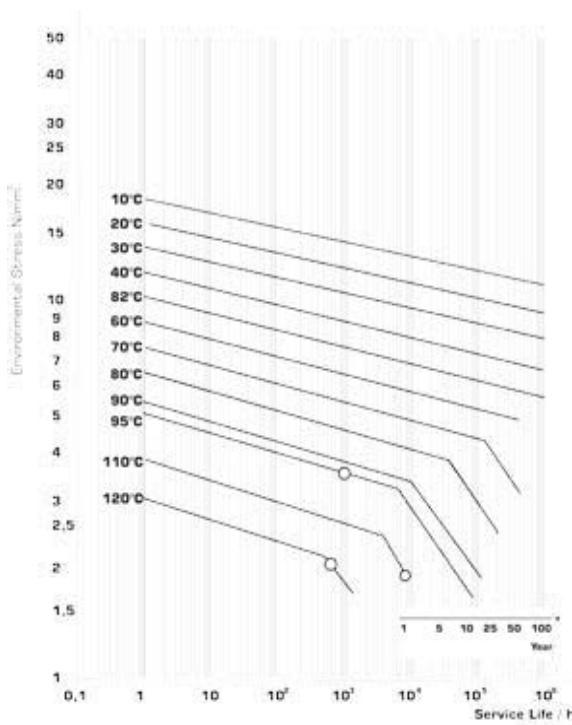
Table 4.3

Testing of Dacta Therm PP-R pipes and fittings

- a. **Density Test:** According to ISO 1183 standard, the density is determined by weighing the material. This value is 0.9 g/cm³ for PP-R material.
- b. **Melt Flow Index (MFI):** a measure of the ease of flow of the melt of a thermoplastic polymer. It is defined as the mass of polymer, in grams, flowing in ten minutes through a capillary of a specific diameter and length by a pressure applied via prescribed alternative gravimetric weights for alternative prescribed temperatures. The method is described in ISO 1133. The average value for PP-R is upto 0.50 gr/10 min.
- c. **Charpy Impact Test:** also known as the Charpy V-notch test, is a standardized high strainrate test which determines the amount of energy absorbed by a material during fracture. This absorbed energy is a measure of a given material's notch toughness and acts as a tool to study temperature-dependent ductile-brittle transition. ISO 9854 specifies a method for determining the Charpy impact strength of the product.
- d. **Longitudinal Reversion:** This test is standardized in EN ISO 2505, which specifies a method for determining the longitudinal reversion of thermoplastics pipes, to be carried out in either a liquid or in air. The pipe is left in the oven for a certain period of time and then removed. The height and diameter variation is calculated after cooling. According to the standards EN 15874 and DIN 8078, this value must not be greater than 3% in length and 2% in diameter.
- e. **Pressure Test:** The internal pressure test is standardized in ISO 1167. "Thermoplastic pipes for the conveyance of fluids - Resistance to internal pressure - Test method". The test specifies a method for determination of the resistance to constant internal pressure at constant temperature. Hydrostatic internal pressure tests are carried out in different pressure values at 20 °C 95 °C for 22 hours, 165 hours and 1000 hours intervals. During this time, the pipes should not burst. In addition to raw materials used in the pressure specified in the standard temperature of 110 °C 8760 hours (one year) are tested. This test can guarantee the material life of 50 years.
- f. **Homogeneity Test:** This test is standardized in EN ISO 13949 which is the method for the assessment of the degree of pigment dispersion in polyolefin pipes, fittings and compounds. The pipe cross-section taken from the surface microns is examined under the microscope to determine whether or not structural deterioration or gaps of non-homogeneous structure exist.

The expected service life of Dacta Therm is more than 50 years

Using Dacta Therm for heating applications within the pressure and temperature conditions given in the "Working pressure" tables will yield at least the projected service life.



Graph 1

Head °C	Service life (year)	Safety Factor: 1,5
		Nominal Pressure PN20 Work pressure (bar)
10°C	1	35,2
	5	33,1
	10	32,3
	25	31,2
	50	30,4
20°C	100	29,6
	1	29,9
	5	28,3
	10	27,5
	25	28,7
30°C	50	25,9
	100	25,1
	1	25,6
	5	24,0
	10	23,2
40°C	25	22,4
	50	21,9
	1	21,6
	5	20,3
	10	19,7
50°C	25	18,9
	50	18,4
	1	18,3
	5	17,1
	10	18,5
60°C	25	18,0
	50	15,5
	1	15,5
	5	14,4
	10	13,9
65°C	25	13,3
	50	12,9
	1	14,9
	5	13,5
	10	13,6
70°C	25	10,7
	50	10,2
	1	13,1
	5	12,0
	10	11,6
80°C	25	9,9
	50	8,5
	1	10,9
	5	9,6
	10	8,0
95°C	25	6,4
	1	7,7
	5	5,2
	10	4,3

Table 5

Solid Pipes

PP-R-80 SDR 6 PN 20 Pipes Manufactured in accordance to DIN 8077/78 & ISO 15874-2



Nominal outside diameter (dn)			Ovality Maximum Allowed	Minimum WT (mm)	Maximum WT (mm)	WT / Mtr (Kg/Mtr)	Avg Internal Diameter (mm)	Packing Unit
Size	Min (dn)	Max (dn)						
20	20	20.3	1.2	3.4	4.0	0.172	12.75	100
25	25	25.3	1.2	4.2	4.9	0.266	16.05	100
32	32	32.3	1.3	5.4	6.2	0.434	20.55	40
40	40	40.4	1.4	6.7	7.6	0.671	25.90	40
50	50	50.5	1.4	8.3	9.4	1.040	32.55	20
63	63	63.6	1.6	10.5	11.8	1.650	41.00	20
75	75	75.7	1.6	12.5	14.0	2.340	48.85	20
90	90	90.9	1.8	15.0	16.7	3.360	58.75	12
110	110	110.9	2.2	18.3	20.4	5.010	71.75	8
125	125	126.2	2.5	20.8	23.1	6.470	81.70	8
140	140	141.3	2.8	23.3	25.9	8.120	91.45	4
160	160	161.5	3.2	26.6	29.5	10.600	104.65	4

SDR7.4 PN 16

Nominal outside diameter (dn)			Minimum WT (mm)	Maximum WT (mm)	WT / Mtr (Kg/Mtr)	Packing Unit
Size	Min (dn)	Max (dn)				
20	20	20.3	2.8	3.3	0.148	100
25	25	25.3	3.5	4.1	0.230	100
32	32	32.3	4.4	5.1	0.370	40
40	40	40.4	5.5	6.3	0.575	40
50	50	50.5	6.9	7.8	0.896	20



Glass Fiber Pipes

PP-R Fiber Pipe - Glass Fiber Reinforced Pipes SDR6 manufactured dimensionally to DIN 8077



Nominal outside diameter (dn)			Ovality Maximum Allowed	Minimum WT (mm)	Maximum WT (mm)	WT / Mtr (Kg/Mtr)	Avg Internal Diameter (mm)	Packing Unit
Size	Min (dn)	Max (dn)						
20	20	20.3	1.2	3.4	4.0	0.172	12.75	100
25	25	25.3	1.2	4.2	4.9	0.266	16.05	100
32	32	32.3	1.3	5.4	6.2	0.434	20.55	40
40	40	40.4	1.4	6.7	7.6	0.671	25.90	40
50	50	50.5	1.4	8.3	9.4	1.040	32.55	20
63	63	63.6	1.6	10.5	11.8	1.650	41.00	20
75	75	75.7	1.6	12.5	14.0	2.340	48.85	20
90	90	90.9	1.8	15.0	16.7	3.360	58.75	12
110	110	110.9	2.2	18.3	20.4	5.010	71.75	8
125	125	126.2	2.5	20.8	23.1	6.470	81.70	8
140	140	141.3	2.8	23.3	25.9	8.120	91.45	4
160	160	161.5	3.2	26.6	29.5	10.600	104.65	4

Welded Fittings

Socket

Art.-No.	Dimension (mm)	Packing Unit	KG / piece
DIPPRGR20S20	20	600	0.013
DIPPRGR20S25	25	400	0.017
DIPPRGR20S32	32	500	0.027
DIPPRGR20S40	40	360	0.045
DIPPRGR20S50	50	210	0.086
DIPPRGR20S63	63	108	0.146
DIPPRGR20S75	75	84	0.213
DIPPRGR20S90	90	54	0.343
DIPPRGR20S110	110	30	0.598



Reducer Socket

Art.-No.	Dimension (mm)	Packing Unit	KG / piece
DIPPRGR20R2520	25/20	500	0.013
DIPPRGR20R3220	32/20	400	0.016
DIPPRGR20R3225	32/25	400	0.017
DIPPRGR20R4020	40/20	750	0.025
DIPPRGR20R4025	40/25	500	0.029
DIPPRGR20R4032	40/32	400	0.033
DIPPRGR20R5020	50/20	480	0.045
DIPPRGR20R5025	50/25	450	0.045
DIPPRGR20R5032	50/32	350	0.048
DIPPRGR20R5040	50/40	400	0.055
DIPPRGR20R6325	63/25	280	0.076
DIPPRGR20R6332	63/32	220	0.078
DIPPRGR20R6340	63/40	210	0.086
DIPPRGR20R6350	63/50	180	0.106
DIPPRGR20R7550	75/50	135	0.137
DIPPRGR20R7563	75/63	120	0.175
DIPPRGR20R9050	90/50	96	0.19
DIPPRGR20R9063	90/63	96	0.222
DIPPRGR20R9075	90/75	68	0.274
DIPPRGR20R11063	110/63	60	0.34
DIPPRGR20R11075	110/75	54	0.375
DIPPRGR20R11090	110/90	35	0.5190



Elbow 90°

Art.-No.	Dimension (mm)	Packing Unit	KG / piece
DIPPRGR20E9020	20	500	0.020
DIPPRGR20E9025	25	500	0.028
DIPPRGR20E9032	32	300	0.050
DIPPRGR20E9040	40	210	0.083
DIPPRGR20E9050	50	100	0.163
DIPPRGR20E9063	63	50	0.309
DIPPRGR20E9075	75	40	0.480
DIPPRGR20E9090	90	24	0.771
DIPPRGR20E90110	110	12	1.425



Elbow 45°

Art.-No.	Dimension (mm)	Packing Unit	KG / piece
DIPPRGR20E4520	20	500	0.017
DIPPRGR20E4525	25	750	0.023
DIPPRGR20E4532	32	480	0.040
DIPPRGR20E4540	40	240	0.062
DIPPRGR20E4550	50	120	0.118
DIPPRGR20E4563	63	72	0.237
DIPPRGR20E4575	75	50	0.33
DIPPRGR20E4590	90	30	0.527
DIPPRGR20E45110	110	15	0.956



Equal Tee

Art.-No.	Dimension (mm)	Packing Unit	KG / piece
DIPPRGR20T20	20	500	0.026
DIPPRGR20T25	25	480	0.034
DIPPRGR20T32	32	240	0.059
DIPPRGR20T40	40	150	0.103
DIPPRGR20T50	50	90	0.190
DIPPRGR20T63	63	50	0.368
DIPPRGR20T75	75	30	0.573
DIPPRGR20T90	90	20	0.911
DIPPRGR20T110	110	12	1.628



Reducing Tee

Art.-No.	Dimension (mm)	Packing Unit	KG / piece
DIPPRGR20RT252020	25 x 20 x 20	500	0.031
DIPPRGR20RT252025	25 x 20 x 25	500	0.030
DIPPRGR20RT322025	32 x 20 x 25	350	0.046
DIPPRGR20RT322032	32 x 20 x 32	350	0.045
DIPPRGR20RT322520	32 x 25 x 20	350	0.047
DIPPRGR20RT322020	32 x 20 x 20	350	0.047
DIPPRGR20RT322532	32 x 25 x 32	300	0.049
DIPPRGR20RT402040	40 x 20 x 40	288	0.071
DIPPRGR20RT402540	40 x 25 x 40	252	0.077
DIPPRGR20RT403240	40 x 32 x 40	160	0.088
DIPPRGR20RT502050	50 x 20 x 50	144	0.132
DIPPRGR20RT502550	50 x 25 x 50	100	0.155
DIPPRGR20RT503250	50 x 32 x 50	90	0.166
DIPPRGR20RT504050	50 x 40 x 50	120	0.128
DIPPRGR20RT632063	63 x 20 x 63	84	0.215
DIPPRGR20RT632563	63 x 25 x 63	72	0.228
DIPPRGR20RT633263	63 x 32 x 63	60	0.252
DIPPRGR20RT634063	63 x 40 x 63	54	0.274
DIPPRGR20RT635063	63 x 50 x 63	56	0.318



End Cap

Art.-No.	Dimension (mm)	Packing Unit	KG / piece
DIPPRGR20EC20	20	1600	0.010
DIPPRGR20EC25	25	1000	0.012
DIPPRGR20EC32	32	980	0.022
DIPPRGR20EC40	40	480	0.040
DIPPRGR20EC50	50	260	0.082
DIPPRGR20EC63	63	144	0.151
DIPPRGR20EC75	75	100	0.231
DIPPRGR20EC90	90	60	0.37
DIPPRGR20EC110	110	30	0.629



Union PPR (welding both sides)

Art.-No.	Dimension (mm)	Packing Unit	KG / piece
DIPPRGR16UW20	20	125	0.033
DIPPRGR16UW25	25	125	0.055
DIPPRGR16UW32	32	100	0.076
DIPPRGR16UW40	40	100	0.117



Flanges Adaptor

Art.-No.	Dimension (mm)	Packing Unit	KG / piece
DIPPRGR20FA75	75	110	0.210
DIPPRGR20FA90	90	75	0.306



Blind Cap

Art.-No.	Dimension (mm)	Packing Unit	KG / piece
DIPPRGR20BC20	20	1800	0.006
DIPPRGR20BC25	25	1500	0.010



Over Bridge Bow

Art.-No.	Dimension (mm)	Packing Unit	KG / piece
DIPPRGR20OBB20	20	600	0.034
DIPPRGR20OBB25	25	300	0.050
DIPPRGR20OBB32	32	200	0.077



Clamp Single

Art.-No.	Dimension (mm)	Packing Unit	KG / piece
DIPPRGR20CS20	20	2700	0.007
DIPPRGR20CS25	25	2100	0.008
DIPPRGR20CS32	32	1000	0.010
DIPPRGR20CS40	40	900	0.014



Transition Fittings

Transition Piece Female - Round

Art.-No.	Dimension (mm)	Packing Unit	KG / piece
DIPPRGR20TPFR2012	20 mm x 1/2"	300	0.059
DIPPRGR20TPFR2034	20 mm x 3/4"	200	0.077
DIPPRGR20TPFR2512	25 mm x 1/2"	200	0.062
DIPPRGR20TPFR2534	25 mm x 3/4"	150	0.079
DIPPRGR20TPFR3234	32 mm x 3/4"	200	0.083



Transition Piece Female - Hexagonal

Art.-No.	Dimension (mm)	Packing Unit	KG / piece
DIPPRGR20TPFH321	32 mm x 1"	100	0.241
DIPPRGR20TPFH40114	40 mm x 1.1/4"	75	0.38
DIPPRGR20TPFH50112	50 mm x 1.1/2"	50	0.429
DIPPRGR20TPFH632	63 mm x 2"	40	0.612
DIPPRGR20TPFH75212	75 mm x 2.1/2"	25	1.053
DIPPRGR20TPFH903	90 mm x 3"	14	1.602
DIPPRGR20TPFH1104	110 mm x 4"	6	3.302



Transition Piece Male - Round

Art.-No.	Dimension (mm)	Packing Unit	KG / piece
DIPPRGR20TPMR2012	20 mm x 1/2"	250	0.072
DIPPRGR20TPMR2034	20 mm x 3/4"	300	0.085
DIPPRGR20TPMR2512	25 mm x 1/2"	200	0.074
DIPPRGR20TPMR2534	25 mm x 3/4"	100	0.086
DIPPRGR20TPMR3234	32 mm x 3/4"	200	0.092



Transition Piece Male - Hexagonal

Art.-No.	Dimension (mm)	Packing Unit	KG / piece
DIPPRGR20TPMH321	32 mm x 1"	120	0.237
DIPPRGR20TPMH40114	40 mm x 1.1/4"	75	0.387
DIPPRGR20TPMH50112	50 mm x 1.1/2"	80	0.455
DIPPRGR20TPMH632	63 mm x 2"	60	0.661
DIPPRGR20TPMH75212	75 mm x 2.1/2"	20	1.045
DIPPRGR20TPMH903	90 mm x 3"	14	1.525
DIPPRGR20TPMH1104	110 mm x 4"	6	4.921



Transition Female Union

Art.-No.	Dimension (mm)	Packing Unit	KG / piece
DIPPRGR20TFU2012	20 mm x 1/2"	250	0.113
DIPPRGR20TFU2534	25 mm x 3/4"	180	0.199
DIPPRGR20TFU321	32 mm x 1"	75	0.296
DIPPRGR20TFU40114	40 mm x 1.1/4"	75	0.439
DIPPRGR20TFU50112	50 mm x 1.1/2"	30	0.648
DIPPRGR20TFU632	63 mm x 2"	25	0.932



Transition Male Union

Art.-No.	Dimension (mm)	Packing Unit	KG / piece
DIPPRGR20TMU2012	20 mm x 1/2"	250	0.152
DIPPRGR20TMU2534	25 mm x 3/4"	180	0.271
DIPPRGR20TMU321	32 mm x 1"	60	0.371
DIPPRGR20TMU40114	40 mm x 1.1/4"	60	0.563
DIPPRGR20TMU50112	50 mm x 1.1/2"	50	0.649
DIPPRGR20TMU632	63 mm x 2"	30	1.071



Transition Tee Female

Art.-No.	Dimension (mm)	Packing Unit	KG / piece
DIPPRGR20TTF2012	20 mm x 1/2"	200	0.076
DIPPRGR20TTF2034	20 mm x 3/4"	200	0.095
DIPPRGR20TTF2512	25 mm x 1/2"	150	0.083
DIPPRGR20TTF2534	25 mm x 3/4"	150	0.108
DIPPRGR20TTF3234	32 mm x 3/4"	120	0.116
DIPPRGR20TTF321	32 mm x 1"	120	0.285



Transition Elbow Female

Art.-No.	Dimension (mm)	Packing Unit	KG / piece
DIPPRGR20TE90F2012	20 mm x 1/2"	300	0.067
DIPPRGR20TE90F2034	20 mm x 3/4"	200	0.093
DIPPRGR20TE90F2512	25 mm x 1/2"	250	0.07
DIPPRGR20TE90F2534	25 mm x 3/4"	200	0.096
DIPPRGR20TE90F3234	32 mm x 3/4"	90	0.11
DIPPRGR20TE90F321	32 mm x 1"	150	0.273



Transition Elbow Male

Art.-No.	Dimension (mm)	Packing Unit	KG / piece
DIPPRGR20TE90M2012	20 mm x 1/2"	250	0.08
DIPPRGR20TE90M2034	20 mm x 3/4"	200	0.106
DIPPRGR20TE90M2512	25 mm x 1/2"	200	0.084
DIPPRGR20TE90M2534	25 mm x 3/4"	150	0.112
DIPPRGR20TE90M3234	32 mm x 3/4"	75	0.124
DIPPRGR20TE90M321	32 mm x 1"	75	0.278



Transition Back Plate Elbow Female

Art.-No.	Dimension (mm)	Packing Unit	KG / piece
DIPPRGR20TBEF2012	20 mm x 1/2"	200	0.034
DIPPRGR20TBEF2512	25 mm x 1/2"	150	0.037



Valve & Accessories

Stop Globe Valve

Art.-No.	Dimension (mm)	Packing Unit	KG / piece
DIPPRGR20VB2034	20 mm x 3/4"	50	0.239
DIPPRGR20VB2534	25 mm x 3/4"	50	0.246
DIPPRGR20VB321	32 mm x 1"	40	0.408



Concealed Valve

Art.-No.	Dimension (mm)	Packing Unit	KG / piece
DIPPRGRCV2034	20 mm x 3/4"	50	0.394
DIPPRGRCV2534	25 mm x 3/4"	50	0.401
DIPPRGRCV321	32 mm x 1"	40	0.490



Ball Valve

Art.-No.	Dimension	Packing Unit	KG / piece
DTPPRGRBV20	20 mm	350	0.089
DTPPRGRBV25	25 mm	250	0.128
DTPPRGRBV32	32 mm	150	0.214
DTPPRGRBV40	40 mm	100	0.302
DTPPRGRBV50	50 mm	50	0.570
DTPPRGRBV63	63 mm	25	1.097



Welding Accessories

Proven technology tested and used by plumbers, widely accepted in various offices, hospitals, schools, hotels, residential, commercial applications, and industrial facilities.

Welding Device

Art.-No.	Dimension (mm)	Packing Unit	KG / piece
DTPPRGRWD2063	20 - 63	1	6.09
DTPPRGRWD75110	75 - 110	1	7
DTPPRGRWD20160	20 - 160	1	10



Welding Tools

Art.-No.	Dimension (mm)	Packing Unit	KG / piece
DTPPRGRWT20	20	1	0.112
DTPPRGRWT25	25	1	0.142
DTPPRGRWT32	32	1	0.185
DTPPRGRWT40	40	1	0.260
DTPPRGRWT50	50	1	0.395
DTPPRGRWT63	63	1	0.618
DTPPRGRWT75	75	1	0.790
DTPPRGRWT90	90	1	1.170
DTPPRGRWT110	110	1	1.750



Pipes Cutter

Art.-No.	Dimension (mm)	Packing Unit	KG / piece
DTPPRGRPC042	0-42	1	0.447
DTPPRGRPC075	0-75	1	1.670
DTPPRGRPC50160	50-160	1	1.750



During the jointing process of PP-R pipes and fittings, a welding machine is required.

Welding machines

During the jointing process of PP-R pipes and fittings, a welding machine is required. Dacta Therm offers two different types of welding machines:

a Welding machine for smaller diameters

Welding Threader

Diameter (mm)				
20	25	32	40	



b Welding machine for bigger diameters

Welding Threader

Diameter (mm)				
50	63	75	90	110



The various types of welding machines consist of complete devices including power sources, monitors and controls.

Application

1. Make sure the working area is safe before starting the machine.
2. Welding heads should be placed on the welding machine so that the parts do not move or are not turned.
3. Plug the welding machine in a 220 volt standard outlet.
4. Adjust the temperature to 260 °C (500° F). Dacta welding machine contains a fast-indicating surface thermometer.
5. Switch on the power button. Heating takes 1-3 minutes. (Switching two buttons will reduce heating time.)
6. Thermostat light will dim down automatically as the temperature reaches 260 °C (500° F).
7. Insert the pipes and fittings to their respective die heads.



Figure 5

8. If UV or Stabil pipe is used, completely peel off the exterior layer first. Blunt peeling blades must be replaced by Dacta Therm - approved blades, (see page 58) It will be necessary to make trial peelings to ensure the correct setting of the new blade. Push the end of the pipe into the guide of the peeling tool. Peel off the outer layer up to the stop of the peeling tool. It is not necessary to mark the welding depth as the stop of the peeling tool indicates the correct welding depth. Before starting the fusion, check to ensure the exterior layer has been completely removed.

- Pipes and fittings should be heated at the same time. Heating times vary depending on the diameter of the pipe. Heating for too short a time can result in improper bonding. Heating for too long can result in ID restriction.

Diameter (mm)	Welding Depth (mm)	Heating Time (sec)	Welding Time (sec)	Cooling Time (sec)
20 MM	14	5	4	2
25 MM	15	7	4	2
32 MM	16.5	8	5	3
40 MM	18	12	6	4
50 MM	20	18	7	4
63 MM	24	24	8	6
75 MM	28	30	8	6
90 MM	29	40	8	8
110 MM	32.5	50	10	8
125 MM	40	70	10	8

Table 6

- After the heating time, quickly remove the pipe and the fitting from the welding tools.



Figure 6

- Join them immediately, by inserting the pipe straight into the fitting without turning. The result of the fusion is an inseparable material joining of pipe and fitting.



Figure 7

- After jointing, wait until the cooling period has elapsed.
- After the cooling period, the fused joint is ready for use.
- After use, switch off and unplug the welding device. Let it cool down. Never use water to cool the welding device, as this will destroy the tempered metal. Always keep the welding heads dry.
- After completion of the welding process, clean the layouts with a clean cloth or absorbent paper.

Important: If the air around the pipe is below 5°C (40°F), the heating times will be increased by 50%. Remember to take greater care with the pipe as it can become brittle in cold temperatures. Using power cutters on cold pipe can cause cracking and is not recommended. Use standard ratchet or wheel cutters instead. Never pre-heat the pipe beyond 38°C (100°F)

Safety precautions

- The surface temperature of the welding iron and heads will normally be between 240°C (400°F) and 260°C (500°F) during operation, and they can remain at these temperatures for as long as 30 minutes after being un-plugged.
- When working with the welding irons, always wear the appropriate hand and arm protection to avoid the risk of burns. Protective eyewear is also recommended.
- During operation, always be aware of the location of the iron. Do not leave the iron hanging loosely or allow it to brush up against flammable materials. Make sure to keep the iron clear of other people. Inform those working nearby that the iron is hot and could pose a safety risk to them. Do not leave the iron unattended while it is plugged in. After unplugging the iron, protect it with a heat-resistant covering or place the iron back in its container. Do not allow the cord to contact the welding surfaces.
- All welding tools must be free from impurities. Make sure they are clean and dry before assembling. If necessary, clean the welding tools with a coarse, non-fibrous tissue and with rubbing alcohol.
- Pipes must be cut perpendicular to the axis with suitable cutting tools. Always ensure that cutters are sharp. Cutting pipes with dull or damaged ratchet cutters can cause the pipe to crack. Only use the cutters to cut PP-R material. It is also acceptable to use power saws with plastic-appropriate blades. Take care that the pipe surface is free from burrs or cutting debris and remove where necessary.
- For perfect fusion, damaged or dirty welding heads must be replaced, as only impeccable heads guarantee a perfect connection.

If the device has been unplugged (e.g. during longer breaks) the heating process must be restarted.

The linear expansion of pipes bases on the difference between the operating temperature and the installation temperature.

The linear expansion of pipes is based on the difference between the operating temperature and the installation temperature:

$$T = T_{\text{operating temperature}} - T_{\text{installation temperature}}$$

For this reason cold water pipes have practically no linear expansion.

Due to the heat-dependent expansion of the material, the linear expansion must be given special consideration for hot water and heating installations. There is a difference between the installation types:

- Open installation
- Installation in ducts
- Concealed installations with piping insulated

In the case of exposed installation pipes (e.g. in the basement), perfect visual characteristics and dimensional stability are significant. Dacta Therm PP-R pipes for hot water and heating systems facilitate this. The coefficient (a) of linear expansion of Dacta Therm PP-R pipes is comparable to the linear expansion of metal pipes:

The coefficient of linear expansion of Dacta Therm PP-R standard piping systems without stabilizing components is a Dacta Therm Standard PP-R Pipe: **0.150 mm/mK**

The coefficient (a) of linear expansion of Dacta Therm - Fiberglass Reinforced PP-R pipes is a Dacta Therm - Fiberglass Reinforced PP-R Pipe: **0.035 mm/mK**

The Dacta Therm - Fiberglass Reinforced PP-R pipes require enough space to expand (see page 7). An expansion control is necessary for straight and long fiberglass pipes (over 120 ft). The Dacta Therm PP-R pipes without the stabilizing compound should have expansion control on every 30 ft of straight runs. Risers made of - composite pipes may be installed tightly without expansion compensation. The following formula, data tables, calculation examples and diagrams help to determine the linear expansion. The difference between working temperature and maximum or minimum installation temperature is fundamental to calculate the linear expansion.

$$\Delta L = L \Delta T \cdot a$$

ΔL = Linear Expansion (mm) L = Pipe Length (m)

ΔT = Temperature Difference between Working and Installation temperature (°K, °C or °F)

a = Coefficient of Linear Expansion (mm/mK)

Example; if a 2m long Dacta Therm - fiberglass re-inforced PP-R pipe operates in 65 °C and is installed in 25° C, the linear expansion will be calculated as follows; $\Delta L = L \cdot \Delta T \cdot a$
 $\Delta L = 2 \cdot 40 \cdot 0,035$
 $\Delta L = 2,8 \text{ mm}$

Pipe Length (mt)	Difference in temperatures (°C)								Difference in temperatures (°C)								Difference in temperatures (°C)							
	$\Delta T = T_{\text{operating temperature}} - T_{\text{installation temperature}}$								$\Delta T = T_{\text{operating temperature}} - T_{\text{installation temperature}}$								$\Delta T = T_{\text{operating temperature}} - T_{\text{installation temperature}}$							
	10°C	20°C	30°C	40°C	50°C	60°C	70°C	80°C	10°C	20°C	30°C	40°C	50°C	60°C	70°C	80°C	10°C	20°C	30°C	40°C	50°C	60°C	70°C	80°C
1,0	1.50	3.00	4.50	6.00	7.50	9.00	10.50	12.00	0.40	0.70	1.10	1.40	1.80	2.10	2.50	2.80	0.30	0.60	0.90	1.20	1.50	1.80	2.10	2.40
2,0	3.00	6.00	9.00	12.00	15.00	18.00	21.00	24.00	0.70	1.40	2.10	2.80	3.50	4.20	4.90	5.60	0.60	1.20	1.80	2.40	3.00	3.60	4.20	4.80
3,0	4.50	9.00	13.50	18.00	22.50	27.00	31.50	36.00	1.10	2.10	3.20	4.20	5.30	6.30	7.40	8.40	0.90	1.80	2.70	3.60	4.50	5.40	6.30	7.20
4,0	6.00	12.00	18.00	24.00	30.00	36.00	42.00	48.00	1.40	2.80	4.20	5.60	7.00	8.40	9.80	11.20	1.20	2.40	3.60	4.80	6.00	7.20	8.40	9.60
5,0	7.00	15.00	22.50	30.00	37.50	45.00	52.50	60.00	1.80	3.50	5.30	7.00	8.80	10.50	12.30	14.00	1.50	3.00	4.50	6.00	7.50	9.00	10.50	12.00
6,0	9.00	18.00	27.00	36.00	45.00	54.00	63.00	72.00	2.10	4.20	6.30	8.40	10.50	12.60	14.70	16.80	1.80	3.60	5.40	7.20	9.00	10.80	12.60	14.40
7,0	10.50	21.00	31.50	42.00	52.50	63.00	73.50	84.00	2.50	4.90	7.40	9.80	12.30	14.70	17.20	19.60	2.10	4.20	6.30	8.40	10.50	12.60	14.70	16.80
8,0	12.50	24.00	36.00	48.00	60.00	72.00	84.00	96.00	2.80	5.60	8.40	11.20	14.00	16.80	19.60	22.40	2.40	4.80	7.20	9.60	12.00	14.40	16.80	19.20
9,0	13.50	27.00	40.50	54.00	67.50	81.00	94.50	108.00	3.20	6.30	9.50	12.60	15.80	18.90	22.10	25.20	2.70	5.40	8.10	10.80	13.50	16.20	18.90	21.60
10,0	13.50	27.00	40.50	54.00	67.50	81.00	94.50	108.00									0.00	9.00	12.00	15.00	18.00	21.00	24.00	

Table 7

Linear expansion of Dacta Therm Solid PP-R pipes

Linear expansion ΔL (in):

Dacta Therm

Standard PP-R Pipe = α -

0.150 mm/mK

The linear expansion is calculated according to the following formula:

$$\Delta L = L \cdot \alpha \cdot \Delta T$$

ΔL : Amount of elongation

α : Linear expansion coefficient

L : First length

ΔT : Difference in temperatures

Linear expansion of Dacta Therm-fiberglass reinforced PP-R pipes

Linear expansion DL (in):

Dacta Therm

- Fiberglass Reinforced PP-R Pipe = α -

0.035 mm/mK

Distance between clamps in PP-R pipe installation

Solid PP-R Pipes

	Ø20	Ø25	Ø32	Ø40	Ø50	Ø63	Ø75	Ø90	Ø110
0°C	85	105	125	140	165	190	205	220	250
20°C	60	75	90	100	120	140	150	160	180
30°C	60	75	90	100	120	140	150	160	180
40°C	60	70	80	90	110	130	140	150	170
50°C	60	70	80	90	110	130	140	150	170
60°C	55	65	75	85	100	115	125	140	160
70°C	50	60	75	80	95	105	115	125	140

Distance between Clamps (cm)

Table 8

Fiberglass Reinforced PP-R Pipes

	Ø20	Ø25	Ø32	Ø40	Ø50	Ø63	Ø75	Ø90	Ø110
0°C	115	130	150	165	185	215	240	260	280
20°C	90	100	115	130	145	165	185	200	215
30°C	90	100	115	130	145	165	185	200	210
40°C	80	90	105	120	135	155	175	190	200
50°C	80	90	105	120	135	155	175	190	180
60°C	70	80	100	115	130	145	165	180	175
70°C	65	75	90	105	120	135	155	175	175

Distance between Clamps (cm)

Table 9

Free Expansion

Fixed supports prevent undesirable movements of the pipe. Stabilizing abilities of the fixed supports must be better than on the sliding supports.

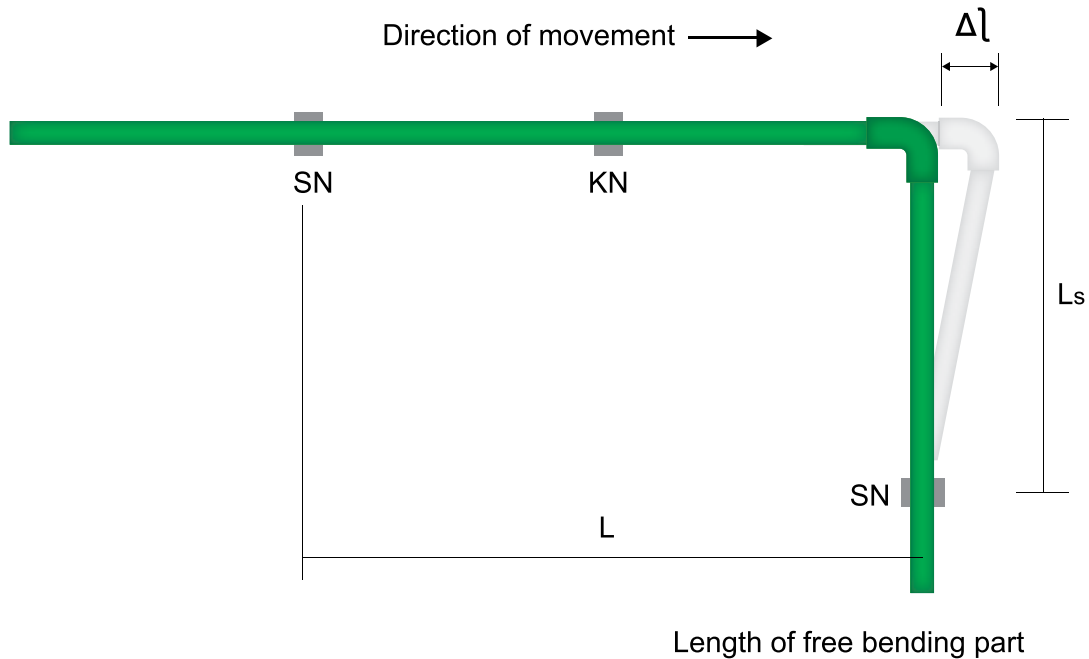


Figure 8

The expansion adjustments are made mostly unidirectionally in polypropylene pipes. The pipe should move freely in the axial direction.

Freely moving expansion parts are created in order to prevent the installation from linear expansion which may arise in the pipes due to temperature fluctuation.

Length of freely moving part is calculated by the following formula:

$$L_s = K \times \sqrt{d \times \Delta f}$$

SN: Fixed point

KN: Varying point

Ls: Length of freely moving part (mm)

D: Pipe outer diameter

Δf : Amount of elongation (mm)

L: Pipe length (m)

K: Specific constant of material (K=30)

Expansion Loop

Bending parts should be used in installations where the expansion will be bidirectional and in runs exceeding 5 meters in length.

Expansion loops cannot be removed for direction change, an expansion chamber must be designed. Shape of this expansion loop is given below.

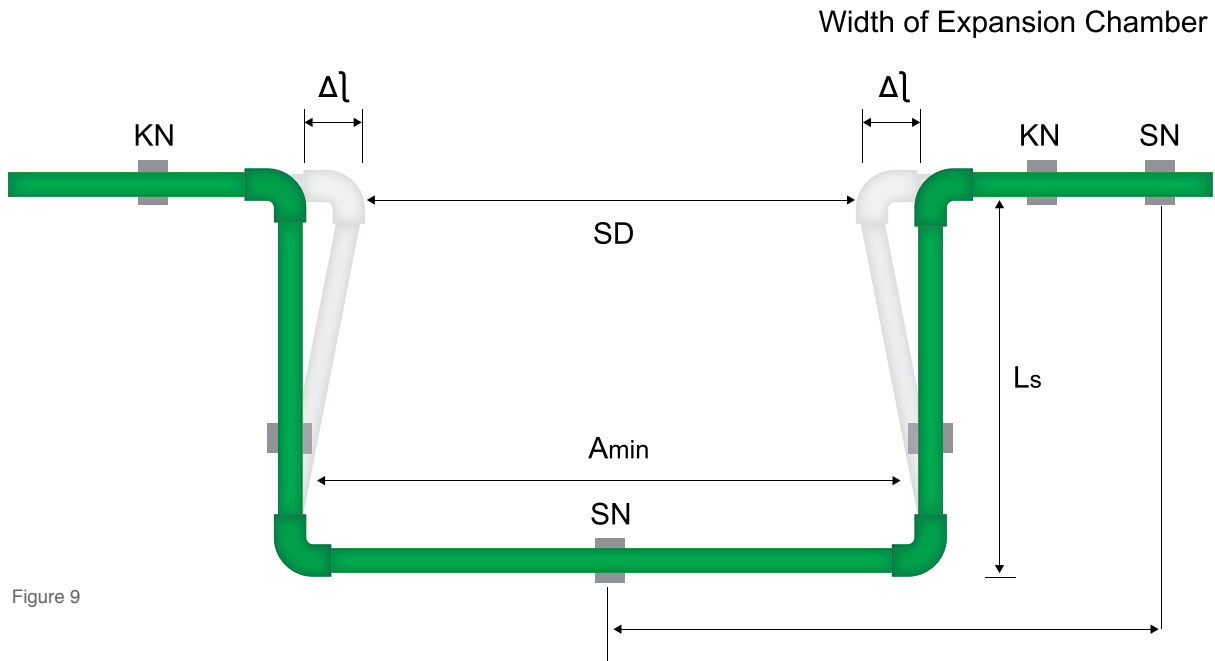


Figure 9

Calculation of minimum width of expansion chamber:

If the linear expansion cannot be compensated for by a change in direction, it may be necessary to install an expansion loop.

The pipe bend A_{min} is calculated according to the following formula:

Safety margin of 150mm is provided considering that elongation amount may increase under temperature fluctuation.

Length of freely moving part is calculated by the following formula:

$$A_{min} = 2 \times \Delta f \times SD$$

A_{min} : Minimum width of expansion loop

SD: Safety margin (150mm)

Ls: Length of freely moving part (mm)

D: Pipe outer diameter

Δf : Amount of elongation (mm)

L: Pipe length (m)

K: Specific constant of material (K=30)

Stress Status

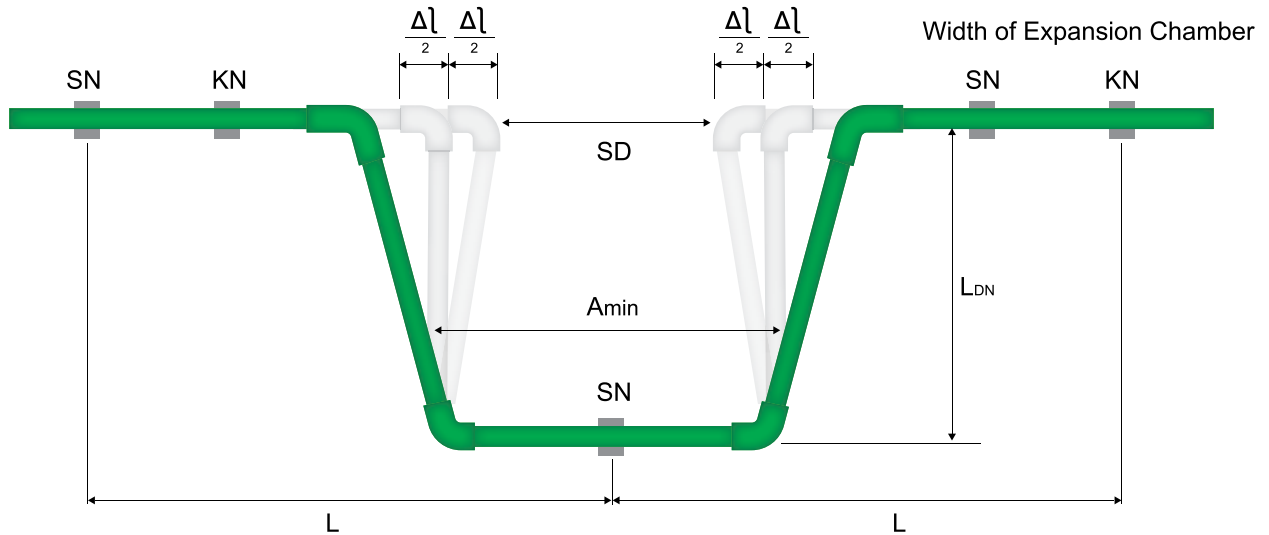


Figure 10

Stress status during installation, if planned and carried out properly, offers a visually perfect installation, as the linear expansion is not noticeable in the operating system.

The side length L_{DN} is calculated according to the following calculation example:

$$L_{DN} = K \times \sqrt{D \times \frac{\Delta f}{2}}$$

A_{min} : Minimum width of expansion loop

SD : Safety margin (150mm)

L_{DN} : Length of stress status (mm)

D : Pipe outer diameter

Δf : Amount of elongation (mm)

L : Pipe length (m)

K : Specific constant of material ($K=30$)

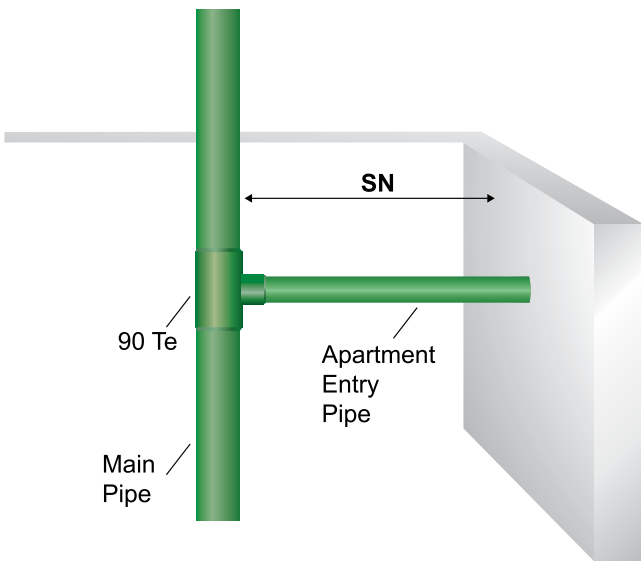


Figure 11

During the installation of the pipes from the main line to the apartments in a building, one of the following techniques is used to allow the pipes to expand linearly.

- 1) When a branch is embedded in concrete, as shown as in Figure 11.0, the SN distance between the tee and wall opening should be ensured to allow for expansion of the pipe during change of temperature.

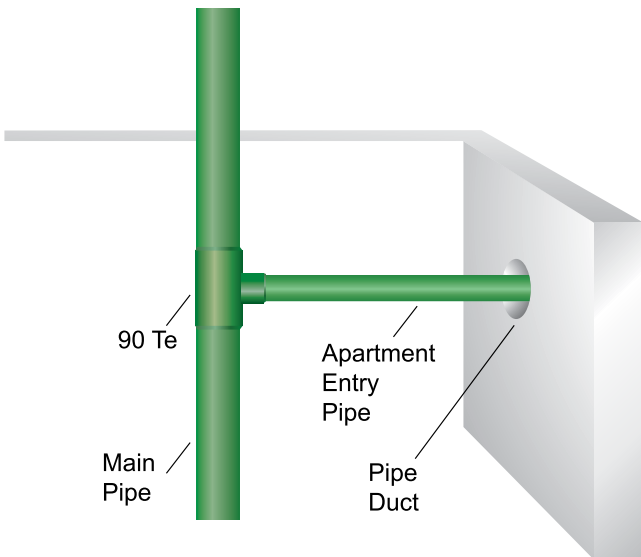


Figure 11.1

- 2) The hole diameter inside the wall should be bigger than the pipe diameter which passes through the wall as shown in Figure 11.1. The diameter of the hole must be specified in such a manner that the branch is able to move during expansion of the main pipe.

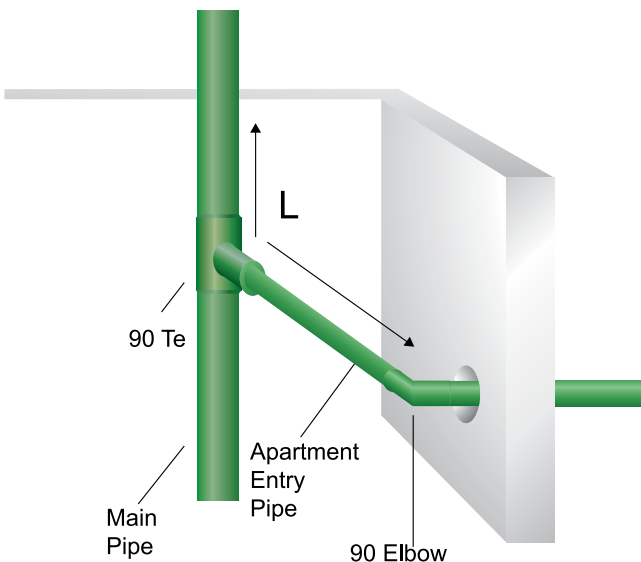


Figure 11.2

- 3) The L-shaped pipe segment in Figure 11.2 is used to compensate for length variations due to thermal expansion.

* The horizontal spacing of fixed clamps depends on the size and type of pipe (see page 34).

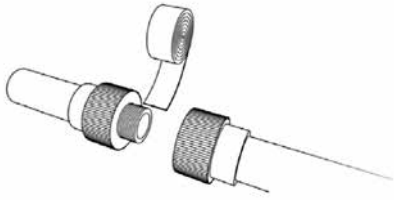


Figure 12

For screw-type joints, threaded fittings must be used. Cutting thread directly to plastic components is not permitted. Threads are sealed with a special teflon tape or sealing compounds.

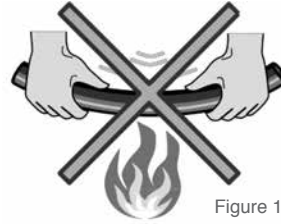


Figure 12.4

Components must not be subjected to open fire.

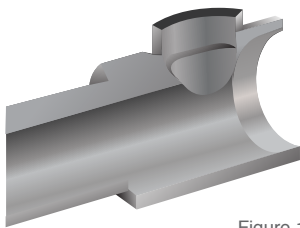


Figure 12.1

Polyfusion welding or electric and butt welding techniques are used to join plastic parts. The result is a high-quality homogeneous joint. A correct working process and appropriate tools must be used in joining procedures. Welding Dacta Therm components together with other brands is not suggested (because of warranty issues).

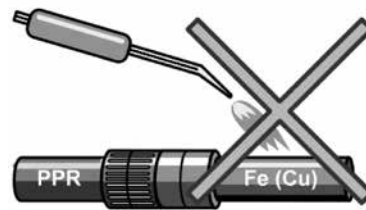


Figure 12.5

If the pipeline continues with metal piping beyond a combined pipe fitting, then no welding or brazing is allowed near this point due to possible hazard of heat transfer to the fitting.

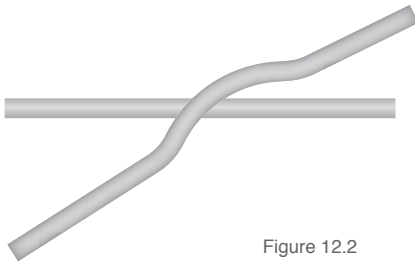


Figure 12.2

Pipeline crossings are made by using components which are specially designed for this purpose.

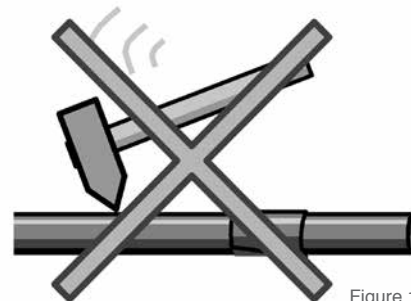


Figure 12.6

Components of plastic piping systems must be protected against falling, impact, blows or another mechanical damage during transport and installation.

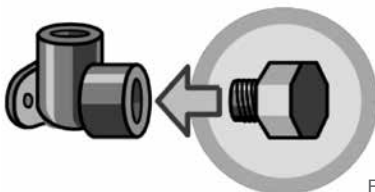


Figure 12.3

To cap off a pipe, e.g. if elbows for wall mounting or wall assemblies are to be closed before mounting outlet fittings, an end cap is used (for example during pressure tests, etc.)



Figure 12.7

Pipe bending should be done at +15 °C. Minimum bending radius for pipes of diameter range 16-32 mm is eight diameters.

- Pipes and fittings should be loaded and unloaded with extreme caution and care.
- Maximum outdoor storage time is 6 months.



Figure 13.0

- Pipes without UV-resistance should not be exposed to UV rays for any length of time.
- Pipes must not be subjected to heavy blows.



Figure 13.1



Figure 13.2



Figure 13.3

- At temperatures below 0°C (32°F), pipes may become damaged by strong impact. In spite of its high impact resistance, the material must be treated with care at low temperatures.
- Providing a solid, flat, and level base for the pipe is very important to avoid a deformation of the pipes while in transport and storage. Improper storage of pipe can cause bowing.



Figure 13.4



Figure 13.5

- Do not drop pipes or slide them over the ground. Unloading pipes, packed as a block, should be done using plastic straps or forklifts equipped with flat prongs or extensions.



Figure 13.6



Figure 13.7

- Avoid contact with metal straps, hooks or chains. Furthermore, make sure that the pipes are not pulled over sharp edges (e.g. tailgate).
- We recommend removing the pipes from the packing only shortly before installation.
- Carton-packed pipes and fitting must be protected against moisture.



Figure 13.8

During transportation and storage, DACTA Therm piping system components could be exposed to open air at any temperature for short period of time provided that it is kept in the shade protected from direct sunlight. However, at temperature below 0°C, the material becomes more susceptible to damage if hard blows are delivered. Hence, at low temperature, the material has to be treated with more caution. It is not recommended that DACTA Therm pipes and fitting be stored in open air for long period of time.

Additionally, a solid base is recommended to avoid any deformation of pipes during transportation and storage. Even though DACTA Therm pipes are extremely robust it is recommended to treat the material with care.

Figure 13.9
Loading block bundles on to flat bed vehicle

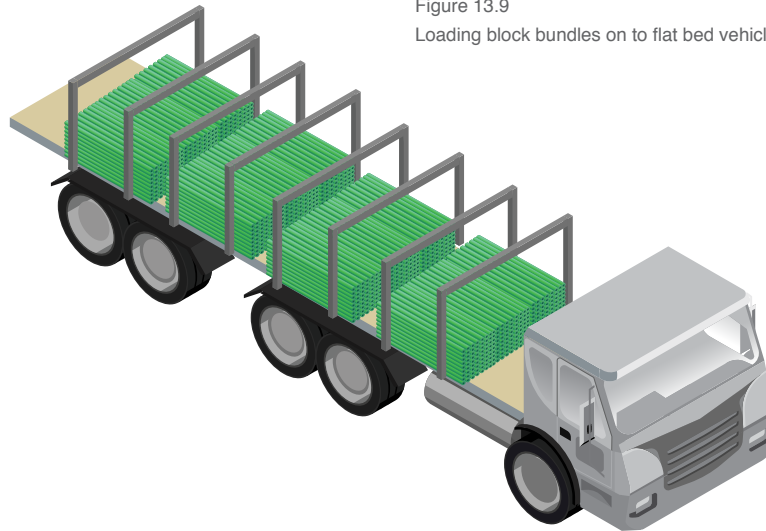


Figure 13.10
Storage of loose pipes on the ground

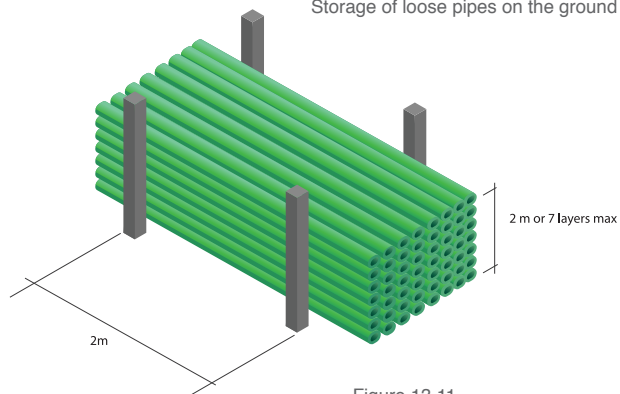
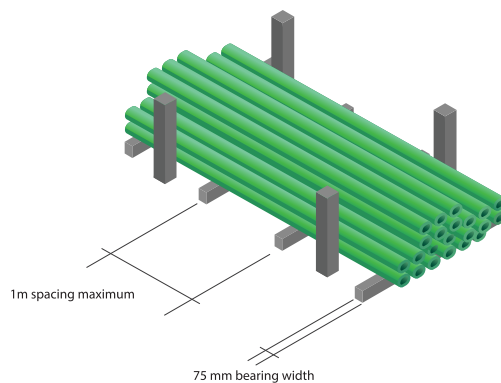


Figure 13.11
Storage of loose pipes on bearers



ZERTIFIKAT
SKZ

SKZ - Testing GmbH awards the following company

Corys Plastic Industries LLC
Mussafah
ICAD III, Plot 47SR37
18570 ABU DHABI
UNITED ARAB EMIRATES

Production site: Corys Plastic Industries LLC, UAE-18570 ABU DHABI

the right to use the SKZ testing and inspection mark

A 821

for the following plastic products

Pressure pipes made of PP-R

Trade name: DACTAtherm

SKZ specification for tests and inspection **HR 3.10:2016-03**

Users of the SKZ mark are obliged to observe the required regulations for the production and testing of these products.

Date of initial certification: ---

Date of expiry: 16 December 2025

Würzburg, 17 December 2020

Dr. Ing. Hans-Peter Krause
 Head of Certification Body

The original language of this certificate is German. In case of doubt, the German version is obligatory.

SKZ - Testing GmbH, Friedrich-Schlegel-Ring 22, 97070 Würzburg, Germany, Tel. +49 931 4704-0, testing@skz.de, www.skz.de

Approval Number: 2001530
 Test Report J-65041188

9th February 2020

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 Abu Dhabi,
 UAE

Water Regulations Advisory Scheme Ltd
 Unit 13,
 Willow Road,
 Pen y Fan Industrial Estate,
 Cwmkyn,
 Gwent,
 NP11 4EQ

WATER REGULATIONS ADVISORY SCHEME LTD (WRAS)
MATERIAL APPROVAL

The material referred to in this letter is suitable for contact with wholesome water for domestic purposes having met the requirements of BS6820-1:2000 and/or 2014 'Suitability of non-metallic products for use in contact with water intended for human consumption with regard to their effect on the quality of the water'.

The reference relates solely to its effect on the quality of the water with which it may come into contact and does not signify the approval of its mechanical or physical properties for any use.

POLYPROPYLENE - COMPONENTS **5300**

DACTAtherm PP-R 80 Green Pipe, Green coloured, extruded polypropylene pipe. For use with water up to 85°C.

APPROVAL NUMBER: 2001530
APPROVAL HOLDER: CORYS PLASTICS INDUSTRIES LLC.

The Scheme reserves the right to renew approval.
 Approval 2001530 is valid between January 2020 and January 2025

An entry, as above, will accordingly be included in the Water Fittings Directory on-line under the section headed, 'Materials which have passed full tests of effect on water quality'.

The Directory may be found at www.wras.co.uk/53002020

Yours faithfully

Jason Farnhill

Jason Farnhill
 Approvals & Enquiries Manager
 Water Regulations Advisory Scheme

The Water Regulations Advisory Scheme Ltd, Registered in England No. 08505000 Registered office: 62 Coopers Close, North Street, Brighton BN1 9EQ
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CERT

DVGW-Baumusterprüfzertifikat
DVGW type examination certificate

DW-8317DM0220
 Registrierungsnummer
 registration number

Anwendungsbereich Field of application	Produkte der Wasserversorgung products of water supply
Zertifikatsinhaber owner of certificate	Corys Plastic Industries LLC Mussafah ICAD III, Plot 47SR37, UAE- Abu Dhabi
Vertreiber distributor	Corys Plastic Industries LLC Mussafah ICAD III, Plot 47SR37, UAE- Abu Dhabi
Produktart product category	Kunststoffrohre für die Trinkwasserinstallation: PP-R, SDR 8 (8317)
Produktbezeichnung product description	Kunststoffrohre für die Trinkwasserinstallation aus PP-R
Modell model	DACTAtherm (DN 75 - 160 mm)
Prüfberichte test reports	Baumusterprüfung: 201869/19-II vom 01.06.2021 (SKZ) USA-Lablinie: BWGL: 20201551 / 11725 / 1H vom 26.05.2025 (DÖF) Mikrobiologische Prüfung: 207562/19 vom 14.10.2020 (SKO)
Prüfgrundlagen test basis	DVGW W 544 (01.05.2007) USA-KTW-BWGL (09.03.2021) DVGW W 270 (01.11.2007)

Ablaufdatum / AZ
date of expiry / file no. 01.06.2026 / 19-0653-WNE

04.06.2021 09A-12
 Datum, Revision, Blatt, Nummer der Prüfungsunterlagen
 date, version by, sheet, number of certificates / test report

Dr. Schmidt

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Approval Number 2000618
 Test Report: J-00089863 & J-00089872

27th May 2021

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 Willow Road,
 Pen y Fan Industrial Estate,
 Cwmkyn,
 Gwent,
 NP11 4EQ

WATER REGULATIONS ADVISORY SCHEME LTD (WRAS)
MATERIAL APPROVAL

The material referred to in this letter is suitable for contact with wholesome water for domestic purposes having met the requirements of BS6820-1:2000 and/or 2014 'Suitability of non-metallic products for use in contact with water intended for human consumption with regard to their effect on the quality of the water'.

The reference relates solely to its effect on the quality of the water with which it may come into contact and does not signify the approval of its mechanical or physical properties for any use.

POLYPROPYLENE - COMPONENTS **5300**

DACTAtherm PP-R 80 Fittings, Green coloured, injection moulded polypropylene fittings. For use with water up to 85°C.

APPROVAL NUMBER: 2000618
APPROVAL HOLDER: CORYS PLASTICS INDUSTRIES LLC.

The Scheme reserves the right to renew approval.
 Approval 2000618 is valid between September 2020 and September 2025

An entry, as above, will accordingly be included in the Water Fittings Directory on-line under the section headed, 'Materials which have passed full tests of effect on water quality'.

The Directory may be found at www.wrasappreciate.co.uk/appreciate-directory/

Yours faithfully

Ian Hughes

Ian Hughes
 WRAS Approvals Manager

The Water Regulations Advisory Scheme Ltd, Registered in England No. 08505000 Registered office: 62 Coopers Close, North Street, Brighton BN1 9EQ
 Tel: +44(0)1293 207 100 Fax: +44(0)1293 207 100 Email: info@wras.co.uk website: www.wras.co.uk

DVGW type examination certificate
DVGW-Baumusterprüfzertifikat

DW-8317DM0219
Registrierungsnummer
Registration Number

Field of Application <small>Anwendungsbereich</small>	products of water supply <small>Produkte der Wasserversorgung</small>
Owner of Certificate <small>Zertifizierender</small>	Corys Plastic Industries LLC Musaffah ICAD III, Plot 47SR37, UAE- Abu Dhabi
Distributor <small>Vertreiber</small>	Corys Plastic Industries LLC Musaffah ICAD III, Plot 47SR37, UAE- Abu Dhabi
Product Category <small>Produktart</small>	plastic pipes for drinking water installations: PP-R, SDR 6 (817)
Product Description <small>Produktbeschreibung</small>	plastic pipes (PP-R) for drinking water installations
Model <small>Modell</small>	DACTAtherm (DN 10 - 63 mm)
Test Reports <small>Prüfberichte</small>	type testing: 201899/19-6 from 01.06.2021 (SKZ) USA-Guideline: 2001551 / 11725 / 1H from 26.05.2025 (Df) hygienic testing: 207992/19 from 14.10.2020 (SKH)
Test Basis <small>Prüfgrundlagen</small>	DVGW W 544 (01.05.2007) USA KTW-BWGL (09.03.2021) DVGW W 270 (01.11.2007)

Date of Expiry / File No. 01.06.2026 / 19-0653-WNE
Ablaufdatum / Aktenzeichen

04.06.2021 01 A-1/2
Das Produkt ist einer Probe der Güteklasse
des Herstellers, nicht einer Probe der Güteklasse
des Herstellers, nicht einer Probe der Güteklasse

DAKKS
Deutsche
Zertifizierungsstelle
D-20 10023-01 01

DAKKS CERT GmbH
Zertifizierungsstelle
Jost-Wilcke-Str. 1-3
01103 Bonn
Tel: +49 228 91 99-300
Fax: +49 228 91 99-303
www.dakks-cert.com
info@dakks-cert.com

ZERTIFIKAT

SKZ - Testing GmbH awards the following company

Corys Plastic Industries LLC
Musaffah
ICAD III, Plot 47SR37
18570 ABU DHABI
UNITED ARAB EMIRATES

Production site: Corys Plastic Industries LLC, UAE-18570 ABU DHABI
The right to use the SKZ testing and inspection mark

A 821

For the following plastic products:

Pressure pipes made of PP-R

Trade name: DACTAtherm

SKZ specification for tests and inspection **HR 3.10.2016-03**

Users of the SKZ mark are obliged to observe the required regulations for the production and testing of these products.

Date of initial certification: ---
Date of expiry: 16 December 2025

Würzburg, 17 December 2020

IV. Schmitt
Dipl.-Ing. Hans-Peter Krauser
Head of Certification Body

The original language of this certificate is German. In case of doubt, the German version is obligatory.
SKZ - Testing GmbH, Friesenburger Ring 22, 97076 Würzburg, Germany. Tel: +49 931 4104-0, testing@skz.de, www.skz.de

DVGW-Baumusterprüfzertifikat
DVGW type examination certificate

DW-8317DM0219
Registrierungsnummer
Registration Number

Anwendungsbereich <small>Field of application</small>	Produkte der Wasserversorgung <small>products of water supply</small>
Zertifizierender <small>owner of certificate</small>	Corys Plastic Industries LLC Musaffah ICAD III, Plot 47SR37, UAE- Abu Dhabi
Vertreiber <small>distributor</small>	Corys Plastic Industries LLC Musaffah ICAD III, Plot 47SR37, UAE- Abu Dhabi
Produktart <small>product category</small>	Kunststoffrohre für die Trinkwasserinstallation: PP-R, SDR 6 (817)
Produktbeschreibung <small>product description</small>	Kunststoffrohre für die Trinkwasserinstallation aus PP-R
Modell <small>model</small>	DACTAtherm (DN 10 - 63 mm)
Prüfberichte <small>test reports</small>	Baumusterprüfung: 201899/19-6 vom 01.06.2021 (SKZ) USA-Ledline-BWGL: 2001551 / 11725 / 1H vom 26.05.2025 (Df) Mikrobiologische Prüfung: 207992/19 vom 14.10.2020 (SKH)
Prüfgrundlagen <small>test basis</small>	DVGW W 544 (01.05.2007) USA KTW-BWGL (09.03.2021) DVGW W 270 (01.11.2007)

Ablaufdatum / AZ 01.06.2026 / 19-0653-WNE
date of expiry / file no.

04.06.2021 01 A-1/2
Das Produkt ist einer Probe der Güteklasse
des Herstellers, nicht einer Probe der Güteklasse
des Herstellers, nicht einer Probe der Güteklasse

DAKKS
Deutsche
Zertifizierungsstelle
D-20 10023-01 01

DAKKS CERT GmbH
Zertifizierungsstelle
Jost-Wilcke-Str. 1-3
01103 Bonn
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Fax: +49 228 91 99-303
www.dakks-cert.com
info@dakks-cert.com

DVGW type examination certificate
DVGW-Baumusterprüfzertifikat

DW-8317DM0228
Registrierungsnummer
Registration Number

Field of Application <small>Anwendungsbereich</small>	products of water supply <small>Produkte der Wasserversorgung</small>
Owner of Certificate <small>Zertifizierender</small>	Corys Plastic Industries LLC Musaffah ICAD III, Plot 47SR37, UAE- Abu Dhabi
Distributor <small>Vertreiber</small>	Corys Plastic Industries LLC Musaffah ICAD III, Plot 47SR37, UAE- Abu Dhabi
Product Category <small>Produktart</small>	plastic pipes for drinking water installations: PP-R, SDR 6 (817)
Product Description <small>Produktbeschreibung</small>	plastic pipes (PP-R) for drinking water installations
Model <small>Modell</small>	DACTAtherm (DN 75 - 180 mm)
Test Reports <small>Prüfberichte</small>	type testing: 201899/19-6 from 01.06.2021 (SKZ) USA-Guideline: 2001551 / 11725 / 1H from 26.05.2025 (Df) hygienic testing: 207992/19 from 14.10.2020 (SKH)
Test Basis <small>Prüfgrundlagen</small>	DVGW W 544 (01.05.2007) USA KTW-BWGL (09.03.2021) DVGW W 270 (01.11.2007)

Date of Expiry / File No. 01.06.2026 / 19-0653-WNE
Ablaufdatum / Aktenzeichen

04.06.2021 01 A-1/2
Das Produkt ist einer Probe der Güteklasse
des Herstellers, nicht einer Probe der Güteklasse
des Herstellers, nicht einer Probe der Güteklasse

DAKKS
Deutsche
Zertifizierungsstelle
D-20 10023-01 01

DAKKS CERT GmbH
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info@dakks-cert.com

DVGW-Baumusterprüfzertifikat DVGW type examination certificate

DW-0317DM0220
Registration number

Anwendungsbereich <i>field of application</i>	Produkte der Wasserversorgung <i>products of water supply</i>
Zertifizierer <i>owner of certificate</i>	Corys Plastic Industries LLC Musassafh ICAD III, Post 475R37, UAE- Abu Dhabi
Vertreiber <i>distributor</i>	Corys Plastic Industries LLC Musassafh ICAD III, Post 475R37, UAE- Abu Dhabi
Produktart <i>product category</i>	Kunststoffrohre für die Trinkwasserinstallation; PP-R, SDR 6 (S317)
Produktbezeichnung <i>product description</i>	Kunststoffrohre für die Trinkwasserinstallation aus PP-R
Modell <i>model</i>	DACTAtherm (DN 75 - 160 mm)
Prüfberichte <i>test reports</i>	Baumusterprüfung: 201896/19-8 vom 01.06.2021 (SRZ) UBA-Leitlinie-BWGL: 2001551 / 11725 / 1H vom 26.06.2025 (DF) Mikrobiologische Prüfung: 207563/19 vom 14.10.2020 (S404)
Prüfungstage <i>test basis</i>	DVGW W 544 (21.05.2007) UBA KTW-BWGL (09.03.2021) DVGW W 270 (21.11.2007)

Ablaufdatum / AZ
date of expiry / file no.

01.05.2025 / 19-0553-VVNE

04.09.2021 CI A-10
Date, Version, Ed. Liefer bei DVGW
Date issued by client, issue or modification

DVGW Cert
DVGW-Certifikat
cert/Miner 01-1-1
02/2020-06
Tel: +49 228 91 85-163
Fax: +49 228 91 85-162
www.dvgw-cert.com
info@dvgw-cert.com

Approval Number: 200519
Test Report: J0058588

15th September 2020

Corys Plastic Industries LLC
Musassafh South
ICAD III
Post 475R37
PO Box 4894
Abu Dhabi
UAE

Water Regulations Advisory Scheme Ltd
Unit 10,
Wolve Road,
Peny Far Industrial Estate,
Gwent,
NP11 4EG

WATER REGULATIONS ADVISORY SCHEME LTD (WRAS) MATERIAL APPROVAL

The material referred to in this letter is suitable for contact with wholesome water for domestic purposes having met the requirements of BS6800:1:2009 and/or 2014 'Suitability of non-metallic products for use in contact with water intended for human consumption with regard to their effect on the quality of the water'

The reference states water, to its effect on the quality of the water with which it may come into contact and does not imply the approval of its mechanical or physical properties for any use.

POLYPROFILIERS - COMPONENTS 2000

DACTAtherm PP-R (S317) Ring, Green coloured, injection moulded polypropylene fittings. For use with water up to 85°C.

APPROVAL NUMBER: 200519
APPROVAL HOLDER: CORYS PLASTICS INDUSTRIES LLC

The Scheme retains the right to revoke approval:
Approval 200519 is valid between September 2020 and September 2025

An entry, as above, will accordingly be included in the Water Fittings Directory on-line under the section headed, 'Materials which have passed full tests of effect on water quality'

The Directory may be found at www.wras.gov.uk/directory

Yours faithfully,

James Furness
Approval & Insurance Manager
Water Regulations Advisory Scheme

The Water Regulations Advisory Scheme is registered in England No. 3499276 Registered office: 40 Colindale Avenue, Hendon, London NW9 7EQ
02083 504000 Fax: 0208 350 5050 Email: enquiries@wras.gov.uk Website: www.wras.gov.uk

DUBAI CENTRAL LABORATORY DEPARTMENT VERIFICATION AND ATTESTATION SERVICE - EVALUATION REPORT

VAS EVALUATION REPORT NO.	VA27000132
DATE	27/04/2021
VAS APPLICATION NO.	AP27040148
APPLICANT NAME	HEPWRTH PINE LLC
PRODUCT DESCRIPTION	DACTAtherm PP-R SDR6 Fittings
MANUFACTURED BY	Corys Plastic Industries Ltd (Proprietary) LLC

DOCUMENT(S) VERIFIED	VERIFICATION DETAILS	RESULT	REMARKS
WRAS Approval Number: 200519	Water Regulations Advisory Scheme Ltd (WRAS) Approval Number: 200519 of Test Report: J0058588	The Certificate of Conformity is valid and applicable to the product and the standard specification and the test report for DACTAtherm PP-R SDR6 Fittings, Green coloured, injection moulded polypropylene fittings. For use with water up to 85°C.	Conforms to the requirements of BS6800:1:2009 and/or 2014 'Suitability of non-metallic products for use in contact with water intended for human consumption with regard to their effect on the quality of the water'

FINAL RECOMMENDATION

It is hereby recommended to grant the Attestation Certificate to the applicant.

This recommendation is based on the full compliance with the requirements in the DM-DCLD-RD-DFPD-0001 'General Rules for Verification and Attestation Service'.

EVALUATED BY

(SOD) Hamad Khalil Aljawi
Products Quality Engineer
Date: 27/04/2021

NOTED & APPROVED BY

(SOD) NEZA MAHMOUD AL AWAZHI
Head, Conformity Assessment Unit
Date: 27/04/2021

* Test is an electronic document. All signatures are required.
Attachments: WRAS approval number 200519

Page 1 of 1
Dubai Central Laboratory Department
DM-DCLD-F-IG-0001 R4

ATTESTATION OF CONFORMITY

ISSUED TO	HEPWRTH PINE LLC
PRODUCT DESCRIPTION	DACTAtherm PP-R SDR6 Fittings, Green coloured, injection moulded polypropylene fittings. For use with water up to 85°C.
MANUFACTURED BY	CORYS PLASTICS INDUSTRIES LLC
APPLICABLE STANDARD SPECIFICATIONS / REQUIREMENTS	BS6800:1:2009 and/or 2014 'Suitability of non-metallic products for use in contact with water intended for human consumption with regard to their effect on the quality of the water'

CONFORMITY CERTIFICATE DETAILS	
CERTIFICATE NUMBER	200519
CERTIFICATE TITLE	MATERIAL APPROVAL
ISSUED BY	WATER REGULATIONS ADVISORY SCHEME LTD (WRAS)
ISSUED TO	CORYS PLASTICS INDUSTRIES LLC
EVALUATION REPORT NO.	VA27000132

ATTESTATION

Dubai Central Laboratory Department hereby attests that the product(s) described above conforms to the requirements of the applicable standard specifications / requirements.

This attestation is based solely on the review and verification of the validity and authenticity of the Product Conformity Certificate and as per Evaluation Reports as mentioned above. **This attestation shall not be used when the Product Conformity Certificate becomes invalid at any time.**

AMIR HUSAIN AL MARZOUQ
Products Conformity Assessment Section Manager
Dubai Central Laboratory Department

Attestation No: VA27000132

Original Issue Date: 27/04/2021
Current Issue Date: 27/04/2021
Valid Up To: 26/09/2025

This Attestation of Conformity is a procedure with certification scheme type IV as described in BS0100:1:2007 (2012) 'Certification Schemes - Requirements of product certification and guidelines for product verification schemes'

This document is an electronic document and shall not be reproduced or used in full. The attestation shall maintain the document's integrity. The electronic report represented herein including all attachments forms an integral part of this document.

Page 1 of 1
Dubai Central Laboratory Department
DM-DCLD-F-IG-0001 R4



Approval Number: 202018
Test Report: J-00290668

Water Regulations Advisory Scheme Ltd
35th Floor
Water House
Piney Fair Industrial Estate
Quincy,
Swansea,
SA3 1EE

28th September 2020
Corys Plastics Industries LLC
Walsingham Drive
SCAD 08
PO Box 4894
Aberystwyth
Ceredigion
SA71 4EJ

WATER REGULATIONS ADVISORY SCHEME LTD (WRAS)
MATERIAL APPROVAL

The material referred to in this entry is suitable for contact with wholesome water for domestic purposes having met the requirements of BS6009:1 2000 and/or BS6134 Suitability of non-metallic pipe for use in contact with water intended for human consumption with regard to their effect on the quality of the water.

The information relates solely to its effect on the quality of the water with which it may come into contact and does not signify the approval of its mechanical or physical properties for any use.

POLYPROPYLENE - COMPONENTS **1000**

100% Virgin PP R 801 50mg Green coloured injection moulded polypropylene fittings. For use with water up to 95 °C.

APPROVAL NUMBER: 202018
APPROVAL HOLDER: CORYS PLASTICS INDUSTRIES LLC

The Scheme reserves the right to revoke approval.
Approval 202018 is valid between September 2020 and September 2025.

All entry, as above, will accordingly be included in the Water Filings Directory online under the section headed: "Materials which have passed fit tests at entry of water quality".

The Directory may be found at www.wras.gov.uk/water-directory

Yours faithfully



Jason Purvis
Approval & Compliance Manager
Water Regulations Advisory Scheme

The Water Regulations Advisory Scheme Ltd, Registered in England No. 0850295 Registered Office: 35 Water House, Piney Fair Industrial Estate, Swansea, SA7 1EE
WRAS Regd No: 197919 The Water Regulations Advisory Scheme Ltd is an exempt charity.

Page 1 of 1



Approval Number: 210517
Test Report: J-00307171

Water Regulations Advisory Scheme Ltd
35th Floor
Water House
Piney Fair Industrial Estate
Quincy,
Swansea,
SA7 1EE

27th June 2021
Corys Plastics Industries LLC
Walsingham Drive
SCAD 08
PO Box 4894
Aberystwyth
Ceredigion
SA71 4EJ

WATER REGULATIONS ADVISORY SCHEME LTD (WRAS)
MATERIAL APPROVAL

The material referred to in this entry is suitable for contact with wholesome water for domestic purposes having met the requirements of BS6009:1 2000 and/or BS6134 Suitability of non-metallic pipe for use in contact with water intended for human consumption with regard to their effect on the quality of the water.

The information relates solely to its effect on the quality of the water with which it may come into contact and does not signify the approval of its mechanical or physical properties for any use.

POLYPROPYLENE - COMPONENTS **1000**

DACTAtherm PP 05 Fibreglass Pipe

Extruded pipe (spiral) pipe comprising of a green coloured polypropylene inner layer, a translucent fibreglass middle layer and a green coloured polypropylene outer layer.

For use with water up to 95 °C

APPROVAL NUMBER: 210517
APPROVAL HOLDER: CORYS PLASTICS INDUSTRIES LLC

The Scheme reserves the right to revoke approval.
Approval 210517 is valid between May 2021 and May 2028.

All entry, as above, will accordingly be included in the Water Filings Directory online under the section headed: "Materials which have passed fit tests at entry of water quality".

The Directory may be found at www.wras.gov.uk/water-directory

Yours faithfully



Ian Hughes
WRAS Approval Manager

The Water Regulations Advisory Scheme Ltd, Registered in England No. 0850295 Registered Office: 35 Water House, Piney Fair Industrial Estate, Swansea, SA7 1EE
WRAS Regd No: 197919 The Water Regulations Advisory Scheme Ltd is an exempt charity.

Page 1 of 1



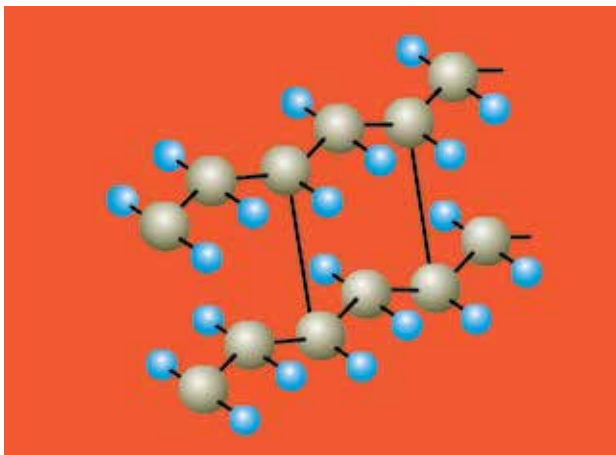
DACTA THERM - COMOPEX

Product & Technical Guide

The applications of plastic pipes are so common in our daily life that these types of pipes have come to replace conventional pipes on a large scale. One of the most important breakthroughs is their use in hot water networks. The raw materials used are polypropylene (PP) and cross-linked polyethylene (PE-X) produced from a special composition of high density polyethylene (HDPE).

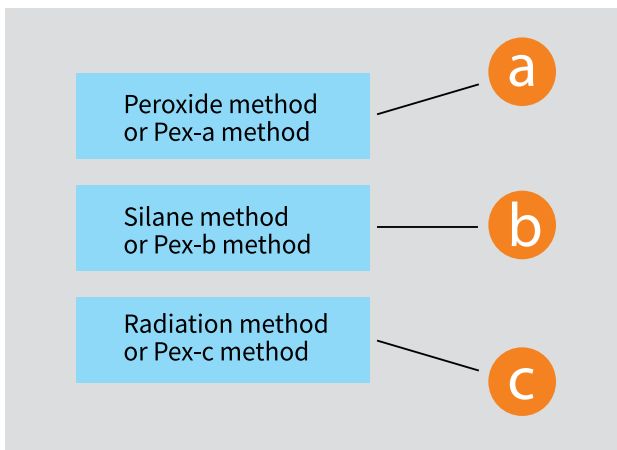
In HDPE, a reaction is induced in the double bonds, so that many of them get connected and by the help of silane molecules, a three-dimensional homogenous network is created of high molecular weight. The final product (crosslinked polyethylene) has excellent performance at high temperatures combined with high pressures, has improved resistance to impact and to chemicals and has a longer lifespan.

Today, 50 years after their first applications and based on their successful history, Pex pipes are constantly growing in demand gaining a significant market share.



Cross-linking methods

The most common cross-linking methods used in industrial production are:



All aforementioned methods achieve the same results in PE-X pipes and meet the DIN 16892/16893 and the recent European EN ISO 15875-1/2 standards. Additionally Como-pex pipes meet the ASTM F876, NSF-ANSI 14/61 and CSA B137.5.

Their only difference lies in the cross-linking degree specified in the US and EN standards. 70% for method –a, 65% for method –b, and -60% for method –c. For example, a pipe with a cross-linking degree of 68% that has been produced using method –a does not meet the specifications, while a pipe with the same cross-linking degree produced by method –b does.

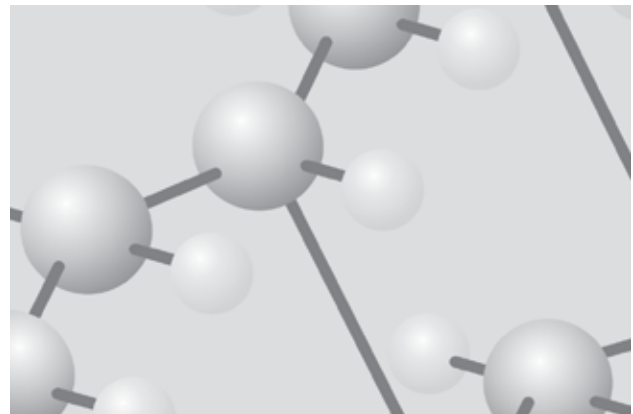
The Como-pex pipes of Interplast are produced using the –b method. It is a method that has managed to improve the characteristics of Pex pipes since the fact that cross-linking degree continues over time, which is considered as a huge advantage, leading as such to exceptional properties of the product during its use. Furthermore, -b method pipes, in varying degrees of cross-linking, are more homogenous in their behavior.

Characteristic is the ever increasing demand of method –b in the markets, with ever increasing trends in the recent years compared to cross-linked manufactured products of the other alternatives.

GLOBAL CONSUMPTION IN TONS PEX

AREA	PE-Xa	PE-Xb	PE-Xc	PE-X OVERALL
Europe	24.000	38.000	20.000	82.000
Middle East & Africa	1.300	8.000	1.800	11.100
Russia	200	4.000		4.200
North America	9.000	14.000		23.000
South America		5.000		5.000
Asia (Pacific)	3.000	20.000		23.000
Total:	37.500	89.000	21.800	148.300

Consumption 2007, Source: Pex Association



Como-pex pipes are manufactured in white and in black if they are to be used under continuous exposure to solar radiation. Upon request, they can also be produced in blue or gray color.

Como-pex pipes are delivered in 100m coils and in 50m coils for diameters 28 and 32mm. Straight lengths or longer coils can be produced according to the needs of the customer.

Como-pex pipes bear a marking per meter, indicating the brand, the outer diameter, the cross-linking method, the wall thickness, the specifications under which the pipes are produced and controlled (US, EN, DIN), the institutes and bodies having certified the pipes (SKZ, CSA, ICC, ASTM, NSF, MPA-NRW, WRAS), the operating pressure at 20°C and 95°C, their class defining the fields of application and a lot number that indicates the date and time of production.

The coils are packed in cardboard boxes bearing a printing with the pipe's brand name and its characteristics (outer diameter, wall thickness, color and certificates).

It is recommended that the white colored pipes be kept in their cartons until the time of installation.

The following table shows some of the main characteristics of Como-pex pipes.

These characteristics have resulted from lifespan diagrams in conjunction with various tests.



Table of main characteristics of Como-Pex Pipe

Outer Diameter	Wall Thickness	Weight	Packaging	Operating Pressure		Content
				at 20°	at 95°	
mm	mm	kg/m	m/roll	(bar) 50 years continuous operation	(bar) 50 years continuous operation	l/m
12	1.10*	0.041	100	12.5	5.5	0.075
12	2.00*	0.067	100	25	10	0.050
14	2.00*	0.076	100	20	8.7	0.078
15	1.50*	0.069	100	12.5	5.5	0.113
15	2.50*	0.097	100	25	10	0.078
16	1.50*	0.070	100	12.5	5.5	0.132
16	1.80*	0.082	100	16	6.9	0.120
16	2.00	0.090	100	18	7.8	0.113
16	2.20	0.098	100	20	8.7	0.105
17	2.00*	0.096	100	17	7.2	0.132
18	2.00	0.102	100	16	6.9	0.153
18	2.50	0.122	100	20	8.7	0.132
20	1.90*	0.117	100	12	5.2	0.206
20	2.00	0.119	100	12.5	5.5	0.201
20	2.80*	0.155	100	20	8.7	0.162
22	2.00*	0.129	100	12.5	5.5	0.254
22	3.00	0.177	100	20	8.7	0.201
25	2.30*	0.166	100	12.5	5.5	0.326
25	3.50*	0.234	100	20	8.7	0.254
28	3.00	0.230	50	16	6.9	0.380
32	2.90*	0.265	50	12	5.2	0.539
32	3.00	0.270	50	12.5	5.5	0.530

*On demand

For the convenience of the installer, Interplast offers the Como-pex pipe within the corrugated pipe (Pipe in Pipe) in the following diameters.

Advantages of pipe in pipe :

- Fast installation
- Safe installation
- Safe transfer of pex pipes in the project
- UV protection
- Installer can remove the pex pipe

Table of Dimensions

Como-pex	Corrugated pipe	Packaging
12x2.00*	25	50
14x2.00*	25	50
15x2.50	25	50
16x1.50*	25 η 28	50
16x2.00	25 η 28	50
16x2.20	25 η 28	50
18x2.00	28	50
18x2.50	28	50
20x2.00*	28 η 35	50
22x3.00*	35	50
20x2.80*	28 η 35	50
25x2.30*	35	50
25x3.50*	35	50
28x3.00*	42	50
32x3.00*	42	50

*On demand



Como-Pex Testing Comparative Table

Dimensions	Temperature (°C)	Test duration (h)	Test in accordance with regulations (bar)	Como-pex test pressure (bar)
12x1.1	20	1	24.22	42.39
	95	1000	8.88	11.10
12x1.3	20	1	29.16	51.03
	95	1000	10.69	13.36
15x2.5	20	1	48	84
	95	1000	17.6	22
16x1.5	20	1	24.83	43.45
	95	1000	9.10	11.38
16x1.8	20	1	30.42	53.24
	95	1000	11.15	13.94
16x2.0	20	1	34.29	60
	95	1000	12.57	15.71
16x2.2	20	1	38.26	66.96
	95	1000	14.03	17.54
18x2.0	20	1	30	52.5
	95	1000	11	13.75
18x2.5	20	1	38.71	67.74
	95	1000	14.19	17.74
20x1.9	20	1	25.19	44.09
	95	1000	9.24	11.55
20x2.0	20	1	26.67	46.67
	95	1000	9.78	12.22
22x3.0	20	1	37.89	66.32
	95	1000	13.89	17.37
25x2.3	20	1	24.32	42.56
	95	1000	8.92	11.14
25x3.5	20	1	39.07	68.37
	95	1000	14.33	17.91
28x3.0	20	1	28.8	50.4
	95	1000	10.56	13.2
32x2.9	20	1	23.92	41.86
	95	1000	8.77	10.96
32x3.0	20	1	24.83	43.44
	95	1000	9.10	11.38

*The above comparative table presents an indicative selection of internal pressure testing

Cross-linked PE pipes present an exceptionally smooth inner surface, resulting in a very low roughness factor (0.006mm), which compared to other pipe types, even copper ($\kappa=0.014$ mm), is much reduced.

The surface of every solid material, no matter how smooth it may look, still presents some level of roughness. The level of this roughness is quantitatively expressed by a characteristic length, e , which is called absolute roughness of the surface. The length e is equal to the statistical mean of the heights of the recesses and the projections of the surface on a large (compared to their size) area.

The value of e depends on the construction material and the processing of the inner walls of the pipe. Corrosion and depositions increase roughness. Since the inner diameter also plays a role on the influence of the pressure drop, in order to decide whether the roughness is negligible or not, we use the ratio e/d that is called relative roughness.

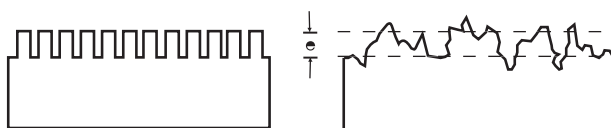
The roughness coefficient, n , is used in hydraulic calculations and is calculated by Manning's formula:

$$n = [R^2/3 \times S^{1/2}] / V$$

where

- R = hydraulic radius,
- S = the slope of the pipeline,
- V = flow velocity

The roughness coefficient depends from the material of the pipe, but also from other factors such as bad connections, bad lining, etc.



Average roughness of commercial tubes

Construction Material	Roughness (mm)	Construction Material	Roughness (mm)
Commercial steel	0.046	Copper, Light metals	0.013 + 0.015
Cast iron	0.26	Concrete	0.3 + +3.0
Galvanized iron	0.15	Ceramic	~ 0.07
Asphalt-treated iron	0.12	Plastic	0.00016

As a result of this characteristic, the pressure losses on the pipeline sections present low values, facilitating the design calculations and rendering installations more economical by the use of pipes with smaller dimensions and pumps of lower power for the same requirements of water supply. The installation operates quietly and smoothly, allowing the possibility to use, where needed, faster water velocities, without having to worry about the noise levels or the vibrations of the pipes during operation. The diagram illustrates the curves calculated for water temperature at 80°C.

For $\varnothing 16 \times 2.0$ pipe and a flow rate of $Q=140$ l/h, the flow velocity is $V = 0.37$ m/sec and the loss of head is equal to $R = 17$ mm H₂O/m.

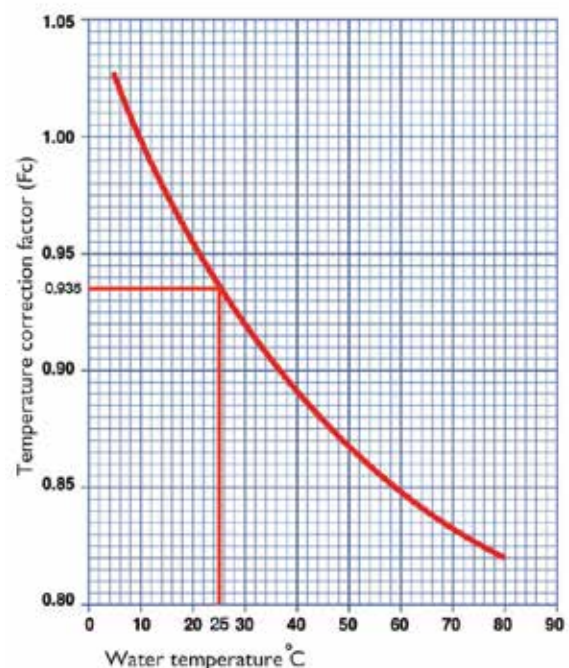
However, since we have calculated the diagram for a water temperature of 80°C (central heating), we have to divide the $R= 17$ mm value by a correction factor (F_c), if we want to calculate the loss at a water temperature of 25°C (plumbing installation). The correction factor is provided in the following diagram and in our example equals to 0.935.

Therefore, $R = 17/0,935 = 18,18$ mm H₂O/m, which is the true value (loss of head) at 25°C.

With the help of the equivalent Pa/m (1000 Pa = 0,01 Bar), the press loss converted to Bar in the specific example is $18,18/10000 = 0,001818$ Bar/m.

In this diagram, it is quite simple to determine the loss of head when all other parameters are known, e.g.:

- R = loss of head value in mm H₂O
- V = water velocity in m/s
- Q = flow rate value in l/h
- L = pipe length to be calculated in m.



Pipe extractor

Special metal component that enables us to replace the plastic pipes in case of failure.

There are two bolts with threading in their bodies and a specially shaped head with perforations in the center from which a wire passes and ends at both ends. The two bolts are placed back-to-back. The set includes two rings.

Usage

On the pipe that we want to replace, we firstly pass the ring and then tighten one bolt to the inner diameter of the pipe until it stops at the end. We do the exact same thing to the new pipe by tightening the other end.

After this we can pull the problematic pipe from its other end and by pulling it into its place it will penetrate into the new pipe.

Production material is st 37 – 2 (370 Kp/mm2)

DIMENSIONS

	A	B	D	G	F
Φ 15x1/2"x1.5	37	21	24	1/2"	9.8
Φ 16x1/2"x2.0	37.5	21	24	1/2"	11.8
Φ 16x1/2"x2.2	36	21	24	1/2"	11.4
Φ 17x1/2"x2.0	39	25	27	1/2"	12.8
Φ 18x1/2"x2.0	39	25	27	1/2"	13.8
Φ 18x1/2"x2.5	39	25	27	1/2"	12.8
Φ 18x3/4"x2.0	39	25	27	3/4"	13.8
Φ 18x3/4"x2.5	39	25	27	3/4"	12.8
Φ 20x1/2"x2.0	40	27	30	1/2"	15.8
Φ 20x1/2"x2.8	40	27	30	1/2"	14.2
Φ 20x3/4"x2.0	40	27	30	3/4"	15.8
Φ 20x3/4"x2.8	41	27	30	3/4"	14.2
Φ 22x3/4"x3.0	44	29	32	3/4"	15.8

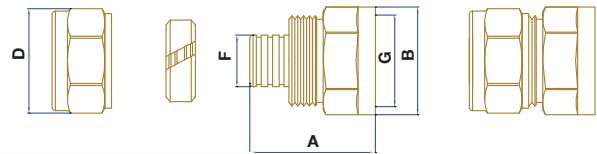
Como-pex Brass Fittings

PEX pipe connection fittings

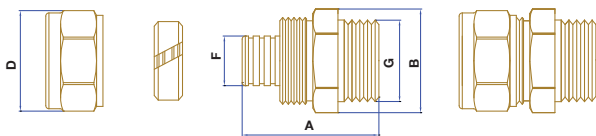
Our company manufactures a full range of connection fittings for cross-linked polyethylene pipes. The following products are available:

- Male, female and connecting coupling.
- Male, female and connecting tee
- Male, female and wall plate elbow
- Wall plate elbow.
- Mini-ball valves for plastic pipe.

Connector Female



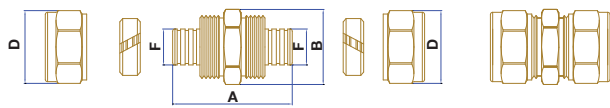
Connector Male



DIMENSIONS

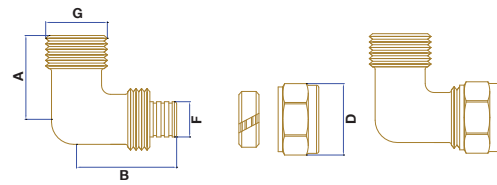
	A	B	D	G	F
Φ 15x1/2"x1.5	33	24	24	1/2"	9.8
Φ 16x1/2"x2.0	33	24	24	1/2"	11.8
Φ 16x1/2"x2.2	33.5	24	24	1/2"	11.4
Φ 17x1/2"x2.0	33.5	24	24	1/2"	12.8
Φ 18x1/2"x2.0	35	25	27	1/2"	13.8
Φ 18x1/2"x2.5	35	25	27	1/2"	12.8
Φ 18x3/4"x2.0	35	25	27	3/4"	13.8
Φ 18x3/4"x2.5	35	25	27	3/4"	12.8
Φ 20x1/2"x2.0	35	27	30	1/2"	15.8
Φ 20x1/2"x2.8	35	27	30	1/2"	14.2
Φ 20x3/4"x2.0	37.5	30	30	1/2"	15.8
Φ 20x3/4"x2.8	37	30	30	3/4"	14.2
Φ 22x3/4"x3.0	39	30	32	3/4"	15.8

Coupling



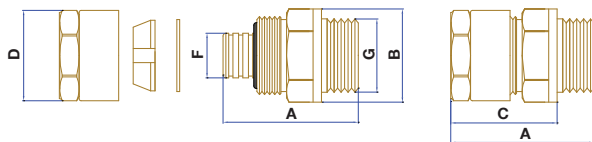
DIMENSIONS	A	B	D	F
Φ 15x15x2.5	44	21	24	9.8
Φ 16x16x1.5	44	21	24	12.8
Φ 16x16x2.0	44.5	21	24	11.8
Φ 16x16x2.2	45	21	24	11.4
Φ 17x17x2.0	45	21	24	12.8
Φ 18x18x2.0	46.5	25	27	13.8
Φ 18x18x2.5	46	25	27	12.8
Φ 20x20x2.0	47.5	27	30	15.8
Φ 20x20x2.8	47.5	27	30	14.2
Φ 22x22x3.0	53	29	32	15.8

Elbow Male



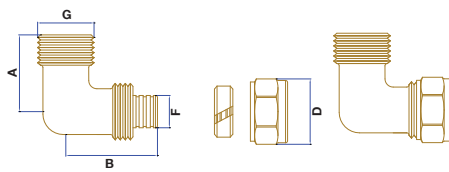
DIMENSIONS	A	B	D	G	F
Φ 15x1/2"x2.5	30	33	24	1/2"	9.8
Φ 16x1/2"x1.5	30	33.5	24	1/2"	12.8
Φ 16x1/2"x2.0	30	33.5	24	1/2"	11.8
Φ 16x1/2"x2.2	30	34	24	1/2"	11.4
Φ 18x1/2"x2.0	32	35	27	1/2"	13.8
Φ 18x1/2"x2.5	30.5	35.5	27	1/2"	12.8
Φ 20x1/2"x2.0	32	38.5	30	1/2"	15.8
Φ 20x3/4"x2.0	32	39	30	3/4"	15.8
Φ 20x3/4"x2.8	31	39	30	3/4"	14.2
Φ 22x3/4"x3.0	34	41	32	3/4"	15.8

Coupling Male for heavy duty plastic pipe



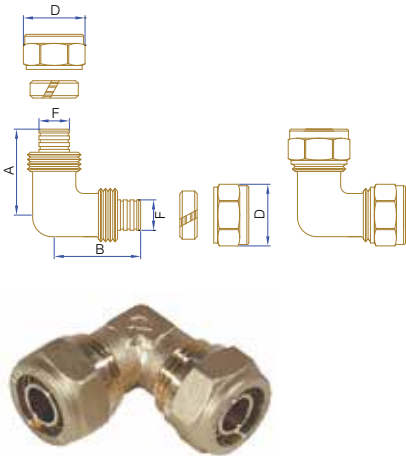
DIMENSIONS	A	B	C	D	F	G
Φ 16x1/2"x2.0	48	22	35	24	11.8	1/2"
Φ 18x1/2"x2.0	46	30	35	27	13.8	1/2"

Elbow Female



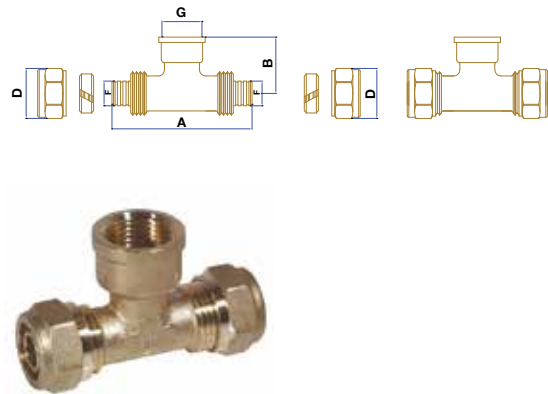
DIMENSIONS	A	B	D	G	F
Φ 15x1/2"x2.5	31.5	33.5	24	1/2"	9.8
Φ 16x1/2"x1.5	31.5	33.5	24	1/2"	12.8
Φ 16x1/2"x2.0	31.5	34	24	1/2"	11.8
Φ 16x1/2"x2.2	31.5	34	24	1/2"	11.4
Φ 18x1/2"x2.0	32	36.5	27	1/2"	13.8
Φ 18x1/2"x2.5	33	37	27	1/2"	12.8
Φ 20x1/2"x2.0	35	40	30	1/2"	15.8
Φ 20x3/4"x2.0	35	40	30	3/4"	15.8
Φ 20x3/4"x2.8	33	38	30	3/4"	14.2
Φ 22x3/4"x3.0	35	41	32	3/4"	15.8

Elbow Double



DIMENSIONS	A	B	D	F
Φ 15x15x2.5	34	34	24	9.8
Φ 16x16x1.5	34	34	24	12.8
Φ 16x16x2.0	33	33	24	11.8
Φ 16x16x2.2	33	33	24	11.4
Φ 18x18x2.0	47	37	27	13.8
Φ 18x18x2.5	36.5	36.5	27	12.8
Φ 20x20x2.0	38.5	38.5	30	15.8
Φ 20x20x2.8	39.5	39.5	30	14.2
Φ 22x22x3.0	40	40	32	15.8

Tee Male



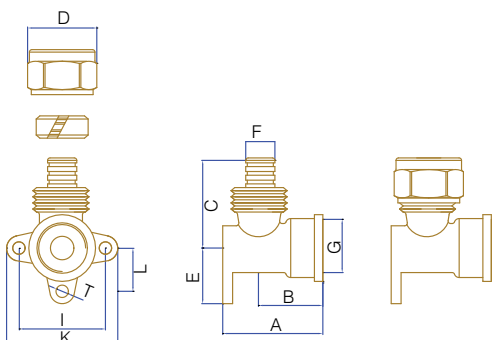
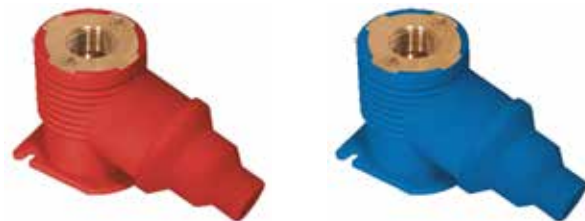
DIMENSIONS	A	B	D	G	F
Φ 15x1/2"x2.5	68	27.5	24	1/2"	9.8
Φ 16x1/2"x1.5	66	29	24	1/2"	12.8
Φ 16x1/2"x2.0	66	29	24	1/2"	11.8
Φ 16x1/2"x2.2	66	29	24	1/2"	11.4
Φ 18x1/2"x2.0	71	30	27	1/2"	13.8
Φ 18x1/2"x2.5	72	30	27	1/2"	12.8
Φ 20x1/2"x2.0	75	33	32	1/2"	15.8
Φ 20x3/4"x2.8	75	33	32	3/4"	14.2
Φ 22x3/4"x3.0	80	33	32	3/4"	15.8

105° Wall Plate Elbow

The 105° wall plate elbow facilitates the intervention by the installer in the event of replacement of the brass part or the entire pipeline. The special cover provides full protection of the metal part from the coatings, such as for ex. the plaster. When testing the network using the 1/2" male test plug, the metal section remains protected since the center of the end cap can be easily removed.

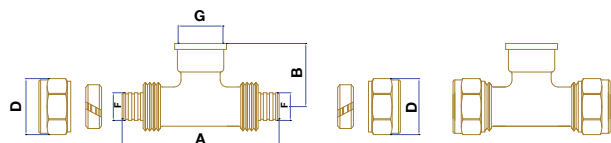
By using the reducing sleeve in the lower part of the wall plate elbow, we prevent any "water dripping out" from the corrugated pipe in case of leakage and have the capability to apply two different dimensions of corrugated pipe, 25mm and 28mm.

Available for plastic pipe Como-pex in dimensions Φ15x2.5mm, Φ16x2.0mm, Φ16x2.2mm, Φ18x2.0mm and Φ18x2.5mm.



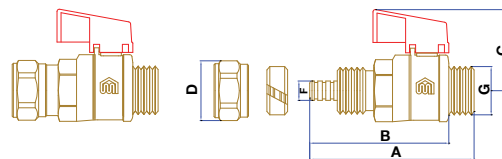
DIMENSIONS	A	B	C	D	E	F	G	I	K	L	T
Φ 15x1/2"x2.5	41	26	34	24	22	9.8	1/2"	34	44.5	17	5.3
Φ 16x1/2"x1.5	41	26	34	24	22	12.8	1/2"	34	44.5	17	5.3
Φ 16x1/2"x2.0	41	14	35	24	22	11.8	1/2"	34	44.5	17	5.3
Φ 16x1/2"x2.2	41	14	35.5	24	22	11.4	1/2"	34	44.5	17	5.3
Φ 18x1/2"x2.0	42	15	37	27	22	13.8	1/2"	34	44.5	17	5.3
Φ 18x1/2"x2.5	42.5	16.5	38.5	27	22	12.8	1/2"	34	44.5	17	5.3

Tee Female



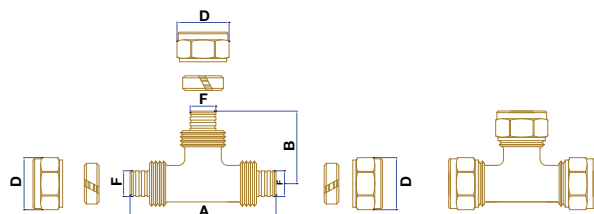
DIMENSIONS	A	B	D	G	F
Φ 15x1/2"x1.5	68	32.5	24	1/2"	9.8
Φ 16x1/2"x1.5	66	32.5	24	1/2"	12.8
Φ 16x1/2"x2.0	68	33	24	1/2"	11.8
Φ 16x1/2"x2.2	68	33	24	1/2"	11.4
Φ 18x1/2"x2.0	72	31	27	1/2"	13.8
Φ 18x1/2"x2.5	73	31	27	1/2"	12.8
Φ 20x3/4"x2.0	78	33	30	3/4"	15.8
Φ 20x3/4"x2.8	78	33	30	3/4"	14.2
Φ 22x3/4"x3.0	80	35	32	3/4"	15.8

Mini ball valve for plastic pipe



DIMENSIONS	A	B	C	D	G	F
Φ 15x1/2"x2.5	66.5	53	33	24	1/2"	9.8
Φ 16x1/2"x1.5	64	44	33	24	1/2"	12.8
Φ 16x1/2"x2.0	64	44	33	24	1/2"	11.8
Φ 16x1/2"x2.2	62	48	33	24	1/2"	11.4
Φ 17x1/2"x2.0	66.5	53	33	27	1/2"	12.8
Φ 18x1/2"x2.0	66.5	55	33	27	1/2"	13.8
Φ 18x1/2"x2.5	66.5	54	33	27	1/2"	12.8
Φ 20x1/2"x2.0	71.5	61	33	27	1/2"	15.8

Tee



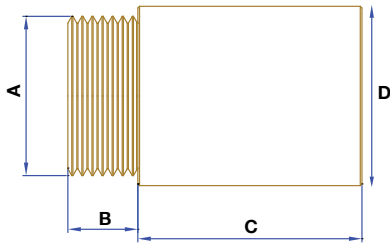
DIMENSIONS	A	B	D	F
Φ 15x15x2.5	68	35.5	24	9.8
Φ 16x16x1.5	68	35.5	24	12.8
Φ 16x16x2.0	67	33.5	24	11.8
Φ 16x16x2.2	67	33.5	24	11.4
Φ 18x18x2.0	73.5	36.5	27	13.8
Φ 18x18x2.5	73.5	36.5	27	12.8
Φ 20x20x2.0	75	38	30	15.8
Φ 20x20x2.8	77.5	38	30	14.2
Φ 22x22x3.0	79	40	32	15.8

Extension pieces

They are produced by copper alloy CW617N and exceed the German standards. Raw material has undergone a special thermal processing in order to obtain the desirable hardness of raw material. Within the product, during its processing, an internal stress is developed, thus increasing its hardness. The final product is subject now, for a second time to thermal processing, eliminating the stresses that have been developed during processing, thus nullifying the possibilities of season cracking and restoring the desirable hardness.



Extension pieces 1/2" & 3/4"



DIMENSIONS	A	B	D	F
L 10	1/2"	11	10	27
L 15	1/2"	11	15	27
L 20	1/2"	11	20	27
L 25	1/2"	11	25	27
L 30	1/2"	11	30	27
L 40	1/2"	11	40	27
L 50	1/2"	11	50	27
L 65	1/2"	11	65	27
L 80	1/2"	11	80	27
L 100	1/2"	11	100	27
L 10	3/4"	11	10	32
L15	3/4"	11	15	32
L 20	3/4"	11	20	32

ELVIOM Brass Fittings

All brass bars processed by ELVIOM conform to the European standards EN 12164, EN 12165, EN 12167 and EN 12168. All incoming materials are subject to dimensional control by instruments and devices, hardness tests with a last generation stable hardness tester and controls of chemical analysis of the alloy composition with a privately-owned mass spectrograph.

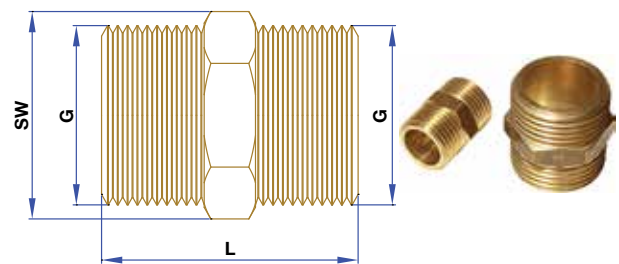
The dimensions of the design are strictly applied during the manufacturing of the components.

The threads of the components are manufactured according to the European standards EN ISO 228 and EN ISO 7(DIN2999) and their control is carried out by thread controllers.

All brass fittings are designed to meet the needs and demands of consumers and to be able to easily and effectively be applied by the installers.

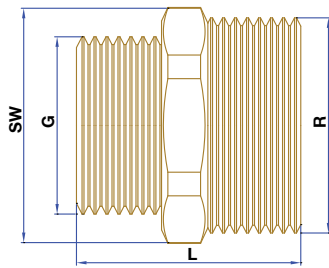


Nipple



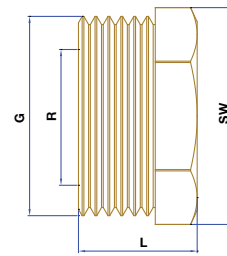
DIMENSIONS	SW	G	L
1/8"x1/8"	10	1/8"	20
1/4"x1/4"	13	1/4"	22
3/8"x3/8"	17	3/8"	25
1/2"x1/2"	21	1/2"	27
1/2"x1/2" B.T.	21	1/2"	30
1/2"x1/2" B.T. 33mm	21	1/2"	33
3/4"x3/4"	27	3/4"	33
1"x1"	33	1"	35
1 1/4"x1 1/4"	42	1 1/4"	38
1 1/2" x 1 1/2"	48	1 1/2"	43
2"x2"	60	2"	50

Reduced Nipple



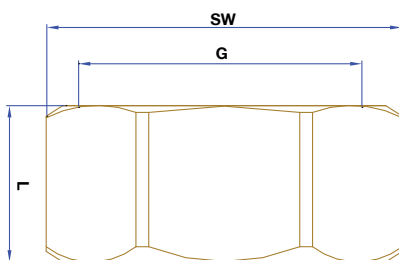
DIMENSIONS	L	G	R	SW
1/4"x1/8"	21	1/8"	1/4"	14
3/8"x1/8"	23	1/8"	3/8"	17
3/8"x1/4"	24	1/4"	3/8"	17
1/2"x1/4"	24	1/4"	1/2"	21
1/2"x3/8"	26	3/8"	1/2"	21
3/4"x1/2"	29	1/2"	3/4"	26
1"x1/2"	32	1/2"	1"	35
1"x3/4"	33	3/4"	1"	35
1 1/4"x1/2"	34	1/2"	1 1/4"	42
1 1/4"x3/4"	35	3/4"	1 1/4"	42
1 1/4"x1"	37	1"	1 1/4"	42
1 1/2"x3/4"	39	3/4"	1 1/4"	50
1 1/2"x1"	40	1"	1 1/2"	50
1 1/2"x1 1/4"	41	1 1/4"	1 1/2"	48
2"x1 1/4"	47	1 1/4"	2"	60
2x1 1/2"	49	1 1/2"	2"	60

Bushing



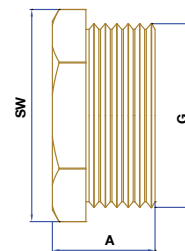
DIMENSIONS	L	G	R	SW
1/4"x1/8"	11.5	1/4"	1/8"	14
3/8"x1/8"	12	3/8"	1/8"	17
3/8"x1/4"	12	3/8"	1/4"	17
1/2"x1/8"	15	1/2"	1/8"	21
1/2"x1/4"	15	1/2"	1/4"	21
1/2"x3/8"	15	1/2"	3/8"	21
3/4"x3/8"	17	3/4"	3/8"	27
3/4"x1/2"	17	3/4"	1/2"	26
1"x1/2"	18.5	1"	1/2"	33
1"x3/4"	18.5	1"	3/4"	33
1 1/4"x1/2"	22	1 1/4"	1/2"	42
1 1/4"x3/4"	22	1 1/4"	3/4"	42
1 1/4"x1"	22	1 1/4"	1"	42
1 1/2"x1 3/4"	24	1 1/2"	3/4"	50
1 1/2"x1"	24	1 1/2"	1"	50
1 1/2"x1 1/4"	24	1 1/2"	1 1/4"	50
2"x1"	30	2"	1"	60
2"x1 1/4"	30	2"	1 1/4"	60
2x1 1/2"	30	2"	1 1/2"	60

Cap



G	SW	L
1/4"	17	10
3/8"	19	11
1/2"	24	12
3/4"	30	14
1"	37	16
1 1/4"	48	15
1 1/2"	52	23
2"	67	25

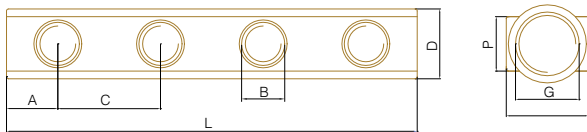
Plug



DIMENSIONS	SW	A	G
1/4"	13	13	1/4"
3/8"	18	12	3/8"
1/2"	21	15	1/2"
3/4"	26	17	3/4"
1"	33	19	1"
1 1/4"	42	20	1 1/4"
1 1/2"	48	24	1 1/2"
2"	60	26	2"
1/2" Square head"	13	22	1/2"

Brass Manifolds

The manifolds are manufactured of CW614N alloy brass profiles compliant to European standard EN 12167 and DIN 50930/6 on the suitability of brass fittings for drinking water installations. They are manufactured in 3/4", 1" and 1 1/4" dimensions, from 2 to 10, 1/2" outlets. The manifold's threading is constructed according to EN ISO 228. The product has low hardness so that it may be more resilient to mechanical stresses and stands out for its extra thick walls



L= Number of outlets X 5 cm



DIMENSIONS	A	B	C	D	G	I	P
3/4"	25	1/2"	50	34	3/4"	34	26
1"	25	1/2"	50	38	1"	40	26
1 1/4"	25	1/2"	50	48	1 1/4"	50	26

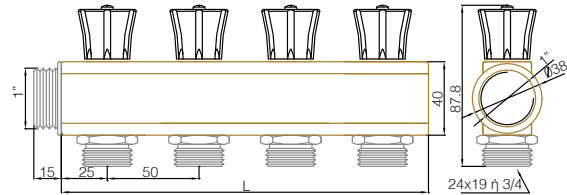
Regulating bar manifolds (with PTFE sealing)

The manifolds are manufactured of brass bars compliant to the European norm EN 12167 and DIN 50930/6, which refer to the suitability of brass fittings for drinking water installations. The product has low hardness so as to be more resistant to mechanical stresses. The mechanisms in the manifold are vertically placed therefore increasing the circuits and improving the flows.

The manifolds are used in heating and plumbing installations of hot and cold water. They are produced in sizes 3/4", 1" and 1 1/4" from 2 to 12 outlets with 24x19 or 3/4" threading.

1" Manifold with balancing valves M/F

1" Manifold with balancing valves M/F

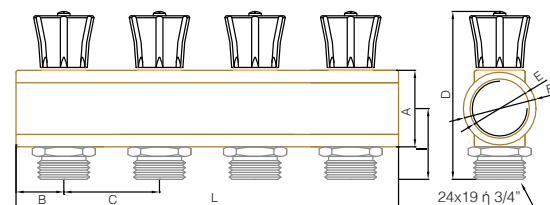


L= (Αριθμός οπών X 5 cm) + 1,5 cm



1" Manifold with balancing valves F/F

1" Manifold with balancing valves F/F



L= Αριθμός οπών X 5 cm



DIMENSIONS	A	B	C	D	F	E	I
1"	1"	25	50	88	38	1"	37
1 1/4"	1 1/4"	25	50	98	48	1 1/4"	42

Certificate of Compliance

Certificate: 1757733 **Master Contract:** 232307
Project: 2299197 **Date Issued:** December 22, 2010
Issued to: Interplast S.A.
 10th Km of National Rd
 Thessaloniki-Katerini
 Sinos Thessaloniki, 57400
 Greece
 Attention: Kostas Voulgaridis

The products listed below are eligible to bear the CSA Mark shown

Gragyna Blaziejewska
Issued by: Gragyna Blaziejewska

PRODUCTS
CLASS 7611 02 - PLASTIC PIPE - Flexible Pressure Pipe - PEX
CLASS 7611 61 - PLASTIC PIPE Flexible Pressure Pipe - Evaluated to NSF/ANSI 61
 Crosslinked Polyethylene (PEX) tubing for hot and cold potable water applications:

- SDR9: NPS 1/2 (natural colour).

APPLICABLE REQUIREMENTS
 CAN/CSA Standard B137.5-09 - Crosslinked Polyethylene (PEX) Tubing Systems for Pressure Applications*
 *Part of CAN/CSA B137 Series-09 - Thermoplastic Pressure Piping Compendium (published October 2009)

0201-107 Rev. 2009-09-03 Page 1

This certifies that

INTERPLAST SA

has had the undermentioned product examined, tested and found, when correctly installed, to comply with the requirements of the United Kingdom Water Supply (Water Fittings) Regulations and Scottish Water Byelaws.

800011620 WALL PLATE ELBOW

The certificate by itself is not evidence of a valid WRAS Approval. Confirmation of the current status of an approval must be obtained from the WRAS Directory (www.wras.co.uk/directory/)

The product so mentioned will be valid until the end of:

May 2025

2005327

Certificate No.

Secretary

Chairman, Product Assessment Group

This certifies that

INTERPLAST SA

has had the undermentioned product examined, tested and found, when correctly installed, to comply with the requirements of the United Kingdom Water Supply (Water Fittings) Regulations and Scottish Water Byelaws.

589403400051 MANIFOLD

The certificate by itself is not evidence of a valid WRAS Approval. Confirmation of the current status of an approval must be obtained from the WRAS Directory (www.wras.co.uk/directory/)

The product so mentioned will be valid until the end of:

May 2025

2005328

Certificate No.

Secretary

Chairman, Product Assessment Group

Water Regulations Advisory Scheme Ltd.
 12th Fl.
 Willow Road,
 Finsbury Park Industrial Estate,
 Croydon,
 Surrey,
 CR9 1 4EG

Approval Number: 2102011
 Test Report: J-02084301

29th April 2021

Interplast SA
 Komodini Industrial Zone,
 Komodini P.O. 68100,
 Greece

**WATER REGULATIONS ADVISORY SCHEME LTD. (WRAS)
MATERIAL APPROVAL**

The material referred to in this letter is suitable for contact with wholesome water for domestic purposes having met the requirements of BS6825:1:2000 and/or 2014 'Suitability of non-metallic products for use in contact with water intended for human consumption with regard to their effect on the quality of the water'.

The reference relates solely to its effect on the quality of the water with which it may come into contact and does not signify the approval of its mechanical or physical properties for any use.

POLYETHYLENE - COMPONENTS. 5240

*'Como Pex Pipe'. Extruded, white coloured HDPE pipe. For use with water up to 65 °C.

APPROVAL NUMBER: 2102011
APPROVAL HOLDER: INTERPLAST SA

The Scheme reserves the right to review approval.
 Approval 2102011 is valid between March 2021 and March 2025

An entry, as above, will accordingly be included in the Water Fittings Directory on-line under the section heading, 'Materials which have passed full tests of effect on water quality'.

The Directory may be found at: www.wrasapprovals.co.uk/approvals-directory/

Yours Faithfully

Ian Hughes
WRAS Approvals Manager

The Water Regulations Advisory Scheme Ltd. Registered in England No. 0880300 Registered office: 100 Leach Close-Royal Dock Workway SW7 9BB
 0203 049 2171 ext 110 Fax: 0203 049 2182 E-mail: enquiries@wras.co.uk www.wras.co.uk Page 1 of 2

ICC-ES PMG Product Certificate **PMG-1581**

Effective Date: September 2020
This listing is subject to re-examination in one year.

www.icc-es.org | (800) 423-6587 | (842) 899-0643 A Subsidiary of the International Code Council®

CIT: DIVISION 22 60 00—PLUMBING
 Section 22 11 16—Domestic Water Piping
 DIVISION 23 60 00—HEATING, VENTILATING AND AIR CONDITIONING (HVAC)
 Section 23 21 13—Hydronic Piping

Product certification system:
 The ICC-ES product certification system includes testing samples taken from the market or supplier's stock, or a combination of both, to verify compliance with applicable codes and standards. The system also involves factory inspections, and assessment and surveillance of the supplier's quality system.

Product: ConoPex PEX Tubing

Listed: Interplast S.A.
 Industrial area of Komotini
 Komotini 69100 Greece
info@icc-es.org

Compliance with the following codes:

- 2021, 2016, 2015, 2012 and 2009 International Plumbing Code® (IPC)
- 2021, 2016, 2015, 2012 and 2009 International Mechanical Code® (IMC)
- 2018, 2015, 2012 and 2009 International Residential Code® (IRC)
- 2021, 2016, 2015, 2012 and 2009 Uniform Plumbing Code® (UPC)†
- 2021, 2016, 2015, 2012 and 2009 Uniform Mechanical Code® (UMC)†
- 2019, 2016, 2013 and 2010 California Plumbing Code (CPC)
- 2018, 2016, 2013 and 2010 California Mechanical Code (CMC)
- 2017 City of Los Angeles Plumbing Code
- 2017 City of Los Angeles Mechanical Code
- 2017 and 2007 Code of Massachusetts Regulations 248 CMR 10.00 Uniform State Plumbing Code
- 2017 Massachusetts State Building Code 780 CMR North Edition Chapter 28
- 2015 and 2010 National Plumbing Code of Canada® (NPC)**

† Copyrighted publications of the International Association of Plumbing and Mechanical Officials
 ** National Plumbing Code of Canada is a copyrighted publication of National Research Council Canada

Compliance with the following standards:

- ASTM F876-2020, Standard Specification for Cross-linked Polyethylene (PEX) Tubing
- NSF 14-2019, Plastics Piping System Components and Related Materials
- NSF INTERNATIONAL 61-2019, Drinking Water System Components – Health Effects
- CSA B137.5-2017 Crosslinked Polyethylene (PEX) Tubing Systems for Pressure Applications

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ZERTIFIKAT

SKZ - Testing GmbH awards the following company

Interplast S.A. Piping Systems
Industrial Area of Komotini
P.C. 69100 KOMOTINI
GREECE

Production site: Interplast S.A. Piping Systems, GR-P.C. 69100 KOMOTINI
 the right to use the SKZ testing and inspection mark

A 311

for the following plastic products

Heating pipes

Pipes made of crosslinked polyethylene PE-Xb

Trade name: ConoPex

SKZ specification for tests and inspection HR 3.2:2015-04

Users of the SKZ mark are obliged to observe the required regulations for the production and testing of these products.

Date of initial certification: 24 July 2000

Date of expiry: 29 May 2024

Würzburg, 21 May 2019

Dipl.-Ing. Hans-Peter Krause

Head of Certification Body

The original language of this certificate is German. In case of doubt, the German version is obligatory.
 SKZ - Testing GmbH, Frankfurterweg 20, 97070 Würzburg, Germany, Tel. +49 (0) 9304-9, testing@skz.de, www.skz.de

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