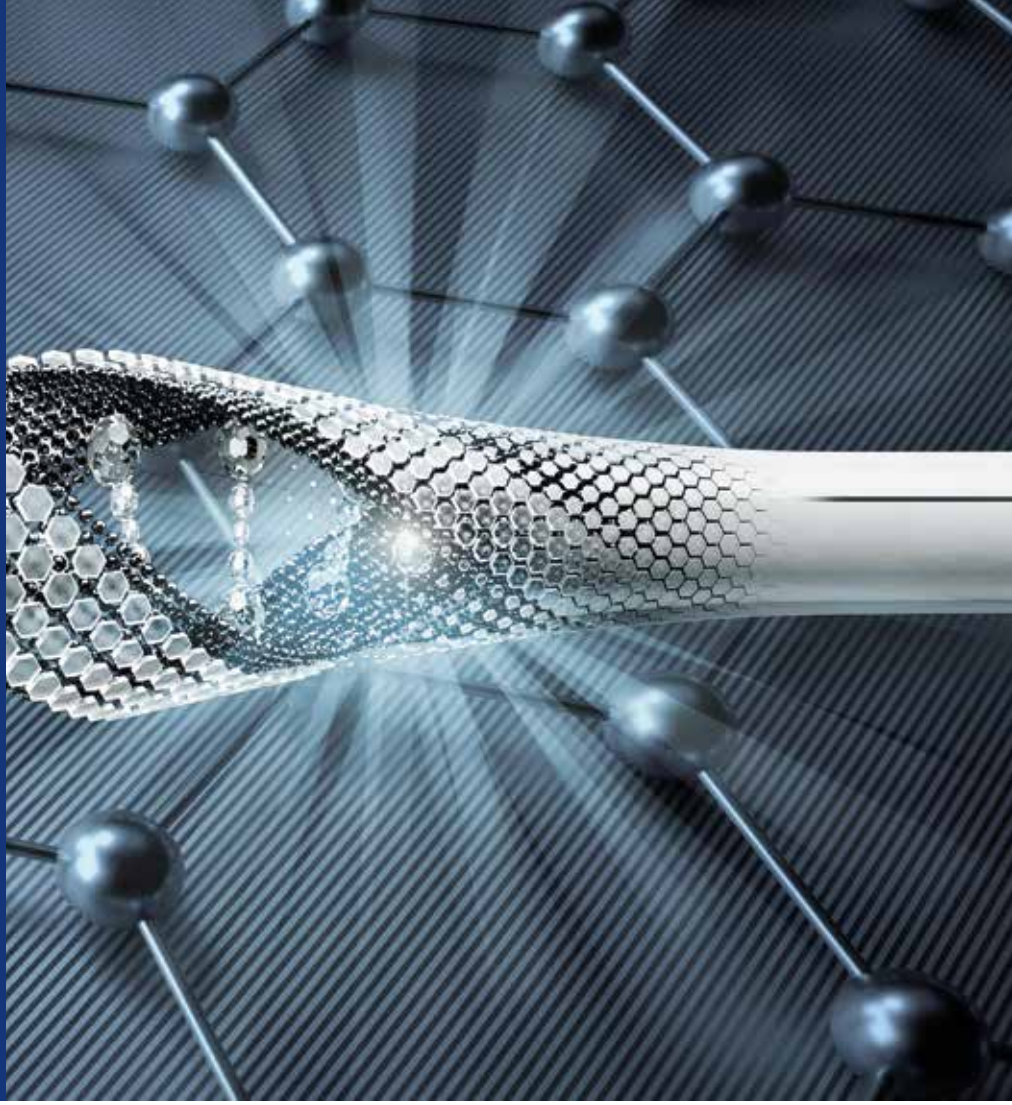
CARBO^{CRP}

ONE OF A KIND CARBON-REINFORCED TECHNOLOGY FOR PP-R PIPING SYSTEMS (Polypropylene Random Copolymer)

PIPELIFE
always part of your life

Perfection has got a name - CARBO^{CRP}

Unique three-layered pipe for pressure water conduit.
The search for optimal application of carbon fibers in the plastic piping systems led to the creation of CARBO^{CRP} – the cutting edge of technological evolution in the area of plastic pipes for hot and cold water. By combining the innovative polypropylene type PP-RCT with carbon fibers, the Czech manufacturer PIPELIFE CZECH Ltd introduced a new generation of plastic assembly materials that offer the best possible properties in the family of polypropylene pipes.



Application of CARBO^{CRP} pipes

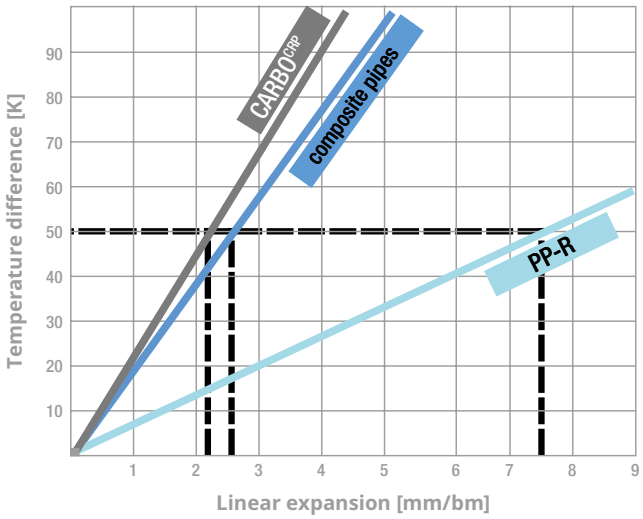
- Distribution pipework for drinking water
- Distribution pipework for hot and cold water
- Distribution pipework for central (radiator) heating
- Distribution pipework for compressed air
- Distribution pipework for the refrigerant in air-conditioning systems

Main advantages of CARBO^{CRP} pipes

- **lower thermal expansion** (as compared to PP-R pipes)
- **heat resistance** up to 90°C
- up to 50% **better stress resistance** at high temperatures
- 20% greater flow rate
- **standard welding procedure** as with the conventional PP-R pipes
- **no need of peeling before welding**
- **flexibility in use** and compatibility with the PP-R systems
- **alternative solution for PP-R S2.5 pipes** (PN20)
- **20 years warranty**
- **lighter weight** – by 17% on the average
- **less wear of cutting tools**

Linear expansion of pipes

Due to the newest type of polypropylene PP-RCT and the carbon fibers, the coefficient of thermal expansion of CARBOCRP pipes is 0.045 mm/mK, which is by one third lower than the value of that same coefficient for PP-R pipes (0.15 mm/mK). Logically that means that the difference resulting from the linear expansion of pipes of equal length at equal temperature shall be 3.3 times lower for carbon fiber-reinforced pipes than for the conventional PP-R pipe.



Calculation of linear expansion

$$\Delta L = \alpha \times L \times \Delta T$$

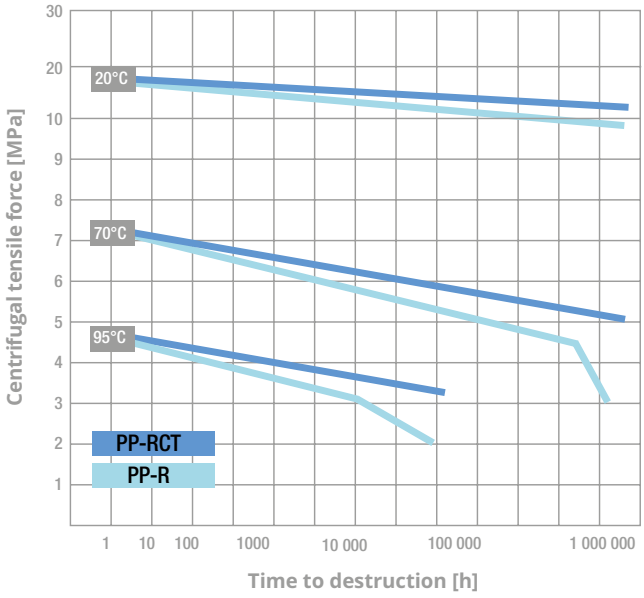
ΔL	length of thermal expansion [mm]
α	coefficient of thermal expansion (CARBO^{CRP} pipe = 0.045 mm/mK)
L	the length of installed pipe [m]
ΔT	the temperature difference during installation of the pipe and the operating temperature [K]

PP-RCT – 4th generation polypropylene

The special nucleation process changes the crystal structure of the static copolymer PP-R.
As a result of this process the material acquires much better thermal resistance and strength properties.

Carbon fibers

Carbon fibers contain differently modified carbon. It is a thin oblong fibrous material with filament diameter ranging from 5 to 8 µm and composed of carbon atoms. Carbon atoms bind together forming microscopic crystals, arranged parallel to the longitudinal axis of the fibers.

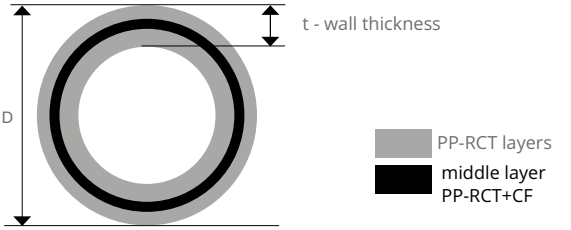


The result of combining these materials is CARBO^{CRP} pipe.
One of a kind pipe for “general” application.

Technical specifications

Structure of the pipe wall	PP-RCT/PP-RCT+CF/PP-RCT
Description of the pipe wall	Multilayered pipe, middle layer is carbon-reinforced
Coefficient of thermal expansion	0,045 mm/mK
Available diameters	DN 20 – DN 160
Available standard length sizes	4 m
Colors	grey or green

3-layered pipe with carbon fibers CARBO^{CRP}



Diameter D	Wall thickness t	Class	Pre-heating before welding [s]	Color codes	
[mm]				4 m bars grey	4 m bars green
20	2,8	S3.2	5	590302.01+	390302.01+
25	3,5	S3.2	7	590303.01+	390303.01+
32	4,4	S3.2	8	590304.01+	390304.01+
40	5,5	S3.2	12	590305.01+	390305.01+
50	6,9	S3.2	18	590306.01+	390306.01+
63	8,6	S3.2	24	590307.01+	390307.01+
75	8,4	S4	30	590308.01+	390308.01+
90	10,1	S4	40	590309.01+	390309.01+
110	12,3	S4	50	590310.01+	390310.01+
125	14,0	S4	60	590311.01+	390311.01+
160	14,6	S5	147	590312.01+	390312.01+

Recommendation for disinfection of PP-R systems

Thermal disinfection of the system
In the case of thermal disinfection to prevent legionella bacteria,we recommend disinfecting with a duration of min. 3 minutes and water at 70°C throughout the system.

Chemical disinfection of the system
Disinfection of the system must be applied only in case of proven contamination.In the case of impact disinfection, it is permitted to load plastic pipes twice a year with a free chlorine content of 50 mg/l for a period not exceeding 12 hours. Alternatively, 150 mg/l hydrogen peroxide (H_2O_2) can be used for 24 hours. The temperature must not exceed 30°C during the disinfection process.

The use of a disinfection process, especially for chlorinated water, can have a direct impact on the life of the drinking water system.
Exceeding the specified temperature, concentration and exposure time values can lead to serious damage to pipes and connecting parts.

CARBO^{CRP} Pipes

The hi-tech elements of

PP-R INSTAPLAST System

CARBO^{CRP} pipes are fully compatible with all types of pipes and fittings of the PP-R INSTAPLAST system. Joints are made by standard polyfusion welding at 260°C. The 160 diameter is butt welded. Pipes need nothing but be cleaned and sharply cut before welding – no peeling is needed. Welding, handling and all other operations are described in the manual for operation of PP-R pipes.

PP-R INSTAPLAST System

	Drinking water	Hot & cold water	Heating I (max. 70°C)	Heating II (max. 90°C)	Compressed air
PP-R S5	■				
PP-R S3.2	■	■			
PP-R S2.5	■	■	■		■
UNIBETA	■	■	■		■
PP-R GFR	■	■	■		■
STABI BETA	■	■	■	■	■
CARBO^{CRP}	■	■	■	■	■

Note: Product images may differ from the actual products.

Production Plant /Central Warehouse
Botevgrad 2140, POB 65, 3 Industrialna Street
E office.bg@pipelife.com, **pipelife.bg**

PIPELIFE
always part of your life