

AT THE TOP OF THE TECHNOLOGICAL EVOLUTION

Carbo CRP
oxy

UNIQUE CARBON TECHNOLOGY
IN PP-R/PP-RCT SYSTEM INSTAPLAST
NOW WITH OXYGEN BARRIER!

PIPELIFE 
always part of your life



UNIQUE THREE-LAYER PRESSURE PIPE NOW ALSO 100% SUITABLE FOR CLOSED PRESSURE CIRCUITS

Another direction of development of the unique three-layer **CARBO^{CRP}** pressure pipe application was to provide an **oxygen barrier** while retaining all the benefits original pipes. This development was successfully completed by measuring "Determination oxygen barrier permeability" to DIN 4726 (paragraph 4.3) and ISO 17455 (dynamic test method) at independent testing laboratory ITC Zlin. The measured value is below the required value of 3.6 mg/(m².day).

The new peak of technological evolution within piping systems is now the **CARBO oxy^{CRP}** pipe in the **HEAT** variant and the **COOL** variant.



Application of CARBO oxy^{CRP} HEAT/COOL pipes

The **CARBO oxy^{CRP} HEAT/COOL** pipe is designed primarily for the following applications:

- heating distribution system (HEAT)
- radiator distribution (HEAT)
- hot water distribution with circulation (HEAT)
- refrigerant distribution for cooling (COOL)
- chemical and industrial applications (HEAT/COOL)



TECHNICAL SPECIFICATION

Wall structure	PP-RCT/PP-RCT+CF+SA/PP-RCT
Wall description	multi-layer pipe, middle layer of carbon-containing composite and special additives to provide an oxygen barrier
Temperature coefficient of expansion	0,045 mm/(m.K)
Diameters available	D 20 - 125
Standard length available	4 m
Colours	grey D 20 - 110, green D 125

The CARBO oxy^{CRP} HEAT/COOL pipe is manufactured in the following dimensions:




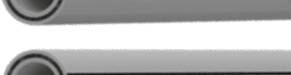
Diameter D [mm]		20	25	32	40	50	63	75	90	110	125
CARBO oxy ^{CRP} HEAT	wall thickness t [mm]	2,8	3,5	4,4	4,5	5,6	7,1	8,4	10,1	12,3	14,0
	pressure range	S3,2	S3,2	S3,2	S4	S4	S4	S4	S4	S4	S4
CARBO oxy ^{CRP} COOL	wall thickness t [mm]	2,8	3,5	4,4	3,7	4,6	5,8	6,8	8,2	10,0	11,4
	pressure range	S3,2	S3,2	S3,2	S5	S5	S5	S5	S5	S5	S5

The CARBO^{CRP} and CARBO oxy^{CRP} pipes are the hi-tech elements of the PP-R/PP-RCT system INSTAPLAST

CARBO^{CRP} and CARBO oxy^{CRP} pipes extend the PP-R/PP-RCT system INSTAPLAST and can be combined with other pipe types and fittings for the system. Pipes with fittings are joined by polyfusion welding at 260 °C.

Before welding, the end of the pipe is only cleaned (possibly shortened and cleaned) as a standard PP-R pipe, but already not be peeled. The welding process, handling and other instructions, are described in the CARBO oxy^{CRP} brochure.

Pipes from PP-R/PP-RCT system INSTAPLAST

		Drinking water	Hot & Cold water	Heating I (max. 70 °C)	Heating II (max. 90 °C)	Pressure air	Cooling medium distribution
	PP-R S5	■					
	PP-R S3,2	■	■				
	PP-R S2,5	■	■			■	
	UNIBETA	■	■			■	
	STABI BETA		■	■	■		
	CARBO ^{CRP}	■	■		■	■	
	CARBO oxy ^{CRP} COOL	■				■	■
	CARBO oxy ^{CRP} HEAT	■	■	■	■	■	■

Pipe dilatation properties

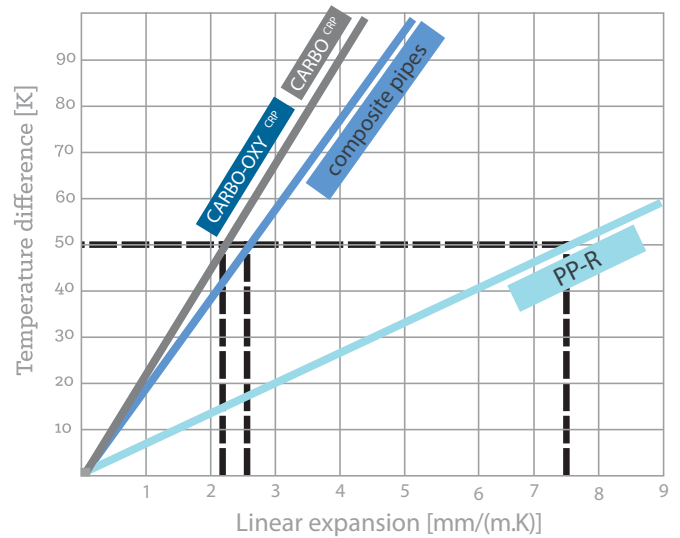
Thanks to compound of PP-RCT and carbon fibres, the temperature coefficient of expansion (TCE) of the **CARBO oxy^{CRP}** pipes is 0,045 mm/(m.K), which is less than one third of the value of the PP-R pipe's coefficient (0.15 mm/(m.K)).

It logically follows from this, that the linear expansion of the pipe with identical length and identical temperature difference will be more than 3.3 times lower in the case of the pipe with carbon fibres than in the case of the a standard PP-R pipe.

Linear temperature expansion formula

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

- ΔL length of temperature expansion [mm]
- α temperature coefficient of expansion (**CARBO oxy^{CRP} pipe** = 0.045 mm/(m.K))
- L length of installed pipe [m]
- ΔT difference of temperature during of installation and working temperature [K]



PP-RCT – Polypropylene of the 4th generation

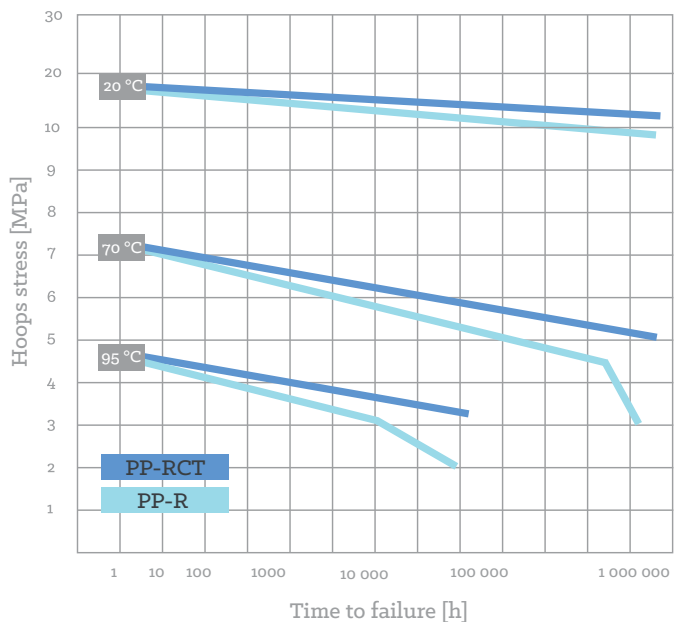
The special **nucleation process** modifies the crystalline structure of static copolymer PP-R. Thanks to this process the material gets much better **pressure and temperature properties**.

Carbon fibre (CF)

The carbon fibre contains carbon in various modifications. It is a long, thin strand of material with a diameter of 5 - 8 μm , comprised carbon atoms. The carbon atoms are bound together to form microscopic crystals which are oriented in parallel to the long axis of the fibre.

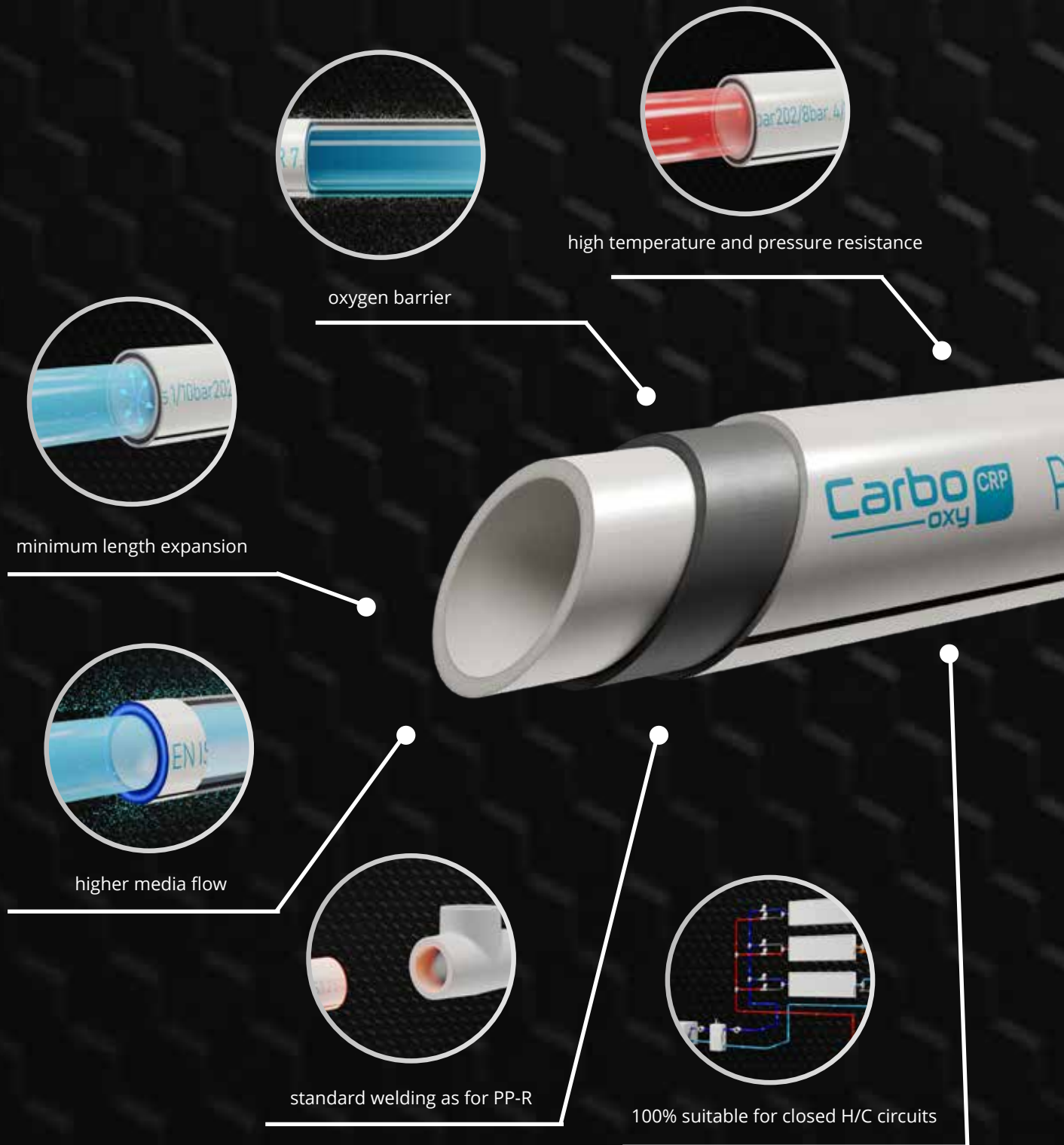
Special Additives (SA)

Chemical compounds to prevent oxygen penetration through the wall of the pipe into the heat transfer / cooling medium.



The result of the combination of these materials is the CARBO oxy^{CRP} pipe - the first plastic pipe* also 100% suitable for closed circuits.

* Metal-free, without the need to adjust the end of the pipe before welding



Advantages of CARBO oxy^{CRP} pipes

- oxygen barrier - protection of sensitive parts of heat / cooling sources in the circuit
- minimum thermal coefficient of linear expansion - 0.045 mm/(m.K)
- higher temperature resistance up to 90 °C
- higher pressure resistance at high temperatures up to 50 %
- higher flow rate of up to 20 % due to the smaller wall thickness of the pipe
- standard welding as for PP-R (no further tube modifications), compatibility
- 20 years of warranty
- lower wear of cutting tools



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