

KELEN[®]

Drinking Water Pipe System

PP-RCT

Poly Propylene-Random Crystallinity



 **KE KELIT[®]**
INNOVATIVE PIPE SYSTEMS

PP-RCT is a fully established pipe class on the market

PP-RCT (PolyPropylene-Random Crystallinity Temperature) is a material classification used to describe the second generation class of PP-R materials (Type 4). It sets a milestone in the advancement of PP pressure piping systems. In 2013 the material classification PP-RCT was added to EN ISO 15874, the global standard for polypropylene piping systems for hot and cold water pipe installations.

PP-RCT is a polypropylene random copolymer with a special crystallinity providing an improved pressure resistance, especially at elevated temperatures.

These very capabilities allow PP-RCT to increase performance and competitiveness for PP-R producers, and offer advantages for building designers and end-users alike.

Using PP-RCT in your pipe design will allow for increased performance vs. standard PP-R

For example:

- Higher pressure classification with the same dimensions
- Higher hydraulic capacity with same outer diameter
- Weight reduction (between 14% and 25%) in pipe production versus regular PP-R
- Special applications are possible such as larger diameter mains for high-rise air conditioning
- Compatible with existing PP welding procedures
- Fully established in domestic as well as global standards including ISO, ASTM and DIN

Close to 10-year track record with PP-RCT and over 30 years of experience with beta-nucleation

- Contain a high level of beta-nucleated crystals enabling excellent slow crack growth properties
- The beta-nucleation technology is well-proven with over 30 years of success in demanding industrial and chemical applications
- State-of-the-art stabilisation package for excellent thermal and chemical resistance
- Full chlorine evaluation in accordance with ASTM F2023
- Ready compounded for maximum quality control
- Colour light grey (RAL7032)
- Established in a wide range of applications, including large diameters for high-rise air-conditioning systems and reinforced multi-layer heating pipes

Material properties

Density:	0,91 g/cm ³
Melting Point:	~ 140° C
Tensile strength:	40 N/mm ²
Elongation at tear:	800 %
E-module (20°C):	900 N/mm ²
Spec. heat	2 kJ/kg K
Heat conductivity:	0,24 W/mK
Spec. thermal expansion:	0,15 mm/mK

The following formula is used to calculate the tensile stress:

$$\sigma_v = p \cdot \frac{(d-s)}{2s}$$

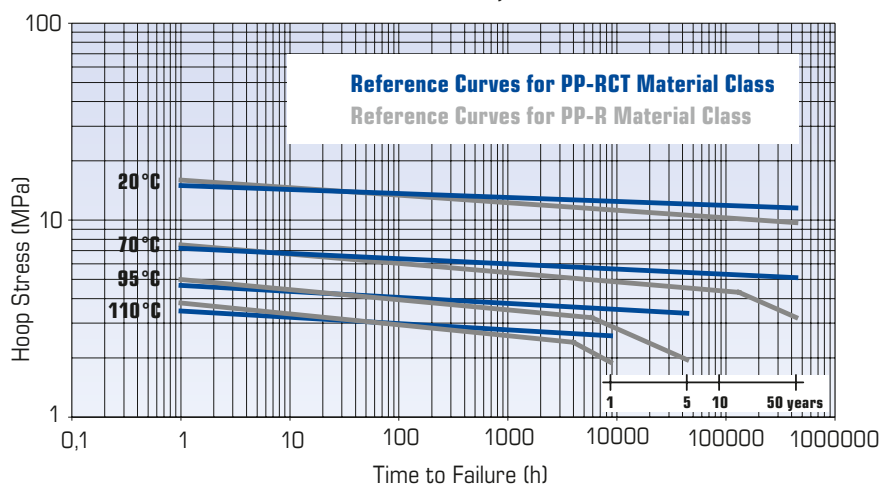
σ_v : Equivalent stress

p = in N/mm² (1bar = 0,1 N/mm²)

The expected service life can be read off the graph.

KE KELIT technology has made KELEN pipes particularly resistant to impact at -5°C. Pipes and fittings are made of the same raw material

Comparison of reference curves PP-R and PP-RCT in Accordance Curves with EN ISO 15874; ISO 3213



Classification of service conditions

ÖNORM EN ISO 15874-1

PN20 – SDR series-6

Class 1 – 60°C/10 bar

Class 2 – 70°C/10 bar

PN16 – SDR series-7,4

Class 1 – 60°C/10 bar

Class 2 – 70°C/10 bar

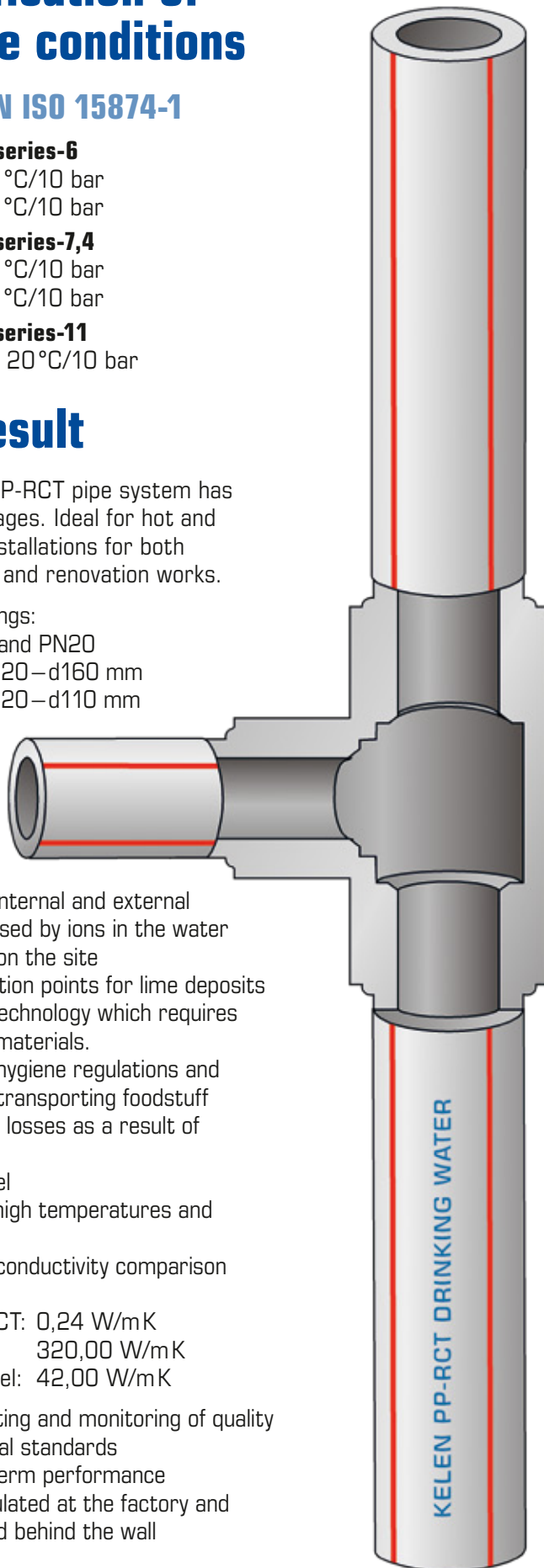
PN10 – SDR series-11

Cold water – 20°C/10 bar

The Result

The KELEN PP-RCT pipe system has many advantages. Ideal for hot and cold water installations for both new projects and renovation works.

- Pressure ratings:
PN10, PN16 and PN20
- Cold water: d20–d160 mm
Hot water: d20–d110 mm
- Resistant to internal and external corrosion caused by ions in the water or chemicals on the site
- No crystallisation points for lime deposits
- Secure joint technology which requires no additional materials.
- Conforms to hygiene regulations and approved for transporting foodstuff
- Low pressure losses as a result of smooth bore
- Low noise level
- Resistant to high temperatures and pressure
- Low thermal conductivity comparison of λ -values
KELEN PP-RCT: 0,24 W/mK
Copper: 320,00 W/mK
Cast iron/steel: 42,00 W/mK
- Stringent testing and monitoring of quality to international standards
- Secure long-term performance
- Pipes are insulated at the factory and can be located behind the wall



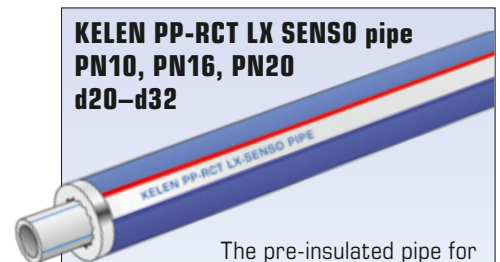
Applications

To meet the practical demands on the system a well thought-out range of pipes and fittings are required to ensure that all problems are solved

- Single houses and apartment blocks
- Residential areas
- Schools, hotels, hospitals, barracks, old people's homes, kindergarten, university clinics and institutes, libraries, guest houses ...

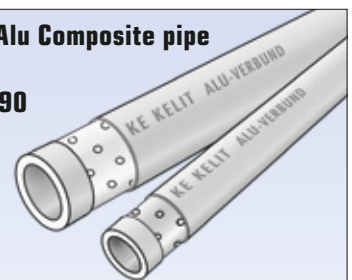
Special pipe types

KELEN PP-RCT LX SENSO pipe PN10, PN16, PN20 d20–d32



The pre-insulated pipe for sound insulation, heat insulation and traceability behind the wall

KELIT Alu Composite pipe PN20 d20–d90



The ALU layer stabilises and reduces linear expansion

Quality characteristics

KELEN PP-RCT is made of polypropylene type 4

High technical expertise has made it possible to make KELEN PP-RCT pipes particularly resistant to impact at temperatures of -5°C . Pipe and fitting are made of the same raw material.

Metal adaptor fittings

Special care has been taken over the choice and quality control of the metal threads.

Special quality criteria:

- Dezincification resistant brass (CW 724 R) for all parts transporting water ensures high resistance against aggressive water.
- A pore-free, chemically applied metal plating prevents stress corrosion cracking.
- Metal parts which are not in contact with the media are generally made of metal-plated MS 58 brass.
- Exceptional resistance to torsion force and suitable for on-site conditions
- Depth of the thread conforms to DIN 16962 for normal faucets

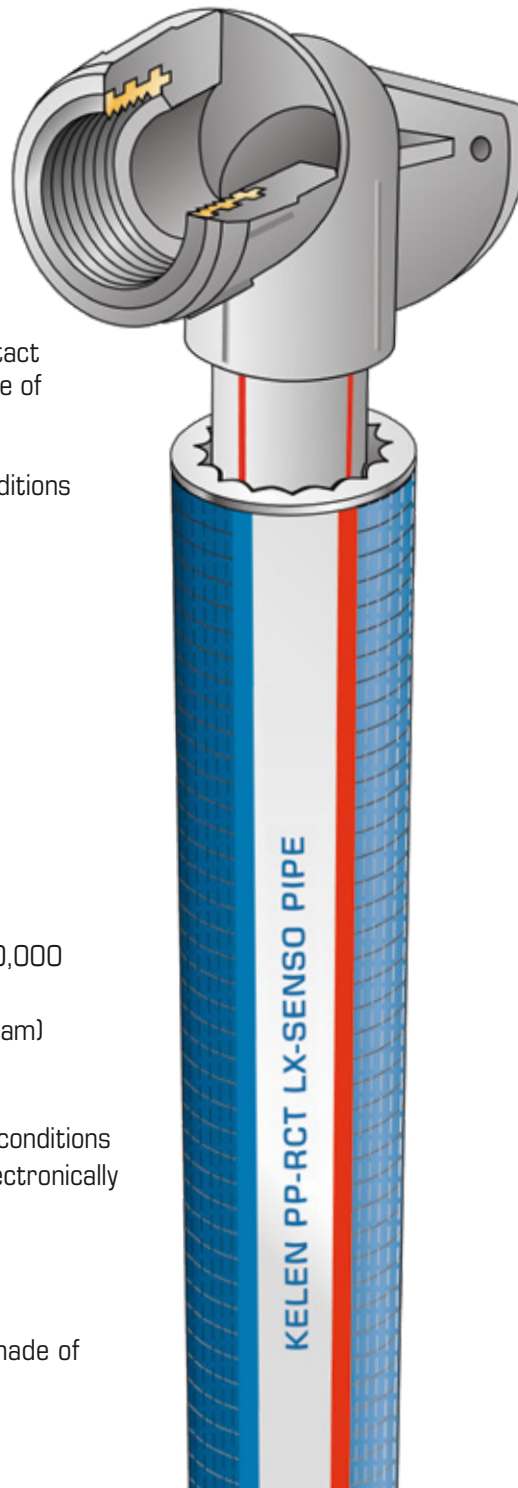
The insulation (LX)

Foam:

- Cross-linked PE
- 100 % closed pore
- Density: 30 kg/m^3
- Heat conductivity λ at:
 - 20° : 0.036 W/mK
 - 40° : 0.039 W/mK
- Water vapour permeability $\mu = 10,000$
- (an effective vapour barrier)
- Environment-friendly (CFC-free foam)
- Bubble structure to insulate against noise transmission
- Strong enough to withstand site conditions
- Concealed pipe can be located electronically
- Insulation can be pushed back to allow room for the welding

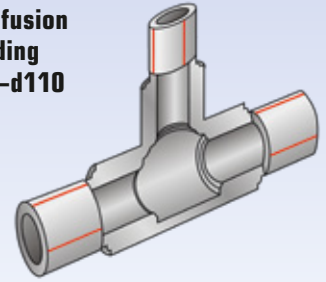
Protective coating:

High quality 5-layer composite made of polyolefines and aluminium

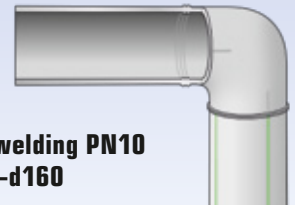


Methods of joining the pipes

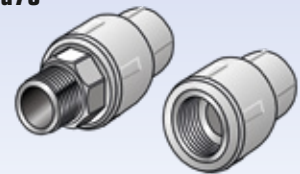
Polyfusion welding
d20–d110



Butt welding PN10
d125–d160



Threaded adaptor fittings
d20–d75



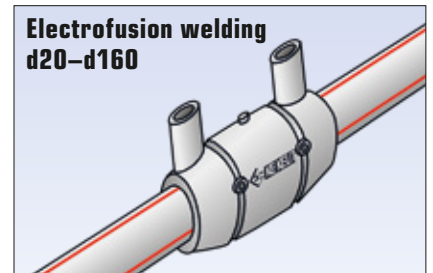
Detachable union fittings
d20–d90



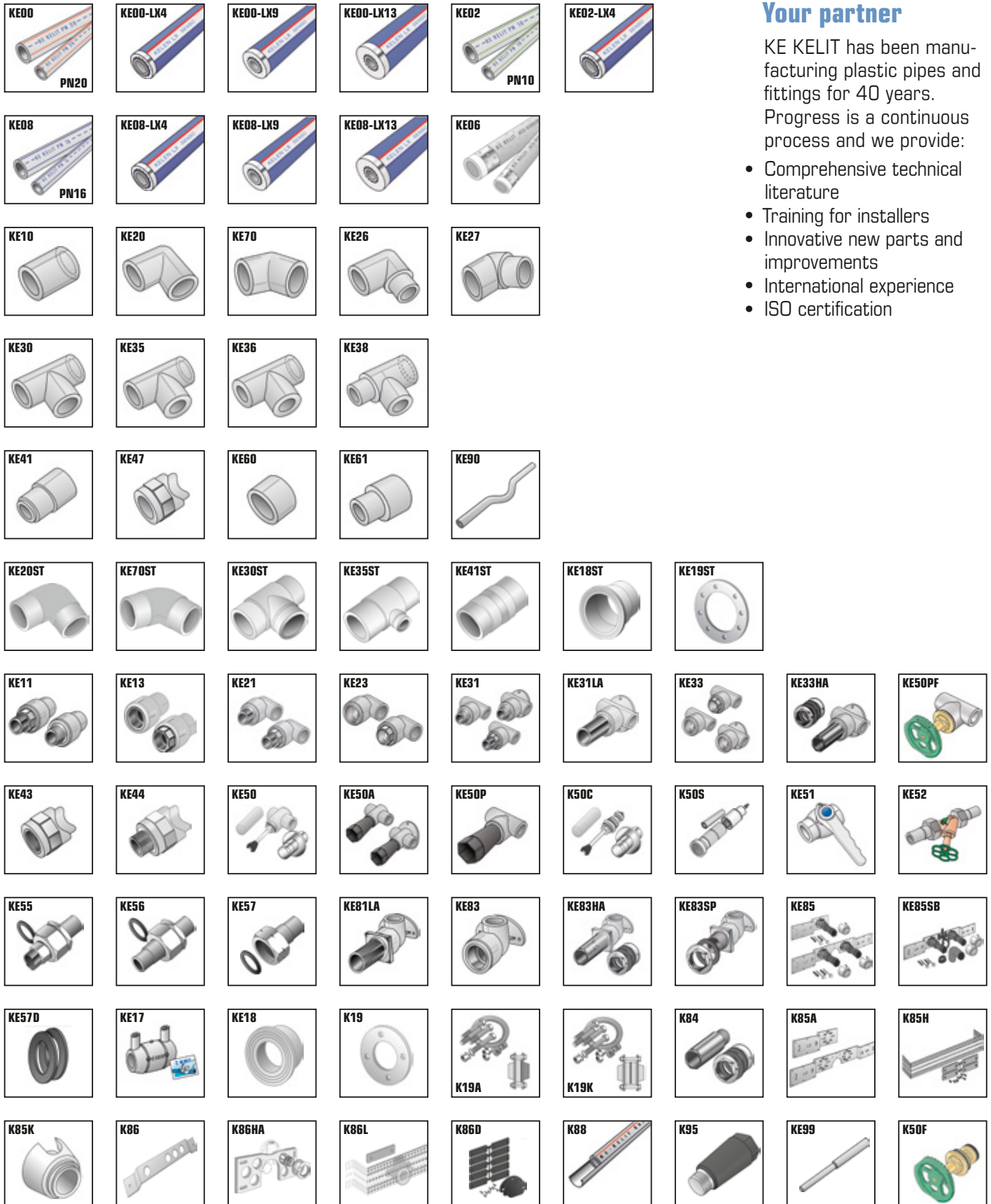
Flange connection PN10
d20–d160



Electrofusion welding
d20–d160



The complete range of products



Your partner

KE KELIT has been manufacturing plastic pipes and fittings for 40 years.

Progress is a continuous process and we provide:

- Comprehensive technical literature
- Training for installers
- Innovative new parts and improvements
- International experience
- ISO certification



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ÖNORM registration in compliance
with EN ISO 15874



Member of the Austrian Working Group
PLASTIC PIPE RECYCLING
ARA Nr. 9087



ÖNORM EN ISO 9001
ÖNORM EN ISO 14001
ÖNORM EN ISO 10005
ÖNORM EN ISO 50001