

COOLSAFE

PRE-INSULATED
PIPING SYSTEMS





The Plastics Experts.

As an effective solution for thermally insulated piping, AGRU offers the COOLSAFE pre-insulated piping system. This system out of PE 100 is specially designed to optimize the whole cooling circle with minimized installation costs. Excellent thermal insulation and AGRU's one stop shop philosophy keep cooled media perfectly conserved.

The AGRU success story has been unfolding now for around seven decades. Founded back in 1948 by Alois Gruber senior, nowadays the company is one of the world's most important single-source suppliers for piping systems, semi-finished products, concrete protection liners and lining systems made from engineering plastics. Our ability to supply everything from a single source sets us apart. We use only top-grade thermoplastic polymers as our raw materials. When it comes to application-technical consulting, we are your best partner in the field.



Quality

At AGRU, customer satisfaction comes first. Technical consultations, training courses, welding instruction and expert supervision on site are essential parts. The AGRU quality assurance system is compliant with ISO 9001:2008 and its environmental management system fulfils ISO 14001:2004. This in turn ensures that the products comply with international norms, as monitored and evaluated on an ongoing basis by independent testing agencies standards.

The start-to-finish attention to quality ensures that the products meet and beat the strictest technical specifications, providing safe operation within gas, water and wastewater infrastructures.

COOLSAFE

Keeps cool up to -30 °C

The AGRU COOLSAFE product line is a double containment piping system made out of high-grade PE 100, in which the space between the inner and outer pipe is filled with high grade closed cell insulating foam. This makes the COOLSAFE system perfect for chilled media transport applications.

Excellent thermal insulation

Double containment piping system with insulation filled annular space

The insulating foam

- minimizes energy loss
- provides a thermal conductivity < 0.026 W/mK
- is protected by the outside pipe

One Stop Shopping

Pipes and fittings from one factory for maximum accuracy of fit

The COOLSAFE product range encompasses

- pipes, tees, bends and reducers
- pipes and fittings in dimensions from 90/32 to 355/250
- technical consulting from AGRU's Plastics Experts for accurate planning

Maintenance free

Low operating costs

COOLSAFE saves money

- no corrosion, no incrustations, no condensation
- insulation is designed to last at least for 25 years
- low pressure loss and high energy efficiency

Fast & safe installation

COOLSAFE is a pre-insulated piping system

High-grade PE 100-RC features

- one step welding by simultaneous butt fusion or electrofusion
- absence of gluing or dangerous open flames during installation
- 30 % less weight than metallic piping systems

State-of-the-art technology

Injection moulded fittings

COOLSAFE installs fast and easy

- suitable for various welding methods
- high dimensional stability and strength durability
- works up to -30 °C
- one system, one manufacturer



COOLSAFE Supply range

Standard sizes are 32 mm - 250 mm for pipes and fittings. Outside and inside pipe are made of PE 100. On customer request COOLSAFE pipes are also available with PP media pipes. In this case, hot media up to 80 °C can be safely transported.

SUPPLY RANGE

| Dimension OD1/OD2 | SDR 1 | s1 min | d1 min | SDR 2 | s2 min | d2 min | Insolation thickness |
|----------------------|-------|-----------|-----------|-------|-----------|-----------|-------------------------|
| 90/32 | 17 | 5,4 | 90 | 11 | 2,0 | 32 | 23,0 |
| 125/63 | 33 | 3,9 | 125 | 17 | 3,8 | 63 | 26,7 |
| 160/90 | 33 | 4,9 | 160 | 17 | 5,4 | 90 | 29,6 |
| 200/110 | 33 | 6,2 | 200 | 17 | 6,6 | 110 | 38,1 |
| 280/160 | 33 | 8,6 | 280 | 17 | 9,5 | 160 | 50,7 |
| 315/200 | 33 | 9,7 | 315 | 17 | 11,9 | 200 | 47,0 |
| 355/250 | 33 | 10,9 | 355 | 17 | 14,8 | 250 | 40,7 |

Insulated 90° bends, 45° bends, tees and reducers are available in the corresponding dimensions.



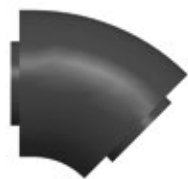
Pipe



Tee



90° Bend



45° Bend



Reducer



Instrumentation fitting



Dog bone



Termination thread adapter



Areas of application

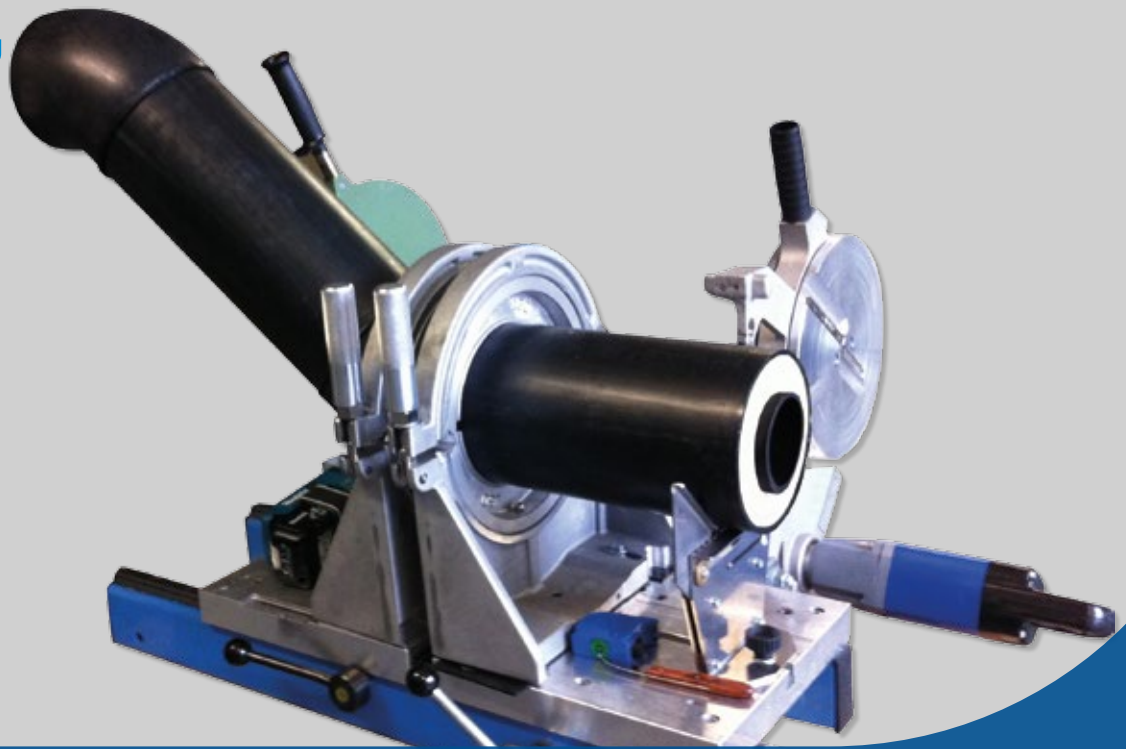
The main applications are pipelines for the cooling system of food and beverage production, ...



... cold storage, commercial refrigeration, ...



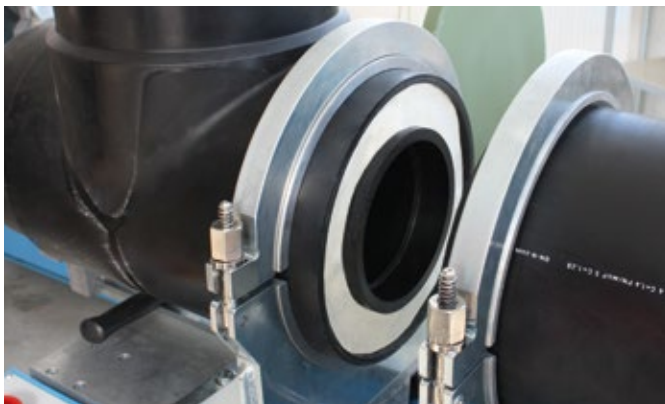
... cooling applications in commercial buildings, pharmaceutical industry and data storage centres.



COOLSAFE Welding methods

Safe and easy welding technology

The COOLSAFE pre-insulated piping system installs easily using conventional simultaneous butt or electrofusion welding methods.



Simultaneous butt welding

The PE/PE design allows the system to be simultaneously butt welded, saving installation time and providing a safer installation. Components are moulded and insulated to strict tolerances to ensure easy installation and long-term insulation of chilled media.

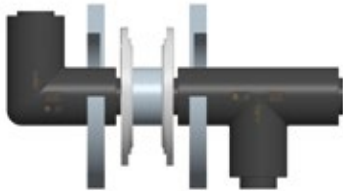


Electrofusion welding

The joining of COOLSAFE pipes and fittings is very easy. The procedure takes just a few minutes and the electrofusion welding device helps to ensure the quality of the joints.

Installation procedure

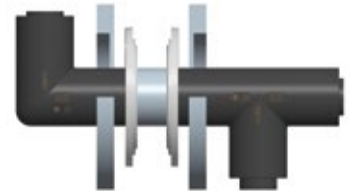
Simultaneous butt welding



1. Plane the inner pipe



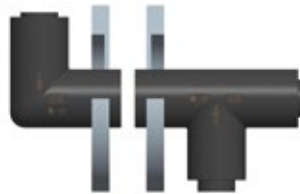
2. Check the alignment



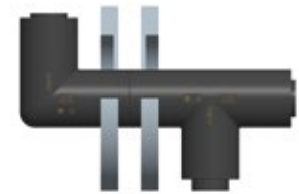
3. Plane inner and outer pipe



4. Warm up the welding areas



5. Remove the heating elements

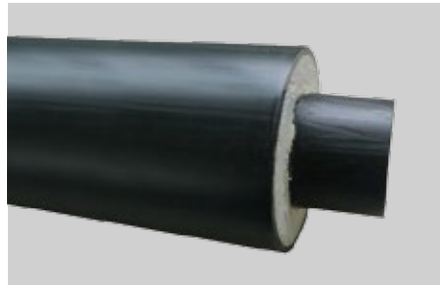


6. Weld the pipes and let them cool off

Electrofusion welding



Check the welding machine visually for physical damages and use only suitable welding machines.



Cut the outside pipe and take out the insulation foam. Scrape the outside of the media and the protection pipe.



Clean the welding area with welding wipes. Do not touch the welding area after preparation.



Place the elongated e-coupler or a shrink sleeve on the outside pipe.



Weld the media pipe using a standard e-coupler from AGRU.



Place the elongated e-coupler over the welded media pipe and weld the outside pipe.

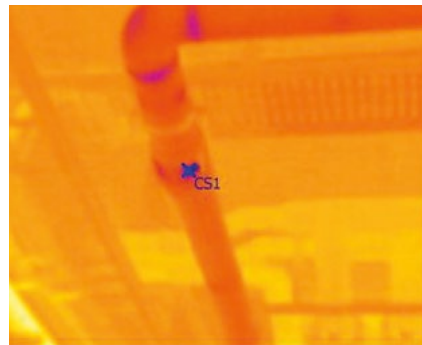


COOLSAFE best solution for energy saving

PE - ideal for low temperatures

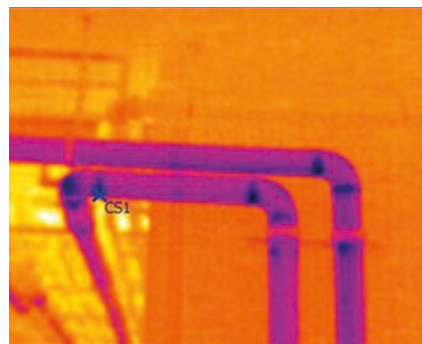
Polyethylene is an excellent choice for low temperature applications. Thermoplastics used in chemical systems require additional safety factors when compared to thermoplastics used in water systems. The COOLSAFE insulated piping system is designed to be used with chilled water applications and a glycol water mix.

Media temperature of -18 °C, infrared camera comparison



COOLSAFE

- even the transported media is chilled to -18 °C, the outside pipe stays warm
- loss of temperature (~50 m installation length): ~1 °C
- no condensation or freezing occurs on the COOLSAFE piping system



Non-insulated pipe

- the non-insulated pipe has large temperature differences compared to the surrounding area
- the outside temperature quickly falls down to 0 °C which results in higher temperature losses compared to the COOLSAFE piping system

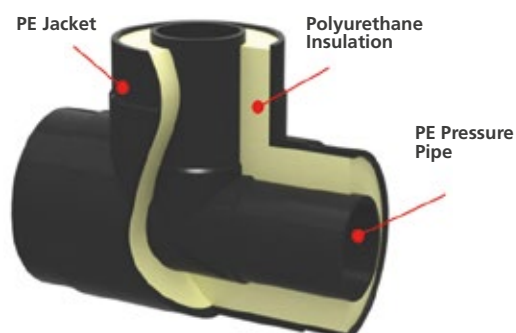


Material Properties

| | | |
|--------------------------------|---|---|
| Materials | Media pipe | PE 100-RC |
| | Insulation | PUR foam |
| | Outside pipe | PE 100-RC |
| Pressure rating | | SDR 17: 150 psi (PN 10) |
| Insulation | Thermal conductivity λ at 20 °C | < 0.026 W/m ^K |
| | Density | < 55 kg/m ³ |
| | Foam cell size | max. Ø 0,5 mm |
| Temperature | Medium | -30 °C to +60 °C -22 °F to +140 °F |
| | | |
| Weight (without liquid) | Pipe 90/32 | 2,90 kg/m |
| | Pipe 280/160 | 16,50 kg/m |
| Standards | EN ISO 15494 | Plastic piping system for industrial applications |
| | DIN 8077 | Plastic piping system out of Polypropylene (PP) |
| | ASTM D2837 | Long-term hydrostatic strength and design of thermoplastic piping compounds |

Pressure rating

Components are pressure rated in accordance with EN 15494 / EN 12201 and ASTM D2837. All inside pipes and fittings of the COOLSAFE system are at least SDR 17 (suitable for 10 bar / 20 °C 25 year life time). For detailed working conditons refer to the valid technical design catalogue for the COOLSAFE piping system.





COOLSAFE References



Purpose: Cooling

- Project: Power plant
- Dimension: COOLSAFE pipe OD 450/280 + OD 630/450
- Application: Supply lines for cooling unit



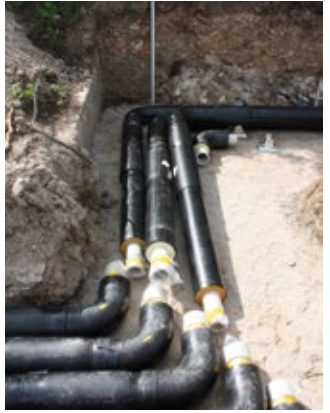
Purpose: Cooling

- Project: Central cooling system in Hotel Complex
- Dimension: COOLSAFE OD 280/160mm
- Application: Supply lines for cooling unit



Purpose: Heating

- Project: Football stadium
- Dimension: COOLSAFE OD 280/160 PE/PP
- Application: grass heating system





The Plastics Experts.

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