

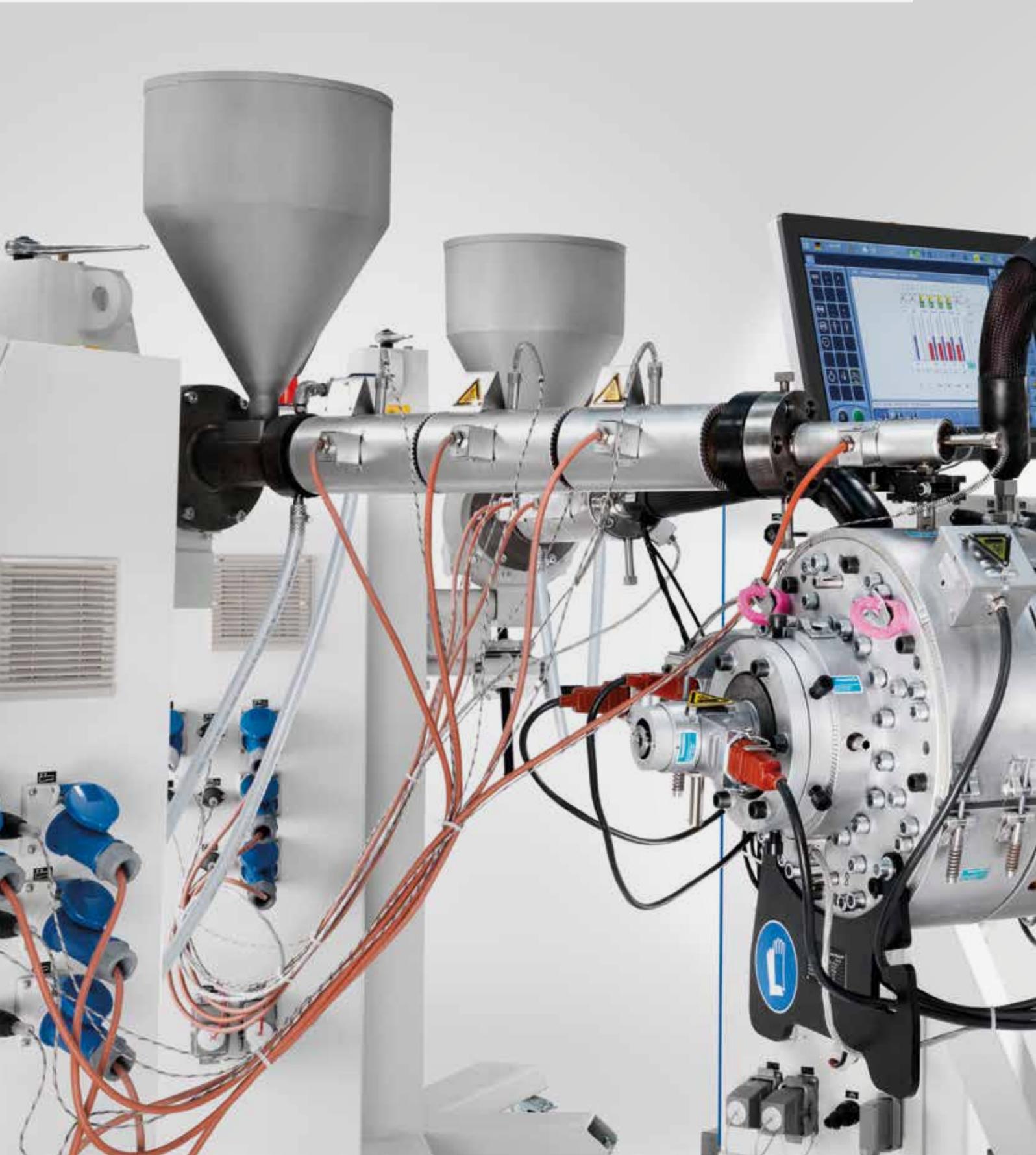
Single-vendor system solutions
Systems for producing
temperature-resistant pipes

Engineering Value

Krauss Maffei
Berstorff

Impressive machine combination

Single-screw extruders for manufacturing multi-layered pipes





Extruder combination with a 5-layer pipehead – optimally suited to the production of multi-layer pipes, for which precision and cost-efficiency are very important.

Solutions for the cost-efficient extrusion of temperature-resistant pipes

Their excellent product characteristics make pipes that are made from modified polyolefins or cross-linked polyethylene all-rounders in underfloor, wall, ceiling and space heating systems.

But they are also increasingly used as drinking and hot water supply pipes. Other areas of application include radiator heating, sanitary installations, climate-controlled floors, cooling systems, gas pipes, district heating systems, geothermic systems, biogas systems and swimming baths.

Whatever the application you decide on, KraussMaffei Berstorff offers you the right solution, specially tailored to your needs. All KraussMaffei Berstorff extruders guarantee the highest outputs with opti-

mum melt quality in conjunction with the highest production reliability and constant product quality.

All components are perfectly matched to one another in a cohesive overall system concept. Thanks to the flexible micro-processor control system, the entire system can be monitored and easily operated from the extruder.

The process unit of the extruders, the pipehead concept, and the cooling and calibration technology are optimally designed for the special production requirements of the respective pipe type.

An elaborate design with spiral distributors ensures minimum tolerances for wall thickness and diameter, as well as precise layer and thickness distribution.

Outputs for the various extruder types

| | Single-screw extruder max., in kg/h for selected reference materials | | | |
|----------------------------|--|---------------|---------------|---------------|
| | KME 45-36 B/R | KME 60-36 B/R | KME 75-36 B/R | KME 90-36 B/R |
| PE-Xb single-stage process | 100 | 150 | 210 | 280 |
| PE-Xb dual-stage process | 150 | 240 | 325 | 435 |
| PE-Xc | 200 | 295 | 400 | 510 |
| PB/PB-R | 135 | 200 | 270 | 345 |
| PE-RT | 225 | 330 | 450 | 575 |
| PP-R | 180 | 290 | 410 | 565 |



Single-screw extruder KME 60-36 B/R



Sheathing tool KM 2L-RKW with coextruders for post-coextrusion of hot water pipes with bonding agent and oxygen barrier layer

Sanitary pipe and heating pipe types perfectly extruded on KraussMaffei Berstorff systems

Thanks to our many years of experience and continual technical optimization and further development, we guarantee production reliability, whatever the materials in use.

PB-H / PB-R pipes

- Specially matched processing unit for 36D single-screw extruder
- Spiral-distributor-type pipehead with design-specific die
- Alternative design as a 3/5-layer pipe
- Entire production process adapted to the special requirements of the material polybutene

PP-R pipes

- 36D single-screw extruder with barrier screw
- Spiral-distributor-type pipehead
- Single-layer / 3-layer pipe with glass-fiber-filled middle layer to reduce linear expansion and increase pipe stiffness

Multi-layer composite pipes (inner pipe layer made of PP-R)

- 7-layer composite pipe:
- Inner pipe layer made of PP-R
 - Glassfiber
 - PP-R
 - Bonding agent
 - EVOH oxygen barrier
 - Bonding agent
 - Outer pipe layer made of PP-R

PE-RT pipes

- 36D single-screw extruder with barrier screw
- Pipehead concept based on the spiral distributor principle guarantees perfect layer thickness distribution at high linear speeds
- Die designed in accordance with the special requirements of PE-RT material

Multi-layer composite pipes (Inner pipe made of PE-X or PE-RT)

- 3- or 5-layer composite pipe:
- Inner pipe layer made of PE-X or PE-RT
 - Bonding agent
 - EVOH oxygen barrier
 - Bonding agent
 - Outer layer made of PE, PE-X or PE-RT

PUR-insulated pipes

- Complete concept for continuous production of insulated pipes, comprising 2 sections:
- Production of inner pipe (made of PE, PE-X or PE-RT)
 - Encapsulation of inner pipe (in-line process) with polyurethane and polyethylene sleeve

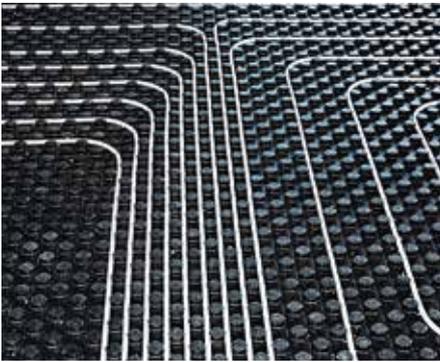
Your benefits:

- Minimal overweight thanks to tight tolerances for wall thickness and diameter
 - Significant material costs reduction thanks to exact layer and thickness distribution
 - Intelligent complete solutions from a single source (pipes and fittings)
 - Competitive advantages thanks to high production speeds coupled with high product quality
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Applications and products in practice

Surface regulation

Surface regulation systems can be used in different installation systems: From exclusive residential buildings or commercial offices to highly frequented industrial buildings.



Underfloor heating with nubs



Wall or ceiling installation



Refurbishing systems

Thanks to the permanent further development of materials and systems, today energy-saving and efficient surface regulation systems are available. With low supply temperatures, these systems can be optimally used with environment-friendly energy sources, thus contributing to reduced energy costs.

Great design flexibility and even heat distribution provide a pleasant, healthy room atmosphere. The most important component of all systems is the water-carrying pipe. The high requirements, for example a minimum service life of 50 years or the oxygen-tightness and corrosion-resistance coupled with high stress fracture resistance, make the heating pipe a complex multi-layer pipe.

Systems designed for refurbishing with, for example, low installation heights or special solutions are available on the market.

The Bundesverband Flächenheizung und Flächenkühlung e.V. (Federal Association of Surface Heating and Surface Cooling) has compiled requirements and information for modernization in its Guideline Number 10. Here you will find all the information on installation.

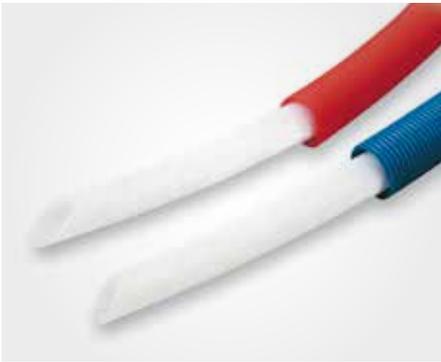
Technical data

| | | PE-RT | PE-Xb | PB |
|-----------------------------|-------------------|-------|---------------|--------------|
| Density | g/cm ³ | 0.94 | 0.938 - 0.945 | 0.914 - 0.92 |
| Heat conductivity | W/(mk) at 60°C | 0.38 | 0.36 - 0.45 | 0.22 |
| Temperature, max. | °C | 90 | 95 | 95 |
| Operating temperature, max. | °C | 70 | 70 | 70 |
| Bending radius | | 5 x | 5 x D | 5 x D |

Applications and products in practice

Wide variety of pipe types

The outstanding properties of pipes made of cross-linked PE or materials such as PE-RT, PP-R or PB-R are impressive. They are more resistant to mechanical and thermal stress, and to chemicals.



PE-Xc pipes
with corrugated pipe outer layer



PE-RT pipe



PUR-insulated pipes



Glassfiber-filled 3-layer PP-R pipe



3- and 5-layer PE-RT pipes



PE-Xb pipes

Further practical examples:

- Underfloor, wall, ceiling and space heating systems
- Drinking water and hot water supply pipes
- Radiator heating
- Sanitary installations, supply lines for the heating and sanitary applications
- Air conditioning
- Cooling systems
- Gas supply lines
- Local and district heating systems
- Geothermal systems
- Biogas systems
- Swimming baths

Single-vendor system solutions

Systems for producing temperature-resistant pipes

The outstanding properties of pipes made of cross-linked PE or materials such as PE-RT, PP-R or PB-R are impressive. They are more resistant to mechanical and thermal stress, and to chemicals.

Whatever the application you decide on, KraussMaffei Berstorff offers you the right solution. The systems stand out because of their extremely high production speeds. The end products feature tight tolerances for wall thickness and diameter, and guarantee minimal overweight. Ideal preconditions for economic production on the basis of significant material costs savings.



OEE Plus
Boosting cost-efficiency for you

For more information
about OEE Plus, visit:
www.kraussmaffeiberstorff.com/oeplus

