AREAS OF APPLICATION
SINGLE-SCREW EXTRUDER PIPE SERIES

Pipe for transporting drinking water
Wastewater pipe
Sanitary and heating pipes
Pipes with special properties
PP-R pipe with glass-fiber reinforcement
3- and 5-layer PE-RT pipes for wall temperature control and underfloor heating

Technical data and measurements of the single-screw extruder pipe series

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Output rate, max. [kg/h] HDPE</td>
<td>270-300</td>
<td>450-500</td>
<td>640-700</td>
<td>850-950</td>
<td>1000-1200</td>
<td>1300-1500</td>
<td>1800-2000</td>
</tr>
<tr>
<td>Output rate, max. [kg/h] PP (PP-H; PP-B)</td>
<td>180-210</td>
<td>290-340</td>
<td>440-480</td>
<td>590-660</td>
<td>690-760</td>
<td>860-980</td>
<td>1050-1280</td>
</tr>
<tr>
<td>Number of heating/cooling zones</td>
<td>5/5</td>
<td>5/5</td>
<td>5/5</td>
<td>5/5</td>
<td>5/5</td>
<td>6/6</td>
<td>6/6</td>
</tr>
<tr>
<td>Screw length [L/D]</td>
<td>36</td>
<td>36</td>
<td>36</td>
<td>36</td>
<td>36</td>
<td>36</td>
<td>36</td>
</tr>
<tr>
<td>Screw diameter [mm]</td>
<td>45</td>
<td>60</td>
<td>75</td>
<td>90</td>
<td>105</td>
<td>125</td>
<td>150</td>
</tr>
<tr>
<td>Extrusion height [mm]</td>
<td>1000</td>
<td>1000</td>
<td>1000</td>
<td>1000</td>
<td>1150</td>
<td>1150</td>
<td>1400</td>
</tr>
</tbody>
</table>
With two series that have process units of different lengths, KraussMaffei is perfectly placed to meet the market demands for cost-effective pipe production and high-performance extrusion.

The successful, well-proven 36D single-screw series combines extremely high levels of product quality with cost-effective production. The single-screw extruders with the 30 L/D process unit are made for special extrusion and coextrusion applications; in particular, they are used for processing special materials.

**Your benefits:**
- The right machine and system configuration for all pipe extrusion tasks
- Cost-effective production and an extremely high level of product quality
- System provider for customer-specific special solutions
FIRST ENCOUNTER
TOUR OF THE
KME 125-36 B/R WITH
36D PROCESS UNIT

Eccentric feed
Avoids turbulence and maximizes throughput rates

Robust gearbox
Minimal maintenance costs as a result of long service life and low space requirement thanks to U-configuration of gearbox and motor
Deep-nitrided grooved bush
Outstanding cooling performance, minimum cooling water consumption, steady material feed – independent of counterpressure – and self-cleaning

Bimetal barrel
Extremely low rates of wear

Barrier screw
For thermal and material homogeneity of melt and low melt temperatures

Ideally dimensioned drive concept
With AC or DC drive unit, air-cooled (standard) or water-cooled (optional)
The process-engineering design of the 36D single-screw extruder series provides you with optimum conditions for successful pipe production.

**Thermal homogeneity for excellent pipe quality**
Pipe quality is significantly influenced by the thermal homogeneity of the materials that are to be processed. This thermal homogeneity can be clearly seen in the appearance of the inner surface of pipes: Thermal inhomogeneity leads to undesirable wavy surfaces. The functional principle of the 36D single-screw extruder series reliably eliminates any thermal inhomogeneities and ensures optimum homogeneity at a consistently low melt temperature.

**Considerable benefits right down the line**
The 36D single-screw extruder series is distinguished by a range of processing advantages that you can easily see for yourself in pipe production: an optimum mixing process in the shearing and mixing part of the screw; perfect line synchronization thanks to the output linearity and the material feed that is independent of the counter-pressure; an extremely high plasticization performance and distinct thermal homogeneity for perfect product quality; and maximum output performances at minimum investment costs. Furthermore, you can benefit from our extensive experience gained from numerous successful practical applications. All machines up to model KME 125-36 B/R are equipped with synchronous AC motor technology as standard.

**Broad range of applications**
The 36D single-screw extruder series is the specialist for processing all common types of material from PE 80, PE 100 and PP. Moreover, of course, it is also suitable for processing a wide variety of other materials, such as LDPE, LLDPE, MDPE, PA 11, PA 12, PE-RT, PE-Xb, PE-Xc, PB, ABS.
YOUR BENEFITS:

- Conveying behavior independent of counter-pressure at all speeds
- Low melt temperature level
- Gentle melt processing
- Long service life thanks to optimized pressure profiles and low rates of wear
- Significantly reduced cooling water consumption for the grooved bush
- Low-maintenance drive concept in proven U arrangement
**WHETHER EXTRUSION OR COEXTRUSION – CHOOSE THE BEST SOLUTION FOR EVERY TASK**

Whatever the extrusion application, KraussMaffei has the right solution for it, including control: featuring impressive technology and excellent cost-efficiency.

**Coextrusion for many tasks**

The compact construction of the KraussMaffei coextruders guarantees their seamless integration into a complete production line – and the height and tilt settings integrated in the coextruders enable their simple connection to the required mold. Depending on the task, the coextruder’s control system works either independently, speed-synchronized with the main extruder, or it is integrated seamlessly into the overall machine control system.

KraussMaffei coextruders are used in a wide-ranging spectrum of applications and special tasks; for example, for the extrusion of multi-layer pipes and for the coextrusion of color strips, bonding agent layers, thin inner and outer layers, oxygen barrier layers or sealing lips. Depending on the application and production requirement, the KraussMaffei extruders in the 36D series can also be used as coextruders.

<table>
<thead>
<tr>
<th>Technical data and dimensions</th>
<th>KME 20-25 D/C</th>
<th>KME 30-25 D/C</th>
<th>KME 30-30 B/C</th>
<th>KME 38-30 B/R</th>
<th>KME 45-30 B/C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output rate, max. [kg/h] HDPE</td>
<td>4.5</td>
<td>16</td>
<td>50</td>
<td>120-130</td>
<td>200-240</td>
</tr>
<tr>
<td>Output rate, max. [kg/h] PP (PP-H; PP-B)</td>
<td>3.5</td>
<td>13</td>
<td>40</td>
<td>110</td>
<td>140-170</td>
</tr>
<tr>
<td>Number of heating/cooling zones</td>
<td>3/0</td>
<td>3/0</td>
<td>4</td>
<td>4/4</td>
<td>4/4</td>
</tr>
<tr>
<td>Screw length [L/D]</td>
<td>25</td>
<td>25</td>
<td>30</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>Grooved bush</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Screw diameter [mm]</td>
<td>20</td>
<td>30</td>
<td>30</td>
<td>38</td>
<td>45</td>
</tr>
<tr>
<td>Extrusion height [mm]</td>
<td>920-1520</td>
<td>920-1510</td>
<td>1000</td>
<td>1000</td>
<td>1000</td>
</tr>
</tbody>
</table>
TAILOR-MADE COEXTRUSION SOLUTIONS
FOR GREATER FLEXIBILITY IN YOUR PRODUCTION

Piggyback version:
Single-screw extruder combination of main extruder KME 75-36 B/R and coextruder KME 45-30 B/R
An intelligent machine configuration for manufacturing multi-layer pipes – with the same space requirement as a system that is used for manufacturing single-layer pipes. The machine is extremely user-friendly because the coextruder is fully integrated in the control system of the main extruder.

Sheathing pipehead KM-2L-RKU 63 with two coextruders KME 30-25 D/C for coating hot water pipes with bonding agent and an oxygen barrier layer in a post-coextrusion process
A compact configuration for sheathing tasks, for example, for production of pipe made of PE-X, PE-RT and PB.
C7 CONTROL SYSTEM –
SUCCESS MOVING TO THE NEXT ROUND

The functions of both of the proven KraussMaffei “BPC Touch” (compounders) and “C6” (PO and PVC lines) control systems are now combined in the new C7 extruder control system. As part of this fusion, the user-friendly interface has additionally been upgraded and updated to a more modern appearance.

One Extrusion – One Control
The blending of the two control systems creates tremendous potential in terms of new flexible system configurations and groundbreaking plastics applications. Using the C7 control system, the machine operator keeps complete control over the entire extrusion line with direct and fast access to the individual units in the higher-level systems network. The numerous monitoring, control and automation functions create the basis for optimum product quality and high process reliability.

One look at the essentials
With the redesign of the user interface, we have succeeded in enhancing the focus on the essentials with the same clear information content. The familiar clear screen layout paired with a pleasing and intuitive color scheme provides a comprehensive process overview for the user at all times, as well as the foundation for fast intervention options.

With the C7 control system, KraussMaffei is also placing particular focus on continuing the ongoing, proven and trusted operating principle and functionality.

Connection to the digital future
With its many interfaces, the C7 control system is ideally equipped for the data world of tomorrow. Alongside the proven conventional paths (USB, PDF export), there are various network-based data interfaces (e.g. OPC-UA, Euromap84) available for accessing machine and operating data. Internal and external data recorders provide support in analyzing and optimizing processes.

The possibility to carry out remote diagnostics via the Internet, as well as to gain secure access to the machine control system through non-contact identification by use of a RFID reader, rounds off the digital portfolio.

YOUR BENEFITS:
- One control system – diverse applications
- State-of-the-art, attractive design
- Proven, intuitive operating philosophy
- Versatile data handling for the digital factory
- Flexible solution for total system concepts and individual machines

Various operating versions

Swivel-mounted on switching cabinet (standard)
Boom-mounted version (option)
Mounted on switching cabinet door (option)
Mobile version (option)
AREAS OF APPLICATION FOR THE PO PIPEHEADS

- PE pressure pipe
- Two-layer PE pipe
- Multi-layer PE pipe
- PP pipe
- PP-R pipe with glass-fiber reinforcement
- Two-layer protective outer layer pipe
- PE-X pipes
- 3- and 5-layer PE-RT pipes
- PE large pipes up to 2500 mm
KraussMaffei pipeheads are the optimal solution for the production of single- and multi-layer polyolefin pipes. The pipe molds rely on the throughput-optimized spiral distributors; multi-layer pipes are produced using a number of spiral distributors fitted coaxially one inside the other. As an alternative to these multi-layer molds, cost-competitive outer layer adapters are available for thin, functional layers.

The highlights at a glance:
- Pipeheads for the entire dimension range, comprising diameters from 10 to 2500 mm and the standardized wall thicknesses
- Optimized melt flow thanks to the multi-dimensional, computer-assisted design of the spiral geometry and melt channels
- Short flushing and cleaning times
- High degree of flexibility in the layer thickness distribution of inner and outer layer
- Reduced cooling section and increased throughput thanks to internal pipe cooling (IPC) above diameters of 110 mm
IMPRESSIVE ENCOUNTERS
TAKE A LOOK INSIDE THE SINGLE-LAYER SPIRAL DISTRIBUTOR FOR POLYOLEFIN...
...AND INSIDE THE MULTI-LAYER SPIRAL DISTRIBUTOR FOR POLYOLEFINS

Layer volume flow
Can be continuously adjusted or stemmed

Coextruder feed
An extruder for inner and outer layer

KM-3L RKW 73-160 with coextruder feed for inner and outer layer
PRACTICAL INCREMENTS
12 PIPEHEAD SIZES
FOR DIAMETERS OF 10 – 2500 MM

The dimension range of KraussMaffei spiral distributor pipeheads is optimally tailored to the requirements of the pipe manufacturer and includes all the conventional pipe dimensions covered by relevant standards and used in practical applications.

The use of reducing adapters allows all the pipe dimensions of the next pipe size down to be produced using the corresponding pipehead.

Short die extensions make setting up easier and reduce set-up times when changing from one pipe dimension to another, and pre-centered positions for the die gap can be maintained.
Pipehead type KM-RKW

DIN 8074 and 12201

max. 200 kg/h
max. 240 kg/h
max. 2000 kg/h
max. 2400 kg/h
max. 350 kg/h
max. 420 kg/h
max. 520 kg/h
max. 700 kg/h
max. 800 kg/h
max. 1100 kg/h
max. 1350 kg/h
max. 1700 kg/h
max. 2000 kg/h
max. 2000 kg/h
max. 2000 kg/h
max. 2000 kg/h
PIPEHEADS FOR SPECIAL AREAS OF APPLICATION
MULTI-LAYER PIPES

Technical data for special pipeheads

<table>
<thead>
<tr>
<th></th>
<th>PEXb</th>
<th></th>
<th>ABS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>KM-RKW 31–63 PEXb</td>
<td>KM-3L RKW 31–63 PEXb</td>
<td>KM-RWK 33–160 ABS</td>
</tr>
<tr>
<td>Diameter (mm)</td>
<td>10 – 63</td>
<td>10 – 63</td>
<td>20 – 160</td>
</tr>
<tr>
<td>Wall thickness (mm)</td>
<td>1.8 – 5.8</td>
<td>1.8 – 5.8</td>
<td>1.8 – 19.2</td>
</tr>
<tr>
<td>Throughput, max. (kg/h)</td>
<td>300</td>
<td>300</td>
<td>300</td>
</tr>
<tr>
<td>Functional layers, min. (mm)</td>
<td>0.05</td>
<td>0.05</td>
<td>0.05</td>
</tr>
</tbody>
</table>

All media connections are exactly where they are needed.
The spiral distributor design offers a number of production and process advantages, which will pay dividends in many ways for your business. The right pipehead for every application – the modular design of KraussMaffei spiral distributor pipeheads opens up possibilities for many different combinations.

### Two- and three-layer spiral distributors

<table>
<thead>
<tr>
<th>Type</th>
<th>KM-2L ...</th>
<th>KM-3L ...</th>
<th>RKW 51-63</th>
<th>RKW 71-63</th>
<th>RKW 52-110</th>
<th>RKW 72-110</th>
<th>RKW 53-160</th>
<th>RKW 73-160</th>
<th>RKW 54-250</th>
<th>RKW 74-250</th>
<th>RKW 55-500</th>
<th>RKW 75-500</th>
<th>RKW 56-630</th>
<th>RKW 76-630</th>
<th>RKW 57-1200</th>
<th>RKW 77-1200</th>
<th>RKW 58-1600</th>
<th>RKW 78-1600</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter range (mm)</td>
<td>10 - 63</td>
<td>16 - 110</td>
<td>20 - 160</td>
<td>50 - 250</td>
<td>90 - 500</td>
<td>160 - 630</td>
<td>355 - 1200</td>
<td>630 - 1600</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Main layer throughput, max. (kg/h)</td>
<td>240</td>
<td>350</td>
<td>520</td>
<td>700</td>
<td>1050</td>
<td>1300</td>
<td>1700</td>
<td>1850</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Main layer thickness (mm)</td>
<td>1.8 - 10.5</td>
<td>1.8 - 12.7</td>
<td>1.8 - 19.2</td>
<td>1.8 - 30.8</td>
<td>1.8 - 54.7</td>
<td>3.2 - 68.3</td>
<td>7.0 - 68.3</td>
<td>12.3 - 89.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thin layer throughput (kg/h)</td>
<td>10 - 100</td>
<td>10 - 100</td>
<td>20 - 200</td>
<td>25 - 250</td>
<td>25 - 250</td>
<td>35 - 350</td>
<td>42 - 425</td>
<td>50 - 500</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thin layer thickness (mm)</td>
<td>1 - 8</td>
<td>1 - 8</td>
<td>1 - 10</td>
<td>1 - 10</td>
<td>1 - 10</td>
<td>1 - 15</td>
<td>1 - 16.5</td>
<td>1 - 23</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Outer layer adapter for spiral distributor pipehead

<table>
<thead>
<tr>
<th>Type</th>
<th>RKW 31/51/71</th>
<th>RKW 32/52/72</th>
<th>RKW 33/53/73</th>
<th>RKW 34/54/74</th>
<th>RKW 35/55/75</th>
<th>RKW 36/56/76</th>
<th>RKW 37/57/77</th>
<th>No outer layer adapter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter range (mm)</td>
<td>10 - 63</td>
<td>16 - 110</td>
<td>20 - 160</td>
<td>50 - 250</td>
<td>90 - 500</td>
<td>160 - 630</td>
<td>355 - 1200</td>
<td>630 - 1600</td>
</tr>
<tr>
<td>Throughput (kg/h)</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Layer thickness (mm)</td>
<td>0.5 - 2*</td>
<td>0.5 - 2*</td>
<td>0.5 - 2*</td>
<td>0.5 - 2*</td>
<td>0.5 - 2*</td>
<td>0.5 - 2*</td>
<td>0.5 - 2*</td>
<td>0.5 - 2*</td>
</tr>
</tbody>
</table>

*other wall thicknesses on request
With the aid of IPC technology, you not only cool the outside of the pipe with water in vacuum tanks and cooling baths, but also cool the inside of the pipe using air. The gains are especially striking in the production of thick-walled pipes, where standard cooling methods are remarkably inefficient at transporting heat away from the pipe.

The air is sucked centrally through the pipehead and then dissipated to the side (see diagram). This maintains the central infeed of the melt by the extruder.

The IPC system uses ambient air which is sucked through the center of the pipe against the haul-off direction with the help of a side channel compressor or a radial blower. Highly effective heat transfer is achieved by sucking the air through the pipe at high speed. This results in turbulent air flow at the inner wall of the pipe.

The IPC technology can be used with all PO pipe extrusion lines from 110 to 2500 mm in diameter. The internal cooling system is well suited to use in SDR class 26 and below.

**YOUR BENEFITS:**

- Shortening the cooling section by up to 40% saves investment costs and space requirements or increased productivity through output increase up to 60%
- Low cooling water consumption and use of ambient air make for energy-efficient production
- Space-saving central melt feed with no risk of increased pressure build-up
- Continuously active IPC control maintains adequate air suction volume despite changing basic conditions to ensure consistently high product quality
Multi-layer adapters for thin outer layers
KraussMaffei has two different versions to offer for the manufacture of multi-layer pipes. If thicker inner and/or outer layers are required, two or three spiral distributors are fitted coaxially one inside the other, which is both compact and saves space. These spiral distributors are also designed for optimum flow and minimum pressure loss. The inner and outer layer can be fed with one or 2 extruders. When using an extruder, the special coextruder feed enables the layer thicknesses to be varied quickly and easily. These multiple spiral distributor pipeheads cover a diameter range from 10 to 1600 mm with the conventional SDR classes/wall thicknesses.

If thin, functional outer layers are required on a core pipe, special radial spiral distributors can be used as outer layer adapters. Depending on the material, these enable layer thicknesses of up to 2 mm. Two of the layer adapters can be installed, one right after the other, directly on the nozzle connection. Instead of the layer adapters or combined with these, color strip adapters for pipe marking can be installed at the same location. Also available are double stripe adapters, which either produce different color stripes on the pipe or enable a very rapid color change from one pipe type to the next.

YOUR BENEFITS:
- Optimal pipe quality with high production reliability
- Produces pipes with minimal internal stress and low melt temperature
- No weld lines, smooth pipe inner surfaces
- Optimal melt flow through the spiral distributor
- Low pressure losses and low melt temperature
- Ideal melt distribution
- Prevents local stagnation zones
- Wide processing window
- Modular, compact design
- High level of production flexibility
- Easy to install and dismantle

Radial spiral distributor
Combination radial and axial spiral distributor
IMPRESSIVE MACHINE COMBINATION
SINGLE-SCREW EXTRUDERS
FOR MANUFACTURING
MULTI-LAYERED PIPES
The outstanding product properties of pipes made from modified polyolefins or cured polyethylene make them genuine all-rounders in heating applications in floors, walls, ceilings and other surfaces.

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 offers the right solution, specially tailored to your needs. All KraussMaffei extruders guarantee the highest outputs with optimum 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.

A sophisticated 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

<table>
<thead>
<tr>
<th></th>
<th>KME 45-36 B/R</th>
<th>KME 60-36 B/R</th>
<th>KME 75-36 B/R</th>
<th>KME 90-36 B/R</th>
</tr>
</thead>
<tbody>
<tr>
<td>PE-Xb single-stage process</td>
<td>100</td>
<td>150</td>
<td>210</td>
<td>280</td>
</tr>
<tr>
<td>PE-Xb dual-stage process</td>
<td>150</td>
<td>240</td>
<td>325</td>
<td>435</td>
</tr>
<tr>
<td>PE-Xc</td>
<td>200</td>
<td>295</td>
<td>400</td>
<td>510</td>
</tr>
<tr>
<td>PB/PB-R</td>
<td>135</td>
<td>200</td>
<td>270</td>
<td>345</td>
</tr>
<tr>
<td>PE-RT</td>
<td>225</td>
<td>330</td>
<td>450</td>
<td>575</td>
</tr>
<tr>
<td>PP-R</td>
<td>180</td>
<td>290</td>
<td>410</td>
<td>565</td>
</tr>
</tbody>
</table>

**Single-screw extruder KME 60-36 B/R**

**KM 2L-RKW sheathing pipehead 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 Systems

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

PB-H / PB-R pipes
- Specially matched process 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 fiberglass-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
- Glass fiber
- 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 layer 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
Overall concept for continuous production of insulated pipes consisting of 2 partial systems:
- Production of the inner pipe (of PE, PE-X or PE-RT)
- Encapsulation of inner pipe (in-line process) with polyurethane and polyethylene sleeve

Your Benefits:
- Minimum overweight thanks to low tolerances for wall thickness and diameter
- Significant material cost 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 paired with high product quality
Surface regulation systems can be used in different installation systems: From exclusive residential buildings or commercial offices to highly frequented industrial buildings.

Thanks to the ongoing further development of materials and systems, energy-saving and efficient surface regulation systems are available today. Thanks to 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 stringent 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. You will find all the information on installation here.

### Technical data

<table>
<thead>
<tr>
<th></th>
<th>PE-RT</th>
<th>PE-Xb</th>
<th>PB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density g/cm³</td>
<td>0.94</td>
<td>0.938 - 0.945</td>
<td>0.914 - 0.92</td>
</tr>
<tr>
<td>Thermal conductivity W/(mk) at 60°C</td>
<td>0.38</td>
<td>0.36 - 0.45</td>
<td>0.22</td>
</tr>
<tr>
<td>Temperature, max. °C</td>
<td>90</td>
<td>95</td>
<td>95</td>
</tr>
<tr>
<td>Operating temperature, max. °C</td>
<td>70</td>
<td>70</td>
<td>70</td>
</tr>
<tr>
<td>Bending radius 5 x D</td>
<td>5 x D</td>
<td>5 x D</td>
<td>5 x D</td>
</tr>
</tbody>
</table>
The exceptional properties of pipes made of cross-linked PE or materials such as PE-RT, PP-R or PB-R make them impressive. They are more resistant to mechanical stressors, thermal influences and chemicals.

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