

# System solutions from a single source

## Systems for producing flexible polyurethane-insulated pipes

One of the major worldwide trends is "efficiency". KraussMaffei Berstorff offers an outstanding example from the world of extrusion technology: Systems for continuous production of polyurethane-encapsulated pipes for the transportation of hot or cold media.

The polyurethane-encapsulated pipes are not only much more compact, more flexible, more leakproof and easier to lay. They are, thanks to an energy-efficient production process with a high degree of automation, also considerably more cost-effective than conventional pipes and are used especially wherever the medium to be transported has to be protected against thermal environmental influences such as heat or cold.



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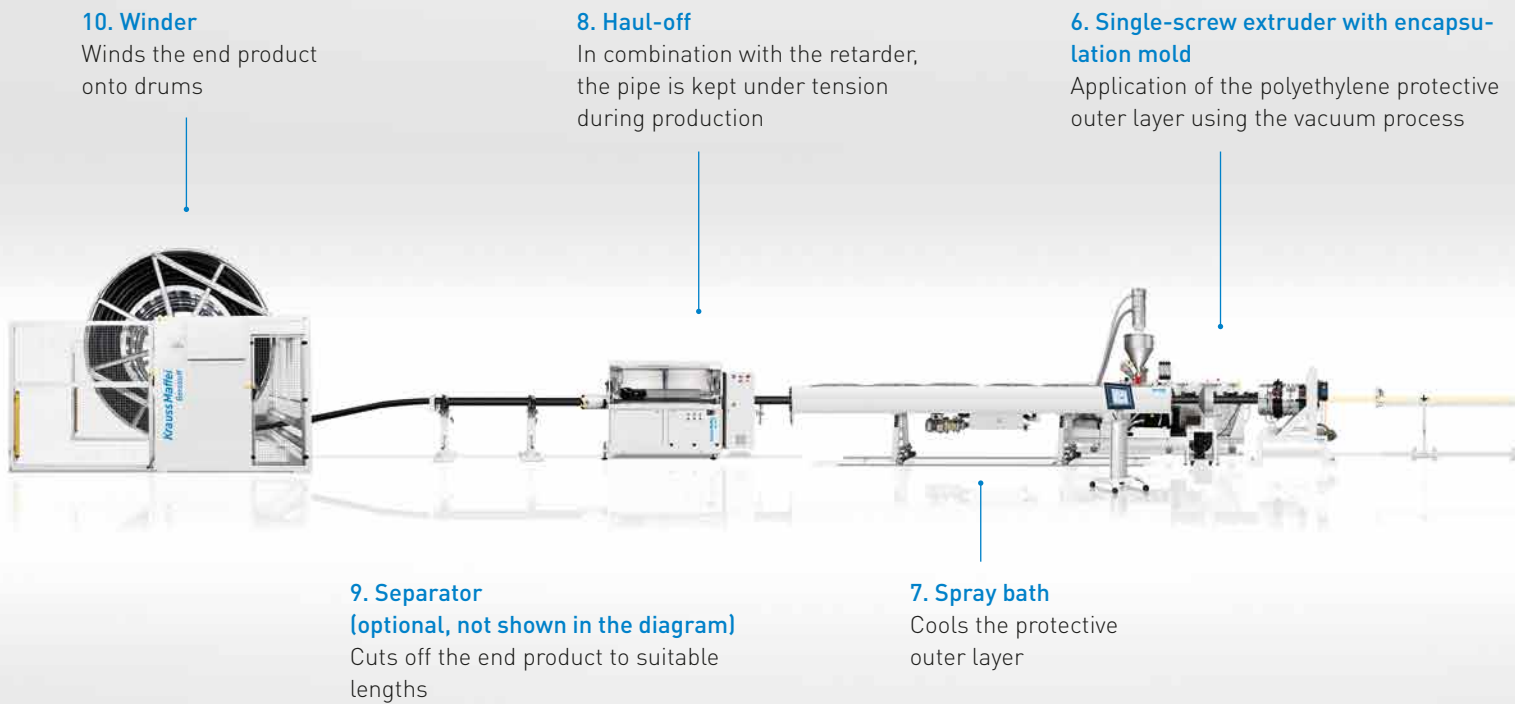
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*Engineering Value*

***Krauss Maffei***  
***Berstorff***

# Impressive machine tour

## All components in a complete system are perfectly coordinated



#### 4. KraussMaffei polyurethane metering machine with mixing head and day tanks

Intermediate storage, processing, feeding and homogeneous mixing of polyol, isocyanate and any other components

#### 2. Prewarming station

Prewarms the media pipe

#### 5. Foam-contouring unit

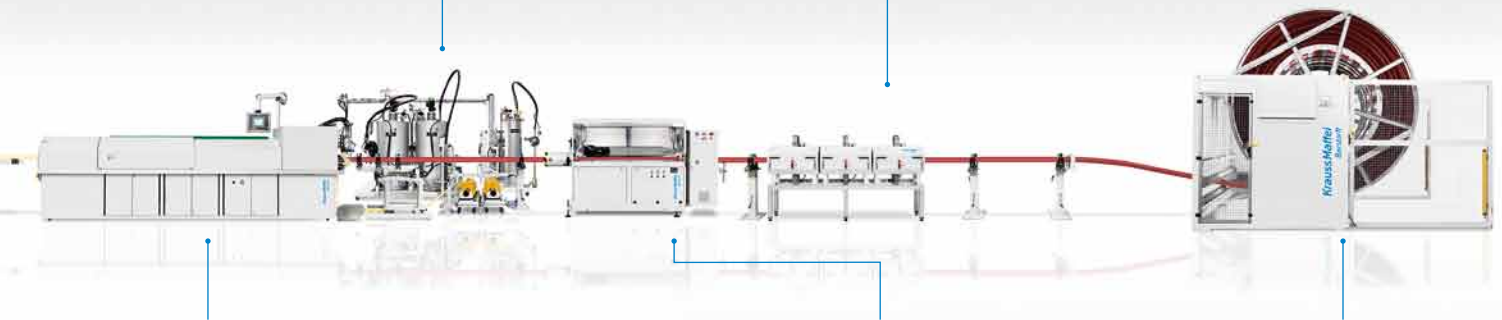
Rotating aluminum half shells synchronized with the production speed define the external diameter of the polyurethane foam during the chemical reaction. A film unwinding station is at the intake of the foam-contouring unit. The film serves as a separator between the polyurethane foam and the aluminum half shells. The film is pulled into the required shape by means of a so-called forming shoulder

#### 3. Retarder

In combination with the haul-off, the pipe is kept under tension during production

#### 1. Unwinder

Unwinding of one or two media pipes from drums



Extrusion direction



KraussMaffei polyurethane metering machine with mixing head and day tanks



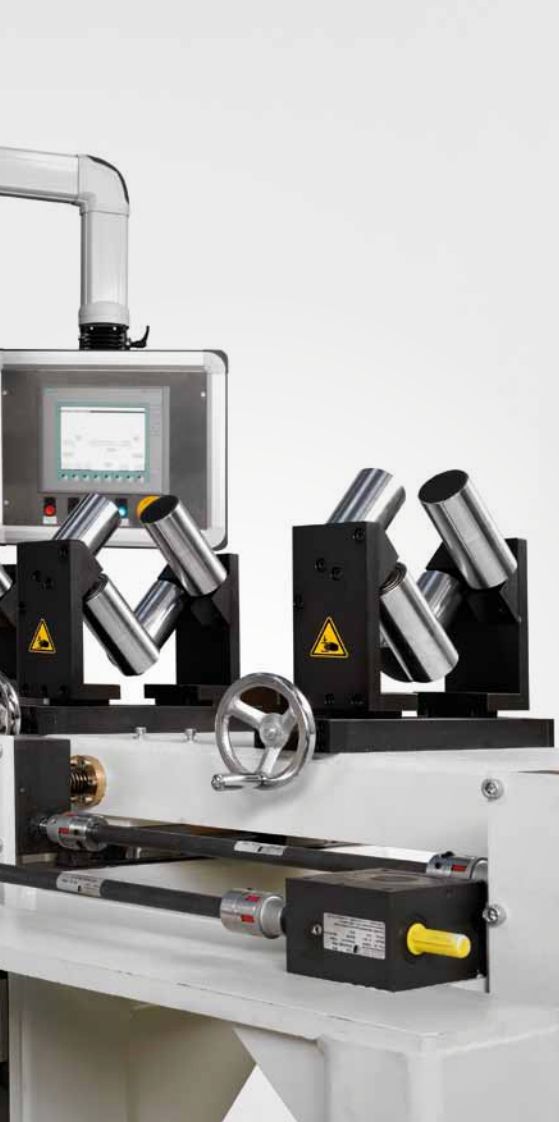
Part view: Foam-contouring unit with pipe centering station and film feed

## Your system supplier Systems for encapsulating pipes

Due to a large number of advantages compared with other materials, plastic pipes are gaining more and more acceptance in everyday life. Plastic pipes with several functional layers are also being used to an increasing extent for special applications.

As part of the global efforts to reduce energy consumption and CO<sub>2</sub> emissions, substantial growth rates are expected in the area of insulated plastic pipes. The increasing use of waste heat in generating electricity will therefore undoubtedly lead to a significant expansion of the district heating supply system (combined heat and power - CHP). A positive effect which protects the environment by using waste heat and also produces economic advantages and creates jobs.

Due to the outstanding insulation properties, polyurethane-insulated pipes will benefit in particular from the imminent changes. Whenever there is a need to transport a medium whose temperature differs from the ambient temperature, conventional pipes will be replaced in future by insulated pipes. In order to minimize transport and network losses, rapidly increasing demand for isolated pipes can be expected, particularly in the areas of district heating and district cooling.



Single-screw extruder KME 90-36 B/R

### Functional principle of the production system:

In its capacity as a system supplier, KraussMaffei Berstorff provides complete integrated system concepts for the production of polyurethane-insulated pipes. We offer the know-how for producing polyurethane-encapsulated pipes in a very economical process.

### The complete production line consists of two subsections:

#### Conventional extrusion system for producing the media pipes

- Diameter of the media pipe: 20 – 110 mm\*
- Depending on the application, the media pipe is made of PE, PE-X, PE-RT or PB
- Production speed is up to 40 m/min

#### System to encapsulate one or two media pipes in polyurethane and to coat with polyethylene

- Diameter of complete pipe: 75 – 180 mm\* (depending on the media pipe and insulation layer)
- Production speed is up to 5 m/min

As an optional extra, the media pipes can be covered with a barrier layer and the polyurethane insulation with a barrier film. This ensures maximum and permanent insulation of the entire pipe bundle. On request, measuring wires can also be integrated in the pipe bundle to monitor leaks.

\* Different diameters on request

## Polyurethane-insulated pipes Application examples from practice

Polyurethane insulation reduces the thermal conductivity of the complete pipe. The medium to be transported is protected against thermal environmental influences such as heat or cold.

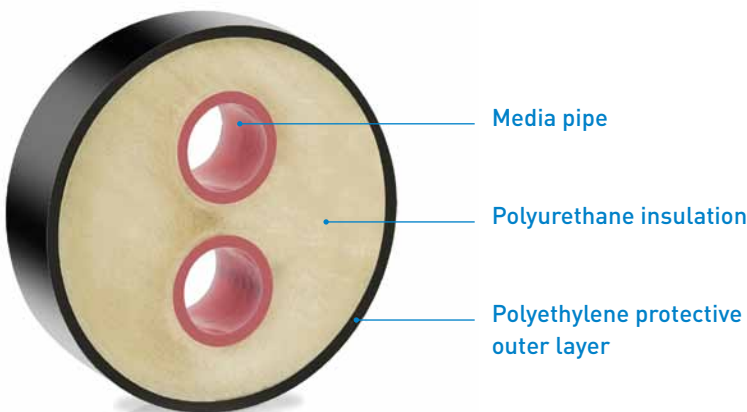
Due to their excellent insulation properties, polyurethane-encapsulated pipes are used in particular as district heating lines (insulation of a hot medium against cold) and also in cooling networks (insulation of a cold medium against heat). They are used in many different ways in regions such as Europe (especially Russia), the Middle East, Asia and North America.

### Other application areas:

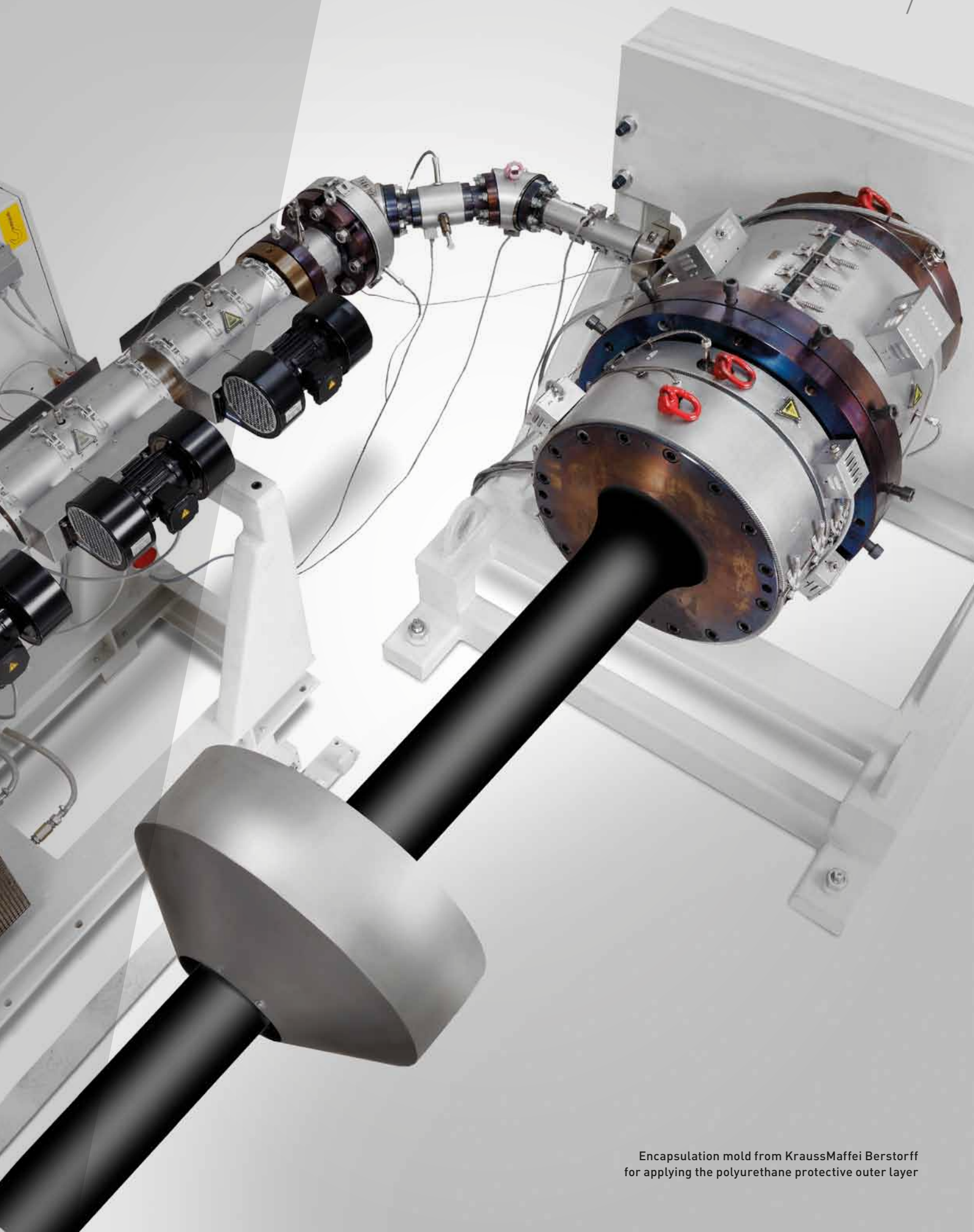
- Geothermics
- Frost-proof drinking water pipes
- Frost-proof laying of pipes on bridges
- Baths and swimming pools

### Your advantages:

- Production of almost unlimited pipe lengths
- Economical production due to a high degree of automation
- Low costs for installing the pipes and connection systems due to large pipe lengths and flexibility of the complete pipe
- High production reliability and long production cycles
- Minimum wear to all system components
- Perfect product quality leads to competitive advantages: Realization of very low thermal conductivity values in the range from 0.020 to 0.030 W/MK (depending on the utilized polyurethane components)
- Perfect homogenization of the two polyurethane components - polyol and isocyanate
- Extremely low heat losses and high flexibility of the entire pipe bundle
- Longitudinal impermeability of the pipe system
- Minimized joints reduce the risk of leaks or thermal bridges
- Turnkey project management by KraussMaffei Berstorff's specialists



Structure of a polyurethane-insulated pipe



Encapsulation mold from KraussMaffei Berstorff for applying the polyurethane protective outer layer