PROFIT FROM THE EXPERTISE OF A SYSTEM SUPPLIER

Complete lines for pipe extrusion
KraussMaffei is a premium partner for the plastics and rubber processing industries worldwide.

Whatever you aim to achieve in plastics or rubber processing, KraussMaffei is your partner. We are the only company with intensive expertise across the three main engineering fields. And we have a strong track record in integrating this expertise to develop new processes and systems.

**Ready for any challenge**

Our Injection Molding Machinery Division supplies machinery and systems from 35 to 4,000 tonnes for standard applications and for all processing variants, together with fully automated solutions. We have a strong customer base in all the relevant industries worldwide.

Our Reaction Process Machinery Division supplies machines and complete systems for processing polyurethanes and other reactive materials. Completing our product portfolio, Automotive Component Systems supplies foam molds, cutters and routers. Our customer base is wide, with a focus on the automotive, construction and white appliances industries.

Our Extrusion Technology Division supplies machinery and systems for compounding, for pipe, profile and sheet extrusion, physical foaming, and the production of technical rubbers and intermediates for tire production. Machinery from the company’s range – from single extruders to complete extrusion lines – is used in many industries, including chemicals, pharmaceuticals, automotive, construction, furniture and packaging.

**People for Plastics**

We are the “people for plastics”. We are your partners from the first exploratory discussion, through development to commissioning, servicing and operating your system, and final disposal. At all times, you are assured of outstanding competence in planning and engineering, as well as reliable and fast spare parts, service and support.

**Adding value for customers**

We put our expertise to work for your success. With machine ranges engineered for modularity, we can deliver application-specific solutions based on our wide range of standard modules and specially engineered solutions. This strategy offers customers technical and cost advantages.

**Close to customers around the world**

As an international company, KraussMaffei has a presence in all the major markets for the plastics and rubber processing industries and employs around 3,000 people worldwide. Our sales and service network keeps us close to all our customers around the world.
As a system supplier, KraussMaffei Berstorff supplies pipe extrusion lines that will boost your flexibility and support your drive to supply top-quality products at competitive prices.

Whether you’re processing PVC or PO, KraussMaffei Berstorff has everything you need for producing plastic pipe from 5 mm to 2400 mm diameter – including automation components to maximize material savings.

Our product portfolio covers single-screw extruders, counter-rotating and corotating twin-screw extruders, pipeheads and all downstream components, supplied either separately or as complete extrusion lines with any level of automation. All our components and automation systems are engineered to maximize savings on materials, energy and costs, without compromising on product quality. We are your expert partner for any type of pipe extrusion line.
Meet the machine: take a tour of a high-performance pipe extrusion line

**Socket-forming machine**
For bonded, O-ring and pressure pipes in standard and high-performance versions for PVC and PP pipe

**Parting unit**
Chopping saw, planetary saws and non-swarf cutters for cutting all thermoplastic pipe to length

**Haul-off**
Belt haul-offs, double caterpillar haul-offs, multiple caterpillar haul-offs
Single-screw extruder
For PO, with spiral distributor pipehead

Spray bath
with high-performance cooling
Spray bath and vacuum tank with flexible design for perfect integration in the extrusion line

Vacuum tank
State-of-the-art, easy to operate and service, multiple options for highest quality

Calibration systems
For PVC, PO and engineering plastics, sleeve or diskpack calibrators, or a fully automated QuickSwitch solution
KraussMaffei Berstorff configures and supplies complete, conventional and fully automated production lines, from extruders and pipe dies to downstream and automation components and all peripherals.

**Application-specific, proven line components**

Our extruders, dies, calibration units and downstream are proven components tailored to your requirements. All downstream components, such as vacuum tanks, spray tanks, haul-offs, cutters, socket machines and add-ons are engineered for maximum interoperability. The automation components are reliable, operator-friendly and easy to maintain. All control and monitoring functions are fully implemented in the extruder’s modular control system. The result: KraussMaffei Berstorff systems give you maximum output coupled with maximum flexibility and maximum material savings. We also supply a range of optional add-ons:

**Fully automated add-ons**

- Seal ring insertion robots
- Pipe hoist and pipe rotating units
- Bundlers
- Palletizers

**Other add-ons**

- Mixers
- Material feed systems, weighing and metering equipment
- Screen changers
- Melt pumps
- Wall thickness and diameter gauges
- Markers
- Winches as start-up aid
- Pipe bending machines
- Thread-cutting machines
- Shredding and grinding systems

**Automatic winding systems**

Single and twin winders for polyolefin pipe up to 160 mm diameter
Extruders from KraussMaffei Berstorff – performance for your pipe extrusion line

Twin-screw and single-screw extruders from KraussMaffei Berstorff are the powerful heart of your pipe extrusion line. Our extruders are engineered as modular systems with integrated control cabinets and operator panels. Modularity means we can always supply an extruder tailored to match your specific application and market requirements. With a KraussMaffei Berstorff extruder, you can be sure of high product quality, constant high output and the lowest possible material consumption.

36D twin-screw series
The 36D twin-screw extruders with their HPG (High Performance Geometry) screw concept are ideal in every way for producing U-PVC and M-PVC pipe, foamcore PVC pipe and PVC-O pipe. The HPG screw design incorporates an effective preheating length with an extended output and mixing zone. The whole length of 36 L/D can be used for processing the PVC compound. This is very advantageous for processors, because it allows very great flexibility to process a many different formulations – always with maximum output and a perfectly homogenous melt. The HPG screw concept reduces process fluctuations to an absolute minimum – for all types of PVC pipe formulation.

36D single-screw series
Our 36D single-screw extruders are designed for extremely cost-effective PO pipe production.
They combine very high output with premium pipe quality. The processing unit is engineered for flexibility, allowing high-performance screws to be matched to the raw material. All extruders are fitted with a high-performance U-shaped gear system and a flexible drive concept (AC or DC motor) for maximum versatility.

**Material savings cut manufacturing costs**

Controlling costs is a high priority in pipe extrusion. Competition is fierce and profit margins are narrow, with the price of extruded pipe often scarcely higher than the cost of the raw material. Keeping material consumption as low as possible is decisive in reducing costs and increasing profitability. KraussMaffei Berstorff extruder systems are unrivalled in their ability to get the most pipe out of the least material while maintaining consistent quality. How do they do it? For a start, by keeping wall thicknesses within extremely tight tolerances. This can be achieved only by a sophisticated control system capable of capturing and reacting to sensor data from the whole extrusion line. All the modules and automation components of our pipe extrusion lines are engineered to minimize material consumption and maximize pipe quality.

**Design of the cooling zone**

*(vacuum tanks [VT] and spray baths [SB]*)

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<td><strong>Total cooling length:</strong> 45 m</td>
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Pipe diameter/wall thickness: 225 x 20.5 mm
Line speed: 0.8 m/min
Distance VT-SB: 1.5 m
Distance SB-SB: 1.5 m
Total cooling length: 45 m

*Tailored to individual production requirements*
Twice the throughput with double-strand extrusion

Higher extruder performance will increase your profit margins as long as other costs are carefully controlled. The initial capital investment for a modern, high-performance extruder line is higher, but space requirements and labor costs are unaltered. A KraussMaffei Berstorff double-strand extruder is a good example. Pipe throughput is often constrained by the die pressure, the calibration system or the haul-off speed. Double strand extrusion doubles the extruder’s throughput of small-diameter pipe. Adjusting the haul-off speed and the cutter function separately for each strand cuts material consumption to an all-time low, because differences in material flow can be allowed for and wall-thickness kept within tight tolerances. Double-strand systems are available for diameters from 12 to 160 mm.

We are making extrusion lines even more cost-effective by developing innovative systems such as QuickSwitch. An automated QuickSwitch system allows push-button dimension change for PVC and PO pipe production, without stopping the extrusion line. Other processes that reduce material costs include high-precision gravimetric throughput monitoring and control, ultrasonic wall-thickness measurement, direct extruders for economical production of highly-filled PP pipes, 36D twin-screw extruders for production of highly-filled PVC pipes with a chalk content of up to 60 phr. In addition, we can configure special systems for special pipes that often command a higher price in the market than standard products.
KraussMaffei Berstorf acts as a system supplier by entering into collaborative ventures with various providers. This gives you access to a comprehensive product portfolio and to complete systems for all kinds of pipe extrusion.

**Many different pipe technologies: overview of the benefits**

To make **corrugated pipe** the extruded tube of melt is shaped by a vacuum calibration sleeve as it is drawn through the corrugator. The result: lightweight flexible pipes and low material consumption. **Steel-reinforced (SRP) pipe** is made in a two-stage process. It is notable for its flexibility, long service life, low weight, simpler handling than steel and concrete pipe, and low material consumption. **Metal composite pipe** is produced continuously in-line. It consists of several layers and offers excellent diffusion tightness, high dimensional stability and high compressive strength. **Crosslinked PE-X pipe** is stable in contact with hot water and has good resistance to aging and stress cracking. **RTP pipe** has a core layer of fiber-reinforced tape for high compressive strength and use in the oil industry.

**Wound pipe** is made by winding an extruded profile inside a steel winding drum. It is flexible and lightweight and offers considerable material savings. **PO multilayer pipe** is made using spiral distributor pipeheads, multilayer adapters and crossheads. Different coextruder variants with processing lengths of 25, 30 and 36 L/D can also be used for thin outer layers and marking stripes. The benefits vary with the material, but include diffusion tightness, dimensional stability and high compressive strength.

**PVC foamcore pipe** is made as a multilayer pipe on a pipehead with three flow channels. It is lightweight and reduces material consumption. KraussMaffei Berstorf supplies complete lines for producing coextruded foamcore pipe with outside diameters of 32 to 500 mm. These normally use two or three extruders. In a 3-extruder configuration, the outer and inner layers are produced by two smaller coextruders. This is the recommended configuration whenever minimal wall-thickness variation is required for the compact inner and outer layers. This pipe can be made up to 25-30% lighter than compact PVC pipe if a C5 control system is installed in the line.
DETAILED PRODUCT INFORMATION

The C5 control – one of the most advanced control and monitoring systems in the industry

Centralized control of the extrusion line
Meeting tough specifications for product quality and output demands a stable, reliable production process. This is where the C5 control system scores. As one of the most advanced systems in the industry, it offers dependable technology and intelligent functions for centralized control and monitoring of extrusion lines. For the operator, the C5 ensures optimal set-up and start-up, and a clear, consistent overview of the production process. Monitoring and control is facilitated by efficient visualization of the status of different extrusion line components on a series of screen pages. Central synchronization of the whole line, including multiple extruders, is fast and simple. The operator panel allows direct intervention in the operation of all key elements in the extrusion line. The current operating status of the whole line is always displayed, together with a customizable selection of seven actual parameters. Prompts and alarm messages flash up in your chosen language. The C5 offers extensive documentation options and easy connection to a host computer. The standard design features an integrated operator panel; swivel-mounted or mobile panels are offered as options. The swivel-mounted panel, for example, enables the operator to run the whole line from a position near the die.

Mobile operator panel (option)  Swivel-mounted operator panel (option)  KraussMaffe Berstorff standard operator panel: integrated in the control cabinet
KraussMaffei Berstorff pipe extrusion systems are just as unique as your own requirements.

No matter what kind of pipe you’re making – smooth or corrugated, single or multilayer, big or small, PVC or PO – KraussMaffei Berstorff pipe extrusion systems keep all your options open.

- Drinking water pipe
- Sewage pipe
- Irrigation pipe
- Drainage pipe
- Hot water and heating pipe
- Cable conduits
- Gas pipe
- Multilayer pipe
- SRP pipe
- PE-X pipe
- RTP pipe
- Coextruded pipe with different combinations of materials, eg, PVC foamcore pipe
- Aluminum composite pipe
- Highly-filled pipe
- PUR-insulated pipe
- Sheathing for steel pipe
- Microduct bundle as conduit for fiber-optic cable
- Extra-large pipe up to 2400 mm

As your single-contact partner, we will supply machinery and customized extrusion lines for every type of pipe. KraussMaffei Berstorff is a system supplier for production lines and systems that deliver all the ingredients for success: maximum flexibility, minimal material consumption and outstanding product quality. Take advantage of our experience as a technology leader and innovative system supplier and our ability to deliver an optimized solution for your business.

**Your benefits at a glance:**

- High-performance, rugged drive system for single- and twin-screw extruders – low-maintenance and a long service life
- Constant, high output at low screw speeds
- Outstanding, uniform product quality
- Cost-effective and flexible production
- Excellent price/performance ratio
- First-class machines and complete systems from a single vendor – an investment that pays dividends
PRODUCTS AND APPLICATIONS

Different pipes for diverse applications

1. Direct-extruded, highly-filled three-layer pipe
2. Aluminum composite pipe
3. Two-layer, corrugated PP pipe
4. Multilayer PE pipe
5. PE-X with PUR foam insulation
6. Crosslinked PE-X pipe
7. Socketed PVC pipe
8. PVC foamcore pipe
9. PP-R pipe, glassfiber-reinforced core layer
10. PE drinking water pipe
11. Telecommunication conduit bundle with seven microducts
12. Extra-large PE pipe 2500 mm diameter
Rely on us for a fast and competent response to all your service needs anywhere in the world. Whatever you need – from troubleshooting and training to spares or repairs – we’re on the job.

We’re dedicated to supplying service quality on a par with the outstanding quality of our machines and systems. We offer far more than spare parts and hotlines. We’ll work with you to choose the best and most cost-effective solution for your operation. We’ll help you test new applications and we’ll plan customized service packages.

**All-round service**
Our service offering is broad. We’ll configure your system, install and commission it, train your staff, plan measures to minimize your downtime risk and maximize productivity, and carry out maintenance, repairs and upgrades. You’ll find us fast, reliable and competent. Our hotline is manned by highly-trained and experienced service technicians. If necessary, we’ll get a technician to you quickly. Remote diagnosis, interfacing directly with your machine’s control system, can be a practical alternative. Spares for all important wear parts are available at short notice. We’re continuously expanding our service network to speed up spare parts shipment. Talk to us about the right service solution for your business.

**Customer trials and prototyping in our test lab**
The Extrusion Division operates a test lab fitted with the latest machinery and equipment. We can run trials, produce prototype parts and fine-tune processes on your behalf. We can work with you to test and evaluate processes, machines and equipment in order to identify the best approach for a particular project. Our highly-qualified application engineers are there to help you.

**Training with high hands-on content**
Courses are held in our lab and training centre, or, optionally, on your premises. We offer clearly-structured basic and advanced training in operation, process control and maintenance for KraussMaffei extrusion systems. On request, we’ll plan and hold special courses on topics of your choice. All participants spend a high proportion of their training working hands-on with original KraussMaffei machines. A well-structured training program produces skilled operators and technicians, which will positively impact your up-time and productivity.
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KraussMaffei is a premium partner for the plastics and rubber processing industries worldwide. KraussMaffei machines and systems are used wherever plastics and rubber are converted into products. As a knowledge-driven technology company, we build on many decades of experience and a strong commitment to research and development.

With the KraussMaffei Berstorff brand, the whole world of pipe extrusion is open to you. As a system supplier, we offer a comprehensive range of products, from single-screw extruders, counter-rotating and corotating twin-screw extruders, pipeheads and downstream components through to fully automated pipe extrusion lines. All our components and automation systems are engineered to maximize savings on materials, energy and costs without compromising on product quality. We are your expert partner for single-vendor, custom systems for every type of pipe. Take advantage of our experience as a technology leader and innovative system supplier and our ability to deliver an optimized solution for your business.