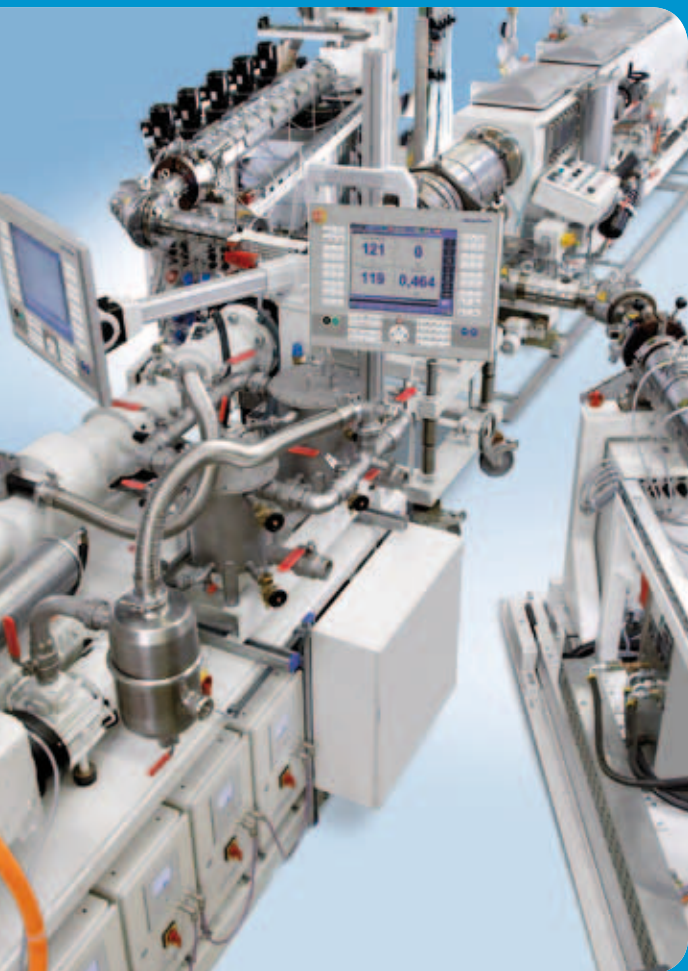


KraussMaffei

Berstorff



THINKING IN SYSTEMS

Extrusion technology for plastics and rubber products.



IN PARTNERSHIP WITH INDUSTRY

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.

Supplying solutions for any application

By integrating the extrusion operations of KraussMaffei and Berstorff in the single KraussMaffei Berstorff brand, we have strengthened our position as a system supplier capable of offering single-vendor solutions for all the main plastics and rubber extrusion processes.



The 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. Our machinery – from single extruders to complete extrusion lines – is used in many industries, including chemicals, pharmaceuticals, automotive, construction, furniture and packaging.

Thinking in systems

We are your partners from the first exploratory discussion, through development to commissioning, servicing and operating your system. At all times, you are assured of outstanding competence in planning and engineering, as well as reliable and fast spare parts delivery, service and support. 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. As an international company, we have 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.

THE POTENTIAL OF EXTRUSION

Performance you can depend on



Dr. Hans Ulrich Golz
Managing Director

What extrusion systems can do today would have been unimaginable only a few years ago. And the trends towards ever more differentiated applications and new and more cost-efficient processes are gaining momentum. They are driven by the need to produce ever better products and to keep a tight grip on manufacturing costs. The building industry is just one sector where pioneering innovations have revolutionized the market in recent years. With a wealth of new products and international patents, KraussMaffei Berstorff has been at the cutting edge of new development.

In this climate of rapid change, KraussMaffei Berstorff's extrusion division, with our highly qualified and experienced staff, is a force to be reckoned with. In close cooperation with our customers, we develop practical and innovative machines and processes that set standards in the industry. They give our customers the reliable processes and the performance bonus they need for a stronger competitive edge in their globalised markets. And your success is our success!



Manfred Reichel

Our aim is to become the preferred system partner for our customers worldwide. To this end, the extrusion division is steadily expanding its network of sales and service centres outside Germany. We are there for our customers all over the world. We guarantee a fast and efficient response to their problems and queries and offer high-quality service and consulting. We are committed to becoming technology leaders not merely by supplying excellent machinery and systems, but also through delivering outstanding process stability, competitive advantage and local presence for our customers. We strive to build long-term relationships with our customers – from advice on the best system configuration right through to cooperative development of complex and innovative production systems.

This brochure will give you an overview of our range of innovative extrusion solutions for any type of application. It will also give you an idea of the services we offer. Find out what you can expect of KraussMaffei Berstorff as a full-service systems supplier.



The world's largest single-screw extruder for melt degassing

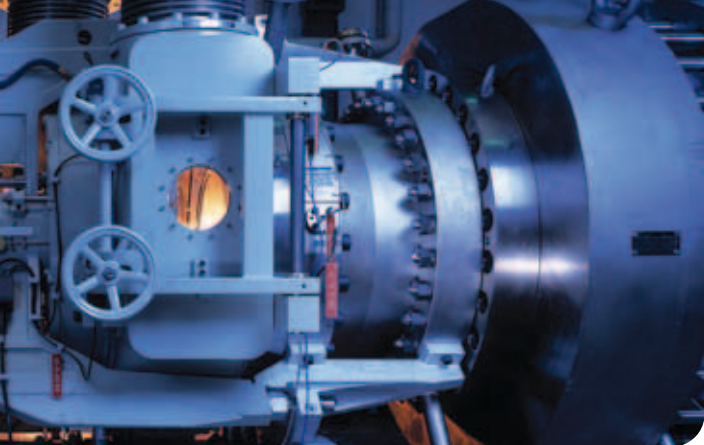
PLASTICS TECHNOLOGY

Single-screw extruders from 250 mm to 800 mm screw diameter

KraussMaffei Berstorff builds single-screw extruders for mixing, degassing and compounding. The KE 800 extruder with a screw diameter of 800 mm is the world's largest single-screw extruder. In LDPE synthesis for melt pellet conversion, throughput rates of up to 74 tonnes per hour are achieved. One key step in compounding is the degassing of hydrocarbons and other volatile matter from the melt. This reduces the need for post-treatment of the pellets in silos and protects the environment.

Pelletising systems

KraussMaffei Berstorff underwater pelletizers have proven their value as compact and efficient



Underwater pelletizer with throughput rates of up to 74 tonnes per hour

downstream units. Together with our single-screw extruders they form a system for compounding thermoplastics.

Areas of application for KraussMaffei Berstorff pelletisers include:

- polyolefin production (LDPE) with throughput rates of up to 74 tonnes per hour
- polypropylene compounding with filler content of 50 % and more.

KraussMaffei Berstorff Single-Screw Extruders

Phone +49 511 5702-434

Email: singlescrew-ext.de@kraussmaffei.com

PLASTICS TECHNOLOGY

Compounding systems with twin-screw extruders

Maximum flexibility for high product quality

KraussMaffei Berstorff ZE compounding systems are engineered to meet the specific requirements of the products and processes as if tailor-made. Based on our comprehensive process expertise, drawn from all the key areas of application, and its design skills as experienced mechanical engineers, KraussMaffei Berstorff can offer customers extrusion systems that are adapted precisely to their formulations and processes, for example for

- incorporating reinforcing agents and fillers, such as glass fibers, talc, carbon fibers, calcium carbonate, barium sulphate, etc.
- producing different plastics and plastic-elastomer alloys (eg, TPE)
- homogenizing materials of different viscosities
- reactive modification of plastics
- melting, coloring, stabilizing, homogenizing and pelletizing powdered polymers



KraussMaffei Berstorff ZE UTX for a range of processing tasks

- Extruding biopolymers
- Producing adhesives and hot-melt adhesives
- Continuous synthesis of TPU
- Degassing of volatile components, such as water, monomers, oligomers, solvents
- Concentration of polymer solutions and reclaim of solvents
- Polymerization and recondensation
- Repelletizing regrind and agglomerate, also sheet and fiber scrap
- Compounding regrind, eg, butyl rubber
- Production of masterbatches, such as pigment, flame-retardants, blowing agents and filler concentrates
- Producing natural fiber reinforced plastics

KraussMaffei Berstorff Twin-Screw Extruders

Email: twinscrew-ext.de@kraussmaffei.com



PLASTICS TECHNOLOGY

Application-specific solutions

System expertise in pipe extrusion

As a system supplier, KraussMaffei Berstorff supplies extrusion lines for producing plastic pipe from 5 to 2500 mm diameter – including automation components to maximize material savings. Our product portfolio covers single-screw extruders, counter-rotating and co-rotating twin-screw extruders, pipeheads and all downstream components, supplied either separately or as complete extrusion lines with any level of automation. To maximize savings on materials, energy and costs, without compromising on product quality, we developed flexible extrusion systems such as QuickSwitch for in-line pipe dimension change and direct extrusion to reduce material costs. For coextrusion, we supply application-specific piggyback or tandem solutions. We also supply complete customized systems for the production of special pipe, both standard and complex.



KraussMaffei Berstorff pipe extrusion lines for PE, PP, PP-R and PE-X and corrugated and aluminum composite pipe

Opening up a world of options in pipe extrusion

- 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 in different material combinations, eg, PVC foamcore pipe
- Aluminum composite pipe
- Highly-filled pipe
- PUR-insulated pipe
- Sheathing for steel pipe
- Wound pipe
- Corrugated pipes

KraussMaffei Berstorff Pipe Extrusion

Email: pipe-ext.de@kraussmaffei.com

Foam extrusion lines

KraussMaffei Berstorff plans and builds reliable, high-performance systems for physical foaming. We draw on our extensive expertise in the areas of single- and twin-screw extruders, the latest calculation processes and the test facilities available in the engineering phase.

Depending on the version and equipment, our foam extrusion lines are suitable for processing PS, PE, PP and other high-grade polymers and co-polymers for producing boards, sheets, beads and pipes. Our systems allow environmentally compatible blowing agents to be used.

Areas of application for foam products produced on KraussMaffei Berstorff systems:

- Foam tubes and profiles:
Insulating tubes for heating and air conditioning systems, edge protector profiles in the furniture industry, fun products for swimming pools.





KraussMaffei Berstorff Schaumtandex lines for the production of insulating tubes and XPS boards

- **Foam sheets:**
Sound-proofing, insulation of walls and ceilings for the construction industry, packaging film, food trays, thermal packaging of medicines, lid seals for glass containers, microwave-safe food packaging for the packaging industry, graphic boards, automotive applications.
- **Foam boards:**
For areas subject to pressure and humidity, for example for insulating cellar walls and floors. Non-foamed minigranulate (EPS) for processing to packaging and insulation.
- **Beads:**
High-grade, foamed pellets (EPP) for the efficient production of high-quality re-usable packaging, elastic impact protectors for cars and technical products for industrial applications.

KraussMaffei Berstorff Foam Extrusion Lines

Email: foam-ext.de@kraussmaffe.com



Single- and double-strand profile extrusion lines

PLASTICS TECHNOLOGY

From single machines to complete production lines

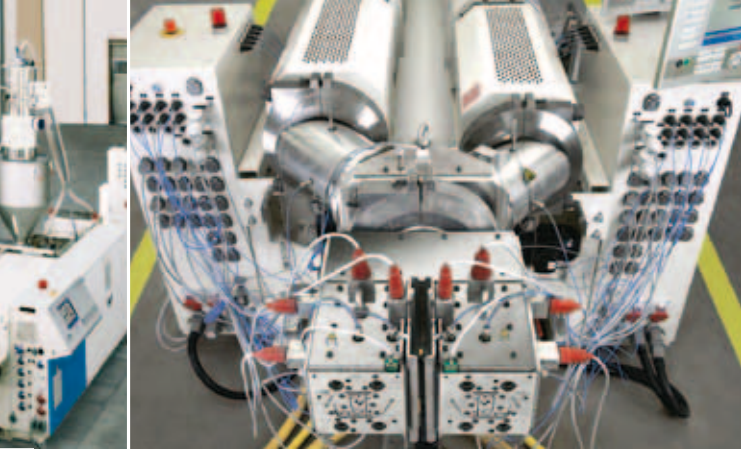
Flexibility in profile extrusion

Our product portfolio for high-performance profile extrusion ranges from 32D conical and parallel twin-screw extruders to single-screw extruders with or without degassing systems. We also supply coextruders for integrated extrusion systems in piggyback or tandem configurations.

We also offer parallel twin-screw extruders for standard applications in the medium output range.

Apart from single machines, we also supply application-specific solutions for high-performance extrusion, for flexible output of window profiles and for production of small or medium-sized technical profiles.

KraussMaffei Berstorff offers single machines and complete profile extrusion lines as single-vendor solutions for the profile extrusion industry.



Double-strand extrusion for regrind-core profiles, with two twin-screw extruders in a tandem configuration

The world of profile extrusion at a glance

- Main and auxiliary window profiles
- Coextruded window profiles
- Expanded profiles
- Door systems
- Roller shutter systems
- Window sills
- Guttering
- Cable conduits
- Technical profiles
- WPC/NFC profiles
- Siding solutions

KraussMaffei Berstorff Profile Extrusion

Email: profile-ext.de@kraussmaffe.com

PLASTICS TECHNOLOGY

Film and sheet extrusion systems

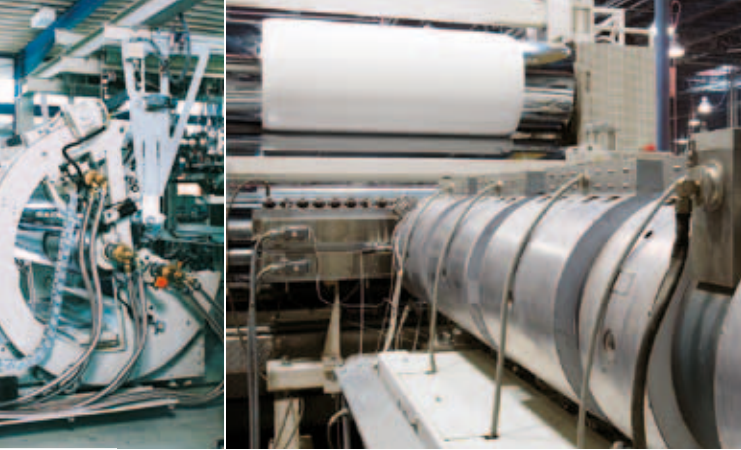


PlanetCalander – flexible polishing stack for producing optical-grade sheet

This is KraussMaffei Berstorff's response to the demand for the cost-effective production of plastics film and sheets, using complete systems that KraussMaffei Berstorff plans and implements from start to finish. These systems are specially adapted to your production concept – from raw material handling to the winding of the sheets. Depending on the application, our systems are equipped with a single- or twin-screw extruder, and with a polishing stack either with fixed rolls or with the patented PlanetCalander®. Extrusion lines with twin-screw extruders from KraussMaffei Berstorff are characterised by their long service life, high throughput rates and in-line compounding, increasing the cost-effectiveness of the entire process. KraussMaffei Berstorff lines supply films and sheets that are subsequently processed to a wide variety of everyday products.

Typical products made from thermoforming sheets are:

- yoghurt or ice cream cups, margarine tubs or plastics milk bottles, ready-meal or microwave trays as well as hot and cold drinks cups
- blister packaging and flower pots.



Extrusion line for the production of coextruded PVC foam sheet

Typical products made from engineering sheets are:

- automobile film for car interiors
- decor veneers for furniture
- various sheets for civil engineering.

Typical products made from plastic sheet are:

- optical-grade sheet
- sheet for applications in the chemicals industry and for container construction.

Typical products made from sheet with fabric reinforcement:

- roofing sheet
- sheet for lining swimming pools and ponds, for sealing rainwater reservoirs and waste dumps and for lining foundations
- floor coverings.

Typical products made from PVC or PO sheet:

- casings
- window and door panels, door systems
- trim- and billboards
- corrugated sheet

Krauss Maffei Berstorff Film and Sheet Extrusion Lines

Email: sheet-ext.de@kraussmaffe.com



Quadroplex system with hydraulically adjustable head

RUBBER TECHNOLOGY

Rubber extrusion technology

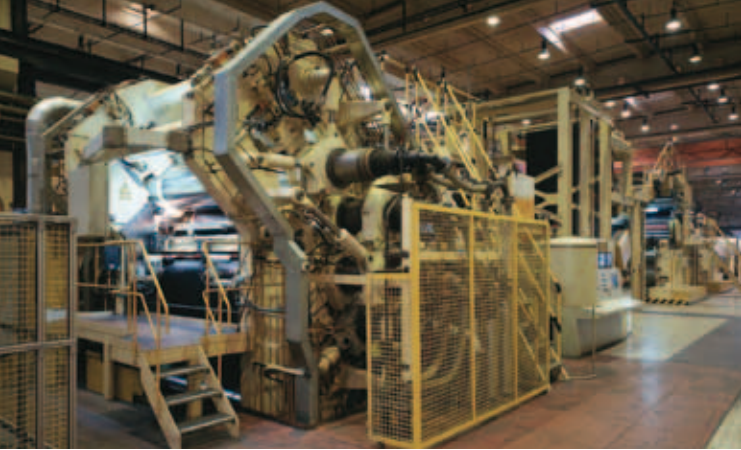
KraussMaffei Berstorff offers the right process technology for any rubber product.

Typical areas of application of our rubber extruders are:

- extrusion of profiles and hoses
- extrusion of intermediates for tire production
- production of webs and sheet, eg, for conveyor belt cover plates, roofing and cable sheathing
- pre-heating of rubber compounds for calender feeding.

Calenders

High-performance calenders for processing rubber and plastics – heavy engineering with the precision of a Swiss watch.



Rubber calender for manufacturing conveyor belt blanks

Areas of application for rubber calenders:

- production of tire cord coated on both sides
- production of conveyor belt blanks
- production of webs and sheet for technical rubber products.

Plastics calenders

- production of sheet from PVC-U and PVC-P for the packaging and furniture industries
- production of credit cards.

KraussMaffei Berstorff Rubber Extrusion Technology

Email: rubber-ext.de@kraussmaffei.com

RUBBER TECHNOLOGY

Systems for high-pressure hoses

KraussMaffei Berstorff offers a complete package solution here: from formulation advice, technical layout, complete machine engineering and commissioning to quality assurance for the finished hoses.

The continuously running lines are fully automated, starting with the let-off device and moving on through the extrusion line, the drum winder and vulcanization up to testing and assembly.

Thanks to the use of plastics and rubber processing extruders, the rubber hose is covered with a recyclable plastic coating instead of being wrapped with a band, so that it retains its shape during vulcanization.

Hoses produced on KraussMaffei Berstorff systems are used in mechanical engineering as hydraulic hoses for high-pressure and low-pressure ranges, in the automotive industry as fuel, air-conditioning, brake or coolant hoses.



Extrusion line for the production of
high-pressure hoses

Silicone hose systems

The machine concept for producing silicone tubing unites the traditional KraussMaffei Berstorff properties, such as robust machinery, long service life and reliability, with our expertise in extrusion and vulcanization of silicone rubber.

Applications for silicone hoses include:

- other medical drainage catheters
- applications
- supply lines for peristaltic pumps.

KraussMaffei Berstorff Hose Production Technology

Email: rubber-ext.de@kraussmaffe.com

RUBBER TECHNOLOGY

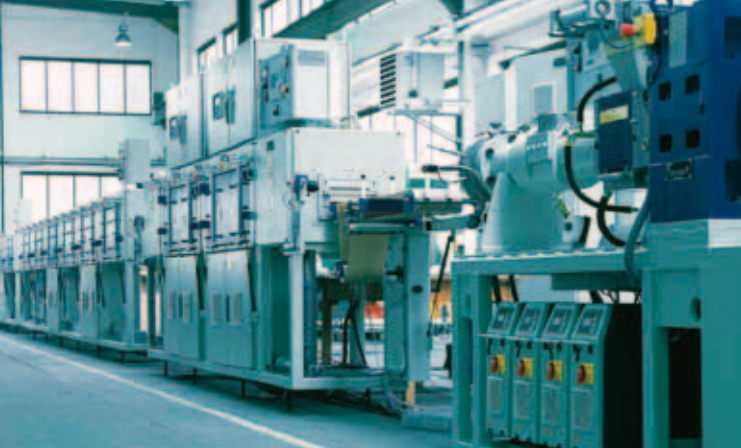
Profile production systems

KraussMaffei Berstorff provides high-performance extrusion technology plus vulcanizing know-how and downstream equipment from a single source for the production of profiles in rubber, TPE or silicone. The different extruder types and the three vulcanization processes – microwave, hot air and salt bath – guarantee tailored solutions that are perfectly adapted to the most diverse products.

Profiles are used as

- sealing profiles for doors and windows in interior design
- door, window, trunk and engine compartment seals, as well as for windscreen wipers and roof strips in automobile construction.





Profile production line for high-quality door sealings

Roll covering systems

Extrusion systems from KraussMaffei Berstorff allow rolls, sleeves and pipes to be coated quickly and easily for a wide variety of industries. The systems with high-performance rubber extruders are suited for all common rubber compounds and provide top quality coating.

KraussMaffei Berstorff Rubber Technology

Email: rubber-ext.de@kraussmaffei.com

RUBBER TECHNOLOGY

V-belt production lines

KraussMaffei Berstorff designs machines and complete production lines for producing wrapped and raw-edge V-belts as well as ribbed V-belts. V-belts produced on KraussMaffei Berstorff machines are suitable for use

- as industrial drive belts
- in the automotive industry
- as drive belts for agricultural machinery
- in household appliances.

AUMA rotary presses

KraussMaffei Berstorff AUMA rotary presses can laminate and vulcanize several rubber sheets at the same time. This saves time in the production of

- rubber sheets with fabric reinforcement
- conveyor belts
- flooring with matt or polished surface
- offset blankets
- membranes and ship-building materials
- soles and sealing sheets.





AUMA rotary press

Other areas of application for AUMA machines include laminating plastic sheets and the manufacture of chipboard and MDF fibreboard.

Flooring

All modules of KraussMaffei Berstorff floor covering lines are carefully coordinated. These lines comprise components from both plastics and rubber technology. KraussMaffei Berstorff extruders, calenders and AUMA units form the heart of these systems, offering maximum quality and economic efficiency when it comes to the production of small and large batches.

KraussMaffei Berstorff Rubber Technology

Email: rubber-ext.de@kraussmaffe.com

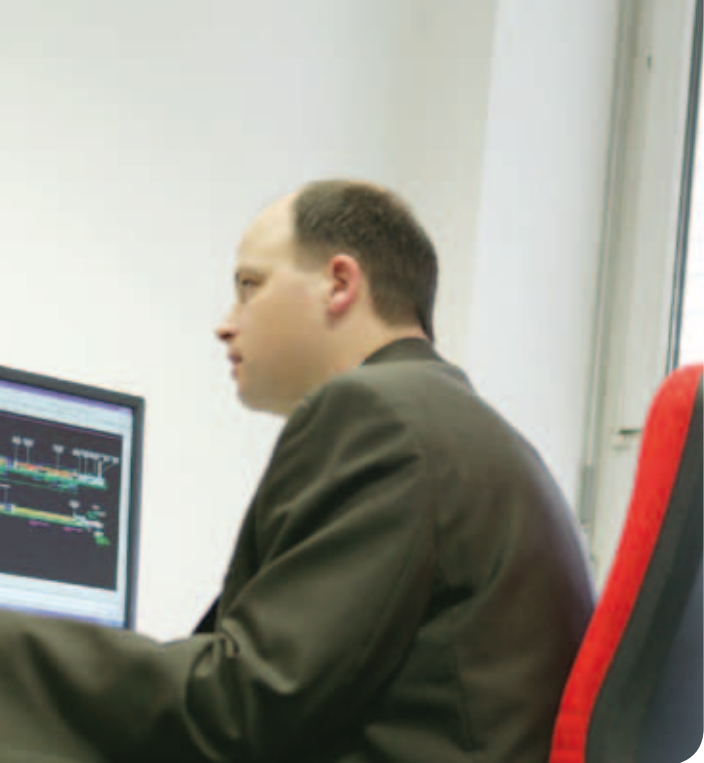


SOLUTION PARTNER

Integrated planning and implementation

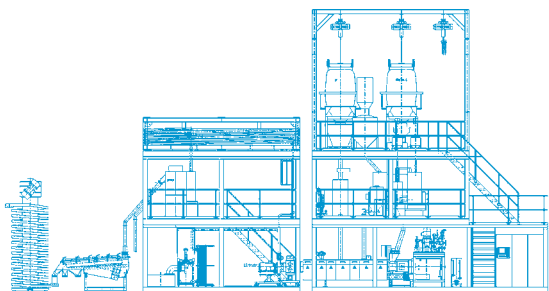
KraussMaffei is your first choice partner – from planning and process engineering for the optimum solution right through to commissioning, maintenance, operation and the eventual disposal of your production line.

From single machines to system solutions and complete turnkey production plant – our experienced, high-caliber engineering teams will plan and implement an application-specific system that will support your drive for productivity and good returns.



A complete system from a single-contact partner offers customers substantial benefits:

- faster project completion
- no component interface problems
- reduced costs





CUSTOMER BENEFITS

TechCenter/Assembly

KraussMaffei Berstorff uses advanced systems and synchronized-flow assembly to manufacture extruders and other line components. Sophisticated logistics, best practice processes and enhanced efficiency deliver benefits for our customers.

Your benefits:

- premium quality
- on-time delivery



In our TechCenters, new ideas are born and visions are turned into reality. The outcome is reliable, high-performance production systems.

KraussMaffei Berstorff's TechCenters are also available for extensive customer trials and test series. Our experts are on hand at all times to provide advice and support.



NETWORK

Service

You can rely on our extensive sales and service network for a fast, expert response to all your service needs anywhere in the world. KraussMaffei currently employs around 3,000 people all over the world.

Whatever you need – from troubleshooting and training to spare parts and repairs – our global spare parts and after-sales service is on call for you.



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.

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.

KraussMaffei Berstorff is a worldwide premium partner for the plastics and rubber processing industries in the field of extrusion technology – offering cost-effective and highly innovative solutions!

KraussMaffei Berstorff extrusion technologies stand for high process stability and a clear competitive advantage. As your system partner, we are committed to increasing your success all along the line.

KraussMaffei Technologies GmbH

Krauss-Maffei-Strasse 2 ... 80997 Munich
Phone +49 89 8899-2546 ... Fax +49 89 8899-4043
www.kraussmaffe.com

KraussMaffei Berstorff GmbH

An der Breiten Wiese 3-5 ... 30625 Hanover
Phone +49 511 5702-0 ... Fax +49 511 561916
www.kraussmaffe.com