Thinking in systems
Extrusion technology for plastics and rubber products

Engineering Value

Krauss Maffei
Berstorff
Stable-value extrusion solutions
KraussMaffei Berstorff is synonymous with reliable and sustainable extrusion solutions at international scale. Applications include degassing during polymerization, compounding, pipe, profile, film and sheet extrusion or physical foaming right through to the production of technical rubber products and semi-finished tire components on stand-alone extruders or complete extrusion lines. All machines and lines are tailored to customer specification for use in the chemicals, automotive, construction, packaging and pharmaceutical industries.

We’re there for you – worldwide
KraussMaffei Berstorff is your first choice partner – from initial project discussions, through development planning and process engineering for the optimum solution right through to start-up, maintenance and operation of your production line. At all times, you are assured of outstanding competence in planning and engineering, as well as of reliable and fast spare parts delivery, service and support. As your system partner, we are committed to increasing your success all along the line.

Customized services
We’re dedicated to supplying excellent and reliable service quality. Our customer service and our experienced fitters, technicians and engineers will be available within shortest time and provide on-site assistance to optimize your equipment and processes and minimize downtimes.
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Extrusion technology at a glance – full scale flexibility puts you on the safe side!

Engineering value
KraussMaffei Berstorff holds a unique position in the plastics and rubber processing industries – we offer extrusion package solutions that are reliable and stable in value. Using innovative technologies, we strive at enhanced cost-effectiveness and even higher efficiency in tomorrow’s production. The KraussMaffei Berstorff brand is well-positioned in almost all markets and in all market segments worldwide.

This is what our unique “Engineering Value” performance slogan is based on. A promise that reflects our outstanding commitment and our pursuit of actively contributing to our customer’s value chain.
KraussMaffei Berstorff’s key asset: qualified staff

The design and construction of extrusion lines involves in-depth process engineering know-how and longstanding experience. This is why highly competent and experienced staff in the development, manufacturing, assembly, marketing, sales, service and administrative divisions are a must. That is the crucial point: a company is only as good as the employees who work for it! The mission of our deeply committed cross-national project teams is to secure our leading position in the fierce international competition.

Systemized service

Our service portfolio is focused on customer-specific and preventive machine and maintenance service, personnel development and training. Consultancy services and remote control or preventive measures via Internet are continuously gaining in importance. Our global service network ensures immediate support and helps you to solve problems and keep your production running.
Part 1

Plastics technology

KraussMaffei Berstorff plastics extrusion lines stand for maximum product quality – from compounding, pipe extrusion up to film and sheet production.
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 metric tons 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. In addition, these single-screw extruders provide optimum melt homogeneity combined with intensive melt cooling.
Pelletizers
KraussMaffei Berstorff underwater pelletizers have proven their value as compact and efficient downstream units. Together with our single-screw extruders, they form a system for efficient thermoplastics compounding.

Areas of application for KraussMaffei Berstorff pelletizers include:
- polyolefin production (LDPE) with throughput rates of up to 50 metric tons per hour;
- polypropylene compounding with filler content of 50% and more.
KraussMaffei Berstorff ZE compounding systems are engineered to meet the specific requirements of products and processes as if tailor-made. Thanks to comprehensive process expertise in all key areas of application and unparalleled design skills of its experienced mechanical engineers, KraussMaffei Berstorff can offer customers extrusion systems that are adapted precisely to their formulations and processes. These include:

- Incorporating reinforcing agents and fillers, such as glass fibers, talc, carbon fibers, calcium carbonate, barium sulphate, etc.
- Producing different plastics and plastic elastomer alloys (e.g. TPE)
- Homogenizing materials of different viscosities
- Reactive modification of plastics
- Melting, coloring, stabilizing, homogenizing and pelletizing powdered polymers
- Extruding biopolymers
- Producing adhesives and hot-melt adhesives
- Continuous TPU synthesis
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, e.g. butyl rubber

Production of masterbatches, such as pigments, flame-retardants, blowing agents and filler concentrates

Producing natural fiber reinforced plastics

KraussMaffei Berstorff ZE BluePower for a wide range of different processing tasks
Pipe extrusion – application-specific solutions

System expertise in pipe extrusion
As a system supplier, KraussMaffei Berstorff supplies extrusion lines for producing plastic pipes 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, pipe heads 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 have developed flexible extrusion systems such as the QuickSwitch for in-line pipe dimension change and the internal pipe cooling system (IPC) for shorter cooling sections. In addition, we offer direct extrusion systems to reduce material costs. For co-extrusion, we supply application-specific piggyback or tandem solutions featuring sophisticated technical design and unparalleled cost-effectiveness. Our portfolio also includes cost-effective pelletizing systems for rigid and soft PVC. And last but not least,
we offer complete system solutions for the production of complex pipes, both standard and special.

Opening up a world of options in pipe extrusion
- Drinking water pipes, sewage pipes
- Irrigation pipes, drainage pipes
- Hot water and heating pipes
- Cable conduits
- Gas pipes
- Multilayer pipes
- SRP pipes, PE-X pipes, RTP pipes
- Co-extruded pipes in different material combinations, PVC foam-core pipes
- Aluminum composite pipes
- Highly-filled pipes
- PUR-insulated pipes
- Sheathing for steel pipes
- Wound pipes
- Corrugated pipes

KraussMaffei Berstorff Pipe Extrusion
Email: pipe-ext.de@kraussmaffei.com
Profile extrusion –
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 co-extruders for integrated extrusion systems in piggyback or tandem configurations.

In addition, our machine spectrum includes parallel twin-screw extruders for standard applications in the medium output range.

We also supply application-specific solutions for high-performance extrusion, for flexible output of window profiles and for the 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.
The world of profile extrusion at a glance
- PVC coex foam boards
- Main and auxiliary window profiles
- Co-extruded window profiles
- Expanded profiles
- Door systems
- Roller shutter systems
- Window sills
- Guttering
- Cable conduits
- Technical profiles
- WPC/NFC profiles
- Siding solutions

Left: Single- and double-strand profile extrusion lines
Right: Double-strand extrusion with two twin-screw extruders in a tandem configuration

KraussMaffei Berstorff Profile Extrusion
Email: profile-ext.de@kraussmaffei.com
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 exclusively use environmentally compatible blowing agents.

Areas of application for foam products produced on KraussMaffeiBerstorff 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
- 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 solutions

- Foam boards:
  for areas subject to pressure and humidity,
  for example for insulating cellar walls and floors, wall and ceiling insulation, sandwich boards, cooling containers

- 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

- Non-foamed mini-granulate (EPS) for processing to packaging and insulation

KraussMaffei Berstorff Schaumtandex lines for the production of XPS boards

KraussMaffei Berstorff Foam Extrusion Lines
Email: foam-ext.de@kraussmaffei.com
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 single- and twin-screw extruders from KraussMaffei Berstorff are characterized by their long service life and high throughput rates, increasing the cost-effectiveness of the entire process. KraussMaffei Berstorff lines supply film 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
Typical products made from engineering sheets are:
- automobile film for car interiors
- decor veneers for furniture
- various sheets for civil engineering
- low-shrinkage EVA film for photovoltaic modules

Typical products made from plastic sheets are:
- optical-grade film and sheets
- sheets for applications in the chemicals industry and for container construction

Typical products made from sheets with fabric reinforcement:
- roofing sheets and floor covering
- sheet for lining swimming pools and ponds, for sealing rainwater reservoirs and waste dumps and for lining foundations

Typical products made from PVC or PO sheet:
- casings
- window and door panels, door systems
- trim- and billboards, container construction, corrugated sheet

KraussMaffei Berstorff Film and Sheet Extrusion Lines
Email: sheet-ext.de@kraussmaffei.com

Left: Planet calender – flexible polishing stack for producing optical-grade sheet
Right: Extrusion line for the production of co-extruded PVC foam sheet
Extrusion technology
Rubber processing
Part 2
Rubber technology

When it comes to production, semi-finished tire components, sealing profiles and rubber hoses have much in common – quality starts with an optimum process technology!
Innovative ideas are combined with sophisticated technology to optimize efficiency and reliability. Our extrusion lines for the production of tire components meet the most exacting standards in terms of quality and productivity and thus form a class of their own. Starting from the feeder right through to the winding equipment – Multiplex and roller-head lines stand out for unparalleled product quality, maximum ease of operation, shortest set-up times and uncompromising machine availability.

Our QuintoPlex lines are designed to combine five tire components based on different compounds – namely cap, base, wings, cushion and chimney – in a single working cycle. Treads with high silica content can thus be provided with a conductive chimney.
**Roller-head lines**
The roller-head technology is a perfect synthesis of precision and cost-effectiveness for the production of innerliners and carcass fillers or squeegee strips.

The rubber compound is plasticized in the extruder and directly fed through a slot die into the roll gap of a two-roll calender. The calender calibrates the sheet precisely to the specified final thickness. Narrow tolerances over the entire sheet width and optimum compound homogenization give perfect tire components.

KraussMaffei Berstorff Rubber Extrusion Technology
Email: rubber-ext.de@kraussmaffei.com
KraussMaffei Berstorff offers a complete package solution here: from formulation advice, technical layout, complete machine engineering and start-up 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.
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:
- medical drainage catheters;
- supply lines for peristaltic pumps;
- other medical applications.
Profile production systems – customized solutions

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.
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 equipped with high-performance rubber extruders are suited for all common rubber compounds and provide top quality coating.

Profile production line for high-quality door sealings

KraussMaffei Berstorff Rubber Technology
Email: rubber-ext.de@kraussmaffei.com
Rubber sheet extrusion lines – perfect synergy for unparalleled product quality

KraussMaffei Berstorff offers excellent solutions for the entire range of applications in rubber sheet extrusion – from floor coverings, conveyor belt blanks, printing blankets, roofing and sealing sheets up to semi-finished tire products.

As a supplier of machinery to the rubber processing industry worldwide, KraussMaffei Berstorff’s in-depth experience and expertise is not limited to the actual extrusion and calendering technology, but also covers doubling and winding processes.

When it comes to complex lines, professional project management is gaining increasing importance. To ensure that all components mesh together like the pinions in a gearbox, the entire project has to be in one pair of hands.
AUMA rotary presses
KraussMaffei Berstorff AUMA rotary presses can laminate and vulcanize several rubber sheets at the same time. Other areas of application for AUMA machines include laminating plastic sheets and the manufacture of chipboard and MDF fiberboard.

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.

KraussMaffei Berstorff Rubber Technology
Email: rubber-ext.de@kraussmaffei.com
Part 3

Competence and advice

KraussMaffei Berstorff offers a complete consultancy package for the plastics and rubber processing industries – from technical layout, project planning and assembly right through to line start-up.
Solution partner – integrated planning and implementation

KraussMaffei is your first choice partner – from planning and process engineering for the optimum solution right through to set-up and start-up, maintenance and operation of your production line.

From stand-alone machines to system solutions and complete turnkey production plants – 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.
KraussMaffei Berstorff uses advanced systems and synchronized-flow assembly to manufacture extruders. Sophisticated logistics, best practice processes and enhanced efficiency deliver benefits for our customers.

Your benefits:
– premium quality;
– on-time delivery.

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

KraussMaffei Berstorff’s technical centers are also available for extensive customer trials and test series. Our experts are on hand at all times to provide advice and support.
Network
Excellent service

We’re dedicated to supplying service quality on a par with the uncompromising quality of our machines and lines.

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. We guarantee competent customer support and a fast and efficient response to problems. KraussMaffei currently employs around 4,000 people all over the world.
We are there for our customers around the globe:
The KraussMaffei group with the brands Krauss-Maffei, KraussMaffei Berstorff and Netstal is the only company supplying machinery that covers the key technologies for the international plastics and rubber processing industries: injection molding, automation, reaction and extrusion technologies. With over 30 subsidiaries, more than 10 production locations and about 570 sales and service partners, the group is represented all over the world. As your competent system partner, we are committed to increasing your success with our extensive and unparalleled expertise. Put us to the test!

More information on the KraussMaffei group at www.kraussmaffei.com

The KraussMaffei group is represented in the blue-colored countries.
KraussMaffei Berstorff Worldwide premium partner


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