



Application and system
expertise at the highest level
Molded flex & interior trim

Engineering Passion

Krauss Maffei

PU system expertise in flexible foam and structural foam applications

Molded flex for foamed parts

KraussMaffei has combined its extensive expertise in building machines and production lines for manufacturing parts made from flexible foam and structural foam in the "Molded flex & interior trim" business unit.

Employees in the unit possess comprehensive knowledge of processes and applications, ranging from parts made entirely from reaction foam to encapsulated or backfoamed structures.

The center of excellence focuses on reaction engineering plants for making "full-foam products". These plants produce not only seats, headrests and armrests for cars, airplanes, buses, caravans and mobile machinery, for example, but also energy-absorbing foam pads. Chairs and mattresses round off the range of parts required in the furniture industry.

Process engineering for mass producing encapsulated parts is another key activity. In this process, supporting parts are coated, depending on the structure, to increase comfort and safety. Steering wheels, gear shift levers, upholstery for center consoles and many other products are made using such machines.

A completely different type of technology is used to backfoam parts for insulating them against sound or heat; backfoamed car floor coverings, for example, and also front wall bulkheads, are insulated using high-density layers.

Encapsulating the wiring harnesses in the car reduces the number of work steps and, in particular, creates a better seal between the wiring loom and the bodywork. Instead of painstakingly "threading" the car's vital "lifelines" through hollow guide channels, the wires are encapsulated directly inside the mold.

Interior trim for surfaced parts

KraussMaffei has combined its expert knowledge of foaming with its expertise in surface finishing in the business area of interior trim, creating production lines for making foamed or backfoamed parts with esthetically pleasing premium-quality surfaces, such as instrument panels, interior door panels, door panels and window frames.

When making many of these products, the foaming processes are fully integrated with the surface finishing process and any necessary post-mold processing, such as trimming and punching. The combination of molded flex and interior trim in one unit enables projects to be supported efficiently and brings customers a number of considerable benefits.

Application and system expertise at the highest level

Molded flex & interior trim

Turning plastics in mass production into durable flexible foam parts with superior properties requires considerable expertise. In addition to developing foam technologies, KraussMaffei has been developing materials, optimizing metering systems and mixing heads, and perfecting the handling of mold carriers in terms of cycle times and working ergonomics for decades. Thanks to our experience and expertise in surface finishing we can offer you solutions for making premium-quality visible foamed parts – both in terms of look and touch.

Your benefits at a glance:

- System-neutral advice
- Technologies specifically adapted to your production volumes
- Short cycle times
- High material and energy efficiency
- High overall equipment efficiency (OEE)
- Solution expertise – everything from a single source

Take a tour

Multiple everyday applications



Instrument panels



Car seats



Doormats



Engine hood insulation



Extensive expertise in reaction process machinery Quick, reliable and cost-effective



KraussMaffei has been developing and manufacturing metering machines, mixing heads, mold carriers and complete systems for decades. This wealth of experience enables us – together with you – to develop process solutions tailored to your requirements.

High-pressure systems for making seat cushions

Making seat cushions using high-pressure systems has long been one of KraussMaffei's fields of expertise. Multi-component mixing heads, which provide the seats with cushions of varying hardness (dual or multi-hardness), are often used to do this.

Such systems are used in the automotive industry and by furniture manufacturers to produce seats as a single piece of molded foam, which is then upholstered with fabric or leather. Sometimes foam is injected directly into the cover (in-situ process) if the design specifications allow.

Backfoaming molded skins

Other machines are used to backfoam ready-made molded skins for dashboards and trim panels. Automobile carpets, which are each backfoamed for a specific vehicle and then trimmed to an exact fit, demonstrate once again how versatile our solutions are.

We offer stationary, rotary or integrated oval conveyor systems depending on your capacity requirements, cycle times and number of work steps.

Mold carriers and molds for the parts to be made pass from station to station at a very high level of automation – and KraussMaffei oversees the complete development, building and commissioning process of the entire production line, including the handling technology and delivery systems. The same applies to maintenance and servicing.

Proven components

As you would expect, KraussMaffei only uses proven components in its systems:

- Metering machines that rank among the world's best
- Mixing heads that are the fruit of several decades of application-specific expertise
- Mold carriers for all common structures – for optimal process design
- Automation systems, such as process control units and handling robots, over 1000 of which KraussMaffei has already commissioned.
- Transportation systems for mold carriers to allow seamless production flows
- Post-mold processing systems, such as machines for trimming and edge milling
- Safety devices, such as protective barriers, tread mats and locking devices
- All kinds of peripheral units, e.g. extractors, crushers, platforms, release agent systems, mold changers

Whether you need a single machine, such as the EcoStar, or a complex production line – no project is too big or too small for KraussMaffei. The most important criteria is the cost-efficiency of the machines and systems in tough everyday use – and it is this criteria that we will always strive to meet.



The versatile RimStar Series, here a modular RimStar.



Premium quality with low investment costs:
The EcoStar Series.

Metering machines For repeatable high-production processes

KraussMaffei selects the most suitable metering machine from its complete range for every project. Because all of our machines are developed and manufactured by us, our practical experience can be used to continuously further their development.

Outstanding product quality in PU processing

Short, rheologically optimized guide paths between machine components allow for reduced pressure losses, exact heating and precise control behavior. This enables you to achieve high levels of process reliability and product quality.

A solution for every application area

The RimStar Nano is the perfect solution if you have low output rates and space requirements. The larger RimStar Compact is based on a space-saving single frame, while the large RimStar Modular is built on several frame segments.

The EcoStar Series from KraussMaffei contains premium-quality PU metering machines with low investment costs – thanks to systematic standardization.



Metering machine for filled PU systems: Comet Hybrid.

The Comet is a high-performance machine for processing innovative polyurethane formulations containing special filler. Components containing filler are metered by hydraulically or electrically driven pistons.

Like the Comet, the Comet Hybrid has piston metering for components containing filler. It also boasts an electrically driven pump from the RimStar Series for conveying standard isocyanates.

So there is always the perfect metering machine for any application.

Your benefits:

- High process reliability thanks to innovative machine technology
 - Outstanding part quality thanks to precise control technology
 - Excellent price-performance ratio
 - Flexible system configuration
 - Easy to operate and service
-

Mixing heads For perfectly uniting all components

Tailor-made mixing heads from KraussMaffei provide the right solution to all production demands. We have the right mixing head for you and can meet even highly specific production requirements.

Wide range of mixing heads

KraussMaffei has used its extensive experience to create an unrivaled range of mixing heads. Extremely high shot counts, premium product quality and top production performances are the result of decades of continuous development of all KraussMaffei mixing heads. They are not only very user-friendly and durable, but also make production as cost-effective and reliable as possible. The way the individual components are combined in the mixing head depends on the task. This converts pressure energy into kinetic energy, which removes the need for mechanical components that are difficult to clean. Processes can only be repeatable when all the building blocks of a multicomponent system are combined with consistent ratios and regular quantities.

Linear mixing heads

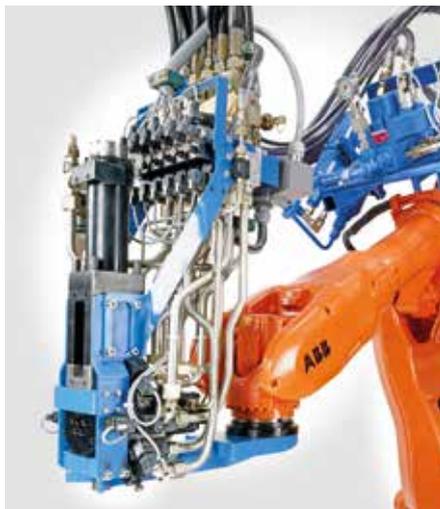
Linear mixing heads from KraussMaffei are available in two- to six-component versions. The nozzle elements of the two- to six-component versions are tailored specifically to the customer's production requirements and processing parameters.

Transfer mixing heads

Transfer mixing heads are suitable for processing systems that are difficult to mix, allowing laminar pouring of the mixture into open and closed molds.

Multicomponent CN mixing heads

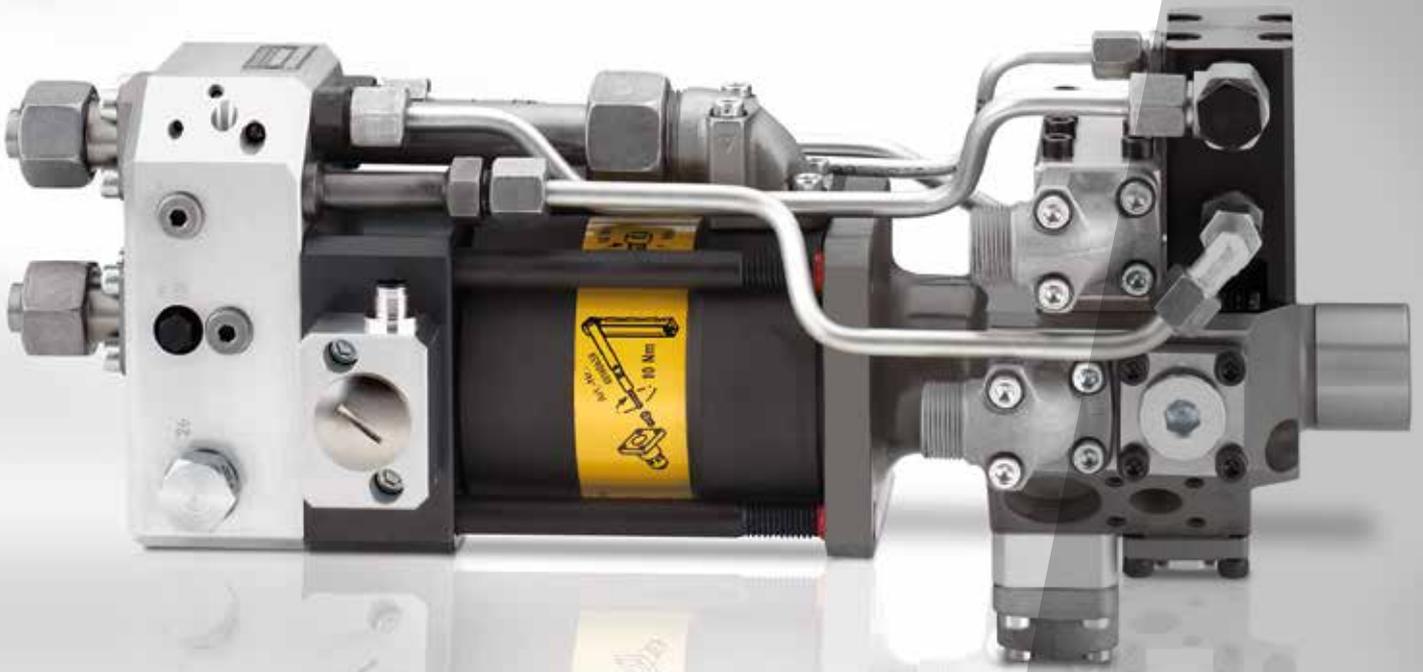
Multicomponent CN mixing heads play an important role in making PU flexible foam using four to six components. The special mixing principle in the MKE-3B mixing head ensures laminar PU pouring and excellent mixing quality at start-up.



MK 18-22 ULP-6-CN connected and installed



Mixing head MK 18/22-ULP-6CN-G connected



Mixing head MKE-3B



Mixing head MK 10P-2K-F-S

Multicolor mixing heads

Multicolor mixing heads allow pigments to be introduced directly into the mixing chamber during PU processing.

Duplex mixing heads

The Duplex mixing head can process two different foam systems in rapid succession.

Your benefits:

- Comprehensive selection of mixing head types specifically for your application
 - Comfortable and low-maintenance operation
 - Self-cleaning design
 - Long service lives
 - Extremely cost-effective
-

Mold carriers

System components for precise heavy labor

Mold carriers are key components of modern reaction process machinery. Once the reaction has finished, they open the molds, move them into the best ergonomic or automated position for demolding the parts and then bring the molds back into line for cleaning or introducing the release agent.

Essential for ensuring product quality

Mold carriers close the molds forcefully and, under program control, move them into the ideal positions for material pouring, foaming and ventilation during the reaction. This means they help to determine the quality of your products and the efficiency of your production.

The process requires the clamping forces to be increased safely and distributed evenly at the same time – but the accuracy of positioning, the operational safety and the precision of the movements running parallel to the part in several degrees of freedom are also essential. And everything must be perfectly timed.

The right mold carrier for every task

The strength-optimized FTR Series is hydraulically locked and its high inherent rigidity allows non-inherently rigid molds to be used. FTR not only provides access to the mold from four sides, but also allows foam to be discharged into the open mold and molds to be changed quickly. Other series also possess a pressure pad and are therefore designed to backfoam large-format, contoured parts, such as carpeting for cars. All series can offer additional functions, such as operating core pulls and ejectors.

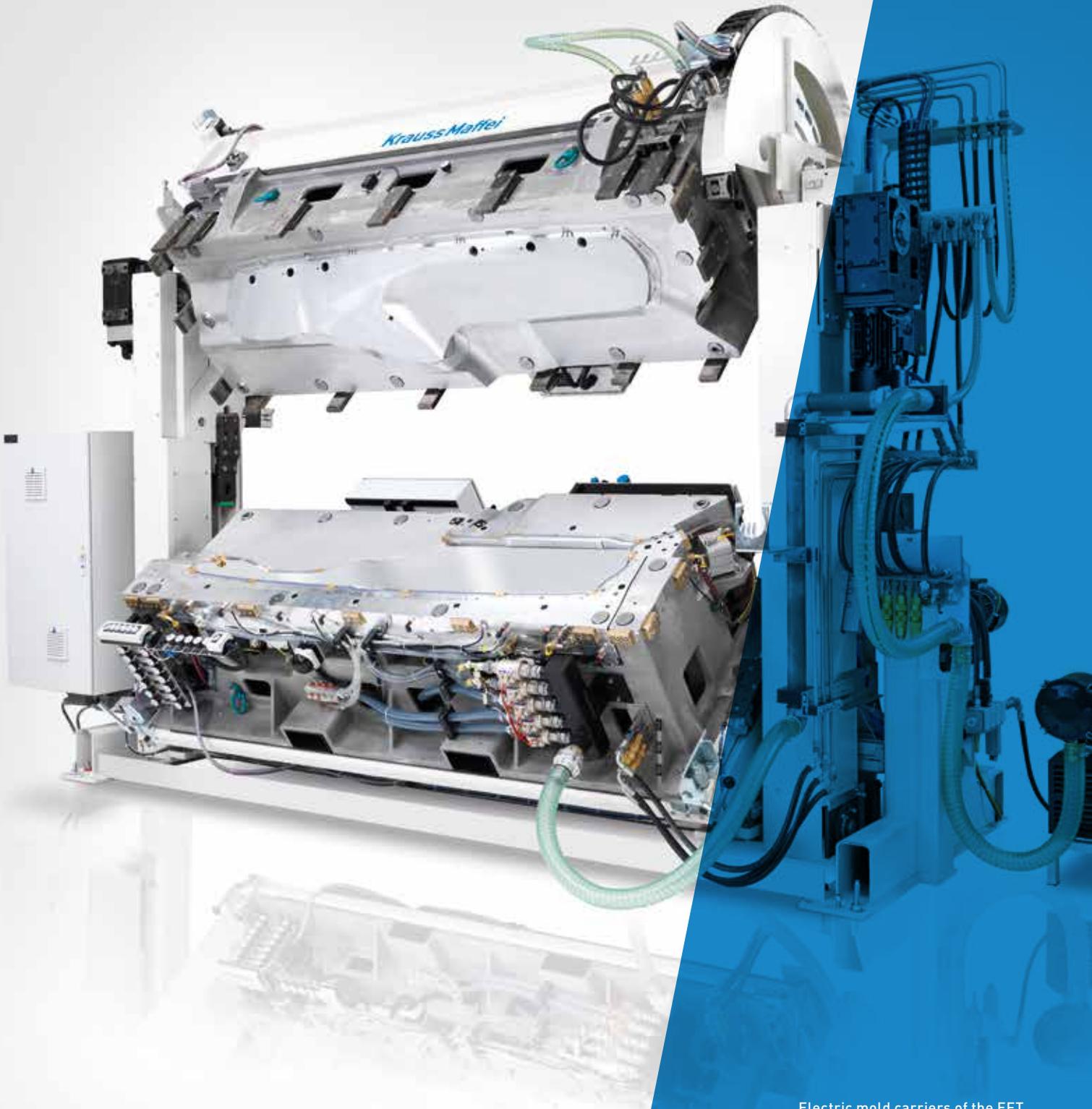
KraussMaffei has developed the robust and low-maintenance EFT Series mold carriers especially for backfoaming instrument panels. They are driven fully electrically, which allows quick, simultaneous movements and very short cycle times.



FTR mold carrier for manufacturing steering wheels. For optimum accessibility.

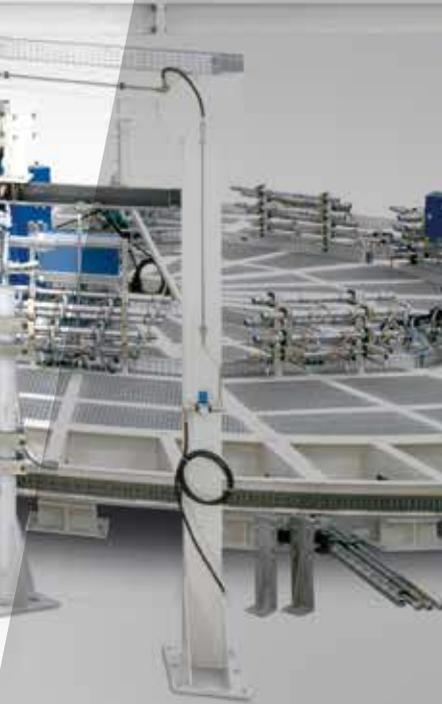


Mold carriers of the EFT series.



Electric mold carriers of the EFT series for manufacturing truck dash panels: consume power only when moving; short cycle times.





Complete lines for maximum efficiency when making parts

Every system for making parts from flexible foam or with excellent surfaces requires even the smallest of components to conform to quality standards. It is therefore a good idea for everything to come from a single source – from one experienced manufacturer who sets the bar for quality extremely high. The costs of your parts per piece alone determine the profitability of your investment.

Solutions from a single source

Whatever you want to foam, backfoam or encapsulate, KraussMaffei has the perfect solution for you from a single source – without any additional interfaces between different suppliers. We take care of development, production, programming, commissioning and maintenance all under one roof.

Peripherals included

In addition to the key components described earlier – metering machines, mixing heads, mold carriers and deliv-

ery systems – our extensive range also includes the following peripheral devices:

- Extractor systems
- Spray systems for automatically or manually applying release agents or paint
- Handling equipment
- Storage tanks
- Mold changing systems
- Protective equipment
- Control systems and their programming



Rotary table systems with chain drives or gear drives support the operating types 'cyclic', 'continuous' or 'continuous with foam stop'. For diameters from 2 – 15 m and payloads of 30 kg to > 5 t per station.

Oval conveyor systems provide high output:

The mold carriers are mounted on roller units and continuously conveyed by the central drive in the oval conveyor system. The number of stations, as well as the size and function of the mold carriers, is variable as desired. The automatic mold carrier change is optional.

Foam molds for perfect parts The right mold for every application

From pouring and foam-molding to backfoaming – KraussMaffei makes molds for creating the perfect parts every time.

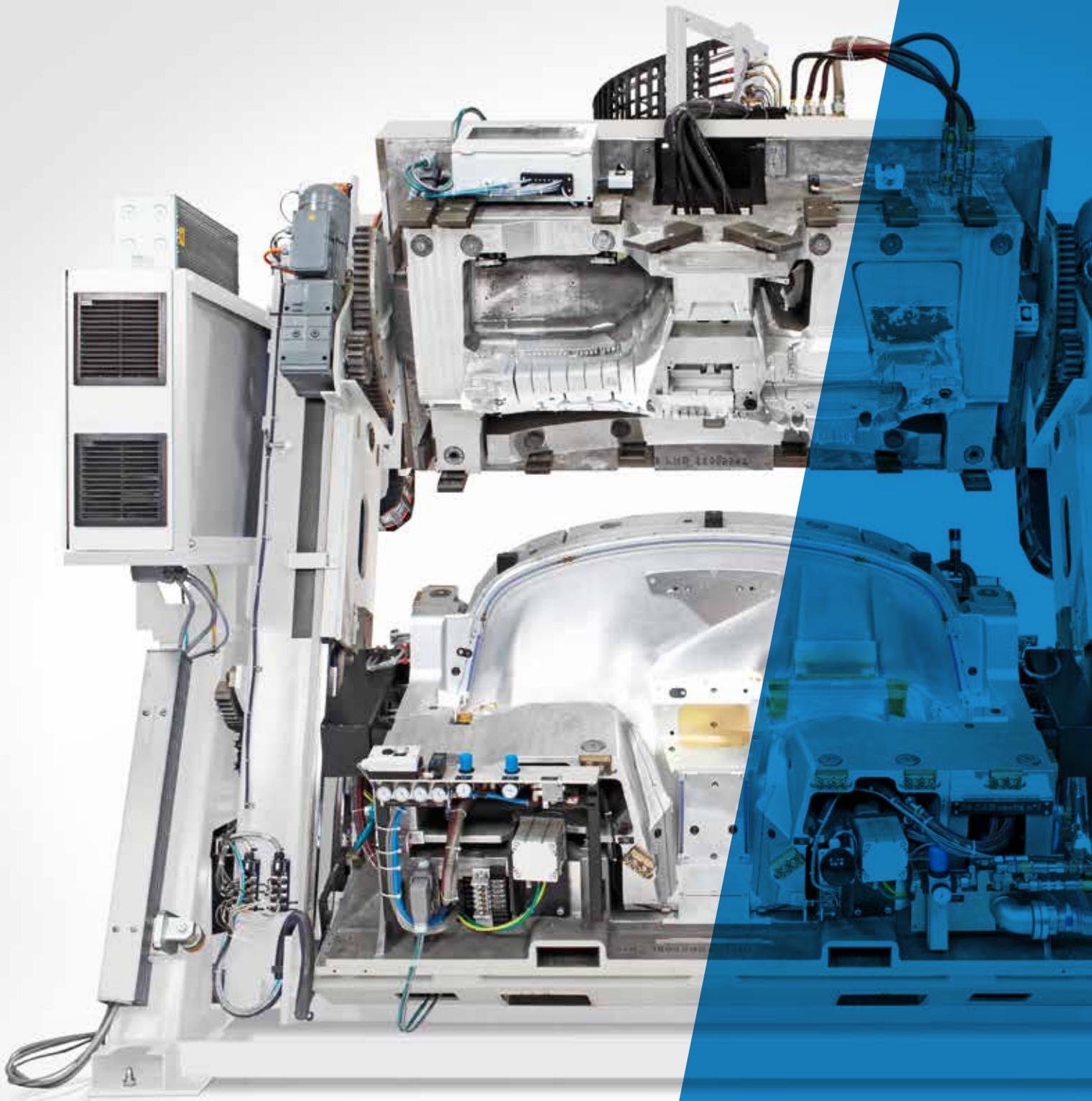
Molds for open or closed pouring are made of steel or aluminum and/or with a polymer surface if required. Our molds are engineered as custom tools for specific applications and ensure process-specific heating. The molds have ejector concepts for damage-free demolding, are fitted with product-specific seal systems and can also come with wear-resistant surfaces if required. This means that the process, machinery, mold carriers and molds are all perfectly integrated.

Your benefits:

- Processing flexible foam
 - Processing rigid foam
 - Processing semi-rigid foam
 - Manufacturing glassfiber-reinforced parts (LFI-PU)
 - Manufacturing flexible integral foam
 - Manufacturing parts for white goods
 - Producing special molds
-



Foam mold for instrument panels



Foam mold for instrument panels

Powerful systems for trimming complex plastic components



In mass production, stable and fully automated processes are very important for parts to be manufactured cost-effectively.

Your benefits:

- Proven technology
 - Individual, process-neutral advice
 - The most cost-effective solution for every task
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KraussMaffei offers you comprehensive solutions for trimming your products. Our portfolio ranges from engineering and prototyping to manufacturing premium-quality individual devices, tools and systems, as well as creating reliable complete solutions that can be integrated for mass production.

We are your specialist for all types of punching, flexible trimming systems using industrial robot and automation of trimming systems. Take advantage of our expertise in all trimming technologies.

Automation of trimming systems

KraussMaffei provides complete interlinked systems with robot-aided handling. The trim line is fed by an industrial 6-axis robot. After the punching process, areas that cannot be punched are milled automatically (including milling the airbag weakening line). The second robot delivers the finished part to a conveyor that takes it to the next process.

Our machining techniques at a glance



Punching

For many years, our molds and systems have been successfully used by customers all over the world. This includes almost all suppliers in the automotive interior trim sector, as well as well-known car manufacturers and various other plastics-processing industries.



Robot milling

We will advise you in all areas of trimming technologies and, in doing so, pay special attention to your individual task.



Automation

We can provide you with perfect solutions for every purpose. We evaluate the feasibility of the project and analyze the machine's capacity by simulating and presenting the cost-efficiency of the process.



RimStar modular

Mold carrier with mold for door armrests,
front foaming process

Everything from a single source So that your plastics project will be a success

All inclusive – this is the most reliable way of building or expanding a plastics processing plant, because project engineering, testing, delivery and commissioning are all carried out by the same contract partner.

Milling cell plant example

Your aim is to produce high-quality parts at a high output while keeping costs and material consumption as low as possible. We can help you achieve all of these things when you choose to have everything in your plant supplied from a single source. Furthermore, reducing the number of project interfaces often releases synergy effects, such as the ability to control peripheral tasks using the untapped reserves of a robotic control unit.

Everything from a single source

KraussMaffei is wholly responsible for everything – including making sure that the cycle times, required production volumes and quality of the manufactured parts match.

KraussMaffei also integrates fully or partially automatic processing cells for trimming, punching and milling into your production line, as well as process engineering for in-mold painting or preparing inserts.



Scoring tool on the robot and product-holding system

The specialists at KraussMaffei even take care of the molds and the peripheral equipment for post-mold processing – such as punching, trimming or milling – that has been integrated into the complete process.

“Everything from a single source” therefore means that you only have to go to one company for all your consulting, project engineering, planning, development, implementation, testing, production support and customer service needs.

The technology experts

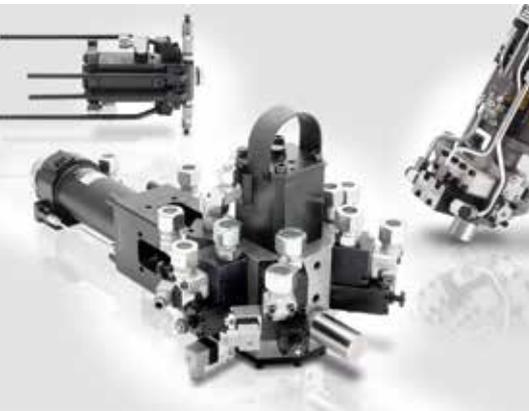
By choosing a system from KraussMaffei, you benefit from our extensive and varied technological expertise that comes from one of the largest centers of excellence in the plastics industry.

KraussMaffei will support your project every step of the way with its global presence, excellent machinery and highly developed expertise in control equipment. From your initial ideas to

the dismantling of your production line, which often happens during product change-overs, our modular system concept means that some units can also be used in the following process.

KraussMaffei will create value and help you to retain it.

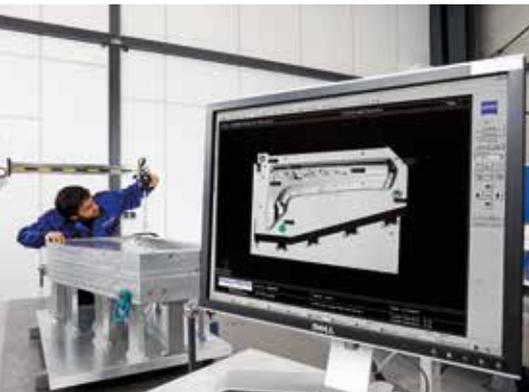
Further information which might also interest you



Are you looking for further information on the following topics?

- Metering machines
- Mixing heads
- Mold carriers
- Foam molds
- Trimming
- Automotive testing

Please contact us. We would be happy to prepare solutions and concepts which are specially tailored to your need.



You can find our brochures and flyers on other topics online at: www.kraussmaffei.com. On request, we would also be happy to send you information and technical data for our products free of charge.

KraussMaffei

A strong brand in a unique global group

Cross-technology system and process solutions

Whether in Injection Molding, Reaction Process Machinery or Automation – the KraussMaffei brand stands for pioneering and cross-technology system and process solutions in plastics processing worldwide. For decades, our expertise, innovative ability and passionate commitment to plastics engineering have been your competitive edge. As a cross-industry system provider, we offer you modular and standardized systems as well as solutions customized to your needs.

There for you around the world

With our worldwide sales and service network, we offer our international customers an excellent basis for a successful business relationship. Due to the close proximity to our customers, we are able to answer your individual inquiries very quickly. We work out the best possible technical and economical solution for your product and production requirements together with you. Test our machine technology for your applications and let our experts put together an individualized service package for you.

Individualized service

Our employees from customer service, application technology and service help you with your questions and needs on every topic dealing with machines, systems and processes – around the globe, quickly and with a high level of expertise. We have developed an extensive customized service spectrum with our lifecycle design, which accompanies you throughout the entire lifecycle of your machines and systems. Take advantage of the personal interaction and flexibility we offer in our practically oriented seminars. We carry out customer-specific trainings either at your location or at our sales and service locations.

You can find additional information about KraussMaffei at: www.kraussmaffeigroup.com

KraussMaffei Group

Comprehensive expertise

Unique selling proposition Technology³

The KraussMaffei Group is the only provider in the world to possess the essential machine technologies for plastics and rubber processing with its KraussMaffei, KraussMaffei Berstorff and Netstal brands: Injection Molding Machinery, Automation, Reaction Process Machinery and Extrusion Technology.

The group is represented internationally with more than 30 subsidiaries and over ten production plants as well as about 570 commercial and service partners. This is what makes us your highly skilled and integrated partner. Use our comprehensive and unique expertise in the industry.

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The KraussMaffei Group has a global presence. Countries with subsidiaries are marked in dark blue. In the white-colored regions, the Group is represented by over 570 sales and service partners.

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