MIXING AND METERING MACHINES FOR PUR PROCESSING

RimStar Nano, Compact and Modular
IN PARTNER shIP WIT h INDU sTRY

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.
RimStar – our answer for your business

KraussMaffei’s RimStar is a family of mixing and metering systems for polyurethane processing. With its three versions – Nano, Compact and Modular – the RimStar family has the right solution for almost every PUR application.

RimStar machines perform brilliantly in every production situation. They have some major advantages: short, rheologically optimized supply lines between machine components result in lower pressure losses, more precise temperature control and optimized control technology. The benefits for processors are more stable processes and improved product quality. Modular engineering and flexibility when it comes to configuration mean that these machines can be adapted to satisfy customer-specific requirements. Other features of the RimStar family are operator and service-friendliness and excellent accessibility.
Meet the machine: take a tour around the RimStar
Compact and Modular

- **Clearly visible displays**
  Easier for operators and maintenance technicians

- **Optional boom**
  For mounting on the machine frame, no extra effort for external piping

- **Centrally-mounted connections**
  for component supply lines and central outlet

- **Plate heat exchangers mounted on machine frame**
  Up to 150 plates enough to cover the full application spectrum, short pipelines mounted compactly on the base frame, higher product quality and lower reject rate due to better control of temperature, pressure and process, clear floor area reduces accident risk
Central water supply
Less effort for on-site installation

Established tank design
Double-walled, e.g. 250 l tanks with integrated agitator, with connections for extra machine components. 250 l tanks mounted compactly on base frame, heating cartridges for cost-effective heating of standalone systems

Hydraulic system can be mounted on either side
An advantage when several machines are being installed

Test valve

Recirculation pump or feed pump
Inexpensive concept for automatic filling from barrel or container

Flexibility now and in the future

Flexibility now:
- Our modular frame concept lets us plan the system to suit your space constraints
- Control cabinet can be mounted on the machine frame or supplied as standalone element (option)

Flexibility in the future:
Our machine concept offers you multiple options for adding to and upgrading machine components in response to changed production requirements
Overview of the RimStar range – RimStar Nano, Compact and Modular

**Highest product quality and lowest reject rates**
Short, rheologically optimized supply lines between machine components result in low pressure losses, more precise temperature control and optimized control technology. The benefits for processors are more stable processes and improved product quality.

**Minimal maintenance effort and costs**
The series is also characterized by user-friendliness and ease of maintenance as well as improved accessibility. Repairs can be carried out quickly and efficiently, resulting in minimal down times.

**Optimal flexibility**
During the development of the new RimStar series, KraussMaffei’s technologies were combined in “Best Practice” processes. The machines are so flexible that they can be employed in any PUR processing application. Thanks to their modular construction, they can be flexibly configured to meet customer-specific requirements.
RimStar Nano
Very small shot volumes and a mini footprint

RimStar Compact
One-piece machine frame: tightly packed elements save space

RimStar Modular
Modular machine frame: ready for upgrades to meet current and future requirements. Standalone control cabinet as an option.

**RimStar Nano**
The RimStar Nano was specially developed for very small shot volumes and minimal space requirements: the length of the supply lines between the tank and the high-pressure pump, and in the high-pressure zone with the filter and volume gauge, is reduced to a minimum. Changes to the materials being processed can be made quickly and easily.

**RimStar Compact**
The RimStar Compact has a one-piece base frame and is engineered as a compact, space-saving system.

The machine and the control unit are both mounted on the base frame. This is a plug-and-play machine, ready for immediate operation.

**RimStar Modular**
The RimStar Modular has a sectional machine frame which can be added to as necessary to meet all current and future requirements. The control cabinet can be supplied as a standalone unit (option).
Features of the RimStar series – for perfect component conditioning, metering and mixing

With machines from KraussMaffei’s RimStar series you can condition, meter and mix PUR materials to the highest standards.

**PUR components perfectly conditioned**
Heat exchangers, temperature control and thorough mixing are required to keep the components in the day tank in perfect condition. The RimStar family offers a number of solutions for these tasks, ranging from tried-and-tested tanks with agitators to complex systems with external heat exchangers and circulation pumps. These latter offer the biggest choice of tank sizes and an optimal height-to-width ratio for component temperature control and homogenization. All tanks are double-walled. Optional add-ons include Viscojet, for optimal mixing of additives, such as fillers, and heating cartridges for low-cost control of component temperature.

**Temperature control system:**
Heat-exchanger can be installed in the flow-back circuit, in the tank bypass with circulation pump, upstream of the pump on the low-pressure side or upstream on the pressure side.

**Perfect metering**
Pumps, edge filters and high-pressure filters, magnetic couplings and volume and mass flow measurement ensure components are metered precisely and reliably.
Magnetic couplings
Magnetic couplings are available as an option on our machines. We use axial-piston pumps purpose-engineered for polyurethane processing. Your benefits: no leaks, no maintenance, longer life, automatic purging to avoid material overheating and degradation. Frequency-regulated drives (option) are available as the basis for a closed-loop control system.

Edge and high-pressure filters
To ensure trouble-free processing of different PUR systems, we use one type of filter for the suction (low-pressure) side and another type for the pressure side. We also offer variants with switch-over and motor-driven filter systems.

Volume-throughput measurement
We offer manual and automated testing systems. We can integrate any available sensor technology (including mass-flow measurement) to monitor the process parameters, pressure, temperature and throughput, in order to maintain machine availability and processing stability.

Optimal mixing
KraussMaffei offers a very wide spectrum of mixing heads for optimal processing of different PUR systems.
Reliable and easy to operate

The RimStar Compact and RimStar Modular can both be combined with a control desk unit or our basic control cabinet.

The operator units OP177B, MP277, MP377 Touch, PUC07 or PUC08 are installed in the lid of the control desk. As option the basic control is also available with mobile operator display.

**Standard functions**

- Siemens control S7-315-2DP with connections for a mixed head
- Flow and mixing ratio display with tolerance monitoring
- Tank component temperature display with tolerance monitoring
- Mixing-head temperature display with tolerance monitoring
- Mixing-head pressure display with tolerance monitoring
- Alarm messages
- Switches for intermittent and weekend operation
- 99 shot programs
- Shot time correction (precision approx. +/- 1 ms)
- Follow-on shots possible

**Additional options available:**

- Two motor speeds
- Frequency converter for throughput control
- Mold carrier interface
- Interface for external units
- With OP177B, MP277 and MP377 – up to 10 additional mixing heads (9 programs per mixing head)
- With PUC07 or PUC08 – up to 30 additional mixing heads (9 programs per mixing head)
- Additional components possible
- Edge filter with electric drive
- Electric heating system for tanks
- Air conditioning for control cabinet
- Printer interface
- Modem

Other machine-specific options available on request. Please contact us for further details.
HOW A RIM-STAR WORKS

Flow chart for a RimStar machine

- RimStar Modular
- RimStar Compact
- RimStar Nano
- CCM
- LFI
- Automatic top-up
- Tanks [Steal]
- Tanks (VA)
- Spraying

P = Pressure measurement
V = Volume flow measurement
T = Temperature measurement
FU = Frequency converter
FA = Non-KraussMaffei system
MAK = Magnetic coupling
USE = Switchover units
WT = Heat-exchanger

POLY
- 4 bar
- 10 bar
- Standard agitator
- Viscojet agitator
- Fill-level sensor
- Fill-level limit switch
- 25 l
- 60 l
- 100 l
- 250 l
- 500 l

ISO
- 4 bar
- 10 bar
- Standard agitator
- Viscojet agitator
- Fill-level sensor
- Fill-level limit switch
- 25 l
- 60 l
- 100 l
- 250 l
- 500 l

COOL

TEMP

Shut-down valve

Feed pump

MAK

FU

Control system

PUC

Robot

FA

Profibus

Boom

Robot

Rotary table

Oval table

Color

Add-on

Number of mixing heads

40 l/min.
80 l/min.
160 l/min.
400 l/min.
1600 l/min.

4 l/min.
8 l/min.
16 l/min.
40 l/min.
80 l/min.
155 l/min.

Viscojet agitator

Standard agitator

Fill-level sensor

Fill-level limit switch

Chiller

Temperature

Fill-level sensor

Fill-level limit switch

4 l/min.
8 l/min.
16 l/min.
40 l/min.
80 l/min.
155 l/min.

4 l/min.
8 l/min.
16 l/min.
40 l/min.
80 l/min.
155 l/min.

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OPTIONAL ADD-ONS

Optional extras for RimStar machines – for even more successful PUR processing

From a container station to process data capture, you can add advanced technology from Krauss-Maffei for improved performance, safety and ease-of-operation.

Container station
We offer a range of solutions – from a basic barrel unit or container station through to complex material handling systems.

Single version, basic configuration
· Container station consisting of a base platform for one exchangeable container (1000 l)
· Gear pump (20 l/min) with magnetic couplings to fill the RimStar day tank
· Flexible hose with quick couplings for fast container exchange
· Customer-specific options for both versions

Double version, basic configuration
· Container station consisting of a base platform with drip tray for one buffer container (1200 l)
· Buffer container with Supermax and minimum filling level switch (capacitive)
· Exchangeable container (1000 l, above) with “container present” monitoring
· Gear pump (20 l/min) with magnetic coupling to fill the buffer container and RimStar day tank
· Flexible hose with quick couplings for fast container exchange

Mixing-head boom, robots and mobile units
We offer a number of handling systems to optimize polyurethane pour into the mould. These include high-performance industrial robots and mixing-head booms. The latter can be swivel-arm and/or linear units, manually operated or motor-driven.
Process data capture with the MP 277 control
The Siemens MP 277 graphic colour display monitor (10.4 inch) for process data visualization offers some major benefits:
- Graphic overview of the whole system with all process data
- Easy management of foam programs, automatic calculation of all foam parameters
- Tolerance monitoring for all relevant process parameters
- Oscilloscope function
- 20-shift shot data and events logging/archiving
- Interface to host computer for process data analysis
- Printer interface
- The MP 377 Touch is also available; it provides the same functions as the MP 277.

Switchover units
Switchover units channel components to different mixing heads as required.

Feed pumps/recirculation pumps
Feed pumps and recirculation pumps can be supplied to pump high-viscosity polyols, to pump components over long distances and to ensure constant feed of filled or nucleated materials.

Process data capture with the PUC 07 control unit
Computer-controlled data capture with the Siemens PC 677 control panel – 12.1 inch colour monitor
- The PUC 07 offers all MP 277 functions plus:
  - Up to 511 foam programs
  - Event logging
  - Statistical analysis
  - Process data capture for multi-station systems
  - Host-computer interface
  - Modem access

PUC 08 control unit
As for PUC 07, but with:
- Separate IPC built into switching cabinet with 15 inch mobile touch screen from B&R Touch Screen
- Specific overview monitoring possible
- Machine functions available without visual display
Service worldwide

Service, support and spare parts – when you need them, where you need them

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 Reaction Process Machinery 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 reaction process machinery. 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.
How to contact us

Apart from email you can contact us on our service hotline or by post at this address:

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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.

KraussMaffei’s **RimStar series of mixing and metering machines**, with its three versions – Nano, Compact and Modular – has the optimal solution for all types of PUR applications. Modular engineering and flexible configuration mean that these machines can be highly customized. RimStar machines deliver a more stable process and higher product quality with short line lengths for lower pressure losses, more precise temperature control and optimized control technology. The machines are operator-and service-friendly and all elements are easily accessible.

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