POWERFUL. PRECISE. EFFICIENT.

SYSTEM SOLUTIONS FOR PROCESSING COMPLEX PLASTIC COMPONENTS

Krauss Maffe

Krauss Maffe



Pioneering Plastics

FACTS & FIGURES

AREAS OF APPLICATION OUR MACHINING PROCESSES AT A GLANCE











Cold-knife cut (scoring)



Deflashing



Ultrasonic cutting

Ultrasonic welding



Automation

Final molded part machining in the automotive industry (interior)



POWERFUL SYSTEMS FOR TRIMMING COMPLEX PLASTIC COMPONENTS

Stable, largely automated processes are indispensable for cost-effective series production. KraussMaffei offers you comprehensive solutions for trimming your products. Our portfolio ranges from pre-engineering and prototyping to delivery of premium-quality individual holders, tools and systems, as well as creating reliable complete solutions that can be integrated.

We are experts in all types of punching and trimming and in linking trimming systems to complete, automated production lines. Furthermore, we professionally handle ancillary processes as well as custom solutions for particular challenges. You benefit from our comprehensive expertise. Our core competence is standard as well as special-purpose machine building for punching tasks and robot-guided processes.

Your benefits at a glance:

- Worldwide experience in the automotive industry
- Individual, process-neutral advice
- Optimal solutions for each task description
- Support that starts as early as product design for production suitability



CHAINING SYSTEMS OUR COMPLETE SOLUTIONS FOR MOLDED PART TRIMMING

Loading station

Automation of trimming systems

Example for a linked trimming system for an instrument panel. The first robot feeds the punch press. The second robot extracts the workpiece and loads the milling cell for trimming residue and for weakening the airbag system. Conveyor belts transport parts automatically to workstations.

Trimming technology process

- Handling using two industrial robots
- Punch press with various slide cycles
- Fully automated waste disposal
- Airbag weakening using milling process
- Component transfer to follow-up processes
- Cycle time for this system: 33 seconds



PUNCHING TECHNOLOGY ACCURATE SOLUTIONS FOR PREMIUM QUALITY COMPONENTS

Reliability, precision and ergonomic design are the basic requirements for the design of our punching machines. We offer you an extensive portfolio of various punching machines customized for your product. When our products and technologies are linked, they create advanced production lines for series production.

Punching series	Locking force (kN)	Clamping area in mm (width x depth)	Ram punch presses	Punch slides	Tool, integrated	Tool changing	Waste management
Compact punching device	variable	variable					integrated, manual
CutStar *	locked	1540 x 840		•	•		Conveyor sidewards R/L or backwards
TrimStar	200	1500 x 800	•	•	•		Conveyor sidewards R/L or backwards
TrimStar Smart	210	2550 x 1200	•	•		•	Conveyor sidewards R/L or backwards
TrimStar Eco	200	2550 x 1300	•	•	•	0	Conveyor sidewards R/L
PunchStar Compact	220	2600 x 1200	•	•		•	Conveyor sidewards R/L
PunchStar	500	2700 x 1200	•	•			Conveyor sidewards R/L
PunchStar RA, rotary table system	500	(2200) 2500 x 1200	•	٠	•	fully automated 120 sec.	Conveyor sidewards R/L

* Different sizes available

FLEXIBLE CUTTING TECHNOLOGY ALTERNATIVE AND ADDITION TO THE PUNCHED CUT

KraussMaffei offers milling and trimming with ultrasonic cutters. Both processes are suitable for trimming complex contours. In addition to the automated linking and the ultrasonic welding with the robot, systems for deflashing and for surface activation (flame treatment) round out our portfolio.

Series for flexible cutting technology	Processing method	Robot	Clamping dimen- sions in mm (width x depth)	Suitable for com- posites	Flex. path program- ming	Tool changing	
RoutingStar	Milling	up to 3	2 clamping positions, each at (1630) 1760 x D960		•	•	Conveyor / option: extractor, integrated at product intake
RoutingStar CXL	Milling	2	2000 x 2500	•	•	•	Cabin extraction / spot extraction at the milling head
RoutingStar Light	Milling	1	(1480) 1350 x 600		•	•	Waste transport integrated, manual
ScoringStar	Film weakening	1	2 clamping positions, each at 1650 x 590		•	•	
ScoringStar RA	Film weakening	2	3 clamping positions, each at 1650 x 460		•	•	Auto. release agent dispensing / option: available as a 2-position rotary table system
SonicStar	Ultrasonic cutting	1	2 clamping positions, each at 1650 x 590		•	•	Waste transport integrated, manual
SonicStar CXL	Ultrasonic cutting	up to 2	2080 x 1480	•	•	•	Waste transport integrated, manual
RobDeflash	Deflashing	1	up to 2 clamping positions, each at 230 x 700		•	•	Extractor, integrated in product intake
FlameStar	Flame treatment	1	(2000) 1500 x 650		•	•	

COMPACT, MOBILE, ERGONOMIC – THE TRIMSTAR SERIES AUTOMATIC PUNCHING PRESSES WITH PRECISION TOOLS

The TrimStar has a zero-degree trim and slide-guided punching knives. The tool can be integrated into the drive unit or, as with TrimStar Smart, can be designed to be changeable. The simpler CutStar version cannot do zero-degree trimming during the mold closing movement.

TrimStar – compact design, ergonomics and reliability Unlike large punch presses, the TrimStar is a compact unit which can be quickly moved as a mobile cell. The tool technology is identical to the proven design of our punch tools which are operated in punch pressure sensors.

Compact quality

The feed unit runs ergonomically on the angled, swiveling pickup table. The pickup table swivels into the punching position for the punching process and then locks. Then a zero-degree trim is carried out with the ram, or right away there is a punching movement of the hydraulic slides with attached punching blades.

Smart tool change as required

TrimStar Smart has a compact design as well as a tool change option toward the front or back of the machine. This solution combines the advantages of a compression solution with the advantages of a compact machine.

- · Compact, space-saving design
- Short cycle times
- · Moves quickly
- Low maintenance expenses
- Flexible waste guide



Ergonomic: punch tool for instrument panel in loading position.



TrimStar Smart: tool change toward the front or back.





PUNCHSTAR – FOR INDUSTRIAL OPERATIONS **PRECISION PUNCHING MACHINE** WITH INTERCHANGEABLE TOOL

PunchStar is a specially designed machine for the punch process with a high base accuracy. The tools can be replaced manually, semi-automatically or in the case of PunchStar RA (rotary table system) even fully automatically with this series.

Accurate trimming

This machine is guided by means of a proven block column system. In combination with the tool guidance, this punching machine allows for accurate trimming with a cutting gap of up to 0.02 mm following a 1200 mm stroke.

Ergonomic and low-maintenance

The punch tools have a solid graphite cast structure which accommodates matrices and splitters. The splitters are largely maintenance-free and high-precision. The bottom part of the tool can optionally be equipped with a swivel mechanism which allows for an ergonomic feed unit.

For industrial applications

PunchStar punch presses are excellent for an automatic feed unit and their use in fully automated production lines. This requires the waste to fall through reliably. KraussMaffei already factors in this requirement when designing the components.

- · High accuracy and cutting quality
- Short cycle times
- Low maintenance costs
- Low tool wear
- Fast tool change is possible, even fully automated
- Automation and linking with other systems are possible



PunchStar RA with rotary table system for fully automated tool change.



Guide system for accurate punching of plastic components (punch tool for an instrument panel).

ROUTINGSTAR -PRECISION IN SYNC ROBOT MILLING CELL FOR FLEXIBLY TRIMMING COMPLEX PLASTIC COMPONENTS

Mobile system for complex milling

The RoutingStar robot milling cell is perfectly designed for milling complex, three-dimensional plastic components. The RoutingStar offers maximum flexibility and precision with very short cycle times. The RoutingStar can quickly be modified for new tasks. As a mobile cell, the system can be quickly repositioned in production and can be used again within the shortest possible time. The use of various end-of-arm technologies turns RoutingStar into a multitalented solution. These enable it to be used for various milling and deflashing tasks.

Premium quality equipment

The RoutingStar is modularly designed with proven components. Standard equipment includes the swinging doors and the waste tray in the front. There is also an optional version with a rolling door. The vertical turntable allows a feed unit to run parallel to the process. There are support arms in requirements-based types for the product intakes. The components are automatically gripped. The system can be fed either manually or using a robot handling system. A central waste material system is integrated into the cell.

Robots that cooperate

The interior can be equipped with up to three cooperating industrial robots. Product intakes are customized to your product. Customers who wish to omit the changeover process like to fall back on our proven duplex holders. In addition, the product intakes are activated using additional rotary axes. This allows multiple holder positions for each table side. The changeover conveniently takes place using the operating panel.

Preparing series production together

We will be happy to support the development of milling projects. You are also welcome to use our TechCenter to produce the prototype (pre-batch production) components. Please contact us.



RoutingStar light: For specific requirements.



RoutingStar CXL: For large components.

Compact and powerful. RoutingStar milling cell with pivoting receiver





Krauss Maffei

- Compact and mobile system design
 Flexibility in defining the trimming
- task
- task
 Ability to process complex geometries
 Milling head breakage monitoring and milling head length measurement
 High productivity and noise protection
 Feed unit that runs parallel to the process (vertical turntable)
 Multiple use of robots
 Automatic setup possible



Changeover magazine for automatic change of milling tools.



Optional: three robots working in parallel for short cycle times.

SCORINGSTAR - FOR ACCURATE AIR BAG WEAKENING PATENTED COLD-KNIFE SYSTEM WITH HIGHEST ACCURACY

The ScoringStar is a compact industrial robot system for weakening the airbag section in the decorated film of instrument panels. For this purpose, a robot-guided tool developed by KraussMaffei is used to weaken the film to a defined residual wall thickness using a cold-knife process.

Design basics

The decorated film is held in place in a contour holder. ScoringStar has a proven track record all over the world as a rotary table system. This design allows the machine to be loaded while it continues to process the material. Depending on requirements, various products can also be produced on one system. You save unnecessary distances and benefit from an optimal material flow thanks to the central loading area. Individual systems or multiple systems are available depending on your needs.

Reliability component after component

The tolerance compensation provided by the special design of KraussMaffei's scoring tool makes ScoringStar particularly reliable and ensures uniform processing quality.

- Process-reliable and cost-effective
 Feed unit that runs parallel to the process
- · Patented scoring tool
- Reliable technology with complete process monitoring and documentation
- Dispensing of release agents possible



ScoringStar RA, scoring and release agent dispensing in one system.



Patented scoring tool.



Rotary table or slide table designs

SONICSTAR -FOR SPECIAL REQUIREMENTS CUTTING WITH ULTRASOUND

SonicStar is suitable for trimming reinforced and unreinforced plastics.



Automatic coupling of the ultrasonic tool.

Standardized design principle

SonicStar differs from the standard cells of RoutingStar and ScoringStar only by its end-of-arm tool on the robot. Here, sonotrodes and quality blades are used and operated between 24 and 35 kHz.

Conversion between milling and ultrasonic cutting

This concept also allows for the conversion between milling and ultrasonic cutting. The machining cells offer component fasteners with maximum precision for both processes. In addition, the KraussMaffei concept for ultrasonic cutting has the option of automated blade changing, without interrupting the production flow.

Solutions for special requirements

The ultrasonic technology is suitable, for example, for trimming preforms to manufacture CFRP components.

SURFACE ACTIVATION WITH THE FLAMESTAR FLAME TREATMENT SYSTEM FOR FOAM PREPARATION

The flame treatment helps with surface activation of components which are to be back-foamed. The FlameStar system from KraussMaffei is an automated, robot-guided solution that can be optionally combined with additional technologies.

Accurate masking

Areas where foam adhesion is not desired are covered with masks that are partly driven individually. Sealing takes place with flame-resistant, molded, impressionfree plastic seals (masking) at this point. The contour accurately follows the specifications of the CAD data and is tailored to subsequent cutting operations.

Compact and flexible use

The system is designed as a compact cell. The cell can be transferred in production without great expense. The programming needs no adjustment afterwards. We would be happy to discuss with you additional alternatives for integration at foaming positions.

YOUR BENEFITS:

Uniform surface treatment
Accurate masking
Mobile system for flexible installation



FlameStar's flaming system with integrated sprue punch



Flame treatment over the masking

FULLY AUTOMATED DEFLASHING FOR PREMIUM QUALITY PLASTIC COMPONENTS

RobDeflash for back-injected film components

When deflashing components that are back-injected with foil, protruding coating flakes are removed fully in an entirely automated process. This deflashing process is suitable for even the most sensitive components as well as for simple and complex geometries. As an option, you can expand the RobDeflash with UV irradiation for finish hardening. The system enclosure is equipped by default with a hanging robot. When two product holding carriages are used for each cell, it is possible to have a feed unit that runs parallel to the process.

Efficiently deflashing PUR components

Rope strand deflashing can be used for deflashing PUR components without harming the component surface in the process. A taut wire rope rotates and can be applied even to complex geometries with the degrees of freedom of an end mill. The rope flexibility compensates for component tolerances and the rope strand hugs the body geometry of the component. This technology can be used in an automated mode and creates fully machined foam components. The rope strand deflashing is incorporated into systems of the RoutingStar family (particularly RoutingStar light) or directly into the component handling.

- Optimal ergonomics
- Compact and mobile system design
- Automatic extraction
- Large-format enclosure ionization
- Quick tool change
- Compact, modular design
- Linking with injection molding systems is possible



RobDeflash: deflashing component holder



Automated deflashing even for complex contours



Rope strand deflashing: automated, surface-friendly deflashing of PUR components



OUR WORLDWIDE EXPERTISE IS YOUR ADVANTAGE DIGITAL & SERVICE SOLUTIONS

With your KraussMaffei machine, you have chosen a product that delivers the highest levels of productivity and reliability. In addition to our range of machinery, KraussMaffei focuses on comprehensive and future-oriented solutions, innovative business models and an innovative portfolio of digital products.

Customer service at the touch of a button

The process of digital transformation is becoming faster and easier than ever for the customer. Our Digital & Service Solutions unit makes your production chain even more flexible and efficient with future-oriented solutions. KraussMaffei thus globally provides an all-inclusive customer service package and networks machines and processes with each other. Our global support offers a sound basis for your local long-term success.

Individual challenges in mechanical engineering call for intelligent solutions

With our services portfolio, we support you throughout your machine's lifecycle with a strong focus on your specific needs. In order to satisfy your wishes, we offer you a wide range of solutions in order to ensure maximum availability and optimum productivity of your machines.

Technology³ as a unique selling proposition

KraussMaffei is the only supplier in the world with a product range comprising the most important machine technologies for plastic and rubber processing: injection molding machinery, automation, reaction process machinery and extrusion technology. KraussMaffei is represented worldwide with more than 30 subsidiaries and over 10 production plants as well as about 570 commercial and service partners. Working together with our customers and partners, we are thus in a position to offer vast and unique expertise in the industry.

You can find further information at: www.kraussmaffei.com

KRAUSSMAFFEI – PIONEERING PLASTICS



Extensive expertise from a single supplier

KraussMaffei is one of the world's leading manufacturers of machinery and systems for producing and processing plastics and rubber. Our brand has been synonymous with cutting-edge technology for over 180 years. Our product range includes all technologies in injection molding, extrusion and reaction process machinery. KraussMaffei has a unique selling proposition in the industry as a result. By drawing on our proven innovative capacity, we can guarantee our customers sustained additional value over their entire value-adding chain through our standardized and individual product, process, digital and service solutions. The range of our products and services allows us to serve customers in many sectors including the automotive, packaging, medical and construction industries. We also supply manufacturers of electrical and electronic products and household appliances.

At your service all over the world

KraussMaffei is represented all over the world. Subsidiaries provide you with support in the countries shown in light blue. Our sales and service partners take care of you in the regions shown in white.

You can find all contact information at www.kraussmaffei.com

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