

KraussMaffei reaction process technology encompasses metering systems, foaming tools, mixing heads, mold carriers and diverse trimming equipment, which are suitable for automotive interior and exterior production, as well as providing efficient and reliable solutions for the insulation and appliance industries.



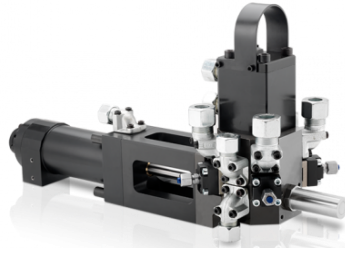
Wincap

For car sun roof, they have become an important component of car aesthetics and comfort configurations. The sealing, noise control, and safety of the connection between glass and the vehicle body have become key issues. Due to long-term use, the shock and vibrations, weak connections, ventilation, or water leakage can shorten the service life of the window glass trim. KraussMaffei has a complete WINCAP (Window encapsulation) production line, which can effectively solve this problem. After pre-treatment (cleaning, undercoating) and glass activation, the glass is placed in a mold, and PU edging treatment is carried out around the glass through KM's Wincap process. After maturation, it is taken out for subsequent trimming and other processes. PU car sunroof glass edge wrapping products have the following characteristics: excellent surface gloss; Compact edge wrapping structure; The binding strip is firmly bonded to the glass; Excellent thermal stability; Pollution-free, non-toxic, and harmless to human health.



Fully electric mold carrier

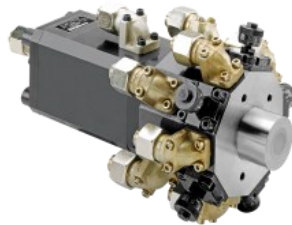
- Customized solution, easy mold changeover and increase productivity
- Infinitely safe locks on both sides of the mold carrier
- Reduce maintenance
- Ergonomic, multi-angle operation



CCM mixing head

Elegant decorations with depth effect in a one-shot process

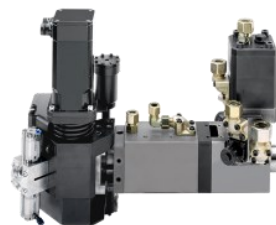
- Filling procedure with perfect mixing and output for optimal part quality
- Exceptional reliability and long service life
- High flexibility in nozzle technology
- Self-cleaning, maintenance-friendly design



Filler mixing head

For abrasive PU systems

- Excellent uniform mixing leads to higher component quality
- Maximum production reliability with long service life
- Outstanding processing for a range of polyurethane/filler formulation
- Mixing of raw material components in a high-pressure, counterflow injection process

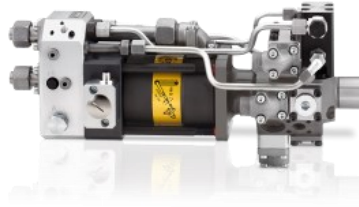


LFI process mixing head

Fibers and PU in Composite material

- Versatile application

- Wetting the fibers with the reaction mix
- Fiber quantity and length can be configured based on requirements
- Flow-optimized geometry of the cleaning piston



MKE-3B mixing head

Cost-effective alternative for laminar mixture output

- Exceptional reliability and long service life
- Very high number of shots and the ability to process higher viscosities
- Laminar and splash-free mixture output
- Self-cleaning, maintenance-friendly design



Spray mixing head

Compact and rugged

- Armor-plated mixinghead for processing highly-filled PUR systems
- Excellent mixing quality even with extreme mixing ratios
- Low overspray, sharp spray edges
- Material savings through optimal material application



Transfer mixing head

Versatile for sophisticated systems and laminar mixture output

- Mixing the raw material components in a high-pressure, counterflow injection process
- Self-cleaning mixing head
- Cartridge system simplifies changing nozzle elements
- Optional cleaning piston positioning during the shot



KraussMaffei "PU Star" polyurethane foaming machine is a new product developed for the Chinese market, featuring a modular design for easy maintenance. The high-pressure metering pumps, specially designed for polyurethane production, are controlled in a closed loop to guarantee the quality of the important components. PU star is widely used in the automotive, construction and household appliance industries.

- PU Star Agile 80/80 and PU Star40/40 are widely used in the rigid foam and white goods applications;
- PU Star Agile 8/8、PU Star Agile 16/8、PU Star Agile 16/16 and PU Star Agile 40/16 are specially developed for the automotive industry and can be used in many foaming fields such as dashboard foaming, armrest foaming, headrest foaming, carpet foaming and so on



RTM

Faced with the huge potential of the current high-speed development of the electric vehicle market, the market demand for lightweight is also increasing day by day, and the RTM molding technology for processing composite materials has obvious advantages in high performance and low cost compared to other molding processes.

In response to market demand, KM has developed equipment for the high-pressure resin transfer molding process (HP-RTM). HP-RTM refers to the molding process of composite products obtained by using high-pressure pressure to mix and inject resin into a vacuum sealed mold pre laid with fiber reinforced materials and pre embedded components, and then filling, impregnating, curing, and demolding by resin flowing to obtain composite products. The specific process includes: coil cutting, dealing with cutting materials, transfer to pre-forming molds, pre-forming process, transfer to HP RTM stations, vacuum process, resin injection, curing, taking out the parts, edge trimming, and other post-processing. KM equipment provides a one-stop turnkey solution for this process.

The main characteristics of this process are: strong flexibility in mold manufacturing and material selection; Capable of manufacturing components with good surface quality and high dimensional accuracy, especially large components; Easy to achieve local enhancement, and embedded components can be pre-installed; The fiber content can reach up to 60%, and fillers can be added to the resin to reduce costs and improve performance; Closed mold molding reduces styrene emissions and is beneficial for environmental protection.



The most commonly used method for forming the foam layer of the steering wheel is the polyurethane (PU) foam manufacturing process, which is made by using polyurethane reaction injection to wrap the alloy skeleton.

The production of foam coating layer includes:

- Preparation of raw materials: Component A is generally composed of a combination of polyols, physical foaming agents, catalysts, and color paste, and the material temperature is maintained at 22 °C. Component B is generally a specialized isocyanate, with a material temperature maintained between 18 and 20 °C. Both materials are pumped into the corresponding storage tanks for use
- Release agent spraying: Usually, a spray gun with a small spray can is used to spray the release agent at a lower flow rate, smaller width, and better atomization in the mold cavity and exhaust hole of the steering wheel mold
- The mold interior painting. The function of the paint inside the mold is to paint the surface of the steering wheel. The spray of paint inside the mold is also sprayed into the mold cavity with appropriate flow rate and atomization through a built-in small spray gun
- Reaction process molding: After completing the above two spraying steps, the mold starts to close, and then the high-pressure pouring machine pours components A and B into the

mold cavity through the mold injection port. At this time, a process called polyurethane self-skinning foam will occur in the mold cavity

- Demolding: The time from mold closing to mold opening depends on the characteristics of the raw materials and the customer's process. The demolding agent plays a decisive role in ensuring that the product can smoothly and completely detach from the mold cavity after mold opening.

The PU steering wheel foam layer integrates decoration and function, with the advantage of comfortable feel, absorbing collision energy from the driver's head and chest, improving safety, and having advantages such as wide adjustable range of performance, strong adaptability, wear resistance, less cracking, good adhesive performance, good elasticity, good weather resistance, and long service life.



KraussMaffei, with its deep technological expertise in the field of polyurethane foaming, has been involved in the pultrusion market since 2017, and in 2019, we successfully acquired Pultrex, a global company with 40 years of experience in the field and more than 600 pultrusion systems in operation worldwide, thus further enhancing KraussMaffei's competitiveness in the market. With the subsequent launch of the iPul™ pultrusion systems, KraussMaffei became one of the few suppliers able to integrate resin injection boxes and profile haul-off lines, offering customers a one-stop turnkey solution.