

# Rattle-Free Part

## *Flexible Turnkey System for Multi-Variant Roller Blinds*

At the US location in Auburn Hills, Michigan, fischer automotive systems produces kinematic components for the center console of the Mercedes GLE class, which are equipped with a roller blind. The individual slats of the roller blind are manufactured on a large two-component injection molding machine and, while they are still in the turnkey system, are combined with externally supplied parts to form the finished roller blind.



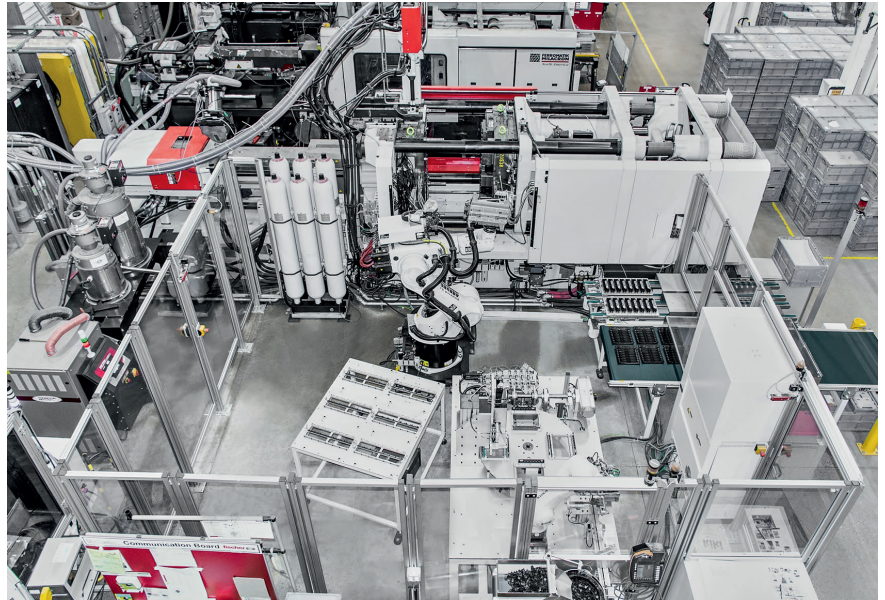
The center console of the Mercedes GLE class, which are equipped with a roller blind. The individual slats of the roller blind are injection molded using a two-component machine and combined with externally supplied parts to form the finished subassembly (© fischer)

It takes almost a bird's eye view to get an overview of the size and complexity of this fully automated plant (Fig. 1). In a production cell, which is docked laterally to a hydraulic two-component injection molding machine (type: Allrounder 920 S) with a clamping force of 5000kN, two six-axis

robots from Kuka assemble several injection molded and externally supplied parts to the basic roller blind, which is then refined to the ready-to-install product in a subsequent step. Both robots are integrated into the Selogica machine control system. In addition, there is a

cooling station, an oscillating conveyor and a manually loaded double shuttle table for feeding external assembly parts.

The injection molding machine produces slats for a roller blind that decorates the center console of the Mercedes GLE class (Title figure). The assembly of »



**Fig. 1.** A two-component injection molding machine with a clamping force of 5000 kN and two six-axis robots integrated into the machine controller form the heart of the system (© fischer)

## Company Profile

fischer America Inc., a subsidiary of fischer automotive systems GmbH & Co. KG in Horb, Germany, produces high-quality car interiors such as storage compartments, air vents and multifunctional components at the Auburn Hills site, MI/USA with 196 employees. The machinery of the subsidiary, founded in 1998, currently comprises 26 injection molding machines.

➤ [www.fischer-automotive-systems.de](http://www.fischer-automotive-systems.de)

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the individual parts is directly integrated into the system in order to ensure consistently high product and assembly quality. But why is this plant dimension necessary at all? The answer is given by Dan Saari (**Fig. 2**), Production Manager at the fischer production plant in Auburn Hills, where the production cell is located: "Because we needed to produce the decorative roller blinds in many variants and in large quantities, we were looking for a very flexible turnkey solution. From plan-

ning to implementation, Arburg provided us with excellent support throughout."

### Central Selogica Controls Processes

According to Saari, fischer automotive was not only interested in flexibility, but above all in ensuring consistently high part quality and production efficiency for the complex product. This required precise coordination and execution of the two-component injection molding pro-



**Fig. 2.** Production Manager Dan Saari, Process Engineer Izet Cejvanovic and Maintenance Manager Jon Anderson (from left) accompanied the turnkey project at fischer automotive systems in the USA (© fischer)

cess and the various assembly steps. Important initial condition: the injection molding parameters are continuously monitored and bad parts are immediately ejected from the process.

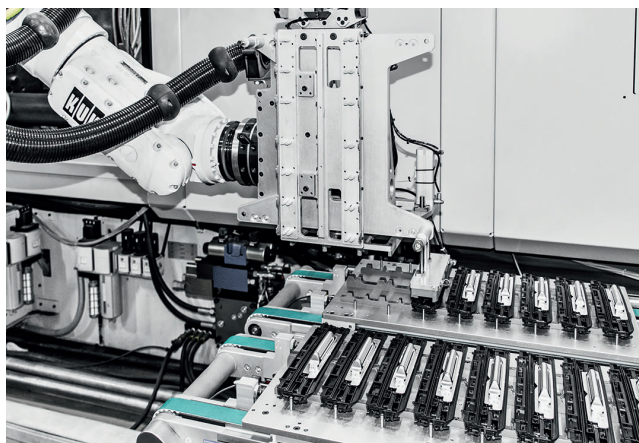
Equipped with an 8+8-cavity mold, the two-component machine initially produces eight individual slats from fiber glass-reinforced polyamide 6. They are rotated precisely by 180° to the next position by an indexing unit in order to inject two soft sealing lips made of thermoplastic polyurethane (TPU) onto each slat. These then ensure that the center console roller blind will not rattle or squeak while driving and does not let through any unwanted light. The injection molding parameters are continuously monitored and reject parts are immediately ejected from the process.

The large six-axis robot (KR30) uses a complex vacuum gripper specially designed for this application. It removes the eight finished hard/soft parts and deposits them on a cooling station with a total of 48 slots.

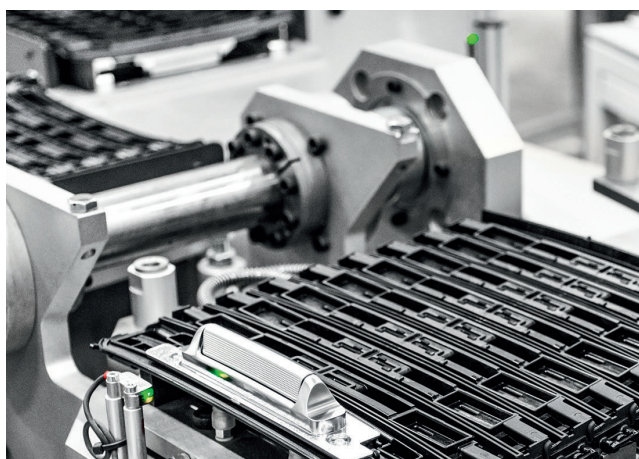
"We can control and monitor all turnkey system processes easily and transparently with the user interface of the central Selogica," explained Izet Cejvanovic, Process Engineer at fischer in the USA, citing a major advantage. In addition, the hot runners, the mold temperature control and the needle-type shut-off nozzle are regulated via the machine controller.

### **A Large and a Small Six-Axis Robot as Assembly Team**

Following the first-in-first-out principle, the robot then grips eight cooled slats and another element with a pre-assembled handle that is fed via a double shuttle table. Now the large six-axis robot places all components in a transfer station. This pushes the nine slats together and, after a vertical 180° rotary



**Fig. 3.** An externally supplied element with a pre-assembled handle is fed via a double shuttle table (© fischer)



**Fig. 4.** The externally supplied element with a pre-assembled handle is pressed together with eight injection molded slats to form a subassembly for roller blinds (© fischer)

movement, deposits them in a station on the turntable of the actual assembly station.

The turntable then rotates horizontally into the working area of the smaller six-axis robot (type: Agilus). With a demanding rotary movement, the robot gradually threads two clips between two slats into the mandrels provided for this purpose. The small parts were previously fed individually via an oscillating conveyor. The turntable rotates to the next station, where the clips are automatically locked in place (Figs. 3 and 4). After a further rotation, the completely assembled basic roller blind is in the output position.

After that, the small Agilus' big brother in turn removes the fully assembled subassembly and places it on a conveyor belt. This is now ejected from the system and subsequently finished to customer specifications, for example with a wood decor or powder enamel coating.

"In this way, around 1.6 million of these products will be produced for the automotive industry over the course of the project," emphasizes Dan Saari. He confidently adds: "We are ideally positioned to meet the demanding requirements of the automotive industry with this flexible and production-efficient turnkey system." ■

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