

# Innovative round latch unit offers flexible solution

Where conventional two-stage ejectors approach their limitations

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1/ HASCO round latch unit Z1780/..., Z1782/...

Whenever it is a case of developing sophisticated injection moulding tools, the toolmaker JBW and the E.W. Konstruktionen GmbH frequently cooperate with one another.

Johannes Becker Werkzeugbau GmbH, specializing in injection moulding tools and precision injection moulding headquartered in Neuenrade in the region of Sauerland, Germany, supports its customers right the way from the original idea through to production. Cooperating closely with its customers, JBW develops plastics-oriented solutions and innovative mould concepts. Even though the company is focused on the production of highly complex hybrid tools for thermoplastics and thermosets – i.e. metal or electronic overmoulding tools – projects regularly arise that perhaps look very simple at first sight but on closer inspection are rather "tricky".

This was the case with a polypropylene sleeve for a gas boiler flue system from the company

In a case involving an injection moulding tool with complex demoulding, round latch units from the Lüdenscheid/Germany-based specialist for standard mould units played an important role in delivering the optimum solution. The round latch units Z1780/... (pulling system) and Z1782/... (pushing system) were showcased for the first time at K 2019. They were developed especially for use in injection moulds and diecasting moulds when a second parting plane is required.

Centrotherm. Here, the particular challenge was to activate a collapsible core for the demoulding of an annular seal groove, until now, was rolled on in a secondary operation. The company from Brilon develops and produces innovative flue systems for the condensing boilers as well as solutions and products in stainless steel for the ventilation and automotive industries. When it came to designing this mould – with a challenging demoulding solution – mould builder JBW was supported by the E.W. Konstruktionen GmbH from the German town of Hille, and its partner, WinterTools from Havixbeck in North Rhine-

Westphalia. These two innovative service providers for the development, design, simulation and documentation of injection moulding tools has always pursued the aim of developing, together with its customers, to get the best solutions in mould and toolmaking. Since the foundation of E.W. Konstruktionen GmbH and WinterTools more than 1,000 projects from virtually all areas of the automotive, electrical, home appliance and other industries have been realized.

## Flue system sleeve undercut

Charged with the task of producing the undercut sealing groove of the sleeve with a diameter of 250 mm by the injection moulding process, the customer – Centrotherm – turned to JBW. Together with E.W. Konstruktionen GmbH and WinterTools, the concept was drawn up, with the component being immediately redesigned in coordination with Centrotherm to enable it to be injection-moulded. In this way, for example, the demoulding draft angles in the area of the groove were optimised. An interchange-

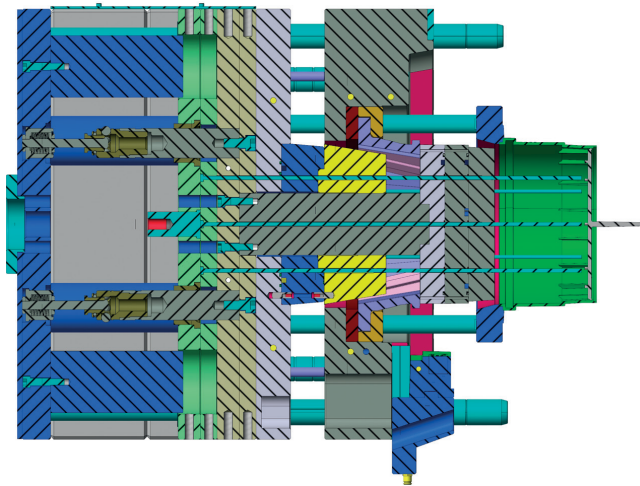


2/ Flue system sleeve

able marking plate is laid open via diagonal bolts and slide bars. The plastic melt enters the mould via a star-shaped cold runner feed system. The sleeve, with a weight around 540 g, is now produced with a cycle time of 2 minutes in quantities of 8,000 to 10,000 pieces a year.

### Two-stage ejector with long strokes

In order to demould the undercut in the sleeve, an initial stroke of 55 mm is needed. For this, the two ejector assemblies 1 and 2 move forward by 55 mm, hydraulically driven, in order to lay open the annular groove. The HASCO round latch unit Z1782/... for pushing motions positively connects the two assemblies, whereby the central circumferential multi-point



3/ Mould Assembly Drawing

unit release the locking mechanism so that ejector assembly 1 can carry out the remaining stroke of 151 mm to activate a strip-plate. This then pushes the

locking system ensures an optimum flow of forces. This is of particular importance because the two ejector assemblies must move absolutely synchronously so as not to damage the device for laying open the groove. Once the initial stroke of 55 has been concluded, the balls in the latch

sleeve for demoulding from the tool. The radial system of runners is demoulded by ejector pins and removed under controlled conditions by a robot gripper. Because the round latch units are positioned within the mould, they are optimally protected during production, transport and storage.

Precautions to offset misalignment due to thermal expansion as well as integrated collision protection also contribute to the reliability of the process.

"We were surprised how easily and reliably this round latch unit system functions," says Benjamin Lionnais, plant manager at JBW. "Installation is very versatile and adjustment and calibration are really very easy." With a normal two-stage ejector, the first stage always has to be adjusted to the final size, and everything has to be unscrewed again for maintenance work and later readjusted after assembly. This is not necessary with HASCO's round latch unit: dismantle – install – ready to go.

Another major advantage of this latch unit is that it alone allows a second stroke in the required range of over 150 mm. With conventional two-stage ejectors, this is not possible because they generally allow only a smaller maximum stroke. Through the rotating locking sleeve in the free gap, the stroke lengths are unimportant as regards wear. This also means that lubrication is not necessary. Only when the desired stop position is reached does a brief release stroke occur in which the five balls roll off gently from the locking sleeve. Normal centralised or decentralised two-stage ejectors also have the disadvantage that the two plates are



4/ Moving half of the mould with stripper plate

not connected but move one after the other. Through this advancing movement, the demoulding and ejection process cannot – in the case of the components being produced here – be carried out so neatly using standard two-stage ejectors. The HASCO round latch unit, on the other hand, enables trailing or a connected procedure of the two ejector assemblies. "An integrated spring assembly serves to protect against collision during the return motion to the starting position, and thus ensures gentle re-threading of the locking sleeve," explains Axel Fehling, HASCO sales manager for the West region. Through the application-hardened locking heads and the free-gap principle,

very gentle engagement and disengagement are ensured, so that a very long service life can be achieved.

Although the complete mould with a baseplate size of 596 x 696 mm weighs around 2.3 tonnes, two HASCO round latch units are sufficient for optimum frictional contact connection with this application.

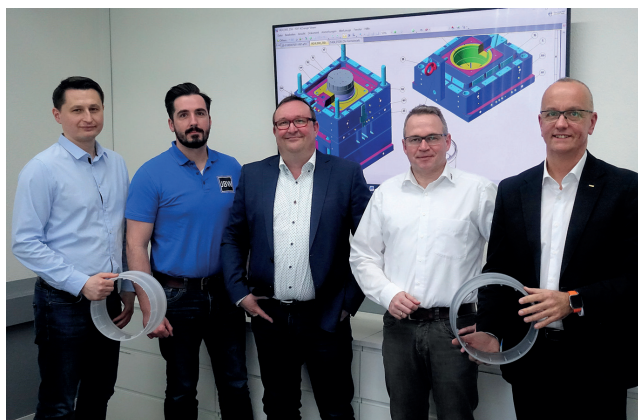
"We greatly appreciate the fact that the round latch units were immediately available from stock at HASCO and were supplied ready for installation in the right length without any need for adjustment," says Andreas Winter, owner of WinterTools.

But not only the round latch units come from HASCO. The complete mould system consists entirely of components from the Lüdenschied-based producer of standard mould units. "We have been working together with HASCO since the 1960s," says JBW plant manager, Benjamin Lionnais.

"We are convinced of the quality of the products. If our customer does not prescribe any other supplier, we exclusively choose HASCO because the quality, product range and delivery times are quite simply ideal. Not least, the personal support given by the respective technical salesman plays an important role. I have a contact partner who is always on hand should I need help and can always assist me with technical questions."

"In the design area, we really like the HASCO Portal," says Eugen Abermet from E.W. Konstruktionen GmbH. "Here, we can find all the information we need easily and quickly at the press of a button."

The round latch unit Z1782/... is, like many other products, configurable online in the HASCO Portal, and parametrised CAD data are available for download for the conventional CAD systems.



5/ Eugen Abermet/ E.W. Konstruktionen GmbH, Benjamin Lionnais/Johannes Becker Werkzeugbau GmbH, Andreas Winter/WinterTools, Andreas Kaersch and Axel Fehling/ HASCO (left to right)

(Pictures: E.W.K., JBW, HASCO)