July 2017

Open to New Approaches

Designed for your profit

Gantry type 5-axis milling and turning centre Umill 1800 in operation at HKR in Spraitbach, manufacturer of high-precision injection mould tools

HKR Werkzeugtechnik GmbH

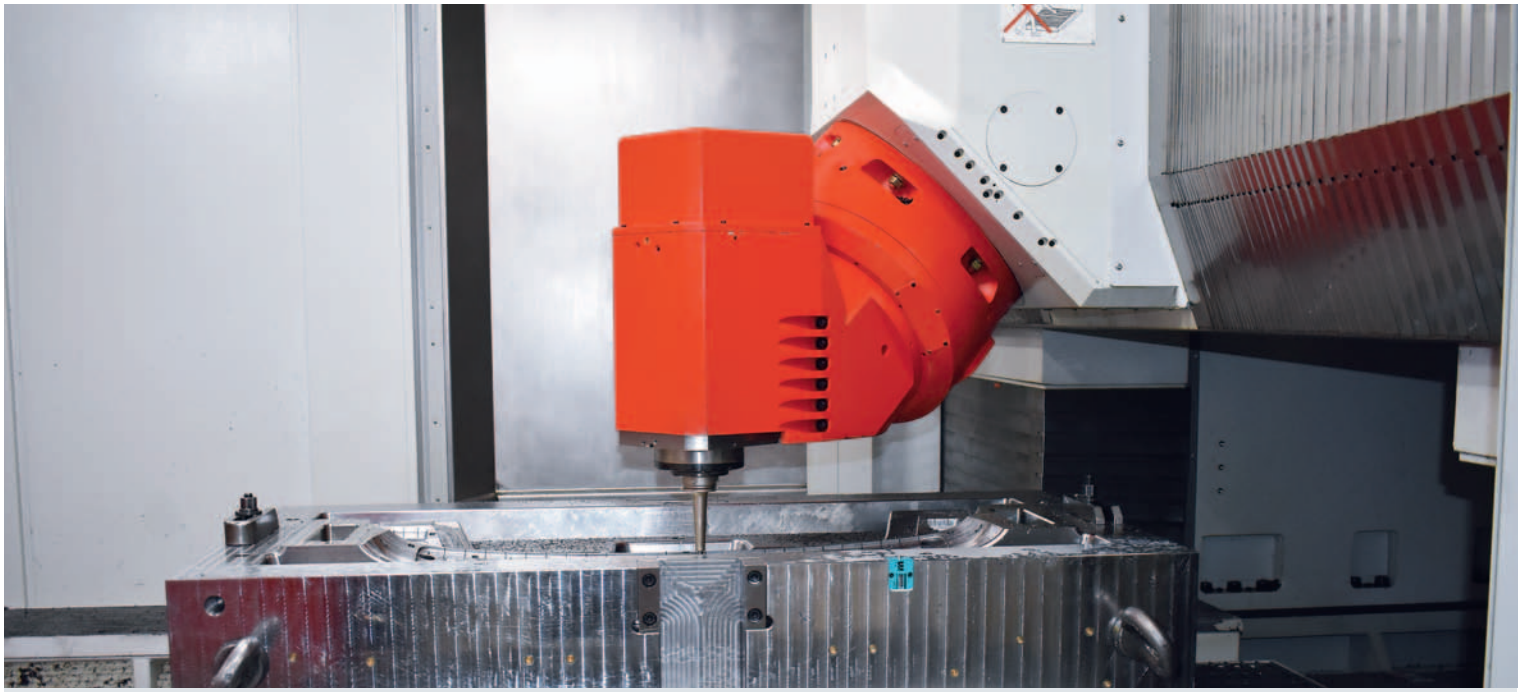
HKR Werkzeugtechnik GmbH from Spraitbach, Baden-Wurttemberg

An employer of more than 60 workers, the HKR Company based in Spraitbach has been a renowned manufacturer of high-precision injection mould tools for more than 20 years. The company is a classic supplier for the automotive industry. Founded in 1994 by Wilhelm Hölldampf, Wilhelm König and Hans Rudolf, it has built a good reputation throughout the entire industry, which is due to its comprehensive production know-how and commitment. With the available machinery and the new Umill 1800 made by EMCO MECOF, the required flexibility, 24-hour automated operation and complete machining can be implemented easily.

HKR Werkzeugtechnik GmbH
Eugen-Hahn-Strasse 35, 73565 Spraitbach
Tel.: 07176 / 90001- 0, Fax: 07176 / 90001- 20
E-Mail: info@hkr-werkzeugtechnik.de
www.hkr-werkzeugtechnik.de
www.emco-mecof.de

Requirements Profile

- 5-axis machining of parts with diameters of up to 2,500 mm and heights of up 1,250 mm
- Flexible applications to cover a wide range of parts
- Heidenhain control and CAD-CAM system
- Service and spare parts supply in Germany



5-axis machining of an injection-mould

HKR Werkzeugtechnik GmbH has been committed to manufacturing high-precision injection mould tools for more than 20 years. Milling machines made by Mecof have been used in the company‘s key areas for almost the same period of time. Travelling column machines have so far been used primarily. However, this has changed with the company‘s latest investment in a 5-axis milling and turning centre, the Umill 1800 made by Emco Mecof. The determining factor for the acquisition was, above all, the increased flexibility in machining processes.

HKR‘s success story started when all protagonists were facing a medium catastrophe. After it had closed its own tool manufacture as a result of the economic crisis in 1993, the company Grau Werkzeug- und Formenbau began focusing on the production of sheet metal parts. Wilhelm Hölldampf, Wilhelm König and Hans Rudolf, all of whom had been employed as master toolmakers, did not want to resign themselves to this predicament just like that. Not only were they sure that the crisis would not last forever, but they were also convinced that the market would soon fall back on companies that could offer such a high level of experience and skills.
Hence, they founded HKR Werkzeugtechnik GmbH, “grabbed” Rolf Schürle – one of the most hopeful young colleagues – and started their own business in 1994 with second-hand machines.
Everything else is quickly told. Due to its know-how and high motivation, the company quickly acquired considerable renown - especially in the automotive industry - that was further enhanced in the course of the years. Even 2008/2009 could be coped with without major losses.
In the meantime, Wilhelm König and Hans Rudolf have left the circle of partners, while Rolf Schürle, whom we have mentioned further above, has been promoted managing director. Today, HKR employs more than 60 workers, approximately two thirds of whom work in production. The company has specialised in the manufacture of injection mould tools, the total weight of which can be as high as 20 tons, for the area of automotive engineering. These include, amongst other things, pillar trim panels and seat trims or centre consoles.
Technically, this description is not 100% up to date anymore, because HKR is well on its way to establishing an additional business area with the parts production using injection moulding machines. Rolf Schürle explains ‚Our customers want more than just the corresponding tools; the request for finished parts is ever increasing. Right now, we are already talking about finished assemblies.‘
The company‘s good and quick establishment is also demonstrated by the fact that the previous second-hand machine tools were soon replaced by new machines. One of the first machines was a MECOF CS 500 which was bought in 2001. Rolf Schürle states, ‘We gained very positive experiences with Mecof machines while we were working for our former employer. Nevertheless, we had made thorough comparisons with products from other manufacturers before we finally opted for this machine.’ A good decision, because the CS 500 had been used in continuous operation for about 15 years, with virtually no downtime at all. Until it was put out of operation, it had always delivered outstanding machining results.
‘Nevertheless,’ says Rolf Schürle, ‘we were well aware of the fact that, despite the good results we were still achieving, we would have to deal with clear restrictions regarding traverse speeds, dynamics and control. And that this would still be the case even if the CS 500 underwent a major overhaul.’
Hence, the company searched (and found) a machine manufacturer that was believed to be capable of delivering a comparable quality product. Considering the good experiences, it came as little surprise that the new machine was a Mecof, too: an Ecomill with universal head plus auxiliary and high-speed spindle respectively. A nice extra: the connection dimensions of the new travelling column machine have been adapted so as to fit those of the old foundation, which could thus still be used. Uwe Urban thinks that HKR‘s ECOMILL features another interesting, customised solution that is worth mentioning, ‘I know Mecof exclusively with the option to flange-mount an electric spindle to a universal head, and to have the tools inserted in the electric spindle by a common tool changer. That is not just comfortable, but simply brilliant.’ By the way, the company could still sell the 15-year-old CS 500 at a reasonable price. It is used to this day.

Ergonomically designed operating panel with large 19" screen

Continuously variable high-performance mechanical universal head for roughing and pre-finishing operations

Combined coolant system, which is used both for the ECOMILL as well as the UMILL 1800

Back when they were reflecting on their investment in an Ecomill machine, Rolf Schürle and managing partner Wilhelm Hölldampf knew that there was a gap between the Ecomill and the existing PosMill 800 5-axis machining centre, a gap that was supposed to be closed. So, it really came in handy that Mecof, up to then a manufacturer of vertical gantry-type milling machines and horizontal travelling column machines, had just developed an innovative, gantry-type 5-axis milling and turning centre for the complete machining of complex workpieces with a weight of up to 10 tons, namely Emco Mecof's Umill 1800.
Dipl.-Ing. Uwe Urban, sales manager at Mecof Germany, explains, 'With the Umill 1800, Emco is closing the gap between Famup's machining centres and Mecof's large-scale machines.' He continues, 'It is a declared strategy of the Emco Group to cover all sizes in the milling area, similar to how things are in the area of turning operations. Hence, it is quite likely that a whole series will be created.'
The Umill 1800 is undoubtedly a remarkable achievement on the part of Mecof. Uwe Urban adds, 'Featuring a travel of 1,800 x 2,150 x 1,250 mm – despite the very compact dimensions – and a newly developed milling head with a 15° undercut, this 5-axis milling and turning centre has been designed for a wide range of parts.' Apart from a milling capacity of 45 kW, other important design parameters include a torque of 300 Nm and an electric spindle with speeds of up to 12,000 rpm.' There are also other electric spindle variants available.
Objections aimed at the Umill's welded steel construction are clearly dismissed by Uwe Urban. He believes that quite the opposite is the case, ‚Thanks to FEM analyses, the steelwork - i.e. the welded construction - can be designed in such a way that the rigidity is not compromised compared to cast or mineral composite constructions. Rather, the opposite is the case. Welded constructions can even exceed the requirements placed on the rigidity, because they can be specifically dimensioned in certain spots.'
The selected control is a Heidenhain iTNC 640 HSCI.
Rolf Schürle explains, 'In our case, Heidenhain controls are mandatory, because their use ensures that all employees are able to work on the most different machines.'
HKR's Umill is equipped with a 120-pocket tool magazine, although there can even be 220 tools available, but Rolf Schürle thinks, '120 tools are more than sufficient for us, also because currently, we are using the Umill almost exclusively for finish machining. As regards many parts, however, we reckon with run times of several days. The machine will then virtually run in 24-hour automated operation.' This is one of the reasons why all machining steps are previously subjected to a virtual test run using a Tebis CAD/CAM system, for '... without simulation, this would be far too critical a procedure.'
There are several advantages that Uwe Urban specifies without hesitation, 'The 1800 does not need a foundation. It features a construction with inherent rigidity, which is why it is very manageable as regards the additional costs that would otherwise be involved. What is more, the spacious access area ensures that both loading and unloading can be performed smoothly thanks to the lateral sliding door that can be opened widely. If required, a micro camera mounted on the milling head housing can give additional insight into what is happening inside the workroom.'
And last but not least: the rotary table is fully NC-controlled and provides support in the accomplishment of complex machining tasks. It is able to hold workpieces with a weight of up to 10 tons. Rolf Schürle says, 'We are also a contract manufacturer for certain parts, an area where flexibility is even more important. Thanks to the rotary table, we can offer a wider range of machining operations, because we can process parts featuring diameters of up to 2500 mm and heights of up to 1250 mm with five-axis machining.'
To Rolf Schürle, however, the technical data are not the only aspects in favour of Mecof, 'To us, it is of major importance that Mecof, as an Emco Group member, is now also represented in Germany with an own sales office and an own service team. We now have a competent contact in Magdeburg, which makes things quite a bit easier. Anyway, ever since Mecof has been part of the Emco Group, we have had only very positive experiences when it comes to the service and spare parts management.'

'We are also a contract manufacturer for certain parts, an area where flexibility is even more important. Thanks to the rotary table, we can offer a wider range of machining operations, because we can process parts featuring diameters of up to 2500 mm and heights of up to 1250 mm with five-axis machining.'

Rolf Schürle, managing director at HKR

'Featuring a travel of 1,800 x 2,150 x 1,250 mm – despite the very compact dimensions – and a newly developed milling head with a 15° undercut, this 5-axis milling and turning centre has been designed for a wide range of parts.'

Dipl.-Ing. Uwe Urban, sales manager at Mecof Deutschland

Umill 1800:
Technical Data

Linear axes	
Cross travel in X	1800 mm
Longitudinal travel in Y	2150 mm
Vertical travel in Z	1250 mm
Feed rate	60 m/min

Numerical control	
Heidenhain	TNC 640 HSCI
Siemens	840D sl

Workpiece/tool cooling system	
External cooling	28 l/min; 6 bar
Internal cooling	20 l/min; 40 bar

Mechanical milling head	
Output (S1 / S6)	38 / 48 kW
Torque (S1 / S6)	600 / 750 Nm
Speed	6000 rpm
Tool taper	ISO 50
Undercut	15°

Milling head with high-speed spindle E58	
Output (S1 / S6)	45 / 58 kW
Torque (S1 / S6)	300 / 372 Nm
Speed	12000 rpm
Tool holder	HSK 100-A/T
Undercut	15°

Milling head with high-speed spindle E61	
Output (S1 / S6)	50 / 63 kW
Torque (S1 / S6)	100 / 125 Nm
Speed	20000 rpm
Tool taper	HSK 63-A
Undercut	15°

Options	
Tool changer	88 / 122 / 203 pockets

Rotary table for milling operations	
Size	ø 1700 x 1400 mm
Max. load capacity	10000 kg
Drive	Torque motor
Max. speed	10 rpm

Rotary table for milling and turning operations	
Size	ø 1800 mm
Max. load capacity	5000 kg
Drive	Torque motor
Max. torque	4000 Nm
Max. speed	250 rpm

www.emco-world.com

Mecof S.r.l.
Via Molino 2 · 15070 Belforte Monferrato (AL) · Italy
Phone +39 0143 8201 · Fax: +39 0143 823088 · info@emco-mecof.it

EMCO MECOF GmbH
Gottlieb-Daimler-Str. 15 · 74385 Pleidelsheim · Deutschland
Phone +49 7144 8242-0 · Fax +49 7144 8242-10 · info@emco-mecof.de