

Multitasking ■ Milling-Turning Centres ■ Large Part Production ■ Heavy Machining

Premium complete machining in XXL format

High power density, tilting spindle, turning tool holder, torque table, top tool management, high ease of operation – Burkhardt + Weber presents its new MCT series.

At Burkhardt + Weber (BW) in Reutlingen, Germany, a manufacturer of premium large machining centres for machining of steel and cast parts, the mood has been positively upbeat since the change of ownership from Riello Sistemi to Industrias Romi in 2012. For years, the renowned niche provider was rather limited in its development due to competition with the Riello subsidiary company Mandelli, among other factors. Accordingly, their annual sales plateaued at around 50 million euro, which was generated by a staff of just un-

a new assembly hall is under construction (completion 2017) for increasingly larger machines and a new building for mechanical production is next. Investments have already been made in technology, operational equipment, and the product line. In the absence of an overlap with the Romi product line, BW can again promote its machines and technology portfolio independently and in line with market conditions. The result is the new MCT series milling-turning centres presented at EMO in Milan.

modular components. Furthermore, close to one-third of sales come from individual special-purpose machines and interlinked overall systems with unique character.

The newly added fourth series of milling-turning centres is in response to increased customer interest in machining centres with expanded technology integration. BW Managing Director Andreas Mittermüller said: »A survey of our customers confirmed that, even in the large part and heavy machining segment, the trend is toward increasing component variance with higher complexity, lower quantities, and maximum quality requirements. Modern design methods are forcing the transition from a large number of simpler component parts to a smaller number of more complex component parts for an even better end product. As a manufacturer of customized premium machining centres, we can now offer the combination of turning and high-performance milling with the new MCT series – and without making any compromises. For an approximately 15 percent price premium, the customer receives two full-value technologies in one machine. This saves our customers from having to purchase additional vertical lathes. Moreover, we see enormous potential in this product series in terms of fields of application and expansion of our unique technological position in the market.« In order to clearly position the four product series within the context of the BW philosophy, a new slogan has been developed: strong, precise, customized. This hints at the already well-established image of BW on the market: a builder of extremely powerful machines whose accuracy class is better than the competition and that are specifically tailored to the customer's processes.

Complete series with distinctive further developments

The new MCT series consists of six basic modules from the outset. These range from the MCT 750 with 1,5 t load, 1400 mm



1 Technology integration of milling, drilling, and turning in a single high-performance 5-axis gearbox centre: the new MCT 900 milling-turning centre of Burkhardt + Weber

(image: Hanser)

der 250 employees and an annual output of approximately 35 machines and services. Structural factors prevented more.

The press conference ahead of EMO at the end of September painted a completely different picture. Under the motto »BW 2020«, the location where development, design, production (60 percent vertical integration) and assembly takes place has been and will continue to be positioned for growth and the future. Besides an already completed administration building,

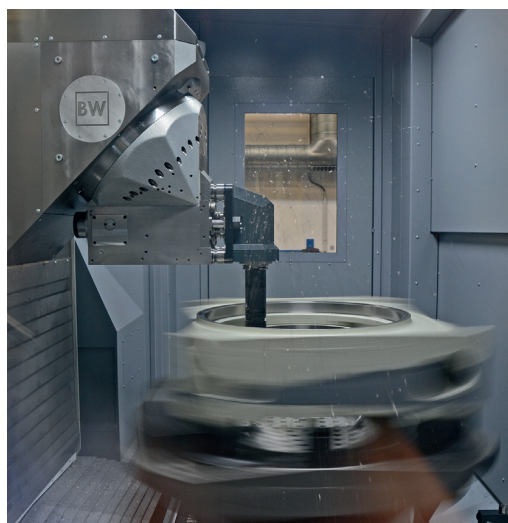
Strong, precise, customised

Up to now, the medium-sized company covered the requirements of its loyal customers with three series of large, high-performance gearbox machining centres: roller-guided machining centres for dynamic large part machining (MCX), slide-guided machining centres for rugged heavy machining with highly effective damping (MCR), and large machining centres for high-precision machining (MCµ). Customized machines are constructed from

turning diameter, and 650 min^{-1} maximum speed of the torque NC table up to the MCT 1250 with 7 t loading, 2800 mm turning diameter, and 300 min^{-1} maximum speed on the table for horizontal, vertical, and contour turning.

All machining centres of the MCT series have a fast-turning torque table made in-house. Over 500,000 euro was invested in the necessary testing and safety equipment and another 600,000 euro in the development. A special feature of the torque table is its extensive cooling on the head side of the motor. A non-contact groove seal was one of the components developed and designed for that.

Special attention had to be paid to the distribution of the turning mass of the turning technology. Many workpieces to be milled and turned are not axially symmetrical or have only limited axial symmetry. For this reason every MCT has a balancing mechanism with display and integrated unbalance monitoring. When the workpiece is loaded with the pallet, the secure, spring-loaded pallet clamping occurs first. A balancing operation at 80 min^{-1} is then started automatically. The vibration sensor installed in the table measures the unbalance and signals the angular position and size of the required counter weights to the operator. If impermissible unbalances arise during machining, the table speed is reduced fully automatically and supported by sensors.



2 Clamped swivel head with turning tool holder and fast-rotating torque table in action; unbalance monitoring is integrated as a standard feature (image: Hanser)



3 Poised to set a new standard for ease of operation: the new 24" smart panel for intuitive machine operation (image: Hanser)

Spindle-friendly turning tool adapter

A central component is the main spindle that can perform powerful milling while also ensuring a firm hold for turning tools. It is implemented as a tilting spindle. The time required to swivel 180° is less than 2 s, even at speeds up to 8000 min^{-1} . The swivel head is securely clamped in end position with 6500 Nm holding torque.

The clamping of the spindle rotor for stationary turning tools is damaging to the bearing, because shocks from an interrupted cut or texture inhomogeneities lead to micro indentations. For this reason, BW loads the turning tools automatically from the magazine but not directly to the spindle. Rather, the turning tools are loaded into an automatically loaded turning tool adapter, which was developed in-house. This adapter is completely decoupled from the spindle bearing arrangement. There is no transfer of forces from the turning tool adapter to the spindle bearing arrangement. Everything is transferred to the rugged spindle housing via a 4-point clamping with high feed forces.

Progress for tool management and operation

BW describes itself as a technical leader in the tool management sector. The magazine capacity was increased to over 600 tools. Greater packing density, better storage strategies, and new transport algorithms enable the machine to be supplied even faster from the same amount of space with tools up to 75 kg in weight,

900 mm in diameter, and 1200 mm in length. A new HMI panel significantly reduces work for the operator when loading the magazine thanks to stored tool data.

Finally, the new operator input concept must be mentioned. The Industry-4.0-capable 24" multitouch smart panel, also developed by BW, increases ease of use and diagnostic depth. The user interface can be customized and has three separate user-configurable areas. Standard features include a work area camera, PDF viewer, machine documentation, and applications for monitoring the process and adjacent operator control points. The network-based controller with fieldbus technology enables sensor and component replacement under fault conditions thanks to a stored IP address, which they "learn" on their own afterwards. This minimizes downtimes. **da** ■

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