

Automated polishing

by **Filipp Pachomow** Step by step automation has taken over the various processes in metalwork manufacturing. One application where automation has until now not left its mark is polishing, a very important process in mould manufacturing. But soon that could all change with the RSC compressed air spindle system with a deflection unit from Biax.



The experts for pneumatic tools and spindles from Biax, a trademark of the Swabian family-owned company Schmid & Wezel from Maulbronn, have brought to the market the modular pneumatic spindle system „RSC“ with a deflection unit that could fundamentally change the polishing and refinishing of surfaces.

The system can be used both in CNC machining centres and with robots. The spindles can be changed automatically. In a machining centre the compressed air supply is fed through the coolant channel. Biax developed the innovation as part of the „IntegFINISH“ project of the Stuttgart Fraunhofer Institute

The RSC pneumatic spindle system with a deflection unit from Biax always ensures a uniform surface contact pressure during polishing and deburring.

Photograph: Biax

for Production Technology IPT, who provide funding from the Federal Ministry of Education and Research (BMBF) within the framework of the support measure „SME Production Research Innovative“ that was supervised and managed by the Project Management Agency Karlsruhe (PTKA). The aim was to reduce processing times in mould manufacture using new methods. The aim was to polish the mould using the same machine immediately after milling. Also on board: Camaix from Aachen, the specialist for CNC, CAD and CAM technologies, Artifex from Kaltenbach, manufacturers of elastically bonded abrasive and polishing tools and Schweiger from Uffing am Staffelsee, the tool and mould manufacturers. „Thanks to the new deflection unit the contours of the workpiece are now sufficient to achieve a uniform contact pressure on the surface. And that is a prerequisite to obtaining a high surface quality“ explained Martin Erle, technical application specialist at Biax.

Deflection unit levels out differences

The Camaix software enables the programming of the surfacing work based on the CAD model, which brings a tremendous time saving as it eliminates the need to program countless points for each of the many surfaces of a mould. Deviations between target and actual surfaces in the milled workpiece are levelled by the deflection unit. It was demonstrated that an automated finishing for surface improvement after the finished milling can be achieved to roughness values of $Ra < 0.1\mu\text{m}$ with the „IntegFINISH“ solution. On large surface areas in particular it is possible to reduce the processing time by more than 50% compared to manual finishing. Consequently it is only a matter of time until automated polishing becomes the norm. „Initially this will be achieved for polishing individual large surfaces on large moulds,“ predicts Martin Erle, even if further development work is still necessary until a mould, with its complicated geometry and countless small surfaces, can be polished entirely automatically. With the „batch size of one“ for a small or medium-sized mould it is currently very easy to quickly reach the limits of profitability. The trick: The modularity of the RSC system enables the deflection unit to be combined with a large variety of pneumatic spindles: 16,000 min⁻¹ to 100,000 min⁻¹, enabling Biax to offer just about every relevant speed. Biax even have a 90° angle spindle and an oscillating spindle up their sleeve. Various adapters such as SK 40, SK 50, HSK 63, HSK 100 and diverse robot connectors offer the user a wide range of applications. ■

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