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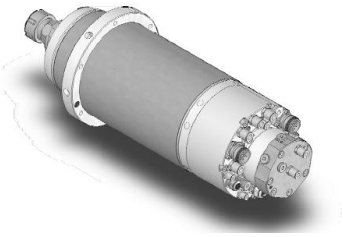
Case Study – High Speed Grinding on Lathe

Morgan AM&T is a globally recognised materials technology division with unparalleled expertise in the processing and applications of carbon, graphite, silicon carbide, oxide ceramics and other related materials.
Morgan AM&T are part of the Morgan Crucible Company PLC, an innovative and truly global organisation engaged in many high technology industries.

Morgan AM&T's Production Manager, Mr Martin Hanks, had a need to upgrade their grinding facility at the Redditch site. Having over 25 years of experience he was well aware of the specific process challenges of the materials used by Morgan AM&T. A recent previously acquired 'grinding centre' failed after a relatively short time span due to the particulates generated from the process penetrating into the machine mechanism. This drove Mr Hanks to do some lateral thinking….. Rather than looking at conventional machine solutions, grinding machines, Mr Hanks worked backward from the process and its particular challenges whilst considering the 'Critical To Quality' elements of the product.



3D CAD Model of Spindle

Combining experience and imagination this led to an unusual conclusion. The clear answer was a CNC lathe! The design chosen had a gang tool-post design (not the normal turret most common in such a sized machine) giving rigidity, less mechanical/moving parts within the enclosure and adequate clearance for the sizes of grinding wheel required for the varied components. By design the enclosure was sealed from the aggressive media preventing the aggressive particulates attacking the ballscrews and wider mechanism. The typical tolerances required could easily be met by the machine as 'super' high precision (<5 micron) was not required. All that was missing was the means to drive the Diamond grinding wheels at the appropriate speeds.

Installed and well 'used' Spindle

Having decided upon this machine tool Mr Hanks approached Emmaco U.K. Ltd for a High-Speed Spindle solution. As the sole agent for the Swiss company, IBAG, the specialist in this type of device, Emmaco were the ideal partner in this project. Mr Ian Baker of Emmaco, in consultation with IBAG and Mr Hanks, selected a 24,000RPM HF140 Spindle and variable speed drive system. The IBAG HF140 spindle has a compact self-contained, integral electric motor and is built to the highest possible standards. The variable speed system gives a speed range to suit the 2-3mm diameter diamond grinding wheels whilst also the power and torque for the up to 180mm diameter heavy grinding wheels. This system gave the required speed range, power, precision and durability to enable Morgan AM&T to reliably produce to their exacting schedules. Emmaco carried out complete system integration between the IBAG system and the CNC lathe.

The initial installation worked so well that several further machines, including with 'C' axis for machining off centre pockets, have been procured. Of course, all have been integrated by Emmaco with the IBAG High-Speed spindle! Mr Hanks "was delighted with the performance and spindle/drive integration and overall 'above and beyond' service from Emmaco U.K. Ltd"

Emmaco UK are the sole agents for IBAG High Speed Spindle Drive Systems providing a comprehensive consultation, installation and service capability.

For more information please contact us at info@emmaco.co.uk or call 020 8398 7733. Further information on our products and services is available at www.emmaco.co.uk