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A milling revolution for turbine blade machining

MaxiMill HFC-TUR ideal for roughing turbine blades

Traditionally button-style milling inserts have been the method of choice when it comes to rough machining turbine blades. Their one limiting factor has always been the achievable feed rates are relatively low for this style of insert. The development by Cutting Solutions by CERATIZIT, the competence brand for innovative tooling solutions at the CERATIZIT Group, of the MaxiMill HFC-TUR milling system has overcome this, achieving feed rates double those achieved with button inserts.

At the heart of the MaxiMill HFC-TUR is the insert itself, which comes in 09 and 12 mm sizes with four indexes per insert. With the larger of the inserts cutting depths up to 5 mm can be achieved and angled ramping of 2.6 degrees (2.3 for helical ramping) can be achieved. Process security is ensured by use of a larger than typical screw and, also the extensive mating faces in the insert pocket.

The insert design with its large effective radius makes it ideal for a variety of 3D machining applications and general face milling and its soft cutting action assists in the cutting of components with thin sections and large unsupported areas, such as turbine blades. A further advantage is that the MaxiMill HFC-TUR cutters can be used on lower powered machines, that would not be suitable for high-feed milling style cutters. The cutter bodies for the HFC-TUR series are available in sizes between 32 and 63 mm, with all dimensions matching the existing button insert cutters, ensuring that CAD programming is exactly the same. Cutter body life is extended by use of nickel plating and insert life is enhanced with through tool coolant on cutter bodies.

With depths of cut up to 5.0 mm and feedrates up to 1 mm/tooth the MaxiMill HFC-TUR cutters dramatically reduce cycle times, with Ceratizit's M50 geometry

enhancing these performance benefits. In a typical example, the machining of a forged turbine blade in Martensitic heat-resistant steel in unstable machining conditions (part clamped at both ends) using Ceratizit's button-style cutters feed per tooth was 0.4mm, switching to the MaxiMill HFC-Tur system this was increased to 0.8 mm. In both cases the surface speed was 320 m/min and depth of cut 3 mm.

"The MaxiMill HFC-TUR series from Cutting Solutions by CERATIZIT of inserts and cutters is another example of working with customers in a specific area of machining to create an advance solution and improve productivity. The machining of turbine blades is an area that is growing, especially here in the UK where we are leaders in the aerospace sector. To be able to show such significant cycle time savings on these parts is a major advantage for our customers," Tony Pennington Managing Director UK & Ireland, CERATIZIT UK & Ireland Ltd.

Further information at www.ceratizit.com.

Attachments:



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Issued on behalf of



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CERATIZIT – passion and pioneering spirit for carbides

For over 95 years, CERATIZIT has been a pioneer developing exceptional hard material products for cutting tools and wear protection. The privately owned company, based in Mamer, Luxembourg, develops and manufactures highly specialised carbide cutting tools, inserts and rods made of hard materials as well as wear parts. The CERATIZIT Group is the market leader in several wear part application areas, and successfully develops new types of carbide, cermet and ceramic grades which are used for instance in the wood and stone working industry.

With over 9,000 employees at 34 production sites and a sales network of over 70 branch offices, CERATIZIT is a global player in the carbide industry. As a leader in materials technology, CERATIZIT continuously invests in research and development and holds over 1,000 patents. Innovative carbide solutions from CERATIZIT are used in mechanical engineering and tool construction and many other industries including the automotive, aerospace, oil and medical sectors.

The internationally active CERATIZIT Group unites the four competence brands Cutting Solutions by CERATIZIT, Hard Material Solutions by CERATIZIT, Tool Solutions by CERATIZIT and Toolmaker Solutions by CERATIZIT. The carbide expert also includes the subsidiaries WNT and CB-CERATIZIT, as well as the tool manufacturers Günther Wirth, PROMAX Tools, Klenk, Cobra Carbide India, Becker Diamantwerkzeuge, Best Carbide Cutting Tools and KOMET.

Cutting Solutions by CERATIZIT - your creative partner for competent dialogue

Cutting Solutions by CERATIZIT is the competence brand of choice for innovative tooling solutions in the cutting tools sector. Under this name the CERATIZIT group offers a complete range of premium standard products such as inserts and solid carbide tools. As a creative partner CERATIZIT also works closely together with its customers to develop individual or industry-specific cutting solutions, for example in the automotive industry and in the energy and transport sectors. With this aim in view, the CERATIZIT group manages and controls the entire process chain of carbide production, from the raw material to the finished product. When marketing the brand, the company relies on a worldwide network of highly competent commercial partners.