ISM Seminar

Surface texturing of cutting tools for improved heat transfer and tribological contact

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Heat generated in a machining process is a common and critical obstacle faced in today's machining industries. The heat generated in the cutting zone has a direct negative influence on the cutting tool life, which further contributes to increase the manufacturing costs. Especially in machining of Heat Resistant Super Alloys, HRSA, the heat generated is a limiting factor. HRSA are capable of retaining their mechanical strength and hardness at elevated temperatures, as in the case of Inconel 718 alloy. This property is advantageous in applications such as aero-engines. However, it is also a disadvantage since this property lowers the machinability of the material significantly.

In an attempt to improve the heat transfer from the cutting zone; the cutting tool has been designed, manufactured and tested. First, the initial uncoated round carbide inserts, which is recommended for face turning operations of Inconel 718 alloy, have been modified with additional surface texture features with the purpose of increasing the available surface area for heat dissipation and improved tribology. Further, several channel features on the rake face were added from the contact zone to the near proximity of the cutting edge. These features also provide improved access of the coolant closer to the cutting edge.

When: 11:00AM, Monday, October 16, 2017
Where: 414A CRMS Building

Tomas Beno is full Professor in Industrial Production since 2014 at the Subtractive and Additive Manufacturing research group within the Production Technology department at University West, Trollhättan, Sweden. He has been Associate Professor at Royal Institute of Technology (KTH, Stockholm, Sweden) and University West (HV, Trollhättan, Sweden) since 2010. Professor Beno did his PhD at the Royal Institute of Technology, KTH, Stockholm, Sweden in 2004; and has also been employed at GKN Aerospace as a machining specialist. He started his own tooling company developing and manufacturing of solid carbide drills, which was sold it in 2008.