

Comparison of optical measurement methods utilization for complex high feed tool geometry

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High Feed Machining (HFM) is an advanced machining technique that offers the potential for up to three times faster machining speeds compared to conventional methods. The geometric characteristics of HFM cutting tools differ significantly from those used in traditional machining, posing challenges when it comes to their precise measurement. Cemented carbide solid high feed mills feature specialized end profiles that enable the utilization of chip thinning mechanisms to achieve substantially increased feed rates. Grinding is a widely adopted manufacturing process for production of carbide tools. The tool's geometry is attained through the coordinated movement of the grinding wheel and the workpiece while employing a cooling medium. The precision of the resulting cutting tool geometry directly impacts the machining process. In the context of the experiment, five HFM tools were manufactured. The primary focus was to assess the geometry of these tools using two distinct measurement methods: a dedicated optical measuring machine designed for cutting tools and a 3D optical scanner. The results from each measurement method were subsequently compared and evaluated using the GOM Inspect software. Based on the analysis of measured data, it's possible to confidently determine that optical scanning represents a reliable and effective method for quality control of the macrogeometry of cutting tools.

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