

## Complementary evaluation of the turning process, regarding surface roughness, tool wear and cutting edge roughness

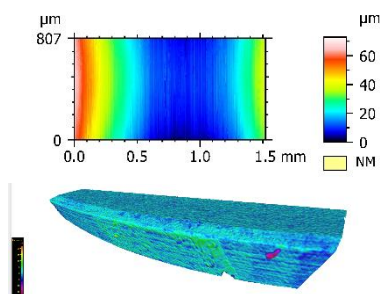
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The importance of the influence of the tool wear on the surface roughness is well known and has been thoroughly examined. In this paper the authors concentrate on utilizing the complementary evaluation of the effects of the turning process using a focus variation microscope, enabling the acquisition of several hundreds of profiles at a time, and allowing to measure the tool wear within minutes after the operation.

The authors examined a shaft turned with 4 different feeds per revolution using round inserts made of cemented carbide. After each session the insert underwent a measurement and at the end the whole shaft was measured for roughness. The acquired datasets were then examined and both roughness and tool wear data were extracted. This article also investigates the influence of the texture of the cutting edge on the acquired surface after turning.



**Fig. 1.**

Roughness measurement and tool wear measurement, both obtained using Focus Variation Microscopy

- [1] T. Chwalczuk, M. Rybicki, D. Korzeniewski, D. Przystacki: Surface roughness after turning of aircraft materials. *Mechanik* 2016 Vol. 10. S. 1312-1313
- [2] E. Segebade, F. Zanger, V. Schulze: Influence of different asymmetrical cutting edge microgeometries on surface integrity. 3rd CIRP Conference on Surface Integrity, *Procedia CIRP* 45 ( 2016 ) 11 – 14.