

COMBINATION OF HARD CUTTING WITH ABRASIVE PROCEDURES

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Hard turning has been applied successfully and more and more frequently as precision finish machining of hardened steels, as an alternative to grinding (to replace it).

But generating surface topography with single point tool cannot be realized in any case instead of abrasive machining. As the experience increased, problems of hard turning with CBN fall in two categories: process safety and surface quality (topography). As regards to the process safety, the wear of CBN inserts – and through that their tool life – is difficult to be handled, the dispersion of the tool life of inserts is high.

If the advantages reachable with hard turning in creating random topography are to be kept, it is expedient to apply combined, so called hybrid machining procedures. In the combined procedures the advantages of the procedures realized with single point tools and abrasive tools can be united and exploited.

The significant development of the pre-fabrication technologies also substituted to the fast spread of the combined proceedings. The pre-fabricated parts are made by the so called “near-net-shape” pre-fabrication procedures with minimal allowance for finishing, thus making the roughing procedures that leave a huge amount of chips unnecessary.

In this paper hard turning is compared to grinding and also the combined procedures generated by abrasive procedures are presented.

Applying the combined machining the supplementary times reduce, the efficiency of machining increases and the workpiece quality can improve besides the appropriate process safety.

Analysing the time expenditure it was stated that among the three procedure versions the oldest one – grinding – requires the longest time.

The next version – hard turning – means dramatic time reduction, while the third version compared to the second one means only minor reduction of time appropriation. And that appears mainly in the norm time. Besides, the quality of work and the safety of the manufacturing process improve significantly.

A further advantage of the combined machining is that the lead-time of parts dramatically reduces, and the production-chain is shorter. The transportation and storage times between the procedures cease, and also the size of side times significantly reduces. The productivity increases, the quality of the workpieces is better besides high flexibility.