NEWRESULTS IN THE FIELD OF HARDMACHINING

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In production engineering, when choosing the machining procedures and operations, the aspects applied so far (accuracy, surface quality, economy etc.) are more and more frequently completed by environmental expectations.

A technologist has to consider what possibilities there are to reduce the significant amount of coolant and lubricant (CL). The functions of CL are: chip disposal with washing and scavenging is 70%, cooling is 20%, and lubrication is 10%. Besides their advantageous features, however, their application have a significant environment polluting effect. Because of this the CL became the most important environment damaging factor in the field of cutting.

In the first part of the experiment it was investigated whether in different machining variations done with the cutting data ensuring the same accuracy and roughness how much CL was used up.

It can be stated that in the case of both diameters, applying the combined procedure, the usage of CL can be reduced to its one fifth, while in hard turning CL is not needed. The operation times of the processes were also investigated. Grinding takes the longest operation time. In hard turning the operation time of a gear-wheel reduces to one fourth compared to grinding. It can be reduced even lower by the application of wiper inserts.

A relatively wide range of hard machining procedures are available for the production of components. In this paper the different variations of grinding and turning applied in finish precision machining of hardened steels are presented on the basis of the used up amount of CL.

The results of the experiments have proved that there are significant differences in the consumption of CL in the procedures suitable to provide the given accuracy and surface quality.

At present, in most cases the technical and technological conditions for the application of hard turning are available, in which the machining can be done economically with no consumption of CL.

There are cases, however, when the functional conditions require ground topography. In such a case the so called combined (hybrid) machining is suggested.

Our investigations have proved that if the combined procedure includes a hard turning procedure besides grinding, the consumption of CL can be reduced to one fifth compared to grinding, having economic efficiency similar to hard turning, if the technological data are chosen properly.