EXPERIMENTAL INVESTIGATION INTO TURNING OF CK-45 STEEL WITH MULTIPLE NOZZLES MINIMUM QUANTITY OF LUBRICATION

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ABSTRACT

In machining processes, the uses of cutting fluids are very important strategy to improve the tool's life and surface finishing of the product. The petroleum based cutting fluids causes to environmental and workers' health related problems. In order to minimize the use of cutting fluids, the minimum quantity lubrication (MQL) technology was introduced. In MQL technique the small amount of lubricant (vegetable oil) is mixed with compressed air to form aerosol mixture and then the mixture is spread out into the cutting zone through the nozzles. The objective of the present work is to analysis the effect of nose radius of cutting inserts and multiple nozzles minimum quantity of lubrication at various cutting speeds on surface roughness during the turning of CK-45 steel. The results are compared with flood cooling and dry cuttings. The experimental results indicated, the surface roughness reduction (Approx.43%) in double nozzles, (35-38%) in single nozzle and (Aprrox34%) in three nozzles with MQL technique. The least surface roughness has been reported in CNMG 120412 cutting insert with double nozzles MQL technique.