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COMPARATIVE EVALUATION OF UNTEXTURED AND TEXTURED WC INSERTS UNDER DRY AND NEAR DRY MACHINING OF C45 STEEL

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ABSTRACT

C45 steel is considered under the category of the most difficult to cut materials because of hardness (45-55 HRC). Based on the size effect, the low machine's ability may be improved by surface texturing on the rock faces of the uncoated carbide (WC) inserts, using Femto second laser. Dry and Minimum Quantity Lubrication (MQL) cutting experiments were performed with these plain inserts and textured inserts under condition of cutting speed = 80 m/min and 120 m/min, depth of cut = 0.5 mm and feed rate = 0.16 mm/rev. These experiments were performed on different machining time. The comparative evaluation is in terms of cutting forces, roughness, tool wear (flank) and tool tip temperature. Results obtained reveal that average of output parameters is minimum in textured of inserts with MQL condition, as compared to without textured and dry condition.

KEYWORDS: Hard Turns, MQL, Surface Textured Tool, C-45 Steel