

Effect of rake angle and feed rate on chip segmentation in machining carbon steel 1050

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ABSTRACT:

A chip breaker plays important role to break the chip and enhance productivity and quality during turning process. However, chip breaker as tool are not able to break the chip and formulate the continuous chip causes the tool wear and the excessive heat generated for interrupting the surface machining quality. These chips formation are influenced by cutting conditions and tool geometries such as spindle speed, feed rate, depth of cut and rake angle. In this study, experiments were carried out on carbon steel 1050 with chip breaker at a constant cutting speed 275 m/min at depth of cut 0.9 mm. The effect of different feed rate and rake angle to chip length produced were further investigated in the experiment. The results obtained that the chip segmented at 0.4 mm/rev of feed rate and -9° of rake angle. Thus, the feed rate and rake angle can play the important role in breaking the chip with a chip breaker to enhance the productivity and quality in the machining process.

Keywords: *Chip breaker; feed rate; rake angle; turning process; segmentation; continuous chip*