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Tool Wear Mechanisms during Cutting of Soda Lime Glass

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Abstract

Soda lime glass milling has high performance application. It is a challenging task to achieve fracture free surface on this material due to its brittle nature. High-speed end milling is capable to achieve ductile mode in an enhance flexibility. In this research, end milling of soda lime using uncoated carbide tool was performed where spindle speed varied from 20,000 to 40,000 rpm, cutting depth from 10 to 30 μ m and feed rate from 5 to 20 mm/min in dry condition. The effects of cutting parameters (cutting speed, feed per tooth and depth of cut) on tool flank wear as well as wear mechanisms of tool flank investigated. Investigation showed that feed per edge has most influencing effect followed by cutting speed and depth of cut on flank wear and the main wear mechanism is abrasion wear. In some cases, oxidation, thermal diffusion and recast layer on tool flank also observed.

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