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Title: Experimental Study on Machinability Of Laser Sintered Material In Ball End Milling

This paper describes an experimental investigation on the cutting mechanism of laser sintered material using small ball end mill focusing on the temperature of the cutting edge. Sintered material was produced by irradiating a laser beam on a layer of loose fine SCM–Ni–Cu powder. Bulk carbon steel AISI 1055 was selected as reference steel. The influence of cutting conditions, tools diameter and unsintered metallic powder on the cutting edge temperature were examined. Comparison of the cutting edge temperature between the peripheral and surface milling were investigated. Investigations of the tool life and wear mechanisms in cutting the sintered material and AISI 1055 were also carried out. Results indicated that the cutting edge temperature for sintered material was higher than for bulk AISI 1055. Cutting at the outer surface of sintered material produced higher temperature than at the inner surface. The temperature of the cutting edge was greatly influenced by the cutting speed followed by depth of cut and feed per tooth. Cutting temperature for different tool's diameter was almost similar under the same rotational speeds and cutting conditions. Cutting tool temperature in peripheral milling was higher than in surface milling. Adhesion of the work material and chipping were the main wear mechanisms of the ball end mill in cutting sintered material.