

An Innovative Green Cooling Approach Using Peltier Chip in Milling Operation for Surface Roughness Improvement

Authors : Md. Anayet U. Patwari, Mohammad Ahsan Habib, Md. Tanzib Ehsan, Md Golam Ahnaf, Md. S. I. Chowdhury

Abstract : Surface roughness is one of the key quality parameters of the finished product. During any machining operation, high temperatures are generated at the tool-chip interface impairing surface quality and dimensional accuracy of products. Cutting fluids are generally applied during machining to reduce temperature at the tool-chip interface. However, usages of cutting fluids give rise to problems such as waste disposal, pollution, high cost, and human health hazard. Researchers, now-a-days, are opting towards dry machining and other cooling techniques to minimize use of coolants during machining while keeping surface roughness of products within desirable limits. In this paper, a concept of using peltier cooling effects during aluminium milling operation has been presented and adopted with an aim to improve surface roughness of the machined surface. Experimental evidence shows that peltier cooling effect provides better surface roughness of the machined surface compared to dry machining.

Keywords : aluminium, milling operation, peltier cooling effect, surface roughness

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