

Internal Dry Cutting Tool

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Abstract

Cutting fluid is traditionally used to remove heat generated during the cutting process, but it can cause environmental pollution, health hazards, and high cost of production. Dry cutting, without using the cooling liquid, is thus desirable and promising for the machining industry to produce components and products, both ecologically and more economically. In this paper, an internally cooled cutting tool for dry cutting is presented as a temperature sensed smart cutting tool in its own right, with further applications for adaptive machining purposes. The cutting tool is characterized by a simple changeable internal cooling structure near the cutting tip. Simulations were performed to study the theoretical cooling efficiency and to optimize the cooling structure by combining it with the Taguchi Method. Furthermore, cutting trials were carried out to validate the novel cutting tool experimentally.

Keywords

Internal Cooling Tool, Dry Cutting, Adaptive Machining.

Biography

Mohammad Sadeq is an undergraduate student of mechanical and production engineering (MPE) in Islamic University of Technology (IUT), Dhaka, Bangladesh. He has worked on different projects related to automatic control system including automatic fire safety system, he is also interested in machining operation and tool life he is recently working on design and analysis of an internally cooled smart cutting tool for dry cutting.

Yaya Ousmanou is studying production engineering in Mechanical Engineering Department at Islamic University of Technology (IUT), Gazipur, Dhaka. As an undergraduate, he conducted many projects such as line follower with Arduino design of turbine blades with Solidworks, command line project (linux), bash scripting. He is interested in digital manufacturing and actually working on 3D printing.

Hameedullah is an undergraduate student of mechanical and production engineering (MPE) in Islamic University of Technology (IUT), Dhaka, Bangladesh. He want to continued his further studies in master from university of casino Italy in production and recently he worked on topics that are related to production an industries and he want to his master in production.