Environmental Impacts and Hazards Associated With Metal Working Fluids and Recent Advances in the Sustainable Systems: A Review

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ABSTRACT

A review of advances in the use of lubrication techniques during machining operations as well as the application of state-of-the-art nanofluids in machining is presented in this research article. A brief review of the available literature on the environmental impact and the health hazards associated with metal working fluids is also included. The performance and drawbacks of different techniques are discussed in terms of machining parameters and output variables. The review of different lubrication techniques finally ends up in the favor of minimum quantity lubrication and cooling technique as a potential alternate to flooded and conventional cooling conditions in different machining processes in terms of dealing with the ecological, social and human health concerns and the finances coupled with the use of metal working fluids in machining processes.

KEYWORDS: Sustainability; Manufacturing; Costs; Occupational; Safety; Health; Tribological; Minimum; Quantity; Lubrication; Cryogenic; Nanofluids; High; Pressure; Coolant; Dry; Solid

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