

Improvement in Tool Life Through Optimizing Cutting Parameters Using Cryogenic Media in Machining of Aerospace Alloy Steel

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Abstract : In this research work, liquid nitrogen gas (LN₂) is used as a cryogenic media to optimize the cutting parameters for evaluation of tool flank wear width of Tungsten Carbide Insert (CNMG 120404-WF 4215) while turning a high strength alloy steel. Robust design concept of Taguchi L₉ (3⁴) method is applied to determine the optimum conditions. The analysis is revealed that cryogenic impact is more significant in reduction of the tool flank wear. However, High Speed Machining is shown most significant as compare to cooling media on work piece surface roughness.

Keywords : turning, cryogenic cooling, liquid nitrogen, flank wear, surface finish

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