

Cryogenic Machining of Sawdust Incorporated Polypropylene Composites

Authors : K. N. Umesh

Abstract : Wood Polymer Composites (WPC) were synthesized artificially by combining polypropylene, wood and resin. It is difficult to obtain a good surface finish by conventional machining on WPC because of material degradation due to excessive heat generated during the process. In order to preserve the material property and deliver a better surface finish and accuracy, a proper solution is devised for the machining of wood composites at low temperature. This research focuses on studying the effects of parameters of cryogenic machining on sawdust incorporated polypropylene composite material, in view of evolving the most suitable composition and an appropriate combination of process parameters. The machining characteristics of the six different compositions of WPC were evaluated by analyzing the trend. An attempt is made to determine proper combinations material composition and process control parameters, through process capability studies. A WPC of 80%-wood (saw dust particles), 20%-polypropylene and 0%-resin was found to be the best alternative for obtaining the best surface finish under cryogenic machining conditions.

Keywords : Cryogenic Machining, Process Capability, Surface Finish, Wood Polymer Composites

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