World Academy of Science, Engineering and Technology
International Journal of Industrial and Manufacturing Engineering
Vol:10, No:01, 2016

Part Performance Improvement through Design Optimisation of Cooling Channels in the Injection Moulding Process

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Abstract : In this study conformal cooling channel (CCC) was employed to dissipate heat of, Polypropylene (PP) parts injected into the Stereolithography (SLA) insert to form tensile and flexural test specimens. The direct metal laser sintering (DMLS) process was used to fabricate a mould with optimised CCC, while optimum parameters of injection moulding were obtained using Optimal-D. The obtained results show that optimisation of the cooling channel layout using a DMLS mould has significantly shortened cycle time without sacrificing the part's mechanical properties. By applying conformal cooling channels, the cooling time phase was reduced by 20 seconds, and also defected parts were eliminated.

Keywords : optimum parameters, injection moulding, conformal cooling channels, cycle time
Conference Title : ICME 2016 : International Conference on Manufacturing Engineering
Conference Location : Jeddah, Saudi Arabia
Conference Dates : January 26-27, 2016