

Abstract

Casting process is widely used in preparing spur gear blanks or in complete production of gears because of its less defect at the end of the process. The importance of the gating system in casting process lies in its ability to channel molten metal into the mould cavity within the allowable period at a controlled parameter. The study therefore investigated the effect of increasing the gating system on the solidification of molten metal during gear cast to determine the time of solidification and casting productivity. Both the top and bottom gating system were modelled in solidwork, while the simulation was done using Pro-Cast. The result revealed that for the case of two runner gating system, both the top and bottom gating system took 9.195 and 9.320 s respectively, to fill the mould cavity. However, the three-runner gating system took a shorter filling time with top gating system having 8.824 s filling time and the bottom gating system took about 9.655 s to fill the mould cavity. The outcome showed that the top gating system tends to discharge molten metal faster than the bottom gating system as seen from the filling time of both the two and the three-gating system.

Keywords

Production technology Simulation Spur gear Energy savings