Effects of holding pressure and process temperatures on the mechanical properties of moulded metallic parts

Metal injection moulding is gaining more and more importance over the time and needs more research to be done to understand the sensitivity of process to different process parameters. The current paper makes an attempt to better understand the effects of holding pressure and process temperatures on the moulded metallic parts. Stainless steel 316L is used in the investigation to produce the specimen by metal injection moulding (MIM) and multiple analyses were carried out on samples produced with different combinations of holding pressure, mould temperature and melt temperature. Finally, the parts were characterized to investigate mechanical properties like density, ultimate tensile strength, shrinkage etc. The results are discussed in the paper. The main conclusion from this study is unlike plastic moulding, the tensile properties of MIM parts doesn't vary based on the flow direction of the melt, and tensile properties are sensitive to holding pressure and process temperatures. In order to achieve higher tensile strength, higher holding pressure is required. It was also observed that the samples shrunk more in thickness than in the width and length.

General information
State: Published
Organisations: Department of Mechanical Engineering, Manufacturing Engineering
Contributors: Islam, A., Hansen, H. N., Esteves, N., Rasmussen, T.
Number of pages: 5
Publication date: 2013

Host publication information
Title of host publication: ANTEC 2013 Conference Proceedings
Publisher: Society of Plastics Engineers
ISBN (Print): 978-1-63266-530-0
Keywords: Metal Injection moulding, Holding pressure, Mechanical properties
Electronic versions:
Effects_of_holding_pressure.pdf
Source: dtu
Source-ID: u::7773
Research output: Research - peer-review › Article in proceedings – Annual report year: 2013