Properties for PIM Feedstocks Used in Fused Filament Fabrication

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Abstract
Fused filament fabrication (FFF) is one of the most commonly used polymer-based additive manufacturing techniques. FFF could be used to shape parts with PIM feedstocks instead of injection moulding and after debinding and sintering obtain solid parts with complex geometry. Currently used PIM feedstocks do not necessarily meet the requirements of the majority of FFF machines available in the market, which rely on the use of flexible filaments. In this paper, the specific properties needed by the FFF feedstock materials are discussed. Different feedstocks with 316L steel powder at 55 vol.-% were characterized (viscosity and mechanical properties) and tested regarding the printability using a conventional FFF machine. Out of these experiments the most important requirements for printable PIM feedstocks are deduced.