ColdMetalFusion – Reliable Serial Production in Metal AM

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ABSTRACT

Headmade Materials pushes the Powder Metallurgy further into the Metal Additive Manufacturing (AM) market with its sinter-based 3D-printing technology called ColdMetalFusion (CMF). Furthermore, Headmade Materials partners with industry leaders in the ColdMetalFusion Alliance to leverage the potential of reliable serial production in Metal AM. Headmade Materials combines standard PM metal powders with its proprietary binder system to form a powdery feedstock that can be processed into green parts on standard plastic laser sintering systems. The subsequent debinding and sintering step is again Powder Metallurgy (PM) industry standard, and the part characteristics are fully comparable to MIM in terms of density and strength. The ColdMetalFusion process offers several advantages over beam-based processes and stands out from other sinter-based 3D printing processes due to its high green part strength and an already existing, partially automated process chain.

In this study the material properties of the recently released CMF M2 tool steel processed with the CMF LabSystem are shown. The CMF LabSystem offers a turnkey solution to reduce cost and fast-track the application development for labscale and small series production with CMF. Furthermore, the study examines the outstanding scalability opportunities of CMF by comparing part properties of 17-4PH-parts processed on different SLS-Printers and sintering furnaces.

INTRODUCTION

The additive manufacturing of metal parts has experienced a strong growth in the last years and the demand for real serial production with AM methods is very high. However, real additive manufactured serial parts are still very rare as existing technologies often reach their technical and economical limits very fast. Sinter-based AM technologies use a polymeric binder mixed with metal powder to shape a green part. Afterwards the green part is debinded and sintered to form a dense metal part. This process