

Capillary rheological studies of 17-4 PH MIM feedstocks prepared using a custom CSIR binder system

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ABSTRACT:

This paper reports on an attempt to establish the rheological properties of 17-4 PH stainless steel MIM feedstocks prepared using a proprietary CSIR wax-based binder system. The influence of powder and feedstock characteristics on the rheological properties of 17-4 PH stainless steel MIM feedstocks were investigated using a capillary rheometer. The effects of bimodal powder distributions on the rheological properties were also studied. Three starting 17-4 PH stainless steel powder materials (5 μm , 15 μm , and – 45 μm) were used to formulate with five feedstocks investigated in this work. Results are presented herein are discussed in terms of known feedstock rheological characteristic parameters (flow behaviour index, activation energy, and high mouldability index). Effects of blending size distributions on feedstock stability and mouldability are reported. Fine powder size distributions and their bimodal blends exhibit superior mouldability.