

Application of Novel and Standard Test Techniques to Evaluate Powder Flow for AM

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ABSTRACT

Critical to the success of the AM industry is the control of the entire AM process chain, encompassing design, AM processing, post-processing, and material supply. Although intrinsically linked, the relationship between raw material and final part properties is not yet fully understood. Traditional characterisation techniques used to assess the flow of AM powders often lack applicability to the AM process. Various novel techniques claim to evaluate the flowability of powder in a method more akin to the AM process, and seek to characterise specific flow characteristics. This paper cross examines the flow evaluations made by multiple tests of four AlSi10Mg powders, and explores the validity of these tests. Included are results from the following tests: spreading test rig, funnel flow, static and dynamic angle of repose, tap testing, rheology, shear cell, and triboelectric charging. It was determined that the evaluation of powder flow characteristics remain complex and non-trivial.