

Automated, Reliable, and Comprehensive Universal Powder Testing to Improve Processing Efficiency and Aid Quality Control

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Abstract

Additive Manufacturing is a highly efficient manufacturing technique involving 'printing' intricate components to a tight specification by gradually building up powder layers which are then selectively fused together. Controlling the performance of the powders is critical for process efficiency and end-product quality. Variability in feedstock can lead to quality issues such as non-uniform layering, low tensile strength, and poor surface finish. Powder characterization has a vital role to play in supporting this process, as testing techniques that can reliably measure properties that correlate directly with AM performance are essential. Identifying which powder properties lead to uniform, repeatable performance of powder allows new formulations to be optimized and helps reduce the occurrence of final products that are out of specification. Existing techniques such as Angle of Repose testing, Flow through a Funnel, and Bulk Density measurements are often too insensitive to accurately quantify subtle differences between powders with different processing performance. The FT4 Powder Rheometer® is a universal powder tester that provides automated, reliable, and comprehensive measurements of powder flow characteristics. This information can be correlated with process experience to improve processing efficiency and aid quality control.