



Assessing Dimensional Precision in Atomic Diffusion Additive Manufacturing (ADAM) Compared to Binder Jetting (BJ) Through Key Feature Analysis

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Keywords:

Additive Manufacturing Metal 3D Objects Dimensional Accuracy Shape Accuracy Surface Roughness

Abstract:

This study undertakes a comparative analysis of the dimensional accuracy between two additive manufacturing techniques: Atomic Diffusion Additive Manufacturing (ADAM) and Binder Jetting (BJ). The objective is to ascertain which process achieves superior precision by examining their fundamental attributes. ADAM employs a method where metal materials are incrementally deposited with a plastic binder, in contrast to BJ, which utilizes a binder on powdered material that is subsequently removed. The investigation delves into the ADAM and BJ processes' characteristics, emphasizing the surface finish, microstructure of the fabricated items, implementation of ideal processing parameters, and the precision of dimensions and shapes. The ultimate characteristics of 3D printed items are influenced by various technological factors, including the geometry, orientation, and arrangement of the components. The findings from this research are vital for evaluating the precision of these additive methods and will provide a solid foundation for determining the most effective strategy in additive manufacturing.