How does HP Multi Jet Fusion work?

Material selection

Introduction

HP Multi Jet Fusion (MJF) technology is a powder-bed fusion 3D printing technology that allows for the production of accurate, functional prototypes and final parts, including color parts. In addition, HP MJF is a technology that does not require support structures, thus enabling the design of complex geometries without additional costs, which would be expensive or not even possible to produce with traditional manufacturing processes.

HP MJF 3D printing process

The HP MJF 3D printing process begins with a thin layer of uniformly pre-heated polymer powder particles that is spread across the build platform.

Then, to achieve part quality at a high speed and produce truly functional parts, HP MJF technology uses the HP multi-agent printing process. HP's in-depth knowledge of 2D printing solutions and the capability of HP's proprietary architecture makes it possible to print millions of drops per second along each inch of the bed width, thus enabling extreme precision and dimensional accuracy.

HP Multi Jet Fusion's multi-agent printing process can control the exact amount of each agent that is deposited in each voxel of the intended part. This printing process involves two different types of agents that are applied across the build platform: fusing agents and detailing agents.

A fusing agent is applied where the particles are meant to fuse together in the powder in order to create the corresponding part cross section, leaving the rest of the powder unaltered. A detailing agent is applied to the edges of the part in order to modify the fusing process and create fine detail and smooth surfaces.

Next, an energy source passes over the build platform, provoking a reaction between the agents and the material that causes the material to selectively fuse to form a complete layer, thus resulting in production throughput, material density similar to common Injection Molded plastics, and consistent mechanical properties in all directions.

The process is then repeated until a completely functional part has been formed.

The 3D printing process using HP MJF is summarized in the following figure:

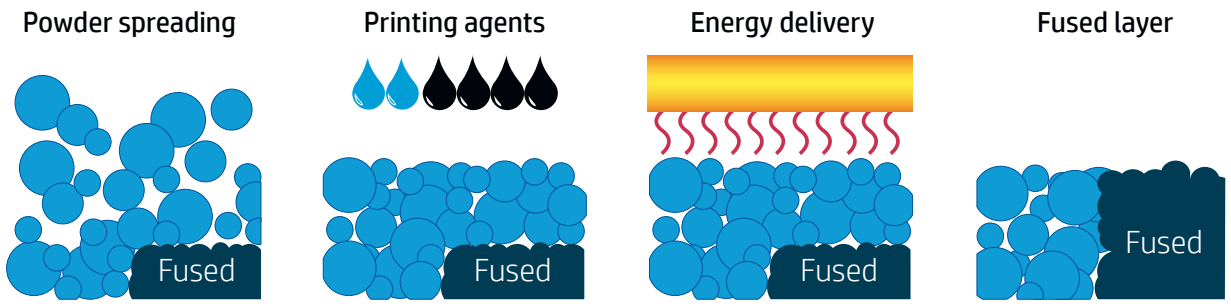

Figure 1: 3D printing process with HP Multi Jet Fusion

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