

The promise of multi material 3D printing

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Today we witness the enormous impact of Additive Manufacturing (AM) technologies on “how we fabricate” and “what we fabricate”, the latter of which has been fundamentally affected by the freedom of form variation enabled by many AM techniques. Now we witness the removal of another major constraint as we add the freedom of material variation. This becomes possible in multi-material AM systems, where each element of the printed model can have different physical or chemical properties. In Stratasys Polyjet 3D printing systems liquid droplets of different materials are simultaneously deposited and solidified. The deposition sequence and resulting spatial distribution of the droplets are controlled by dedicated software. In effect, we turn digital voxels into physical blocks and we call the resulting structure Digital Material (DM). Naturally, a pair of materials with different physical properties can yield numerous DMs, each having a unique set of properties, inherited from its parent materials.

Our research group in Stratasys is investigating the capabilities that made available by multi-material 3D printing and is testing various combinations of parent materials in different DM structures. We believe these new Digital Materials could grow to become a completely new form of composite materials promising a completely new degree of freedom to engineers and scientists.