The Various Types Of 3D Printing

Posted by Waldo - 2012/05/21 14:35

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3D printing is a pretty fascinating form of manufacturing technology in my opinion; there are many branches of 3D printing such as Stereolithography (SLA), Selective Laser Sintering (SLS), Direct Metal Laser Sintering (DMLS), Fused Deposition Modeling (FDM), Multi-Jet Modeling (MJM), or Ink Jet 3D printing. Each form of additive manufacturing is significant in its own way through its own niches. I'd like to cover some applications of each.

Stereolithography (SLA) methods involve ultraviolet beams of light hitting curable resins to result in final parts. These parts play an active role in creating many medical applications. For example, SLA methods are dominant in the 3D printing world for dental applications, hearing aids, and similar implants. SLA 3D printing has been great for creating extremely precise parts.

Direct Metal Laser Sintering (DMLS) stands out in the 3D printing world as "metal 3D printing" for a reason: it is metal 3D printing! Through a layer by layer process of using laser technology to melt powdered metal together, it isn't difficult to manufacture intricate organic metal pieces. DMLS is known for "one-upping" the machining industry. When parts can be manufactured in a matter of hours at detail levels far superior than traditional machining, 3D printing caught the attention of product developers and engineers. Not to mention, DMLS is almost entirely geometrically independent when it comes down to designing parts; good bye machinists and CNC cutting, hello DMLS 3D printing!

Selective Laser Sintering (SLS) is very similar to DMLS, but typically it just revolves around different materials. Layers of material powder will be stacked up on a build table and melted together in accordance to the design, just like DMLS. The part will be able to "float" within a bed of powder, so supports aren't necessary! This technology is great for product developers and designers around the globe, as a wide variety of materials can be made at great detail without the use of supports.

Fused Deposition modeling (FDM) is an interesting form of 3D printing, and one of the most popular. Essentially, a nozzle aided by a computer will draw from a spool of material in wire form. This nozzle is very hot, and will melt the material and stack the melted material layer by layer to create a final product. Think about a hot glue gun as an analogy; material (or the glue) will be pushed through the hot nozzle, and the glue (or material) will be stacked up to make a final product. Stratasys, a well known 3D printing company, truly outdid themselves when they developed this technology and they are making it more affordable than ever.

Multi-Jet Modeling (MJM) is very similar to FDM technology. Imagine the same exact thing, except there are multiple nozzles. Objet, another well known 3D printing company, did a great job when they came out with "digital material," in which multiple colors and materials can be used in a single print.

Ink Jet 3D Printing is one of my favorite styles of additive manufacturing, as it allows for full color prints out of a sandstone like material. It is very similar to DMLS and SLS methods, as it stacks up layers of material powder and fuses them together. There are two major differences between DMLS & SLS and Ink Jet printing. Ink jet printing does not use a laser to melt pieces together, it uses an adhesive chemical to bond the powder together. At each layer, the ink jet itself will actually color the product in accordance to the design! The level of color detail is great; you can have your face printed! Full character models and great prototypes result from this technology. The only down side to this in my opinion is that the product pulled from the printer is very weak, and filled with around 40% air. To fix this, technicians will dip the product in a super glue like liquid or epoxy to infiltrate the product… then you have your piece!

If you have any questions about the various types of 3D printing or if I missed anything, let me know!

Hope it helps guys.

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Re:The Various Types Of 3D Printing

Posted by AlessandroFX10 - 2013/04/03 10:47

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Waldo wrote:
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Sinterização seletiva a laser de metal (DMLS) stands out in the 3D printing world as "metal 3D printing" for a reason: it is metal 3D printing! Through a layer by layer process of using laser technology to melt powdered metal together, it isn't difficult to manufacture intricate organic metal pieces. DMLS is known for "one-upping" the machining industry. When parts can be manufactured in a matter of hours at detail levels far superior than traditional machining, 3D printing caught the attention of product developers and engineers. Not to mention, DMLS is almost entirely geometrically independent when it comes down to designing parts; good bye machinists and CNC cutting, hello DMLS 3D printing!

Sinterização Seletiva a Laser (SLS) is very similar to DMLS, but typically it just revolves around different materials. Layers of material powder will be stacked up on a build table and melted together in accordance to the design, just like DMLS. The part will be able to "float" within a bed of powder, so supports aren't necessary! This technology is great for product developers and designers around the globe, as a wide variety of materials can be made at great detail without the use of supports.

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If you have any questions about the various types of 3D printing or if I missed anything, let me know! Hope it helps guys.

Que parte da arma pode ser impressa ?

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Re:The Various Types Of 3D Printing

Posted by Marco CM - 2013/04/04 11:37

Nearly all components of a gun could be 3d printed in one material or another. The stock in hard plastic or nylon. Perhaps the lower receiver in steel. Sorry we have not 3d printed any weapons as it is against our policy.

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Re:The Various Types Of 3D Printing

Posted by 3dtech - 2016/06/10 03:43

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thanks for this information.

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Re:The Various Types Of 3D Printing

Posted by Jose K. Rojas - 2016/08/12 01:56

It is a very helpful post regarding various 3d metal printing techniques. I also like to add that along with techniques like FDM, SLS, DMLS, etc.. SLM is another 3D metal printing process that uses 3D CAD data as a digital information source and energy in the form of a high-power laser beam, to create three-dimensional metal parts by fusing fine metal powders together. While Surfing on the internet, I came across this 3D printing technology called as SLM which results accurate.

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Re:The Various Types Of 3D Printing

Posted by kjayden932@gmail.com - 2018/10/29 12:25

Actually, it is certain that there are different types of 3D Printer which can be utilized by the users in the various platform they want to use in their own way of fields. There are multiple factors which they face trouble like fix Epson error code 0x97 that should be resolved by them only.

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