

PRESENTATION ON 3D PRINTING





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3D PRINTING- An Introduction



3D Printing (3DP) or Additive Manufacturing is a process of making three dimensional solid objects from a digital model.

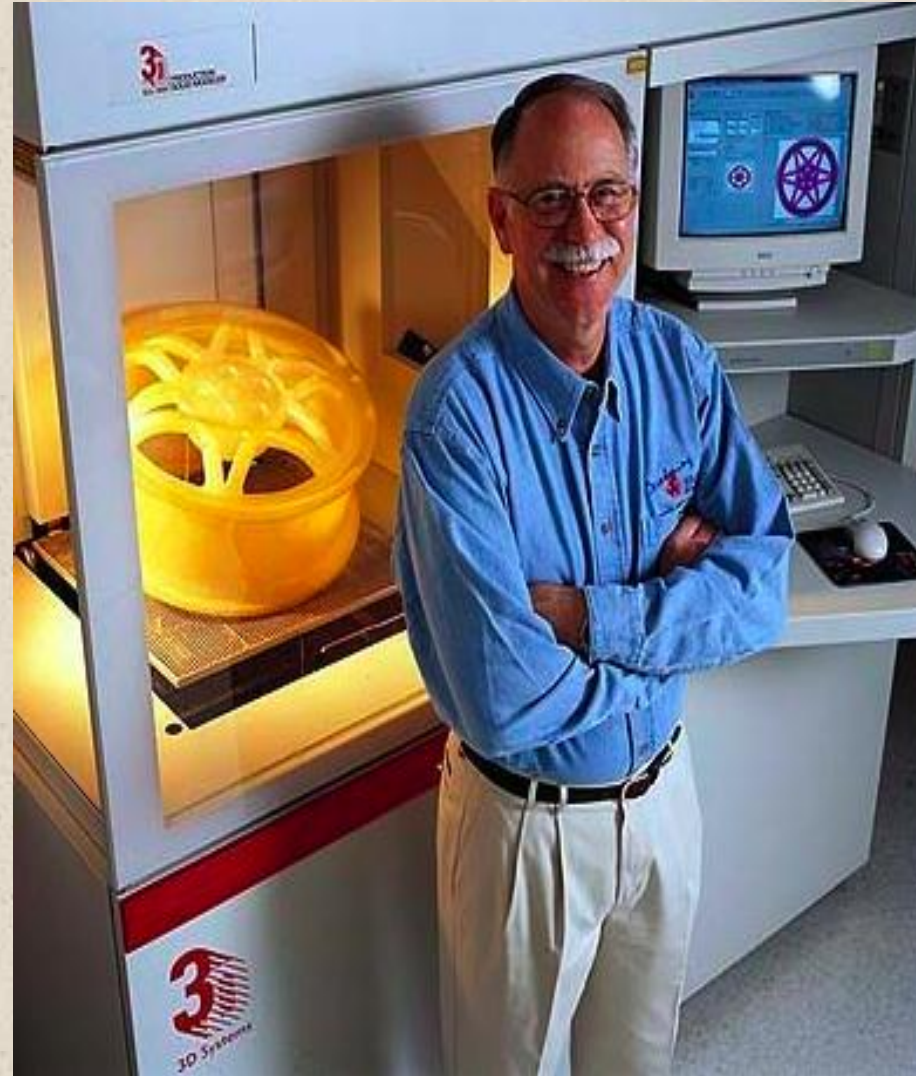


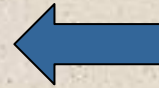
A 3D printing process gives concrete shape to the 3D design through the usage of 3D printers.



The INVENTOR

The technology for printing physical 3D objects from digital data was first developed by Charles Hull in 1984. He named the technique stereo lithography and obtained a patent for the technique in 1986. The same year, he founded 3D Systems and developed the first commercial 3D Printing machine.





This is a *3D Printer*

They have been around for almost 30 years now, which is quite amazing to think of.

Specially used for:

- *Product Designing*
- *Creating Prototypes*
- *Packaging etc.*

Fig 1.1

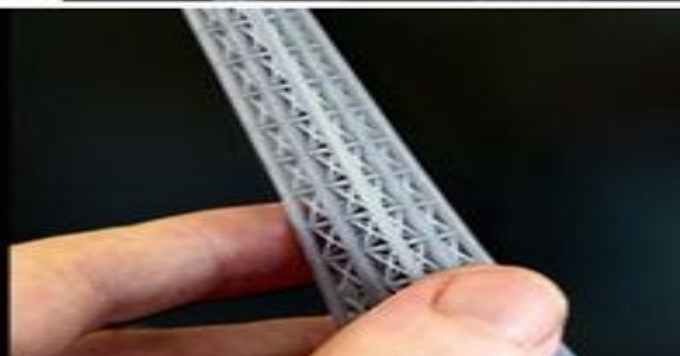
MARVELS OF 3D PRINTING













PROSTHETIC LEG



GLOVE ONE (To be released later this year)

Techniques of 3D Printing

1

• *Stereo Lithography*

2

• *Selective Laser Sintering*

3

• *Fusion Deposition Modelling*

How Stereo Lithography 3-D Layering Works?

*Stereo lithography, also known as **3-D layering** or **3-D printing**, allows you to create solid, plastic, three-dimensional (3-D) objects from CAD drawings in a matter of hours.*

This machine has four important parts:

- *A tank filled with several gallons of **liquid photopolymer**. The photopolymer is a clear, liquid plastic.*
- *A perforated platform immersed in the tank. The platform can move up and down in the tank as the printing process proceeds.*
- *An ultraviolet laser*
- *A computer that drives the laser and the platform*

The photopolymer is sensitive to ultraviolet light, so when the laser touches the photopolymer, the polymer hardens.

If you stand next to the **stereo lithograph apparatus** (SLA), you can actually see the laser as it builds each layer.

[This short MPEG file](#) lets you see the laser building a small section of a model.



Detailed Process

The Stereo lithography Process

The basic printing process goes like this:

- *You create a 3-D model of your object in a CAD program.*
- *A piece of software chops your CAD model up into thin layers -- typically five to 10 layers/ millimetre.*
- *The 3-D printer's laser "paints" one of the layers, exposing the liquid plastic in the tank and hardening it.*
- *The platform drops down into the tank a fraction of a millimetre and the laser paints the next layer.*
- *This process repeats, layer by layer, until your model is complete.*

Once the run is complete, you rinse the objects with a solvent and then "bake" them in an ultraviolet oven that thoroughly cures the plastic.



It's like living in the future. You want something, you press a button and a machine in your home starts producing it. Print in 3D puts the power to create in the hands of ordinary people, like US!

Materials Used

- *Various clay and ceramic materials.*
- *Metals, sand and glass*
- *Thermoplastics*
- *Photopolymer*
- *Titanium alloys*

Stereo Lithographic Apparatus



PHYSIBLES

A digital file containing instructions that enable a 3D printer to create a physical object is known as a physibble.

Physibles are CAD programs that contain the detailed information on how to print the 3D object.

New Developments

First ever 3-D printed car.

- *Urbee is the first prototype car ever to have its entire body 3D printed with an additive process. All exterior components, including the glass panel prototypes, were created using Dimension 3D Printers and Fortus 3D Production Systems at Stratasys' digital manufacturing service.*



The Liver

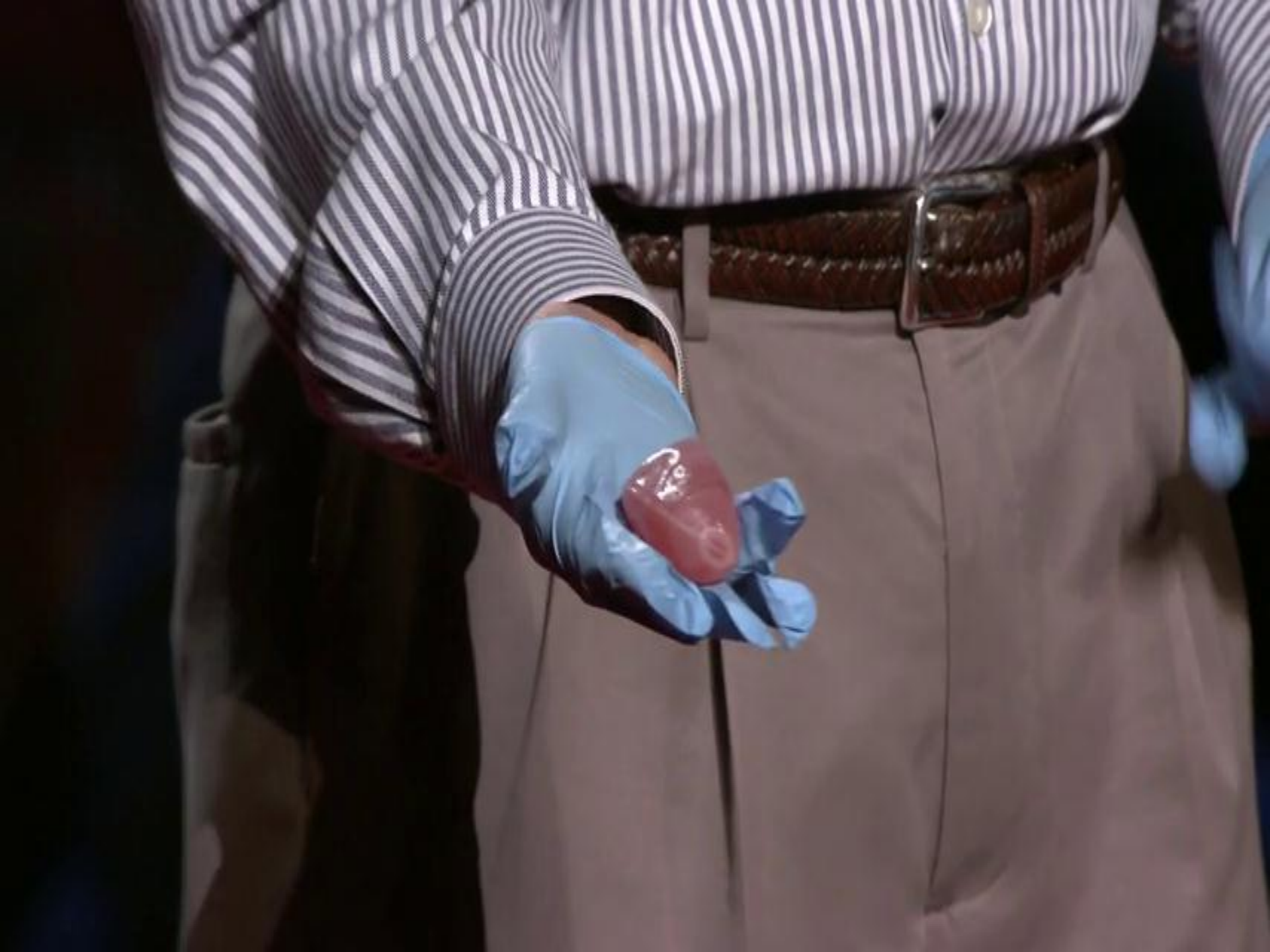
There's actually a major health crisis today in terms of the shortage of organs.

Over 90% of the patients are on a death row due to shortage of these organs.

Thanks to 3DP that we have a way out.

Cells from damaged liver are taken as materials and are used to print a liver.

And which works like a charm!





Thank You

