

REPRAPWORLD

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Next Beer & Pizza party on 7th September!

Meet the maker

by Jos Richters

Meccano (3D Printed)

The idea was for children aged 10-12 to create materials which could be easily assembled into new objects during Code Club meeting hours. The Code Club is a weekly organised, Wednesday afternoon meeting at the local library where children are encouraged to be creative. The children are involved with using a 3D Printer, a 3D Pen, programming small robots, making music with fruits, and lots of other ideas (including this Meccano idea).

When the project came along my first thoughts were about Meccano. A toy from my youth which consisted of metal strips and bars. Because of the development of Lego's and Play Mobile the metal Meccano disappeared. But I felt that Meccano is still a great toy which allows children to play and learn about the basics of constructing and gain some technical skills. Because we all hear on the Dutch news technical educated people are in high demand I decided to start using the 3D Printer to (re)create the Meccano parts.

Because the children were already using a 3D Printer during Code Club, we tasked them to print the Meccano parts. After which they can use those parts to complete simple tasks. In the picture you can see a sailing boat and bicycle made by the children.

Who knows, this might be the push which makes a toy from my youth accessible and fun even for my own grandchildren.



**Did you print something for one of our products?
Let us know and we will put it in our next
newsletter**

REPRAPWORLD

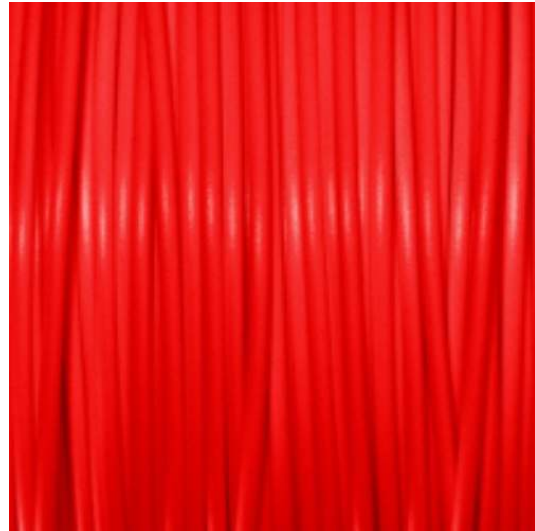
New: RepRapFilament!

We are the official distributor of Real Filament. This is a high-end filament which is targeted at enthusiasts and small business who have a need for a high-end Filament. Only being able to offer smaller spool sizes when price matters we decided to look for a solution in a different way. Real Filament was not able to provide us with that solution as they focus on the production of Real Filament and were not willing to compromise on the overall quality of the filament and product.

So we were searching for a production company which could fulfill our need of a more basic filament. We get daily offers of Chinese companies producing filament, but in our experience those filaments are not at the quality level we want.

In the end we did find a European based company willing to produce our RepRapFilament. It is a no

nonsense filament of good quality. Reducing the amount of colors available we are able to buy them in bulk reducing the price for the consumer.



RepRapFilament reflects the value-seeking nature of the RepRap spirit. The RepRapFilament is available in 4 popular colors (Black, White, Blue and RepRapWorld Red.) and is packaged in a simple, sturdy brown box. By keeping things basic we are able to provide you with a good quality filament at a very friendly price point.

Available in:

Material: PLA

Colors: Black, White, Blue and RepRapWorld Red.

Diameter: 1.75mm and 2.85mm

Size: 1.00 Kg

PLA (polylactic acid) filament is amongst the oldest and still the most heavily used mediums in the 3D printing community, mainly due to its benefits as a versatile and environmentally friendly thermoplastic. Both organic and biodegradable, PLA is easily compounded with other ingredients to influence its final properties.

RepRapFilament prints best at a temperature of roughly 200 degrees. The filament should extrude smoothly and the end result appear slightly shiny.

PLA can print well on an unheated surface using Blue Painters or Kapton tape, and most 3D print stickers. For ease and convenience, we recommend using spray such as 3DLAC on a glass bed. A low bed temperature between 50 - 60 degrees further reduces the chance of warping and makes final print removal easier once the print surface has cooled.

**See here our newest products, including
RepRapFilament!**

SLA; a basic introduction

by Jaap van Wietmarschen



Many RepRap enthusiasts are involved in FDM or FFF printing. Using a variant of the i3 or a delta printer. Most of us have printed a small little tugboat and have progressed from printing small items to make use of the maximum build size of our printer. And then it's all about the quality of the prints, having no artifacts, warping, etc. All our efforts are nothing compared to the precision of a SLA printed object.

So what is SLA?

SLA is short for Stereolithography apparatus. It basically means you are using light to solidify a liquid material layer by layer and building up your object.

Who invented it? A brief 3D printing history lesson.

Without quoting wikipedia, SLA is about as old as FDM printing (1986). And the name you should remember is Chuck Hull. He patented SLA and started 3D Systems. A company name that most of us recognize.

Appreciating the RepRap spirit, one can put question marks at the success of capitalizing the patent, the time it took them to do this and the flight 3d Printing in general is taking with real world applications after the patents expired in recent years.

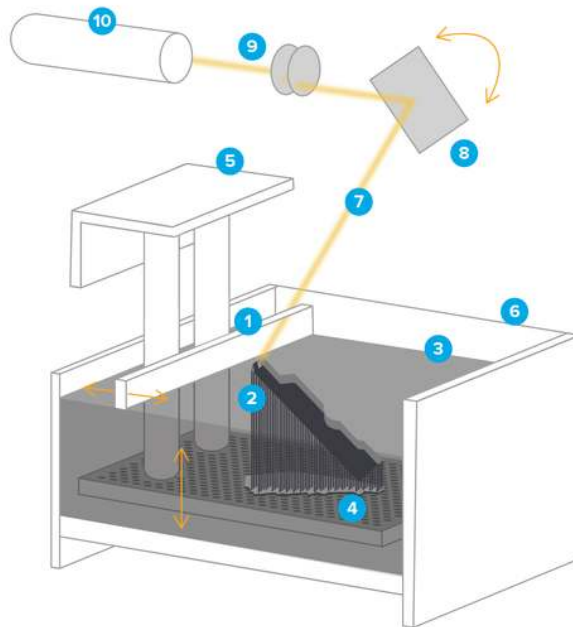
So how does SLA work?

SLA machines can be divided into two categories. "Right side up" and "upside down".

Both variants work by exposing a thin layer of liquid material (a polymer resin) to light. This resin is photosensitive and will solidify when exposed to light.

Right side up

The right side up machines use a large tank of resin and starts out with the build platform just underneath the surface of the resin. The distance between the build platform and the surface is the layer height. A laser then traces the object and where the laser goes the resin solidifies. Once the layer is done, the build platform lowers, allowing resin to flow ontop of the layer and the machine resets to the desired layer height. Allowing the laser to trace another layer on top of the previous one.

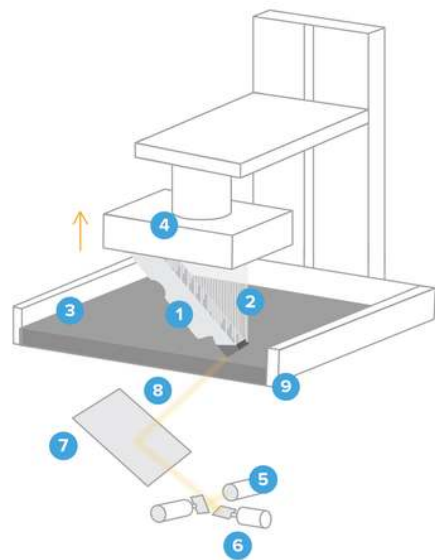


Right-Side Up SLA

- 1 Sweeper
- 2 Printed Part
- 3 Resin
- 4 Build Platform
- 5 Elevator
- 6 Resin Tank
- 7 Laser Beam
- 8 X-Y Scanning Mirror
- 9 Lenses
- 10 UV Laser

Upside down

When looking at a upside down machine the build platform is raised up and away from the resin. The light source is underneath the machine and the tank where the resin is located has a transparent bottom. The start position is where the build plate is lowered into the tank and the resin sits in between the bottom of the tank and the build platform. The distance between the two is the layer height. The light source then solidifies the resin and the platform is raised. Because the bottom of the tank has a special layer where the resin doesn't like to stick, the object sticks to the build platform. The build platform is raised, resin flows back on the entire bottom of the tank and the build platform is lowered again till the layer height and the light source solidifies another layer sticking it to the one attached to the build plate.



Upside-Down (Inverted) SLA

- 1 Printed Part
- 2 Supports
- 3 Resin
- 4 Build Platform
- 5 UV Laser
- 6 Galvonometers
- 7 X-Y Scanning Mirror
- 8 Laser Beam
- 9 Resin Tank

Which type is better?

The downside of the right side up method is that the build platform is lowered into the tank of resin. So if you want to print a object 100mm tall, you also at a minimum need 100mm of resin in the entire tank. The resin is compared to FDM materials like liquid gold, so that is a big minus. In the upside down method you only need to fill up the layer height of the print. Meaning you only need the amount of resin needed of your total print plus a little extra in the tank.

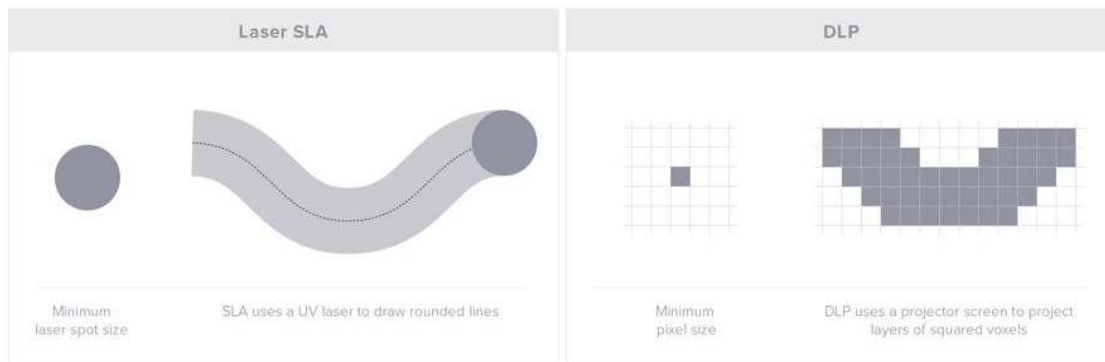


For RepRap enthusiasts another bonus is the light source. Lasers are most common on ready to go machines but sourcing the module is pretty hard. A more easily available option is the use of a DLP projector or a LCD screen. And those work especially well with the upside down method.

The downside of the upside down method is the use of a special coating on the bottom of the tank. Usually that coating will deteriorate with use or when it is exposed to the laser. Adding to the cost of using the machine.

DLP vs Laser

As said a DLP projector will work as your primary light source. A projector works like your LCD screen and is made up out of pixels. The pixels itself are smaller than the dot size of the laser. But the laser is moved by stepper motors which are very precise and allow more smooth operation. The DLP projector is fixed in place, so the grid is fixed in place. So when using a projector the corners and roundness of a object is more square.



Compared to FDM prints this can be completely ignored. But because this technology is meant for small and ultra precise parts it is a definite downside and something to take into account.

The positive side of a projector is that you can expose the entire layer to light in 1 go. SLA is often used to create batches of small objects and for that the DLP is faster since the laser has to touch every part you want to solidify.

Resin types

SLA is used in many small precise applications. I have seen model cars ,trains and scenery printed. But once you step more into the small business applications you see dental, pressure molding and casting applications advertised. All at a much higher precision than regular FDM printing.

Speed of printing

Settings influence speed a lot but in general when comparing SLA printing to FDM printing you can't really see a difference in printing speed. A medium sized print will take just as long as a FDM print. But with SLA you are not done with only the printing process.



Post production & Post curing

Resin's are usually not the most environmentally friendly products. So once you finish printing it is normal to wash off any residual resin with alcohol. Some resins are a little more friendly and are washable with water.

Once you clean your object you should also expose the object to more light to solidify the objects even more. This is called post curing. Each layer is attached to the next, but the light source is usually not able to fully penetrate the layer height and some semi-liquid state resin is present in between layers. The post curing is meant to fully solidify the resin in the entire model.



Hopefully this will have answered some of your questions about SLA printing, if you have any more questions. You know where to find us.

Disclaimer, I borrowed a lot of pictures from different sources trying to explain how the technology works. The rights of the pictures are with the original source.

Photocentric3d.com SLA Resins



Now available at RepRapWorld.com,
Photocentric SLA resins.

Photocentric offers a full range of UV and Daylight sensitive resins. Suitable for both laser and DLP solutions.

Available in: Hard resin, Flexible resin, High Tensile Resin, Castable resin and Tough resin.



See here our newest products, including the 3D Resins from Photocentric!

RepRapWorld's Meet the maker wanted!

If you would like to participate in the Meet the maker section. Please use the button below to contact us. And share your story with thousands of like-minded-makers!

Want to pitch your project for the 'Meet the maker' section. Please click here!

Real Filament update; Bamboo and Cork filament



Real Filament just updated the portfolio with 2 new nature products: Cork and Bamboo.

These filaments from Real Filament are a mix from PLA and Cork and Bamboo particles. These filaments are mixed to give the end-result a real wood feeling and as a bonus your workshop will smell like a wood-workshop.

Keep in mind that the wood particles will wear down your brass nozzle, upgrade to steel is advised!



See here our newest products, including Bamboo and Cork

Thingiverse updates

Thingiverse

On Thingiverse you can find a lot of cool stuff to print. From Spinners to Pokemon. You can also find handy stuff to cover up electronics.

Maker djvdant

Did you buy a keypad to complement your LCD to use with your Megatronics? And you have no idea on how to use it? You can use the design by djvdant!

Find the keypad cover [here](#).



Exhibitions

Exhibitions update: The stand for fomnext has now also been confirmed. We will be upstairs in Hall 3 (Halle 3.1) and stand B61. We will be showing off our electronics, Proline, Real Filament and (DIY) printers.



26 - 28 September 2017
NEC, Birmingham, UK

Stand G56

RepRapWorld will be attending the TCT show 2017. And we would like to invite all of you to come visit us at the booth.

14 - 17 November 2017
Frankfurt, Germany
Messe Frankfurt Hall 3

formnext

POWERED BY



Stand: Halle 3.1 B61

RepRapWorld will also be attending the formnext show in the messe in Frankfurt. Again, everyone is welcome to join us.

See here our newest products, including RepRapFilament!

RepRapFilament reflects the value-seeking nature of the RepRap spirit.



**RepRapFilament
PLA White**
1.75mm 1.0 Kg
€16.49

[Buy Now](#)



**Photocentric3D
Daylight Castable**
Amber, 1000 gram
€59.50

[Buy Now](#)



**Real Filament
Wood**
1.75mm 0.75 Kg
€17.99

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