
BattleFX
Kickstarter - Deadly Print Studio
User Guide - Tips and tricks

Deadly Print Studio

Thank you very much for supporting us in our first Kickstarter campaign. Without all of you this wouldn't be possible.

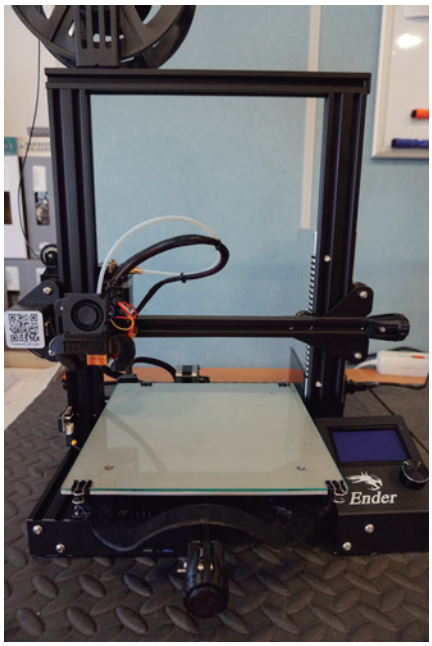
In this guide you will find information on how use BattleFX and bring it to your favorite battlefields and miniatures in the most direct and simple way possible. From our hands, the creators, we will give you all the tricks we have learned, designing and printing all the 60 FX that you will find in the bundle.

Do not hesitate to contact us on our website (deadlyprintstudio.com)
or in our email (deadlyprintstudio@gmail.com)

Happy 3D printing!

# 3D Printers

## FDM - Ender 3




The FDM printers (Fused Deposition Modeling) melt a plastic material and deposit layer after layer to create the 3D piece that we want to print.

In our case we used the well-known Ender 3. A printer with a large community and with some very good factory finishes.

The quality of printing comes from many factors, the most important being the layer height and the thickness of the extruder nozzle.

We use a layer height of 0.12 in most cases and nozzles that vary depending on the size.

- Nozzle 0.2: We use it for S or M files (scaled small). We use slower printing speeds. Between 30 and 50 mm / s

- Nozzle 0.4: The standard and more versatile nozzle. We use it for all the FX that of the bundle. If you don`t want to complicate yourself, with this all-terrain nozzle you are able to print everything. We use faster printing speeds Between 50 and 90mm / s

- Nozzle 0.6: A larger nozzle, to save hours of printing on the largest FX. Speeds between 50 and 90mm / s

### What materials do we use with FDM printers?

Our recommendation is PLA (polylactic acid) is a biodegradable material, in which petrol oil has been used. It does not emit odors, it´s really ease to use and affordable.
Its great advantages are:
- Easy to use
- Solidifies fast
- Minimum deformation due to thermal stress
- Good adhesion in the warm bed
- Biodegradable
- Price

Its disadvantages
- Resistance
- Final finish

## PLA Brands

All our FX have been tested with several PLA brands. Here we name our top 3 brands and which colors we like the most (These brands are accessible from Spain)

### Cheap - Enotepad

- Quality/price incredible , you can find in Amazon about € 16/Kg.
- We especially like gray one and transparent.




### Premium - Smartfill

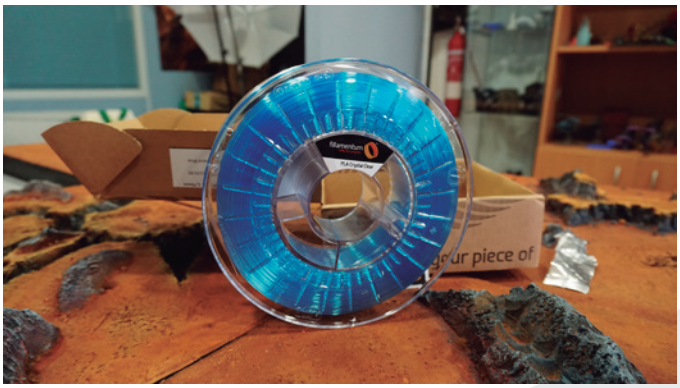
- Very good quality, perfectly rolled filament and hermetic container.
- Higher cost, € 17 - 750 grams.
- We especially like gray and silver.

Ideal for small precision parts. It doesn´t need a lot of temperature, 195 Cº It´s perfect

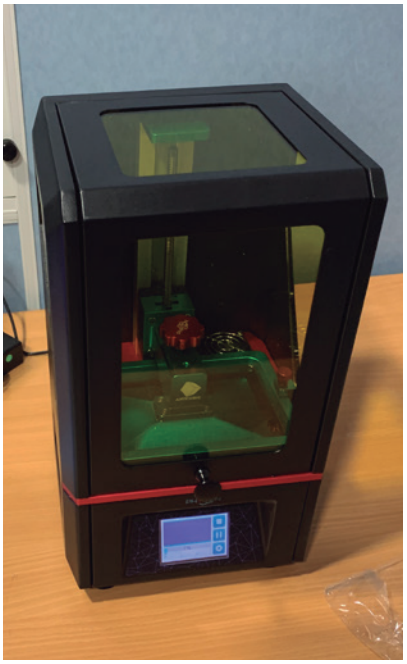


### Premium - Filamentum

- Very good quality, perfectly rolled filament and premium packaging.
- Higher cost, € 18 - 750grams.
- Its translucent colors are beautiful, ice blue is our favorite.



## DLP - Anycubic Photon



DLP (Digital Light Processing) printers generate a UV light beam that solidifies the photosensitive resin layer by layer.

In our case we have used the queen of the low range of resin printers, the Anycubic Photon. With a very solid construction and a small printing area.

The operation is quite simple, an LCD screen project UV light into a container with the resin. It will harden layer by layer. The software will decompose our 3D model in layers, these layers will be projected 1 by 1. The light with different shapes will solidify that shapes, change the shape and so on.

The printing quality is overwhelming, it seems almost plastic injection.

In this case, the print quality depends on 2 factors, the quality of the LCD panel and the height of the layer. In this case, this printer is a 2K panel.

We recommend using this printer for the smaller range of BattleFX if you want to achieve very high levels of detail, for the most demanding people!

### What materials do we use with DLP printers?

In the case of these kind of printers, we use photosensitive resin. There are many types and hardness, we use the brand Anycubic 405nm.

Its advantages are
- Print quality
- Quickness
- Less supports
- Print several pieces at once, makes it much faster
- Variety of materials. Gray and transparent ones are our favorites.

Its disadvantages
- Price
- The resin is toxic
- Unpleasant vapors
- You have to clean the piece with alcohol
- The piece must be solidified with UV or solar light

## Tools

In the studio we have a few tools that make our lives easier to get the best of each 3D printing. The post-processing of the prints can be a bit tedious, but these tools that we advise you, will help you!

### Wire cutters



Our great allies.
We usually use them to cut the supports, and the parts that we do not like. I recommend to press on the support and turn them. Be cautious with them, use the slicer 3D model to not cut where you should not. Patience is your friend using it.

### Sandpaper or simillar



The sandpaper helps us to finish the job of the wire cutters. It helps us to improve differnt zones of 3D printed objets. This group of  limes with all kinds of shapes helps a lot to reach holes that do not reach sandpaper.

Highly recommended for small figures.

### Modelling knife



If you have adequate supports, the best is a good sharp blade. Be careful with your fingers!

Very useful with the supports of the resin printers.

### Glue



The best way to join pieces to our miniatures or even join 2 printed pieces.

## Epoxy Putty - Bicomponent




We use it in 2 different ways.
To join pieces, this way you can not see the joining areas. It is recommended to sand afterwards.
To fill gaps or printing failures. Many times we do not put enough supports in the figure or a gap is generated. This is where the "green" putty plays a fundamental role. Better to fix than to reprint something that has taken hours!

## Liquid putty



For FDM printers it is basic. It is one of the best forms of covers printing lines generated in curved angles. Applying a thin layer on the printed figure and sanding gently makes the famous lines disappear in an FDM print. We also use it to fill small imperfections and holes. Highly recommended to have it in the arsenal.



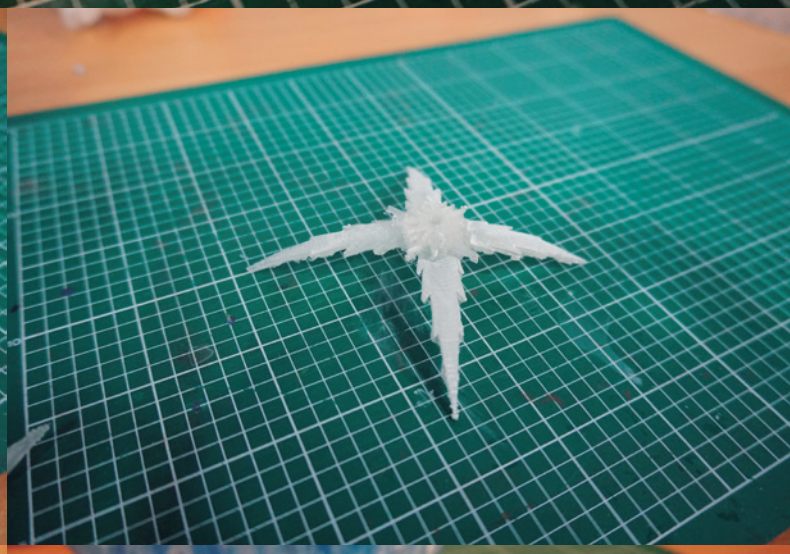
## Fire is your best friend

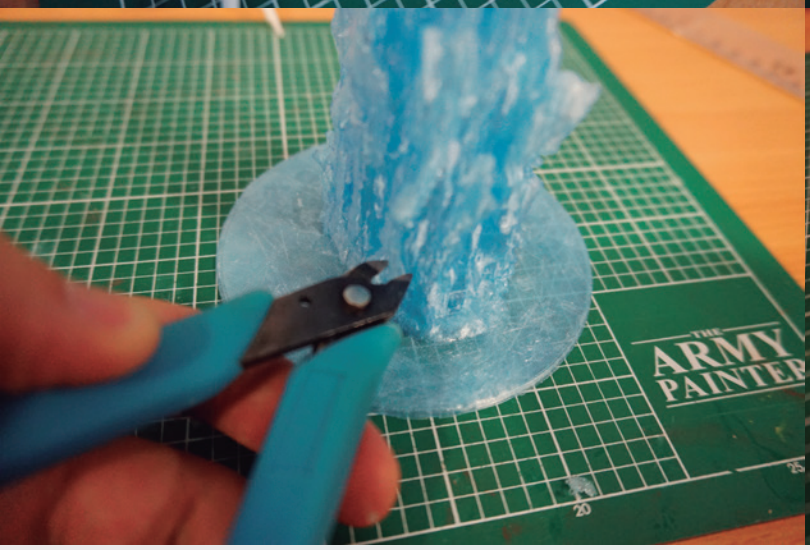
Fire is one of the best tools when it comes to printing with PLA.
Our most common uses are:
- Fold pieces: you can use it to fold pieces or adapt them better to a surface. Generate a 2D mesh (chainmail, cloth...) and with heat adapt to the area is very easy and gives you the advantage of printing in 2 dimensions.
- Merge pieces: pla is plastic. Instead of using glue, you can melt one of the sides and quickly join it to the broken area.
- Eliminate strings: It is very common to have problems with stringings because of retraction when printing. Thanks to the heat we can eliminate them quickly, always with caution to not destroy the piece.

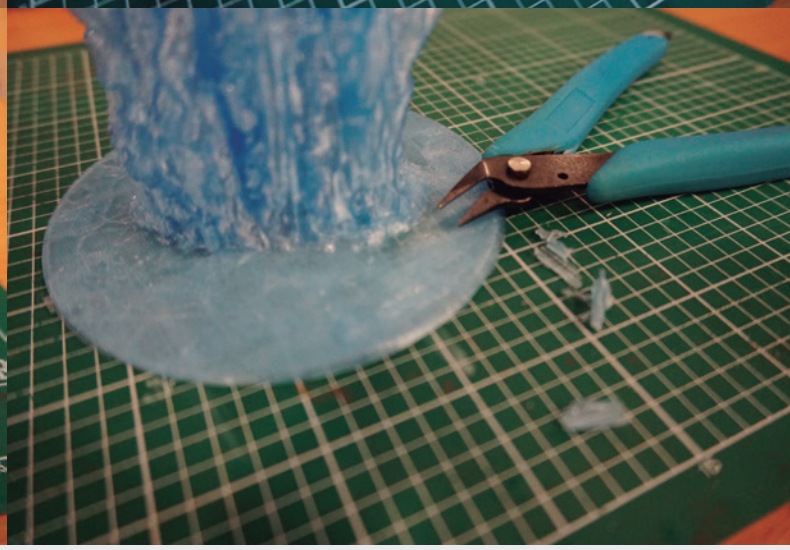
I leave you sample images of all cases of use of tools




PLASTIC
PUTTY

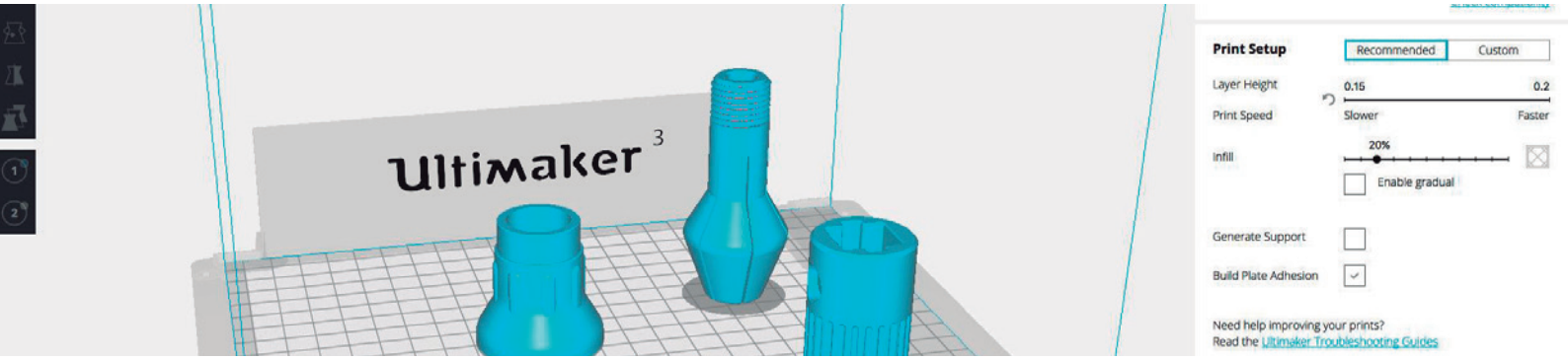



THE
ARMY
PAINTER

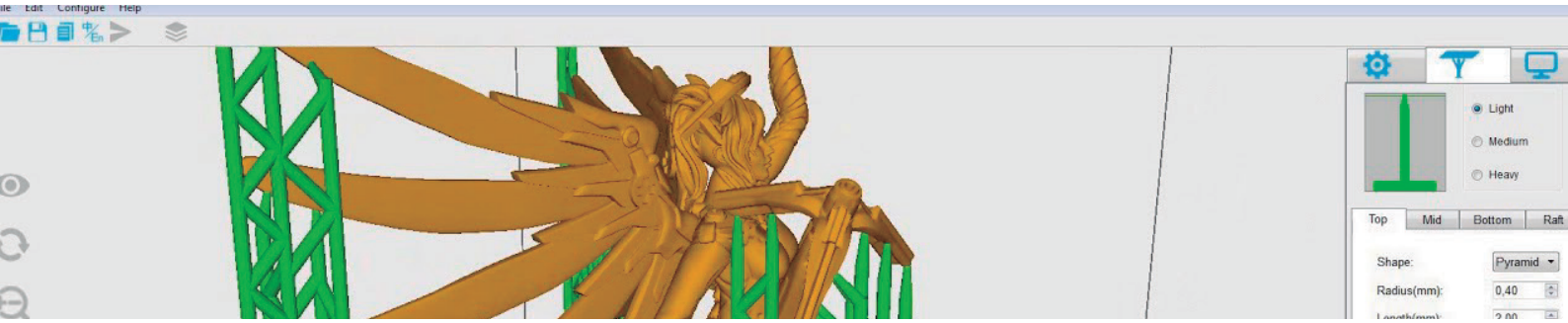


## I have the BattleFX bundle, and now how to prepare to 3D print?

Programs that prepare 3D object to be printables are commonly called Slicers. In our case we use several more tools that help us to prepare our 3D objects in something printable for our machines.

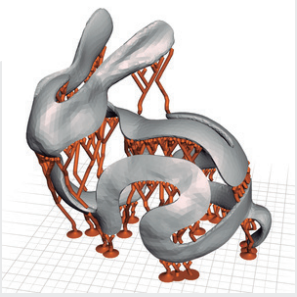



Ultimaker Cura: is a free slicer. It is one of the most commonly used. There is a large community behind and many profiles for the best known printers. You can use a multitude of file types, directly by dragging (.stl, .obj, .x3d and, 3mf).
It is our favorite for the Ender 3.




The Anycubic Photon comes with its own slicing software. It is not the most intuitive or powerful, but once you know a bit the tool, It is quite simple. There are other options, but we stick with this one because it is the more common used by the community of this printer. Included with your Anycubic Photon.

Autodesk meshmisxer is  a software that we could say It is a "Swiss army knife". We can use it from repairing 3D mesh to generate our custom supports.
Highly recommended to have it installed and give it a try!





# The supports, our great enemies. No fear!

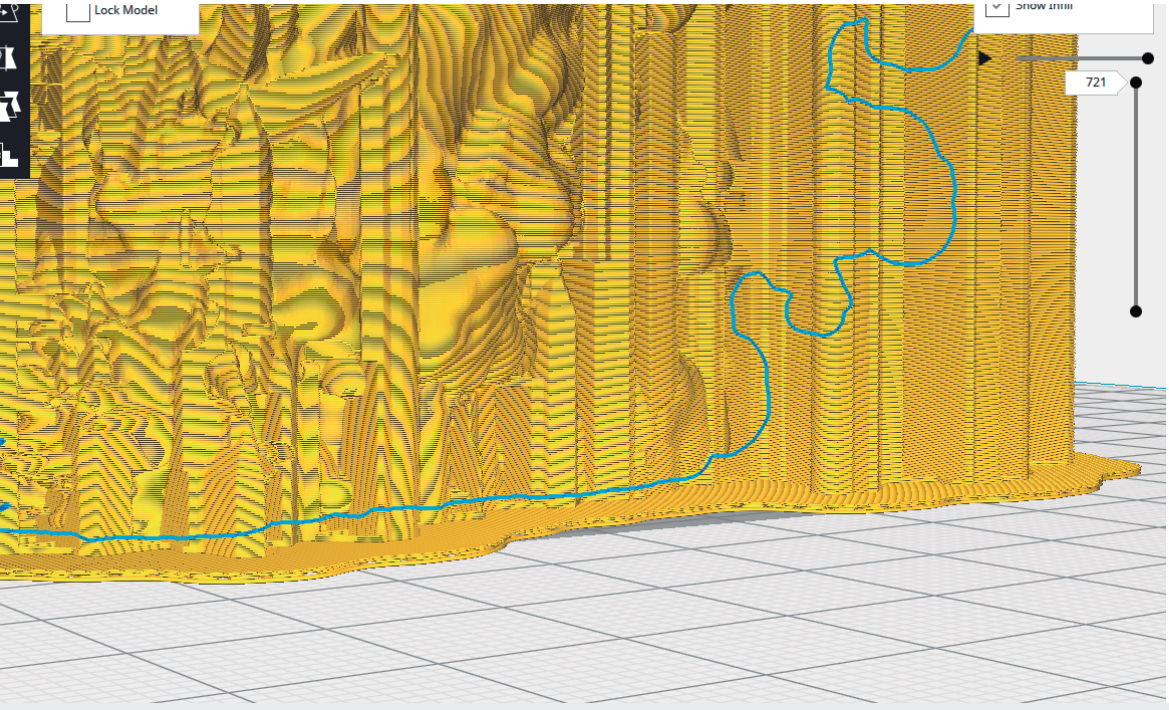
One of the biggest challenges and hassles of 3D printing is the supports. Whether with resin, PLA or ABS, combating them is part of our job when preparing a piece for 3D printing.

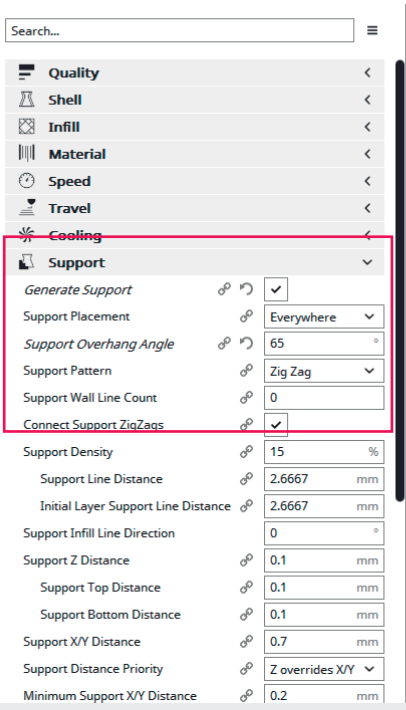
For BattleFX, we always try to think first about supports, but we haven't been limited our creativity to these. For this reason, in many of the FX will have to place supports.
I hope this guide helps you to get rid of your fear and live with them!

We are going to divide the supports into 3 categories:

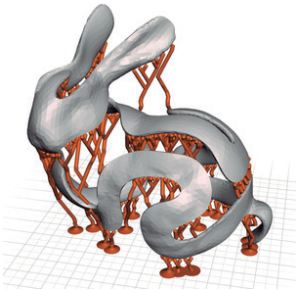
- Tower supports

They are most commonly used in FDM printers. In our case, Cura, calculate which parts of the 3D piece will stay in the air (overhang) and create supports. These supports have different types of filling, thickness etc. All this can be configured in Cura.
Our recommendation is to put in Cura 65 degrees of hanging (depends a lot of the piece to print). For small parts or high printing speed, we recommend lowering this value.
Remember, the smaller the extruder nozzle of our printer, the easier it will be to remove these supports. The lower the density, it will also be easier. A value of 15% is quite common.



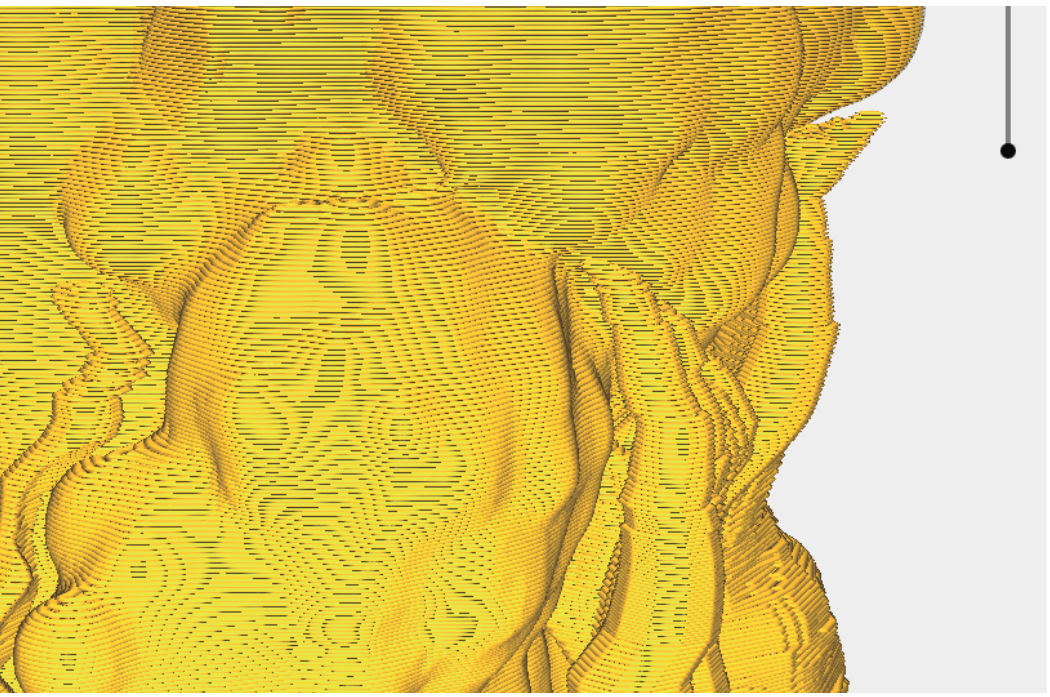
## Tree supports

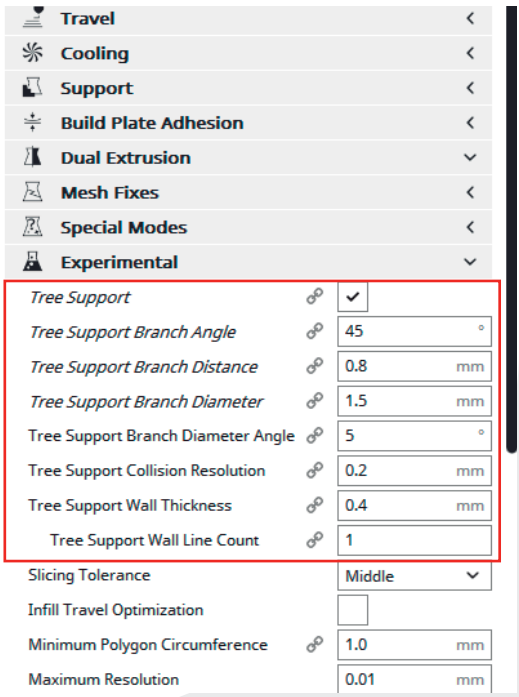


Tree supports are a more efficient and modern way to place supports in a 3d object. Its use in resin is highly recommended. With  Meshmixer you can create these supports very easily and with a multitude of options.

In Cura (example above) they have been added in the "Experimental" tab. With Cura we use it only in certain cases.

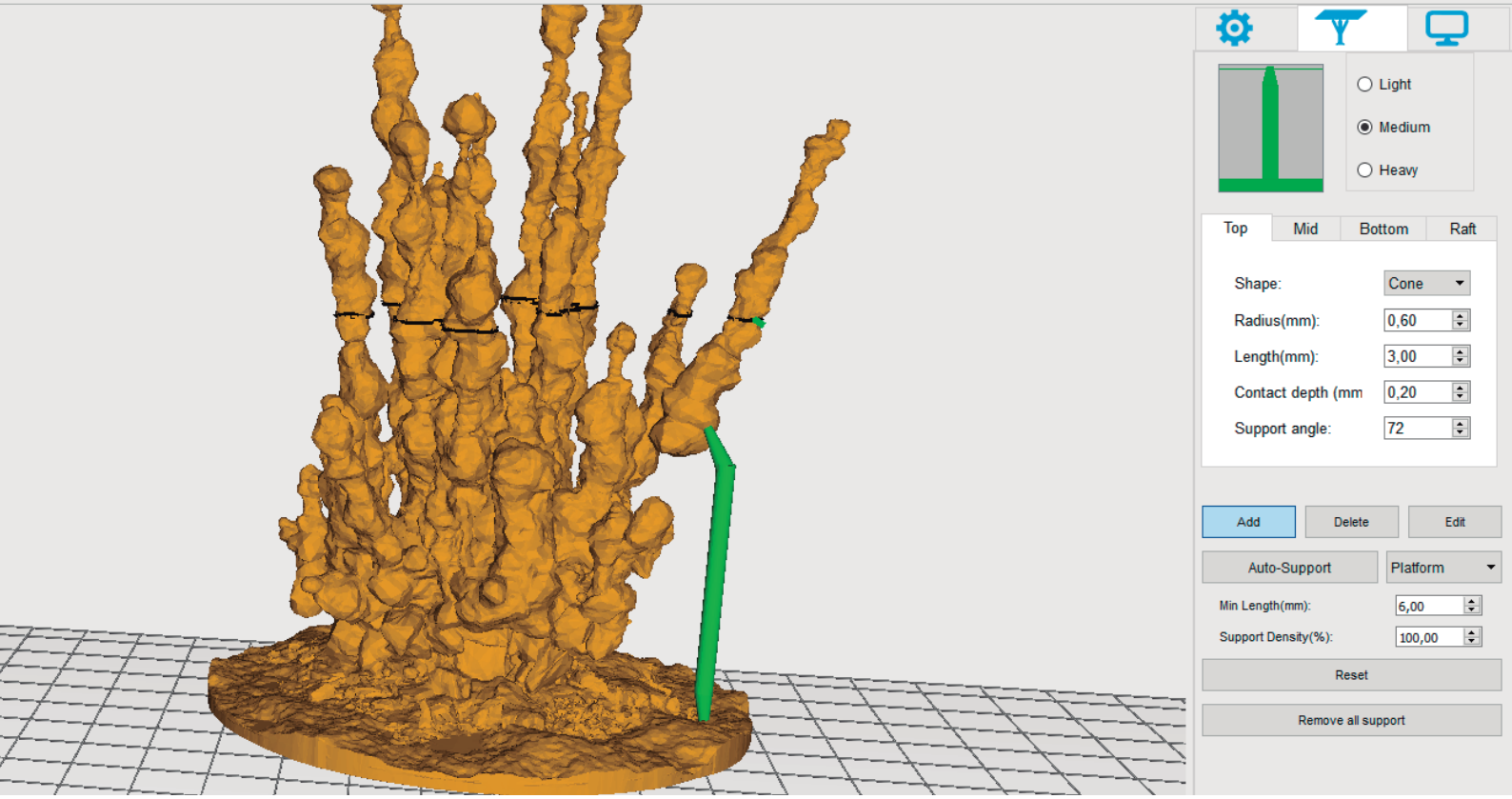
The tree supports have big advantages, It use less of filament that the traditional supports and only place in areas that really need support. Its ease of removal and for certain pieces have to be your favorite choice.






## Custom Supports

If a piece is really hard to print, you can always generate the support manualy with cura, mesh-mixer or the Anycubic software itself. Many times the automatic generation of supports leave parts that will not print correctly.

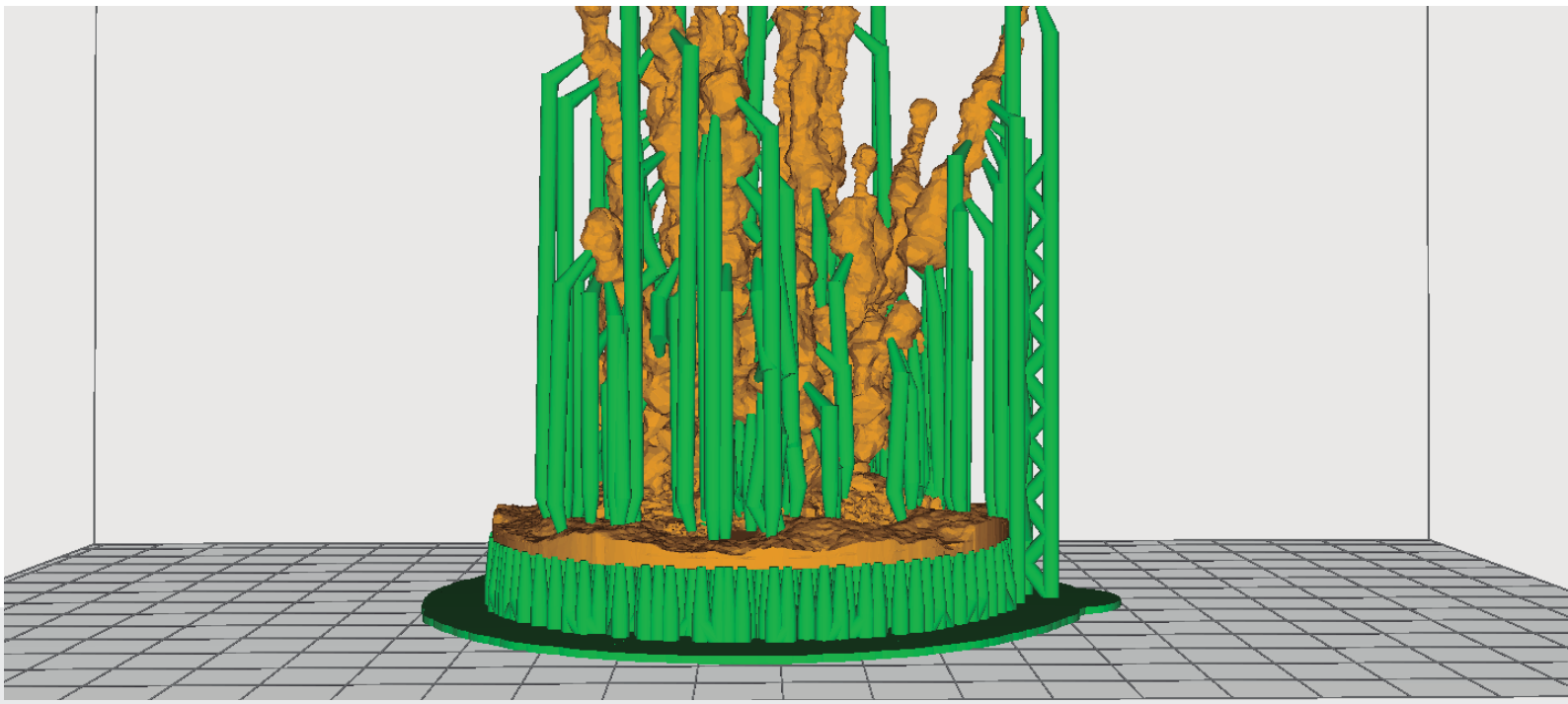



## Ribs Supports

We make this one with the software included with the Anycubic Photon. These are not as good as the ones you do with mexmixer, but they generally work quite well.

You can also generate them manually, but take care! Sometimes is better to use auto suppert, delete a few and create specific ones by hand.
Automatic generation generate a lot of supports. You can change that with support density tab.

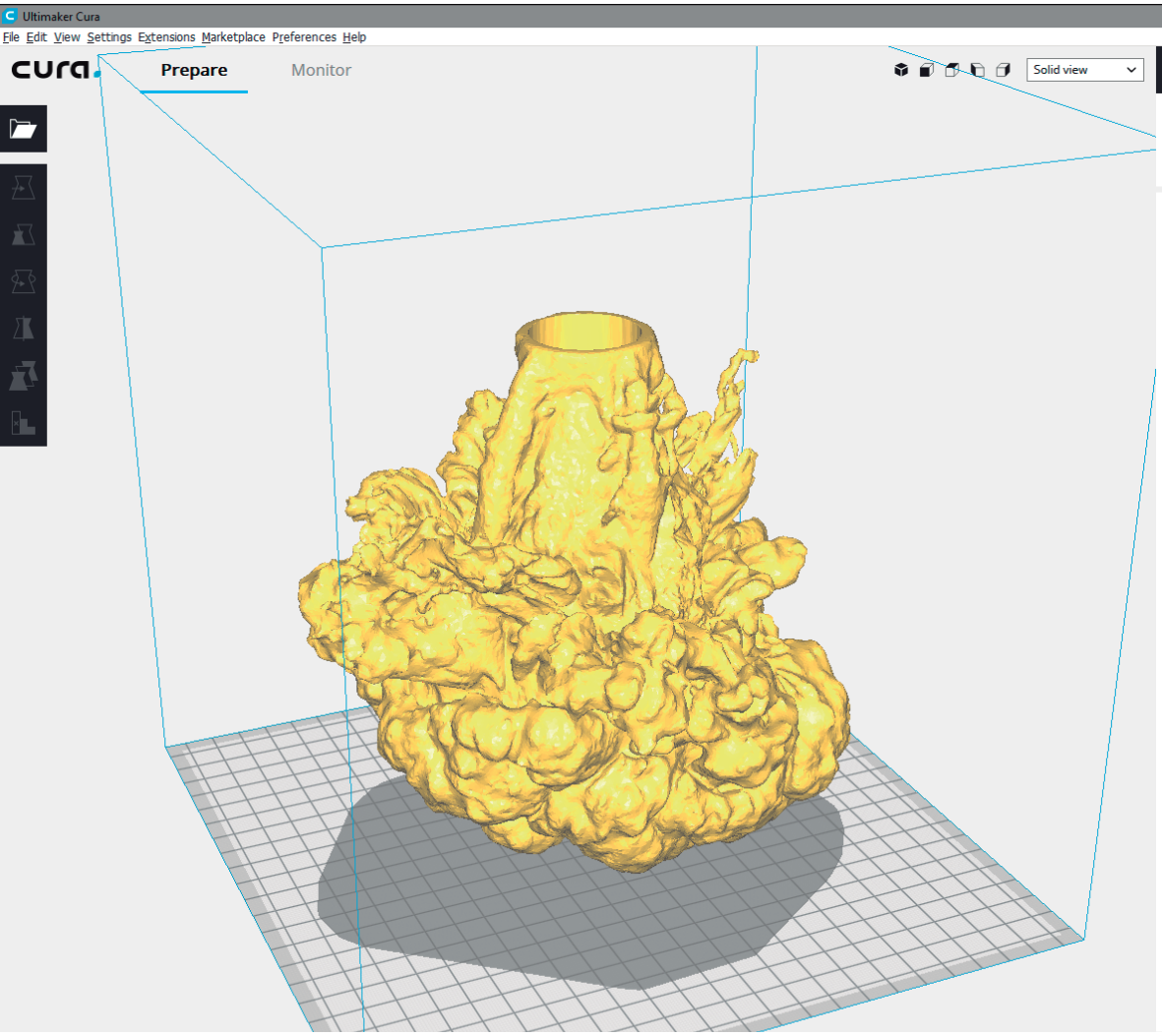
To facilitate the removal of resin supports, they must be removed before solidifying the resin with UV or solar light.



## Case Study

## Epic Explosion - BattleFX_E_1_Explosion.stl

This giant explosion is one of the stars of the Kickstarter. Because of its size and complexity, we are going to study it:




We are going to place it face up. The scale is adjusted to fit a 34mm candle as the attached image.

In this case we do not want infill in the explosion. We want it to be hollow so that light can affect the interior easily.

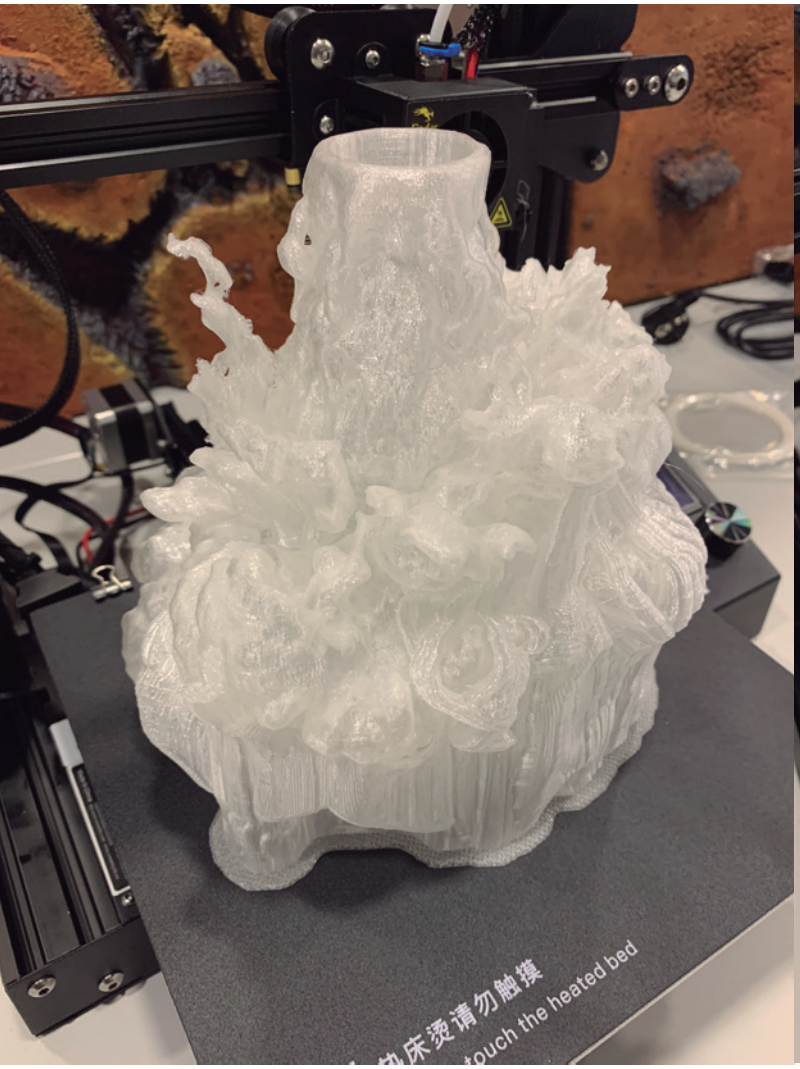
Ideally, use transparent or white filament.

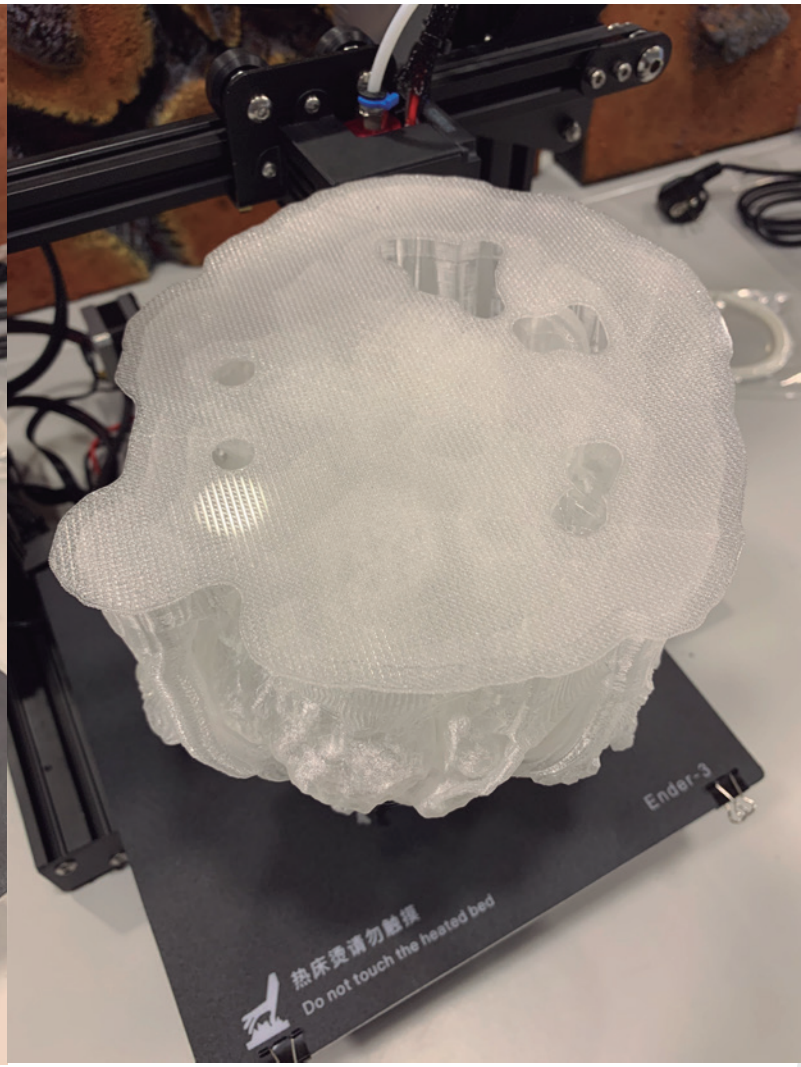


For this type of printing an FDM printer is needed for these huge sizes. Of course, it is scalable like every .STL file and you can make smaller resin printed explosion.

We are going to use a 0.4 nozzle, high printing speed and no filling. Still, it's the longest printing in the bundle.

We will use experimental tree supports. We want the epic explosion to be as adhered as possible to the bed, for that reason we will add lacquer and we will use "raft" in the "Build plate adhesion" section. It is a very big print and we have to use all our weapons!




After more than 2 days of printing, we have our explosion ready to be cleaned.
If you have had problems with threads, remember the fire is your friend.
If you have left some holes for not having "infill", it is easily fixable with putty.
It is better to fix some small flaw than to double the printing time!

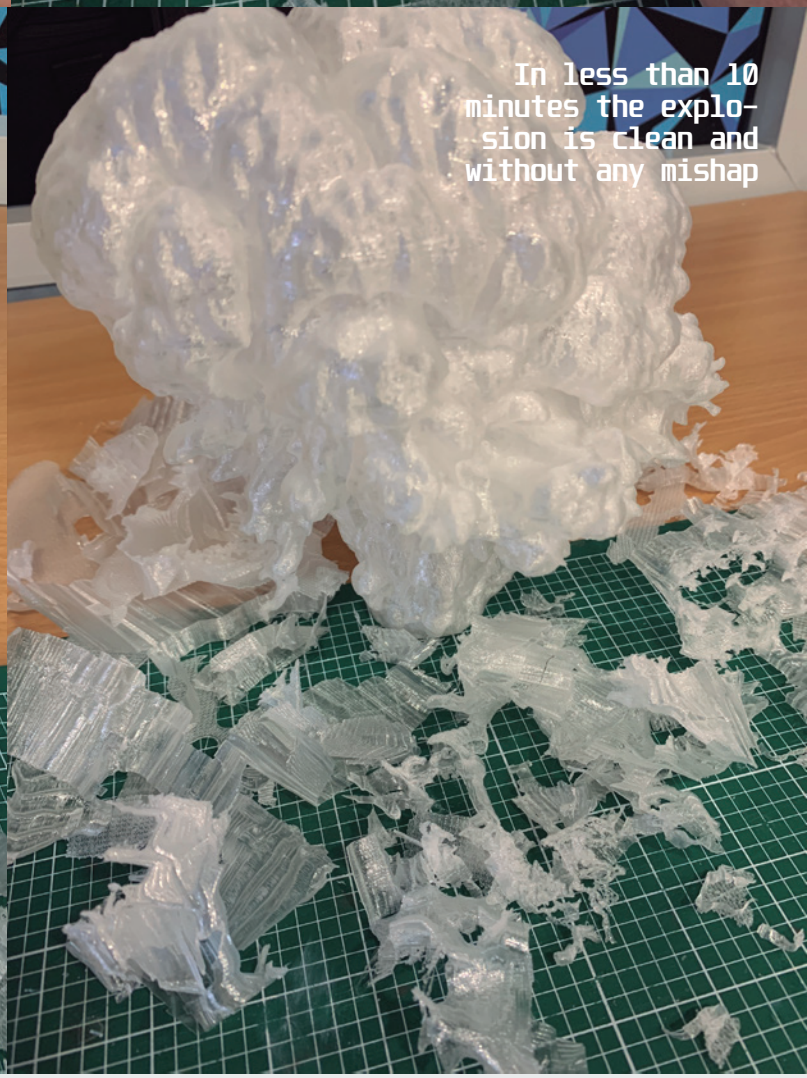
Do not be afraid, with pliers and some patience will go very well! Let's go to mess!



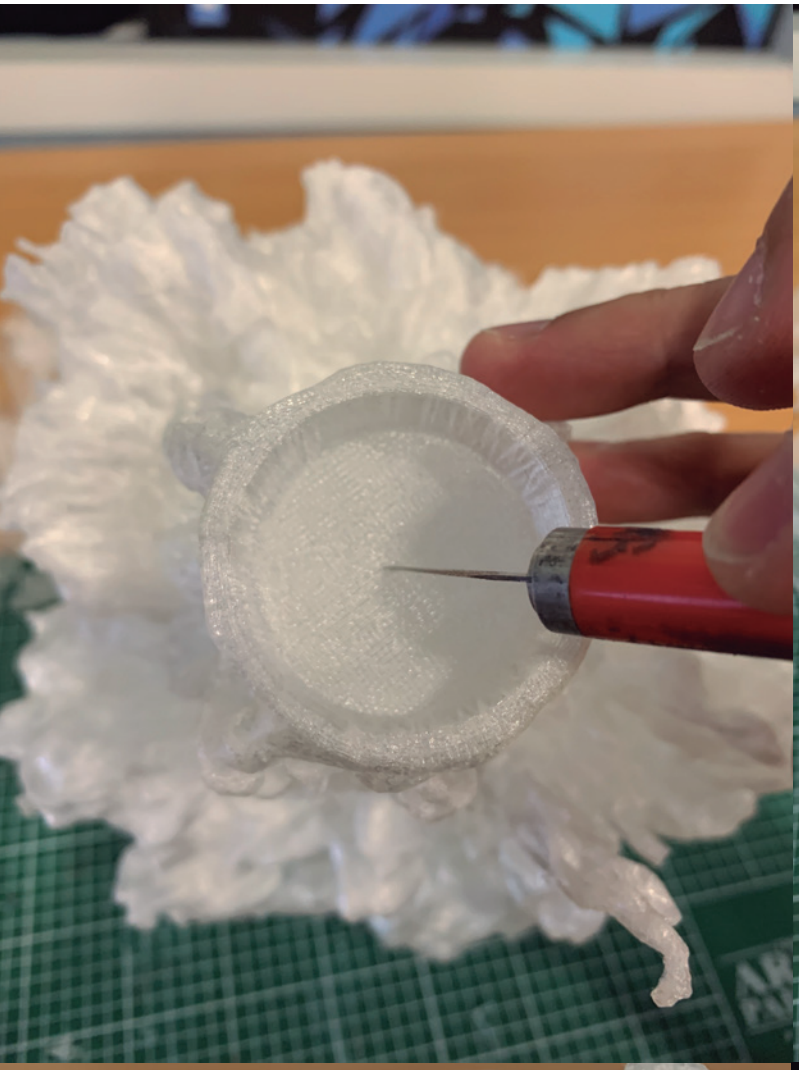


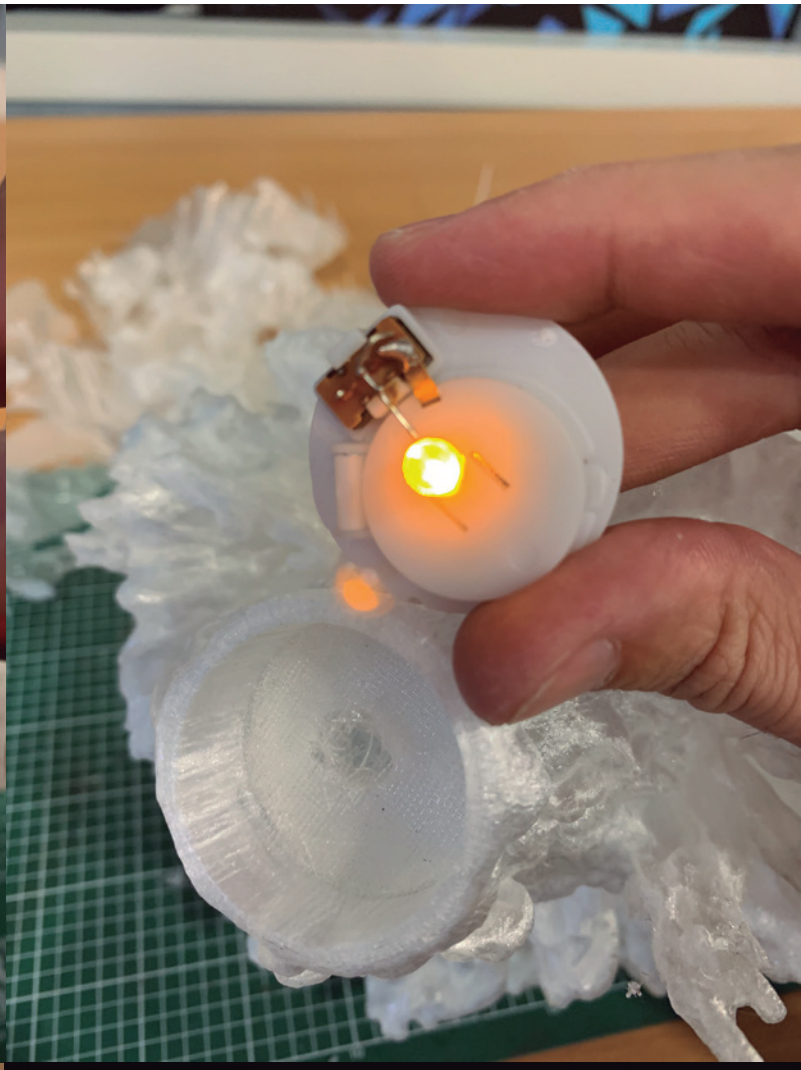
Use your hands! The 80% have been removed with my hands





In less than 10 minutes the explosion is clean and without any mishap









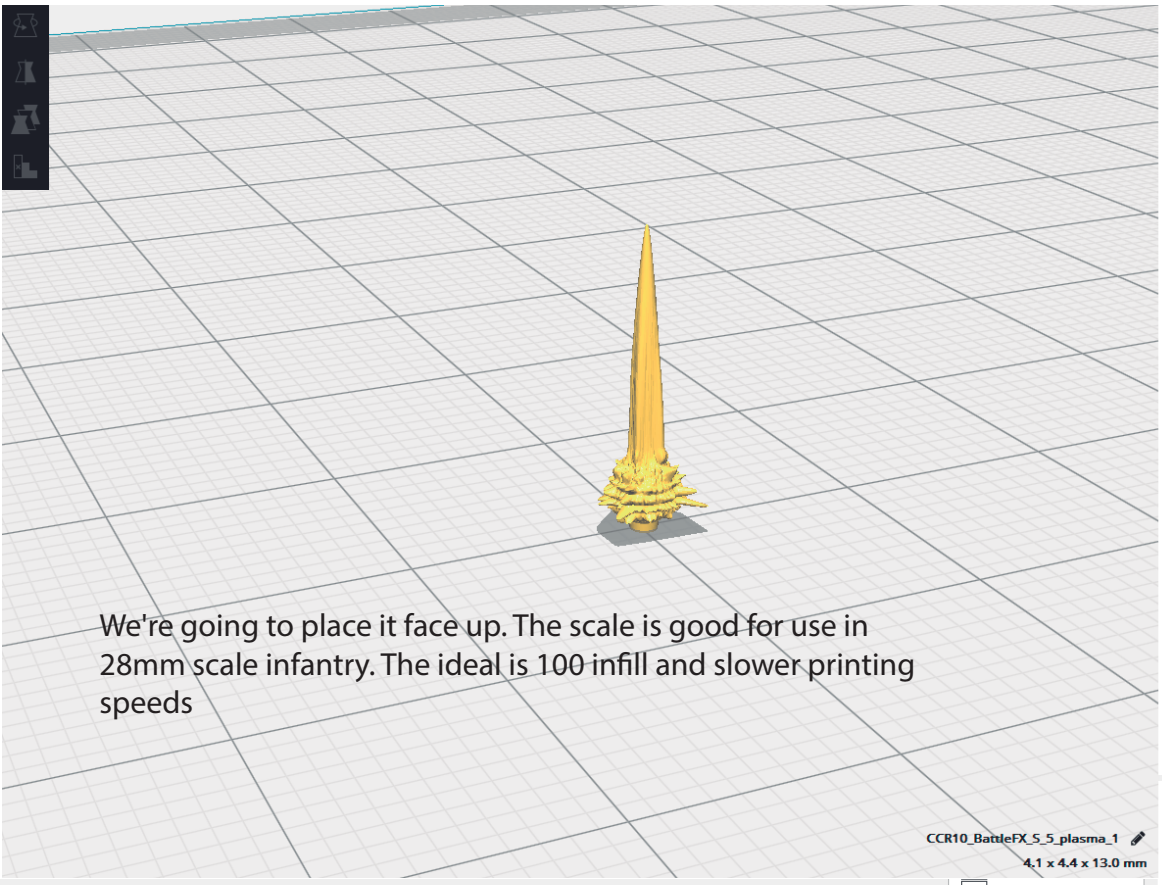


Check out our blog for the painting sesions of the explosion

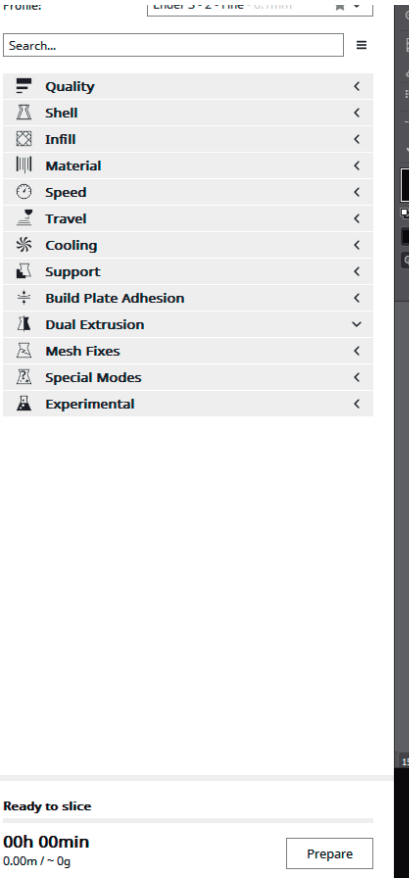
## Case Study

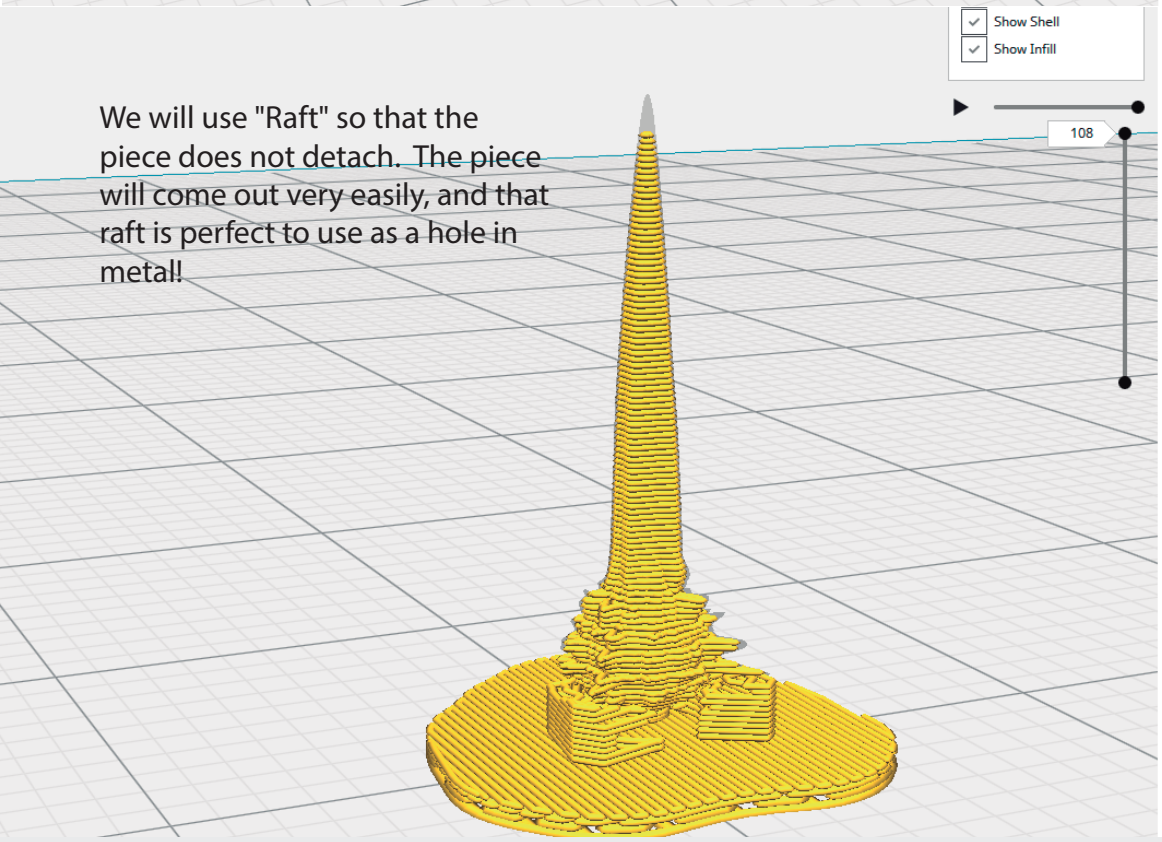
## Plasma - BattleFX_S_5_plasma_1.stl

This plasma shot has great detail and is perfect to see the quality we can achieve with our printers. My recommendation: 0.2 nozzle or resin printer.

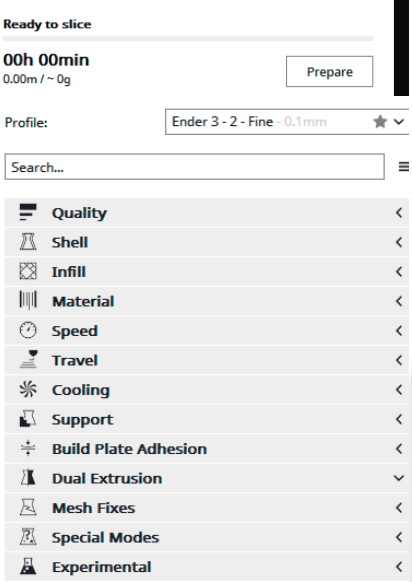



We're going to place it face up. The scale is good for use in 28mm scale infantry. The ideal is 100 infill and slower printing speeds




We will use "Raft" so that the piece does not detach. The piece will come out very easily, and that raft is perfect to use as a hole in metal!

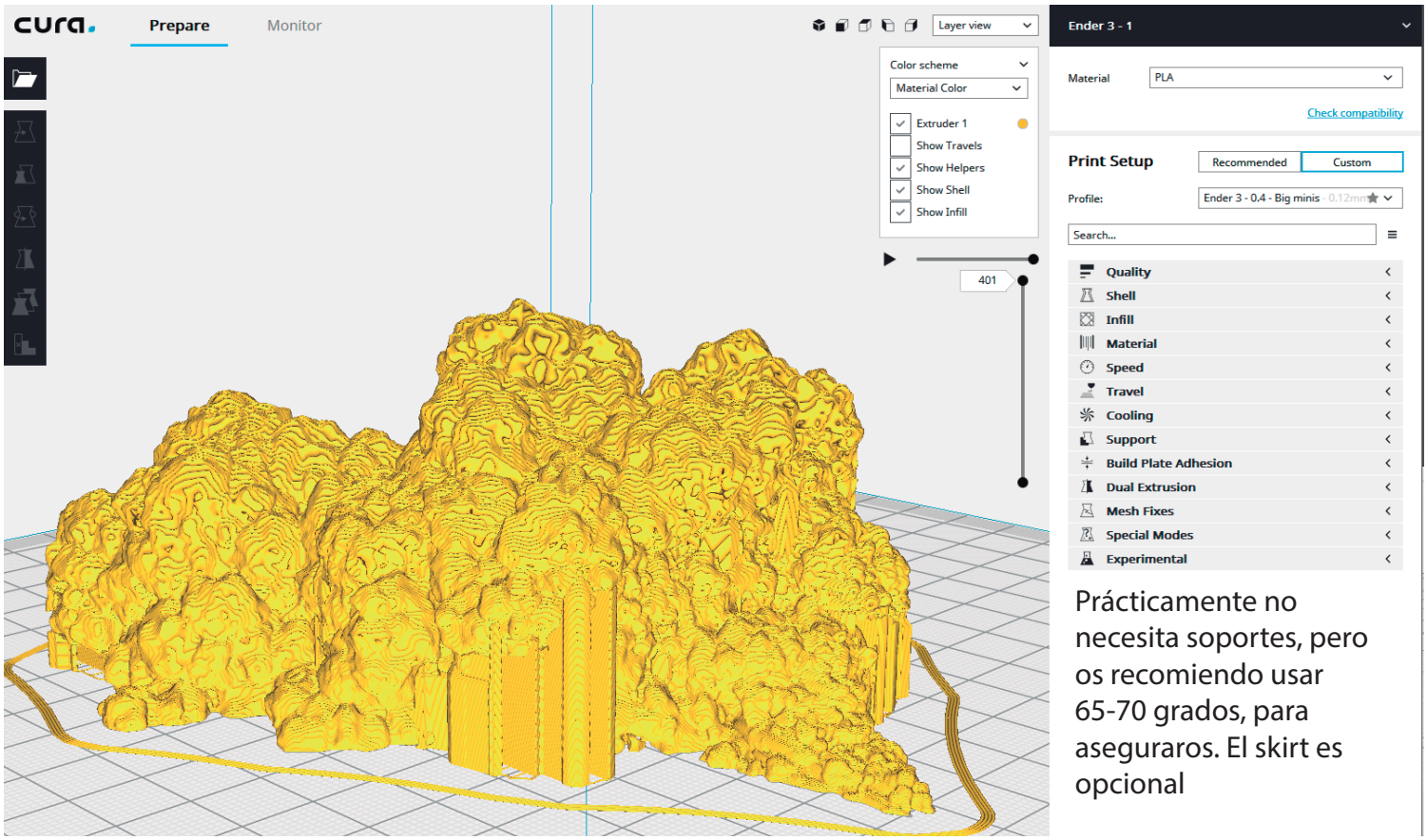



The long and detailed gun flashes can be printed perfectly like this one.

## Case Study

### Evolved Smoke Grenade - BattleFX_L_6_SmokeGrenadeEvolve.stl

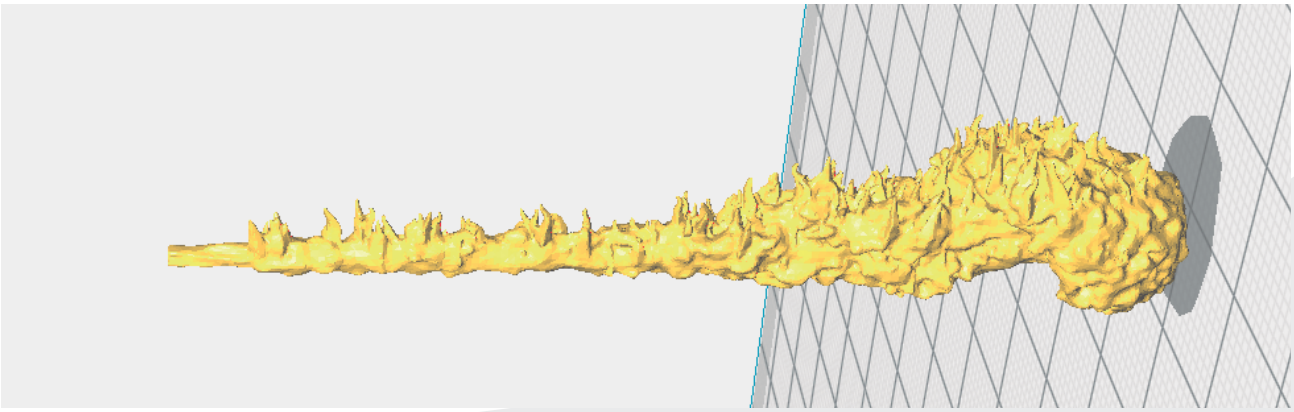
This grenade is one of those pleasant and easy to printable effects. For this type of effects I recommend using a 0.4 nozzle, high printing speeds and low fill (5-10%).

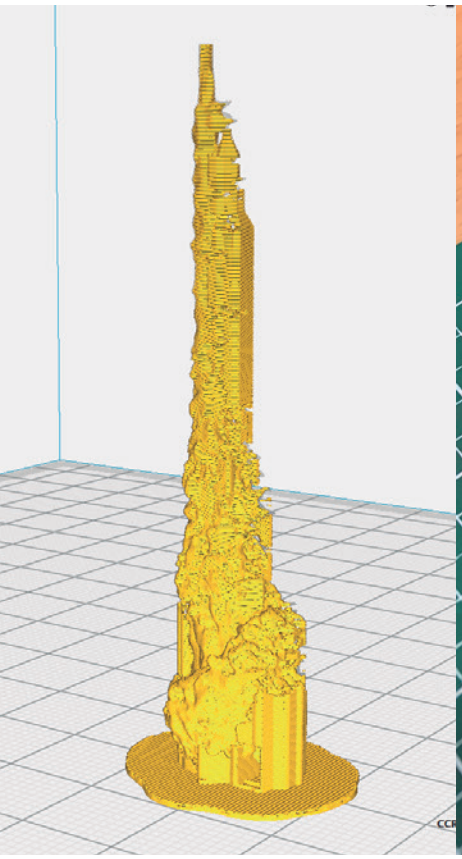


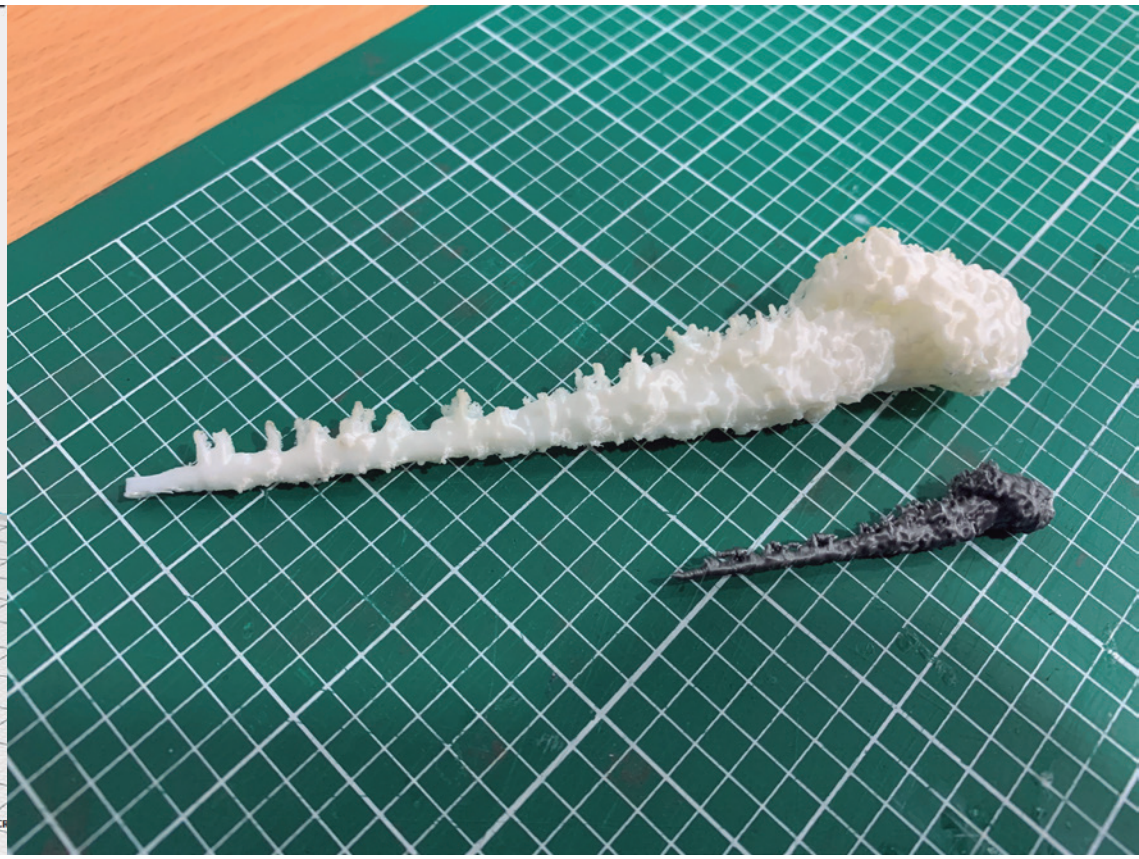

Prácticamente no necesita soportes, pero os recomiendo usar 65-70 grados, para aseguraros. El skirt es opcional

### Flamer- BattleFX_M_1_flametower.stl

One of our favorites! This flamethrower has infinite details, perfect for printing with FDM 0.4 nozzle (8 cm or more), 0.2 nozzle(8cm or less) or in resin!
We put it vertically, add a raft and supports to avoid problems during printing. As always, the smaller the more filling!

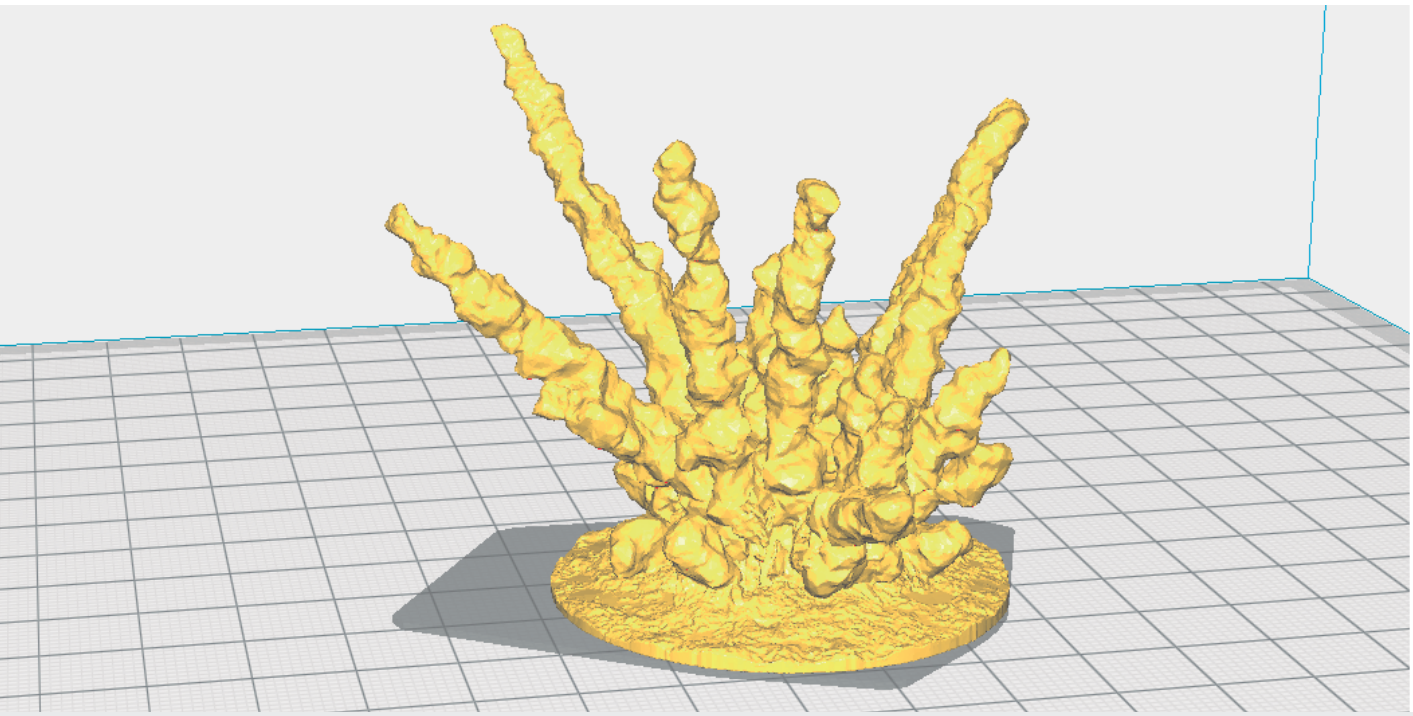




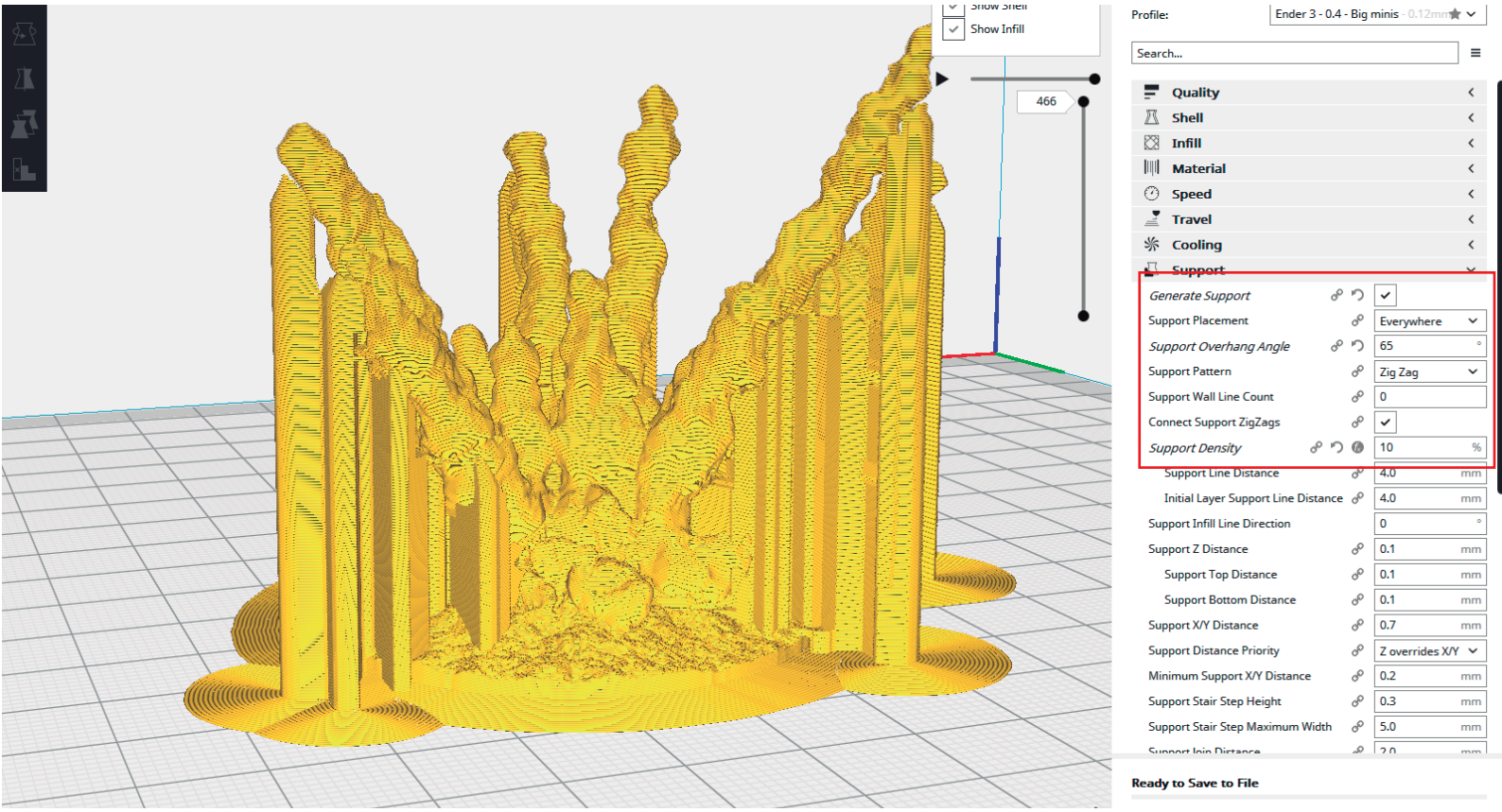


## Ground explosion - BattleFX_L_1_groundexplosion.stl

This explosion has many uses and possibilities. From an explosion or attack, until the ground explode in tons of pieces. This type of effects are what help us generate a more cinematic aspect to our battlefields. With FDM use a 0.4 nozzle for 3cm or more (X axis), 0.2 nozzle (3cm or less) or in resin of course!
We have left in a position that we believe in the best for supports. Let's go to the slicer and prepare the supports!



## Case Study

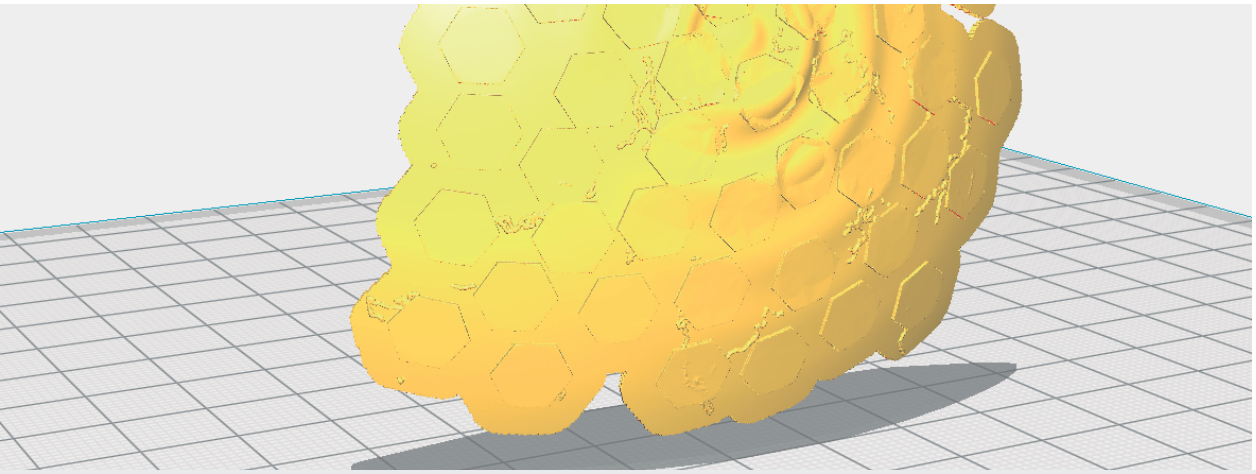



The supports are in the outside, low density and a high overhang angle that create a very easy to remove supports. If you print with 0.2 nozzle the support will fall practically alone. We continue to recommend layer heights 0.12 for Ender 3, we only change to layer heights less or higher if we want something very special.

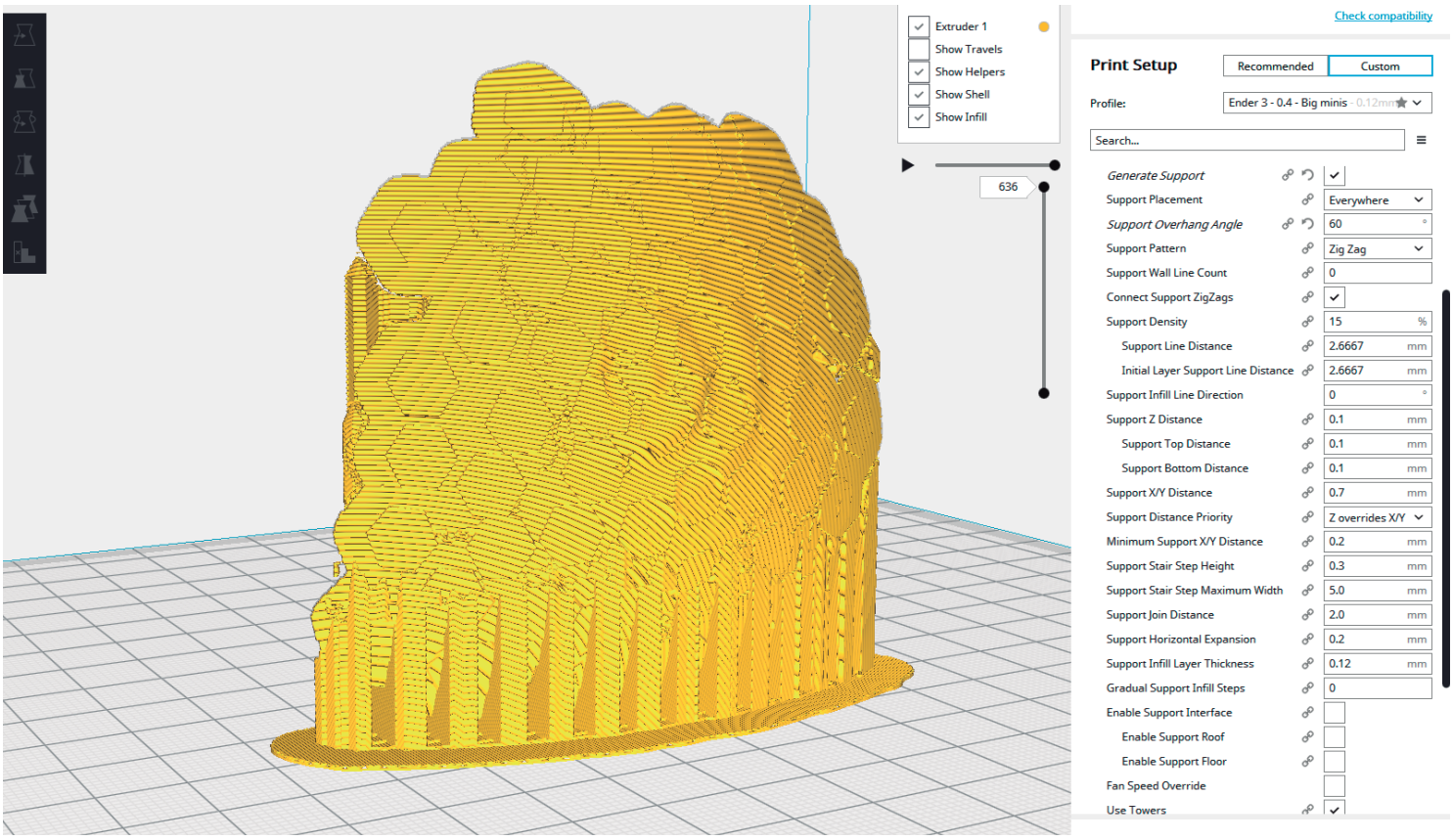
### Force field - BattleFX_M_7_Forcefield.stl

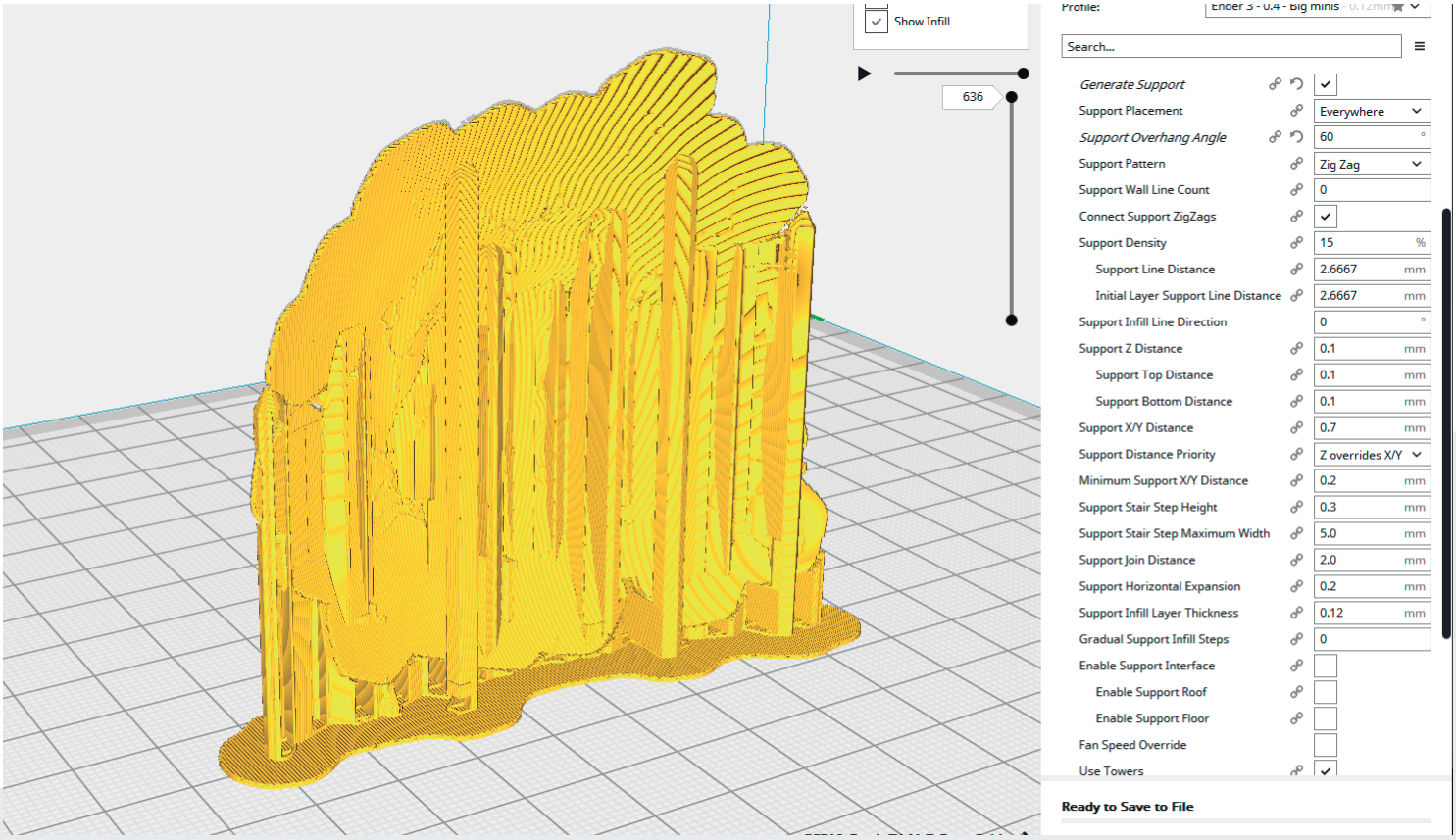
This is one of the complicated effects of printing without using a crazy amount of supports. The best way we have found is to do it vertically and with a bit of backward angulation. Depending on the size we recommend larger or smaller nozzles, or different resin layer height.

This effect looks cooler with transparent filament, but of course the best looking is with translucent colored resin. The level of detail and transparency we achieve with the resin in this force shield is impressive.



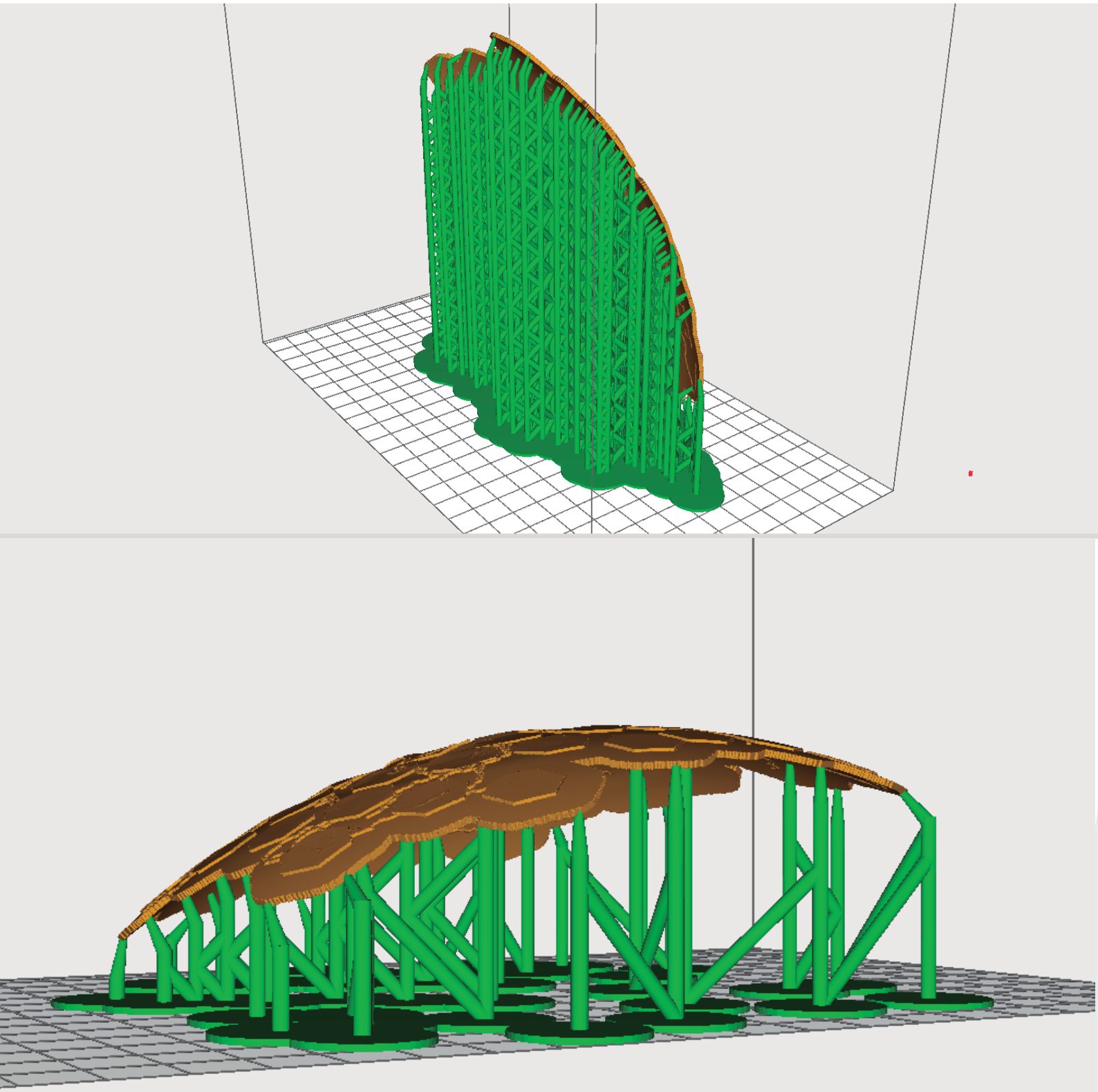
t is recommended to use a raft, so the print will be really good fixed to the bed.



## Case Study

In the case of resin printing, it depends a lot on the size of the resin printer. In our case, if we want to make it big, we suffer from many supports. Remember to remove the supports before hitting them with sunlight or UV light. We don´t have any problem with an small shield.

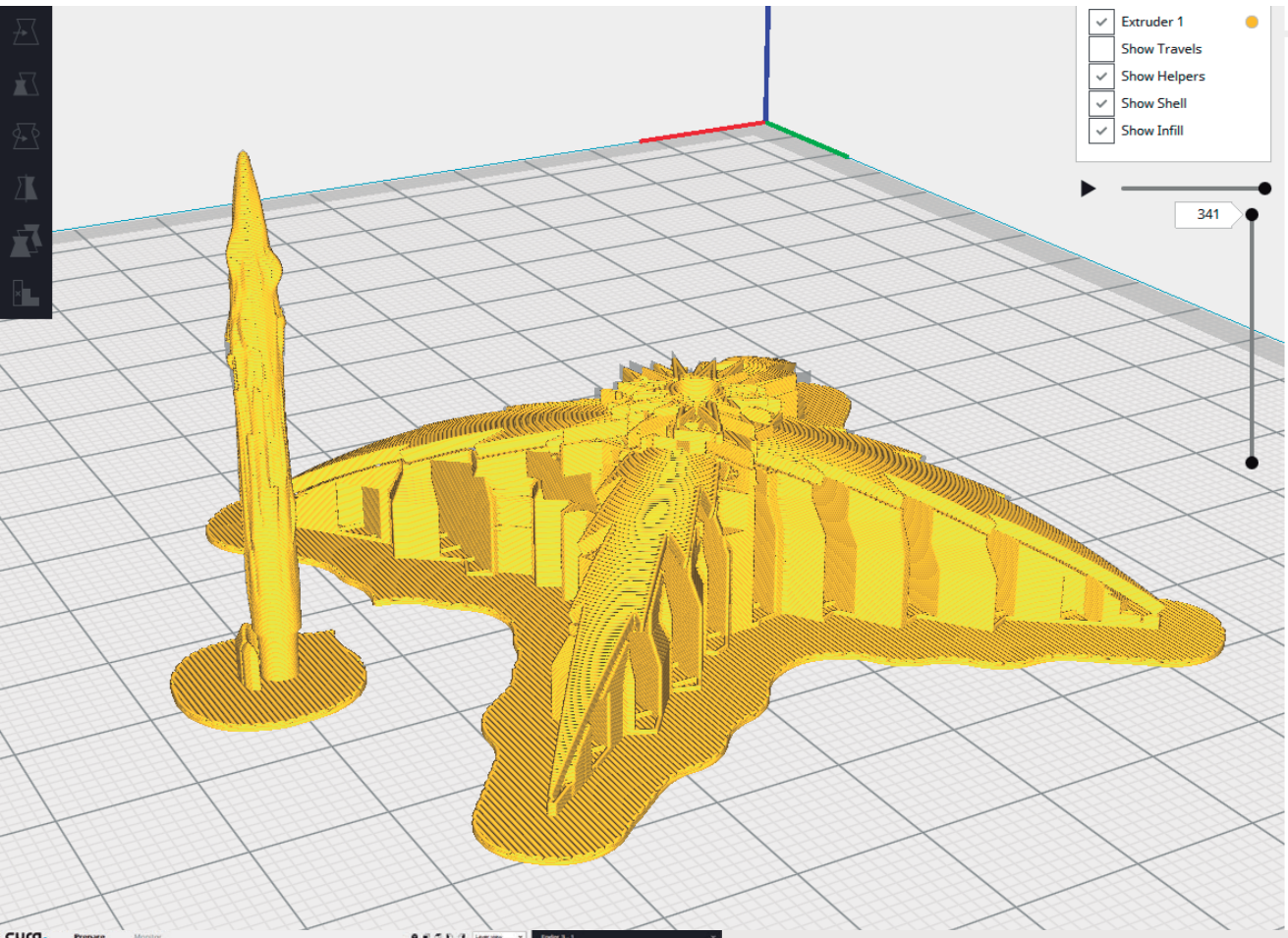


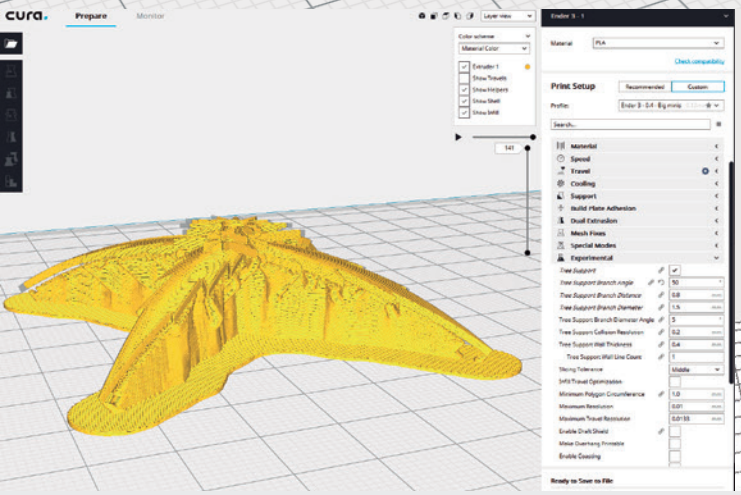
## Case Study

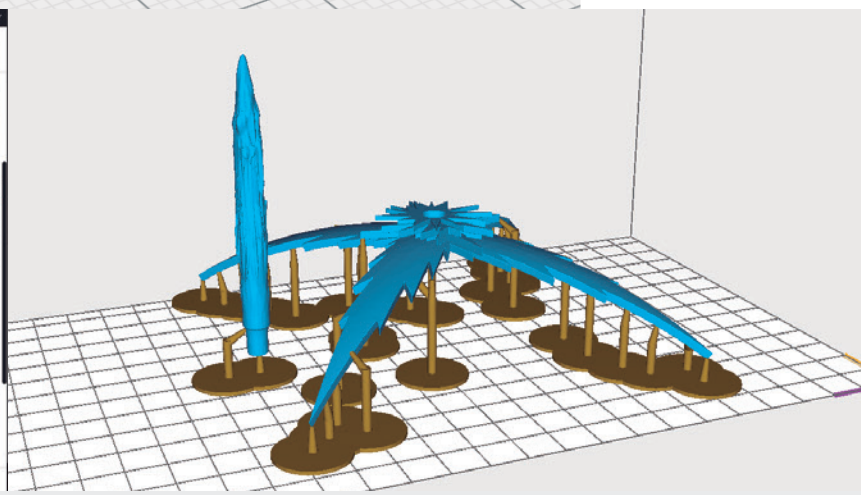
### Sci fi complex blast - BattleFX_M_12_blastcomplex_1.stl y Battle-FX_M_12_blastcomplex_2.stl

A slightly more stylized shot, perfect for sci-fi games. Fully scalable and usable in small or large minis !. We decided to divide this effect by 2 for ease of printing. The 2 pieces fit perfectly, all you have to do is glue them.

As always with vertical pieces, we will use raft, and in this case try to have 100% fill to give strength to the most fine parts of the object. For the largest part of the effect you can use tower or tree supports. The problem with this piece is its curvature. It is likely that you have some "lines" more visible than normal. It is easy to hide in this type of pieces using a bit of putty.



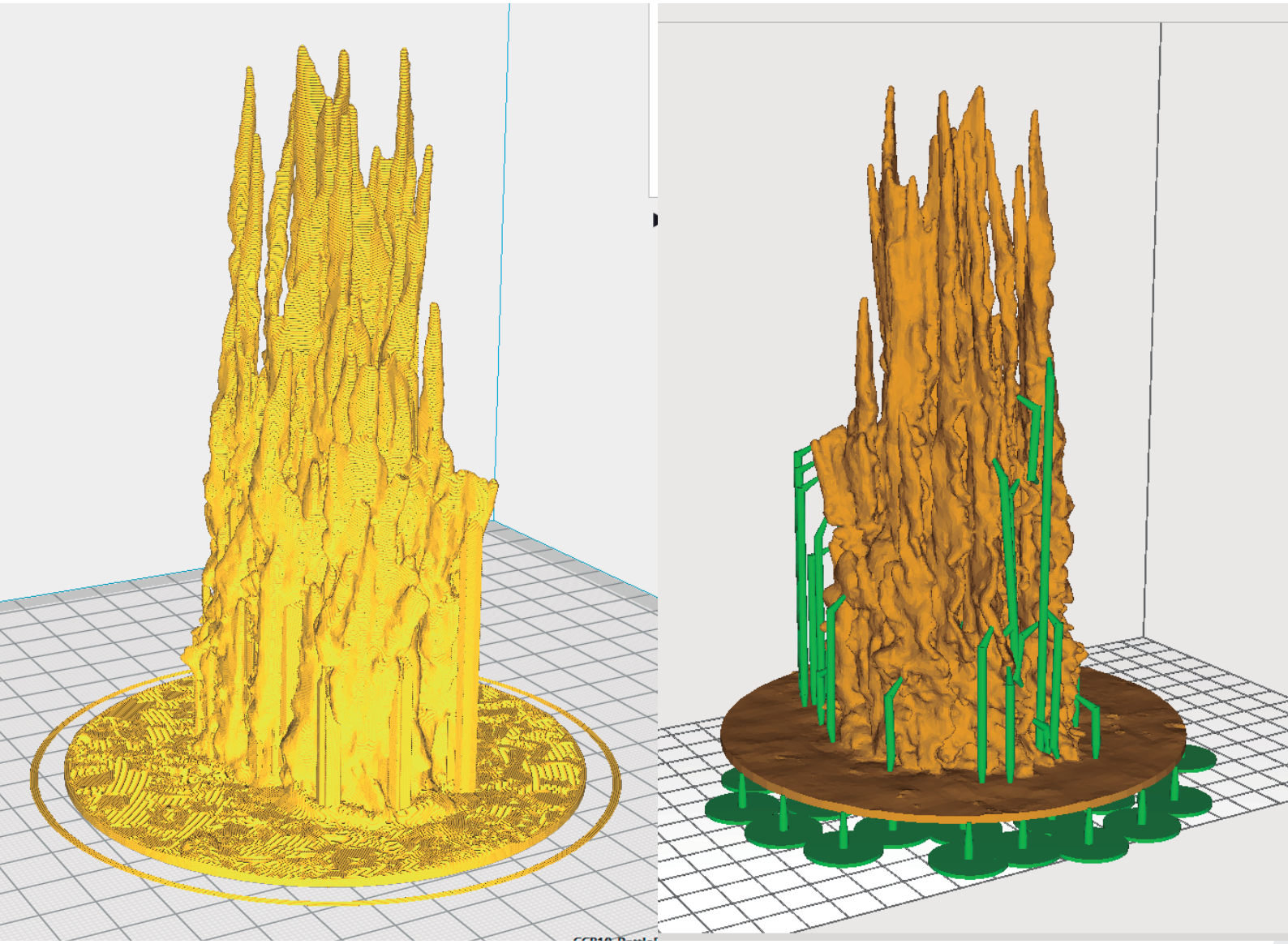



## Case Study

### Water explosion- BattleFX_L_2_waterexplosion.stl

For this FX I reliced a water simulation, and we love how it looks!. You can paint it in many ways to imitate explosions in other places, let your imagination fly!
This is one of the effects that are very scalable, easy to print and almost without supports.



With this effect we dont't have to be conservative with filling or supports. A filling of 5-10% is more than enough and will help us to have more transparency if we print it with transparent filament. If you want more print quality remember that we can always add "Wall Line Count". With 3 walls it works very well with the nozzle 0.4 and the giant printed effect!

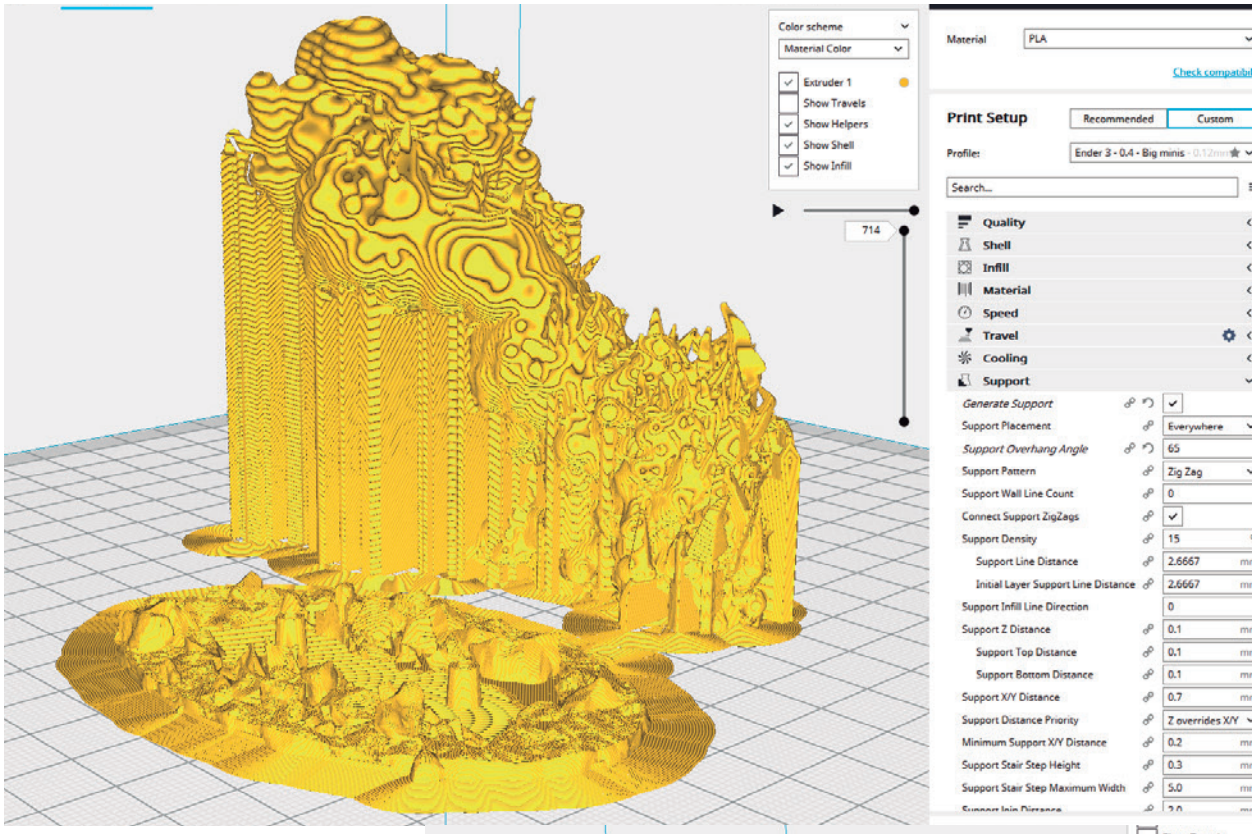
In resin the same thing happens to us, almost does not need support. The look that gives the transparent resin will help you create an incredible effect.

Why do not you try painting it like ice? Using imagination in painting will give your BattleFX bundle even more possibilities. We are looking forward to seeing your creations.

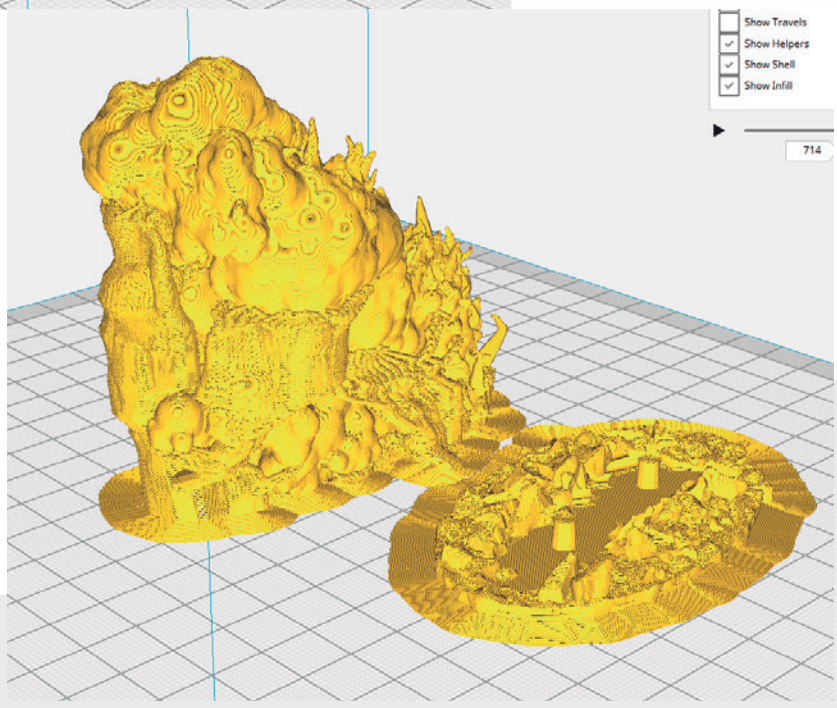
## Fire after the disaster - BattleFX_L_3_Firefloor_1.stl y Battle-FX_L_3_Firefloor_2.stl

This is one of the most usable in game and as scenography. Put it on top of a damaged tank or leave it where our beloved unit died!

This piece has been divided into 2 for ease of print. We also plan to add different bases to better adapt it to different games and tables. We recommend printing separately. Add more infill to this piece to add resistance to the small flames. 15-20% fill would be perfect. If you add more "Wall lines" they will be even stronger.




We have checked with the supports on the tree and we have obtained a faster impression and it is easier to remove the supports. It is always a good option if you want to save filament and printing time!



## Magnetize

### Adding FX to our miniatures gives it a spectacular look, but it can be bad in a competitive match.

We are printing with filament or resin so we are in the same situation as any other plastic figure in the market. We always have the option to glue the effect, but it is always good to have the ability to remove it and we do not want to. Magnetize is a cheap and easy option. Glue a magnets and you have it!



## Painting

Our way of working is like any figure. We give a primer coat of the color we want and use acrylic paints. In our blog: deadlyprintstudio.com/blog You could find me (Juan) painting some of our effects.

## Something more Deadly Print Studio?

We are working hard in several aspects:

1 - Print farm
2 - Twitch Channel: In this we will have good time painting, designing or killing your doubts!
3 - Sell printed products
4 - Our next Kickstarter (ahem ... Fantasy ... ahem)