

Helpful Links

<https://www.tinkercad.com> - online, free 3D modeling program

<https://www.youtube.com/watch?v=sh4o9k599pQ> - Basic operations in Tinkercad

<https://www.thingiverse.com/> - open source library of downloadable 3D models

<http://www.briarpress.org/45913> - Some notes on troubleshooting 3D Type in a Letterpress

<https://www.printmypart.co.uk/single-post/2017/11/16/3D-Printing-Letterpress-Printing-Blocks> - More experiments with 3D Type in a Letterpress (the file formats discussed here are different than ones applicable to our machines)

Adobe Illustrator and Tinkercad : 2D to 3D

What is an SVG? A Scalable Vector Graphics file uses encoded information to create 2D graphics. SVG files do not lose any quality if they are scaled up or down. Files are marked with a .svg tag.

The Illustrator to 3D Modeling conversion when dealing with text / type is easiest and most foolproof when using a sans-serif font and working with a larger text size. From Illustrator, SVG export settings matter, as the encoding of the SVG file is what Tinkercad and other programs reference in the conversion process that makes your type into a 3D object. If you have a bunch of complex paths or type with fiddly / loopy edges, you may have to play around with the paths AND the export settings in Illustrator to get an accurate 2D to 3D extrusion result in Tinkercad.

Quick Overview of Illustrator Text to Paths Process

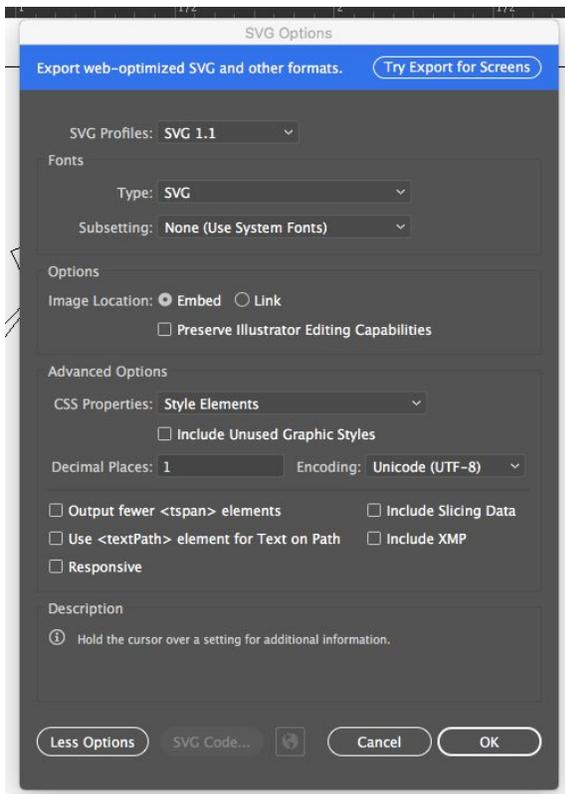
1. Create your text using the Type Tool (the "T" icon in the tools panel on the left side of your screen). Typesetting (**Window > Type > Character** and/or **Paragraph**) should happen at this point in the process, as any text blocks you export as one SVG file will import as one solid object into Tinkercad.
2. When you are finished, select the text box (black arrow tool in the tools panel on your left). Go to **Object > Expand** to turn your finished text into a solid shape with paths outlined. Once you do this, your text will no longer be able to be edited, as your letters will be solid shapes instead of active text in a text box.
3. If your text needs altering or your paths need cleaning up after they have been expanded, select your text and go to **Object > Path**. Under this menu heading **Simplify** will give you a menu to help simplify your path structure if it is too messy or complex. **Clean Up** will identify and clean up stray bits of information. **Offset Path** will expand or retract the borders of your existing set of paths, making the letterforms thicker or thinner. Heresy, I know.

4. Choose one of the methods below to export / save an SVG from Illustrator. If you have multiple artboards in a file, make sure you are indicating the artboard you wish to save / export at the bottom of the first menu you will encounter after choosing one of these options.

File > Export > Export As > SVG



File > Save As > SVG



The **Decimal** menu option in both export / save SVG panels specifies the degree of precision of vector placement in the output artwork. A higher number of decimal places results in a more complex and precise image, but as you will see in the example on the next page, with SVG text imported into Tinkercad a higher number of decimals can also render an overly complex object and distort the type object.

After double-checking your path structure in Illustrator, this is the first menu setting you should tinker with if your SVG appears distorted upon import into Tinkercad.

Example Tinkercad SVG Import Results With A Script Font

Original Object, Paths in Illustrator

Texture

Tinkercad Result



Illustrator SVG Export Settings

File > Export > Export As

SVG Options Menu Settings

Font: SVG

Decimal: 2

File > Export > Export As

SVG Options Menu Settings

Font: SVG

Decimal: 0

File > Save As > SVG

SVG Options Menu Settings

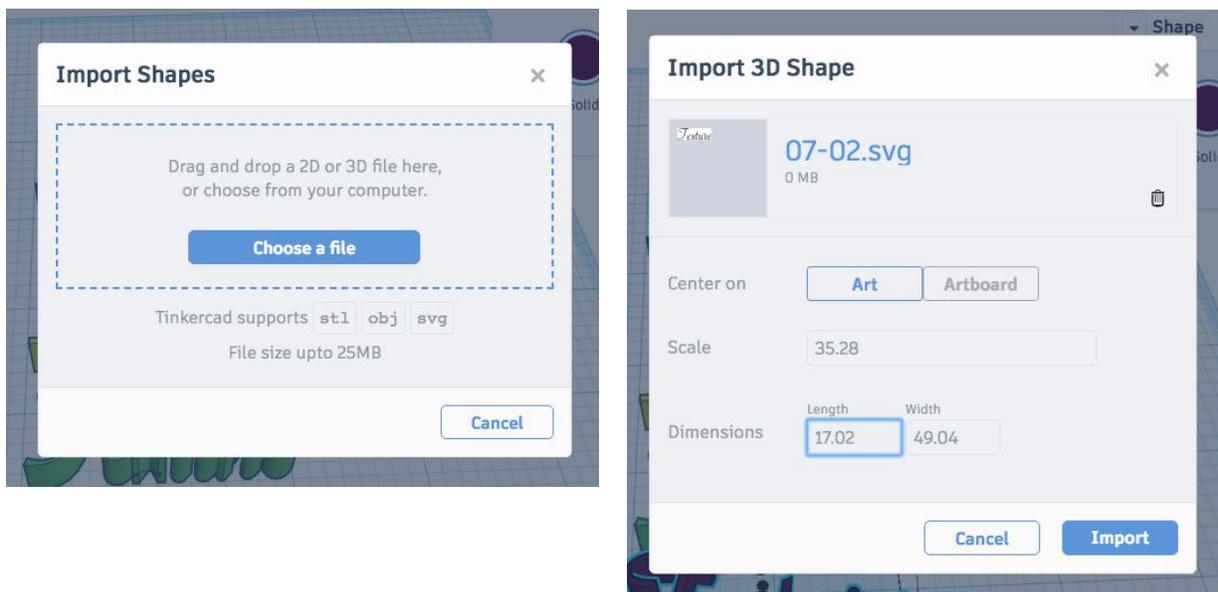
Font: SVG

Decimal: 1

Tinkercad Import Process

1. In your Project Build Space, click the **Import** button in the upper right corner.
2. Click on **Choose a File** or drag your file into the dotted space. Find your SVG file and hit **Open**.
3. Set the **Center on** and **Scale** settings in the **Import 3D Shape** menu and hit **Import**.
4. Depending on the size of your file it may take a moment to process, but your SVG file should pop up as a 3D object in the center of your Build Space.

Tinkercad Import Menu Settings



If you are looking for a direct scale translation from Illustrator (i.e. you want your type to be the same size it was in Illustrator upon import into Tinkercad) make sure to:

1. Center on **Art**, not the Artboard.
2. **Scale** your text to **35.28%**

Illustrator encodes saved files using points as the native measurement, not mm or inches. Tinkercad and other 3D modeling programs use mm/inches as their native measurement. Ergo, if you are importing an SVG file with a character that is 72 **pt**, Tinkercad will convert that into its native measurement system and give you a character that is 72 **mm**; much larger than originally intended. There are .3528 mm per point, so resizing your SVG to be 35.28% of the detected size in Tinkercad will give you a size-accurate object upon import.

3D Printer Info Sheet

DaVinci XYZ

Print turnaround time with CTS 7+ days

Pricing \$1 per 40g of PLA / ABS

Build Space 5 x 5 x 5"

Extruder Nozzle Width 0.4 mm

PLA - Polylactic Acid (cornstarch and sugarcane), easy to work with, smooth finish when sanded / painted. Less toxic as it is made of organic material, but prone to melting and warping in high heat situations, as it has a lower melting point.

ABS - Oil-based plastic, strong and durable with a higher melting point (requires a printer with a heated print bed). Often harder to sand / finish if there are irregularities in the print. Used for product / professional applications because of its durability.

Formlabs Form 2

Print turnaround time with CTS 7+ days

Pricing \$1 per 4 ml of Resin

Build Space 5 x 5 x 6.9"

Laser Spot Width .0055 mm

Photopolymer Resin - Light activated resin, hardens and cures under UV light. Smooth finish, high detail and good durability. Prints take a little longer to process as they need an alcohol bath and 3-24 hours under a UV light to remove excess Resin (it's toxic) and be fully cured (hardened).

We have both **Standard** Resins and a **Tough** Resin that has more strength and flexibility than the standard formula.

Sending Files and Scheduling 3D Printing Time With CTS

Before booking your appointment, double check your file.

1. Check the size of the model. Max printable area:
 - a. DaVinci, 5" x 5" x 5"
 - b. Formlabs, 5" x 5" x 6.9"
2. Check for holes in the mesh, or parts that have not been completely joined.
3. Plan to book your printing session at least 7 days in advance.

Step 1 : Book An Appointment

Go to this [Google Calendar](https://bitly.com/2glH39b) (copy link: bitly.com/2glH39b) to schedule a block of time on whichever printer you would like to use to print your model. Again, **schedule at least 7 days in advance.**

On the Google Calendar, select an available block of time for the printer you would like to use. There are 3 different printers you can select:

1. Davinci 1 (PLA/ABS)
2. Davinci 2 (PLA/ABS)
3. Form2 (SLA - Resin)

Click on an available time block to book your appointment. **Title the appointment with your name, leave the other areas blank.** If you would like to attend the printing session or have special concerns or needs regarding the 3D print, please detail those in your follow up email to CTS , which is explained below.

Step 2 : Send Your Files

After booking your appointment, email your file to CTS@montserrat.edu **seven days before your scheduled appointment** so model integrity can be checked and errors resolved if necessary. In the email include:

1. **An STL and OBJ file for printing.** Both types are preferred; at minimum an STL file is required.
2. **Type of material (PLA, ABS or SLA-Resin) and color choice.** There is an info sheet about both printers and related materials in Knowlton, or CTS can help you with this choice, just ask in the email if you are unsure.
3. **The size of the final piece (W x H x D).**

continued on reverse

After you email your files and relevant info, CTS will alert you if there are any issues with your file submission within a couple of business days. If your file requires fixes, you may keep your original printing time slot if you can fix and re-submit the file to CTS by your scheduled day and time. If not, you will be rescheduled into the next available time slot after your fixed file is re-sent.

When your print is completed you will be notified by CTS via email. You will pay for your print upon pickup in the CTS offices, which are on the first floor of the Hardie Building. Payment can be made through your PaperCut account.

Want to learn more?

CTS encourages you to **join us** for the first 15 - 20 minutes of your scheduled printing time. We will show you the process to prepare a file for printing and to send the job. Please include this info in your email if you plan to join us for the print job. Meet us in the CTS offices at your scheduled printing appointment time.

FAQ

How much does a 3D print cost?

The Davinci printers cost \$1 per 40 g of PLA / ABS used to make your print. Average print costs for a larger size print run between \$3 - \$6 depending on your model. The Formlabs printer costs \$1 per 4 ml of resin used to make your print. Average print costs for a larger size print run between \$15-\$30. CTS will be happy to give you an estimate based on the size of your object and what printer you will be using, please contact us with any pricing questions you may have before the day/time of your printing appointment.

What if my print fails or gets messed up during printing? Will you charge me for it?

If a print fails due to machine error, we will print you another version at no cost to you. If this happens during your printing appointment, CTS will notify you via email to discuss a further plan of action and revised printing date.

My printing appointment day / time has passed and I haven't heard anything from CTS. What's going on and where is my print?

Depending on the volume of print jobs we have in the queue, we may be running behind on printing or be fixing an issue with one of the printers. Please stop by the CTS office during business hours or email CTS@montserrat.edu and we will get back to you with an update as soon as we can.