



# ALPINE COUNTY LIBRARY

## 3D PRINTING POLICY

April, 2018

In keeping with our Mission to help people “pursue their educational, cultural and recreational interests, have access to ideas and information, and get help with technology services...” the Alpine County Library strives to offer community access to new and emerging technologies, including 3D printers. This policy establishes guidelines governing the public use of 3D printers in the Markleeville and Bear Valley Libraries. Please read all of the following guidelines and procedures before submitting your print requests. A signed **3D Print Request Form** (below) is required to initiate your print.

### 3D Printing Simplified

A 3D printer is a computer-aided manufacturing (CAM) device that creates three-dimensional objects. Like traditional printers, a 3D printer receives digital data [from a computer or other device] as input. However, instead of printing the output on paper, a 3D printer builds or “prints” a three-dimensional model by heating and laying down a succession of very thin layers of material known as [filament](#).

### Why It Is Important

Personal manufacturing is going to have increasingly profound social impacts, much of them in ways that have yet to be anticipated. The library wants to bring to Alpine the concepts of what 3D printing and personal manufacturing are all about, along with an understanding of the design skills needed to take full advantage of the creative opportunities that are arising. Alpine County has tremendously creative communities and the library is excited to be able to offer access to another avenue for the expression of that creativity.

### What We Have

We offer the Lulzbot Taz 6 and the Lulzbot Mini printers in our libraries. These printers are fused deposition modeling printers which work on an “additive” principle by extruding multiple layers of material to build a 3D object. We also offer a design software ([Tinkercad](#)) and slicer [CURA](#) on the library computers for use by both novices and advanced users.

The following 3D printers are available for patron use:

Markleeville Library: [Lulzbot Taz 6](#)

Specifications:

**Print Surface:** Heated borosilicate glass bed covered with PEI print surface.

**Print Area:** 280 mm x 280 mm x 250 mm (11.02 in x 11.02 in x 9.8 in)

**Print Volume:** 19,600 cm<sup>3</sup> (1,185 in<sup>3</sup>) of usable space

**Tool Head:** v2.1 single head extruder

**Top Print Speed:** 200 mm/sec (7.9 in/sec)

**Average Print Speed:** 30 - 50 mm/sec (1.18 - 1.97in) Using default nGen profile

**Layer Thickness with 0.5 mm nozzle:** 0.050 mm to 0.5 mm (0.002 in - 0.02 in)

**Capable Materials:** ABS, PLA, HIPS, PVA, wood filled filaments, Polyester (Tritan), PETT, bronze, copper, stainless steel-filled filaments, Polycarbonate, Nylon, PETG, conductive PLA and ABS, UV luminescent filaments, PCTPE, PC-ABS, Alloy 910, and more every day.

**Discouraged Materials:** 3D printing with carbon fiber filaments is not recommended at this time because carbon fiber filaments can degrade both the nozzle and hot end of the LulzBot TAZ 6 Tool Head.

**Usable Filament Sizes:** standard 3 mm (0.1 in)

Bear Valley Library: [Lulzbot Mini](#)

Specifications:

**Print Surface:** Heated borosilicate glass bed covered with PEI print surface

**Print Area:** 152 mm x 152 mm x 158 mm (6 in x 6 in x 6.2 in)

**Print Volume:** 3,650 cm<sup>3</sup> (223 in<sup>3</sup>) of usable space

**Tool Head:** v2.1 single head extruder

**Top Print Speed:** 275mm/sec (10.8 in/sec) at 0.18 mm layer height

**Layer Thickness:** From 0.05 mm to 0.50 mm (0.002in - 0.020 in)

**Capable Materials:** ABS, PLA, HIPS, PVA, wood filled filaments, Polyester (Tritan), PETT, bronze and copper filled filaments, Polycarbonate, Nylon, PETG, conductive PLA and ABS, UV luminescent filaments, PCTPE, PC-ABS, Alloy 910, and more every day.

**Discouraged Materials:** 3D printing with carbon fiber filaments is not recommended at this time because carbon fiber filaments can degrade both the nozzle and hot end of the LulzBot Mini Tool Head.

**Usable Filament Sizes:** standard 3 mm (0.1 in)

## Scheduling a Print

Interest in our 3D printer is very strong. Since prints can take several hours, use of the 3D printer must be scheduled at least 48 hours in advance. We will do our best to print your model within 10-14 days, but the Library makes no commitment to being able to produce print submissions in a specific timeframe. Wait times may increase when demand for the printer is high. Additionally, jobs that require printing multiple components may drop in the queue position. Staff will choose the order in which jobs are printed to maximize efficiency and give as many people as possible a chance to obtain a print.

Patrons may supply their own filament for printing as long as the filament is compatible with our devices. We currently accept a variety of 3mm filaments, and use a v2.1 single extruder tool head. To verify compatibility of your filament, check the Lulzbot website <https://www.lulzbot.com/store/filament> and confirm with library staff. If supplying your own filament, please submit with your print request.

## Guidelines For Use

- Builds must be scheduled for printing at least 48 hours in advance.
  - To schedule in Markleeville email [library@alpinecountyca.gov](mailto:library@alpinecountyca.gov) or call (530) 694-2120
  - To schedule in Bear Valley email [tschoettgen@alpinecountyca.gov](mailto:tschoettgen@alpinecountyca.gov) or call (209) 753-6219
- Please be aware that prints may be visible to the general public and the Library does not ensure they will be shielded from public view.
- The identity of the submitter of a job will fall under the same legal protection that extends to the privacy of the intellectual content of borrowers of library material.
- No functioning weapons or salacious items will be accepted for printing.
- Patrons are responsible for complying with all privacy and personal property rights and copyright laws.
- Both Libraries have Cura installed on public machines to assist in converting files to G-code. Likewise public machines have shortcuts to Thingiverse to help find printing projects.
- The 3D printer in Markleeville prints from an SD card. *The Markleeville Library has SD cards available for patron use if needed.*
- In Bear Valley, projects are printed from USB flash drives. *The Bear Valley Library has flash drives available for public use if needed.*
- 3D printers use metric coordinates. For consistency, it is recommended that you design and export your .STL file in millimeters.
- Alpine County Library reserves the right to refuse any print request.

## Procedures for Printing

- Submit your Print Request Form to Library staff along with any cash payment required.
- Submit the appropriate device (SD card or USB flash drive) that contains your project to Library staff. (If you need these devices, they are available from your Library)
- Files in .STL format may also be emailed to library staff, along with print request form.
- Files must be submitted in .STL (Sterio Lithography) format.
- Staff will let you know when your project is complete. Be sure all contact information on the Print Request Form is correct.

## Costs

The Library's goal is to assess costs in a manner that encourage our communities to explore 3D printing. However we need funds to continue purchasing filament and to maintain our 3D printers. Therefore, *in absence of grants or donations to fund printing costs*, charges will be assessed in the following manner:

- 3D print projects are charged according to weight in grams, as estimated by the [CURA](#) slicer software (installed on all public Library computers). A charge of \$.05 (five cents) per gram will be assessed for standard PLA filament. Since specialized filament (i.e. iron infused or copper) are more expensive, they will be assessed at a higher rate. As prices will vary, please inquire at the front desk for the current cost to print your desired model.
- **Cash Only** payments are accepted at this time and are to be made at the time of project submission.
- Patrons will be charged for all material used, including any aborted or flawed prints. (Software such as [Netfabb](#) that checks for and helps repair errors in your build is recommended before submitting your print file.)
- Cost to print is waived if patrons supply [printer compatible](#) filament for their project. *If the print fails, the Library will not reimburse patrons for any used filament.*

*The following links and tutorials are meant only as suggestions to assist with the creation of your 3D projects. The Alpine County Library does not in any way endorse or vouch for the credibility of these sources.*

## Links to Software

### Useful Software

- 123D: [www.123dapp.com/design](http://www.123dapp.com/design)
- OpenSCAD: [www.openscad.org/](http://www.openscad.org/)
- Makerware: [www.makerbot.com/makerware/](http://www.makerbot.com/makerware/)
- Meshmixer: [www.meshmixer.com/](http://www.meshmixer.com/)
- Sketchup: [www.sketchup.com/](http://www.sketchup.com/)
- Tinkercad: <https://tinkercad.com/>

## Links to Tutorials

### Tutorials on Creating Your Own Design:

- Autodesk 123D: [www.123dapp.com/howto/design](http://www.123dapp.com/howto/design)
- OpenSCAD: [www.openscad.org/documentation.html](http://www.openscad.org/documentation.html)
- Makerware: [www.makerbot.com/support/makerware/documentation/usage/](http://www.makerbot.com/support/makerware/documentation/usage/)
- Meshmixer: [meshmixer.com/help/](http://meshmixer.com/help/)
- Sketchup: [www.sketchup.com/learn/videos](http://www.sketchup.com/learn/videos)
- Tinkercad: <https://www.tinkercad.com/learn/>

## Discover 3D Models

### Find Existing Models Online

- Thingiverse: [www.thingiverse.com](http://www.thingiverse.com)
- 3D Warehouse: <https://3dwarehouse.sketchup.com/>
- GrabCAD: <http://www.grabcad.com>
- 3DContentCentral: <http://www.3dcontentcentral.com/>
- Inventables: <http://www.inventables.com/>



Markleeville, CA (530) 694-2120

Bear Valley, CA (209) 753-6219

## Alpine County Library 3D Print Request Form

**Patron Name (First & Last)**

**Telephone Number**

**Library Card #**

**Email Address** \_\_\_\_\_

**Print Project Name** \_\_\_\_\_

**Filament Color** \_\_\_\_\_

**Filament Type** \_\_\_\_\_

**Print speed/detail** \_\_\_\_\_

**NOTES**

**Amount paid** \_\_\_\_\_ **Staff Signature** \_\_\_\_\_

*By signing this form, I agree under oath to adhere to all the policies and procedures set forth in the Alpine County Library 3D Printing Policy. I further agree that my projects are not duplicating intellectual property belonging to another and that I am not reproducing copyright material without permission.*

Markleeville, CA (530) 694-2120  
Bear Valley, CA (209) 753-6219

Patron Signature \_\_\_\_\_