

HACKERS
and
HOSPITALS

whoami

Michael McMahon

- Web developer at the Free Software Foundation (FSF) since January 2019.
- Background in education, manufacturing, game design, and music with an emphasis on free software and free culture.
- Taught 3D printing with the Boys & Girls Club of Boston in 2014.



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 **FREE SOFTWARE
FOUNDATION**

<https://ryf.fsf.org>



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3D Printers

Categories

- All Products
- Laptops
- Routers
- Bluetooth Adapters
- Workstations and Servers
- Mainboards
- Wireless Adapters
- Ethernet Adapters

Vendor: Sort by: Order:

<h4>LulzBot Mini desktop 3D printer</h4> 	<h4>LulzBot TAZ 6 desktop 3D printer</h4> 
--	---

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LulzBot Mini desktop 3D printer



[LulzBot Mini product page](#)

Certification Date

April 29, 2013

Source Code Links

[Download LulzBot Mini source code](#)

Categories

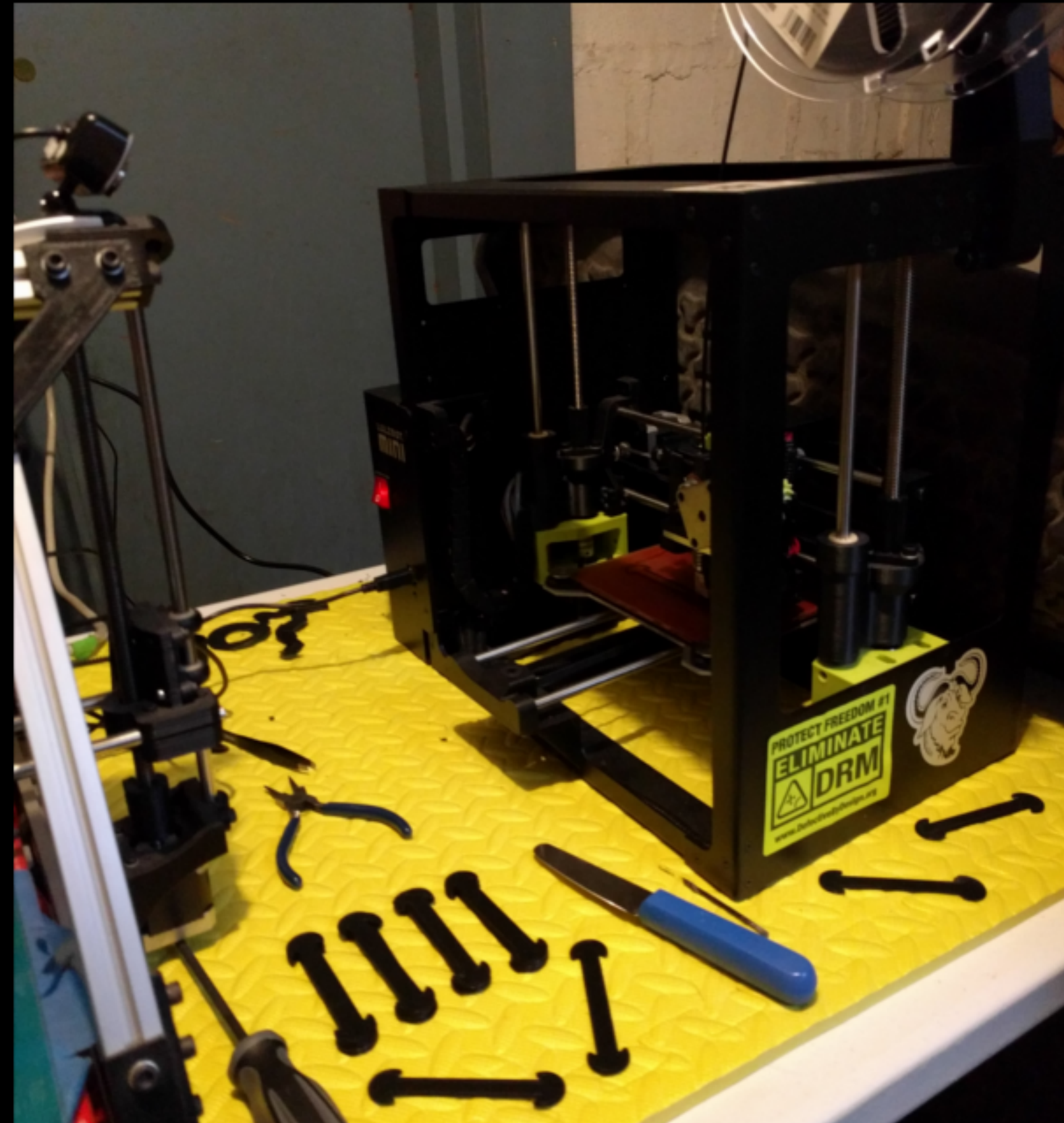
[3D Printers](#)

Vendor

[Aleph Objects, Inc](#)

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<https://www.lulzbot.com>



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<https://github.com/TechnologyClassroom/yhoseadapter>

```
118 }
119 }
120 }
121 module helpers0 {
122 // Inner module since it's only needed inside helpers
123 module line0 color("Black") cylinder(r=1, h=10, center=true);
124
125 scale(0.5) {
126 // Left
127 translate([-40,0,-50-SPACE]) {
128 intersected();
129 translate([-SPACE,0,-SPACE]) body0;
130 translate([0,0,-SPACE]) intersector0;
131 // translate([-7.5,0,-17.5]) rotate([0,30,0]) line0;
132 // translate([7.5,0,-17.5]) rotate([0,-30,0]) line0;
133 }
134
135 // Right
136 translate([50,0,-50-SPACE]) {
137 holes();
138 translate([0,0,-SPACE]) holeA0;
139 translate([SPACE/2,0,-SPACE]) holeB0;
140 translate([SPACE,0,-SPACE]) holeC0;
141 translate([3*SPACE/2,0,-SPACE]) holeD0;
142 // 4 Way
143 if (SPLITS==4) {
144 translate([2*SPACE,0,-SPACE]) holeE0;
145 translate([5*SPACE/2,0,-SPACE]) holeF0;
146 }
147 }
148 }
149 }
150
151 echo(version=version());
```

Console

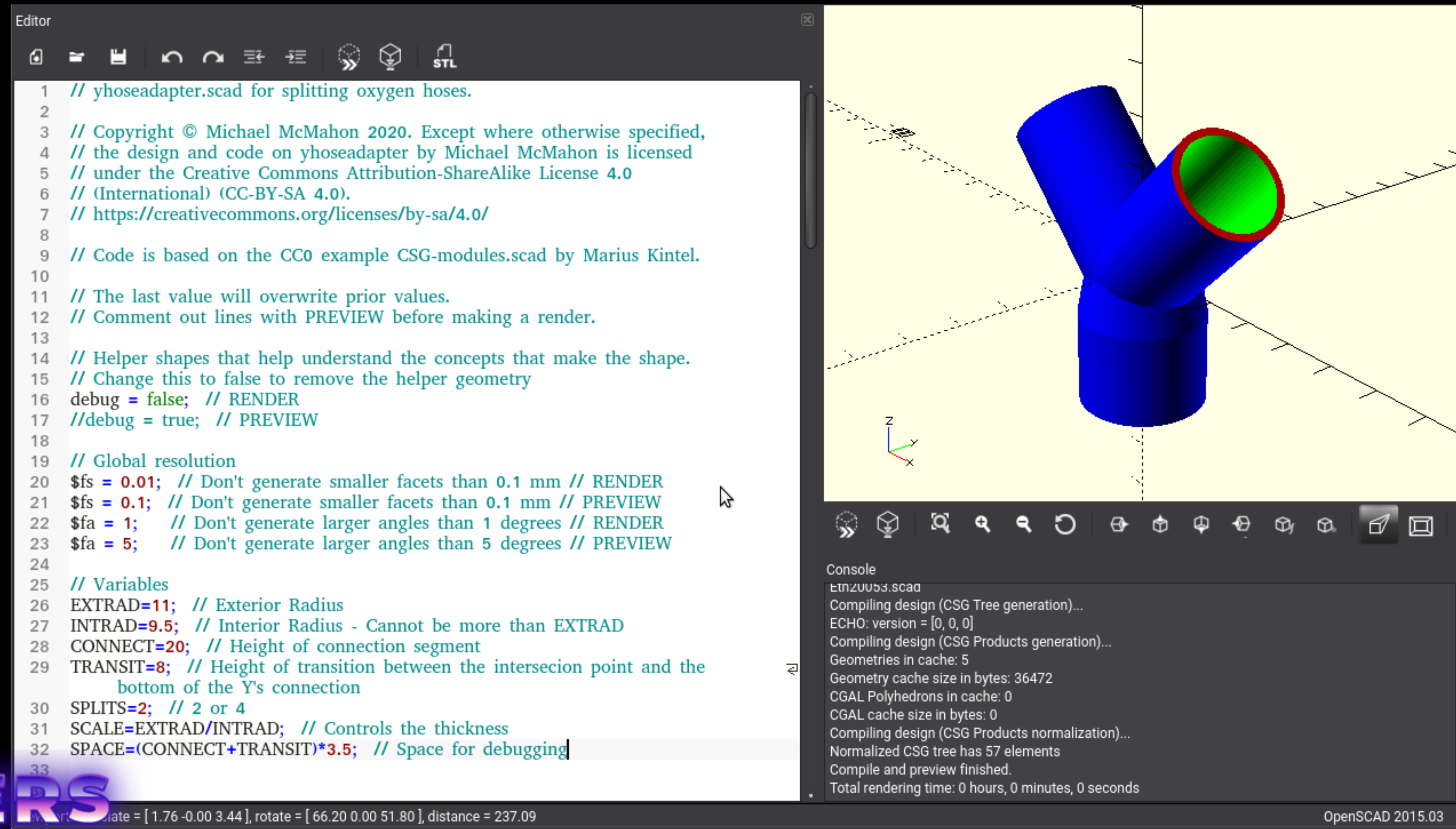
```
Compiling design (CSG Tree generation)...
ECHO: version = [0, 0, 0]
Compiling design (CSG Products generation)...
Geometries in cache: 5
Geometry cache size in bytes: 36472
CGAL Polyhedrons in cache: 0
CGAL cache size in bytes: 0
Compiling design (CSG Products normalization)...
Normalized CSG tree has 96 elements
Compile and preview finished.
Total rendering time: 0 hours, 0 minutes, 0 seconds
```

date = [-0.00 -0.00 -0.00], rotate = [90.00 0.00 0.00], distance = 755.52

OpenSCAD 2015.03

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<https://github.com/TechnologyClassroom/yhoseadapter>



The image shows a screenshot of the OpenSCAD software interface. On the left is the code editor, and on the right is the 3D viewer. The code defines a Y-shaped hose adapter with various parameters for radius, height, and thickness. The 3D viewer shows a blue Y-shaped adapter with a red inner lining, set against a light blue background with a coordinate system.

```
1 // yhoseadapter.scad for splitting oxygen hoses.
2
3 // Copyright © Michael McMahon 2020. Except where otherwise specified,
4 // the design and code on yhoseadapter by Michael McMahon is licensed
5 // under the Creative Commons Attribution-ShareAlike License 4.0
6 // (International) (CC-BY-SA 4.0).
7 // https://creativecommons.org/licenses/by-sa/4.0/
8
9 // Code is based on the CC0 example CSG-modules.scad by Marius Kintel.
10
11 // The last value will overwrite prior values.
12 // Comment out lines with PREVIEW before making a render.
13
14 // Helper shapes that help understand the concepts that make the shape.
15 // Change this to false to remove the helper geometry
16 debug = false; // RENDER
17 //debug = true; // PREVIEW
18
19 // Global resolution
20 $fs = 0.01; // Don't generate smaller facets than 0.1 mm // RENDER
21 $fs = 0.1; // Don't generate smaller facets than 0.1 mm // PREVIEW
22 $fa = 1; // Don't generate larger angles than 1 degrees // RENDER
23 $fa = 5; // Don't generate larger angles than 5 degrees // PREVIEW
24
25 // Variables
26 EXTRAD=11; // Exterior Radius
27 INTRAD=9.5; // Interior Radius - Cannot be more than EXTRAD
28 CONNECT=20; // Height of connection segment
29 TRANSIT=8; // Height of transition between the intersecion point and the
    bottom of the Y's connection
30 SPLITS=2; // 2 or 4
31 SCALE=EXTRAD/INTRAD; // Controls the thickness
32 SPACE=(CONNECT+TRANSIT)*3.5; // Space for debugging
33
```

Console

```
ETn2U053.scad
Compiling design (CSG Tree generation)...
ECHO: version = [0, 0, 0]
Compiling design (CSG Products generation)...
Geometries in cache: 5
Geometry cache size in bytes: 36472
CGAL Polyhedrons in cache: 0
CGAL cache size in bytes: 0
Compiling design (CSG Products normalization)...
Normalized CSG tree has 57 elements
Compile and preview finished.
Total rendering time: 0 hours, 0 minutes, 0 seconds
```

OpenSCAD 2015.03


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<https://3dprint.nih.gov/discover/3dpx-013734>

U.S. Department of Health and Human Services — National Institutes of Health Create Account Login

NIH NIH 3D Print Exchange DISCOVER SHARE CREATE LEARN

LRTee: Ventilator Splitter

 **This device requires FDA approval or it may have design flaws that introduce safety risks. It has not been assessed for safe use.**

Submitted by:  [makefastworkshop](#)   

Thu, 2020-04-09 15:10

General Information

Model ID 3DPX-013734

Category Labware & Devices

Patients with COVID-19 in serious or critical condition often require assisted breathing via ventilator. As the number of patients in need of ventilators grows (exponentially in many densely populated regions), there are not adequate numbers of ventilators to support the high number of patients.

This is an EXPERIMENTAL splitter for 22m tubing to allow two patients to share a single ventilator. After printing/testing multiple versions of other splitter designs (see below) we decided to build a new splitter that:

- Has uniformly thicker walls.
- Has shorter branches (less likely to break).

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<https://3dprint.nih.gov/discover/3dpx-013734>



**HACKERS
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<https://3dprint.nih.gov/discover/3dpx-013734>

The screenshot displays the CURA 3D printing software interface. The main window shows a 3D view of a yellow T-junction part on a grid. The interface includes a menu bar (File, Edit, View, Settings, Extensions, Plugins, Preferences, Help), a toolbar with icons for file operations and view modes, and a settings panel on the right. The settings panel is for a "LulzBot Mini 2 with 1 wipe" printer. The material is set to "PLA (210)" and the profile is "Default - 0.1mm". The print setup is set to "Recommended". The infill is set to 100% and "Enable gradual" is unchecked. The "Generate Support" checkbox is also unchecked. The bottom status bar shows the file name "LM2W1W_LRTEE3_PrintNormal_0" and dimensions "32.6 x 68.3 x 59.2 mm". The estimated print time is "03h 05min" and the material usage is "2.51m / ~ 19g". A "Save to File" button is visible in the bottom right corner.

File Edit View Settings Extensions Plugins Preferences Help

CURA Prepare Monitor Solid view

LulzBot Mini 2 with 1 wipe

Category: All

Material: PLA (210)

Adhesion Info: None

Profile: Default - 0.1mm

Print Setup: Recommended Custom

Infill: 100%
 Enable gradual

Generate Support:

Ready to Save to File

03h 05min
2.51m / ~ 19g

Save to File

LM2W1W_LRTEE3_PrintNormal_0
32.6 x 68.3 x 59.2 mm


HACKERS
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<https://3dprint.nih.gov/discover/3dpx-013440>

Mask Comfort Strap



This design has undergone review in a clinical setting and is recommended when fabricated as instructed.

Submitted by:  [bdsearle](#)

Thu, 2020-04-02 16:24



Remix It

I Printed This

Other version(s) of this model: [View All](#)

This model is a remix of [3DPX-013359](#) by [tprestero](#).

General Information

Model ID 3DPX-013440

Category Labware & Devices

*** Updated version 2 can be found here - <https://3dprint.nih.gov/discover/3DPX-013470> ***

Simple and disposable bone shaped mask strap to relieve pressure on the ears. Quick to print at 1mm thick and semi flexible with PETG filament. Will be posting updated STL files to allow for multiple prints of a single style.

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<https://3dprint.nih.gov/discover/3dpx-013440>



**HACKERS
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<https://3dprint.nih.gov/discover/3dpx-013440>

File Edit View Settings Extensions Plugins Preferences Help

CURA Prepare Monitor

Solid view

LulzBot Mini 2 with 1 wipe

Category: All

Material: *i* PLA (210)

Adhesion Info: None

Profile: Default - 0.1mm

Print Setup: Recommended Custom

Infill: 100%
 Enable gradual

Generate Support:

Ready to Print with OctoPrint

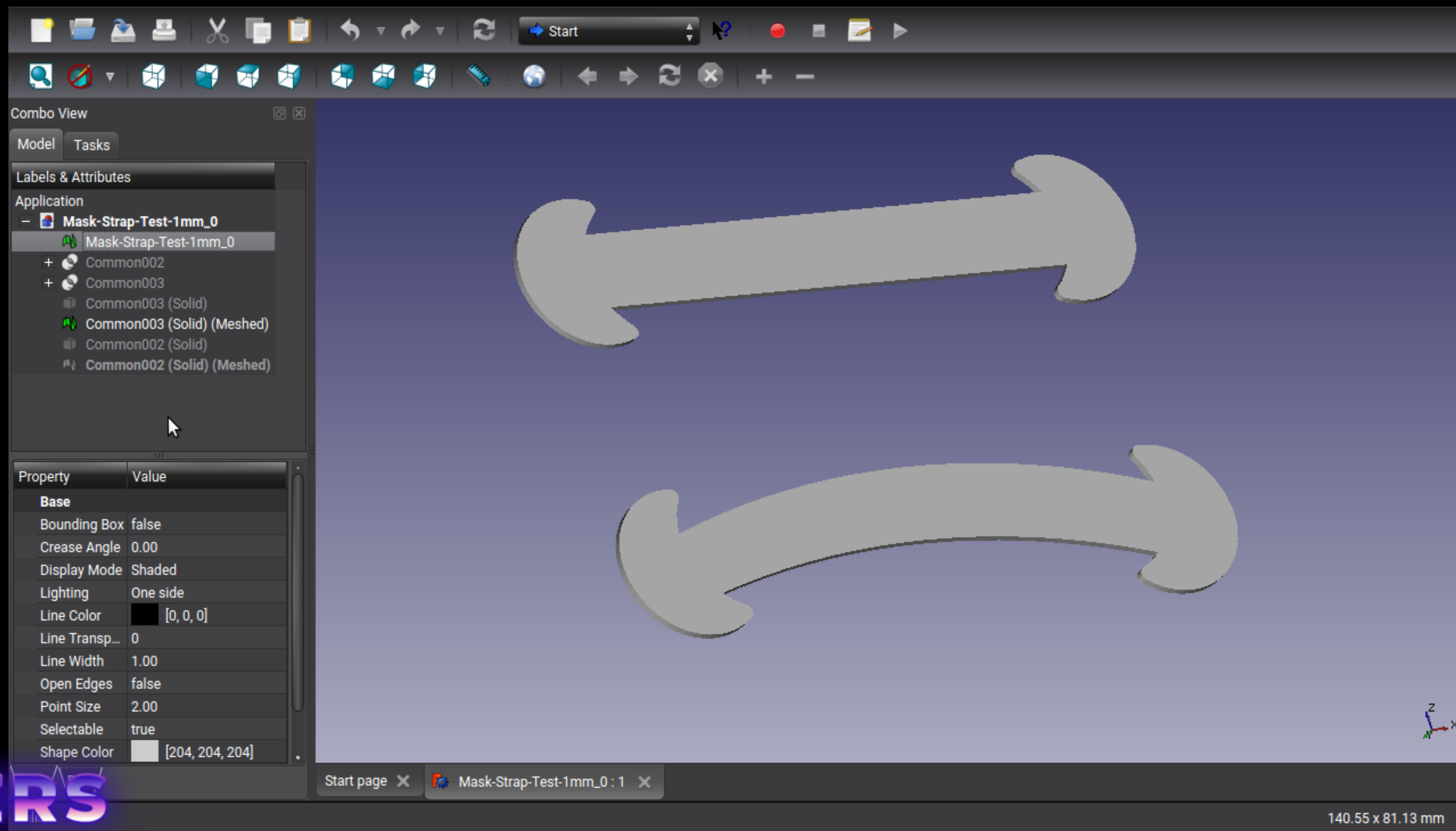
LM2W1W_Mask-Strap-Test-1mm 90.0 x 128.1 x 1.0 mm

00h 41min
0.69m / ~ 5g

Print with OctoPrint

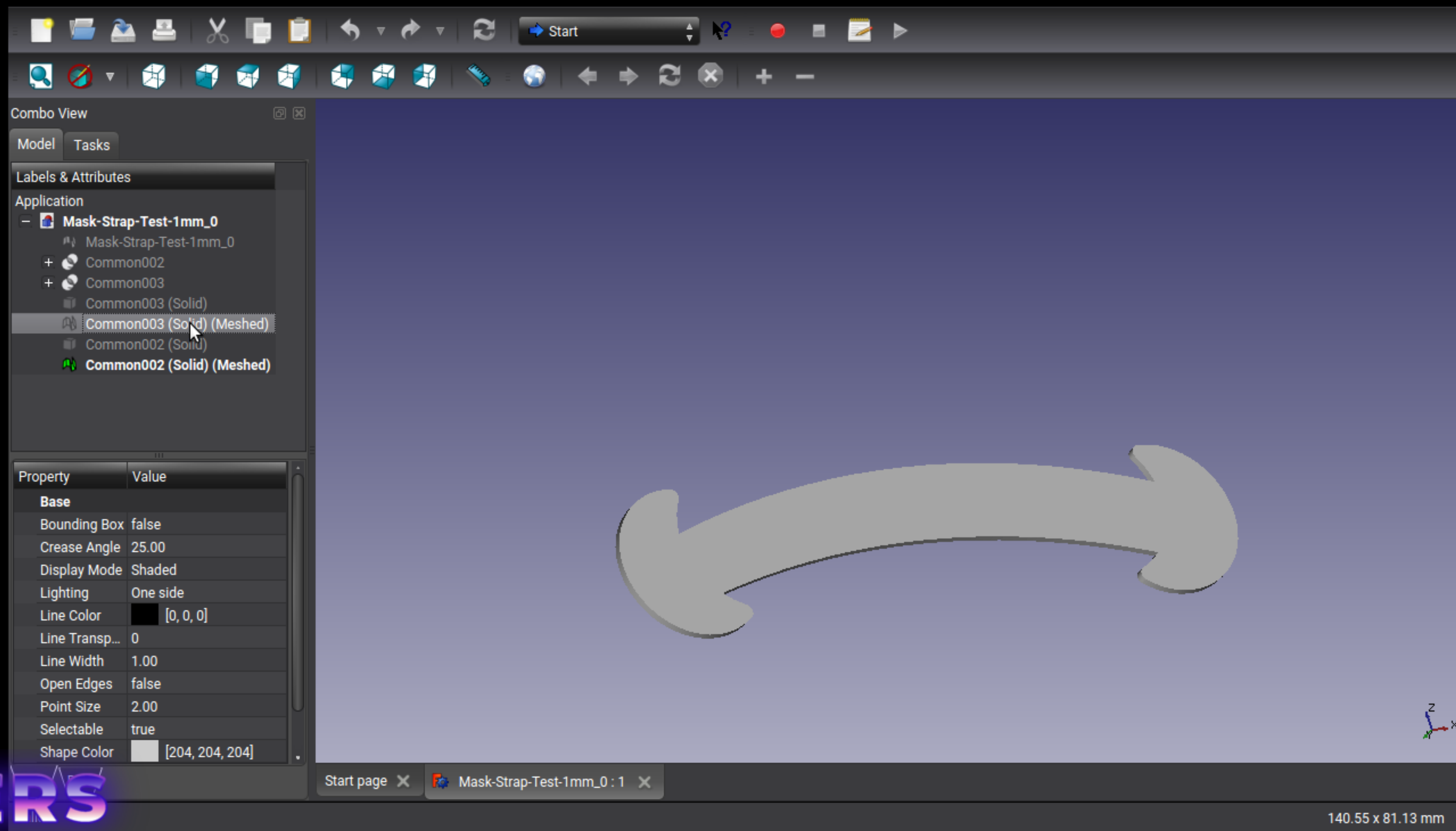
HACKERS
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<https://3dprint.nih.gov/discover/3dpx-013440>



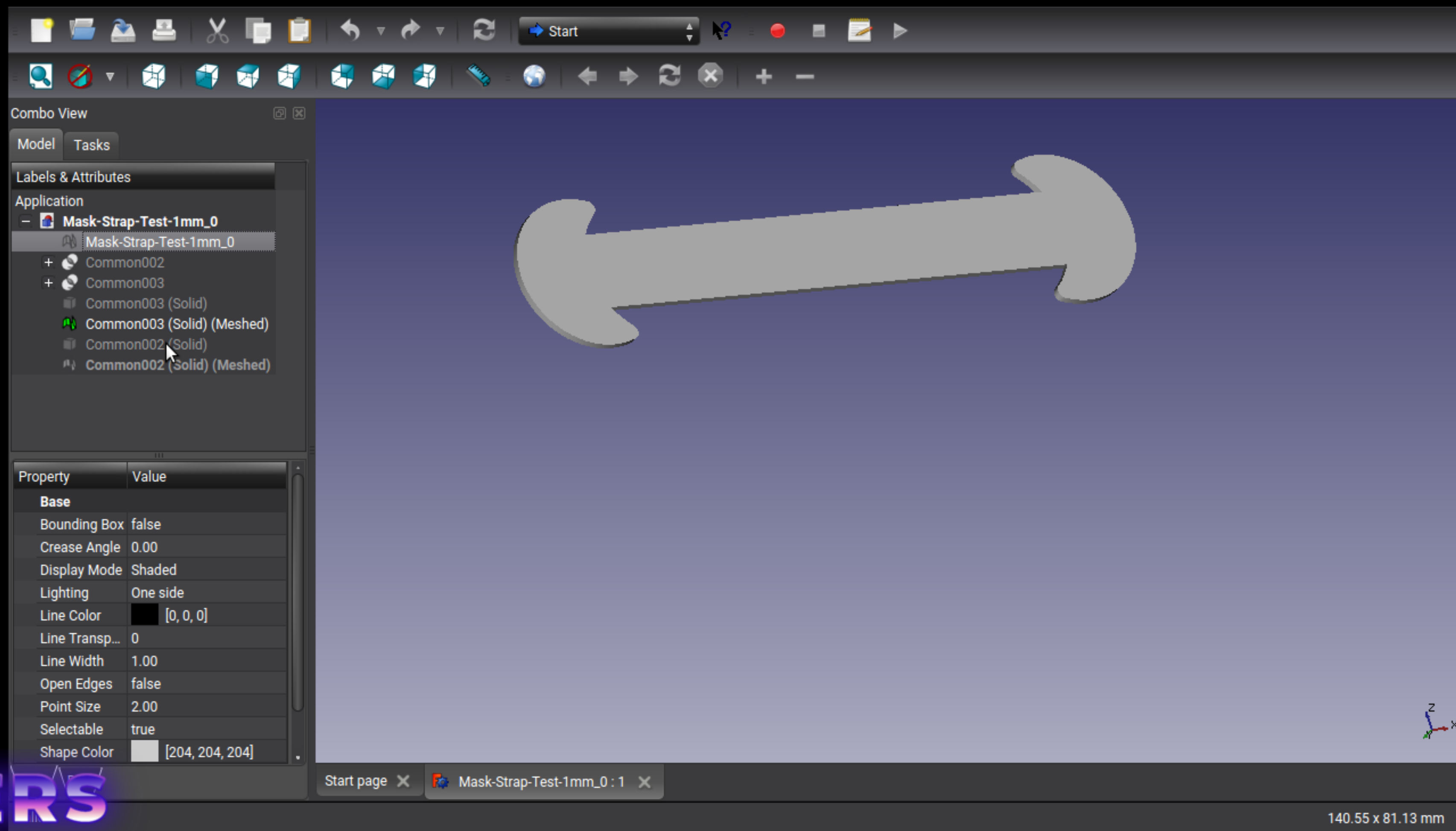
HACKERS
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<https://3dprint.nih.gov/discover/3dpx-013864>



HACKERS
and
HOSPITALS

<https://3dprint.nih.gov/discover/3dpx-013863>



HACKERS
and
HOSPITALS

<https://3dprint.nih.gov/discover/3dpx-013863>

File Edit View Settings Extensions Plugins Preferences Help

CURA Prepare Monitor

Solid view

LulzBot Mini 2 with 1 wipe

Category: All

Material: PLA (210)

Adhesion Info: None

Profile: Default - 0.1mm

Print Setup: Recommended Custom

Infill: 100%
 Enable gradual

Generate Support:

Ready to Save to File

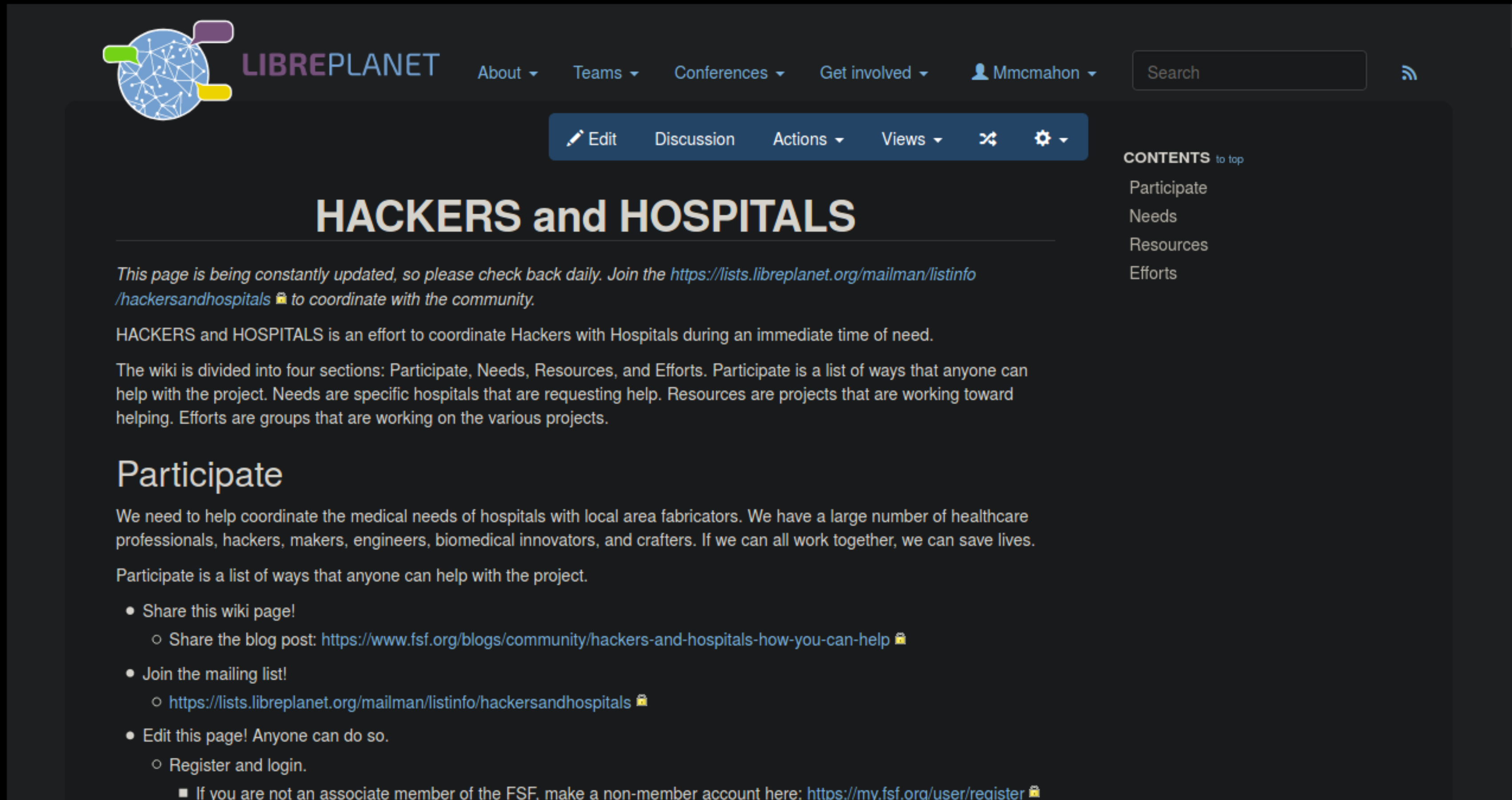
LM2W1W_Mask-Strap-Test-1mm-straight
143.2 x 144.5 x 1.0 mm

01h 12min
1.20m / ~ 9g


Save to File




HACKERS
and
HOSPITALS

https://libreplanet.org/wiki/HACKERS_and_HOSPITALS




The screenshot shows the LibrePlanet wiki page for "HACKERS and HOSPITALS". The page header includes the LibrePlanet logo, navigation links (About, Teams, Conferences, Get involved), a user profile for Mmcmahon, a search bar, and a RSS feed icon. Below the header is a toolbar with "Edit", "Discussion", "Actions", "Views", and other icons. The main content area features the title "HACKERS and HOSPITALS" and a notice that the page is constantly updated. It describes the project's goal to coordinate hackers with hospitals during emergencies and lists four sections: Participate, Needs, Resources, and Efforts. The "Participate" section is expanded, showing a list of ways to help, including sharing the page, joining a mailing list, and editing the page. A sidebar on the right contains a "CONTENTS" table of contents with links to Participate, Needs, Resources, and Efforts.

LIBREPLANET About ▾ Teams ▾ Conferences ▾ Get involved ▾ Mmcmahon ▾ Search 

 Edit Discussion Actions ▾ Views ▾  

HACKERS and HOSPITALS

This page is being constantly updated, so please check back daily. Join the <https://lists.libreplanet.org/mailman/listinfo/hackersandhospitals>  to coordinate with the community.




HACKERS and HOSPITALS is an effort to coordinate Hackers with Hospitals during an immediate time of need.

The wiki is divided into four sections: Participate, Needs, Resources, and Efforts. Participate is a list of ways that anyone can help with the project. Needs are specific hospitals that are requesting help. Resources are projects that are working toward helping. Efforts are groups that are working on the various projects.

Participate

We need to help coordinate the medical needs of hospitals with local area fabricators. We have a large number of healthcare professionals, hackers, makers, engineers, biomedical innovators, and crafters. If we can all work together, we can save lives.

Participate is a list of ways that anyone can help with the project.

- Share this wiki page!
 - Share the blog post: <https://www.fsf.org/blogs/community/hackers-and-hospitals-how-you-can-help> 
- Join the mailing list!
 - <https://lists.libreplanet.org/mailman/listinfo/hackersandhospitals> 
- Edit this page! Anyone can do so.
 - Register and login.
 - If you are not an associate member of the FSF, make a non-member account here: <https://my.fsf.org/user/register> 

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- Participate
- Needs
- Resources
- Efforts







**HACKERS
and
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https://libreplanet.org/wiki/HACKERS_and_HOSPITALS

Participate

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- Join the mailing list!
 - <https://lists.libreplanet.org/mailman/listinfo/hackersandhospitals> 
- Edit this page! Anyone can do so.
 - Register and login.
 - If you are not an associate member of the FSF, make a non-member account here: <https://my.fsf.org/user/register> 
 - Login here: <https://libreplanet.org/wiki?title=Special:UserLogin&returnto=HACKERS+and+HOSPITALS> 
 - Search for plans that are licensed under a free culture license and post them here.
 - If you are working on a plan...
 - Post what you are working on (even works in progress) to a public version control system (such as git).
 - License your project under a free culture license.
 - Link your project here.
- Find out what your local needs are.
 - Organize local fabricators and hospitals.
 - Assess the needs of the hospitals.
 - Do not produce unless there is a need.
- Consider emailing the project heads at <https://covidinnovation.partners.org/wg-info/>  to join a MGB Center for COVID Innovation working group. Note: The group uses Zoom, Slack, and Google Drive, but has assured me that their result would be public domain.
 - Watch the MGB Center for COVID Innovation Town Hall video if you missed it: <https://www.invidio.us/watch?v=SDI6M7-sMy4> 

If you have any suggestions, questions or comments regarding HACKERS and HOSPITALS, you can contact: michael at fsf.org

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Participate

Needs

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HACKERS and HOSPITALS

https://libreplanet.org/wiki/HACKERS_and_HOSPITALS


Needs

Needs are specific hospitals and organizations that are requesting help.







These Hospitals have put out a public call for help. I would advise against shipping things from far away. If your local hospitals are not listed, reach out to them to find out their needs.

USA

Arkansas

- Baxter Regional Medical Center: <https://www.baxterregional.org/foundation/covid-19-pandemic-needs/face-masks-hats/> 

Connecticut

- Bristol Health: <https://www.bristolhealth.org/Why-Bristol-Health/Bristol-Hospital-Foundation> 
- Hartford HealthCare: <https://hartfordhealthcare.org/health-wellness/coronavirus/ppe-donations> 
- Trinity Health of New England: <http://www.trinityhealthofne.org/covid-19-donations> 
- UCONN Health: <https://health.uconn.edu/coronavirus/ppe-donations/> 
- Western Connecticut Health Network: <https://www.westernconnecticuthealthnetwork.org/novel-coronavirus-covid19-update/support-our-efforts> 
- Yale New Haven Hospital: <https://www.givetoynhh.org/covid-19/> 

Massachusetts

- Boston Medical Center: https://www.bmc.org/covid19relief?utm_campaign=COVID-19-appeal&utm_medium=bmc-homepage-promo&utm_source=bmc-website#donatesupplies 
- Cambridge Health Alliance: https://www.challiance.org/about/newsroom/personal_protective_equipment_ppe_homemade_donatio_1180 
- Cooley Dickenson Healthcare: <https://www.cooleydickinson.org/home/coronavirus-resources/donations/> 
- Emerson Hospital (Concord, MA): <https://www.emersonhospital.org/coronavirus-covid-19-resources/covid-19-help> 
- Lowell General Hospital: <https://www.lowellgeneral.org/news-and-media/news/calling-our-crafty-community> 
- Melrose Wakefield Hospital: <https://www.melrosewakefield.org/news/melrosewakefield-healthcare-seeks-donations-of-personal-protective-equipment/> 
- Trinity Health of New England: <http://www.trinityhealthofne.org/covid-19-donations> 

Michigan

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Richard Stallman's Four Essential Freedoms



- The freedom to run the program as you wish, for any purpose (freedom 0).
- The freedom to study how the program works, and change it so it does your computing as you wish (freedom 1). Access to the source code is a precondition for this.
- The freedom to redistribute copies so you can help others (freedom 2).
- The freedom to distribute copies of your modified versions to others (freedom 3). By doing this you can give the whole community a chance to benefit from your changes. Access to the source code is a precondition for this.

<https://www.gnu.org/philosophy/free-sw.en.html>

CC BY-SA Aurélio A. Heckert 2003
https://www.gnu.org/graphics/heckert_gnu.html

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https://libreplanet.org/wiki/HACKERS_and_HOSPITALS










Resources

Resources are projects that are working toward helping.

Before fabricating any equipment, check first with your local hospitals to see if this is what they need and will use. Each hospital will have its own requirements.

Reviewed Personal Protective Equipment (PPE)

Face Shields

- CVHCS Laser Cut or 3D Printable Face shield - Approved by National Institutes of Health (NIH) for clinical use
 - <https://3dprint.nih.gov/discover/3dpx-013456> 
 - License CC0
- Face Shield - PNWS
 - Short <https://3dprint.nih.gov/discover/3DPX-013884> 
 - Full <https://3dprint.nih.gov/discover/3DPX-013883> 
 - License: CC BY
- SLS Printed RAG Mask - Approved by National Institutes of Health (NIH) for clinical use
 - <https://3dprint.nih.gov/discover/3dpx-013444> 
 - License: CC-BY
- 3DVerkstan 3D printed face shield head band - Approved by National Institutes of Health (NIH) for clinical use
 - <https://3dverkstan.se/protective-visor/> 
 - <https://3dprint.nih.gov/discover/3dpx-013306> 
 - License: CC BY
- 3D Printed Face Shield - MITRE - Approved by National Institutes of Health (NIH) for clinical use
 - <https://3dprint.nih.gov/discover/3dpx-013406> 
 - License: CC-BY
- DtM-v3.1 Face Shield PPE, 3D printable headband - Approved by National Institutes of Health (NIH) for clinical use
 - <https://www.designthatmatters.org/covid-19> 
 - <https://3dprint.nih.gov/discover/3dpx-013359> 

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Medical supplies unrelated to COVID-19

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https://libreplanet.org/wiki/HACKERS_and_HOSPITALS

- <https://faceshield.us/> 📄
- <https://3dprint.nih.gov/discover/3dpx-013532> 📄
- License: CC BY-NC :(

Face Masks

- Stoppap Surgical Face Mask (SFM) - Approved by National Institutes of Health (NIH) for clinical use
 - <https://3dprint.nih.gov/discover/3dpx-013429> 📄
 - License: CC BY

Cloth mask adapters

Devices that relieve pressure on the ears during long-term usage of masks.

- Mask Comfort Strap - Approved by National Institutes of Health (NIH) for clinical use
 - <https://3dprint.nih.gov/discover/3dpx-013440> 📄
 - Quick to print at 1mm thick and semi flexible with PETG or PLA filament.
 - License: CC BY
 - Only the straight piece: <https://3dprint.nih.gov/discover/3dpx-013863> 📄
 - Only the curved piece: <https://3dprint.nih.gov/discover/3DPX-013864> 📄
 - Great use of small 3D printers.
- Surgical Mask Band for Ear Comfort - Extra Security V2 - Approved by National Institutes of Health (NIH) for clinical use
 - <https://3dprint.nih.gov/discover/3dpx-013574> 📄
 - <https://www.thingiverse.com/thing:4249113> 📄
 - License: CC0
- Surgical Mask Tension Release Band for Ear Comfort & Extended Use - Approved by National Institutes of Health (NIH) for clinical use
 - <https://3dprint.nih.gov/discover/3dpx-013410> 📄
 - <https://www.thingiverse.com/thing:4249113> 📄
 - License: CC0

Unreviewed PPE

Face Shields

- Designs that require a 3D printer:

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— <https://www.delve.com/assets/documents/OPEN-SOURCE-FACE-SHIELD-DRAWING-v1.PDF> 📄

- https://psjh.blob.core.windows.net/covid/PSJH_Faceshield.pdf 📄

Cloth Masks

- Regulations:
 - <https://www.astm.org/COVID-19/> 📄
 - <https://www.prnewswire.com/in/news-releases/astm-international-provides-public-access-to-standards-used-for-covid-19-870878934.html> 📄
 - <https://www.fda.gov/regulatory-information/search-fda-guidance-documents/surgical-masks-premarket-notification-510k-submissions> 📄
- Gentl Mask
 - <https://solutionshub.epam.com/solution/gentl-mask> 📄
 - <https://www.invidio.us/watch?v=c9aMin8DRBQ> 📄
- <https://necsi.edu/sewing-masks> 📄
- <https://www.project-cloth-masks.com/> 📄
- <https://imgur.com/a/rOYijtF> 📄

Cloth mask adapters

Devices that relieve pressure on the ears during long-term usage of masks.

- <https://www.thingiverse.com/thing:4263289> 📄

3D Printed Face Masks

- <https://www.thingiverse.com/thing:4225667> 📄
 - Picture and video guide: <https://lowellmakes.com/covid-19-response/> 📄
- <https://longliveyoursmile.com/3d-printable-mask-for-covid-19/> 📄
- Copper3D
 - Users are reporting problems with this design.
 - <https://copper3d.com/> 📄 Antimicrobial filament
 - <https://copper3d.com/hackthepandemic/> 📄 Mask Design
 - <https://www.3dprintingmedia.network/copper3d-organizing-global-campaign-to-3d-print-antimicrobial-masks-on->

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■ License: CC BY-NC-ND :(

Medical gowns

- http://wiki.artisansasylum.com/index.php/Medical_gowns

Door handles

Ways to open doors without touching the handle.

- - Manija Project - MASSARD V1.0 Hand off door opener - Approved by National Institutes of Health (NIH) for community use
 - <https://3dprint.nih.gov/discover/3dpx-013380>
 - License: CC BY
- <https://www.thingiverse.com/thing:4265995>
- <https://www.thingiverse.com/thing:4265787>

Procedure shields/screens

- Intubation Box - Dr. Hsien Yung Lai, Taiwan
 - Clear, reusable, cleanable shield for performing intubations.
 - <https://intubationbox.com/for-makers/>
 - https://intubationbox.com/wp-content/uploads/2020/03/IntubationBox_20200330.pdf
 - news news

Diagnostics

3D Printed stethoscope

- <https://glia.org/stethoscope/>
 - <https://github.com/GliaX/Stethoscope>

3D Printed Otoscope:

- <https://glia.org/otoscope/>
 - <https://github.com/GliaX/Otoscope>

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Therapeutics

Ventilators

Vent Specifications

Ventilator specifications can help hackers design and understand how a ventilator works.

- UK's specifications for a basic ventilator: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/876167/RMVS001_v3.1.pdf

Vent Designs

Ventilator designs are plans and projects that need help designing a quick solution. Most projects require testing before clinical use.

- <https://opensourceventilator.ie/>
 - <https://gitlab.com/open-source-ventilator/OpenLung>
- VentilAid
 - <https://www.ventilaid.org/>
 - <https://gitlab.com/Urbicum/ventilaid>
- Rice University - ApolloBVM - Automated Bag Valve Mask
 - <http://oedk.rice.edu/ApolloBVM-DIY>
 - License: CC BY
 - Arduino code: <https://github.com/apollobvm/apollobvm>
 - License: GPLv3
 - Note: Instructions require registration that works without scripts. Part files are stored on dropbox. Dropbox requires nonfree JavaScript.
- Israeli Air Force - AmboVent
 - <https://members.smoove.io/view.ashx?message=h44811613O122349105O219654O122419175>
 - <https://github.com/AmboVent/AmboVent>
 - License: The Unlicense
- MIT - Emergency Ventilator (E-Vent)

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- <https://github.com/Inspire-Poli-USP/Inspire-OpenLung> 

Vent Splitting

Ventilator Splitting could potentially increase the patient capacity of commercial ventilators.

Note: This method is controversial and has many obstacles to overcome. Read the criticisms of this method before testing as there are problems that must be addressed. Read as much about this as you can before considering this route for patients.

- - <https://www.hhs.gov/about/news/2020/03/31/optimizing-ventilator-use-during-covid19-pandemic.html> 
 - <https://www.hhs.gov/sites/default/files/optimizing-ventilator-use-during-covid19-pandemic.pdf> 
 - <https://www.apsf.org/news-updates/joint-statement-on-multiple-patients-per-ventilator/> 
- LRTee: Ventilator Splitter
 - PETG or PLA: <https://3dprint.nih.gov/discover/3dpx-013734> 
 - License: CC0
- Y hose adapter - 2 or 4 way oxygen hose splitter
 - Note: Requires testing. May need adjustments.
 - <https://github.com/TechnologyClassroom/yhoseadapter> 
 - License: CC BY-SA
- <https://www.nytimes.com/2020/03/26/health/coronavirus-ventilator-sharing.html> 
- <https://www.invidio.us/watch?v=uClq978oohY> 
- <https://onlinelibrary.wiley.com/doi/pdfdirect/10.1197/j.aem.2006.05.009?download=true> 
- <https://www.saasceo.com/ventilator-capacity/> 
- <https://player.vimeo.com/external/401547170.source.mp4?s=a9007a813b20f3868c2c48d4bdb18059379d28dd&download=1> 
- Quad splitter
 - Note: The files are "open source" without a license.
 - youtube-dl <https://www.facebook.com/SenatorSaudAnwar/videos/vb.547215488788904/1314441232082287/> 
 - <https://intcadsol.com/ventilator-quad-splitter> 
- <https://3dprint.nih.gov/discover/ventilator> 
- <https://www.prusaprinters.org/prints/25808-3d-printed-circuit-splitter-and-flow-restriction-d> 

Vent Parts

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- <https://www.prusaprinters.org/prints/25808-3d-printed-circuit-splitter-and-flow-restriction-d>

Vent Parts

Ventilator Parts could be used for ventilators with ventilators in an emergency situation.

- [evanalb/covid19](#)
 - Overview of common ventilator parts and includes STL files.
 - <https://github.com/ervanalb/covid19/blob/master/ventilator.md>
 - License: Unlicense / Public Domain
 - Source uses onshape and requires nonfree JavaScript, but STL files are published on GitHub.
- Ambu bag adapters
 - <https://grabcad.com/library/30-mm-male-to-22-mm-female-adapter-1>
 - <https://grabcad.com/library/22-mm-male-to-30-mm-female-adapter-1>
- Check valves (One-way)
 - Decathlon mask valve
 - <https://www.thingiverse.com/thing:4261394>
 - <https://gitlab.com/ma-d-kers/library>
- Venturi valve
 - <https://hackaday.com/2020/03/16/3d-printed-parts-keep-respirators-operational-during-covid-19-epidemic/>
 - <https://github.com/tombombadilbridpost/CORONA>
- PEEP Valve
 - <https://www.thingiverse.com/thing:4261377>
- Hose adaptor - Adjustable with OpenSCAD
 - <https://www.thingiverse.com/thing:3764039>

Medical supplies unrelated to COVID-19

3D Printed Tourniquet

- <https://glia.org/tourniquet/>
 - <https://github.com/GliaX/tourniquet>

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Software

Software listed here is free software. <https://www.gnu.org/philosophy/free-sw.en.html>  Concerns should be edited or supplemented.

CAD:

- OpenSCAD
 - <http://www.openscad.org/> 
 - <https://github.com/openscad/openscad/> 
- FreeCAD
 - <https://www.freecadweb.org/> 
 - <https://github.com/FreeCAD/FreeCAD/> 
- BOLTS - Common part specifications addon for OpenSCAD and FreeCAD
 - <https://github.com/boltsparts/BOLTS/> 
 - <https://www.bolts-library.org/en/> 
- Blender
 - <https://www.blender.org/> 
 - <https://developer.blender.org/diffusion/B/> 
- ImplicitCAD
 - <http://www.implicitcad.org/> 
 - <http://kalli1.faikvm.com/ImplicitCAD/Stable> 
- SolveSpace
 - <http://solvespace.com/index.pl> 
 - <https://github.com/solvespace/solvespace/> 

Slicing for printing:

- Cura
 - <https://www.lulzbot.com/cura#download> 
 - <https://directory.fsf.org/wiki/CuraEngine> 

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- <https://directory.fsf.org/wiki/CuraEngine> 📄
- Slic3r
 - <https://slic3r.org/> 📄
 - <https://github.com/slic3r/Slic3r> 📄

3D print server:

- OctoPrint
 - <https://octoprint.org/> 📄
 - <https://github.com/OctoPrint/OctoPrint> 📄

Pandemic tracking:

- The Fevermap
 - <https://fevermap.net/> 📄
 - <https://gitlab.com/fevermap/fevermap/> 📄
- Symptomradar
 - <https://github.com/futurice/symptomradar> 📄
- OpenTrace
 - <https://github.com/opentrace-community> 📄

Hospital Database:

- GNU Health - Alternative to Epic.
 - <https://www.gnuhealth.org/> 📄
- Orthanc - PACS server for medical imaging.
 - <https://www.orthanc-server.com/> 📄

More:

- Free Software Directory COVID-19 Response Team is collecting more free software in this category:
https://directory.fsf.org/wiki/Free_Software_Directory:COVID-19_Response_Team 📄

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Efforts


Efforts are groups that are working on the various projects.

USA





Connecticut

- MakeHaven: <https://www.makehaven.org/covid-19-response> 



Maine

- Helping Maine Hospitals: <https://www.prusaprinters.org/group/helping-maine-hospitals-6O5mvRJ> 


Massachusetts

- Greater Boston Area
 - MGB Center for COVID Innovation <https://covidinnovation.partners.org/> 
 - New England Complex Systems Institute <https://necsi.edu/corona-virus-pandemic> 
 - Artisan's Asylum <http://wiki.artisansasylum.com/index.php/COVID> 
 - Lowell Makes <https://lowellmakes.com/covid-19-response/> 


Michigan

- COVID-19 "Operation Face Shield": <https://www.hunnywaggin.com/covid-19-eye-sheild-pipeline> 
- Detroit Sewn Masks: <https://www.detroitsewn.com/> 


New Hampshire

- Face Shields for NH: <https://www.prusaprinters.org/group/face-shields-for-nh-7RpKg5a> 

New Jersey

- Rowan University builds intubation boxes: <https://today.rowan.edu/news/2020/04/rowan-engineers-make-intubation-boxes.html> 

New York

- NYC Face Shields: <https://www.prusaprinters.org/group/nyc-face-shields-GARxvQm> 

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Thank you!

- FSF <https://www.fsf.org> & GNU <https://www.gnu.org>
- OpenSCAD www.openscad.org
- FreeCAD <https://www.freecadweb.org>
- OctoPrint <https://octoprint.org>
- Mask Comfort Strap <https://3dprint.nih.gov/discover/3dpx-013440>
- LRTee <https://3dprint.nih.gov/discover/3dpx-013734>
- HaH title made with Logos By Nick GIMP Tutorial: Retro 80s Style
Text <https://invidio.us/watch?v=401re7GL0LM>
- GIMP <https://www.gimp.org>
- ImageMagick <https://imagemagick.org>
- Big Blue Button <https://bigbluebutton.org/>
- Privacy Safe <https://privacysafe.ai/>

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Thank you!



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Contact

Michael McMahon

- E-mail: michael@fsf.org
- GPG key fingerprint:
43372794C8ADD5CA8FCF
FA6CD03759DAB600E3C0
- IRC: thomzane
- Mastodon: [@thomzane@daedal.io](https://daedal.io/@thomzane)



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