

Developing a 3D Printing Program and Preliminary Results

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Establishing the Program



- Pilot program
 - Resources
 - Training
 - Succession
 - Goal markers

Resources

- Budget
 - \$1500 First year. \$750 subsequent years
- Dedicating staff
- Physical footprint
 - Space considerations



Training

- Standard Operating Procedures (SOP's)
 - Hardware
 - Software
- Succession planning

SAN GABRIEL VALLEY MOSQUITO AND VECTOR CONTROL DISTRICT

3D Printing: Filament Change

Standard Operating Procedure

OVERVIEW

1. Purpose

This SOP describes the procedure for changing the filament on the Ender 3 S1 Pro.

2. Background

3D printers can be used with different colors and material filaments. Following procedures when switching filaments will lead to cleaner prints and lessen the wear and tear of 3D printer over time.

3. General Workflow Overview

- A. Unload the Current Filament
- B. Load the New Filament
- C. Store Unused Filament

4. Materials

- a. Filament cutters
- b. Pliers
- c. Vacuum seal bag
- d. Vacuum pump

5. Instructions

A. Unload the Current Filament

Filament needs to be heated to remove cleanly from the 3D printer hot end and extruder. Start the process with the printer turned on. Turn on the lights for more visibility.

- 1) Use cutters to cut the filament ~2in above the hot end
 - a. Cut at a 45° angle
- 2) Take care to tighten and secure the spooled filament as much as you can to prevent loosened and tangled filament and pull the spool filament back out through the filament detector
- 3) Secure the end of the spool filament to the side of the spool with some tape and remove from the spool holder
- 4) Raise the hot end to a comfortable height to work on



One-, three- and five-year goals

One Year (Post Est.)	Three Year	Five Year
Exhaustive SOP's	3-4 fully trained staff	Evaluation of tangible products
2-3 filaments in rotation	Prints are in regular use	Program use survey
Routinely functional	Assess district printing needs	Cost analysis for in use items
Additional staff training		



Program Specifics: Hardware



Ender 3 S1 Pro

- Immediate use “out of the box”
 - Self leveling
 - Full metal extruder
- Estimated 1-2 years of project development
- \$500 for unit
- \$300 for maintenance tools
- \$200 filament stocking

Program Specifics: Filaments

- PLA



- PETG



- ABS



Program Specifics: Software

- Tinkercad



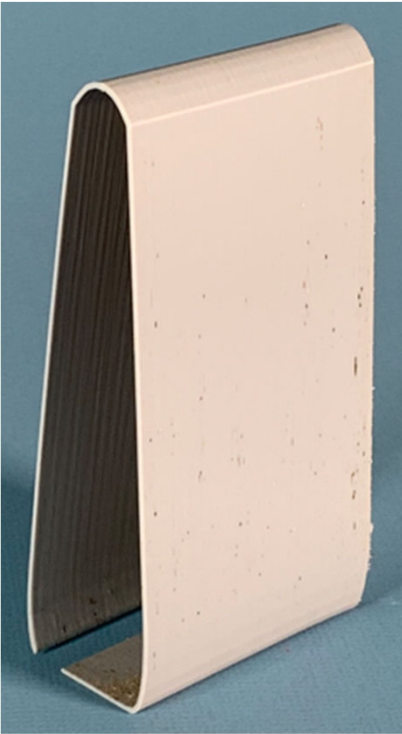
- Blender



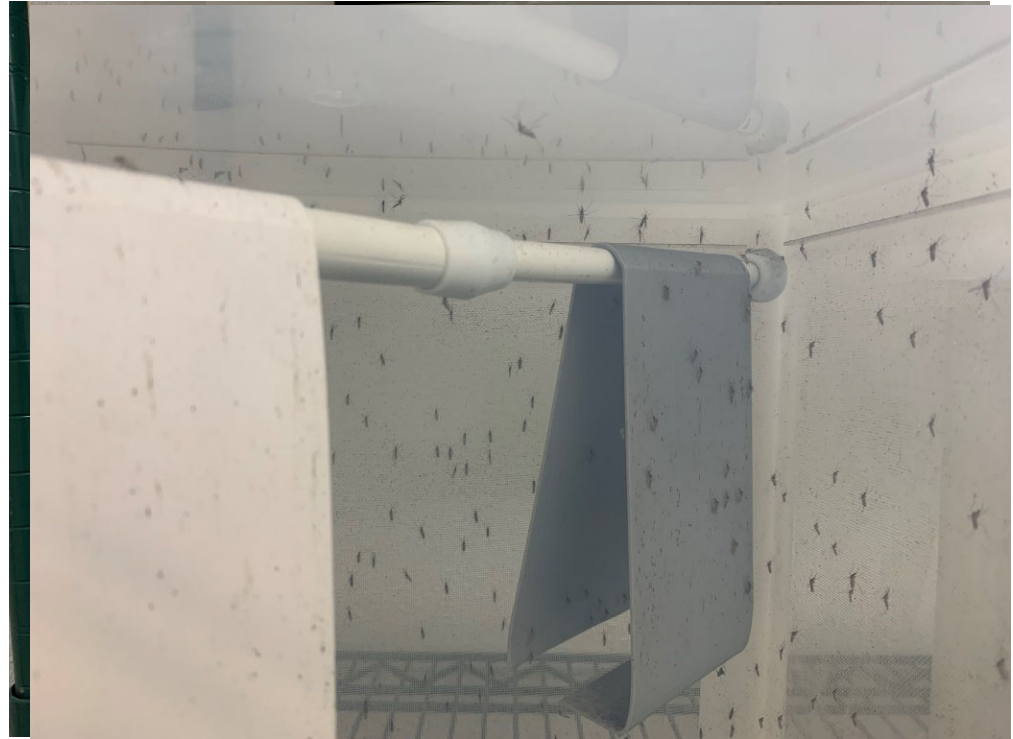
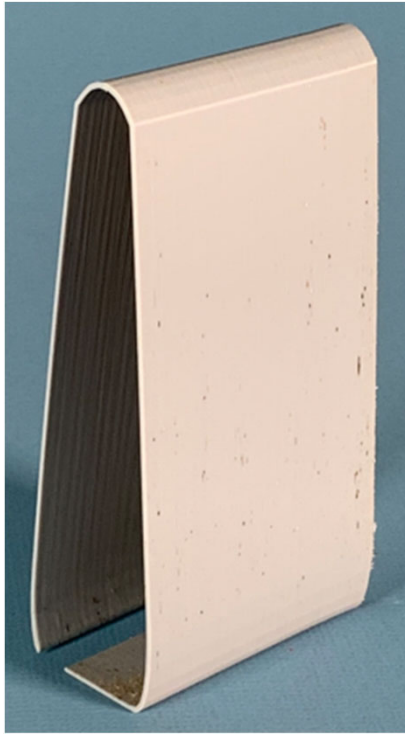
- Prusa Slicer



Preliminary Results



Preliminary Results



Preliminary Results



Preliminary Results



Preliminary Results



In summary

- The program was structured with an established pilot protocol
- Pilot goals outlined immediate and future requirements for material needs
- Once needs were met products could begin development





THANK YOU

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