

# Dental Triturator

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## Abstract

This poster displays the findings and results from the Dental Hygiene Fall 2017 Capstone project. This project was created to design a dental triturator that would better suit the needs of the NAU Dental Hygiene Department. Weight and independence from electricity were the main focus of the design. This design will allow the NAU Dental Hygiene Department to use a more beneficial device when traveling out of the country.

## Introduction

**Purpose:** The purpose of this project is engineer a new dental triturator that functions similar to the original design.

**Method:** Develop and test 3D printed attachments of different percentage fill to fit on the end of an electric toothbrush. Test the viscosity of the capsules with the original machine and three different electric toothbrushes.

## Background

In dentistry, a dental triturator is used to mix dental capsules. These dental capsules are then used to fill cavities or holes in teeth. Typically, tritulators are tabletop machines that run off of wall outlet electricity. The device shakes dental capsules that contain a homogeneous mixture for an approximate time. The mixture is then applied to cavities or holes in teeth.

## 3D Printing

The choice of 3D printed attachment parts being used is to ease the process of manufacturing spare parts and strong, lightweight material. Durability and manufacturing tests were performed to test 10, 40, and 90 percent filled parts, shown in Figure 1.

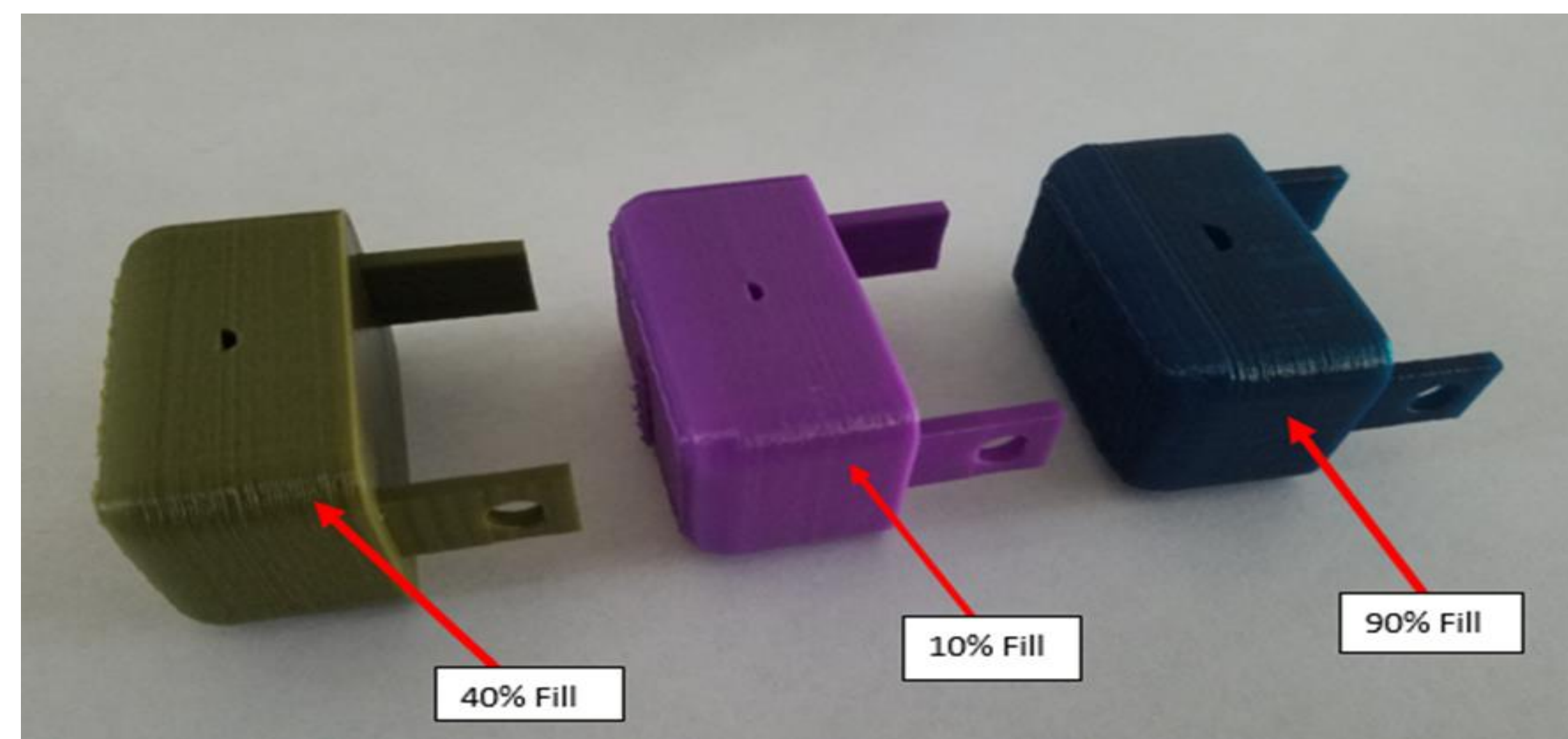


Figure 1: 3D Printed attachments with different percentage filled

## Results and Final Design

The final choice was the... Toothbrush and the 10% Filled attachment. The results show that this toothbrush had the best results according to viscosity of the mixture. Even though the 10% Fill was the most brittle, it is the cheapest and lightest choice.

### 3D Printing:

- 10% Fill was brittle
- 40% Fill less brittle, 2 g heavier
- 90% Fill has ductility, toothbrush failure

### Viscosity Testing:

- Toothbrush Viscosity
  - 1
  - 2
  - 3
- Machine Viscosity
- % Error



Figure 4 : Toothbrush with attachment

## Viscosity Testing

### Viscosity Results

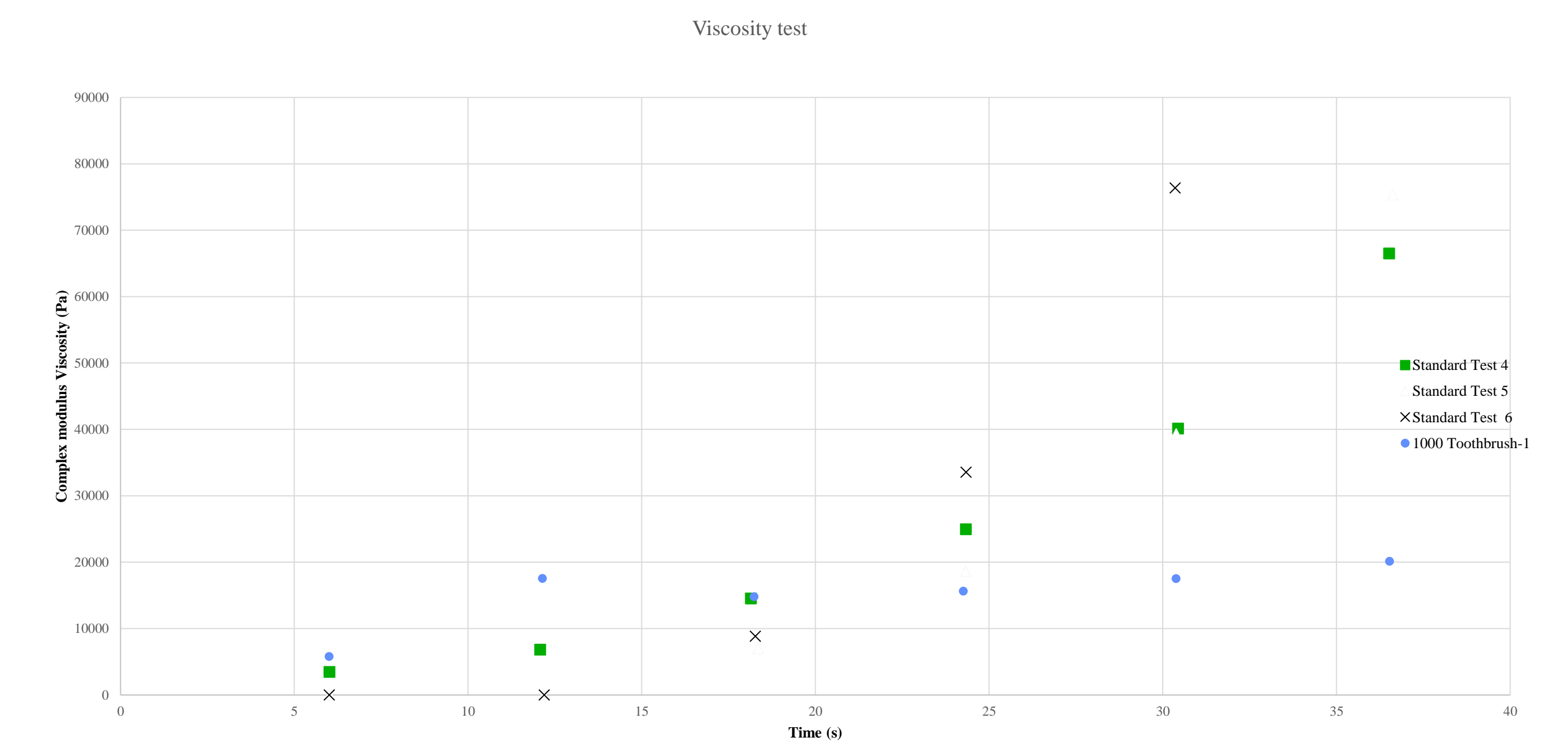


Figure 2: Viscosity Results



Figure 3: Left to right 8000, 1000 Oral B, and Low grade Toothbrushes

## References

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