

Final Product Testing proof

Open-Source 3D Printed Foot Prosthesis

Team 18F04

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04-12-2019



Testing:

The testing was taken in the machine shop at building (98C) using the machine called hand press. A hand press machine can be used for pressing and removing bearings (Figure 1.). There were three tests done in the machine shop. The first test was taken on the full design being positioned at an angle. The second test was on the full design standing up straight to see how much force it can withstand. The last test was on the PVC pipes by itself because the team wanted to see if anything would happen with the PVC pipes since they are fixed with a zinc metal screw.



Figure1: Hand Press

Results:

Test 1: The result of the first test was not done because as soon as we fixed it to the hand press it broke. Figure 2 shows how the design was added to the hand press before it broke with an old foot and Figure 3 shows the foot that was actually broken.



Figure 2: Position of the foot that was used



Figure 3: broken foot

Test 2: The results of the second test was that the design was put up straight and three push of the hand press was added on a metal piece that weighs 7 pounds. The reason why the metal block was added in order to fix the hand press metal. There was not an exact amount of force calculated because the hand press didn't have a dial gauge. The gauge that is found on the hand press machine is used to measure the Psi, so the equation was used to come with the result:

$$A = \pi r^2$$

$$A = \pi \times 2.5^2 = 19.634$$

$$F = P \times A$$

$$F = 19.634 \times 50 + 7 = 988.74$$

The workers that operated on the machine shop said that one click is about 50 Psi and the video shows that there were three clicks which means that the design held more pressure than the amount that was required (219).





Figure 4: Design assembly

Test 3: The third test was testing the PVC pipes alone with the same amount of pressure that we used to test the whole assembled design. The result was positive with no changes what so ever.



Figure 5: PVC pipes



Figure 6: The holes that were made on the PVC pipes

- Videos of testing:

1. <https://www.youtube.com/watch?v=xYlxcP5gi2Y>

2. <https://www.youtube.com/watch?v=o5WCqnn2EOY>