# Prototype I and Customer Feedback

## The Doors

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# Abstract

*This document contains the results of testing of the clamping systems functionality performed using prototype 1 and the prototyping test plan that will be used to test prototype 2. Also included is the feedback received from our presentation at AMBICO and how it has altered our designs.*

# Customer Feedback and Revisions

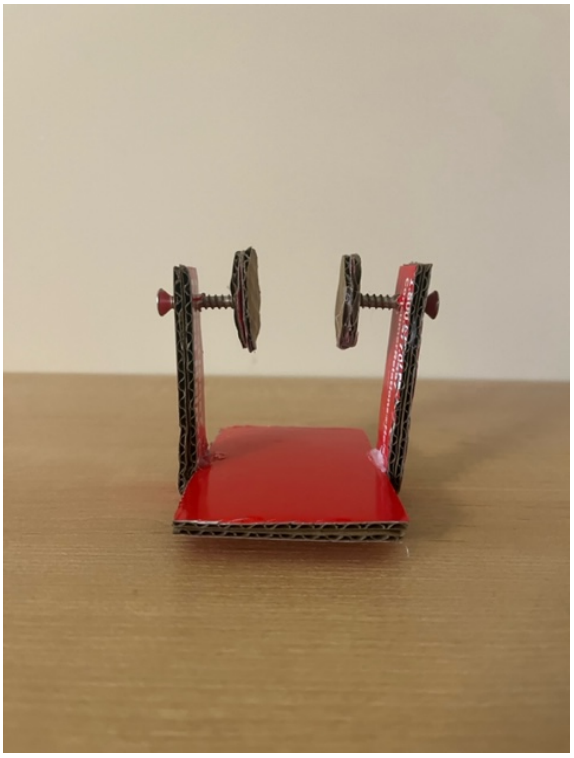
After the initial client meeting during which we presented five different designs, then explained that a combination of two would best suit their needs. The client feedback allowed

us to adjust the design in such a way that allowed all the design needs to be met. The primary feedback the client gave was to prioritize stability in the clamp system, add tubes to help properly align the drill, and not be concerned with the weight of the product as long as the door will not be damaged. We used this feedback to make small changes to our final design. Firstly, a second C-shaped clamp was added to the bottom of the jig for additional stability. Additionally, tubes were added to the holes in the plate portion of the jig to ensure the drill would only enter the jig completely perpendicular to the door, and taking the comments about the weight of the jig into account, we are able to choose a material that is more durable without having to worry about weight restrictions.

# Prototype I

The goal of this prototype was to determine if the clamping system would perform as needed for our final design. While crude, this prototype will provide information on the speed and reliability of the sub-system as well as user-friendliness

# Prototype Photos



# Test Results

## Speed Test:

In order to test the speed of this design I asked my roommate to attach the clamp to our dinner table with no instruction while I timed him. He achieved a time of 12.8 seconds on his first attempt and 11.68 seconds on his second attempt. These times have satisfied the criteria needed to meet the client's needs and will only be reduced once more refined prototypes are reduced

## User Friendliness Test:

After the test was complete I asked my roommate a few questions about how easy he felt a system of this type was to operate. Based on his initial speed installing the clamp and his feedback it was determined that this design will be suitable for our final design.

## Grip Test:

While providing good support vertically where this design failed was when pulled horizontally away from the surface it has been clamped onto. This tells us that there will need to be improvements made to the gripping system of our clamp. This will be done using the second prototype where we will test different materials and surface areas to determine the optimal design.

# Prototyping test plan

| Test ID | Test objective (why) | Description of Prototype used and of Basic Test Method (What) | Description of Results to be Recorded and How These Results will be used (How) | Estimated Test duration and planned start date (When) |
|---|---|---|---|---|
| 1 | To test if the structure ( clamp connecting to plate) can stabilize itself on the door | Stability test | Place the prototype on the side of a desk, and simulate a door placed horizontally/ hang some weight on the prototype and it needs to remain stable on the table | 30 min/ 17-Nov |
| 2 | To test if the structure (whole structure) is fragile or not | Structure consolidation test | Drop the prototype on the floor/ increase the height after each drop/ check if there is a broken part after each drop/ Stop after reaching 2m | 15min/ 17-Nov |
| 3 | To test if the structure ( tube connecting to the plate) can withstand the shock and vibration from the driller | Shock test | Put the driller inside the tube/ turn on the driller/ hold the driller for 3 min on each tube | 20 min/ 17-Nov |
| 4 | To test the grip strength of the clamping system and if it can provide enough stability to prevent | Grip test | A horizontal force will be applied to the jig in increasing increments until the Jig fails. Results will be | 10 second intervals/ 17-Nov |

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|---|---|---|---|---|
| | movement when a drill is repeatedly inserted and removed | | used to determine the optimal size and material of the clamping point | |
| 5 | To test if the placement of holes is correct and if the driller can fit into the tube | Size and shape test | Compare the holes with the actual hinge/ try to fit the driller into the tube | 10 min/ 17-Nov |

# Conclusion

Prototype 2 needs to be done soon to begin further testing because, at this stage, prototype 1 cannot provide much information. It is made out of cardboard, which can provide us with the model of the jig, but we can't do any structural testing due to the material difference. That is why prototype 2 needs to be done as soon as possible to start testing,  identify design flaws, and fix design problems.