Deliverable G

GNG 1103F-
Winter 2024
University of Ottawa

Breaking Good
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Contents

Introduction

In this deliverable, we delve into the comprehensive testing and documentation of Prototype II, marking a significant stride in our project's evolution. With a keen focus on meticulous testing procedures, we've rigorously examined key components including the motor, overheating duration, sample rotating system, leakage potential, and the slurry mechanism. This iteration represents a crucial phase where we not only assess the functionality of our prototype but also seek invaluable feedback from potential clients to refine our design further. Alongside detailed testing outcomes, we present a comprehensive bill of materials and unveil the test plan for our next iteration, Prototype III, setting the stage for continued innovation and refinement aligned with our client's needs and expectations.

Prototype test plan/Analysis/results

Time until overheats	5 min
Time until cooldown	20 min
Secure lid on system (3X2.5min)	Lid is secure
Is rod secure (3X2.5min)	Rod is secure
Slurry to put? (1/8 container)	Good
Slurry to put? (1/4 container)	Good
Slurry to put? (1/2 container)	Good

Feedback from potential clients

Client 1: Shania Sheth

Shania.sheth@queensu.ca

"Simulating natural environments, makes a lot of sense so I see the point. And there are lots of environmental climates out there, perhaps if you did it in ice cold water or put it over a Bunsen burner to simulate different heats of erosion it would be useful"

Client 2: Siddharth Seth

Siddharth.seth@queensu.ca

"Change slurry, like, replace the liquid to different things. Because then you can measure something that has to do with the system"

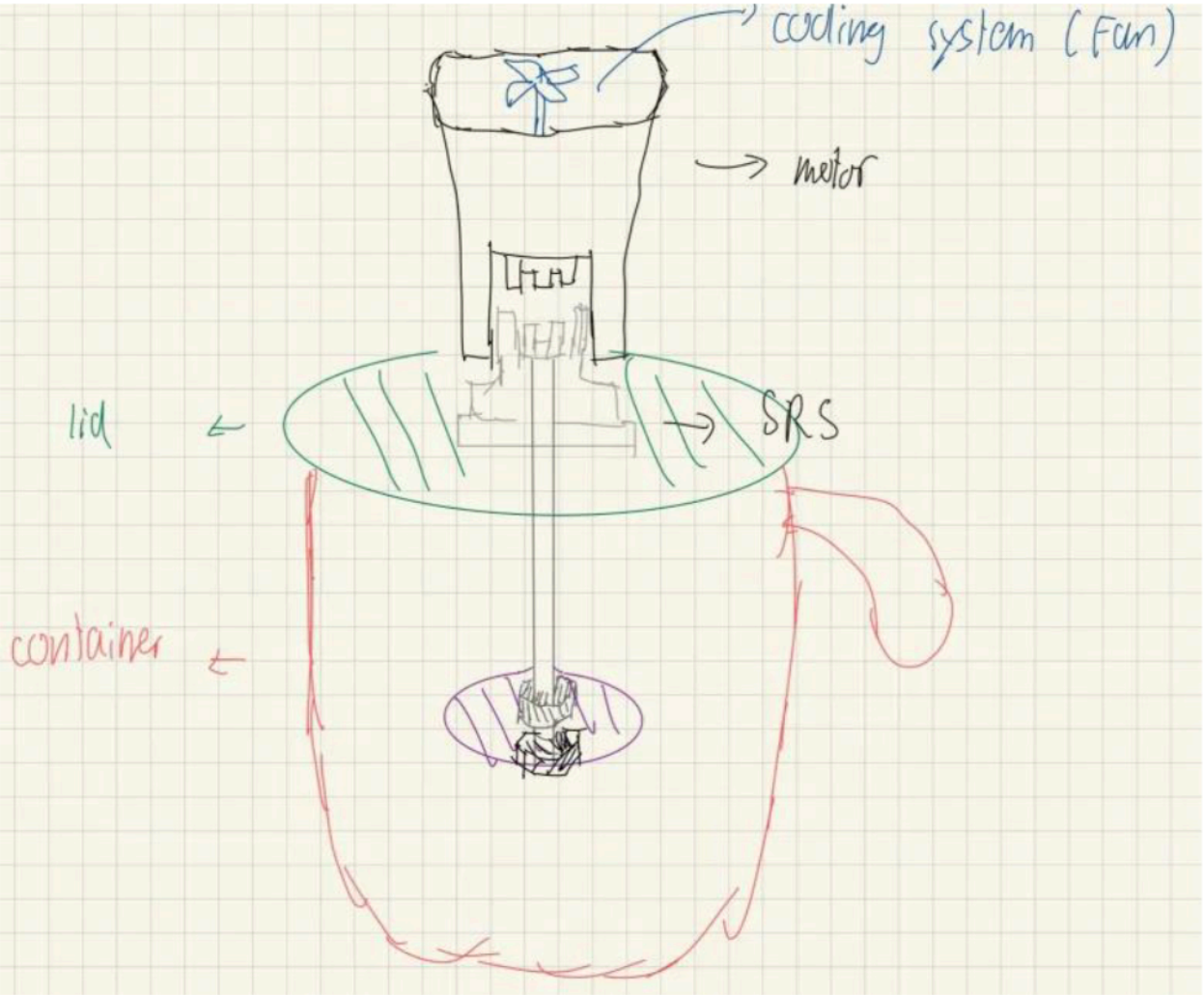
Client 3: name unknown

Luih4@mcmaster.ca

"This experiment will only be really useful if you can find a time equivalent in the real world to time in the machine. For example, find the rate of erosion in minutes then find out how many years that would take to be that degraded"

These are people we approached in the STEM science fair this weekend, so they are all research students from different schools

Detailed Design of Prototype II



Bill Of Materials (BOM)

Materials	Price $
Bucket	4.75
Juice Jug	2.5

Other materials that do not cost any money

- Bolt
- Screw
- 2 nuts
- Washer
- Motor (lightning)

- Lid (3d print)

Prototyping test plan for Prototype III

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 see if a microcontroller Arduino works.	For the prototype III we are going to put an Arduino onto the switch	We will record if the Arduino is accurate, if it is then we will mark down that the Arduino works	2 min 3/24/2024
2	Different slurries	We will use 3 different abrasives in the liquid used in prototype III	If the material deteriorates enough, then the weight before and after will be measured. If there is not much erosion, then photographic data will be recorded to find which slurry is the best for erosion.	4h 3/17/2024- 3/24/2024

Trello Link

https://trello.com/invite/b/D74MvsJy/ATTI177f776d7e29c28ddcd4394a249d72f950CCDAD2/breaking-good