To Predict ▶ To Design ▶ To Perform

College of Engineering
Department of Mechanical & Industrial Engineering

ME, ECE, BE Capstone Design Programs

Team 3: Instant Rim Brush

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Background

- Current rim cleaning methods are effective yet inefficient
- Most common method involves manually scrubbing the rim with a brush or cloth
- Time consuming and arduous

Objectives

- Clean the rims of any vehicle
- Lightweight, portable design
- Versatile brush and drill attachments

Eng. Specifications

- Overall weight: < 7 pounds
- Structural deflection under normal operating loads: < 0.125”
- Allowable Stress in Aluminum Tube: 24 ksi
- Center of mass must be located between the cordless drill and ergonomic handle for optimal control

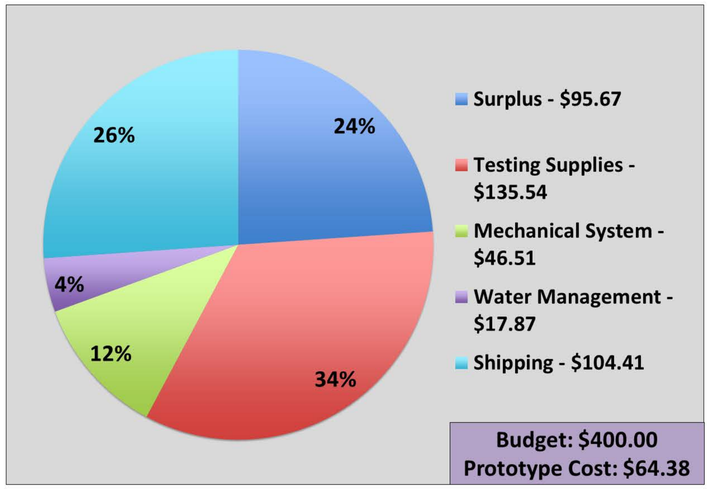
SolidWorks 3D Model

Testing and Results

- Tape lift test to determine the percent area coverage of the rim
- Samples were analyzed under a microscope to determine size and quantity of particulate contaminates
- On average from 40 samples, the Instant Rim Brush outperformed hand washing:
    - Removed 18% more contaminates
    - Required 44% less time

Instant Rim Brush

Budget



Materials/Manufacturing

- Structure: 6061-T6 Aluminum
- Connectors: 6061-T6 Aluminum
- Brush: Nylon Bristles
- Bearings: 52100 Chrome Steel

Safety

- Design includes an ergonomic handle to ensure comfortable and safe operation
- User kept away from hazardous rotating equipment
- Keep cordless drill away from water source and chemicals