

40 Quart Cooler Design

Progress Report Presentation

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Overview

- Team Introduction
- Product Description
- Client Identification
- Client Needs
- Typical Customer
- Prototyping
- Testing
- Group Progress



Product Description

We are designing a 40 quart cooler, with a MSRP of no more than \$ 189.99 that offers excellent construction quality and features with the best coolers available on the market.



Client Identification

- Mr. Jason Costello
- Has been working at Canyon Coolers for two years
- Marketed coolers range from 22 to 800 quarts

Client Needs

- Unreliable production quality of coolers manufactured in Thailand
- Fairly high failure rate of small components
- Profit is lost in handling returns and exchanges
- Existing 40 quart cooler does not nest inside other existing coolers sold by the company
- Insulation and wall thickness is not quite adequate in the existing 40 quart model

Typical Customer

- Outdoors sports enthusiast, camper, hunter
- Enjoys multiple day long excursions in the wilderness
- Keeping food and beverages refrigerated is a vital need
- Needs an extremely reliable product
- Maximum insulation is key choice when purchasing a cooler

Prototyping

“Phantom” latch

- CAD file completed
- Already have rapid prototype
- Ready for manufacture
- Talking to contacts for injection molding



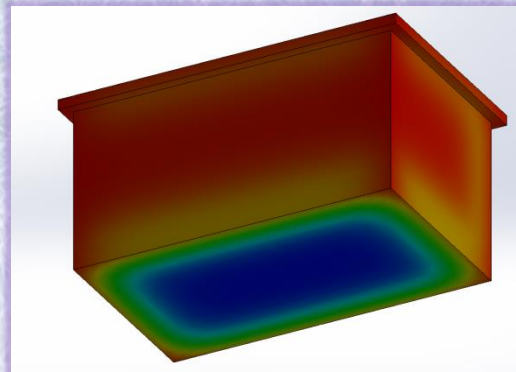
Prototyping

Hinge Section

- Redesigned cooler hinge
- Developing a scaled down functional prototype
- Prototyping will be carried out via NAU's rapid prototyping facilities (3-D printer)

Testing Overview

- Conduct experiment on the existing 40qt cooler to collect heat transfer data
- Model the existing 40qt cooler in SolidWorks
- Use experimental data to verify the accuracy of the SolidWorks heat transfer analysis
- Model our cooler in SolidWorks and conduct a heat transfer analysis, to show how our cooler preforms.



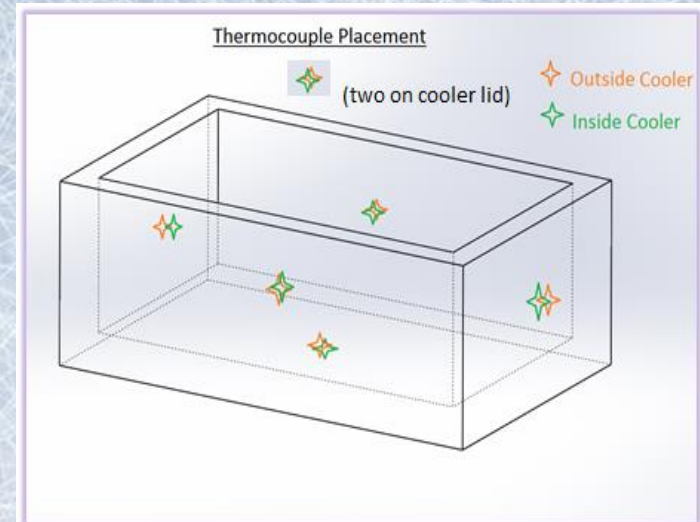
Testing

Procedure

- Tested in constant room temperature
- 12 J type thermocouples and data logging software
- 1 block of ice
- 5 hour duration

Purpose

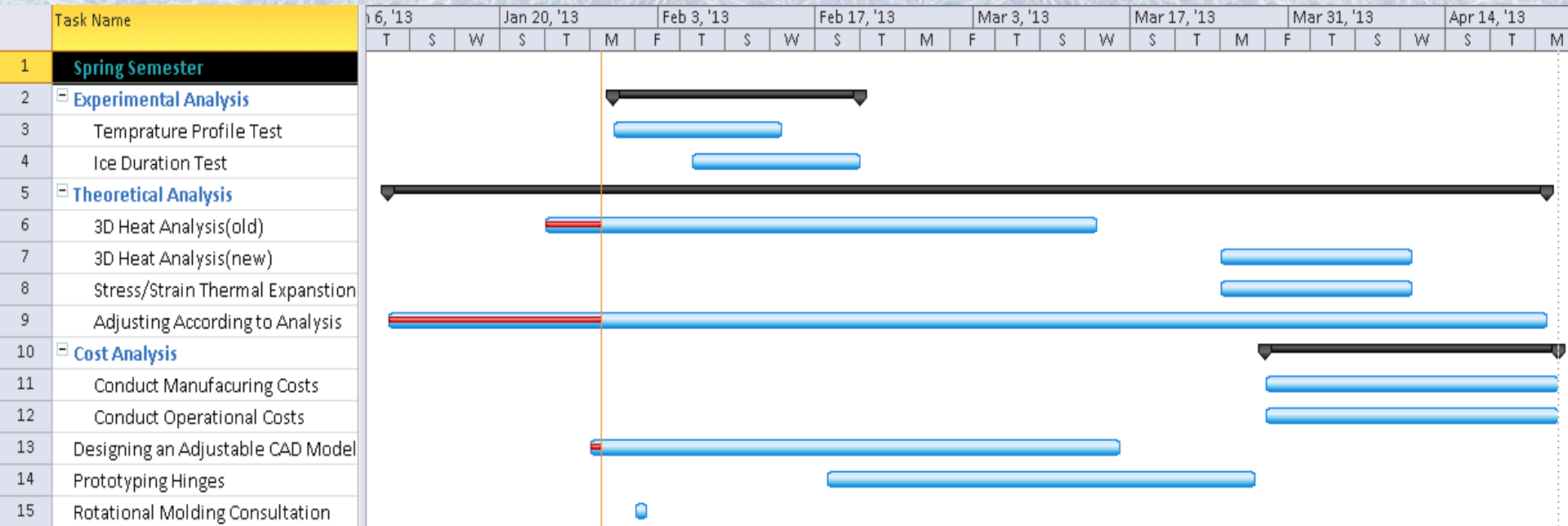
- Get data to determine real heat loss values
- Use data to verify our theoretical analysis



Semester Overview

- Conducting experiments to validate our computer simulations
 - Heat transfer and stress\strain analysis
- Manufacturing research for injection and rotational molding
 - Visit Michael Bros. Rotational Molding Company in Prescott AZ.
 - Find a client for injection molding the improved latch
- Manufacture a fully functional “Phantom Latch”
- Develop a scaled down functional model of the improved hinge assembly.
- Final cost analysis
- Present to client and UGRADS

Group Progress



References

- www.canyoncoolers.com
- <http://www.lascarelectronics.com>
- <http://www.solidworks.com/>

Questions?

