



# Cooler Cooler

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## Introduction

The problem was noticed by our sponsor when tailgating at a tennis tournament.



Storing a large trash bag with ice in the spare tire compartment causes issues.

This led to a realization that creating a collapsable, free-form, efficient cooler could revolutionize the cooler market.

## Problem Statement

What is the problem?

A truly malleable, soft cooler isn't available on the market

Why is it a problem?

The rigid geometry of cooler can cause practical problems:

- Space
- Usage
- Portability

Where will it work?

Function in any reasonable climate

## Objectives & Constraints

Keeps Contents Cold for a Long Time

Contents are at or below 40°F for 8-12 hours

Operate in a Wide Range

50-100°F

Testing done at 90 °F

Collapsible by a Majority of Expanded Volume

75% reduction

## Design

The quilted insulation allows for the cooler to collapse more due to the gaps in the insulation acting as hinges. This allows the cooler to fold together in the same way every time and because the gaps are so small (2-5mm), the heat transfer through them is negligible.

The outer material is a 1680 denier, ballistic nylon fiber capable of withstanding just about anything the user could throw at it due to its flak jacket like properties.

This photo shows the cooler in its fully expanded form, having an internal volume equivalent to 15 liters.

The wide fabric handles allow the cooler to be comfortably and securely carried even when completely full of ice and drinks.



Quilted Insulation



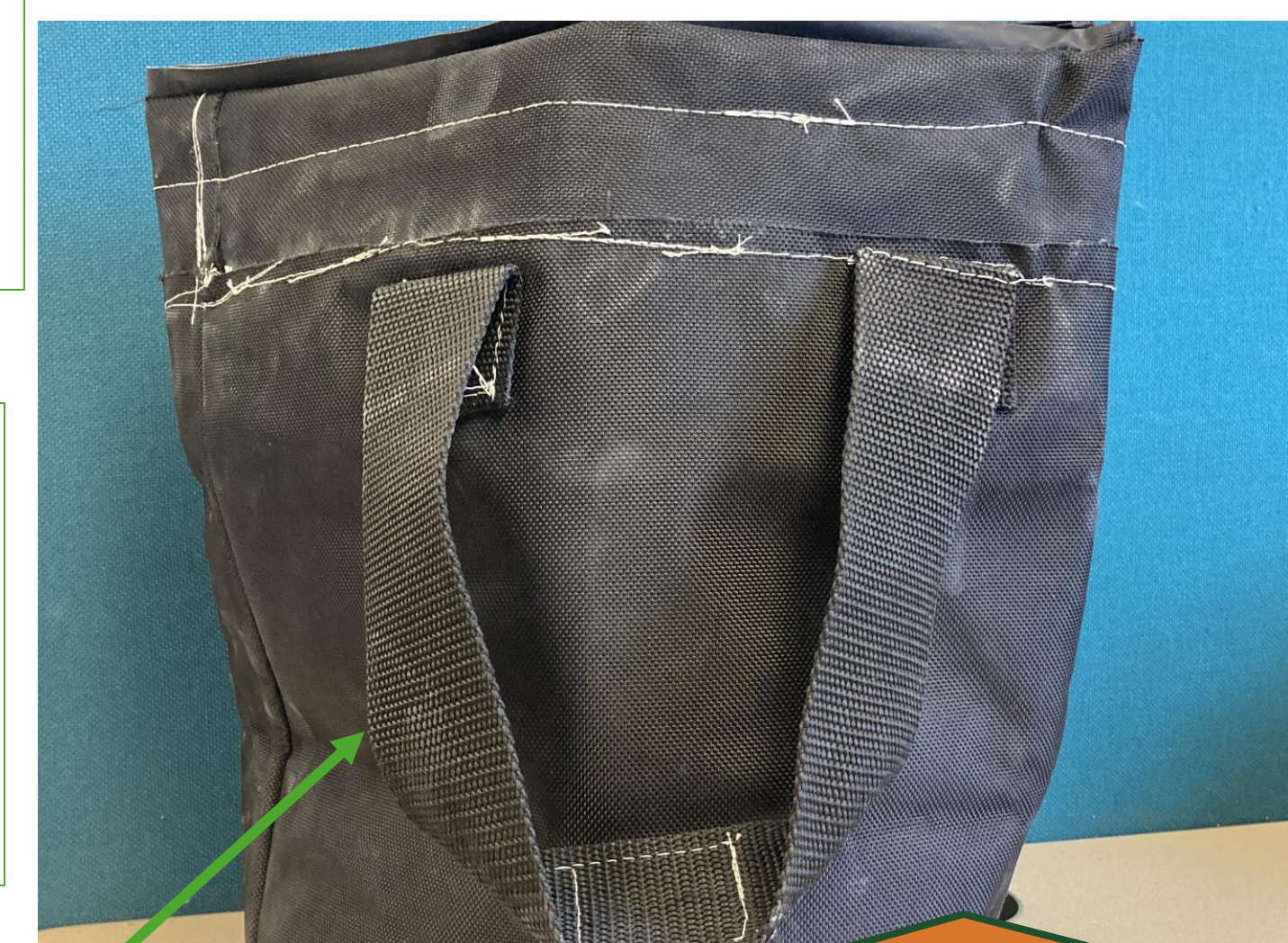
Interior

The inner material is a durable, highly reflective, aluminum-based vapor barrier that repels radiative heat transfer and provides water proofing.

The sown in base at the bottom of the inner material, insulation bag provides structure while still allowing the cooler to be completely collapsable and malleable.

The handles are multipurpose as they also wrap around the cooler to Velcro together when collapsed to help keep the cooler together during transport. Doing this saves space and keeps the product practical.

A waterproof zipper was chosen instead of the more industry common "roll and buckle" at the request of the sponsor, providing a unique look and feel to the design.

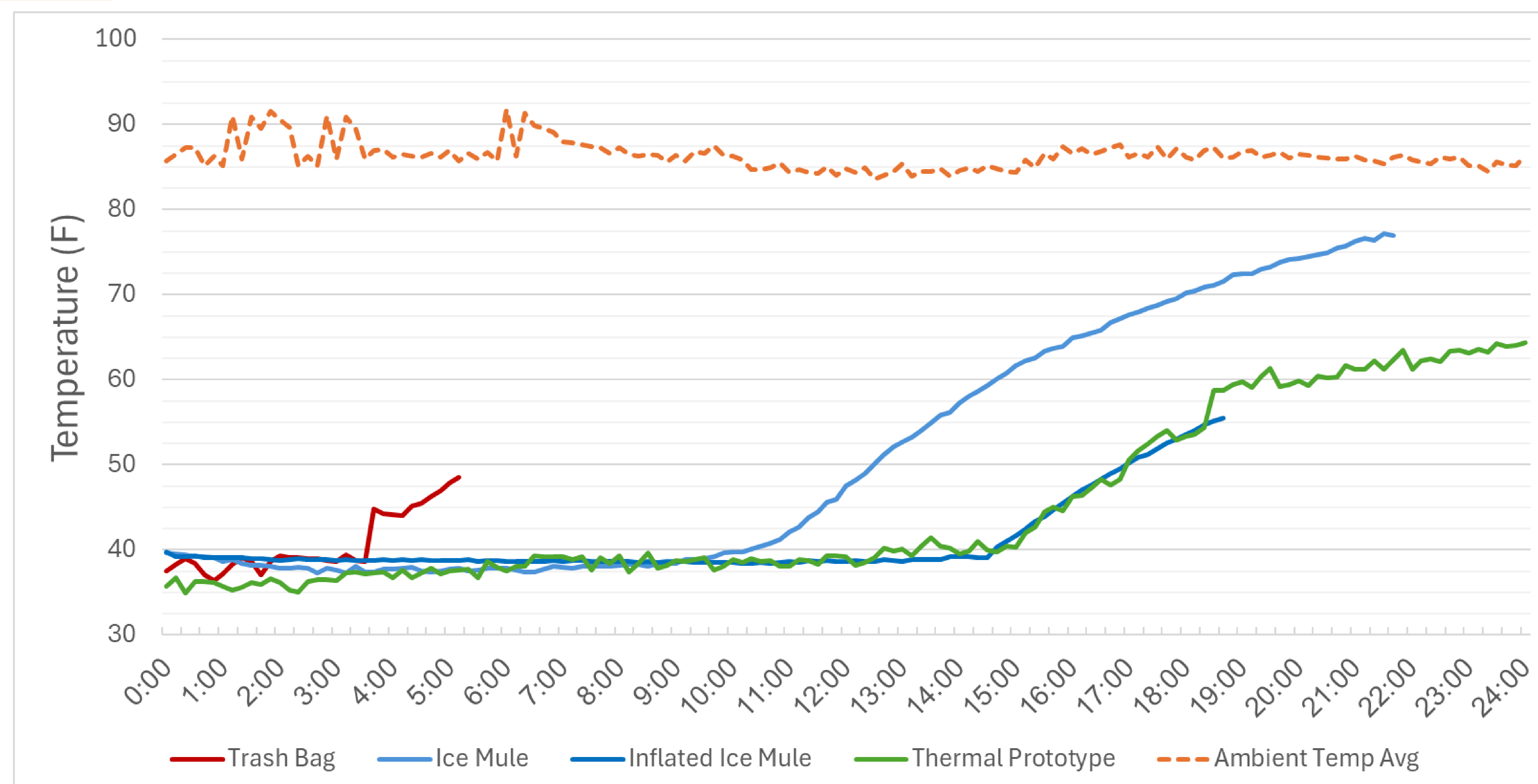


Expanded Form



Collapsed Form

## Thermal Testing Results



## Results

Objective	Target Value	Tested Value
Time to keep contents at or below refrigerator temp (40 F).	8-12 Hours	14 hours, 20 minutes
Operates in hot ambient temperatures.	~ 90° F	~ 87° F
R-Value	5.76	6.37
Waterproof	Yes	Yes
Malleable	Yes	Yes
Collapsible	75% reduction	85% reduction

## Conclusions

Thermal testing exceeded the requirements by 2 hours.

R Value exceeded requirements by 0.61  
Cooler is waterproof, malleable, and collapsible.

Room for improvement can be seen in the team's inexperience in consumer product design, textile manufacturing, sewing, waterproofing, and product assembly.

## Next Steps Forward

Before handing off the project, our team has documented and given the sponsors what they need to allow the inheritors to create:

- Professional tech packs (for manufacturing)
- Professional prototypes (improved cosmetics, waterproofing, and assembly procedure)
- Make the product more economical

