



FAMU-FSU
College of
Engineering

Virtual Design Review 2

Team 509 - Corning



Team Introductions



Anthony Arroyo
*Manufacturing
Engineer*



Austin Cramer
*Control Systems
Engineer*



Khanh Nguyen
Material Specialist



William Shuman
Testing Specialist



Nathan Thompson
Design Engineer



Sponsor and Advisor



Project Sponsor
Dr. McConomy, Ph.D.
Professor



Project Sponsor
Jeffery Roche
Project Manager



Project Sponsor
Trent Brush
*Additive Manufacturing
Engineer*



Project Sponsor
Justin Barber
*Additive Manufacturing
Engineer*



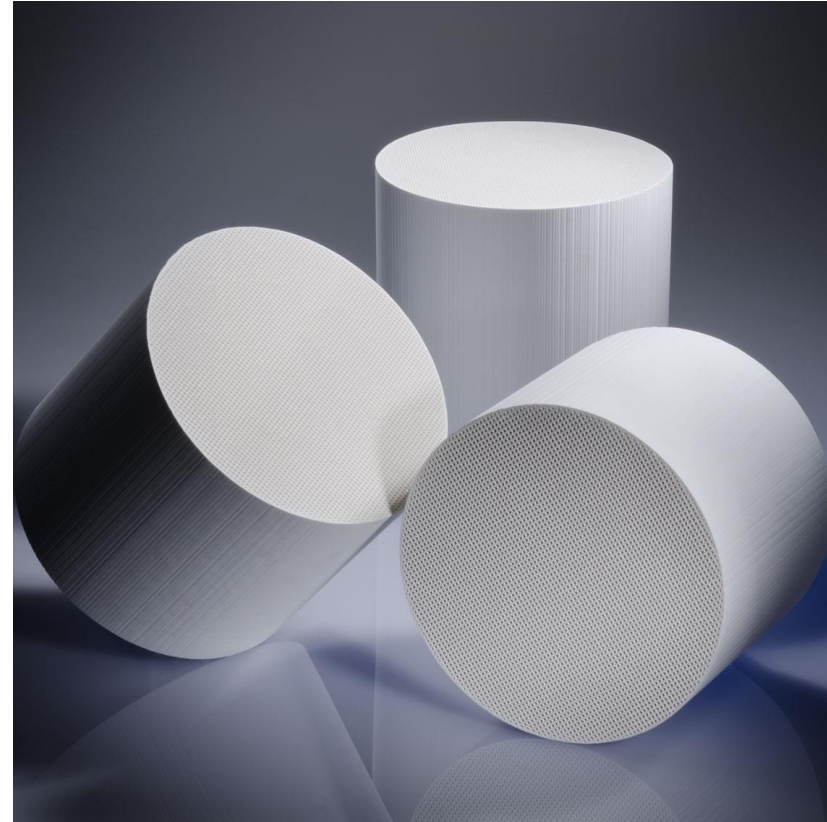
Objective

The objective of this project is to mitigate debris on the mylar sheet during the justification process.

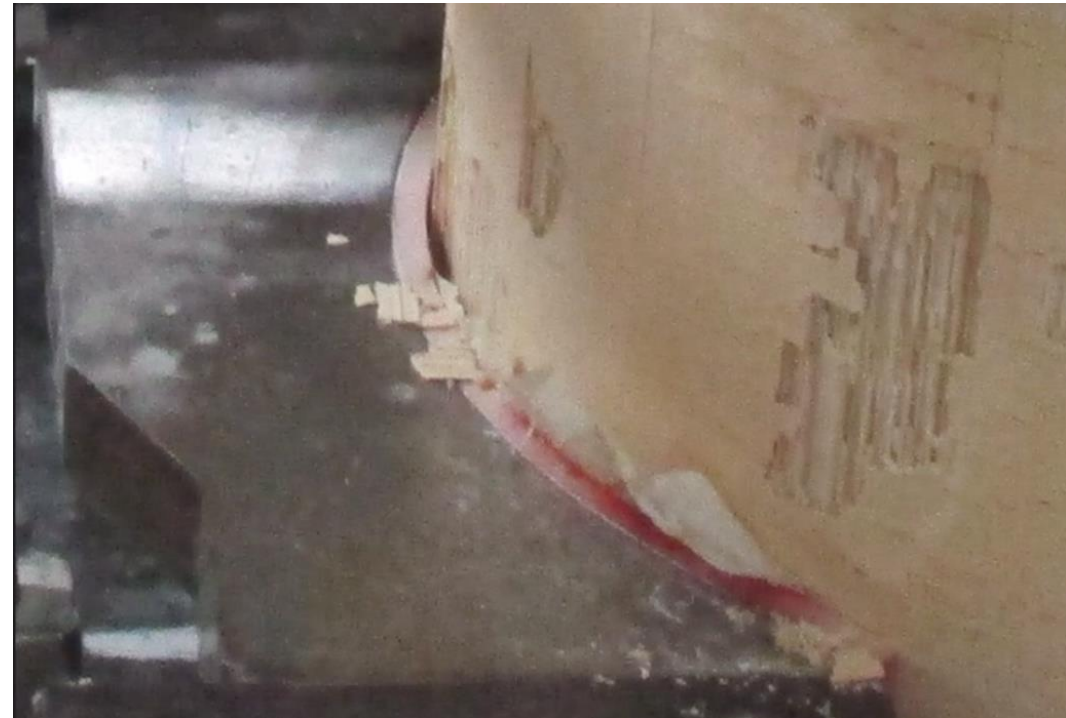


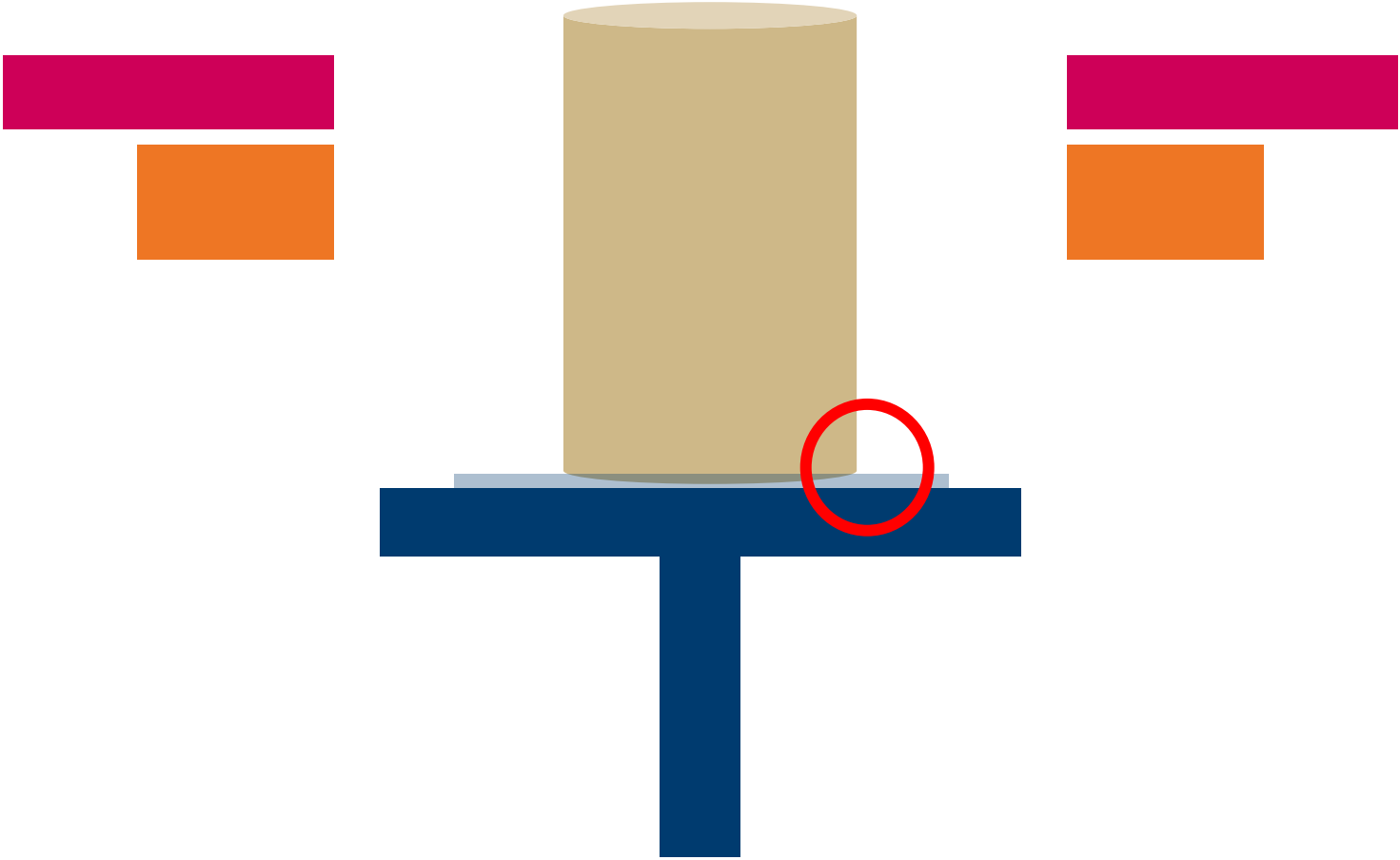
Background

- DPFs are used to filter diesel exhaust gasses.
- Made of an extruded cellular ceramic material.
- Cement is pumped in on both sides.



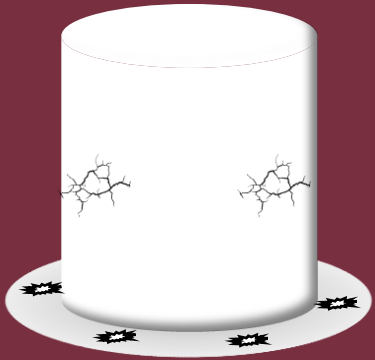
Project Summary



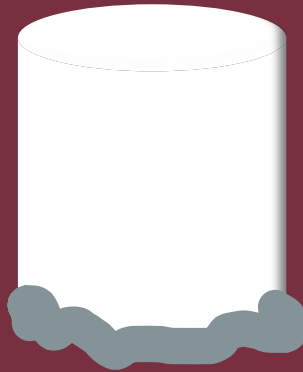


Key goals

Prevent Debris On Mylar



Reduce Filler Waste



Reduce Downtime



Critical Targets

Automated
Design

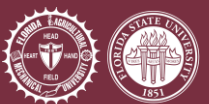
Fix 50 Parts
per Day

2 Degrees of
Freedom

0.4 g of
debris

9 hrs/month
of Downtime

Concept Generation



Generation Methods

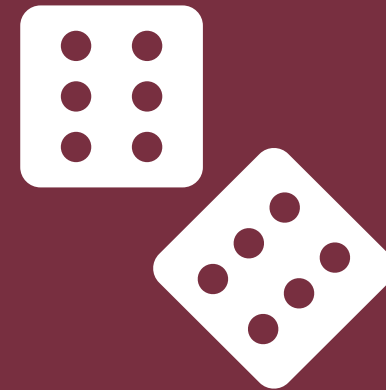
Anti Problem

~~Problem~~

Brainstorming

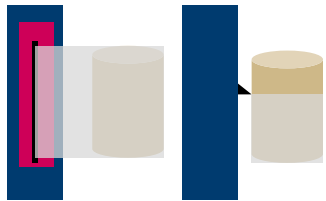


Crap Shoot

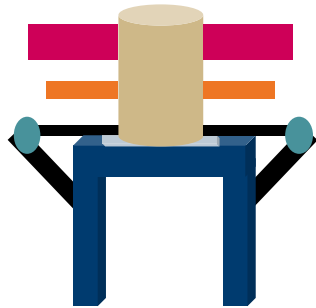


Medium Fidelity Concepts

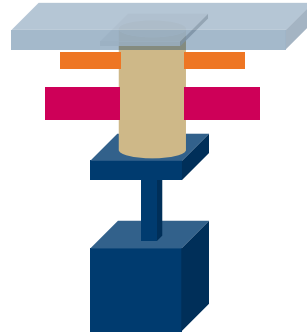
Plastic Wrapper



Mylar Defender



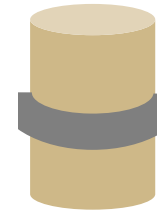
Inverted Justification



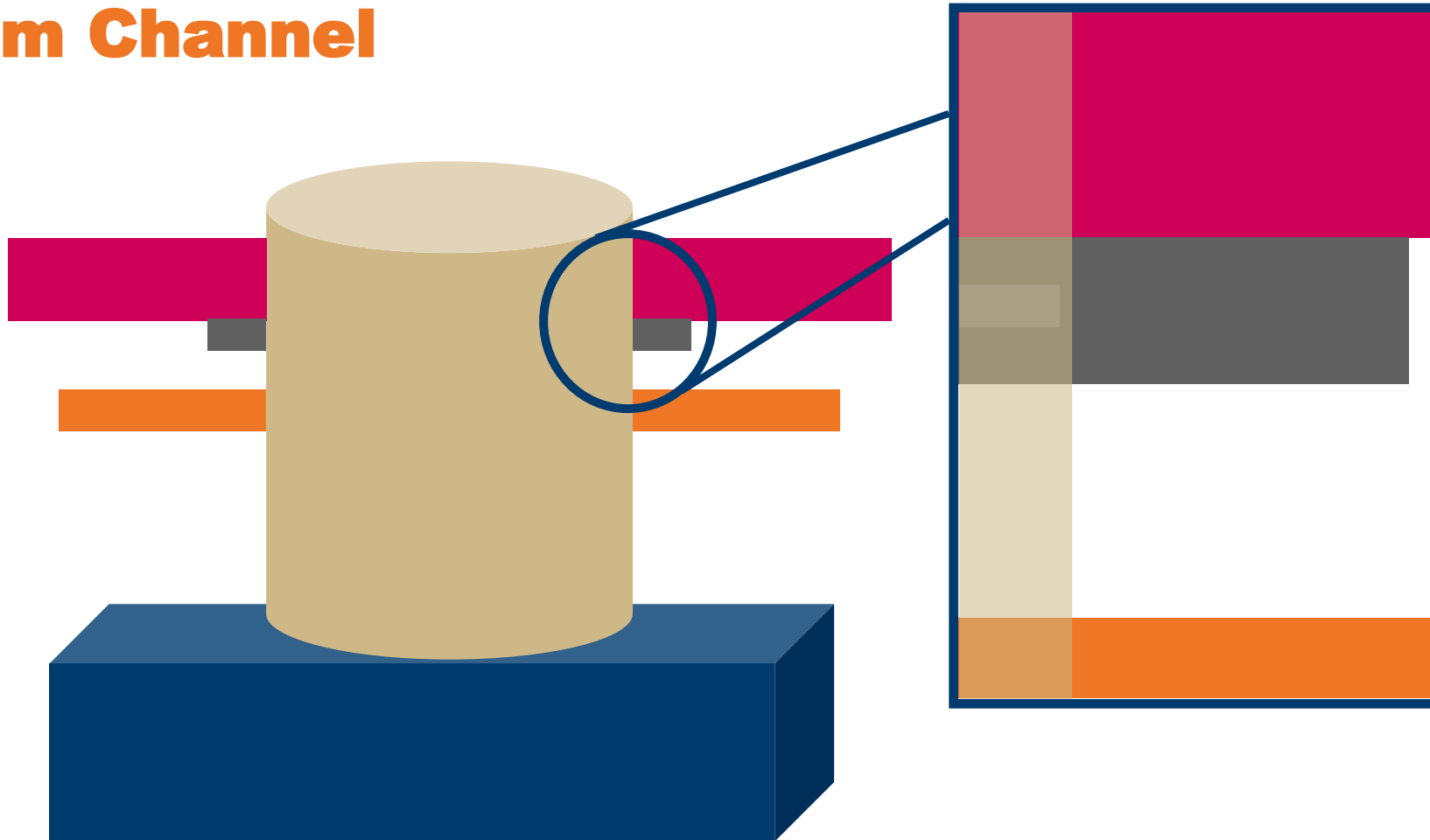
Mylar Vacuum Seal



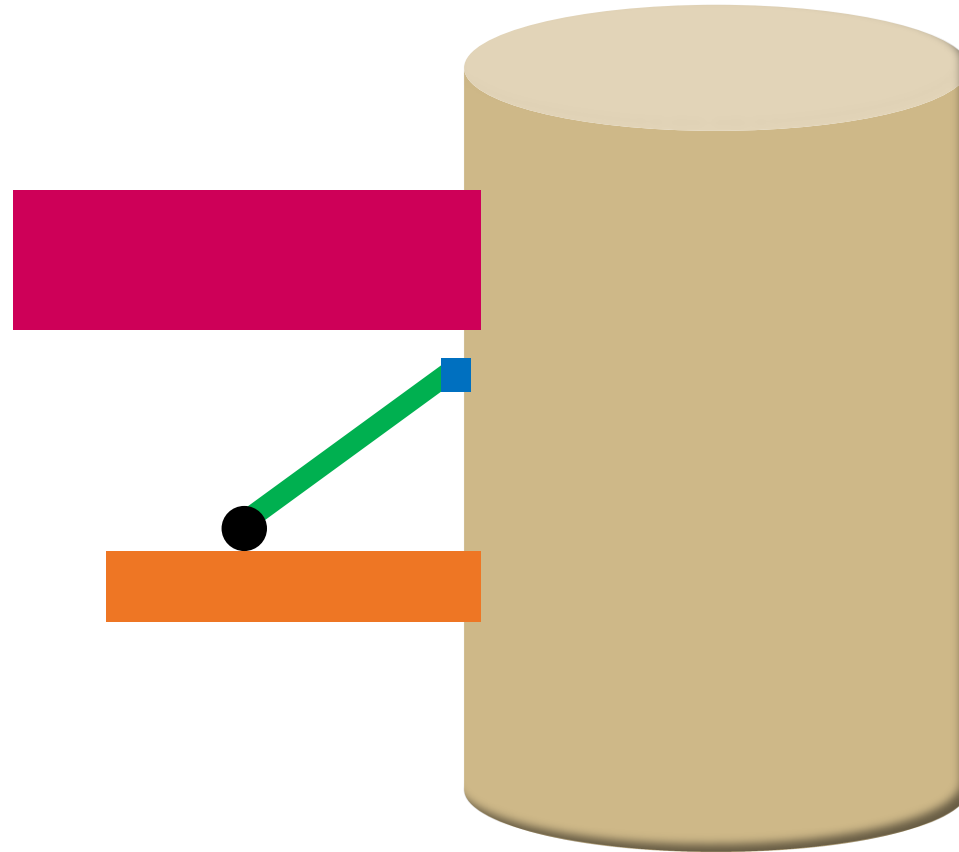
Ring On Mylar



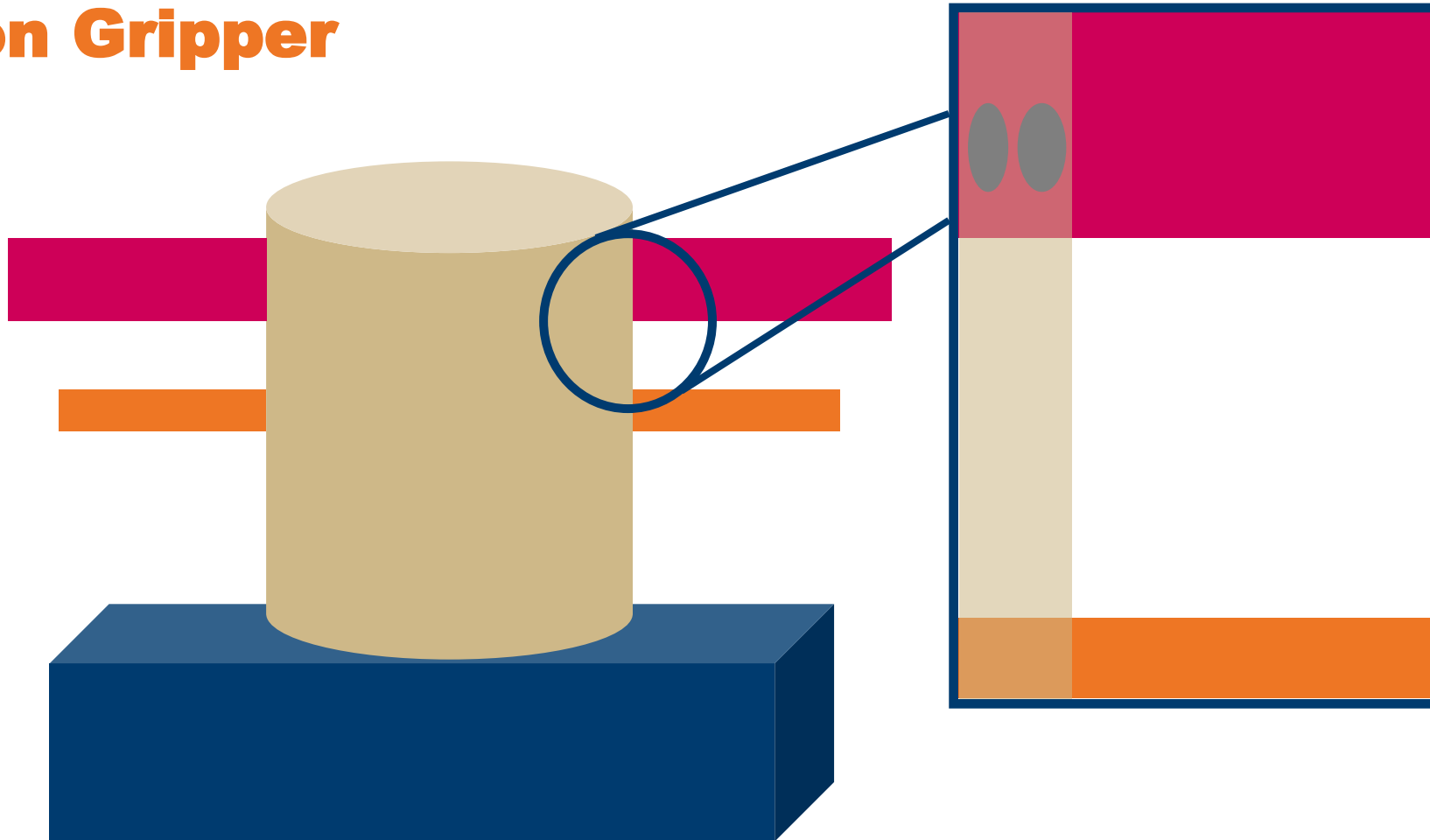
High Fidelity Concept: Vacuum Channel



High Fidelity Concept: Spring Ramp



High Fidelity Concept: Suction Gripper



Concept Selection



House of Quality

Debris on Mylar

Maintenance

Stabilize DPF

Longevity

Integrate with Tooling

Automation

1

2

3

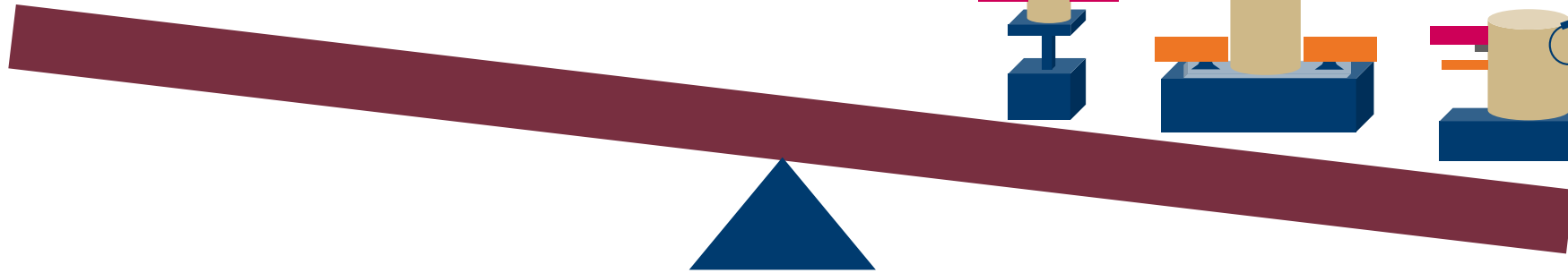
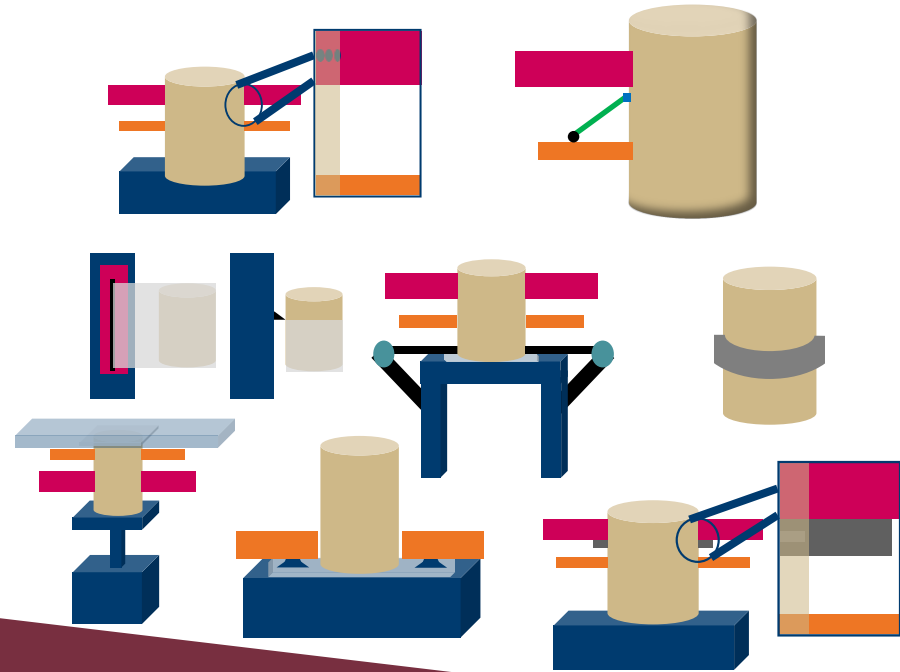
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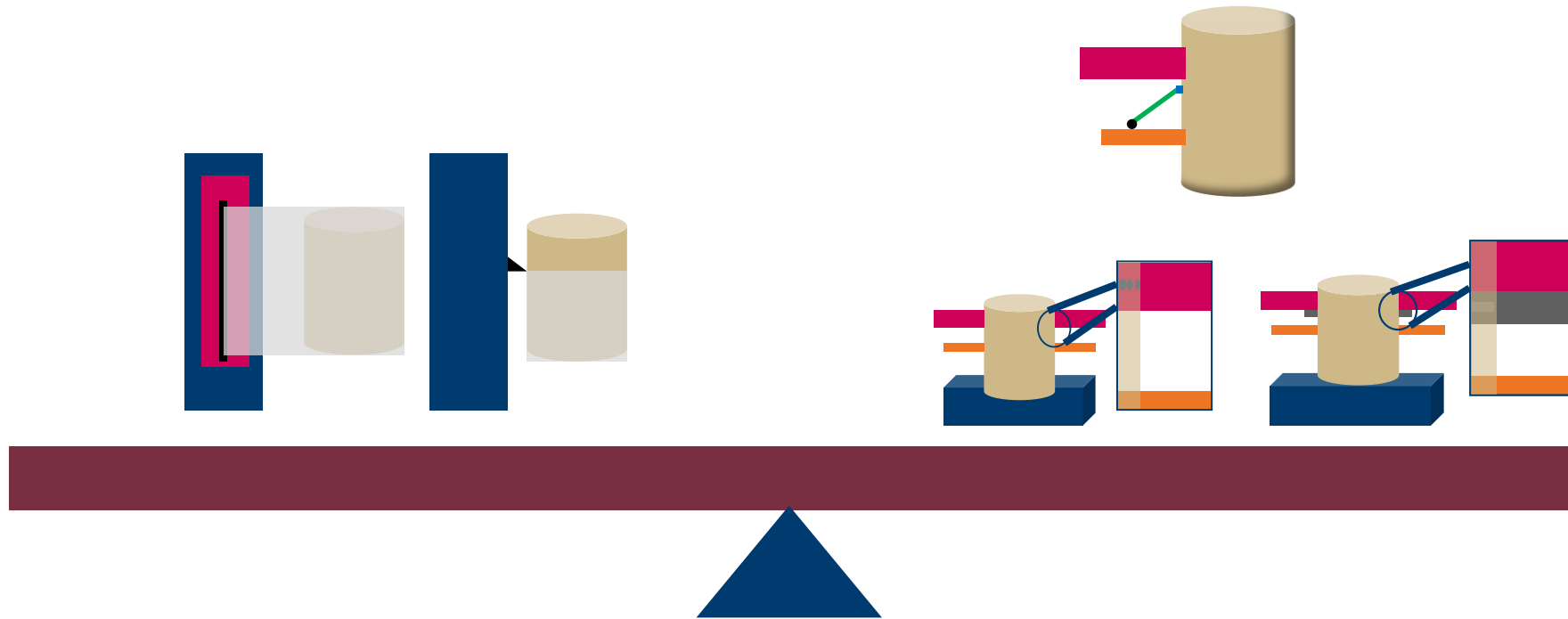
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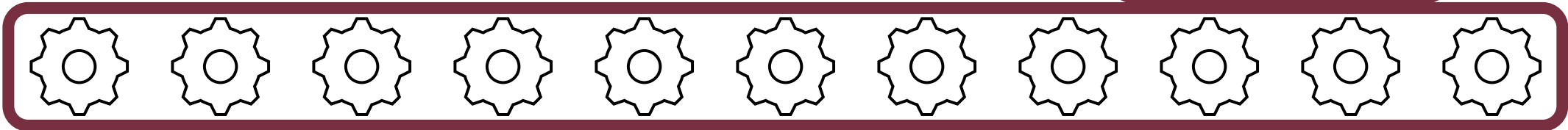
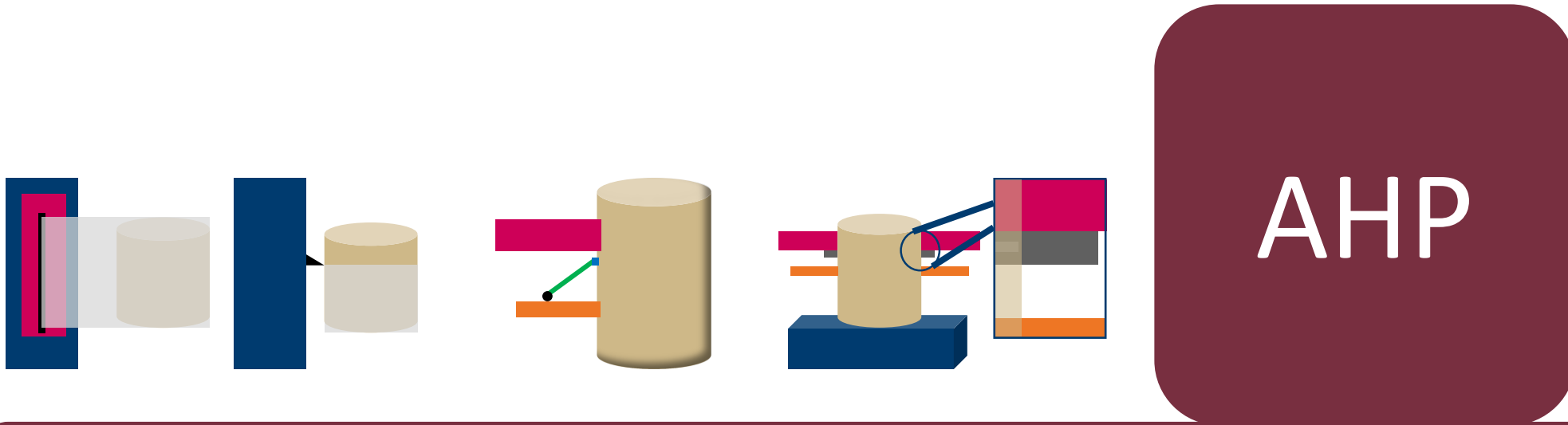
Pugh Chart: Market Datum



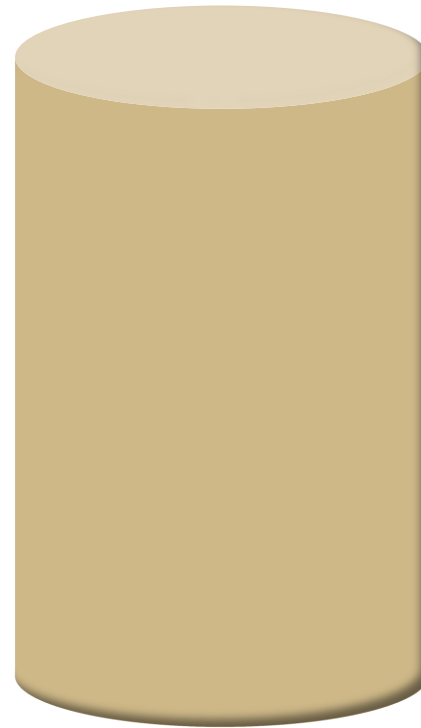
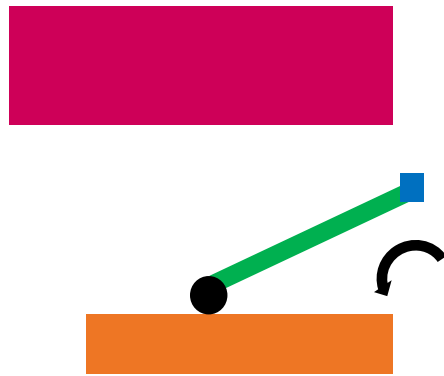
Pugh Chart: Concept Datum



Analytical Hierarchy Process



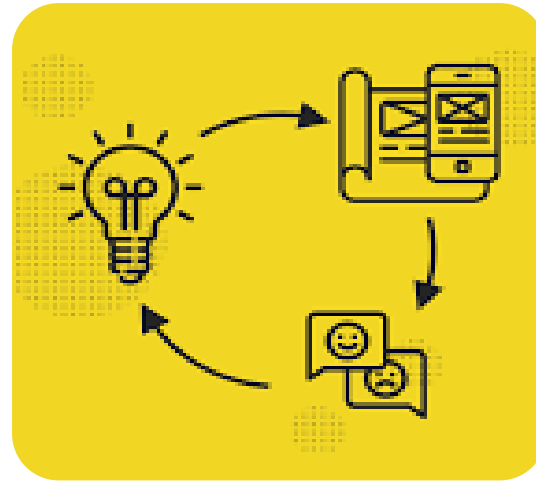
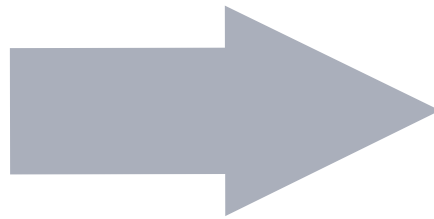
Final Selection



Future Work



Planning



Prototyping

Thank You


Anthony Arroyo | Austin Cramer | Khanh Nguyen | William Shuman | Nathan Thompson





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Concept Generation

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Concept Selection

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Future Work



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