Hose Shield: Robust Liners for Enhanced Leak Protection and Detection

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Introduction

The **HOSE Shield** project aims to tackle the critical issue of industrial hose leaks, which pose significant risks to safety, environmental sustainability, and operational efficiency. The project focuses on developing an innovative system to detect, contain, and prevent leaks, ensuring safer and more efficient industrial operations.

Constraints

Material Safety: FDA or REACH compliant materials.

Industry Standards: Hose linings to meet ASTM and ISO standards.

Ease of Integration: Compatible with existing infrastructure.

Specifications

Max change in length < 5%

Max Temperature <= 350 °C

12 < P (MPa) < 15

6 < Stress(Mpa) < 14

Project Impacts

Environmental Impact:

- Reduces chemical spills, minimizing environmental contamination
- Limits water waste, promoting sustainable industrial practices.

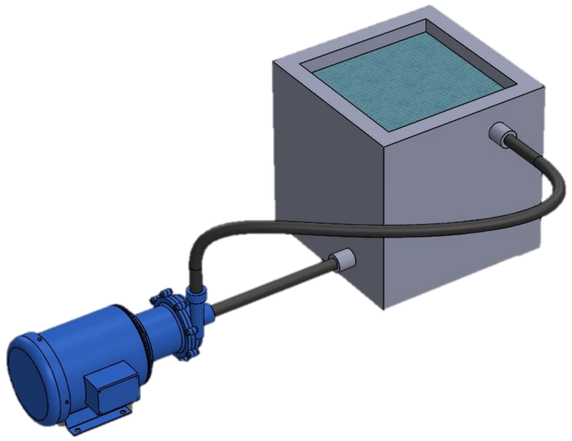
Cost Savings:

- Prevents costly equipment damage caused by leaks
- Decreases unplanned downtime, improving financial efficiency.

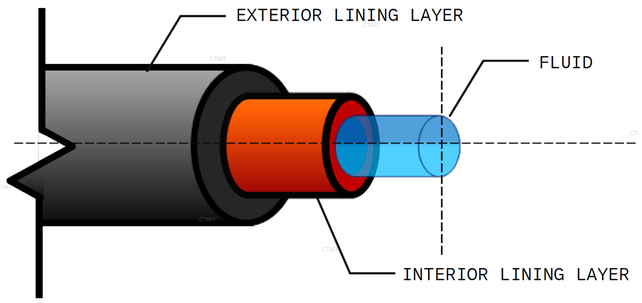
Safety:

- Detects and contains leaks to prevent workplace hazards.
- Protects workers and the surrounding environment from exposure to harmful substances.

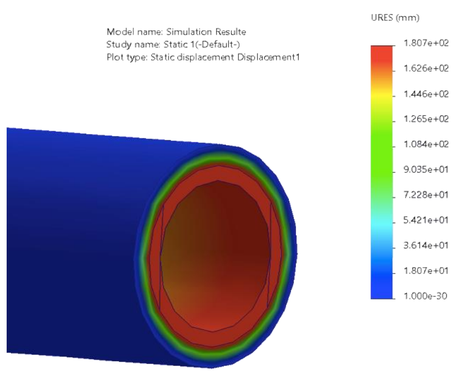
Prototype Design



3D Layout of the Prototype



3D Section view of Hose's Layers



3D Dimensions Simulation of Hose's Layers

Novelty

Dual-layer Protection

Internal and external liners provide enhanced durability in wear-prone areas, resistant to chemicals, temperature, and stress.

Proactive Leak Prevention

Reinforces critical areas, preventing leaks before they occur, reducing maintenance.

Creativity

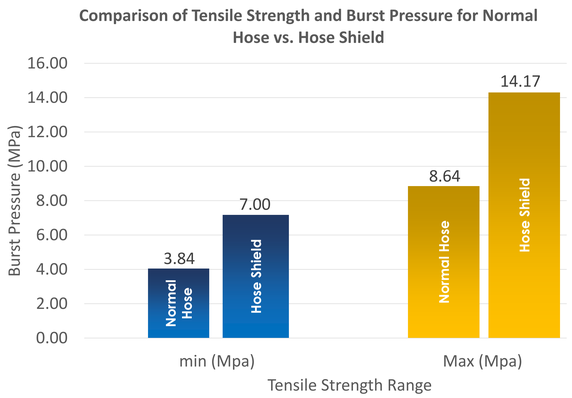
Combines

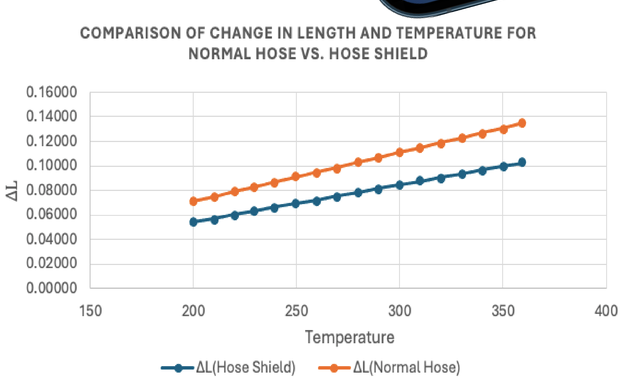
self-sealing materials, real-time leak detection, and robust protection layers

Reduces

reliance on manual inspections and costly replacements

Testing & Validating





Conclusion

The project prioritizes refugees' rights, public health, safety, welfare, environmental sustainability, and cost-efficiency. The shelters are designed to be sanitary, safe, and affordable, with easy-to-clean materials and ventilation. They are built with fire-resistant materials and circuit breakers, ensuring structural integrity. The modular design allows for customization to various global settings and cultural practices. The shelters are also designed to minimize their ecological footprint, using renewable energy sources and recyclable materials. Cost efficiency is also a priority, with locally sourced materials and simplified designs minimizing production and transportation costs.

Acknowledgement

This work was supervised by TEAM Design Coach Mohammed Al-Yaqoub

SCAN THE CODE

For the Video