This design project was made possible by our sponsor, Lockheed Martin. This opportunity broadened our perspective on the products developed in your company.

PennState College of Engineering

HEAT EXCHANGER DESIGN PROJECT

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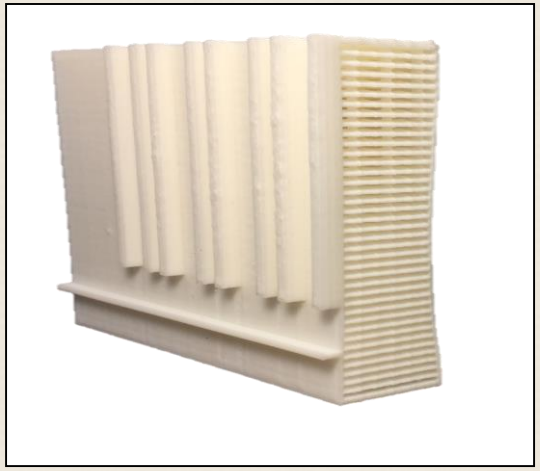
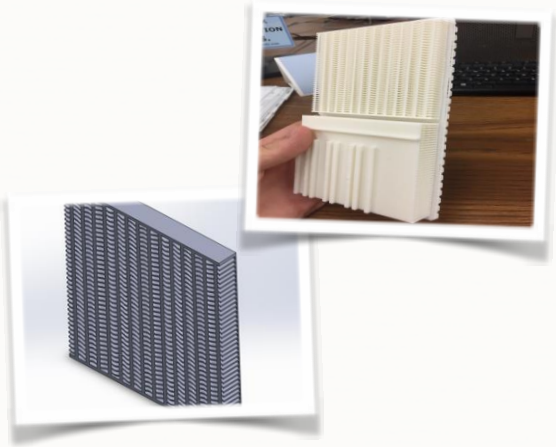
Sponsored by:

LOCKHEED MARTIN





Overview of solution

A heat exchanger is a device that let warm air and cool air flow through different sections. The heat exchanger filters out warm air and allows only cool air exit.

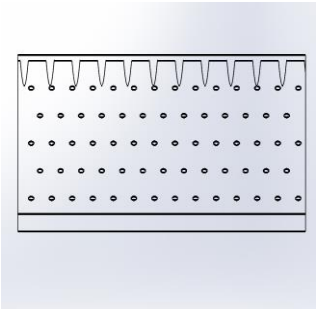
The main problem with process of manufacturing heat exchangers are

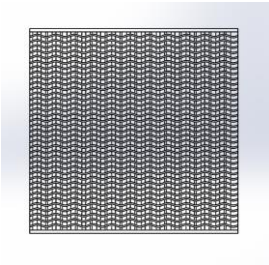
- Expensive.
- Time-consuming
- Inefficient.

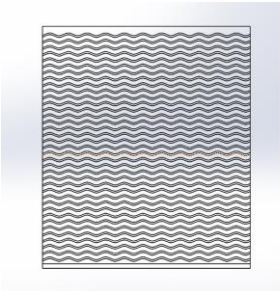
Within the instructed specifications, our group intends to change the internal geometry and material in order to decrease cost and build time of heat exchangers.

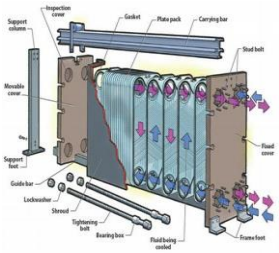
INTERNAL GEOMETRY

- Developed a wavy pattern by the function 0.04*sin(10x).
- A total of 38 waves through the interior.
- Small spines were introduced to reduce air turbulence.
- Increased surface area by over 20%









MATERIAL

- Durability, thermal conductivity, density and cost were some of the properties considered before choosing the material.
- Aluminum 6101 and copper were chosen after research.
- Chose aluminum over copper because of its price and density.