Stirling Silver

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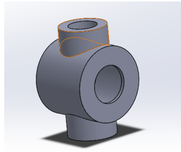
Abstract

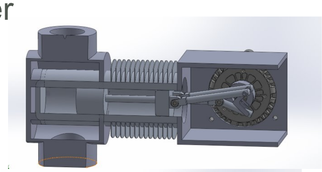
Project Stirling Silver is a self proposed project with the intent of regenerating wasted energy from a building into reusable electricity. The device is designed to:

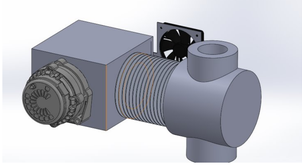
1. Be mounted to a furnace exhaust flue.
2. Recycle the excess wasted heat via a Stirling Engine.
3. Transfer the energy back into rotational, mechanical energy.

Objectives

1. Design an adapter to house a Stirling Engine onto a furnace exhaust flue.
2. Program Stirling Engine to operate when at proper temperature range.
3. Convert excess heat energy into rotational energy to power an alternator.
4. Recycle stored electrical energy into the power grid of the building.



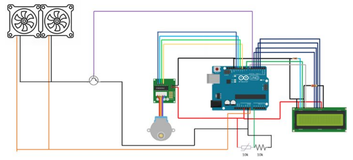




Methods and Materials

Manufacturing: Machine made of primarily 6061 Aluminum.

Arduino chip used electrical display as well as powering of the device.

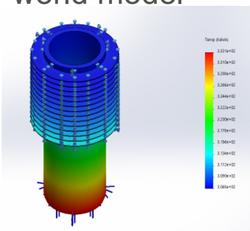


Coding: Coding performed on Arduino 1.8.12

Results

Prototyping was successful in providing proof of concept for the machine. Initial analytical tests provide applicable numbers to provide real world results.

The thermal study displayed an acceptable range of temperatures for a real world model



Conclusions

Primary concerns in the design would be improving life span of the product. As we only have a prototype we are unsure of the life expectancy. Assuming a life span of 5 years makes the device profitable to manufacture.

The Stirling Silver application of a Stirling engine shows great promise in real world application. Our findings show that given a power generation of 1320W and a cycle of 7 hours/day during 6 cold months a year at a 12¢/kWh **the estimated annual savings are around $202.49**

The virtual build we have provided could be an excellent template to a concrete profitable model in the future.

Acknowledgements

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