



Home Insulation Analysis



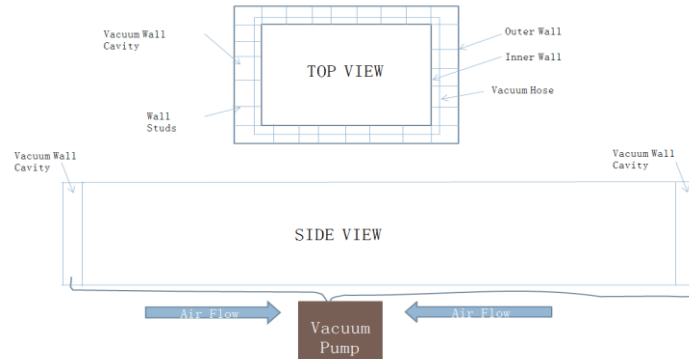
A comparison of Insulation Methods
EGR 7113 Sustainable Materials

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Project Overview

Overview

- Compare a new insulation method with the most common current insulation method, fiberglass batts.
- Compare based on price, material intensity, impact, end of life, etc.

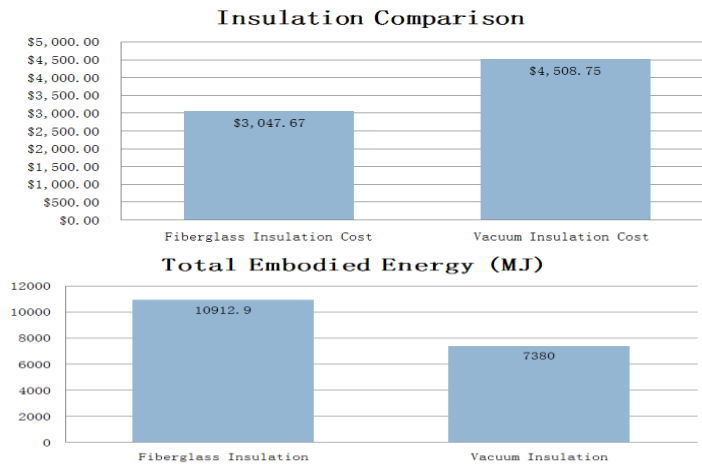


Vacuum Insulation

- It is possible to create a vacuum insulated wall with a central pump and hose within the walls.
- No significant material required inside of the wall, maintains high R value, and allows for thinner walls.

Analysis

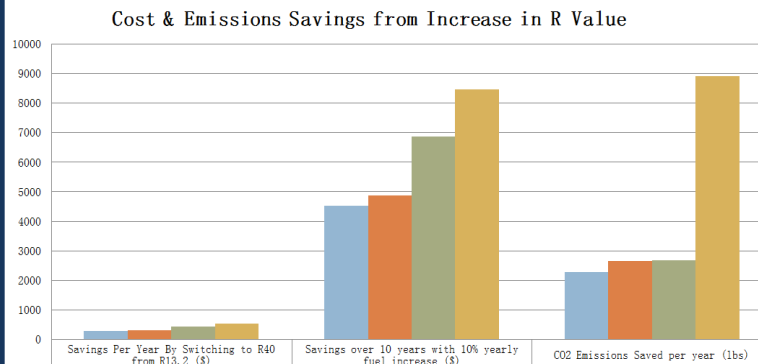
- The comparison is based on a house consisting of three stories, each being 25ftx30ft (2250 square feet).
- This comparison is on a house being located in south eastern PA.
- Based on a 50 year analysis timeframe.



- Vacuum insulation requires more financing, professional installation, maintenance, and an electricity source.
- However, if installed it will have a higher R value, maintain effectiveness, and require less material.
- Can be improved with scale and integration with HVAC systems.

Conclusions & Recommendation

- Vacuum pump pays for itself over time because of its significant R value.
- Most beneficial where energy is expensive
- Negates the harmful exposure required fiberglass production.



- Removes the material intensity of fiberglass and other popular alternatives.
- There are more materially sustainable products than a vacuum pump system, but the performance saves energy. This is an acceptable tradeoff.