Mushroom Composite

A Carbon Smart Material

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Outline

Background

Goals and Objective

Method

Analysis

Results

Conclusion

Workshop

Background – Composite Material

Glass Fibre

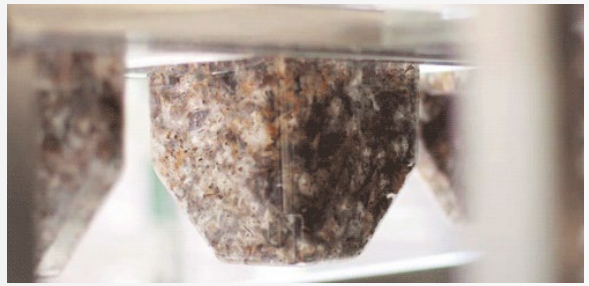
Epoxy Glue

Composites – used in furniture, automobile, wind turbine, and aviation parts

Mushroom

Mushroom Composite

Commercial products in market



ecovative

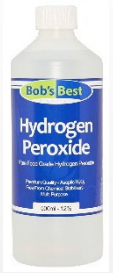
MAGMA NOVA

MYCOWORKS

Objective

- Proof of concept
- Facility to grow the material
- Facility to test
- Internal collaboration
- Students involvement

Mushroom Growth Process

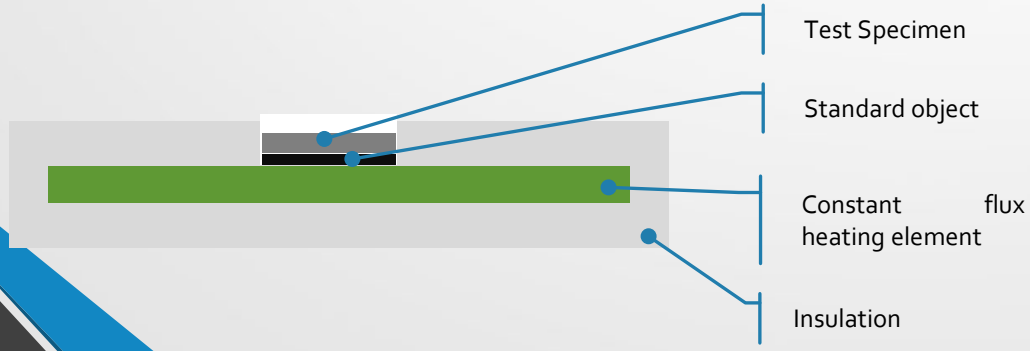


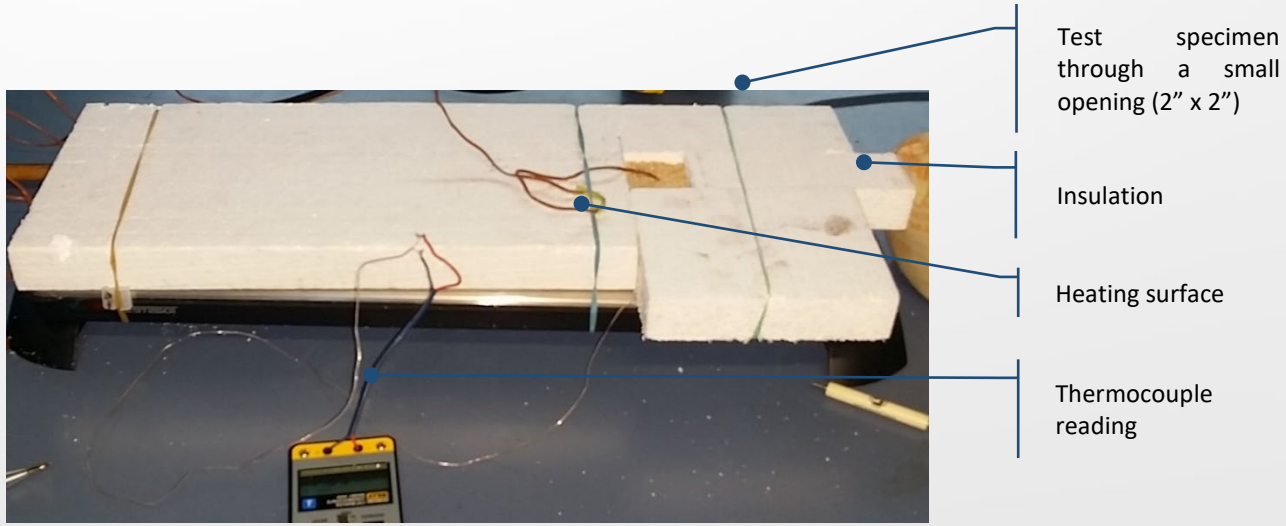
Mushroom Growth Facility

Mold

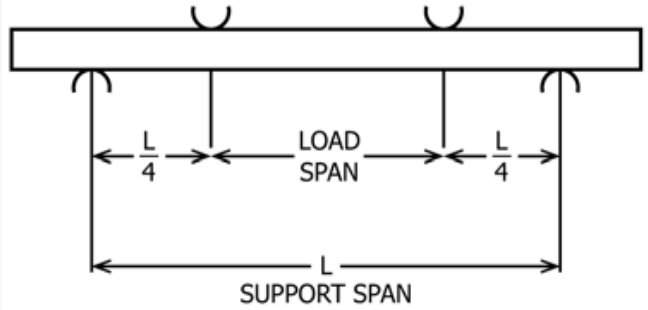
Incubator

Thermal Insulation Testing





Strength Analysis



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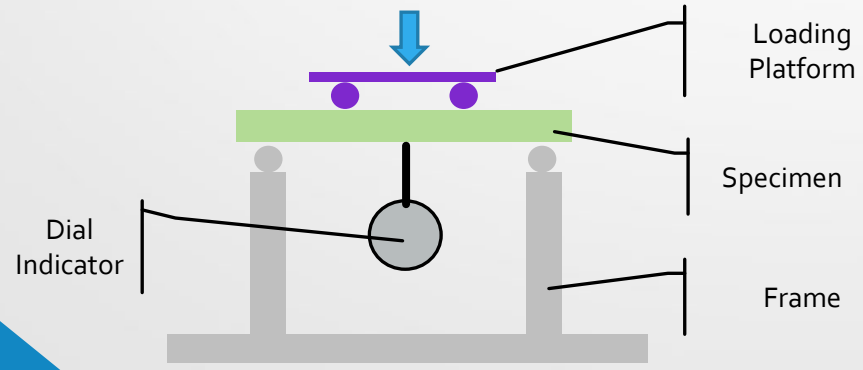

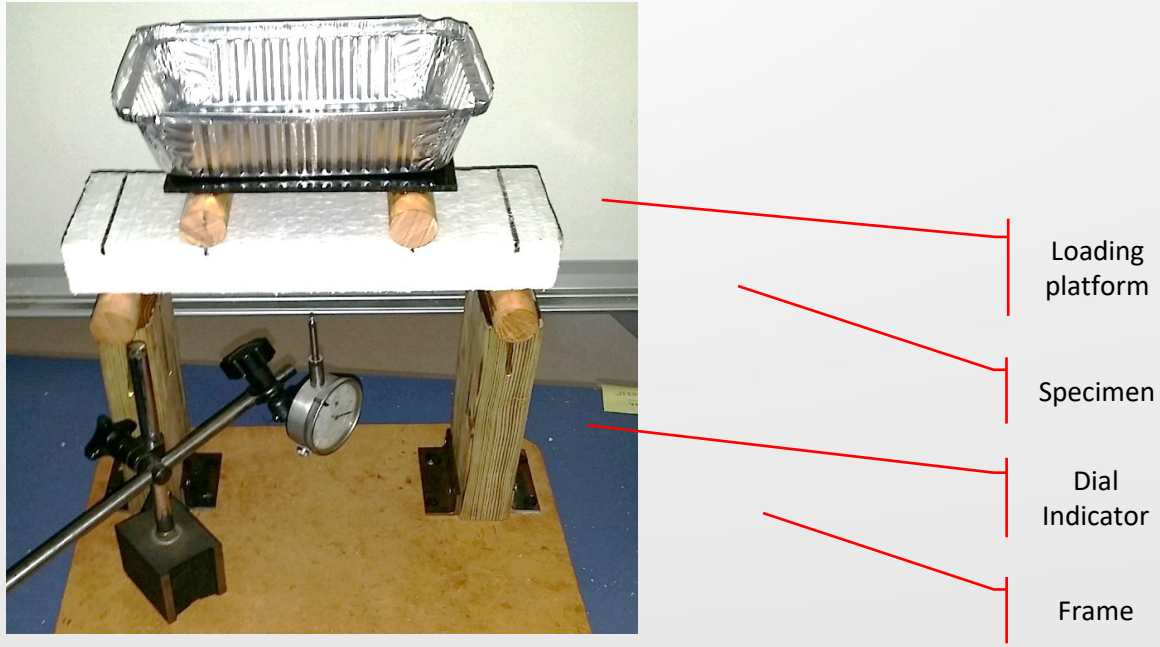

Results

- Thermal resistance of mushroom (0.66 m2.⁰C/W) was about 12 % less than that of the Styrofoam.
- The average value of modulus of elasticity of Styrofoam is 740 kPa and that of mushroom is 1120 kPa. This means the composite was about 50% stiffer than Styrofoam specimen

Conclusion

- Slightly lower in insulating value (12%) than Styrofoam
- More stiffer than Styrofoam
- Mushroom composite can be a substitute to the Styrofoam in many applications.

SWOT Analysis

Strength

- Eco-friendly to produce and dispose
- Value addition to biomass fibre
- Insulating and fire resistance
- Able to mold in complex shapes

Weakness

- Susceptible to moisture - molding
- Expensive than Styrofoam
- Heaver

Opportunity

- Short lifecycle packaging use case
- High-strength composites
- Moisture repellant

Threats

- Papers are already eco-packaging alternatives
- Other biomass-based expanded foams

Workshop

- Any niche areas you think this product is most suited for?
- What additional aspects do you want to see investigated?