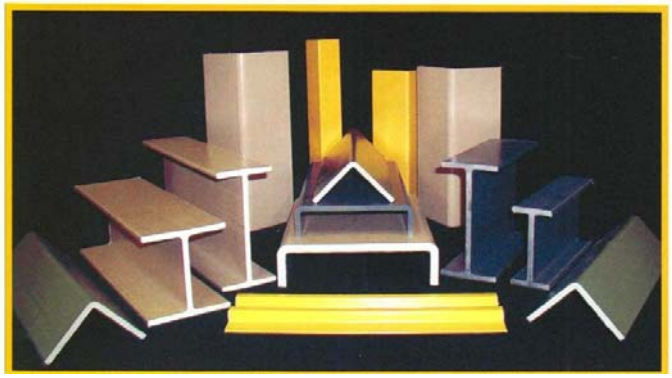
Sustainable Composite Materials



Impact: Demand is mounting for building products that are not only cost effective and thermally superior, but also have environmentally friendly raw materials in production processes. Pultrusion is a low-cost process that combines raw materials to create a composite product. Composites have many advantages, which include a high strength to weight ratio, corrosion resistance, fire retardancy, low life cycle costs, excellent mechanical and thermal properties, high impact resistance, and low embodied energy.

Current fiberglass composites are produced from fossil fuel-based and synthetic polymers, which are high in embodied energy and compounds that negatively affect indoor air quality and contribute to greenhouse gas emissions. Increasing interest in developing environmentally benign and energy efficient products is fueling this quest to create products that meet these objectives and are cost effective in both their production and utilization. This project pioneers the use of renewable materials in composite pultrusion and will open new markets for natural material producers.

Project Overview: The *Green Composites* project will examine using rapidly renewable and recycled raw materials in the creation of non-load bearing composite building components. The product has the potential to reduce the energy demands of a building, reduce capital and operational costs, and reduce the environmental impacts of the construction and operation of buildings and other structures. The project team will design, manufacture and assess composites made from natural fibers and recycled materials. These sustainable materials will be pultruded into building products such as including wall, window, and door panels. The project will seek to enhance the thermal or insulative value, reduce the cost, and increase the sustainability of these manufactured products. The project team will also select raw materials, produce and commercialize the products. They will also perform a life cycle assessment on the green composites and implement process improvements to maximize their environmental performance.

GBA Product Innovation Grant Amount: $100,000

Leadership Team: Bedford Reinforced Plastics is one of the industry leaders in the production of standard and custom pultruded fiberglass products; their team is led by engineer Bhyrav Mutnuri. University partners include University of Pittsburgh Assistant Professors Dr. Joe Marriott, Dr. Melissa Bilec, and Dr. Kent Harries, all of the Civil and Environmental Engineering Department.

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