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Walking on Eggshells: Renewable Bio-composite

Is it possible to combine renewable resources with their own strengths to make an even stronger bio composite? My project is trying to find a way to make that possible.

I tested two kinds of materials: a material with tensile strength (hemp), and a combination of two materials to make something with compressive strength (milk casein protein glue and calcium carbonate). To make the final project I had to conduct several tests looking at strength, drying time, shrinkage, and cracking. With these tests I found an ideal ratio between the milk glue and calcium carbonate of 1:1.

I also conducted a test of 2.5 x 2.5 x .5 inch squares combining different layers of calcium carbonate and hemp fibers. The strongest composite had a layer of hemp on either side of the calcium carbonate as well as a layer of hemp in the middle.

These experiments indicated that I should be able to stand on a platform big enough to allow both my feet in the middle using that construction combination of materials in the same order. After constructing the full-sized platform (9 x 12 x .5 inches), it was able to support my 112.6 pounds without breaking.

Combining the tensile and compressive strengths of the materials (hemp and calcium carbonate mixture) successfully produced a stronger bio-composite that I could stand on.