

Biodegradable Boards Made From Plant Fibers Provide Alternative To Standard Materials

Cornell University



Composite materials, such as particleboard, fiberglass and carbon-fiber products, are held together with a moldable glue or resin. Unfortunately, most glues are not safe for the environment, are not biodegradable, and are often toxic.

Many of the polymers used in composites are petroleum-based — a nonrenewable, high cost resource. Engineered wood products also contain formaldehyde, a known carcinogen that degasses slowly over time, creating indoor air quality problems. Huge amounts of engineered wood products are thrown into landfills every year, both from tear-downs and new construction projects.

Scientists at Cornell University in Ithaca, N.Y., have invented an alternative to standard composite materials — biodegradable composites made entirely from plant materials.

“ *This biodegradable composite technology is stronger, cheaper and safer for the environment.*

Developed by Anil Netravali, a professor of fiber science and apparel design at Cornell University, the process binds together renewable fibers from fast-growing plants with a proprietary soy protein-based resin. This material is then processed into sheets. Many of these fibers, such as bamboo, kenaf, and flax, can be grown on marginal or unused farmlands. Other advantages include a high strength-to-weight ratio, no petrochemical content, and lower overall cost compared to traditional composite materials.

e2e Materials LLC, an Ithaca company founded on this new technology, is developing biodegradable composites with a wide range of strength properties, reaching as high as midrange steels, for different industries and applications. Biodegradable composites manufactured by e2e Materials are currently being used in skateboard decks and office furniture. The company is also developing advanced composites that are stronger than steel but almost six times lighter, which will be suitable for a variety of structural applications, such as I-beams.

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