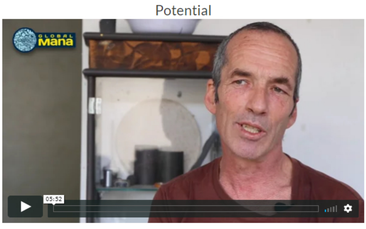
NANOFIBRILLATED CELLULOSE

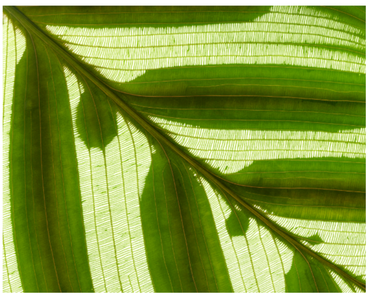
The Future of Sustainable Materials

What Is It?

Process

Potential





Bye Bye Plastic, Hello Progress

Nanofibrillated cellulose (NFC) would change everything—if it gained mass commercial support. This revolutionary material would disrupt traditional manufacturing practices and help eliminate plastic from our waste streams. NFC is made of 100% cellulose fiber and water—and nothing else. Patented milling processes convert plant cellulose into an industrial strength molding material that is resilient and versatile enough to make thousands of products used every day around the world. Cellulose is a long linked chain of sugar molecules that form the main component of plant cell walls. This natural polymer is what gives wood its remarkable strength, and it is the building block of any textile or paper. NFC is completely non-toxic, biodegradable and compostable throughout its life—from harvest to manufacturing, use to disposal. What more, NFC can be made from a wide range of byproducts and organic waste that would otherwise sit in the landfill, including hemp, agricultural biomass, recycled denim, carpet fibers, paper, sugarcane and more. The scraps from your green food bin could potentially enjoy an afterlife as a lounge chair in the living room, or as the membranes of the speakers you use to listen to music (yes, it even has impressive acoustic qualities), or the beams that support your home. Turning nanofibrillated cellulose into useful products "locks up" and sequesters carbon into beautiful, functional forms and transforms waste into possibilities.

Nanofibrillated Cellulose Rivals Existing Materials

Nanofibrillated cellulose is being explored as a robust platform for numerous green-technology applications. NFC's tensile strength is about 500MPa, similar to that of aluminum, so it is flexible and strong. Its stiffness is about 140–220 GPa, comparable to that of Kevlar and better than that of fiberglass, both of which are commercially used to reinforce plastics. Films made from NFC have high strength (over 200 MPa), high stiffness (around 20 GPa) and high strain (12%). Its strength/weight ratio is eight times that of stainless steel. This material can be lighter than cork or as dense as ebony, and its increased functionality, improved mechanical properties, novel optical and conductivity properties, light weight-high performance capabilities makes NFC ideal for diverse range of applications across industries: from furniture to automotive, construction, building, storage, shipping, housewares, music, medical, electronics and consumer goods. This means that NFC can potentially replace hardwood, aluminum, fiberglass and plastic—the leading cause of environmental degradation.

NFC could potentially become a central part of emerging green-tech with its cross-industry uses. Consumer education and awareness is key to driving interest and compelling manufacturers, designers, artists, architects, engineers and fabricators to explore the potential of NFC to meet demands for environmentally-kind materials.

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Global Mana Foundation
59079 Hakuola Rd., Haleiwa, HI 96712
connect@globalmana.org
808.457.8297