The Promise of Wood-Based Nanotechnology at the USDA Forest Service Forest Products Laboratory

Over 50,000 wildfires annually.

Wood is made up of nanometer-size building blocks that are incredibly strong and lightweight compared to solid wood. These building blocks do not require the use of large diameter trees, cost less than other nanomaterials to produce, and have much higher value than other forest products.

FPL’s nanocellulose pilot plant is the first of its kind in the U.S., producing renewable, forest-based nanomaterials to supply researchers and early adopters of cellulosic nanomaterials with working quantities. The plant produces batches of cellulose nanofibrils (CNFs) and cellulose nanocrystals (CNCs).

Nanoscale cellulose fibers offer unique advantages that enable remarkable mechanical and chemical properties (including an elastic modulus greater than that of Kevlar®).

America’s forests contribute over $240 billion to our Gross Domestic Product and employ more than 1.1 million people.

Wood-derived nanomaterials can generate new, high-value products that can create new revenue streams for forest-based product manufacturers and new jobs for American workers.

FPL is devoted to the efficient use of our Nation’s wood resources, helping keep our forests healthy.

Using structural, chemical, and mechanical evaluation techniques by interdisciplinary teams of chemists, materials scientists, engineers, and botanists, the Forest Products Laboratory continues to expand its fundamental research in wood nanotechnology to promote healthy forests and forest-based economies through the efficient, sustainable use of wood.