

# TECHLINE

## Properties and Use of Wood, Composites, and Fiber Products

### Water Filtration Mats Using Wood Fiber



Research at the Forest Products Laboratory (FPL) has shown that filters made from wood and agricultural fibers can remove heavy metals, oils, phosphates, and pesticides from water. The successful removal of contaminants from a Wisconsin lake using these filters is leading to a number of promising research opportunities. Current

demonstration projects include (1) removing pollutants from agricultural runoff in the New York City watersheds, (2) removing heavy metal contaminants from mining site runoff on the Wayne National Forest, (3) adsorbing residual pesticides and phosphates from surface water in the cranberry industry, and (4) removing nitrates and ammonia in recirculated water from fish aquaculture.

To apply this technology, non-point-source pollution runoff is diverted into troughs that contain the filters made from wood and agricultural fiber (see photograph). Water running in the troughs passes through the fiber filters, which are modified with chemicals to adsorb the targeted contaminant. The fiber filters act as ion exchange devices, removing contaminants before the runoff enters a larger water supply system such as a lake, river, stream, or creek. The technology may prove to be an inexpensive means of removing water pollution.

New York City watersheds are being contaminated by non-point-source pollution runoff from agricultural, development, and recreational sites. FPL researchers are evaluating the efficiency and effectiveness of fiber filters to remove targeted contaminants. Demonstration and evaluation sites are under development.

Acid mine discharge is of major concern because rainwater runoff flowing over mine tailings picks up acidic contaminants, resulting in increased acidity of streams and creeks. Increased acidity can kill fish and permanently alter their habitats. The FPL established a demonstration site on

the Wayne National Forest where modified wood fiber filters were inserted in troughs to adsorb the acidic heavy metals before runoff water enters the nearby creek.

In the cranberry industry, growing sites are flooded to harvest the cranberries. The floodwaters also carry residual pesticides and phosphates. A demonstration project with the Cranberry Institute is evaluating the capability of wood fiber filters to adsorb chlorpyrifos, chlorothalonil, and dichlobenil.

Fish aquaculture is a growing agribusiness, particularly in the Midwest. However, raising fish economically in tanks requires that the water be filtered and recycled to remove ammonia and nitrate buildup. The FPL, in cooperation with the University of Wisconsin, is evaluating the effectiveness of agricultural and wood fibers as filters.

Opportunities for using wood fiber filters for removing contaminants from our water supply are numerous. However, fundamental information, such as effectiveness, efficiency, and costs, needs to be developed to turn such research into enterprises. This is the purpose of the demonstration projects. Partners in these projects include the following:

- USDA Forest Service, Forest Products Laboratory
- USDA Forest Service, Northeastern Area State and Private Forestry
- U.S. Environmental Protection Agency
- U.S. Geological Survey
- NYC Watershed Agricultural Council (WAC), Watershed Forestry Program
- NYC Department of Environmental Protection
- University of Wisconsin-Madison
- École Polytechnique Federale de Lausanne
- Catskill Watershed Corporation (CWC) and Watershed Agricultural Council (WAC)
- Odbek Industries, Inc.

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