Materials Recycling and Reuse

This category has technologies that are made from environmentally attractive materials (salvaged products, post-consumer or post-industrial recycled content, rapidly renewable products, minimally processed materials). It also can include products that are green because of what isn't there (products that use less material, products that are alternatives to ozone-depleting substances, and other hazardous components).

Technology Scanning

One of PATH's major research support services is PATH Technology Scanning. *Technology Scanning* tells us about technology developments in other industries, from other nations, from federal laboratories, and from other building sectors. PATH looks for breakthroughs in other industries that could be transferred and applied to housing. *Technology Scanning*—published by the U.S. Department of Housing and Urban Development/PATH and prepared by the NAHB Research Center, Inc.—are updated as technology developments dictate. The Research Center works to unite technology developers from outside of residential construction with manufacturers in the residential housing sector.

This issue of *Technology Scanning* is one in a series. Each issue in the series falls into one of the following categories:

- *Design and Internet Tools*
- *Safety*
- *Surfaces and Interior Finishes*
- *Building Envelope Technologies*
- *Electrical*
- *Plumbing*
- *Heating, Ventilating and Air Conditioning*
- *Energy/Power Systems Generation*
- *Basic Materials*
- *Information Technology*
- *Sustainable Design Strategies*
- *Materials Recycling and Reuse*
- *Thermal and Moisture Protection*
- *Indoor Environmental Quality*

Call the ToolBase Hotline at 800-898-2842 for information about other available *Technology Scanning* issues. Or, log onto pathnet.org and www.toolbase.org.

PATH
451 7th Street, SW
Washington, DC 20410
Email: pathnet@pathnet.org

Alternative Use

These specific technologies could provide more environmentally attractive alternatives to common building ingredients. They involve rapidly regenerating resources.

Soy Bean Composite Products

These products are made from environmentally attractive, agricultural, rapidly renewable resources that farmers can grow in many regions of the U.S. Many are lower cost alternatives as well. Three products that are ready for use are as follows:

- *Environ* is a bio-composite that resembles wood, but is made from recycled paper products, soy flour, and soy-based resin. It is designed for use in countertops and cabinetry. Tests have shown it to be three times harder than oak.
- *SoyOyl* is a soy-based foam with uses in appliances, carpets, and other construction products.
- *Soy-Based Wood Adhesives* are under development as replacements for formaldehyde adhesives used today in OSB and plywood. These would reduce VOC emissions at major processing plants making building products and sheet materials consumed in home building.

Contact:
United Soybean Board
St Louis, MO
Phone: 888-235-4332
www.unitedsoybean.org

Innvironments Organic Wall Coverings

Innovations has produced a revolutionary new line of organic wall coverings that create a new direction in the surfaces industry. The line of wall coverings is created entirely from natural resources or environmentally attractive products.

The organics, including coffee, aduzki bean, green tea, charcoal, and mugwort are transformed into particle form and applied to cellulose backing. Its other line is Paper-Weaves, developed from cellulose paper, washed with pearlized translucent color using powder from mineral mica. Both lines are amazingly creative, fresh, and environmentally friendly wall coverings or surface solutions.

Contact:
Innovations
New York, NY
Phone: 1-800-227-8053
Email: samples@innovationsusa.com
www.innovationsusa.com/innvironments.html

Waste Stream Reuse

These technologies take advantage and put to use waste stream material that otherwise is thrown away. They have been reused in part or in whole in applications that solve problems for another industry.

Extensive South African Study on Waste for Usable Construction Products

CSIR Boutek, a national agency in South Africa, aligns R&D with current and future needs in South Africa, bringing the latest technology to bear on applied solutions. Among the materials research is an extensive study of waste materials turned into construction products.

Contact:
Theuns Knoetze, Programmer
Phone: +27-12-841-4985
Email: tknoetze@csir.co.za
Neo Moikangoa, Div. Director
Phone: +27-12-841-3763
Email: nmoikang@csir.co.za
www.csir.co.za

Solid Waste Used as Synthetic Aggregate

The University of Calgary developed Terra-Bond, a process which encapsulates any form of solid waste (contaminated soil, sand, mine tailings, ash, slag, mineral, and refinery wastes) and binds their contaminants to produce an inert aggregate. This inert aggregate (a patent is pending in the U.S. and Canada) is then available for use in most any masonry, landscaping, or concrete mix application. This waste stream reuse

Solid Waste Used as Synthetic Aggregate, continued

technology also reduces the impact of mining natural aggregate from gravel pits, river bottoms, and other open excavation processes.

Contact:
Hugh Jones, VP of UTI
University of Calgary - University Technologies International
Calgary, Alberta
Phone: 403-270-7027
Email: jonesh@uti.com
www.uti.ca

Coating from Shellfish Protects Materials

This unique solution was derived watching and wondering how the delicate body of a shellfish stays protected in harsh conditions. The technology is an environmentally attractive, water-based coating made from extracted components of crushed shellfish. This coating protects metals and other common substrates from corrosion and moisture damage. It is harmless to the environment and puts to use a by-product of the seafood processing industry, which is thrown out today.

Contact:
Peter Genzer
Brookhaven National Laboratory
Phone: 631-344-3174
Email: genzer@bnl.gov
www.bnl.gov/bnlweb/pubaf/pr/bnlpr082399.html

Eco Floors

Made from recycled rubber, this durable flooring is used in retail and commercial environments. It makes use of old tires. It is manufactured in tiles that are odor-free, and flexible in design. It could be used in places where ceramic tile is found today for a softer, environmentally friendly floor surface.

Contact:
Phone: 1-877-ECO-SURF
Email: EcoSurfaces@Dodge-Regupol, Inc
www.regupol.com/comm/ECOsurf.htm

Composite Housing System Uses Thirteen Tons of Waste Glass

The ACE awards, one of the composites industry's best new applications, went to the Ambiente Housing System made completely of composite materials. It is billed as hazard-resistant housing, designed to resist hurricanes and withstand earthquake forces. It also claims to be fire and flame resistant. With no timber or steel in the home, it's made entirely from recycled glass core material, generating no production waste in the manufacturing process. This housing system has superior thermal and sound characteristics, is low maintenance, durable, and long lasting.

Raw waste glass is processed into honeycomb-like material, then cast into a composite of resin and fiber. This technology uses non-degradable waste. It uses 13 tons of waste glass per house, that is waste that would have gone to landfill.

This system is affordable, durable (20-year warranty), reduces damage from natural hazards, and is environmentally responsible and friendly. Ambiente has turn-key manufacturing plants developed. This technology has direct potential application for advanced wall panel systems and whole house systems.

Contact:
Malcolm Parish, Director
Ambersham Technology Group
Ambiente Housing
Luquillo, Puerto Rico
Phone: 787-889-1362
Email: ambiente@prtc.net
www.ambientehomes.com

Courtesy: Pacific Northwest National Laboratory

By studying shells, bones, and teeth, Pacific Northwest National Laboratory researchers developed a process that "grows" bone-like material on implants, such as the hip implant shown here, making them stronger and last longer.

Edible Packaging Can be Consumed

Edible packaging material technology that is being developed for the food packaging industry could rapidly be applied across other industries. This consumable packaging, under development at the U.S. Department of Agriculture, Agricultural Research Center in Albany, CA, could eliminate much of the packaging going to landfill. Developer Tara McHugh created the packaging from pureed fruits and vegetables, dried and formed to a thin sheet.

Current work is looking at consumable modifiers that adapt the packaging to various property needs in different packaging applications. The packaging can be consumed by people or more likely by animals instead of being thrown away. If applied to other industries, it brings new meaning to "eating on the job." You could open up a whole new animal-based clean-up crew for jobsites.

Contact:
Tara McHugh
U.S. Dept. of Agriculture
Agricultural Research Center
Albany, CA
Phone: 550-559-6060
www.pw.usda.gov