

applied

The Science Of Soy

The Soybean Comes Of Age

Never mind that it's been a staple of the U.S. agricultural economy for decades. The focus now is on the snappy little legume for green building products.

From insulated concrete forms to spray treatments, soybean derivatives are finding a niche in a host of products, and it's certainly not for residential only. In fact, much of the focus is on innovation in commercial, industrial and institutional building and construction applications—where off gassing or emitting other contaminants into the environment becomes ever so important in a concentrated population area.

Soybean-based products contain no urea/formaldehyde and release no volatile chemicals or other toxic emissions. And, until recently, most polyurethane products used petroleum or petroleum derivatives, so soybean-based products make a suitable alternative that's safe and cost effective.

Promotional Efforts

The list of products that can be produced from soybeans and soybean derivatives continues to grow and includes foam insulation, carpet-backing, wood and concrete coatings, stains, and wood adhesives—it's also used as a membrane and coating for green roofs and other environmental barrier applications.

The United Soybean Board (USB), Chesterfield, Mo., has a cooperative initiative known as the national soybean checkoff to promote, educate and conduct research on soybeans. Another group is the American Soybean Association (ASA), St. Louis, Mo., a grass-roots, nonprofit organization that represents U.S. soybean farmers.

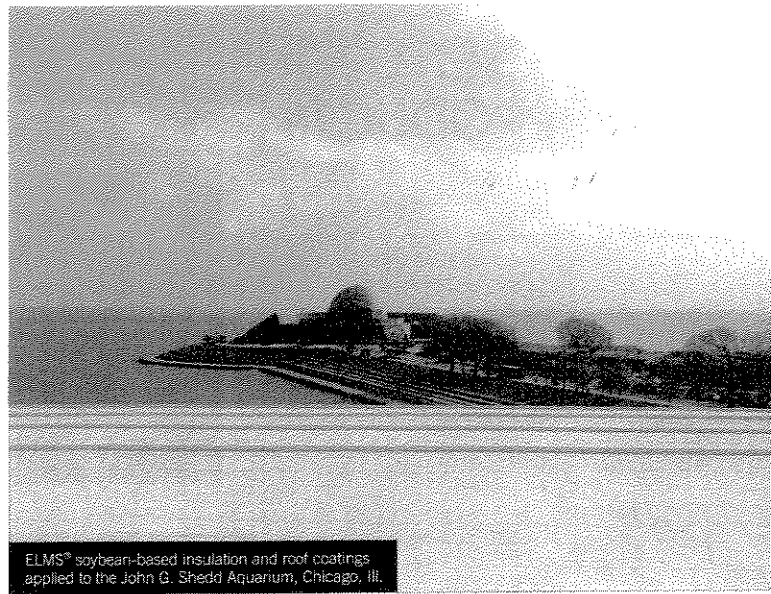
The soybean checkoff program has helped fund research and development of new products in the construction market, says Grant Grable, LEED® Accredited Professional and vice president, sales and marketing, Green Products LLC, Romeoville, Ill. The company's Environmental Liquid Membrane System® (ELMS) soybean-based roof coating was developed as a result of biopolymer research and funding from the U.S. Department of Agriculture and the USB. The renovation of the Museum of Broadcast Communications in Chicago, utilized the soy-based ELMS insulation and roof coating products. In addition, when the John G. Shedd Aquarium in Chicago unveiled its new, renovated green roof, the ELMS system was the eco-friendly membrane used.

Emega Technologies, Lancaster, Ohio, also produces soy-based polyurethane foams, panels, and a small-scale insulated concrete form manufacturing system. Don Duffy, owner of Emega Technologies adds, "It absolutely can be used in commercial applications." Insulated concrete forms are lightweight and can be shaped into a variety of flexible forms, he says.

But building and environmental safety is where soy-based products leave others in the dust. "It's much safer," Duffy says, "because it does not emit gases and chemicals present in many other different types of building materials."

Foam Insulation

The introduction of soy-based products, notably insulation, to the construction industry is relatively new. Soy-based spray foam insulation is available in different formulas ranging in R-values from 13 to 24. It provides excellent insulation qualities and is less expensive than traditional spray foam insulations.



ELMS® soybean-based insulation and roof coatings applied to the John G. Shedd Aquarium, Chicago, Ill.

The insulation expands in the wall as traditional spray-foam insulations, but it contains none of the formaldehydes found in most fiberglass batting insulation. According to the USB, soy insulation provides as good as or better insulation characteristics in four-inch walls as traditional batting insulations with six-inch stud construction. Soy-based insulation can also reduce building costs by decreasing the amount of lumber used in the structure. And, soy-based spray foam is completely resistant to mold and mildew.

Currently, the USB is also investigating alternative soy-based materials for fiber-board and the Iowa Soybean Promotion Board (ISPB) and the soybean checkoff program have funded research into adhesives for engineered wood. As a result of this funding, Heartland Resource Technologies (HRT), Pasadena, Calif., has developed a low-cost soy adhesive called Soyad that may replace traditional resins.

As sustainable and green design and environmental considerations continue to play a role in how we build, soy provides a healthy alternative that's easy to swallow. **Circle 308.**

Consider these sources of soy information and soy products:

- **Green Products LLC**—membrane system, adhesive and environmental barriers—www.greenproducts.net
- **United Soybean Board**—www.unitedsoybean.org
- **American Soybean Association**—www.soygrowers.com
- **BioBased Systems**—spray foam insulation—www.biobased.net
- **New Century Coatings**—soy-based coating for wood—www.newcenturycoatings.com
- **Dow Chemical Company**—floor covering/backing—www.dow.com
- **Construction Polymers**—spray foam insulation—www.enduralite.com
- **BioPolymers**—foam insulation—www.healthyseal.com
- **Urethane Soy Systems**—Soyad®—www.soyad.com
- **SoyClean**—sealer for wood, decks and docks—www.soyclean.biz
- **Emega Technologies**—soy-based insulated concrete form manufacturing system—www.emegabuild.com
- **Heartland Resource Technologies**—soy protein adhesives for engineered wood—www.heartlandresource.com

science