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Innovative New Uses for Soy

Soy-Based Products Reduce VOCs, Help Improve Air Quality



Soy can be used to replace formaldehyde in interior wood glue

Soy-based products reduce volatile organic compounds (VOCs), and that improves air quality. The United Soybean Board (USB) and the soybean checkoff promote soy-based product research and development, much of which helps reduce VOCs.

Many petrochemicals emit VOCs and some have short- and long-term adverse health effects, according to the U.S. Environmental Protection Agency (EPA). In the United States, EPA regulates outdoor emissions of

VOCs mostly to prevent the formation of ground level ozone, a primary cause of smog.

While the federal government does not regulate total VOCs for indoor air quality, it does regulate some air borne emissions called hazardous air pollutants (HAPs,) such as formaldehyde, which have been shown to cause respiratory problems or even be carcinogenic.

VOCs and HAP emissions have raised concerns among manufacturers and consumers alike, and that can present an opportunity for some soy-based products.

"Products formulated with soybean oil and its derivatives are typically not very volatile," says Jim Martin of Omni Tech International, which provides technical consulting to manufacturers, including information about renewable resources and biobased products. "Soybean oil has to be heated above normal ambient temperatures before it becomes become volatile."

Martin says cleaning products formulated with methyl soyate produce fewer VOCs than other solvents, like mineral spirits, because they evaporate more slowly. They may also replace HAPs. Adhesives made from soybean meal are being used to make decorative plywood and contain no formaldehyde. Most plywood and other wood composites, are glued together with urea formaldehyde or phenol-formaldehyde adhesives. That formaldehyde off-gases from the wood adhesives in cabinets, furniture or other wood products in a home and may reach unsafe or unhealthy concentrations if the home is tightly built and well insulated. That is what happened with the trailers supplied by the Federal Emergency Management Agency (FEMA) after Hurricane Katrina, says Martin.

"Soy cleaners, lubricants, inks and coatings represent some soy-based products that replace petrochemicals and help reduce VOCs," says Martin. "Soy plastics typically don't reduce VOCs in use, but may reduce VOCs in manufacturing."

The federal government and state governments regulate VOCs. The Clean Air Act serves as the primary regulation, which limits VOC emissions. California has enacted the most stringent VOC regulations, where the California Air Resources Board (CARB) has placed limits on the amount of VOC emissions a product may emit, causing companies to re-formulate products.

"Using soy products allows some companies to meet tough emission standards, especially CARB standards," says Martin.

To learn more about soy-based products, some of which can play a role in reducing VOCs, visit <u>www.soynewuses.org</u>.

USB is made up of 69 farmer-directors who oversee the investments of the soybean checkoff on behalf of all U.S. soybean farmers. Checkoff funds are invested in the areas of animal utilization, human utilization, industrial utilization, industry relations, market access and supply. As stipulated in the Soybean Promotion, Research and Consumer Information Act, USDA's Agricultural Marketing Service has oversight responsibilities for USB and the soybean checkoff.

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