

## SOY BASED THERMOSET PLASTICS

Soy oil is an indirect replacement for the glycols (ethylene glycol, propylene glycol, etc.) and soy based sugars can be fermented to replace the acids (fumaric, maleic, terephthalic) used to produce unsaturated polyester resins. Assuming the total replacement of the portion of the thermoset resin that could be replaced with soy based ingredients, the total amount would be around 20 million bushels.

Soy oil containing unsaturated polyester resins are being produced by two major chemical companies today. Other chemical companies have reported developing these soy containing resins, but no commercial activity by others has been announced. Improved reactivity of the resin system containing soy oil is a sought after property.

Soy based thermoset composites continue to slowly gain market penetration. Interest in renewable resources drives this interest, but cost parity is a must. Pricing of soy oil compared to petroleum based products is favorable. Aggressive marketing of the benefits of these resins helps to drive the market penetration.

Another route to producing thermoset unsaturated polyester and epoxy resins from soy oil is from glycerin, which is a byproduct of the biodiesel manufacturing process. The amount of biodiesel produced in the United States will dictate the supply of glycerin, and new found uses will determine its value. The conversion of glycerin for materials to be used in thermoset composites will be driven by the economics of glycerin feedstock and the technology to find economical conversion processes. Some companies have announced making epichlorohydrin for thermoset epoxy from glycerin. Other companies are reported to be converting glycerin into propylene glycol, which is used to make unsaturated polyester resins. Most of these announcements are from overseas plants. Other routes of producing feedstock for thermoset resins from soy meal by fermentation are being investigated. Soy meal, flour, and hulls are also being investigated as filler for thermoset plastics.

This information is based upon information provided as part of a Market Opportunity Summary report by the United Soybean Board.