VIKOFLEX®, VIKOL® AND VIKOPLAST™ EPOXIDIZED VEGETABLE OILS

THE RENEWABLE OPTIONS FOR TODAY'S BIOBASED NEEDS.

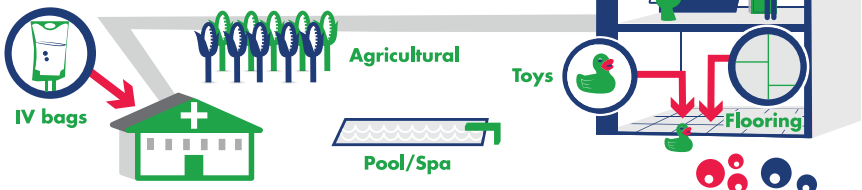
Made from soybeans grown and processed in the USA, these epoxides provide excellent performance in many applications.

Soy is one of the most important and widely grown crops in the world. Arkema's approach is to expand the use of **alternative technologies beyond the reach of petroleum derivatives**.

The 2014 forecast for soy in the United States is 3.91 billion bushels, up 624 million bushels from 2013. **The portion of soy that will be crushed to make soybean oil is 1.77 BILLION BUSHELS, up 40 million from 2013.***

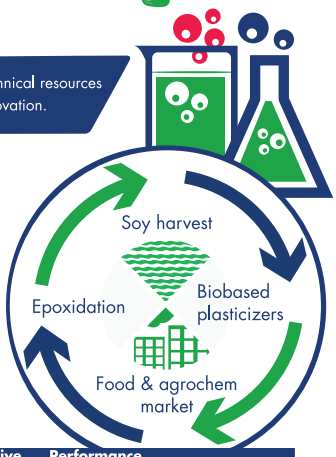
Arkema's epoxide manufacturing process uses soybean oil and other vegetable oils as the key raw materials and **hydrogen peroxide acts as the reactant**, which is recycled back through the process.

The result is a broad range of products that support conveniences of every day life:



Arkema has been developing new uses for epoxides since the 1960's. Our technical resources are among **"Best in Class,"** providing new products and application innovation.

- The low toxicity of **Vikoflex®** epoxidized vegetable oils make them a standout for polymer application, such as food packaging or bottles, medical tubing, and fabric coatings among others.
- **Vikoplast™** soy plasticizers are specially formulated to replace the common phthalates used in flexible PVC.
- Biodegradable polymer bubbles made with **Vikol®** soy polyols are used to encapsulate fertilizer that will time release over 15 to 30 days. Delayed release products help farmers produce more robust harvests, while reducing waste.



Application	Current product	Arkema alternative	Performance
urethane sealants	dibenzoates, DINP, linear phthalates	Vikoplast™ 400	UV resistance, low volatility, long shelf life
wallpaper	DINP, DIDP, DPHP	Vikoplast™ 100	low indoor air emissions
hoses	DINP, DIDP, DPHP, trimellitates	Vikoflex® 7170	FDA compliant, high clarity
roofing	DIDP, DPHP, linear phthalates	Vikoplast™ 100	UV resistance
time release fertilizer	urethanes	Vikol® 1C	biodegradable, full life cycle
tile	BBP, dibenzoates, DINP, DOP, DIDP, DPHP	Vikoplast™ 100 & 400	low migration, ease of processing
carpet	DINP, DOTP	Vikoflex® 7170	low odor, ease of processing
furniture	DINP, DIDP, DPHP, DOTP, linear phthalates,	Vikoplast™ 500	low emissions, stain resistance
vinyl table cloths	DOP, DINP, DIDP, DPHP, DOTP	Vikoflex® 7170	stain resistance, migration resistance
shower curtains	DOP, DINP, DIDP, DPHP, DOTP	Vikoplast™ 100	low water solubility
childrens' toys	DOTP, citrates, polymerics	Vikoplast™ 500	low odor, low migration, fast processing
food contact medical	DEHP, DPHP, DINCH, benzoates, mineral oils	Vikoflex® 7190 & 5075	FDA compliant for food and medical applications
wire cable	DOP, DIDP, DINP, DPHP, TOTM	Vikoplast™ 400 & 500	low temperature performance and low volatiles

*Source: http://www.epa.gov/agriculture/ag101/cropmajor.html

ARKEMA INNOVATIVE CHEMISTRY

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