

# Soy Technologies, LLC



## Soyanol™

*Green Additives and Specialties for  
Paints and Coatings*

Developing environmentally  
responsible chemistry ...  
safe for the user, safe for the  
air, and safe for the earth!

*Soy Technologies, LLC is a privately owned specialty chemical manufacturer based in Nicholasville, Ky., just south of Lexington. Pioneering soy-based chemistry since 2001, Soy Technologies develops and markets green additives and intermediary blends under the brand name of Soyanol™ for the paint and coatings market, cosmetics and personal care, Industrial & Institutional and related markets.*

# Soyanol™ Product Overview

At Soy Technologies, we understand your commitment to sustainable chemistry; we are rather obsessive about it ourselves. Our commitment to bring sustainable soy-based chemistry to the market is exemplified by the Soyanol™ line of functional additives. We have formulated these products to help meet the most pressing needs of formulators today, while maintaining strict regulatory and environmental compliance. Soyanol™ products will help you find solutions to meet the growing challenges presented by increasing scrutiny not only of the VOC content, but also of the hazards presented by additives such as phthalates or APE surfactants. Soyanol™ products utilize high grade refined soy oils as their primary component. Our materials have undergone a rigorous review process at the U.S. EPA and we have qualified the materials under the Design for Environment program. We have also had the materials verified by the USDA BioPreferred program, ensuring that these sustainable solutions meet the most demanding criteria.

The following Soyanol™ products are currently available:

- Soyanol™ 1000E, 5000E
- Soyanol™ 5000X, 5000X-HS, 5000X-TB
- Soyanol™ SGE40
- Soyanol™ Custom Blends

## ***Benefits:***

Products bearing the Soyanol™ trademark meet the following criteria:

- No hazardous or toxic materials
- No alkyl phenol ethoxylate surfactants
- No carcinogens, reproductive toxins, or ozone depleting compounds
- Use high quality, clear soy esters
- Non-flammable
- No Proposition 65 components
- No HAPS
- No phthalates or other endocrine disruptors
- USDA BioPreferred Certified
- US EPA Design for Environment Recognized
- Best available soy chemistry
- Grown, processed and packaged in the USA

## ***Technical Data:***

	Soyanol™ 5000X	Soyanol™ 5000X-HS	Soyanol™ 5000X-TB	Soyanol™ 1000E Concentrates	Soyanol™ 5000E Concentrates	Soyanol™ SGE40
VOC -- Method 24	535 g/l	245 g/l	715 g/l	< 20 g/l	450 g/l	18 g/l
VOC -- Method 313-06	Not Tested	Not Tested	44 g/l	8.7 g/l	Not Tested	6.8 g/l
Specific Gravity	0.960	0.940	1.020	0.904	0.975	0.945
Viscosity	10 cps	10 cps	10 cps	10 - 12 cps	10 - 12 cps	1,400 cps
% Solids	55%	80%	32%	84%	45%	40%
Type	Solvent	Solvent	Solvent	Emulsion	Emulsion	Emulsion
Color (Gardner)	1 - 2	0 - 1	1 - 2	1	1 - 2	n/a
Flash Point	>217°F	>220°F	>220°F	>220°F	>220°F	n/a to boiling
pH @ 1% solution	5.0 - 6.0	5.0 - 6.0	5.0 - 6.0	7.0 - 9.0	4.0 - 6.0	5.0 - 6.0

 **Soy Technologies, LLC**

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# Green Additives for Paints, Stains and Sealers

## ***Soyanol™ Solvent Series***

### **Soyanol™ 5000X; 5000X-HS**

- Viscosity and flow modifier for solvent borne coatings
- Non-phthalate plasticizer
- Compatible with most conventional resin systems and exempt solvents
- Provides excellent dispersion characteristics in paints and stains
- Deep penetration is excellent for wood and concrete applications
- Improves leveling
- Increases open time for better cure rates and smoother finishes
- More efficient than other options (use less, get more)

### **Soyanol™ 5000X-TB**

- Unique Thinner Base for use in compliant lacquer and paint thinner formulations
- Certified Formulations by SCAQMD
- Multiple base formulations available for blending of compliant solvents
- Typical usage 7% to formulate a 25 g/l VOC thinner solution

## ***Soyanol™ Emulsion Series***

### **Soyanol™ 1000E**

- Water-based additive for paints or stains
- Highly compatible with many chemistries, including most latex, acrylic and urethane emulsion systems
- Helps develop high stability emulsions
- Increases open times
- Improves freeze / thaw performance over industry leading coalescents
- Does double duty as coalescent and plasticizer
- Efficient and cost effective solution
- Typical usage 2%-7%

### **Soyanol™ 5000E**

- Derivative of SG1000E
- High KB value to increase dissolving power
- Faster drying formulation
- Viscosity modifier

### **Soyanol™ SGE40 Resin Systems**

- Unique ultra low surfactant emulsion system
- Base for paints, wood and concrete stains or adhesives
- Compatible with standard latex and acrylic resins
- Compatible with other alkyd dispersion resins
- Low surfactant system improves water resistance and finish
- Soy provides oil base performance in waterborne emulsion systems
- Many custom blending solutions available that will save you time and money

Let us help you develop your next generation compliant coatings.

We will be glad to add some sustainability to your formulating diet.



# *Soyanol™ 5000X-TB* Lacquer Thinner and Multipurpose Solvent Base








U.S. Patent #7785413



## TYPICAL USAGE:

Replace VOC solvents at a rate of 1 part Soyanol™ 5000X-TB up to 10 parts VOC solvent such as toluene, Xylene, Mineral Spirits and Naphtha.

## *Base Features:*

-  Soyanol™ 5000X-TB is a high performance additive, designed to replace VOC materials in consumer grade lacquer thinner and multipurpose solvent products
-  Patented lacquer and paint thinner formulations that fully comply with all California and national regulations (25 g/l VOC)
-  Listed Clean Air Solvent with SCAQMD (Certification #LVLT01)
-  For use in a wide variety of paint and coatings applications as a diluent and clean up solvent
-  Control drying profiles for improved film performance
-  Lowering VOC's reduces hazards to the end user
-  Provides the perfect balance to acetone and other exempt solvents used in low VOC diluents and multipurpose solvents

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# Compliant Lacquer Thinner Base

New regulations on the horizon will forever change the paint and lacquer thinner market as well as the package solvent market. Soyanol™ is a line of soy-based additives designed to enhance performance and provide formulators with easy to use technology to help meet tough regulations. Unlike other product lines, Soyanol™ provides “green” chemistry for both solvent and water-based formulating.

Soyanol™ 5000X-TB is an exclusive lacquer thinner base which has been certified in a lacquer thinner formulation by the South Coast Air Quality Management District (SCAQMD) as meeting the 25 g/l VOC limit designated by Rule 1143. When blended with the recommended amount of acetone, the formulator may utilize this “clean air solvent” designation to provide customers with the reassurance that their product meets the strictest regulatory standards.

Like all our thinner components, Soyanol™ 5000X-TB is formulated to provide performance similar to existing product lines. Not only can our lacquer thinner base be used for thinning lacquers, clear varnishes and other coatings, it provides the cleaning power the commercial contractor expects in a quality, medium dry time lacquer thinner.

Soyanol™ 5000X-TB can also be blended with other exempt solvents such as methyl acetate and propylene carbonate.

## *Additional Green Additive Options:*

### Soyanol™ 5000X and 5000X-HS

- Complimentary additives to be used with exempt solvents such as acetone, methyl acetate or propylene carbonate
- Allows for regulation of dry times and cure properties
- Improve flow, leveling and application characteristics
- High KB values insure easy mixing and excellent cleaning
- Soyanol™ 5000X
  - Excellent dissolving power. KB value = 330
  - Medium to fast dry
  - Usage range 5% - 10% of thinner blend
- Soyanol™ 5000X-HS
  - Slow drying times
  - Improves flow and leveling of many coatings, especially lower VOC (solvent borne) coatings
  - Excellent as a standalone drying time extender or as a component of a solvent system
  - Usage 5% -10% of thinner blend

### Soyanol™ 1000E and 5000E

- Emulsion ready systems that are perfect for prep work, cleanup and thinning oil or water based paints
- Improves flow, leveling and dispersion characteristics
- Recommended for thinning paints and primers
- Readily blends with other hydrocarbons and exempt solvents for customized, low VOC solutions

Soyanol™ additives are the perfect solution for low VOC thinners and solvents. With customized solutions and well documented results, our “green” additives will make your solvent-based program stand out among the crowd.



# *Soyanol™ 1000E* Green Coalescent and Plasticizer

## TYPICAL USAGE:

1 part Soyanol™ 1000E replaces 2 parts coalescent + 1 part plasticizer.

## Base Features:

- 🌱 Ultra low, VOC Coalescent and plasticizer for Coatings
- 🌱 90% bio-renewable content (plant based)
- 🌱 For use in a wide variety of paint applications
- 🌱 Easily blends into most waterborne applications
- 🌱 Permanent, non-leaching plasticizer
- 🌱 Non-Toxic, Non-flammable, and No Odors
- 🌱 Replaces standard Coalescence and Plasticizers with 1 product
- 🌱 U.S. EPA Design for Environment Recognized

# *Soyanol™ SGE40* Multipurpose Soy Resin Base

## Base Features:

- 🌱 Multipurpose base can be utilized in applications ranging from stains to Architectural and Industrial Coatings
- 🌱 40% solids emulsion and binder system provides formula stabilization, plasticization, and coalescence
- 🌱 Low surfactant count <1% provides excellent hydrophobic qualities for finished film

## TYPICAL USAGE:

Replaces plasticizers, coalescence, and emulsifiers in acrylic formulations. 8% SGE40 = 3% benzoflex + 5% dowanol + emulsifier.

- 🌱 Deep penetration in wood and concrete allows for higher usage levels
- 🌱 Additional usages include as penetrating oil in concrete and wood stains
- 🌱 Excellent dispersion and suspension characteristics
- 🌱 Minimum stability 2 years

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# Soyanol™ as a Plasticizer

Phthalate based plasticizers have been the industry standard for decades. Now with these products under regulatory and public scrutiny, formulators need new solutions. Phthalates are the most common type of plasticizers. Several factors make phthalates less than ideal for use as plasticizers. They migrate to the surface of plastics and can then evaporate or leach into the surrounding environment. This limits the usefulness of phthalate plasticizers as they eventually migrate out of rubber/plastic entirely, and as a result the materials become brittle. The release of phthalates into the environment represents an environmental hazard as well. As a result of the widespread use of phthalates, they have become one of the most abundant industrial pollutants in the environment. Many phthalates, including DOP, are classified as toxic chemicals by the EPA's Toxic Release Inventory.

Soyanol™ products are efficient plasticizers in both solvent and waterborne systems. Soyanol™ plasticizers are non-migrating and non-evaporative. Instead they are permanently bonded into the film, providing long term protection against cracking due to heat, cold or other adverse conditions. Soyanol™ plasticizers can tame the hardest resins and can be integrated early in the manufacturing process to help smooth the handling and integration of the materials during blending.

Soyanol™ is the most effective non-phthalate solution currently available. These materials can reduce the amount of material needed for plasticization by 30%-50%, thereby reducing costs and increasing formulating latitude.

Plasticizers are typically used to increase elongation and flexibility of coatings and stains. They're incorporated to boost the solids content and improve the volume of solids of the formulation thereby reducing shrinkage. Lower density plasticizers increase the volume with minimal increase in solids. It's important that the plasticizer have a density less than or equal to that of water (8.3454 lb/gal). A good benchmark is a density of <9 lbs/gal.

## Comparative Density Chart

Product	Density lbs/gal	Comments
DOP	8.20-8.23	Diocetyl phthalate
DINP	8.12	Diisononyl phthalate
DIDP	8.04	Diisodecyl phthalate
DOTP	8.2	Diocetyl-terephthalate
Jayflex 77	8.29	Diisoheptyl phthalate
Santicizer 141	9.1	2-ethylhexyl diphenyl phosphate
Santicizer 160	9.29	Butyl benzyl phthalate (BBP)
Santicizer 261	8.9	Alky benzyl phthalate (ABP)
Benzoflex 50	9.6	Diethylene glycol dibenzoate; Dipropylene glycol dibenzoate
Benzoflex 9-88	9.35	Dipropylene glycol dibenzoate
Benzoflex LA-705	9.6	Dibenzoate esters
Benzoflex 2088	9.6	45% diethylene glycol & 23% dipropylene glycol dibenzoate
Polybutene	7.14	Homopolymer of butane derived mainly from isobutylene
Paraplex WP-1	8.42	Polymeric plasticizer (medium molecular-weight, non-volatile)
TXIB	7.84	2,2,4-trimethyl-1,3-pentanediol diisobutyrate
Soyanol™ 1000E	7.52	
Soyanol™ 5000E	8.11	
Soyanol™ 5000X-HS	7.82	
Soyanol™ 5000X-X	7.99	
Soyanol™ 5000X-TB	8.49	
Soyanol™ SGE40	7.86	

## Benefits & Cost Savings of Using Soyanol™

The key in considering Soyanoles in terms of cost is the potential savings. While Soyanol™ may cost a bit more than phthalates, initially, their cost in use is actually very low due to several factors:

- High efficiency reduces amount of product required
- No special storage or disposal
- Low VOC/phthalate-free product
- Safer raw material in terms of worker health & safety

## Conclusion

Soyanol™ provides the right solution for formulators of architectural coatings, industrial coatings, nail enamels, plastics, elastomerics, caulks, adhesives, and a host of other applications. Soyanol™ is the right product line to ensure flexibility in your coatings and in your formulating options.



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