



VertecBio ELSOL™-CXR

Patent Pending Blend of Biobased Solvents

- 100% Biobased Replacement for Cyclohexanone
- Reduced Solvent Usage vs. Cyclohexanone
- Precision Cleaning Solvent that Leaves no Residue
- High Performance, Versatile Solvent Blends for Formulations
- Excellent Solvency for Paints, Coatings and Inks Formulations
- 20% - 30% More Efficient in Viscosity Reduction than Cyclohexanone
- Provides Excellent Flow Characteristics vs. Petroleum Solvents
- Low Vapor Pressure and High Loading Capacity
- 100% Biodegradable to Carbon Dioxide and Water
- Sustainable Chemistry – Does Not Contribute to Global Warming
- High Biobased Content, Made From Renewable Resources
- Easy and Inexpensive to Distill/Recycle
- No HAP's – No Hazardous Air Pollutants
- EPA Approved SNAP Solvents – No Ozone Depleting Chemicals
- No Environmentally Hazardous Ingredients
- Safe, Non-Toxic, Non-Carcinogenic

GENERAL PHYSICAL PROPERTIES

VERTECBIO ELSOL-CXR

Flash Point...107 F ASTM D93 closed cup
Vapor Pressure.....3.8 mmHg @ 68 F
PH of Water Dispersion.....4
Specific Gravity.....0.973
Evaporation Rate.....0.18
Boiling Point Range.....232-310 F



Vertec BioSolvents ELSOL™ CXR Performance Sheet

Suggested Replacement for Cyclohexanone

Introduction

Cyclohexanone's largest use is in industrial coatings application. For coatings formulators looking to achieve further HAPS (hazardous air polluting solvent) reductions. Vertec BioSolvents blend is an ideal replacement for cyclohexanone in a wide array of coatings formulations.

Vertec BioSolvents suggests a replacement blend with renewable, carbon neutral biobased solvents. These biobased solvents are derived from corn, soybeans, citrus fruits and other renewable feedstocks, and have a reduced toxicity profile.

Reformulation Solvents

Hazardous Solvents	Cyclohexanone
BioBased Replacements	ELSOL™ CXR

The solvent blends shown are only suggested starting points for developing alternative systems. All blends should be thoroughly evaluated to determine suitability for specific applications

	Relative Evaporation Rate	Hansen Solubility Parameters				Total
		Dispersion	Polar	H Bonding		
ELSOL™ CXR	.18	7.7	3.5	6.4	10.7	
Cyclohexanone	.02	8.7	3.1	2.5	9.6	

Reformulation Solvents Typical Properties

Blend	Environmental	Uses	Comments
ELSOL™ CXR	Non Hap	Paint, coatings	Renewable, carbon neutral
	Non SARA reportable	cleaners, adhesives	Reduced toxicity profile

Conclusion

Formulators and applicators are looking for a sustainable technology that is an alternative to hazardous solvents. This can be seen in many industries including paint and coatings, adhesives and inks. Formulators are not only feeling the pressures at the federal and state level, but abroad as well. The suggested replacements using the sustainable, carbon neutral, biobased solvents above should assist in meeting your requirements and the regulatory challenges.



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Cyclohexanone Replacement

Specifications

Item	Unit	Specification
Appearance		Free From Insoluble and Haze
Specific Gravity	20/20° C	0.973
Acidity	Wt % as Acetic Acid, Max.	0.05
Purity	Wt % Min.	99.5
Water Content	Wt % Max.	0.20
Viscosity	cps @ 20° C	≈0.8
Color	APHA, Max	10

Physical Properties

Item	CXR
Molecular Weight	105.6
Specific Gravity 20/20° C	0.973
Boiling Point	232° - 310°F
Flash Point	107°F
Viscosity @ 20°C (cps)	0.8
Evaporation Rate	0.18
Vapor Pressure, mm Hg, @20°C	3.8