



VertecBio ELSOL™ - PMAR

Patent Pending Blend of Biobased Solvents

- 100% Biobased Replacement for PM Acetate
- Better Cleaning Power and Reduced Solvent Usage vs. PMA
- Precision Cleaning Solvent, Dries Completely and Leaves No Residue
- High Performance, Versatile Solvent Blend for Formulations
- Excellent Solvency for Paint, Coating and Ink Formulations
- 20% - 30% More Efficient in Viscosity Reduction than PMA
- Provides Excellent Flow Characteristics When Used in Formulation
- Easy and Inexpensive to Distill/Recycle
- High Loading Capacity
- 100% Biodegradable to Carbon Dioxide and Water
- Sustainable Chemistry – No Impact on Global Warming (“Carbon Neutral”)
- EPA Approved SNAP Solvent – No Ozone Depleting Chemicals
- No Environmentally Hazardous Ingredients
- Safe, Non-Toxic, Non-Carcinogenic
- No HAP’s – No Hazardous Air Pollutants
- Manufactured in the United States

GENERAL PHYSICAL PROPERTIES

VERTECBIO ELSOL-PMAR

Flash Point .105 F ASTM D3278 (Setaflash)
Vapor Pressure.....≈5 mmHg @ 68 F
PH of Water Dispersion.....4
Specific Gravity.....0.96
Evaporation Rate.....0.27
Boiling Point Range.....114 - 174 F

11/19/08



Vertec BioSolvents ELSOL™-PMAR Performance Sheet

Suggested Replacement for PM Acetate

Introduction

PM Acetate's largest use is in industrial coatings applications, primarily in coil, extrusion, wood furniture and fixtures, containers and closures, automotive finishes and machinery. Formulators have been seeking an alternative to these hazardous solvents due to employee exposure concerns and increased legislative pressure geared toward reducing the use of these solvents.

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 reduced toxicity profiles.

Reformulation Solvents

Hazardous Solvents	PM Acetate
BioBased Replacement	ELSOL-PMAR

The solvent blend shown is only a suggested starting point for developing alternative systems. All blends should be thoroughly evaluated to determine suitability for specific applications

	Relative Evaporation Rate	Flash Point(°F)	Hansen Solubility Parameters			Total
			Dispersion	Polar	H Bonding	
ELSOL™ - PMAR	0.27	105	7.7	3.1	6.2	10.4
Propylene Glycol Methyl Ether Acetate	0.368	114	8.9	1.8	3.0	9.6

Reformulation Solvents Typical Properties

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

Conclusion

Formulators and applicators are looking for alternatives to hazardous solvents as more regulations are enforced. 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 performance requirements and the regulatory challenges.

11/19/08, klm



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PM Acetate Replacement

Specifications

Item	Unit	Specification
Appearance		Clear, substantially Free From Suspended Matter
Specific Gravity	20/20° C	0.96
Acidity	Wt % as Acetic Acid, Max.	0.05
Purity	Wt % Min.	99.5
Water Content	Wt % Max.	0.2
Viscosity	cps @ 20° C	2.4
Color	PtCO, Max	10

Physical Properties

Item	PMAR
Molecular Weight	106.43
Specific Gravity 20/20° C	0.96
Boiling Point	114° - 174°F
Flash Point	105°F
Viscosity @ 20° C (cps)	2.4
Evaporation Rate	0.27
Vapor Pressure, mm Hg, @20°C	≈5