



RHOPLEX™ E-1691LF Emulsion

Regional Product Availability

- North America

Description

RHOPLEX™ E-1691LF Emulsion is a low-formaldehyde*, aqueous acrylic emulsion designed specifically as an overprint or letdown vehicle for adhesion to vinyl films and vinyl-coated substrates. The product offers excellent stain and solvent resistance, adhesion to vinyl, excellent plasticizer migration resistance, and excellent thermal color stability.

To achieve optimum properties, the polymer is typically formulated with wetting agents, coalescents for film formation, and rheology modifiers for printability.

Standard RHOPLEX E-1691 Emulsion contains low levels of formaldehyde (present in additives used in the polymerization of the emulsion). The additives, however, have been removed in the new version—RHOPLEX E-1691LF Emulsion—which has maximum formaldehyde level of 10 ppm.

Key Features

- Excellent adhesion to vinyl
- Plasticizer migration resistance
- Excellent stain resistance (Flair pen, ballpoint pen, blood, ketchup, mustard, lipstick and coffee)
- Excellent alkali and solvent scrub resistance (typical household cleaners)
- Color stability
- Fast drying
- Low formaldehyde*

Typical Physical Properties

(These properties are typical but do not constitute specifications.)

Property	Value
Appearance	Milky white emulsion
Solids, %	41.0%
pH	5.5
Viscosity, cP	<600
MFFT	40° C
Acid number	<10
Formaldehyde	10 ppm max.
Freeze/thaw stability	Keep from freezing
VOC	Negligible

* No formaldehyde or formaldehyde generating materials are intentionally added. Formaldehyde is not used in the manufacture, would not be expected to form during manufacture, and would not be expected to be present in the final composition unless at trace levels (\leq ppm) as an unknown impurity from the raw materials.

Compatibility Guidelines

Solvent Compatibility with RHOPLEX™ E-1691 Emulsion

RHOPLEX™ E-1691LF Emulsion is compatible with the typical alcohols and glycol ethers used in the graphic arts industry. We recommend formulating with a blend of coalescing agents to give optimum film formation:

- *50 parts Butyl CELLOSOLVE™ Faster Evaporating Solvent
- *50 parts of DPnB (Dipropylene Glycol Monobutyl ether) Slower evaporating solvent
- Surfynol 104 BC surfactant supplied by and a trademark of Air Products, can be used with this blend to keep the solvents from separating

Compatibility with Other Polymers

RHOPLEX™ E-1691LF Emulsion is not readily compatible with standard styrene/acrylics used in the graphic arts industry. We recommend laboratory testing to check viscosity stability and general compatibility prior to producing larger scale batches.

Typical Starting Point Formulation

RHOPLEX™ E-1691LF Emulsion is compatible with most commercially available formulating additives. A typical overprint formulation based on this emulsion may include the following:

- Coalescent - for film formation. Typically, 20% by weight on polymer solids is required.
- Leveler - for flow and leveling. TRITON™ X-405 and TRITON MA-65 are good candidates.
- Wetting Aids - used for improving adhesion. TRITON X-114 along with lower HLB surfactants work well.
- Surfactants -as transfer aids (from gravure cylinder). Pluronic 101 surfactant supplied by and a trademark of BASF, can be used for this purpose.
- Buffer - Sodium bicarbonate is recommended to bring pH up to 8.0 - 8.5 and to help improve block resistance.
- Thickener / Rheology Modifier - ACRY SOL™ RM-2020NPR Thickener in combination with ACRY SOL TT-678 Rheology Modifier provides the proper viscosity and rheology needed for flexo and gravure printing. ACRY SOL TT-678 Rheology Modifier should also aid flow and leveling.

Application Formulations

Overprint Varnish for Vinyl Wallcovering

Premix:

	Gloss	Matte
DPnB	3.0	3.0
Butyl CELLOSOLVE™ Solvent	3.0	3.0
Patcote 811 Defoamer ¹	0.4	0.4
Pluronic 101 Surfctant ²	0.05	0.05
TRITON™ X-114 Surfactant	2.0	2.0
PRIMAL™ Leveler MA-6	6.0	6.0
ACRY SOL™ TT-678 Rheology Modifier	2.0	2.0
Water	11.15	7.55

Add:

Level 27 Flattig agent ³	–	5.0
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Application Formulations (cont.)

Overprint Varnish for Vinyl Wallcovering (cont.)

Then Add:

RHOPLEX™ E-1691LF Emulsion	67.0	67.0
Sodium Bicarbonate	1.4	-
ACRYSOL RM-2020NPR	4.0	4.0

Total	100.0	100.0
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Solids	35.0	38.5
Viscosity	800	200
pH	8.5	7.0
Dilute to desired viscosity		

¹Supplied by and trademark of Hydrite Chemical

²Supplied by and trademark of BASF

³Supplied by and trademark of PPG

Ink Formulation for Vinyl Wallcovering

Inks can be made by adding color concentrates to the overprint varnish formulation. Color concentrates based on surfactant stabilized pigments offer better compatibility and better final film properties.

Properties of the Final Product

(These properties are typical but do not constitute specifications.)

Test	Conditions	Results
Block	5 psi / 180° F / 30 minutes	Passes both face-to-back and face-to-face
Adhesion	610 and scotch tape pull	Passes both
Color Stability	200 hrs./ 7 days @ 158° F	No change on Fade-Ometer
Gardner Scrub Resistance	With Formula 409/ 500 scrubs	Passes
Stain Resistance	Flair pens & coffee	Excellent
	Ketchup & blood	Very good
	Mustard & Lipstick	Good

Food Legislation

RHOPLEX™ E-1691LF Emulsion complies with applicable requirements of FDA Regulation 21CFR175.105-Adhesives. We recommend that you make your own determination on the suitability of RHOPLEX E-1691LF Emulsion for your particular application. We also recommend that you periodically verify the regulatory status of RHOPLEX E-1691LF Emulsion.

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