ROSHIELD™ 636 Emulsion Polymer

Styrene-Acrylic Emulsion for Sealers/Topcoats

ROSHIELD™ 636 Emulsion is a hard, styrene-acrylic polymer that offers one-component, self-crosslinking technology for kitchen cabinets, for sealers and topcoats in molding formulations, and any interior board application.

Coatings based on ROSHIELD 636 Emulsion exhibit outstanding mar, print, and block resistance without the limitation of pot life. The excellent color retention of ROSHIELD 636 Emulsion makes it an excellent choice for use over white and light colored basecoats. It offers very good ammonia resistance, is highly resistant to a wide range of stains and chemicals, and has unsurpassed humidity resistance.

In general, ROSHIELD 636 Emulsion offers very good sandability and good substrate adhesion, and can be self-sealed. Coatings based on ROSHIELD 636 Emulsion can be clear or pigmented and can be formulated in a range of finishes from flat to gloss.

For kitchen cabinets specifically, ROSHIELD 636 Emulsion provides its best performance when used in combination with a waterborne sealer based on RHOPLEX™ AC-337N Emulsion. Each of these polymers is based on acrylic technology recognized for offering highly durable finishes. This sealer/topcoat combination results in a low-VOC and low-HAPs system with excellent appearance and resistance properties.

Benefits

- Ease of formulating
- 1K—No pot life issues
- Outstanding mar, block, and print resistance
- Exceptional humidity resistance
- Excellent color retention (non-yellowing)
- Very good ammonia resistance
- Low VOCs and low HAPs

Typical Physical Properties

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

Property	Typical Values
Appearance	Opaque
Weight solids, %	40.0
Volume solids, %	36.9
pH	8.5
Viscosity (#2 Zahn @ 25° C)	28 sec
Acid number (NV)	75
MFFT (° C)	74
Dry density (lb./gal.)	9.3
Wet density (lb./gal.)	8.7

Applications

- Interior furniture
- Kitchen cabinet topcoats
- Interior board primers
- Interior board topcoats
- Doorskin primers
- Molding

Traditional sealers and topcoats used to finish kitchen cabinets are generally solventborne, acid-catalyzed systems that can pose regulatory issues, including HAPs and high VOC concerns. They also have limited pot life. As described above, these are not issues with ROSHIELD 636 Emulsion which is well suited for low-VOC and low-HAPs finishes. Additionally, the combination of a sealer based on RHOPLEX AC-337N Emulsion and a topcoat based on ROSHIELD 636 Emulsion easily passes each of the KCMA tests, including the challenging edge soak test. The following table presents the results of sealer/topcoat testing for kitchen cabinets.

PERFORMANCE PROPERTIES OF KITCHEN CABINET COATING SYSTEM BASED ON RHOPLEX™ AC-337N AND ROSHIELD™ 636 EMULSIONS

Performance Properties Rating: 1 to 10, 10 = Best	ROSHIELD 636 Topcoat RHOPLEX AC-337N Sealer*	Solventborne Acid-Catalyzed System	Waterborne Acid-Catalyzed Topcoat Waterborne Sealer	Waterborne Acid-Catalyzed Topcoat Solventborne Sealer
Stain and Chemical Resistance				
1-hour spot test				
50% ethanol in water	7	10	9	10
isopropanol	8	8	8	8
butyl acetate	7	6	8	8
acetone	9	5	8	8
Pro 409 super concentrate	4	10	10	10
lipid test	6	10	10	10
10% ammonia (2 minutes only)	8	10	10	10
16-hour spot test				
water	10	10	10	10
4% hot Swedish coffee	8	10	7	7
50% ethanol in water	7	10	9	10
Pro 409 super concentrate	3	10	8	10
isopropanol	6	7	7	10
red ink	2	4	2	3
grape juice	10	10	7	7
KCMA Tests	Pass	Pass	Pass	Pass
Appearance/Resistance Properties				
Mar resistance	9	8	7	7
Mar resistance after humidity	9	4	7	7
Print resistance (2 psi)	8	9	10	10
Humidity resistance (recovered appearance)	10	10	8	7
KCMA edge soak resistance	Pass	Pass	Pass	Pass
Color retention**	10	8	8	7
Cold check	Pass	Pass	Pass	Pass
Sandability (sealer only)	7	10	7	10
Heat age	Pass	Pass	Pass	Pass

* 2 coats sealer

** 6 wet mils on white primed board; no UV absorber/HALs in any of the coatings

Hybrid Finishing

To reduce the grain raising associated with waterborne coatings applied directly to wood, a hybrid finishing approach is recommended with the sealer/topcoat system discussed above. Commercial solventborne stains reduce grain raising and have excellent compatibility with our waterborne, one-component, sealer/topcoat recommendations. When the stain is applied, it should be dried and then sealed with a recommended formula based on RHOPLEX AC-337N Emulsion. One coat of sealer is acceptable but two is preferred for exceptional performance. Two sealer coats allow for the option of sanding only the second coat of sealer, thereby reducing the possibility of secondary grain-raising after the topcoat is applied. The topcoat based on the ROSHIELD 636 Emulsion is then applied, resulting in a top-quality, low-emission finish.

Starting Point Formulations

The following sealer and topcoat formulations are recommended starting points.

SANDING SEALER STARTING POINT FORMULATION BASED ON RHOPLEX™ AC-337N EMULSION

Material	Weight Percent	Gallons
RHOPLEX™ AC-337N Emulsion	64.00	62.64
Premix (add to above)		
Ethylene Glycol Monobutyl Ether (EB)	2.90	3.32
Water	27.30	28.59
Synpro Zincloid	3.00	3.04
Surfynol 104 DPM surfactant	0.50	0.60
Tego 410 additive (50% in DPM)	0.10	0.10
Tego Foamex 805	0.50	0.51
ACRYSOL™ RM-12W Thickener	0.70	0.70
Syloid 7000 silica	1.00	0.50
Total	**100.00**	**100.00**
Formulation Constants		
Wt./gal., lb./gal.	8.65	
Solids,Weight %	32.2	
Solids,Volume %	27.3	
VOC, lb./gal.	0.79	
Viscosity, #2 Zahn @ 78° F.	18”	

Starting Point Formulations (con't.)

SEMI-GLOSS TOPCOAT STARTING POINT FORMULATION BASED ON ROSHIELD™ 636 EMULSION

Material	Weight Percent	Gallons
ROSHIELD™ 636 Emulsion	77.80	76.05
Premix (add to above)		
Ethylene Glycol Monobutyl Ether (EB)	8.00	9.31
Dipropylene Glycol Monobutyl Ether (DPnB)	1.00	1.13
RHOPLEX™ WP-1 Plasticizer	1.70	1.74
Water	6.70	6.96
ACRYSOL™ RM-825 Thickener	0.50	0.52
Tego 410 additive (50% in DPM)	1.00	1.05
Surfynol 104 DPM surfactant	0.50	0.53
Byk-346 defoamer	0.30	0.35
Byk-028	0.50	0.53
Ceraflour 921 polymer	1.00	0.78
Michemlube 39235 emulsion	1.00	1.05
Total	**100.00**	**100.00**
Formulation Constants		
Wt./gal., lb./gal.	8.70	
Solids,Weight %	33.90	
Solids,Volume %	29.90	
VOC, lb./gal.	1.98	
Viscosity, #2 Zahn @ 78° F.	25 to 28	

Starting Point Formulations (con't.)

PIGMENTED TOPCOAT STARTING POINT FORMULATIONBASED ON ROSHIELD™ 636 EMULSION

Material	Weight Percent	Gallons
ROSHIELD™ 636 Emulsion	66.00	70.00
Premix (add to above)		
Ethylene Glycol Monobutyl Ether (EB)	6.80	8.55
Dipropylene Glycol Monobutyl Ether (DPnB)	0.90	1.11
RHOPLEX™ WP-1 Plasticizer	1.70	1.91
Water	7.20	8.15
Mix for 15 minutes and add slowly		
Tego 410 additive (50% in DPM)	0.90	1.01
Surfynol 104 DPM surfactant	0.40	0.45
Byk-346 defoamer	0.30	0.35
Byk-028	0.40	0.47
ACRYSOL™ RM-825 Thickener	0.40	0.44
Mix for 15 minutes and add slowly		
Premix		
Water	3.30	3.74
TAMOL™ 731A Dispersant	0.44	0.45
TRITON™ CF-10 Surfactant	0.10	0.11
Foamex 804 defoamer	0.11	0.12
Ti-Pure R-706 titanium dioxide	11.05	3.13
Total	**100.00**	**100.00**
Formulation Constants		
Wt./gal., lb./gal.	9.45	
Solids,Weight %	36.1	
Solids,Volume %	26.8	
VOC, g/l	222	

Starting Point Formulations (con't.)

GLOSS TOPCOAT STARTING POINT FORMULATION BASED ON ROSHIELD™ 636 EMULSION

Material	Weight Percent	Gallons
ROSHIELD™ 636 Emulsion	77.00	75.40
Premix (slowly add premix to above)		
Ethylene Glycol Monobutyl Ether (EB)	6.00	6.97
Dipropylene Glycol Monobutyl Ether (DPnB)	3.00	3.42
RHOPLEX™ WP-1 Plasticizer	1.80	1.69
Water	9.80	10.03
Tego 410 additive (50% in DPM)	1.00	1.00
Surfynol 104 DPM surfactant	0.50	0.60
Byk-346 defoamer	0.30	0.30
Byk-028	0.50	0.50
ACRYSOL™ RM-825 Thickener	0.10	0.09
Total	**100.00**	**100.00**
Formulation Constants		
Wt./gal., lb./gal.	8.60	
Solids,Weight %	34.5	
Solids,Volume %	31.7	
VOC, lb./gal.	1.85	
Viscosity, #2 Zahn @ 78° F.	20 sec	

Handling Precautions

Before using this product, consult the Material Safety Data Sheet (MSDS)/Safety Data Sheet (SDS) for details on product hazards, recommended handling precautions and product storage.

Storage

Store products in tightly closed original containers at temperatures recommended on the product label.

Disposal Considerations

Dispose in accordance with all local, state (provincial) and federal regulations. Empty containers may contain hazardous residues. This material and its container must be disposed in a safe and legal manner.

It is the user's responsibility to verify that treatment and disposal procedures comply with local, state (provincial) and federal regulations. Contact your Dow Coating Materials Technical Representative for more information.

Chemical Registration

Many countries require the registration of chemicals, either imported or produced locally, prior to their commercial use. Violation of these regulations may lead to substantial penalties imposed upon the user, the importer or manufacturer, and/or cessation of supply. It is in your interest to ensure that all chemicals used by you are registered. Dow does not supply unregistered products unless permitted under limited sampling procedures as a precursor to registration.

Product Stewardship

Dow has a fundamental concern for all who make, distribute, and use its products, and for the environment in which we live. This concern is the basis for our product stewardship philosophy by which we assess the safety, health, and environmental information on our products and then take appropriate steps to protect employee and public health and our environment. The success of our product stewardship program rests with each and every individual involved with Dow products - from the initial concept and research, to manufacture, use, sale, disposal, and recycle of each product.

Customer Notice

Dow strongly encourages its customers to review both their manufacturing processes and their applications of Dow products from the standpoint of human health and environmental quality to ensure that Dow products are not used in ways for which they are not intended or tested. Dow personnel are available to answer your questions and to provide reasonable technical support. Dow product literature, including safety data sheets, should be consulted prior to use of Dow products. Current safety data sheets are available from Dow.

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