AROLON® 880

Acrylic Emulsion For High-Performance Acid-Catalyzed Wood Coatings

AROLON® 880 is a self-crosslinking acrylic emulsion designed for easy-to-use, compliant, waterborne, environmentally friendly wood sealer and topcoat applications. AROLON 880 is intended for use in clear sealers and clear topcoats when formulated with aminoplast resins and acid catalysts.

Clear coatings based on AROLON 880 pass all KCMA ANSI 161.1-1995 specifications, whether applied over an oil-based sealer or as a two coat self-sealed system. These coatings have excellent print resistance and film hardness, yet are resistant to cold checking.

When crosslinked with aminoplast resins, AROLON 880 cures rapidly to give hard, chemical-resistant films. Clear coatings containing AROLON 880 cure under low heat KCMA conditions (150º F). Even at ambient (72º F) conditions, catalyzed clears are sandable in less than 30 minutes. Whether cured under heat or at ambient, AROLON 880 coatings pass KCMA ANSI 161.1 tests. The cured films show excellent stain and chemical resistance.

Low VOC formulations can be developed using AROLON 880. Clear formulations made from AROLON 880 exhibit low odor when compared to competitive offerings.

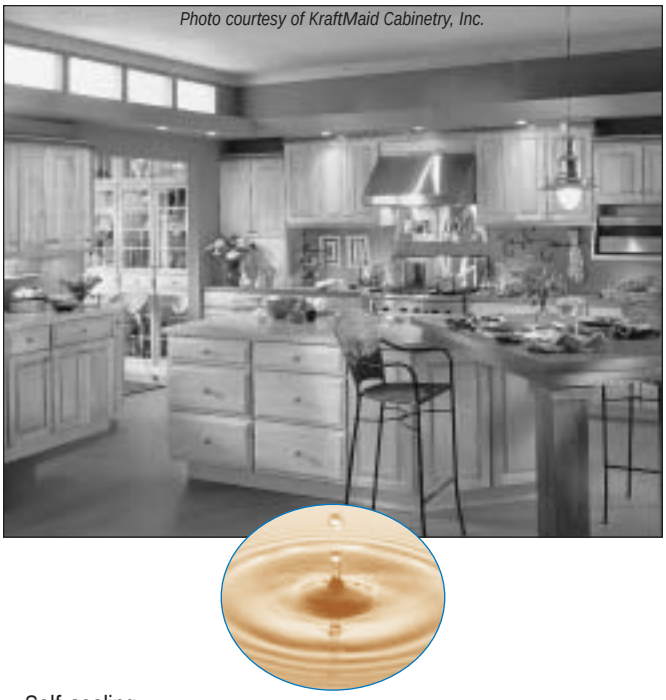


Photo courtesy of KraftMaid Cabinetry, Inc.

Typical Performance

Features:

- Excellent gloss development and clarity.
- Forms hard, water and detergent resistant films, which also exhibit good chemical and stain resistance.
- When formulated properly, AROLON 880 has little formaldehyde odor, as well as low free and evolved formaldehyde levels.
- Offers outstanding cold check resistance with no checking or loss of gloss.
- Self-sealing.
- Passes print resistance of 1 and 2 lbs/sq. in. after only a 30-minute ambient cure.
- Develops outstanding film hardness with good mar resistance.
- VOC's of 2.3 lb/gal or lower can be formulated to achieve compliant, environmentally friendly coatings.
- Fast cure gives a sandable sealer in under 30 minutes even at ambient conditions (72º F).

Benefits:

- Waterborne, compliant, environmentally friendly.
- Passes or exceeds all KCMA ANSI 161.1-1995 tests.
- Can be used as a self-sealer utilizing the same formulation as the topcoat.

Typical Physical Properties

The following are typical properties and should not be taken as product specifications:

Appearance: Milky White
Percent Solids, Weight: 43
Percent Solids, Volume: 41
Viscosity at 25º C, cps: 100
(Brookfield LVT, #4 Spindle @ 50 rpm)
Pounds Per Gallon, Solution: 8.86
Pounds/Gallon, Solids: 9.61
Specific Gravity, 25/25º C: 1.06
pH: 9.3
Particle Size, nm: 65
Minimum Filming Temperature: 40º C

Suggested Applications

AROLON® 880 can be used in Airless, Air-Assisted Airless, Conventional, and HVLP spray applications. AROLON 880 can be used in Roll Coat and Electrostatic applications as well. Conventional and HVLP can use either formula 96080-1 (for lower shear) or 96080-2 (for higher shear). Formula 96080-2 is the recommended formula for Airless and Air-Assisted Airless due to the high shear rate in these application methods.

The best performance can be achieved using the following spray equipment and settings:

Conventional:
Model: Binks 2001 Siphon Feed
Air Cap: 66SK
Nozzle: 66SS
Needle: 565
Air Pressure: 45 psi

HVLP:
Model: Accuspray Model 36
Air Cap: #7
Atomizing Set: 0.028 in.
Fluid Pressure: 8.5 psi
Inlet Pressure: 45 psi

Airless:
Model: Graco AA Plus Spray Gun
Model: Graco President 30:1 Pump
Spray Tip: 0.011 in.
Inlet Pressure: 40 psi
Fluid Pressure: 1200 psi

Air-Assisted Airless:
Model: Graco AA Plus Spray Gun
Model: Graco President 30:1 Pump
Spray Tip: 0.011 in.
Inlet Pressure: 40 psi
Fluid Pressure: 1200 psi
Air Pressure: 45 psi

The above equipment and settings were tested with formula 96080-2. The sealer was sprayed at 3-4 wet mils, sanded after a 30-minute ambient cure and then topcoated with an additional 3-4 wet mils.

Formulating Guidelines

Crosslinking Resin:
Crosslinker selection is very important in maintaining the proper balance of cure speed and stability. Cytec's Cymel® UM-20, a methylated urea formaldehyde resin, is highly recommended because it exhibits the best balance of properties. A 70:30 ratio of AROLON 880 to Cymel UM-20 on resin solids should be used to maximize properties. This ratio will give a 30-minute or less ambient cure in formulations 96080-1 and 96080-2. Both formulations (uncatalyzed) will give 6+ weeks of 120º F oven stability without significant viscosity increase or change in gloss. This unique AROLON 880:Cymel UM-20 combination provides the ability for self-sealing panels that can be sanded in less than 30 minutes and then immediately topcoated using the exact same formula.

Alcohol Selection:
Stability of formulated AROLON 880 is greatly affected by choice of alcohol. The following alcohols are recommended in decreasing order of acceptability: methanol > ethanol > isopropanol. The formulator should avoid n-propanol, butanol, isobutanol, sec-butanol, and other higher chain alcohols. These higher chain alcohols may cause stability problems as well as gellation. Methanol yields the fastest cure and best oven stability. Methanol, ethanol, and isopropanol are also utilized for proper flow and leveling during spray applications. These alcohols should be incorporated at approximately 15%-20% based on AROLON 880 solids.

Coalescents:
AROLON® 880 is not a film former by itself. Therefore, proper selection of coalescents is very important. AROLON 880 shows good compatibility with various types of coalescents. One determining factor is whether to use HAPs or HAPs-Free cosolvents. The following coalescents are recommended with their percentage based on AROLON 880 resin solids:

HAPs

1 Diethylene Glycol Butyl Ether
7%-12% on AROLON 880 Solids
Very slow evaporation rate
100% soluble in water

2 Ethylene Glycol Propyl Ether
7%-12% on AROLON 880 solids
Fast evaporation rate
100% soluble in water

HAPs-Free

1 Propylene Glycol n-Propyl Ether
7%-10% on AROLON 880 solids
Fast evaporation rate
100% soluble in water

2 Exxate 600
7-12% on AROLON 880 Solids
Fast evaporation rate
0.66% soluble in water

3 Dipropylene Glycol Methyl Ether
7-15% on AROLON 880 solids
Moderately slow evaporation rate
100% soluble in water

4 Dipropylene Glycol n-Butyl Ether
4%-6% on AROLON 880 solids
Very slow evaporation rate
5% soluble in water

All hydrophobic coalescents such as Exxate® 600 and Dipropylene Glycol n-Butyl Ether should be premixed in the water phase to prevent swelling of the emulsion polymer. Hydrophobic coalescents can be used to increase associative thickener efficiency. Fast evaporating coalescents will improve early hardness development. Slower evaporating coalescents can be used to slow the dry rate or prevent dry spraying on high shear applications such as airless or air-assisted airless.

Mar Resistance
AROLON 880 provides excellent mar resistance and early hardness development. If an improvement in mar resistance is needed, various waxes may be incorporated. Depending on the mar resistance needed, 2%-15% wax on AROLON 880 solids may be incorporated. The following waxes are recommended:

- Chemcor AS-35
  35% solids Carnauba emulsion
- Chemcor RM 634
  35% solids High Density Polyethylene emulsion
- Michemlube 743
  32% solids Paraffin emulsion

Rheology Modifiers
Associative thickeners are effective thixotropes for AROLON 880. The associative thickeners that show compatibility with AROLON 880 are Tafigel® PUR 50, Acrysol® RM-8W, and Rheolate® 288. All offer excellent clarity and gloss throughout a 10+ hour pot life. Rheolate 288 is the most efficient of the three, requiring less material to achieve equal viscosity compared to other thickeners. Thickeners should be cut 50% by weight in Dipropylene Glycol Methyl Ether for ease of incorporation. Alkali-swellable and silica-based thickeners should be avoided.

Wetting and Flow Agents
Proper wetting and flow agent selection is critical to ensure excellent appearance. Depending on the application technique, different wetting agents may be recommended. For low shear applications, i.e. conventional or HVLP spray, Surfynol® 104 DPM is a good choice. Surfynol 104 DPM should be incorporated at approximately 0.25% to 0.5% by weight of the total formula. For higher shear applications, i.e. airless or air-assisted airless spray, Dynol® 604 should be used. Dynol 604 should be incorporated at approximately 0.4% to 0.7%. Dynol 604 greatly improves the flow and wetting over porous substrates while controlling both the macrofoam and microfoam generated. Both wetting agents have minimal effect on water sensitivity. Due to the dynamic surface tension of Dynol 604, flow and wetting is improved as more shear is generated. Both Surfynol 104 DPM and Dynol 604 should equilibrate into the formula at least 24 hours prior to use.

Defoamers
Selection of defoamers is dependent upon the application technique. BYK®-028 is recommended for low shear applications. BYK-028 alleviates most macrofoam and should be incorporated at 0.1% to 0.3% by weight of total formula. The recommended defoamer for high shear applications is Surfynol® DF-66. Surfynol DF-66 alleviates

both macrofoam and microfoam. This defoamer should be incorporated at 0.05% to 0.15% by weight of total formula. Both defoamers should equilibrate at least 24 hours prior to use in the formulated coating.

Catalysts

The recommended catalyst is para–toluenesulfonic acid (PTSA) cut 50% by weight in water. PTSA cut in water is both an efficient and cost effective means of catalyzing AROLON® 880. K-Cure® 1040W can also be used but must be adjusted for PTSA solids. K-Cure 1040W is a 40% PTSA solution cut in water. It is extremely important to add enough catalyst to achieve a 2.05 pH in order to obtain a fast cure rate. This will give a 10+ hour pot life with no loss of gloss and no viscosity change. Solvent cuts of PTSA should be avoided for catalyzation of AROLON 880.

Performance

Tables I, II, and III outline the competitive benchmarking of AROLON 880 versus Solventborne Competitor A (a commercially available alkyd/urea conversion varnish), Waterborne Competitor B (an acid catalyzed emulsion in a supplier recommended formula), and Waterborne Competitor C (a water reducible acid catalyzed commercially available formula).

Table I shows both KCMA ANSI 161.1-1995 testing as well as competitive benchmarking. Non-KCMA tests such as QUV exposure and print resistance were performed as well. As noted in the table, AROLON 880 outperforms the competitors in regards to 100 hour QUV B313 exposure. KCMA tests such as detergent edge soak resistance, chemical resistance, and hot/cold check resistance were performed. All four samples passed KCMA testing except Waterborne Competitor C fails chemical resistance. Waterborne Competitor C failed chemical resistance testing leaving a slight ring with vinegar, lemon juice, and 100 proof alcohol.

Table II tests finished formulations for 120º F Oven Stability. All four samples were evaluated weekly for pH drift and viscosity change. As seen, formulated AROLON 880 exhibits the best viscosity and pH stability of all the waterborne samples rivaling that of the solventborne product. Waterborne Competitors B and C failed after only the second week of testing. Both waterborne competitors had significant pH drift and viscosity increase, even gellation.

Table III compares the samples over a 10-hour pot life. Viscosity testing showed Waterborne Competitor B failing after 8 hours. When testing for pH, formulated AROLON 880 exhibits little or no change after 10 hours. Also, Waterborne Competitors B and C exhibited poor clarity throughout the pot life. One of the unique characteristics of formulated AROLON 880 is the dry to sand time rivaling that of nitrocellulose lacquers. When properly catalyzed to a 2.05 pH, AROLON 880 can be sanded after only a 24-minute ambient cure. The other competitors are much slower to dry, taking up to 87 minutes before sanding could occur (nearly 4 times slower than AROLON 880). Gloss was measured throughout the pot life. AROLON 880 maintained a 95 gloss (60º gloss measurement) over 10 hours. The gloss of Waterborne Competitor B dropped 30% in 5 hours after catalyzation. Formulated AROLON 880 exhibited the least amount of foam generation out of all the waterborne samples. Thus, AROLON 880 can be used in many different application methods including airless and air-assisted airless spray. Table III also shows the VOC measurements of all four samples. Only AROLON 880 and Waterborne Competitor C achieved a 2.3 lb./gal or lower VOC.

To summarize the tables, AROLON 880 gave the best overall range of properties with the least amount of deficiencies. Through proper formulation, it is possible to achieve solventborne properties while being environmentally friendly.

Figure I and II outline the rejuvenation of AROLON 880. Rejuvenation is the ability to use formulated AROLON 880 for next day and after weekend use. Rejuvenation is accomplished by blending catalyzed material with uncatalyzed material to extend to pot life. Figure I shows how it is possible to rejuvenate AROLON 880 for next day use with a 1:1 blend of catalyzed and uncatalyzed product at the end of the eight hour work shift. Figure II shows how it is possible to rejuvenate AROLON 880 for use after 62 hours if rejuvenated after the end of the eight-hour work shift. With only 4 parts uncatalyzed product to 1 part catalyzed product, AROLON 880 can be used after a weekend. In all cases, AROLON 880 must be recatalyzed to pH 2.05 before using. AROLON 880 exhibits no loss of properties during rejuvenation.

Two separate formulations are listed so that AROLON 880 can be optimized in different application methods. Formulation 96080-1 is used in low shear methods such as conventional spray, HVLP, roll coat and brush. Formulation 96080-2 is used for high shear applications such as airless and air-assisted airless spray. Both formulations underwent extensive testing. Although the formulas are only suggested starting point formulations, little modification should be needed to achieve the maximum properties.

Table I — Competitive Benchmarking — KCMA Testing

Print Resistance	
AROLON 880	Pass 1 and 2 Pounds/Square Inch
Solventborne Competitor A	Pass 1 and 2 Pounds/Square Inch
Waterborne Competitor B	Pass 1 and 2 Pounds/Square Inch
Waterborne Competitor C	Pass 1 and 2 Pounds/Square Inch

100 Hour QUV B313	
AROLON 880	Slight Splotches
Solventborne Competitor A	Water Spots/Blisters
Waterborne Competitor B	Hazy Yellow/Cracked
Waterborne Competitor C	Substantial Splotches

Detergent Edge Soak Resistance (ANSI 161.1-1995)	
AROLON 880	Pass
Solventborne Competitor A	Pass
Waterborne Competitor B	Pass
Waterborne Competitor C	Pass

Chemical Resistance (24 Hours) (ANSI 161.1-1995)	AROLON 880	Solventborne Competitor A	Waterborne Competitor B	Waterborne Competitor C
Vinegar	Pass	Pass	Pass	Slight Ring
Lemon Juice	Pass	Pass	Pass	Slight Ring
Orange Juice	Pass	Pass	Pass	Pass
Grape Juice	Pass	Pass	Pass	Pass
Tomato Catsup	Pass	Pass	Pass	Pass
Coffee (115ºF)	Pass	Pass	Pass	Pass
Olive Oil	Pass	Pass	Pass	Pass
100 Proof Alcohol	Pass	Pass	Pass	Slight Ring
1% Detergent Solution	Pass	Pass	Pass	Pass
Mustard (1 Hour)	Pass	Pass	Pass	Pass
Gasoline Resistance (2 Hours)	Pass	Pass	Pass	Pass

Hot and Cold Check Resistance (ANSI 161.1-1995)	AROLON 880	Solventborne Competitor A	Waterborne Competitor B	Waterborne Competitor C
1 Hour @ 120º F/70% Relative Humidity 30 Minutes Ambient 1 Hour @ -5º F 30 Minutes Ambient Repeat 5 Cycles	Pass	Pass	Pass	Pass

AROLON 880 is Reichhold's Acid Catalyzed Emulsion in a Finished Formula 96080-1.
Competitor A is a Finished Alkyd/Urea Conversion Varnish.
Competitor B is an Acid Catalyzed Emulsion in a Finished Formula.
Competitor C is a Water Reducible Acid Catalyzed Finished Formula.

Table II — Competitive Benchmarking — 120º F Stability

AROLON 880	pH	Viscosity (Zahn #2)
Week 0	9.43	21”
Week 1	9.43	21”
Week 2	9.29	23”
Week 3	9.17	23”
Week 4	9.10	23”
Week 5	9.03	24”
Week 6	8.93	24”

Solventborne Competitor A	pH	Viscosity (Zahn #2)
Week 0	N/A	19”
Week 1	N/A	21”
Week 2	N/A	21”
Week 3	N/A	21”
Week 4	N/A	21”
Week 5	N/A	21”
Week 6	N/A	21”

Waterborne Competitor B	pH	Viscosity (Zahn #2)
Week 0	6.30	37”
Week 1	4.94	37”
Week 2	4.91	39”
Week 3	4.91	64”
Week 4	4.90	67”
Week 5	4.69	70”
Week 6	4.69	78”

Waterborne Competitor C	pH	Viscosity (Zahn #2)
Week 0	6.86	29”
Week 1	6.69	29”
Week 2	6.65	32”
Week 3	6.50	53”
Week 4	6.43	Gelled
Week 5	6.33	Gelled
Week 6	6.27	Gelled

AROLON 880 is Reichhold’s Acid Catalyzed Emulsion in a Finished Formula 96080-1.
Competitor A is a Finished Alkyd/Urea Conversion Varnish.
Competitor B is an Acid Catalyzed Emulsion in a Finished Formula.
Competitor C is a Water Reducible Acid Catalyzed Finished Formula.

Table III — Competitive Benchmarking — Pot Life

Viscosity

Catalyzed Product	0 Hours	5 Hours	8 Hours	10 Hours
AROLON 880	22" Zahn #2	22" Zahn #2	22" Zahn #2	23" Zahn #2
Solventborne Competitor A	20" Zahn #2	21" Zahn #2	21" Zahn #2	22" Zahn #2
Waterborne Competitor B	17" Zahn #2	18" Zahn #2	20" Zahn #2	Gelled
Waterborne Competitor C	19" Zahn #2	20" Zahn #2	22" Zahn #2	22" Zahn #2

pH

Catalyzed Product	0 Hours	4 Hours	8 Hours	10 Hours
AROLON 880	2.08	2.05	2.05	2.04
Solventborne Competitor A	N/A	N/A	N/A	N/A
Waterborne Competitor B	1.63	1.46	1.42	1.41
Waterborne Competitor C	1.91	1.86	1.79	1.61

Appearance and Clarity

Catalyzed Product	0 Hours	5 Hours	8 Hours	10 Hours
AROLON 880	Excellent	Excellent	Excellent	Excellent
Solventborne Competitor A	Excellent	Excellent	Excellent	Excellent
Waterborne Competitor B	Hazy	Hazy	Hazy	Hazy
Waterborne Competitor C	Very Slight Haze	Very Slight Haze	Very Slight Haze	Very Slight Haze

Performance

Catalyzed Product	Grit Formation	Dry to Sand Time	Foam Generation
AROLON 880	Negligible	24 Minutes	Negligible Microfoam
Solventborne Competitor A	Negligible	60 Minutes	No Microfoam
Waterborne Competitor B	Negligible	35 Minutes	Slight Microfoam
Waterborne Competitor C	Negligible	87 Minutes	Slight Microfoam

60° Gloss

Catalyzed Product	0 Hours	5 Hours	8 Hours	10 Hours
AROLON 880	95	95	95	95
Solventborne Competitor A	95	95	95	95
Waterborne Competitor B	73	52	3	3
Waterborne Competitor C	93	95	95	95

VOC (lb/gal)

Catalyzed Product	Measured VOC (ASTM D3960)
AROLON 880	2.3 lb/gal
Solventborne Competitor A	5.1 lb/gal
Waterborne Competitor B	2.9 lb/gal
Waterborne Competitor C	2.3 lb/gal

AROLON 880 is Reichhold's Acid Catalyzed Emulsion in a Finished Formula 96080-1.
Competitor A is a Finished Alkyd/Urea Conversion Varnish.
Competitor B is an Acid Catalyzed Emulsion in a Finished Formula.
Competitor C is a Water Reducible Acid Catalyzed Finished Formula.

Rejuvenation

Figure I. 1:1 Rejuvenation Evaluation at End of Eight Hour Pot Life

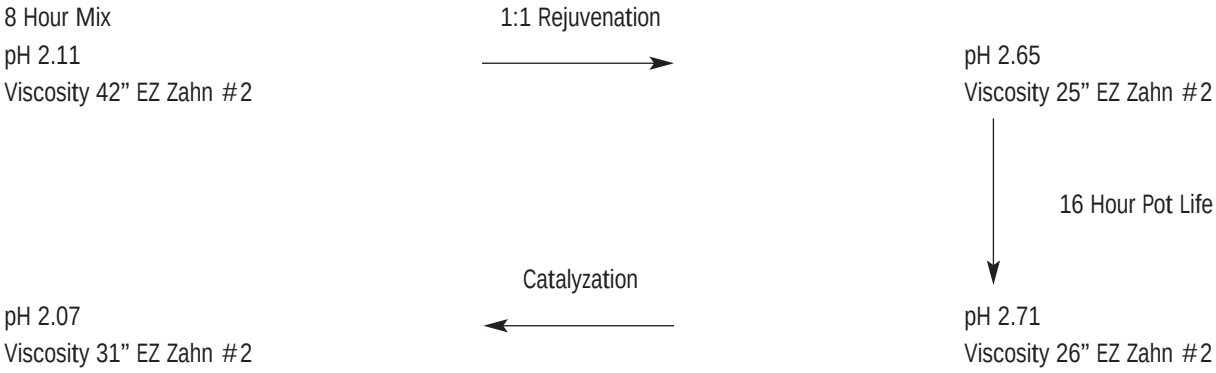
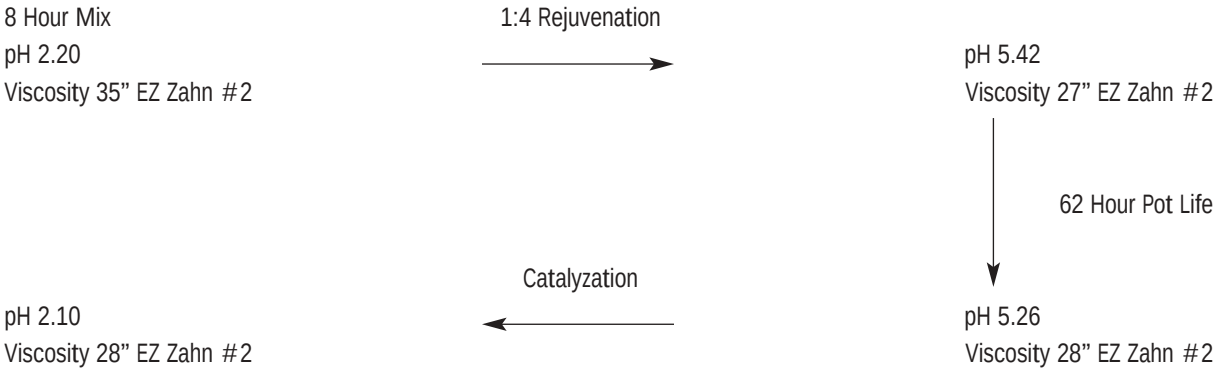


Figure II. 1:4 Rejuvenation Evaluation at End of Eight Hour Pot Life



SUGGESTED FORMULATIONS

Clear Sealer/Topcoat for Low Shear Applications
Formulation #96080-1

Part A

Lbs.	Gals.	Material	
Premix 1: Add the following ingredients under agitation:			
193.55	23.24	Deionized Water	
2.46	0.28	Surfynol® 104 DPM	(1)
15.85	2.00	Butyl Carbitol®	(2)
47.03	6.96	Ethanol	
Premix 2: Add the following ingredients under agitation:			
474.50	53.56	AROLON® 880	(3)
2.87	0.34	Dimethylethanolamine*	
Add Premix 1 to Premix 2 under agitation, then add the following:			
94.62	9.46	Cymel® UM-20	(4)
5.81	0.67	Rheolate® 288 (50% in DPM)	(5)
2.79	0.34	Michemlube® 743	(6)
1.48	0.17	BYK®-028	(7)
840.96	97.01	TOTAL	

Part B

26.80	3.06	50% PTSA in water; IMPORTANT: adjust to pH 2.05

Total (A + B)

867.76	100.07

Analysis (Uncatalyzed):

8.67	Pounds per Gallon
36.26	Non-Volatile by Weight, Percent
2.25	VOC, Pounds per Gallon, Measured
0.71	VOC, Pounds per Pounds Non-Volatile, Measured
4.53	PTSA on Resin Non-Volatile by Weight, Percent
9.40	pH, Uncatalyzed
2.05	pH, Catalyzed
23"	Viscosity, #2 Zahn Cup

*Triethylamine (50% in water) can be used also.

Recommended Applications:

- Conventional Spray
- Brush
- HVLP Spray
- Roll Coat

Suppliers:

(1) Air Products
(2) Union Carbide
(3) Reichhold
(4) Cytec
(5) Elementis
(6) Michelman
(7) BYK-chemie

Clear Sealer/Topcoat for High Shear Applications
Formulation #96080-2

Part A

Lbs.	Gals.	Material	
Premix 1: Add the following ingredients under agitation:			
192.40	23.10	Deionized Water	
4.21	0.51	Dynol® 604	(1)
15.85	2.00	Butyl Carbitol®	(2)
47.03	6.96	Ethanol	
Premix 2: Add the following ingredients under agitation:			
474.50	53.56	AROLON® 880	(3)
2.87	0.34	Dimethylethanolamine*	
Add Premix 1 to Premix 2 under agitation, then add the following:			
94.62	9.46	Cymel® UM-20	(4)
5.81	0.67	Rheolate® 288 (50% in DPM)	(5)
2.79	0.34	Michemlube® 743	(6)
0.70	0.08	Surfynol® DF-66	(7)
840.78	97.01	TOTAL	

Part B

26.80	3.06	50% PTSA in water; IMPORTANT: adjust to pH 2.05

Total (A + B)

867.58	100.07

Analysis (Uncatalyzed):

8.67	Pounds per Gallon
36.48	Non-Volatile by Weight, Percent
2.26	VOC, Pounds per Gallon, Measured
0.71	VOC, Pounds per Pounds Non-Volatile, Measured
4.53	PTSA on Resin Non-Volatile by Weight, Percent
9.40	pH, Uncatalyzed
2.05	pH, Catalyzed
21"	Viscosity, #2 Zahn Cup

*Triethylamine (50% in water) can be used also.

Recommended Applications:

- Airless Spray
- Air-Assisted Airless Spray

Suppliers:

(1) Air Products
(2) Union Carbide
(3) Reichhold
(4) Cytec
(5) Elementis
(6) Michelman
(7) Air Products

Appendix

Raw Materials	Suppliers
AROLON® 880	Reichhold, Inc.
Cymel® UM-20	Cytec
Exxate® 600	Exxon Chemical Co.
Chemcor® AS-35 Chemcor® RM 634	Chemcor (Chemical Corporation of America)
Michemlube® 743	Michelman, Inc.
Tafigel® PUR 50 K-Cure® 1040W	King Industries, Inc.
Rheolate® 288	Elementis plc
Acrysol® RM-8W	Rohm & Haas Co.
Surfynol® 104DPM Dynol® 604 Surfynol® DF-66	Air Products & Chemicals, Inc.
BYK®-028	BYK-Chemie USA
Diethylene Glycol Butyl Ether (Butyl Carbitol®)	Union Carbide Corp.
Ethylene Glycol Propyl Ether (Eastman EP)	Eastman Chemical Co.
Propylene Glycol n-Propyl Ether (Arcosolv® PnP) Dipropylene Glycol Methyl Ether (Arcosolv® DPM) Dipropylene Glycol n-Butyl Ether (Arcosolv® DPnB)	Lyondell Chemical

Material Safety Data Sheets
Material Safety Data Sheets are available for all of the Reichhold products listed in this brochure. Please request the appropriate data sheets from your customer service representative before using any product.

Please Note Certain Typical Property Changes
Some of the typical properties in this publication may be slightly different from those in previous publications. The changes reflect most recent manufacturing experience and/or changes in test procedures. Due to availability of raw materials, changing government regulations, market conditions, or other reasons, typical properties may change or a product may be discontinued.

The information herein is to assist customers in determining whether our products are suitable for their applications. Our products are intended for sale to industrial and commercial customers. We require customers to inspect and test our products before use and to satisfy themselves as to the contents and suitability for their applications. We warrant that our products will meet our written specifications. **Nothing herein shall constitute any other warranty, express or implied, including any warranty of merchantability or fitness for a particular purpose, nor is any protection from any law or patent to be inferred.** All patent rights are reserved. The exclusive remedy for all proven claims is replacement of our materials and in no event shall we be liable for incidental or consequential damages.

For further information contact:

REICHHOLD
A DIC Group Company

PO Box 13582
Research Triangle Park, NC 27709-3582

Phone: (800) 431-1920
Email: productinfo@reichhold.com
www.reichhold.com