

ACRYSOL™ WS-24

Acrylic Copolymer Dispersion Resin

Description

ACRYSOL WS-24 acrylic dispersion resin is supplied in water and can be solubilized readily to combine the advantages of outstanding flow and pigment dispersion characteristic of solution polymers with some of the toughness of emulsion polymers. Both clear and pigmented films can be formed at room temperature or by force drying.

Suggested uses for ACRYSOL WS-24 resin include dip coatings for brass, alkali-removable temporary coatings, and other general industrial finishes.

Typical Properties

These properties are typical but do not constitute specifications.

Appearance	Translucent, milky white fluid
Solids Content, %	36.0
Volatiles, by wt.	99.4 water/0.6 ammonia
pH	7.0
Density, lbs./gal.	8.7
Glass transition temperature, Tg, °C (DSC)	46
Minimum film formation temperature, MFT, °F	<10
Freeze/thaw stability	Keep from freezing

Formulating Guidelines

The viscosity of formulations using ACRYSOL WS-24 resin can be increased by using either of two techniques or a combination of both. The addition of basic materials such as ammonium hydroxide, triethylamine or other volatile amine will thicken the system. Water-miscible alcohols such as t-butanol, isopropanol or ethanol can also be added to increase the viscosity. These materials should be added slowly with agitation to avoid localized high concentrations. The viscosity/pH relationship of ACRYSOL WS-24 is shown in Figures 1 and 2.

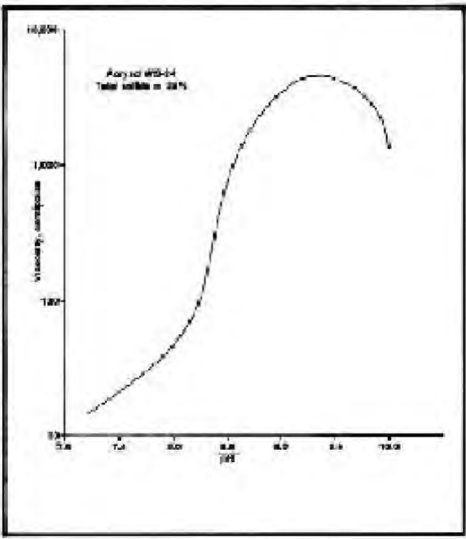


FIGURE 1—VISCOSITY/pH RELATIONSHIP OF ACRYSOL WS-24 AT 25% SOLIDS— TITRATED WITH NH₄OH

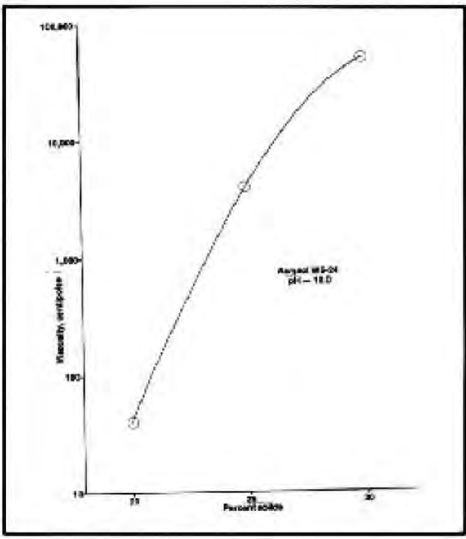


FIGURE 2—VISCOSITY/SOLIDS RELATIONSHIP OF ACRYSOL WS-24 AT pH 10.0



The use of basic materials and alcohols will also improve the pigment wetting and the flow of formulations based on ACRY SOL WS-24 resin.

For best stability in formulating with this resin, the pH should be kept moderately alkaline.

Table I contains a typical starting point formulation for thermoplastic pigmented coatings based on ACRY SOL WS-24 resin.

Table I
Starting Point Formulation For Sprayable White Lacquer
Based On ACRY SOL WS-24 Resin

Materials	Parts by Weight
Pebble mill grind for 16 hours:	250.0
Titanium dioxide	67.5
ACRY SOL WS-24 (36%)	54.8
Isopropanol	127.5
Water	6.0
Dimethylaminoethanol (DMAE)	1.2
Nopco NDW (Diamond Shamrock)	507.0
Letdown for spraying:	
Pebble mill paste (above)	507.0
ACRY SOL WS-24 (36%)	958.0
Water	127.0
	1,592.0
Formulation constants	
Solids content, %	39.0
Pigment/binder ratio	40.4/59.6
Viscosity, No. 4 Ford Cup, sec.	18
Volatiles, wt. %	93.4 water/6.2 organic/0.4 ammonia

Alkali Removable Coatings

The formulation given in Table II is suggested as a starting point for an alkali-removable temporary coating (air dry). Softer water-soluble resins such as ACRY SOL WS-32 are also available for modification of this formulation where greater flexibility is desired.

A suitable stripper for this temporary coating formulation can be made using a wetting agent and a base such as ammonium hydroxide or sodium metasilicate.

Table II
Alkali-Removable Formulation

Materials	Parts by Weight
ACRY SOL WS-24 (36%)	45.0
Water	38.0
Dimethylaminoethanol (DMAE)	Adjust pH to 9.0
Isopropanol	17.0
Formulation constants	
Solids content, %	15.75
Water/alcohol ratio, by wt.	80/20
Approximate viscosity, cps.	15 to 25
pH	9.0



Black Dip Coating Formulation

A black dip coating based on ACRY SOL WS-24 resin has been developed which gives one-coat hiding and shows good overall appearance at 10% black pigmentation level. This formulation can also be spray-applied.

Table III
Black Dip Coating Formulation

Materials	Parts by Weight
Ball mill grind for 3 days	
ACRY SOL WS-24 (36%)	270
Water	75
Isopropanol	105
Black Pearls 607 (Cabot)	50
DMAE	to pH 9.5
Nopco NDW (Diamond Shamrock)	4
Letdown	
Ball mill grind	75
ACRY SOL WS-24 (36%)	147.1
Water	122.3
Isopropanol	30.6
DMAE	to pH 9.5
Formulation Constants	
Solids content, %	20
Pigment/binder ratio	10/90
Viscosity, sec. (No. 4 Ford Cup)	24
pH	9.5
Application Properties	
Film Thickness, mils (approx.)	0.3
60° Gloss	
Brass	86
Bonderite 100	65
Appearance	
Hiding	Good
Sag	Trace-slight

Safe Handling Information

Based on its composition, ACRY SOL WS-24 is not expected to be acutely toxic. It should be treated as a potential skin, eye, and/or respiratory irritant.

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