Technical Data Sheet

PARALOID™ B-56 Resin (100%)

For Low VOC Concrete Sealers and Paints

Introduction

Designed for use in the lower VOC concrete sealer/paint markets, PARALOID™ B-56 Resin (100%) meets the need for a product with minimum application solids of 25% and viscosity suitable for application with standard low-shear deck spraying equipment. This application performance may be accomplished with a variety of solvent choices, even those with higher flash points (above 100°F), at VOC levels calculated between 400 - 700 grams / liter.

PARALOID™ B-56 Resin (100%) is also suitable for general metal applications, maintenance coating uses, plastics coatings, and as a letdown (in combination with nitrocellulose) resin in gravure inks. Broad resin compatibility and wide solvent use potential increase the market appeal for PARALOID™ B-56 Resin (100%).

The overall film performance exhibited by PARALOID™ B-56 Resin (100%) is similar to that of the parent product in this family of all-acrylic products, PARALOID™ B-66 Thermoplastic Solution Resin (100%).

Typical Physical Properties[1]

Property	Typical Values
Appearance	100% Ground White Powder
Density, US lb/gal	9.1
Bulking Value, US gal/lb Dry	 0.11
Tg, °C	50
Composition	All Acrylic

1. These properties are typical but do not constitute specifications.

Table 1: Solids/Brookfield Viscosity Profile, PARALOID™ B-56 Resin (100%), Unpigmented

Solids	Xylene	Aromatic 100 fluid/ VARSOL 1 non-dearomatized fluid, 1/1
55%	19,000	-
50%	3600	-
45%	860	10,000
40%	295	2600
35%	110	800
30%	50	240
25%	20	70
20%	-	20

Suggested Starting Point Clear Concrete Coatings

All formulations below are suggested starting points only. They are not intended to be, nor should they be considered, commercially successful systems. You must perform your own testing to determine the suitability of any formulation you choose to use.

Component	Weight Percent
Non-Flammable Dissolve resin in Aromatic 100 fluid then dilute with mineral thinner.	
PARALOID™ B-56 Resin (100%)	25
Aromatic 100 fluid	37.5
Mineral Thinner, 10 - 20% Aromatics	37.5
Waterproofing Sealer Dissolve resin in Xylene then add other solvents.	
PARALOID™ B-56 Resin (100%)	33
Xylene	57
Acetone	5
PCBTF[2]	5
Concrete Sealer	
PARALOID™ B-56 Resin (100%)	23
Xylene	15
Acetone	26
PCBTF[2]	26

2. Parachlorobenzotrifluoride and acetone are non-VOC solvents.

Starting Point Formulations

Property	Formulation 1	Formulation 2	Formulation 3
Weight Solids, %	25	33	23
Viscosity, Brookfield, cP	70	80	80
VOC, lbs/gal (gms/l)	5.5 (665)	4.97 (595)	3.27 (392)

Figure 1: Solids/Brookfield Viscosity Profile PARALOID™ B-56 Resin (100%) Unpigmented in 1/1 Mix of Aromatic 100 fluid/Varsol 1 non-dearomatized fluid

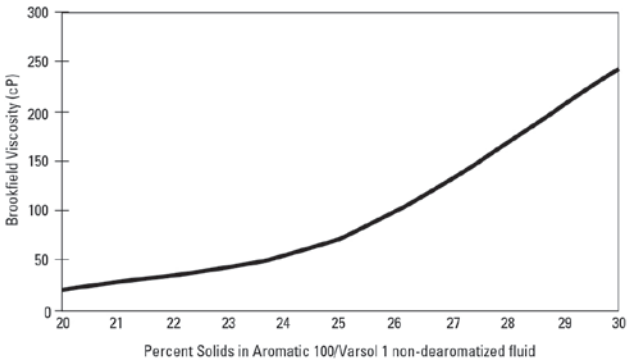

Figure 2: Solids/Viscosity Profile PARALOID™ B-56 Resin (100%) in Xylene

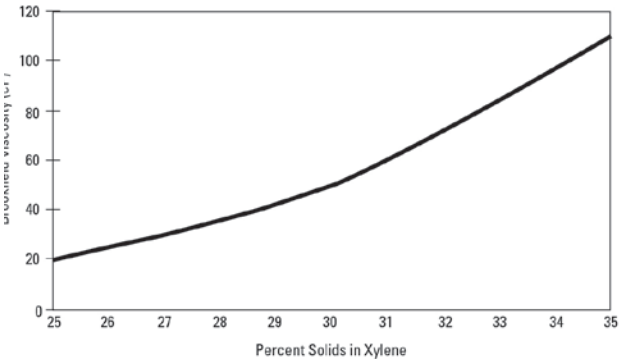

Table 2: Film Properties, Phthalocyanine Blue Light Tints Based on PARALOID™ B-56 Resin (100%), 25/75 Pigment Binder

Properties	Unmodified PARALOID™ B-56 Resin (100%), Formulation 4[3]	PARALOID™ B-56 Resin (100%)/ VAGH/BBP, 75/20/5, Formulation 5[3]	PARALOID™ B-56 Resin (100%)/ BBP[4], 80/20, Formulation 6[5]
Gloss			
20°	63	63	79
60°	80	83	88
König Hardness	157	123	30
Pencil Hardness			
Treated Aluminum	2B	HB	B
ABS	HB	HB	F
Impact, inch/pounds			
Direct	4	4	8
Reverse	<2	<2	<2
Flexibility, Mandrel	Fails 1 / 2”	Fails 1 / 2”	Pass 1 / 8”
Knife Adhesion (Dry/24 hr. Wet)			
Treated Aluminum	Very Poor / Very Poor	Poor / Very Poor	Fair / Poor
Cold Rolled Steel	Very Poor / Very Poor	Poor / Very Poor	Good / Very Poor
ABS	Excellent / Excellent	Excellent / Excellent	Very Good / Very Good
Water Immersion, 72 hrs.	OK, No Change	OK, No Change	Moderate, Dull
“Y” Reflectance	37.03	40.08	40.77
“L” Value	67.30	69.66	69.96
“b” Value	-34.81	-31.55	-30.46

3. Spray-Applied to treated aluminum ; 1.5 mils dft
4. Note that this system is a brushing lacquer – flow and leveling are excellent; sag is bad.
5. Brush-Applied to treated aluminum ; 2 mils dft

Cone & Plate Viscosity is 3.1 @ 90” #4 Ford Cup.

Phthalocyanine Blue Light Tints Based on PARALOID™ B-56 Resin (100%)
25/75 : Pigment/Binder
Formulation 4

Materials		Pounds	Gallons
Sand Mill Grind:			
TiPure R-960 titanium dioxide		64.3	1.93
Phthalo Blue, Heliogen D-7080 pigment		1.3	0.11
PARALOID™ DM-55 Solid Grade Thermoplastic Acrylic Resin (60% in Toluene)		13.0	1.59
Xylene		36.4	5.06
PM Acetate		15.6	1.94
Letdown to 65", #4 Ford Cup			
PARALOID™ B-56 Resin (100%) (55% in Xylene)		340.4	41.51
Byk-300 silicone surface additive		0.4	0.05
Raybo 3 anti-silk		0.4	0.05
Xylene		104.0	14.44
Letdown to 30", #4 Ford Cup			
Xylene		75.6	10.50
Dilute to 15", #4 Ford Cup			
Xylene/PM Acetate : 3/1 Volume		168.9	22.82
Total:		820.3	100.00

Physical Constants	
PVC, %	8.5
Pigment / Binder	25/75
Weight Solids	
@ 65"	45.2
@ 30"	40.0
@ 15"	31.8
Volume Solids	
@ 65"	35.2
@ 30"	30.4
@ 15"	23.5

Phthalocyanine Blue Light Tints Based on PARALOID™ B-56 Resin (100%) 25/75 : Pigment/Binder, PARALOID™ B-56 Resin (100%)/Vinyl/BBP: 75/20/5 Formulation 5

Materials		Pounds	Gallons
Sand Mill Grind:			
Ti-Pure R-960 titanium dioxide		56.7	1.70
Phthalo Blue, Heliogen D-7080 pigment		1.2	0.10
PARALOID™ DM-55 Solid Grade Thermoplastic Acrylic Resin (60% in Toluene)		9.4	1.15
Xylene		28.9	4.01
Letdown to 65", #4 Ford Cup			
PARALOID™ B-56 Resin (100%) (55% in Xylene)		228.4	27.86
VAGH Vinyl* (25% in Toluene/ MEK: 1/1)		134.0	17.36
Butyl Benzyl Phthalate		8.4	0.90
Byk-300 silicone surface additive		0.4	0.05
Toluene/MEK/PM Acetate (1/1/1 by Volume)		102.6	14.00
Dilute to 15", #4 Ford Cup for Spray			
Toluene/MEK/PM Acetate		240.6	32.82
Total:		811.0	100.00

Physical Constants	
PVC, %	8.9
Pigment / Binder	25/75
Binder (PARALOID™ B-56 Resin (100%)/VAGH Vinyl*/BBP	75/20/5
Weight Solids @ 65" @ 15"	 40.4 28.4
Volume Solids @ 65" @ 15"	 28.9 19.4

* VAGH Vinyl (acetate/chloride mix) resin

Phthalocyanine Blue Light Tints Based on PARALOID™ B-56 Resin (100%) Brushing Lacquer 25/75 : Pigment/Binder, PARALOID™ B-56 Resin (100%)/ BBP: 80/20

Formulation 6

Materials		Pounds	Gallons
Sand Mill Grind:			
Ti-Pure R-960 titanium dioxide		98.0	2.94
Phthalo Blue, Heliogen D-7080 pigment		2.0	0.16
PARALOID™ DM-55 Solid Grade Thermoplastic Acrylic Resin (60% in Toluene)		16.4	2.0
Xylene		49.9	6.93
Letdown to 90", #4 Ford Cup			
PARALOID™ B-56 Resin (100%) (45% in A-100/Varsol 1 non-dearomatized fluid: 1/1 Weight)		513.9	65.88
Butyl Benzyl Phthalate		57.9	6.21
Byk-300 silicone surface additive		0.6	0.07
Raybo 3 anti-silk		0.6	0.07
Aromatic 100 fluid		54.9	7.49
Varsol 1 non-dearomatized fluid		54.9	8.25
Total:		849.1	100.00

Physical Constants	
PVC, %	8.5
Pigment / Binder	25/75
Binder (PARALOID™ B-56 Resin (100%)/BBP	80/20
Weight, Solids	47.0
Volume, Solids	35.8

Material Safety Data Sheets

The Dow Chemical Company Material Safety Data Sheets (MSDS) contain pertinent information that you may need to protect your employees and customers against any known health or safety hazards associated with our products.

Under the OSHA Hazard Communication Standard, workers must have access to and understand MSDS on all hazardous substances to which they are exposed. Thus, it is important that you provide appropriate training and information to your employees and make sure they have available to them MSDS on any hazardous products in their workplace.

The Dow Chemical Company sends MSDS for all its products, whether or not they are considered OSHA-hazardous, to both the "bill to" and/or "ship to" locations of all its customers upon initial shipment, including samples. If you do not have access to one of these MSDS, please contact your local Dow representative for an additional copy.

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MSDS should be obtained from your suppliers of other materials recommended in this bulletin.

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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.

CAUTION! Keep combustible and/or flammable products and their vapors away from heat, sparks, flames and other sources of ignition including static discharge. Processing or operating at temperatures near or above product flashpoint may pose a fire hazard. Use appropriate grounding and bonding techniques to manage static discharge hazards.

CAUTION! Failure to maintain proper volume level when using immersion heaters can expose tank and solution to excessive heat resulting in a possible combustion hazard, particularly when plastic tanks are used.

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 Technical Representative for more information.

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