

EPS® 2535

Suggested Formulation

EPS® 2535 offers exceptional corrosion resistance without the use of anticorrosive pigments and additives. This resin provide paint formulators with a waterborne alternative to alkyd resins, which can be used for maintenance coatings and general product finishes on ferrous and non-ferrous metal, wood, and plastic substrates.

PROPERTIES

- Excellent gloss development and retention
- Excellent adhesion to ferrous and non-ferrous metal substrates
- Excellent early water resistance and broad solvent compatibility
- Allow formulators to use typical hydrophilic solvents (EB, DB), and hydrophobic solvents (DPnB, Texanol) for superior performance

COMMON APPLICATIONS

Primer, Topcoat

Specifications

Weight Solids	45.0 ± 0.7%
Weight/Gallon	8.70 ± 0.10
pH	7.5 – 8.5

Typical Properties

Volume Solids	42.0 ± 0.7%
MFFT	56° C
Volatile(s)	Water

FORMULATING GUIDELINES

The following guidelines are offered to assist the paint formulator in achieving the high-performance properties offered by EPS 2535. Several suggested paint formulations are also available for reference.

Pigment Volume Concentration (PVC)

Formulating at the correct PVC is critical in optimizing corrosion resistance of coatings. For best results in high gloss coatings, the PVC should be formulated as low as possible (less than 20 % is suggested) to obtain maximum corrosion protection and gloss development. In primer formulations, where a higher PVC or the use of corrosion inhibitive pigments is desired, it is necessary to use a higher level of dispersant. Formulas at a PVC of approximately 40% still show good long-term viscosity stability, as well as resistance to settling and separation. The use of AMP-95

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(Angus), at a level of 1 pound per 100 gallons, has also been found effective in terms of long term stability, as well as aiding in pigment dispersion and grind base stability of these higher PVC coatings.

Dispersants

Tamol 681(Dow), Byk 190 (BYK), and Disperse-Ayd W-22 (Elementis) are recommended for use with EPS 2535. Each should be evaluated and compared to see which fits your particular formulating needs. Disperse-Ayd W22 has been found most effective in high PVC (40%) primer formulas (such as EPS 2535 SP-3). This formula shows a slightly higher level of dispersant than would be used at lower PVCs, although this level was determined necessary for the proper balance of required properties.

Co-solvents

The use of DPnB (25% on resin solids) is recommended to form films as low as 40°F while offering excellent corrosion resistance and excellent open dry times for finishing large objects. Small additions of plasticizer, such as Paraplex WP-1, Santicizer 160, or KP140 may enhance the film properties. Other co-solvents, such as Texanol (25% on solids), PnB (30%) have been found to be adequate when used with EPS 2535, albeit with slightly less performance.

Thickeners

Most rheological additives work well with the EPS 2535. It may be necessary at times to use a package of Rheology modifiers, in order to attain viscosity control as well as proper sag resistance. Among those showing particular success were Acrysol RM-825 and Acrysol RM-2020 (Dow), Tafigel PUR-60 (Munzing), Rheolate 1 (Elementis), and Attagel 50 (BASF).

Corrosion Inhibitive Pigments

While EPS 2535 has been found stable with a large variety of corrosion inhibitors, the proper balance of corrosion resistance in regard to properties such as viscosity stability, settling and desired gloss can be difficult to attain. In high PVC primer formulas, EPS has determined that a unique synergy makes the combination of SZP-391 (Halox) and Shieldex AC-5 (Grace), at levels of 25 and 15 pounds per 100 gallons, respectively, an ideal choice to attain all properties.

Flash Rust Inhibitors

The addition of a flash rust additive to DTM paints is recommended. Sodium nitrite is recommended at a maximum level of one pound per 100 gallons of paint.

Defoamers

For difficult foaming issues, or during formulation of higher PVC coatings, it may be necessary to use a combination of defoaming products. Strong defoamers, such as BYK 024 (BYK), or FoamStar SI 2210 (BASF), may not be as effective for microfoaming. In this case, an additional anti-foam agent may be required. Laboratory results have found Foamaster 111, Foamaster S (BASF) and Surfynol DF-210 (Evonik) to be adequate for this purpose. Most anti-foam agents evaluated with EPS 2535 proved effective to various degrees.

pH

The pH of paints produced with EPS 2535 should be 8.0-9.5. AMP-95 (Angus) and ammonium hydroxide are recommended for pH adjustments.

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Suggested Formulation EPS 2535 WHT ST1 – White High Gloss Enamel

<u>Pounds</u>	<u>Gallons</u>	<u>Raw Material</u>	<u>Supplier</u>	<u>Instructions</u>
50.0	6.00	Water		Add in order, under agitation.
9.0	0.99	Tamol 681	Dow	
3.0	0.34	Surfynol PSA-336	Evonik	
1.0	0.13	AMP-95	Angus	
3.0	0.36	Octafoam S-675	Hi-Mar Specialties	
170.0	4.98	Ti-Pure R-706	Du Pont	Add with good agitation. Disperse to 7+ Hegman.
583.0	67.01	EPS 2535	EPS	Letdown in order with good agitation.
2.0	0.22	Nuosept 498	Troy	Add grind at this point.
46.2	5.55	Water		Premix and add with good agitation.
10.0	1.20	4% Sodium Nitrite solution		
65.6	8.58	DPnB	Lyondell	
25.9	3.00	Propylene Glycol		
12.0	1.31	Acrysol RM-2020	Dow	Add with good agitation.
1.5	0.17	Propylene Glycol		Premix and add to adjust viscosity.
<u>1.5</u>	<u>0.17</u>	DSX 1550	BASF	
983.7	100.00	Totals		

Formulation Parameters

Weight Solids	45.36	%
Volume Solids	34.54	%
Weight / Gallon	9.84	lb/gal
Pigment Volume Conc.	15.03	%
Pigment / Binder	0.65	
VOC	248	g/l
	2.07	lb/gal

Typical Paint Properties

Viscosity (Stormer)	75 - 85 KU
pH	8.5 - 9.0
20°/60° Gloss (2.0-2.5 mils DFT)	50+ / 85+
Corrosion Resistance (2.0-2.5 mils DFT on CRS)	300+ Hours

Suggested Application Methods
Brush, Roll, Spray

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