

EPS[®] 2540

Suggested Formulation

MARKET SEGMENTS

Industrial Metal, Industrial OEM

DESCRIPTION

EPS[®] 2540 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

- 50% solids
- 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
- Unique application properties: Ample set-to-touch (STT) dry time while maintaining short tack-free (TF) dry time. Ideal for spraying larger objects.

COMMON APPLICATIONS

Primer, Topcoat

Specifications

Weight Solids	50.0 ± 0.7%
Weight/Gallon	8.70 ± 0.10
pH	7.5 – 8.5

Typical Properties

Volume Solids	47.8 ± 0.7%
MFFT	57° 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 2540. 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

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resistance to settling and separation. The use of AMP-95 (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), Disperbyk 190 (BYK), and Disperse-Ayd W-22 (Elementis) are recommended for use with EPS 2540. 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 2540 SP-1). 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%), as well as EB and DB (35%) have been found to be adequate when used with EPS 2540, albeit with slightly less performance.

Thickeners

Most rheological additives work well with the EPS 2540. 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). 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.

Corrosion Inhibitive Pigments

While EPS 2540 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

Most anti-foam agents evaluated with EPS 2540 proved effective to various degrees. For difficult defoaming 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), 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.

pH

The pH of paints produced with EPS 2540 should be 8.0-9.5. AMP-95 (Angus) and ammonium hydroxide are recommended for pH adjustments.

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Suggested Formulation EPS 2540 WHT ST2 - High Gloss White Railcar Enamel

<u>Pounds</u>	<u>Gallons</u>	<u>Raw Material</u>	<u>Supplier</u>	<u>Instructions</u>
40.0	4.80	Water		Add in order with good agitation.
12.0	1.36	Disperse Ayd W-22	Elementis	
3.0	0.41	Surfynol 104A	Evonik	
5.0	0.67	Ammonium Hydroxide		
4.0	0.46	BYK 024	BYK	
217.3	6.23	TiONA 596	Cristal	Add under agitation; disperse to 7+Hegman.
570.0	65.52	EPS 2540	EPS	Letdown in order with agitation.
32.8	3.94	Water		
2.0	0.27	Ammonium Hydroxide		Add grind at this point.
1.5	0.16	Nuosept 95	Troy	
41.7	5.01	Water		Premix next 3 items, then add DPnB. Mix well & add with good agitation.
10.0	1.20	4% Sodium Nitrite		
4.8	0.54	Rheolate 1	Elementis	
71.3	9.32	DPnB	Lyondell	
0.5	0.06	Tafigel PUR-60	Munzing	
<u>0.5</u>	<u>0.06</u>	DPM		Premix and add to adjust viscosity.
1016.4	100.01	Totals		

Formulation Parameters

Weight Solids	50.63	%
Volume Solids	39.01	%
Weight / Gallon	10.16	lb/gal
Pigment Volume Conc.	16.53	%
	1.52	lb/gal

Typical Paint Properties

Viscosity (Stormer)	85 - 95 KU
pH	8.5 - 9.0
Color	White
60° Gloss (@ 3mils DFT)	90+

Suggested Application Methods

Spray, Brush, Roll

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