

GP[®] 4003 Coating Resin

INTRODUCTION

GP[®] 4003 is a second-generation waterborne phenolic resin developed by Georgia-Pacific Chemicals. It is an opaque, white liquid dispersion that incorporates a non-ionic protective colloid. GP 4003 is a heat-reactive resin that is intended to replace solvent-based phenolic resins where low Volatile Organic Compound (VOC) emissions are desired. GP 4003 resin has a high degree of crosslink density and, when properly cured, produces protective coatings with excellent resistance to solvents and organic chemicals. It exhibits good corrosion resistance and may be useful in coating formulations for applications involving severe exposures. Its resistance to elements such as saltwater, make it an ideal resin for coatings for offshore oilfield platforms, metal fasteners and equipment. Storage life is one year at 50°F (10°C). Freezing or temperatures in excess of 77°F (25°C) for extended periods of time should be avoided.

WATERBORNE VS SOLVENTBORNE COMPARISON

Coatings made with GP 4003 resin can produce films with physical and chemical properties similar to films made with GP[®] 2600, a solvent-based resin.

GP 4003 Resin Properties			
Solids (%)	Viscosity (cP)	Specific Gravity	pH
44 - 48	1500 - 6000	1.08 – 1.11	5.8 – 6.5

Waterborne Coating Formulation	
Ingredient	Percent by Weight
GP [®] 4003 Phenolic Resin	78.0
Butyl CELLOSOLVE [®]	3.9
Water	15.6
75/25 water/ DMEA* Mixture	2.5

*DMEA is add to prevent flash rusting. It may be adjusted as desired.

Solventborne Coating Formulation	
Ingredient	Percent by Weight
GP [®] BKS-2600 Phenolic Resin	72.00
Acetone	2.00
Methyl Ethyl Ketone (MEK)	2.50
Ethanol, 95%	15.20
Propyl Propasol	4.00
Cyclonhexanone	4.25
SILWET [®] Surfactant L-7602	0.05

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Coating Physical Properties		
Property	GP BKS-2600	GP 4003
Solid, % by weight	40.32	37.44
Viscosity, #4 Ford Cup, sec.	N/A	35
Weight per gallon, lbs.	8.4	8.95
pH	N/A	8.25
VOC, lb./gal.	5.4	2.77

COATING FILM TEST RESULTS

The coatings were drawn down and tested over Q-Panel™ cold rolled steel. The films were baked at 400°F (204°C) for 15 minutes. .

Coating Film Properties		
Property	GP [®] BKS-2600	GP [®] 4003
Dry Film Thickness, mils	0.86	0.96
Pencil Hardness	9H	9H
Adhesion	100	100
Forward Impact, in-lb.	20	12
.Reverse Impact, in-lb.	0	0

Chemical Resistance Test Data				
Chemical Name	Ratings with 30-minute test		Ratings with 24-hour test	
	GP [®] BKS-2600	GP [®] 4003	GP [®] BKS-2600	GP [®] 4003
50% Nitric Acid	10, clear	10, clear	10, clear	10, clear
96% Sulfuric Acid	10, brown	8, brown	10, brown	10, brown
10% Sodium Hydroxide	10, clear	10, clear	destroyed	destroyed
100% DMEA	10, clear	10, clear	10, clear	10, clear
Cyclohexanone	10, clear	10, clear	10, clear	10, clear
MEK	10, clear	10, clear	10, clear	10, clear

Rating System: 0=Poor, 10 = Superior

Salt Fog Test Data @ 1,000 Hours		
Property	GP [®] BKS-2600	GP [®] 4003
Blister Size	10.0	8.0
Blister Frequency	None	Few
Area Rusted, %	1	1
Scribe, mm	1 - 3	1 - 3

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