

# GP<sup>®</sup> 5022 Resin/GP<sup>®</sup> 4822 Phenolic System for FRP

## Product Information

### DESCRIPTION

GP<sup>®</sup> 5022 phenolic resin with GP<sup>®</sup> 4822 acid catalyst was developed by Georgia-Pacific Chemicals for use in the manufacture of fiber-reinforced polymer (FRP) products. The resin system is suitable for hand layup, resin transfer molding (RTM), pultrusion, and filament winding. FRP products manufactured with the GP 5022/ GP 4822 system demonstrate the superior flame resistance and low smoke generation required in many composite applications where fire and smoke are a concern; i.e., in the aerospace, construction, and mass transit industries.

### USES AND APPLICATION

Georgia-Pacific's acid catalyst is provided in two parts: GP 4822A (strong acid) and GP 4822B (latent acid). When preparing the catalyst mixture, components A and B should be used in a 1:1 ratio by weight and should be used within two days. By varying the amount of the catalyst mixture in the GP 5022 resin, desired pot life and cure speed can be achieved; e.g., decreased catalyst mixture level results in increased pot life.

The laminate, hand laid or RTM, should be cured for two hours at a temperature of 140°F - 176°F (60°C - 80°C). Mechanical strength and glass transition temperature can be enhanced by post-cure at 180°F - 210°F (82°C - 100°C). Slow heating rate and gradual increase in post-cure temperature are suggested to avoid blistering and optimize the performance of finished FRP products.

With filament winding, initial cure should be performed on the mandrel using infrared, hot air, or hot water heating sources at 160°F - 180°F (71°C - 82°C). Temperatures higher than 180°F may cause blistering. After demolding, post-cure at 180°F - 210°F is recommended. For fiberglass reinforcement, phenolic-compatible glass should be used. For application-specific questions, please contact your Georgia-Pacific technical or sales representative.

### STORAGE AND HANDLING

GP 5022 resin and GP 4822 catalyst should be used in areas with good ventilation. Storage at temperatures below 40°F (5°C) is recommended for the resin, which should be brought to room temperature prior to use. GP 4822 acid catalyst can be stored at room temperature.

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[www.gp-chemicals.com](http://www.gp-chemicals.com)

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### STORAGE AND HANDLING (continued)

As with any resin/acid system, precise and thorough mixing of the resin and catalyst mixture is essential to achieve uniform cure and optimum quality.

Georgia-Pacific Chemicals supplies GP<sup>®</sup> 5022 resin and GP<sup>®</sup> 4822 catalyst in drums and bulk quantities.

Additional information on the safe handling of GP 5022 resin and GP 4822 catalyst is in the Safety Data Sheets available from Georgia-Pacific Chemicals.

#### Typical Properties of GP 5022 Resin

Typical Properties of GP 5022 Resin	
Type	Phenol-Formaldehyde Resole
Appearance	Amber to Brown Liquid
Non-Volatiles, %	70 – 74
Viscosity @ 25°C, cps	600 – 1000
pH	7.0 – 8.0
Weight, lbs/gallon	10
Flash Point, °C	>93
Free Formaldehyde, %	<2.5
Storage Life @ 5°C	6 months

#### GP 5022/GP 4822 System

GP 5022 / GP 4822 Pbw	Pot life, Minutes <sup>1</sup>	Cure Speed, sec. @ 194°F (90°C) <sup>2</sup>
100/ 7	45	55
100/ 8	40	50
100/ 9	30	43
100/ 10	20	30

<sup>1</sup> Pot Life is measured by Brookfield Viscosity increase to 3000 cps in 1000-gram mass.

<sup>2</sup> Cure Speed measured by Hot Plate Stroke test @ 194°F.

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### Fire and Smoke Properties of GP<sup>®</sup> 5022/4822 Composites

Test and Method	Results with GP 5022
OSU Heat Release (kw-min-m <sup>-2</sup> /kw-m <sup>-2</sup> )	7/30
NBS Smoke Density, ASTM F-814	3
Smoke Density at 90 sec., ASTM E-662	1
Smoke Density at 4 min., ASTM E-662	3
Smoke Density, max., ASTM E-662	9
Flame Spread Index, ASTM E-162	1

Test specimens: 6-ply laminate (using 100 pbw of GP 5022 resin and 7 pbw of GP 4822 catalyst) with 7781 A-1100 soft finish glass cloth prepared at room temperature and then post-cured at 180°F for 1 hour. Resin content: 38.5%.

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