PRODUCT BULLETIN

May 2021

EPOVIA® RF1001L Series

BPA-Based Vinyl Ester Resins

DESCRIPTION

EPOVIA® RF1001L Series resins are Bisphenol A based vinyl ester resins containing styrene monomer. These resins are formulated for building reinforced plastic parts using closed molding processes and specifically infusion processes such as vacuum bagging, SCRIMP® and resin injection. EPOVIA RF1001L-00 is an unpromoted version, while EPOVIA® RF1001L-17, and RF1001L-35 are promoted.

EPOVIA® RF1001L-00 and RF1001L-35 can be used in infusion applications that specify Derakane® 411, Hetron® 922, Dion® 9100, Vipel® F010 and other equivalent Bisphenol A based vinyl ester resins.

BENEFITS & FEATURES

- Corrosion resistant storage tanks for many industries, process pipes, flanges and fittings
- Infrastructure pipe construction
- Fume and vapor ducting
- Load bearing, structural construction members
- Automotive structural or heat exposed parts
- Low viscosity for easy flow through glass fiber fabrics and cores
- Excellent corrosion resistance to large number of chemicals including acids, alkalis, and solvents (Note: Please refer to the EPOVIA® Corrosion Guide for RF1001 for detailed information on specific service conditions)
- Low shrinkage for good dimensional stability for accurate design tolerances
- Superior mechanical strength allows for larger safety factors in high stress applications

PROPERTIES – LIQUID

Property[1]	Unit	RF1001L-00	RF1001L-17	RF1001L-35
Viscosity[2]	cps	-	100	100
Gel Time	minutes	21[3]	17.5[4]	35[5]
Gel To Peak	minutes	36	-	-
Peak Exotherm	°C/°F	149/300 (Max.)	-	-

1) All properties at 25°C/77°F unless otherwise noted
2) Brookfield Viscometer LV Spindle #2 at 60 RPM
3) 100 g mass, 25°C, Promotion: 0.15% Cobalt 12%, 0.05% DMA. 1.50% Luperox® DDM-9 peroxide
4) 1.5% MEKP 925
5) 1.25% United Initiators MEKP-9 peroxide

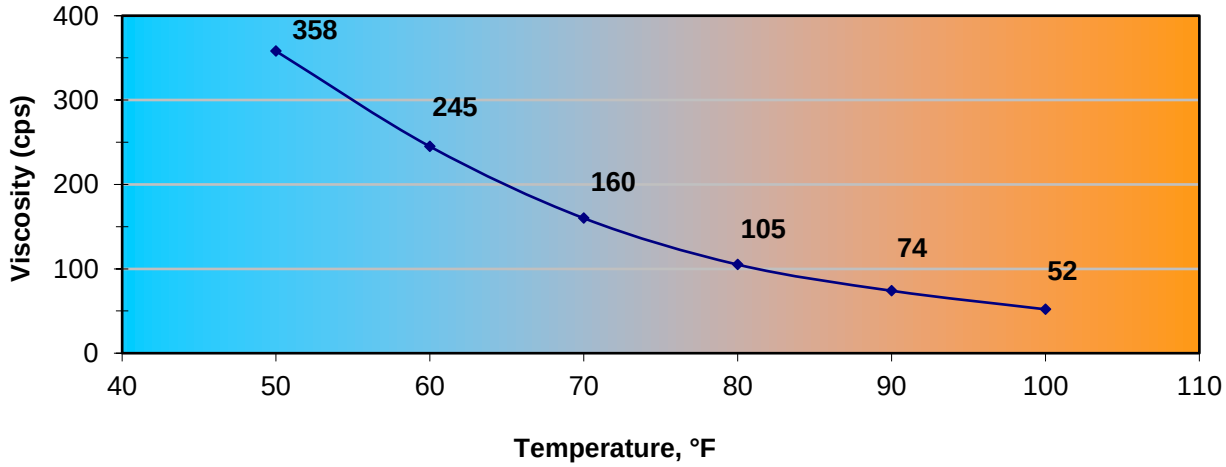
PROPERTIES – PHYSICAL

Property[1]	Unit	Neat Resin Casting[2]	Laminate 1[3]	Laminate 2[4]	Test Method
Tensile Strength	psi	12,000	18,000	84,000	ASTM D 638
Tensile Modulus	psi	540,000	1,300,000	7,040,000	ASTM D 638
Tensile Elongation	%	5.5	1.8	1.41	ASTM D 638
Flexure Strength	psi	22,000	29,000	168,000	ASTM D 790
Flexure Modulus	psi	500,000	1,200,000	5,600,000	ASTM D 790
Heat Distortion, 264 psi	°C/°F	108/226	-	-	ASTM D 648
DMA, Tg	°C/°F	-	-	116/241	-
Hardness, Barcol Model 934-1	HB	40	52	-	ASTM D 2583

1) Physical properties were determined using internal Polynt test methods that are similar to those listed above.
2) Neat Resin Casting – Post cured for 2 hours at 80°C for followed by 2 hours at 120°C
3) Laminate – Laminate construction is as follows: 1 surface layer (10% glass), 1 chopped strand mat (25% glass), 1 chopped strand plus roving and reinforcement (35% glass)
4) Laminate – (EPOVIA® RF1001L-00 only) 2 plies PPG L1200/G50-E07 Hybon® 2026 (ref. C.P. Hsu) (79.7% glass)

APPLICATION

EPOVIA® RF1001L-00 and RF1001L-35 are formulated with a low viscosity for thorough wet-out of reinforcing materials and rapid fill times. To fully realize the benefit of EPOVIA® RF1001L-00 and RF1001L-35's low viscosity, temperature control is recommended. Resin viscosity is affected by temperature with the resin being higher in viscosity at cooler temperatures and lower at warmer temperatures. The effect of temperature on viscosity is represented below.

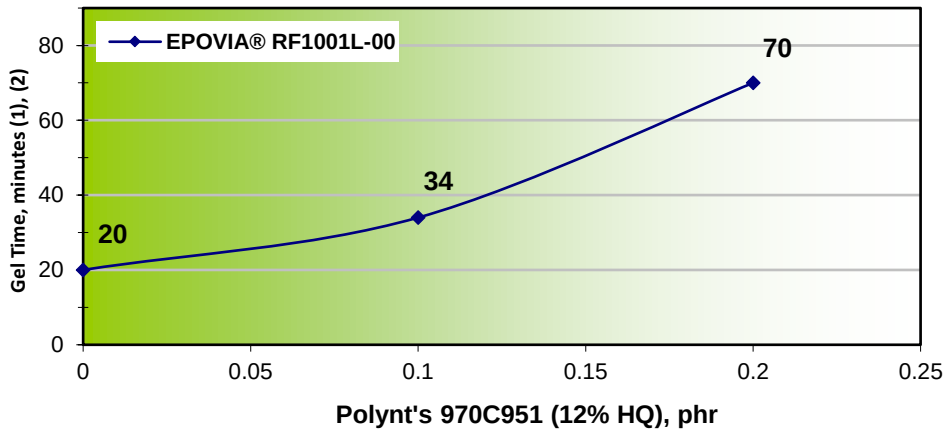


EPOVIA RF1001L-00

EPOVIA® RF1001L-00 is un-promoted to allow for customization of fast and slow gel times for small or large parts. Sample promotion formulations for fast, medium, slow and extended gel times are shown below. The samples formulations below are provided as a guideline only. Polynt Composites recommends that gel time be checked in the customer's plant because age, temperature, humidity, promoter levels and peroxide age and type will produce varied gel times.

	Fast	Medium	Slow	Extended (3)
Gel Time	**11 min.**	**16 min.**	**30 min.**	**70 min.**
Promoter: 12% COBALT	0.20 phr (2)	0.15 phr (2)	0.15 phr (2)	0.15 phr (2)
Co-promoter: DMA	0.20 phr	0.10 phr	0.05 phr	0.05 phr
Inhibitor: 970C951 (12% HQ)	none	0.05 phr	0.07 phr	0.20 phr

1) 100 g mass, 1.25% United Initiators MEKP-925H peroxide at 77ºF (25ºC)
2) phr = parts per hundred resin (%)
3) Post cure highly suggested



(1) Promotion—Cobalt 12%, 0.15 phr; DMA, 0.05 phr
(2) United Initiators NOROX® 1.25% MEKP-925H, 77 °F

When using 1.5% Arkema LUPEROX® DDM-9, expect gel time ≈ 13 min.; with 1.25% United Initiators NOROX® MEKP-925, gel time ≈ 20 min.; and with 1.75% United Initiators NOROX® CHM-50, expect gel time ≈ 45 min.

The gel time customization data shown above was generated using United Initiators MEKP-925H. Other MEKP catalysts such as United Initiators NOROX® MEKP-9 and NOROX® MEKP-9H, Akzo Nobel CADOX L-50a and CADOX D-50 are expected to yield similar performance. Arkema LUPEROX® DHD-9, United Initiators NOROX® MEKP-925, and Chemtura HP-90 may also be used, but gel and cure times may vary.

The catalyst level should not exceed 2.4% nor fall below 0.9% for proper cure. The recommended range is 1.25% at 25°C or 77°F depending on material and room temperature, humidity, air movement, and catalyst concentration.

EPOVIA® RF1001L-00 should not be used when temperature conditions are below 18°C (64°F), as significantly longer gel, poor flow, and poor cure should be expected.

EPOVIA RF1001L-35

EPOVIA® RF1001L-35 is pre-promoted, but if longer gel times are needed the gel time of EPOVIA® RF1001L-35 can be extended by addition of POLYCOR® 970C951. (Note a 12% solution of HQ may be substituted for POLYCOR® 970C951.) Please contact your Polynt Representative for further information on gel time adjustments.

EPOVIA® RF1001L-35 is quality control tested using United Initiators MEKP-9. Other MEKP catalysts such as Arkema Luperox® DHD-9, United Initiators NOROX® MEKP-925, and Chemtura HP-90 are expected to yield similar performance. United Initiators NOROX® MEKP-925H and NOROX® MEKP-9H, Akzo Nobel CADOX L-50a and CADOX D-50 may also be used, but gel and cure times may vary.

The catalyst level should not exceed 2.4% nor fall below 0.9% for proper cure. The recommended range is 1.5% at 25°C or 77°F depending on material and room temperature, humidity, air movement, and catalyst concentration.

EPOVIA® RF1001L-35 should not be used when temperature conditions are below 18°C (64°F), as significantly longer gel, poor flow, and poor cure should be expected.

Refer to Polynt's Composites Applications Guide ("Cookbook") for equipment and application recommendations. Each user must determine the suitability of this product to his/her particular mode of operation and intended end-use application. A Polynt representative will be available to assist in the proper selection of all Polynt-Reichhold products available for commercial use.

SHELF LIFE & STORAGE

The shelf life of EPOVIA® RF1001L-00 is 180 days from the date of manufacture, while the shelf life of EPOVIA® RF1001L-17 and RF1001L-35 is 120 days from the date of manufacture form Polynt. To maximize usage life and maintain optimum properties, resins and gel coats should be stored in the original closed container at temperatures below 23°C/73°F and away from ignition sources and sunlight. Keep containers sealed to prevent moisture pick-up and monomer loss.

RELATED PRODUCTS

EPOVIA® RF1001L-35 – Pre-promoted infusion version

EPOVIA® RF1001L-56 – Pre-promoted infusion resin with extended gel time and controlled exotherm for large/thick parts

EPOVIA® RF1001DMV – Un-promoted, medium viscosity version (400 cps) for non-infusion applications

See the EPOVIA® Epoxy Vinyl Ester Product Guide for Corrosion and Chemically Resistant Resins for related products.

SAFETY & WARRANTY

To receive a copy of our safety and warranty information, please email safetyandwarranty@polynt.com.