



RF1001M-35

Epoxy Vinyl Ester Laminating and Filament Winding Resin

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Description

EPOVIA® RF1001M-35 is a pre-promoted, Bisphenol-A based vinyl ester resin containing styrene monomer. **EPOVIA® RF1001M-35** is formulated for building reinforced plastic parts by hand lay-up or spray-up open-molding or filament winding processes.

EPOVIA® RF1001M-35 can be used in applications that specify Derakane® 411, Hetron® 922, Dion® 9100, Vipel® F010 and other equivalent Bisphenol-A based vinyl ester resins. **EPOVIA® RF1001M-35** is suitable for use in a wide range of end-use applications including:

- Corrosion resistant storage tanks, process pipes, flanges and fittings for many industries
- Infrastructure pipe construction
- Fume and vapor ducting
- Load-bearing, structural construction members
- Automotive structural or heat exposed parts

Please refer to the **EPOVIA® Corrosion Guide for RF1001** for detailed information on specific service conditions.

Features and Benefits

- Excellent heat resistance allows use at elevated service temperatures
- Excellent resistance to corrosion from a 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 and accurate design tolerances.
- Superior mechanical strength allows for larger safety factors in high stress applications
- Rapid wet-out of glass fiber, fabrics and cores
- User friendly, pre-promoted formulation that requires only the addition of organic peroxide

Liquid Properties (77°F, 25°C)

Liquid properties of **EPOVIA® RF1001M-35** are shown below. These values may or may not be manufacturing control criteria. They are listed for a reference guide only. Particular batches will not conform exactly to the numbers listed because storage conditions, temperature changes, age, testing equipment (type and procedure) can have a significant effect on the results. Products with properties outside of these readings



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can perform acceptably. Final suitability of this product should be determined by the fabricator in the end use performance.

Test	Value
Viscosity ¹	350 cps
Weight Per Gallon	8.7 lbs
Specific Gravity @ 25°C	1.04
Gel time, (25°C) ²	35.0 minutes

¹Brookfield, LV #2 spindle @ 60 rpm.
²100 g mass, 1.5% Syrgis[®] MEKP-9 peroxide

Physical Properties

The physical properties of **EPOVIA[®] RF1001M-35** are shown below. Properties are shown for both a neat resin casting and for a glass fiber reinforced laminate. These are typical values and are provided for reference only.

Note: The physical properties of thermoset resins evolve as the resin cures. The properties given below are for well cured castings and laminates. Resin and laminates at different stages of cure will have varying properties.

Test	Test Method	Neat Resin Casting ¹	Laminate ²
Tensile Strength	ASTM D638	12,000 psi	18,000 psi
Tensile Modulus		540,000 psi	1,300,000 psi
Tensile Elongation		5.5%	1.8%
Flexural Strength	ASTM D790	22,000	29,000 psi
Flexural Modulus		500,000 psi	1,200,000 psi
Heat Distortion Point at 264 psi	ASTM D648	108°C/226°F	--
Barcol Hardness		40	52
Glass Content	ASTM D2584	--	See Note 2

Notes:

¹Neat Resin Casting – Post cured for 2 hours at 80°C followed by 2 hours at 120°C.

²Laminate - 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)

³Reference Cray Valley Korea

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Application

EPOVIA® RF1001M-35 should be mixed prior to use. Use mixing equipment with sufficient horsepower (relative to container size) to achieve thorough circulation from top to bottom and out to the sides of the container. The agitator must be properly sized for the container and must allow for uniform mixing regardless of the liquid level in the container. Mixing once a day for 10 minutes is typically sufficient. Air bubbling should not be used for mixing. It is not effective and only serves as a potential source of water or oil contamination.

EPOVIA® RF1001M-35 is pre-promoted, but if longer gel times are needed the gel time of **EPOVIA® RF1001M-35** can be extended by addition of **POLYCOR® 970C951**. (Note a 12% solution of HQ may be substituted for **POLYCOR® 970C951**.) Please contact your CCP Representative for further information on gel time adjustments.

EPOVIA® RF1001M-35 is quality control tested using Syrgis® MEKP-9. Other MEKP catalysts such as Arkema Luperox® DHD-9, Syrgis NOROX® MEKP-925, and Chemtura HP-90 are expected to yield similar performance. Syrgis 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.

This product 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.

Related Products

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

Caution

Do not add any material, other than the recommended inhibitors and organic peroxide to this product without the advice of a representative of CCP Composites US.

Storage

EPOVIA® RF1001M-35 has a usage life of 3 months from date of shipment from CCP when stored at 73°F or below in a closed, factory-sealed, opaque container, and out of direct sunlight. The usage life is cut in half for every 20°F over 73°F.

Data Sheets/MSDS:

CCP data sheets and MSDS's are available in printable format at www.ccpcompositesus.com.

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CCP COMPOSITES US**WARRANTIES, DISCLAIMERS AND LIMITATION OF LIABILITY (Rev. 10/11)**

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Without limiting the generality of the foregoing, if any product fails to meet warranties mentioned above, Seller shall at Seller's option either replace the nonconforming product at no cost to Buyer or refund the Buyer the purchase price thereof. The foregoing is Buyer's sole and exclusive remedy for failure of Seller to deliver or supply product that meets the foregoing warranties. Seller's liability with respect to this contract and the product purchased under it shall not exceed the purchase price of the portion of such product as to which such liability arises. Seller shall not be liable for any injury, loss or damage, resulting from the handling or use of the product shipped hereunder whether in the manufacturing process or otherwise. In no event shall Seller be liable for special, incidental or consequential damages, including without limitations loss of profits, capital or business opportunity, downtime costs, or claims of customers or employees of Buyer. Failure to give Seller notice of any claim within thirty (30) days of shipment of the product concerned shall constitute a waiver of such claim by Buyer. Any product credit received by Buyer hereunder, if not used, shall automatically expire one (1) year from the date the credit was granted. Notwithstanding any applicable statute of limitations to the contrary, any action by Buyer relation to a claim hereunder must be instituted no later than two (2) years after the occurrence of the event upon which the claim is based. All the foregoing limitations shall apply irrespective of whether Buyer's claim is based upon breach of contract, breach of warranty, negligence, strict liability, or any other legal theory.

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**COMPOSITES SAFETY INFORMATION
(October 2011)**

All sales of products manufactured by CCP Composites US (CCP), and described herein, are made solely on condition that CCP's customers comply with applicable health and safety laws, regulations and orders relating to the handling of our products in the workplace. Before using, read the following information, and both the product label, and Material Safety Data Sheet pertaining to each product.

Most products contain styrene. Styrene can cause eye, skin and respiratory tract irritation. Avoid contact with eyes, skin and clothing. Impermeable gloves, safety eyewear and protective clothing should be worn during use to avoid skin and eye contact. Wash thoroughly after use.

Styrene is a solvent and may be harmful if inhaled. Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage. Extended exposure to styrene at concentrations above the recommended exposure limits may cause central nervous system depression causing dizziness, headaches or nausea and, if overexposure is continued indefinitely, loss of consciousness, liver and kidney damage.

Do not ingest or breathe vapor, spray mists or dusts caused by applying, sanding, grinding and sawing products. Wear an appropriate NIOSH/MSHA approved and properly fitted respirator during application and use of these products until vapors, mists and dusts are exhausted, unless air monitoring demonstrates vapors, mists and dusts are below applicable exposure limits. Follow respirator manufacturer's directions for respirator use.

The International Agency for Research on Cancer (IARC) reclassified styrene as Group 2B, "possibly carcinogenic to humans." This revised classification was not based on new health data relating to either humans or animals, but on a change in the IARC classification system. The Styrene Information and Research Center does not agree with the reclassification and published the following statement: Recently published studies tracing 50,000 workers exposed to high occupational levels of styrene over a period of 45 years showed no association between styrene and cancer, no increase in cancer among styrene workers (as opposed to the average among all workers), and no increase in mortality related to styrene.

Styrene is classified by OSHA and the Department of Transportation as a flammable liquid. Flammable products should be kept away from heat, sparks, and flame. Lighting and other electrical systems in the work place should be vapor-proof and protected from breakage.

Vapors from styrene may cause flash fire. Styrene vapors are heavier than air and may concentrate in the lower levels of molds and the work area. General clean air dilution or local exhaust ventilation should be provided in volume and pattern to keep vapors well below the lower explosion limit and all air contaminants (vapor, mists and dusts) below the current permissible exposure limits in the mixing, application, curing and repair areas.

Some products may contain additional hazardous ingredients. To determine the hazardous ingredients present, their applicable exposure limits and other safety information, read the Material Safety Data Sheet for each product (identified by product number) before using. If unavailable, these can be obtained, free of charge, from your CCP representative or from: CCP Composites US, P.O. Box 419389, Kansas City, MO 64141-6389; 816-391-6053.

FIRST AID: In case of eye contact, flush immediately with plenty of water for at least 15 minutes and get medical attention; for skin, wash thoroughly with soap and water. If affected by inhalation of vapors or spray mist, remove to fresh air. If swallowed, get medical attention.

Those products have at least two components that must be mixed before use. Any mixture of components will have hazards of all components. Before opening the packages read all warning labels. Observe all precautions.

Keep containers closed when not in use. In case of spillage, absorb with inert material and dispose of in accordance with applicable regulations. Emptied containers may retain hazardous residue. Do not cut, puncture or weld on or near these containers. Follow container label warnings until containers are thoroughly cleaned or destroyed.

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