PRODUCT BULLETIN

November 2021

DION® IMPACT 9102-70 (US)

Bisphenol-A Epoxy Vinyl Ester Resin

DESCRIPTION

DION® IMPACT 9102-70 (US) is a bisphenol-epoxy vinyl ester resin that provides improved curing at low promoter levels for enhanced performance, especially in filament winding operations, while maintaining outstanding mechanical properties and the corrosion-resistance of the DION® 9100 Series resins. This resin technology produces a very low color which translates to better aesthetics in final composites equipment. DION® IMPACT 9102-70 (US) is unique because it is certified to NSF/ANSI 61 for use in domestic and commercial drinking water applications in both piping and tanks.
DION® IMPACT 9102-70 (US) can be used in hand lay-up, spray-up and filament winding applications. It also adapts to other methods of fabrication with no additional modifications.

DION® IMPACT 9102-70(US) is certified to NSF/ANSI 61 for use in domestic and commercial potable water applications in both piping and tanks.

BENEFITS & FEATURES

- Batch-to-batch consistency and uniformity from production utilizing Statistical Process Control (S.P.C) & Statistical Quality Control (S.Q.C) techniques
- Easy rollout and improved glass fiber wet out due to low viscosity
- Improved color and clarity to help find and eliminate visual defects resulting in better quality parts
- Very good high-temperature stability, crack and stress-fatigue resistance, and resistance to an extensive range of acids, bleaching technologies and solvents through a multitude of temperature ranges due to premium epoxy vinyl ester polymer
- Extended shelf life requiring less inventory turnaround due to a stabilized resin system
- Minimal curing components are required with faster green strength development, less stressing during cure eliminates micro cracking and allows thicker laminations due to improved reactivity
- Can be used in drinking water systems due to certification by NSF International to NSF/ANSI Standard 61, Drinking Water

PROPERTIES – LIQUID

Property[1]	Unit	9102-70
NVM	%	56
Viscosity[2]	cps	250
Gel Time[3]	minutes	20
Gel to Peak	minutes	16
Peak Exotherm	°C/°F	149/300
Specific Gravity	-	1.07
Flash Point (Seta Closed Cup)	°C/°F	32/89

1) All properties at 25°C/77°F unless otherwise noted
2) Brookfield Viscometer RVF Spindle #2 at 20 RPM
3) Promoter: 0.20 g of 6% cobalt per 100.00 g of resin; Initiator: 1.25 g of MEKP-925 or equivalent

PROPERTIES – PHYSICAL

Property(1)	Unit	Neat Resin Casting	Test Method
Tensile Strength	psi	12,000	ASTM D 638
Tensile Modulus	psi	460,000	ASTM D 638
Tensile Elongation	%	5.2	ASTM D 638
Flexure Strength	psi	23,000	ASTM D 790
Flexure Modulus	psi	500,000	ASTM D 790
Heat Deflection Temperature	°C/°F	104/220	ASTM D 648
Hardness, Barcol Model 934-1	HB	35	ASTM D 2583

1) Physical properties were determined using internal Polynt test methods that are similar to those listed above.

Typical Laminate Properties

Temperature (°C/°F)	Tensile Strength (psi)	Tensile Modulus (psi)	Flexural Strength (psi)	Flexural Modulus (psi)
25/77	19,200	1,700,000	32,800	1,170,000
66/150	22,100	1,700,000	33,100	1,120,000
93/200	22,700	1,390,000	25,700	830,000
121/250	14,600	800,000	3,000	370,000
149/300	9,900	800,000	-	-

1) Laminate Construction: V/M/M/WR/M/WR/M/M; V = 1 ply of 10 mil C-glass veil, M = 1 ply of 1.5 oz/ft^2 of chopped strand mat; WR = 1 ply of 24 oz/yd^2 of woven roving; Glass Content: 42%; Thickness: 0.25 in

PROPERTIES – OTHER

REQUIREMENTS FOR USE OF DION® IMPACT 9102-70 (US) IN A COATING SYSTEM CERTIFIED BY NSF TO NSF/ANSI STANDARD 61. DRINKING WATER SYSTEM COMPONENTS. (COLD WATER-CLD 23)

DION® IMPACT 9102-70 (US) is recommended as a coating system in drinking water tanks (≥ 150 gal) and piping (≥ 6" diameter) for cold water applications (23 ± 2°C (73 ± 4°F)).

In drinking water applications, the following are required of the coating system. Additional, non-specified chemical components or designated components that are utilized outside the percentage limitations specified below, constitutes non-compliance with the NSF Certified DION® IMPACT 9102-70 (US) Coating System. Strict adherence to components and percentages is required.

Certified to NSF/ANSI 61

COMPONENT	*Percentage*
DION® IMPACT 9102-70(US)	97.9% - 98.85%
MEKP by United Initiators Norox® MEKP-925 or Equivalent or Phthalate free versions of MEKP by Arkema (LUPEROX® DHD-9) or (LUPEROX® DDM-9)	1% - 1.5%
Cobalt Napthenate 6% by OMG Americas, Inc.	0.1% - 0.4%
Diethylaniline (DEA) by Aceto Corporation, Aarti Industries Ltd., Buffalo Color Corp., or Ashland Chemical	0.0% - 0.5%
Blend of 90% Styrene / 10% Paraffin Wax (for top coating of air inhibited regions only). Gulfwax Household Paraffin Wax from Royal Oak Styrene by Amoco, Arco, Chevron, GE, Shell Chemical, Sterling Chemicals, Lyondell Chemical, Huntsman Chemical Corp., Sabic	5.0% maximum
Amorphous Fumed Silica (for top coating) by Cabot Corp. (Cab-O-Sil TS-720) or Nippon Aerosil Co., Ltd. (Aerosil R-972)	0.0 - 2.5%
Owens Corning Fiberglass C-veil	1 Ply (Veil Thickness – Nominal 10 mils)
2,4 – Pentanedione (Acetyl Acetone) by Aceto Corporation	0.0 – 0.07
Cure time shall be 2 – 100 hours at ambient temperature with a post-cure of 4 hours at 160°F, followed by 2 hours at 180°F. Equipment must be washed with a non-ionic detergent solution after post-cure and rinsed with potable water.	
The DION® 9102-70 (US) Coating System is Certified by NSF International to the requirements of NSF/ANSI Standard 61: Drinking Water System Components-Health Effects. This certification is non-transferable. Certain jurisdictions may require certain end products to be coated with an NSF Certified coating system, while other jurisdictions may require certain end products to be Certified to NSF 61. If you would like information regarding NSF Certification, please contact NSF International at info@nsf.org; www.nsf.org; or at 1-800-NSF-MARK.	

APPLICATION

DION® IMPACT 9102-70 (US) is a non-promoted vinyl ester resin for use with cobalt naphthenate and an aniline accelerator which responds well to most MEKP initiator systems. Other initiators work as well, but should be throughly evaluated prior to use. This resin, however, is very sensitive to low temperatures and care must be taken to avoid less than minimum stated quantities of MEKP type initiators. At temperatures 75°F and below, it may be necessary to add diethylaniline (DEA) in incremental amounts of 0.05% to decrease gel times and enhance cure profiles. For applications at high temperatures (85-95°F) the MEKP initiator levels must still be maintained above the minimum recommendation to achieve optimum cure. In order to increase gel times at these temperatures, it is suggested that the MEKP initiator be maintained at 1.25%-1.50% and the gel time be adjusted with additions of low levels of 2,4 pentadedione (PDO). Add cobalt naphthenate, diethylaniline (DEA) or 2,4 pentanedione (PDO) in quantities shown to achieve working life at the temperature indicated.

APPLICATION (Continued)

Temperature (°F)	15 ± 5 min	30 ± 10 min	60 ± 15 min
65	0.3% Co 6% 0.5% DEA 1.25% MEKP-925	0.2% Co 6% - 1.50% MEKP-925	0.1% Co 6% - 1.25% MEKP-925
75	0.3% Co 6% 0.15% DEA 1.5% MEKP-925	0.2% Co 6% - 1.25% MEKP-925	0.1% Co 6% 0.03% PDO 1.25% MEKP-925
85	0.2% Co 6% - 1.5% MEKP-925	0.1% Co 6% 0.025% PDO 1.25% MEKP-925	0.1% Co 6% 0.055% PDO 1.25% MEKP-925
95	0.1% Co 6% - 1.25% MEKP-925	0.1% Co 6% 0.05% PDO 1.25% MEKP-925	0.1% Co 6% 0.07% PDO 1.25% MEKP-925

Co 6% = cobalt naphthenate; DEA = diethylaniline; PDO = 2,4-pentanedione

Caution: Excessive cobalt can inhibit cure and degrade corrosion resistance. Do not use more than 0.5% of cobalt 6% or 0.25% of cobalt 12%. If using cobalt octoate (12%), use half of the amount indicated in the chart for cobalt 6%. NOTE: Cobalt Octoate (12%) should not be used for FDA applications.

Initiator: Lucidol™ DHD-9, MEKP-925, and Trigonox™ 239 have proven to be particularly well suited for curing DION® vinyl ester resins. Trigonox™ 239 has been shown to reduce or eliminate foaming upon initiator addition, but may not adapt to the above cure guidelines. Other brands of MEKP have also been used successfully. A thorough evaluation of initiator characteristics is suggested prior to fabrication to satisfy user's expectations.

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 DION® IMPACT 9102-70 (US) is 270 days from the date of manufacture from 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 LITERATURE

MB-382 National Sanitation Foundation (NSF) International Certification

SAFETY & WARRANTY

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