PRODUCT BULLETIN

November 2025

DION® 9102 Series

Bisphenol-Epoxy Vinyl Ester Resin

DESCRIPTION

The DION® 9102 Series are special versions of the DION® 9100 of bisphenol-epoxy vinyl ester resins. They provide reduced viscosity and improved curing at low promoter levels for enhanced performance in filament winding operations, while maintaining the mechanical properties and corrosion-resistance of the DION® 9100 resins.

BENEFITS & FEATURES

- Very good high-temperature stability, resistance to a wide variety of corrosive environments, and resistance to crack and stress-fatigue due to premium epoxy vinyl ester polymer
- Extended shelf life due to stabilized resin system
- Improved glass fiber wet-out due to low viscosity. Approvable for use in indirect food contact due to components being listed under FDA 177.2420, Title 21
- Excellent for use in vacuum infusion and Cured-In-Place Pipe (CIPP) applications that require extended working time at ambient temperatures (Lateral Lining & Point Repair). Gel times are extendible to several hours at ambient temperature without affecting the cure
- Consistent batch-to-batch performance due to manufacturing with statistical process control in ISO-9002 certified plants

PROPERTIES – LIQUID

Property[1]	Unit	9102-42	9102-48	9102-55	9102-86
NVM	-	53.0	58.0	58	52.0
Viscosity	cps	500[3]	450[3]	450[3]	165[4]
Gel Time	minutes	22[5]	20[6]	20[6]	20.0[6]
Gel to Peak	minutes	22	15.5	16.0	16.0
Peak Exo	°C/°F	160/320	149/300	149/300	160/320
Specific Gravity	g/cm³	1.06	1.07	1.07	1.07

1) All properties at 25°C/77°F unless otherwise noted
2) See Application section for initiator and promoter addition tables
3) Brookfield Viscometer RV Spindle #2 at 20 RPM
4) Brookfield Viscometer RV Spindle #1 at 20 RPM
5) 1.0 g Nouryon Cadox® L50a per 100 g resin
6) 1.25 g United Initiators Norox® MEKP 925 per 100 g resin

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PROPERTIES – PHYSICAL

Property[1]	Unit	Clear Casting	Test Method
Tensile Strength	psi	12,000	ASTM D 638
Tensile Modulus	psi	460,000	ASTM D 638
Tensile Elongation (at break)	%	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 at Elevated Temperature

Temperature (°F)	Tensile Strength (psi)	Tensile Modulus (psi)	Flexural Strength (psi)	Flexural Modulus (psi)
77	19,200	1,7000,000	33,000	1,170,000
150	22,100	1,700,000	33,000	1,120,000
200	22,700	1,400,000	26,000	830,000
250	14,600	800,000	3,000	370,000
300	9,900	800,000	-	-

1) Laminate Construction: V-M-M-WR-M-WR-M-M; Glass Content: 42%; Thickness: 0.250 inches
   a. 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

APPLICATION

The DION® 9102 products are unpromoted vinyl ester resins for use with cobalt naphthenate, or octoate, and an aniline accelerator which responds well to MEKP initiator systems. Other initiators work as well but should be thoroughly evaluated prior to use. These resins, however, are sensitive to low temperatures and care must be taken to avoid less than minimum stated quantities of MEKP type initiators.

At temperatures below 60°F, it may be necessary to add dimethylaniline in incremental amounts of 0.05 parts per 100 parts resin (phr) to increase gel and cure profiles. For applications at high ambient temperatures (80-90°F) the MEKP catalyst levels must still be maintained above the minimum recommendation to achieve optimum cure. In order to lengthen gel times at these temperatures, it is suggested that the MEKP catalyst be maintained at 1.25 phr and the gel time be adjusted with additions of tert-butyl catechol solution (TBC-10) or low levels of 2,4 pentanedione (PDO).

The DION® 9102 products can also be effectively cured using a benzyl peroxide (BPO) / dimethylaniline (DMA) system.

GUIDELINES FOR DION® 9102 SERIES RESINS • INITIATOR AND PROMOTER ADDITIONS

Add cobalt naphthenate and dimethylaniline in quantities shown to achieve working life at the temperature indicated. Resin gel time will drift slightly if allowed to stand overnight. Readjust with additional DMA.

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Guidelines for initiator and promoter additions at various ambient temperatures:

Ambient Temperature (°F)	Additive (phr)[1]	Gel Time (Minutes)			
		10	20	30	60
55-65	6% cobalt[2]	-	0.4	0.3	0.2
	DMA NOROX®	-	0.10	0.05	0.05
	MEKP-925[3]	-	1.5	1.25	1.25
70-80	6% cobalt	0.4	0.3	0.2	0.1
	DMA NOROX®	0.10	0.05	0.05	0.05
	MEKP-925	1.5	1.25	1.25	1.00
85-95	6% cobalt	0.3	0.2	0.1	0.1
	DMA NOROX®	0.05	0.05	0.05	0.00
	MEKP-925	1.25	1.25	1.00	1.00

1) phr = Parts per hundred resin.
2) **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%.
3) United Initiators Norox® MEKP-925 or equivalent. United Initiators Norox® MEKP-925 or equivalent, Arkema Luperox® DHD-9 and Nouryon Trigonox® 239A have proven to be particularly well suited for curing DION® vinyl ester resins. Nouryon Trigonox® 239A has been shown to reduce or eliminate foaming upon initiator addition but may not adapt to the above cure grids. 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.

WARNING: CARE MUST BE TAKEN TO AVOID DIRECT MIXING OF ANY ORGANIC PEROXIDE WITH METAL SOAPS, AMINE OR ANY OTHER POLYMERIZATION ACCELERATOR OR PROMOTER, AS VIOLENT

EXTENDED AMBIENT CURING TIME WITH DION® 9102 USING 2,4 – PENTANEDIONE (PDO)

DECOMPOSITION WILL RESULT!

Due to the unique manner in which vinyl ester resins react when small amounts of 2,4-Pentanedione (PDO) are added, it is possible to extend the ambient temperature gel time of these resins without greatly affecting their peak exotherm and gel-to-peak profile. The following charts and graphs show ambient gel time data for various levels of 2,4-PDO at different temperatures.

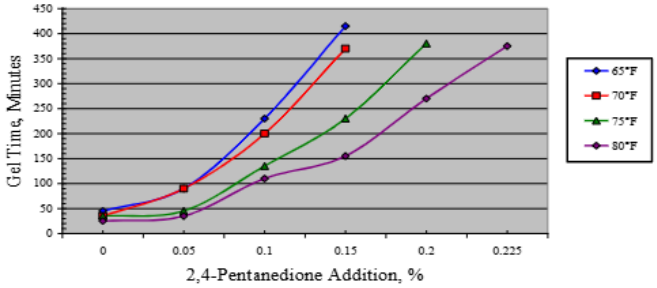
Ambient Temperature (°F)	**2,4 – PDO Addition, phr[1]**					
	0.0	**0.05**	**0.1**	**0.15**	**0.2**	**0.225**
65	00:45[2][3]	00:90	3:50	6:55	-	-
70	00:35	00:90	3:20	6:10	-	-
75	00:35	00:45	2:15	3:50	6:20	-
80	00:25	00:35	1:50	2:35	4:30	6:15

1) phr = Parts per hundred resin
2) Gel Times are listed in the format Hours:Minutes
3) Resin was promoted using 0.4% cobalt 6% (by weight) and 0.05% DMA (by weight). The initiator used for this chart was United Initiators Norox® MEKP-925H at 1.25% (by weight).

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DION® 9102 Extended Ambient Temperature Gel Time with Norac MEKP-925H



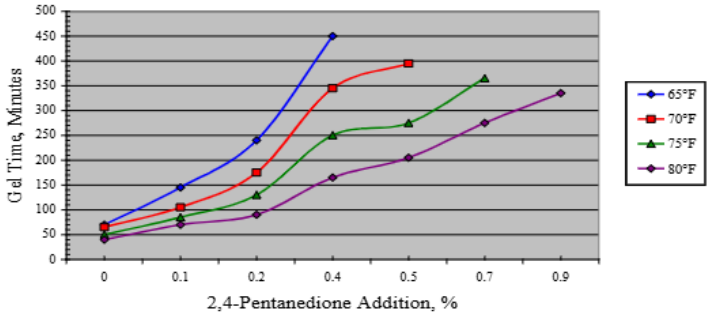
Ambient Temperature (°F)	2,4 – PDO Addition, phr[1]					
	0.0	0.2	0.4	0.5	0.7	0.9
65	1:10[2][3]	4:00	7:30	-	-	-
70	1:05	2:55	5:40	6:35	-	-
75	00:50	2:10	4:10	4:40	6:10	-
80	00:40	1:30	2:45	3:25	4:35	5:35[4]

1) phr = Parts per hundred resin
2) Gel times are listed in the format Hours:Minutes
3) Resin was promoted using 0.4% cobalt 6% (by weight) and 0.05% DMA (by weight). The initiator used for this chart was United Initiators Norox® CHP at 1.25% (by weight).
4) Other gel tests were run using higher levels of 2,4-PDO. Results indicate that gel time will not lengthen significantly beyond the 0.9% level. The 2,4-PDO may actually begin to act as a promoter or plasticizer.

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DION® 9102 Extended Ambient Temperature Gel Time with Norac 46727 CHP



DION® 9102 PARAFFINATED TOPCOATS

Even fully cured resin of a non-mold sided surface can demonstrate some tackiness due to air inhibition. Surface cure may be improved by incorporating a paraffin wax into the resin to be used in the final ply. Alternatively, a wax modified resin can be added as a protective topcoat once the laminate has hardened. **These topcoated surfaces will negatively influence secondary bonding.** Grinding and additional surface preparation will become necessary to enhance the success of the bond.

SUGGESTED TOPCOAT FORMULATION(1)	
COMPONENT	***PARTS***
DION® 9102-00	100.0
10% paraffin wax solution in styrene	5.0
DMA (dimethylaniline)	0.2
6% cobalt naphthenate	0.4
Tween® 20 or 80	0.3
Fumed silica thixotrope(2)	1.5
Norox® MEKP-925 or Luperox® DHD-9 initiator	1.3

1) Approximate gel time: 15 minutes
2) Use in sodium hypochlorite environments will result in decreased chemical resistance. We suggest this be omitted from the formulation in those situations. Hydrophobic grades of fumed silica are suggested for vinyl ester resins.

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 products available for commercial use.

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SHELF LIFE & STORAGE

The shelf life of DION® 9102 Series is either 120 days or 180 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.

Property	Unit	9102-42	9102-48	9102-55	9102-86
Shelf Life	Days (Minimum)	120	120	180	120

RELATED PRODUCTS

DION® IMPACT 9102-70 – Certified to NSF/ANSI 61 for use in domestic and commercial potable water applications in both piping and tanks

SAFETY & WARRANTY

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