PRODUCT BULLETIN

May 2018

DION® IMPACT 9400 (US)

Epoxy Novolac Vinyl Ester Resin

DESCRIPTION

DION® IMPACT 9400 (US) is a premium epoxy novolac vinyl ester resin that has been specially modified for improved fabrication properties. This high crosslink density resin provides excellent retention of mechanical properties at elevated temperatures, and offers high resistance to solvents, aggressive chemicals, acidic, alkaline, and oxidizing environments. DION® IMPACT resins are an extension of Polynt-Reichhold's well-known and respected line of premium DION® resins. They offer the end-user improved fabrication efficiency and product quality. They are lighter in color than typical vinyl esters resins which make defects easier to see and correct while the resin is still in a workable state.

BENEFITS & FEATURES

- Batch-to-batch consistency and uniformity from production utilizing Statistical Process Control (S.P.C) & Statistical Quality Control (S.Q.C) techniques
- Excellent high temperature performance typical of an epoxy novolac-based vinyl ester polymer
- Better clarity for better quality parts and a more transparent composite which aids in final inspection of parts due to low color compared to typical vinyl ester resins
- An economical alternative to exotic metal alloys that retains its mechanical properties at elevated temperatures

PROPERTIES – LIQUID

Property(1)	Unit	9400
NVM	%	66.5
Viscosity(2)	cps	450
Gel Time(3)	minutes	20.0
Gel to Peak	minutes	24
Peak Exotherm	°C/°F	185/365
Specific Gravity	-	1.08
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) Promotion: 0.10 g of Cobalt 12% + 0.05 g of DMA per 100.00 g of resin; Initiator: 1.50 g of CHP

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PROPERTIES – PHYSICAL

Property[1]	Unit	Neat Resin Casting[2]	Laminate[3]	Test Method
Tensile Strength	psi	12,000	28,000	ASTM D 638
Tensile Modulus	psi	520,000	1,730,000	ASTM D 638
Tensile Elongation	%	3.1	-	ASTM D 638
Flexure Strength	psi	22,000	30,000	ASTM D 790
Flexure Modulus	psi	530,000	1,580,000	ASTM D 790
Compression Strength	psi	20,000	-	ASTM D 695
Compression Modulus	psi	340,000	-	ASTM D 695
Heat Deflection Temperature	°C/°F	143/290	-	ASTM D 648
Hardness, Barcol Model 934-1	HB	55	-	ASTM D 2583
Water Absorption - 2 hours at 212°F - 24 hours at 73°F	 % gain % gain	 0.48 0.30	 - -	ASTM D 570

1) Physical properties were determined using internal Polynt test methods that are similar to those listed above.
2) Initiator type and ratio: 1.5 g of CHP per 100.0 g of resin; Cure conditions: 16 hrs. @ 73°F; Post-cure conditions: 2 hrs. @ 150°F, 2 hrs. @ 250°F, 1 hr. @ 300°F, 1 hr. @ 320°F
3) Laminate Construction: V/M/M/WR/M/WR/M, V = C Glass Veil, M = 1.5 oz./ft² CSM, WR = 24 oz./yd² Woven Roving; Glass Content: 40%; Thickness: 0.25"; Initiator type and ratio: 1.25% of MEKP 925 per 100 g of resin; Cure conditions: 16 hrs. @ 73°F; Post-cure conditions: : 2 hrs. @ 150°F, 2 hrs. @ 250°F, 1 hr. @ 300°F, 1 hr. @ 320°F

APPLICATION

GUIDELINES FOR INITIATOR AND PROMOTER ADDITIONS

DION® IMPACT 9400 (US) is a non-promoted epoxy novolac vinyl ester resin for use with cobalt naphthenate or octoate and an aniline accelerator. It is designed to respond well to MEKP initiator systems. Other initiators work as well, but should be thoroughly evaluated prior to use. Please note that vinyl ester resins are sensitive to low temperatures and care should be taken to avoid less than the minimum stated quantities of MEKP type initiators.

At temperatures below 75°F, it may be necessary to add diethylaniline (DEA) in incremental amounts of 0.05 % by weight to increase gel and cure profiles. For applications at high ambient temperatures (80-90°F), the MEKP initiator levels must still be maintained above the minimum recommendations to achieve optimal cure. In order to lengthen the working/gel time at these temperatures, it is suggested that the MEKP initiator be maintained at 1.25% by weight and the working/gel time be adjusted with additions of low levels of 2,4-pentanedione (2,4-PDO).

Add cobalt 6%, diethylaniline (DEA), or 2,4-pentanedione (2,4-PDO) in the quantities shown to achieve the desired working life at the temperature indicated below:

Temperature	15 ± 5 min	30 ± 10 min	60 ± 15 min
65°F	0.2% Co 6% 0.3% DEA 1.25% MEKP 925	0.25% Co 6% 1.5% MEKP 925 -	0.15% Co 6% 1.25% MEKP 925 -
75°F	0.3% Co 6% 1.5% MEKP 925 -	0.15% Co 6% 1.25% MEKP 925 -	0.1% Co 6% 1.25% MEKP 925 -
85°F	0.2% Co 6% 1.5% MEKP 925 -	0.1% Co 6% 1.25% MEKP 925 -	0.1% Co 6% 0.07% PDO 1.25% MEKP 925
95°F	0.1% Co 6% 1.25% MEKP 925 -	0.1% Co 6% 0.07% PDO 1.25% MEKP 925	0.1% Co 6% 0.15% 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%.

Initiator: MEKP 925 or equivalent. MEKP 925, Lucidol™ DHD-9, 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.

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 9400 (US) is 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.

SAFETY & WARRANTY

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