

TECHNICAL DATA SHEET

DION IMPACT 9400

EPOXY NOVOLAC VINYL ESTER RESIN

REVISION: DDS0318/044

DESCRIPTION

DION[®] IMPACT 9400 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, offers a high resistance to solvents, chemicals, acidic, alkaline, and oxidizing environments. DION[®] IMPACT resins are a new and exciting extension of 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 ester resins which make defects easier to see and correct while the resin is still in a workable state. They also offer an improved shelf life over typical vinyl ester resins providing additional flexibility to fabricators.

APPLICATION

Can be used in most FRP fabrication processes including hand lay-up, spray-up, and filament winding.

FEATURES

- Epoxy novolac-based vinyl ester base polymer
- Stabilized resin system
- Low color compared to typical vinyl ester resins
- Manufactured using statistical process control
- Excellent corrosion and temperature performance

BENEFITS

- Excellent high temperature performance
- Extended shelf life, less inventory turnaround
- Better clarity for better quality parts
- More transparent composite makes defects easier to see and aids in final inspection of parts
- Consistent batch-to-batch performance
- Resists organic solvents, acidic, alkaline, and oxidizing environments, and an extensive range of corrosive media over a wide temperature range
- An economical alternative to exotic metal alloys
- Retains mechanical properties at elevated temperatures
- Long term equipment life and serviceability holds down replacement capital expenses.

TYPICAL PROPERTIES

TYPICAL PHYSICAL DATA IN LIQUID STATE AT 25°C

PROPERTY	UNIT	SPECIFICATION	TEST METHOD
Volatile Content	%	33.5	B070
Viscosity (Brookfield)	cps	450	ASTM D 2196-86
Density	g / cm ³	1.08	ISO 2811-2001
Flash point(Seta Closed Cup)	° C	31.6	ASTM D 3278-95
Shelf Life, Minimum	months	8	G180

TYPICAL MECHANICAL PROPERTIES

PROPERTY	UNIT	3mm clear casting	6mm reinforced laminate*	TEST METHOD
Tensile strength	MPa	82.7	193	ISO 527-2
Tensile modulus	MPa	3585	11928	ISO 527-2
Elongation at break	%	3.0 - 3.5	2.2 - 2.5	ISO 527-2
Flexural strength	MPa	151.7	206.8	ISO 178
Flexural modulus	MPa	3654	10894	ISO 178
Heat distortion temperature	° C	143	-	ISO 75-2
Glass transition temperature, T _g	° C	160	155	ASTM D3419
Hardness, Barcol 934-1	-	40	50	BS 2782-10, Method 1001

* Laminate Construction - V/M/MWR/MWR/M where V = Glass Veil, M = 450g/m² CSM, WR = Woven Roving 40% Glass Content, 6mm Nominal Thickness

DION® IMPACT 9400 is an unpromoted epoxy novolac vinyl ester resin for use with cobalt naphthenate and

DION® IMPACT 9400 CURING

an aniline accelerator and 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 weight % to increase gel and cure profiles. For applications at high ambient temperatures (80°F - 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 weight % and the working/gel time be adjusted with additions of low levels of 2,4-pentanedione (2,4-PDO).

GUIDELINES FOR DION® IMPACT 9400 RESIN

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

Temperature	15 ± 5 min	30 ± 10 min	60 ± 15 min
20°C	0.3% Co 6% 0.06% DMA 1.5% Butanox® LPT	0.3% Co 6% 1.5% Butanox® LPT	0.2% Co 6% 1.5% Butanox® LPT
25°C	0.3% Co 6% 1.5% Butanox® LPT	0.15% Co 6% 1.5% Butanox® LPT	0.185% Co 6% 0.02% PDO 1.5% Butanox® LPT
30°C	0.18% Co 6% 1.5% Butanox® LPT	0.1% Co 6% 1.5% Butanox® LPT	0.17% Co 6% 0.03% PDO 1.5% Butanox® LPT
35°C	0.125% Co 6% 1.5% Butanox® LPT	0.14% Co 6% 0.04% PDO 1.5% Butanox® LPT	0.13% Co 6% 0.07% PDO 1.2% Butanox® LPT

Co 6% = cobalt naphthenate; DEA = diethylaniline; PDO = 2,4-pentanedione(Acetyl Acetone); LPT = Butanox® LPT

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%.

Catalyst: Butanox® LPT or equivalent. Butanox® LPT, Curox® M102, and Trigonox™ 239A have proven to be particularly well suited for curing DION® vinyl ester resins. Trigonox™ 239A has been shown to reduce or eliminate foaming upon initiator addition, but may not adapt to the above cure grids. A thorough evaluation of initiator characteristics is recommended 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 DECOMPOSITION WILL RESULT!

STORAGE AND HANDLING

To ensure maximum stability and maintain optimum properties, DION® IMPACT 9400 should be stored in closed containers, maintained below 25°C and away from heat sources and sunlight. All storage should conform to local fire and building codes. Drum stock should be kept to a reasonable minimum with first-in, first-out stock rotation. Where bung-in-head containers are stored outside, it is recommended that these be stored in a horizontal position to avoid the ingress of water.

STANDARD PACKAGING

Non-returnable metal drums.

Bulk supplies can be delivered by road tanker

MATERIAL SAFETY DATA SHEET

PLEASE READ AND UNDERSTAND THE MATERIAL SAFETY DATA SHEET BEFORE WORKING WITH THIS PRODUCT

A Material Safety Data Sheet is available from your NCS Resins' representative. Make certain that you obtain a copy of this guide to the safe handling of unsaturated polyester resins and resin systems.

WARNING: CARE MUST BE TAKEN TO AVOID DIRECT MIXING OF ANY ORGANIC PEROXIDE (CATALYST) WITH METAL SOAPS, AMINE OR ANY OTHER POLYMERISATION ACCELERATOR OR PROMOTER, AS VIOLENT DECOMPOSITION WILL RESULT!

NCS RESINS BRANCHES AT:

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