REICHHOLD
A DIC GROUP COMPANY

DION® IMPACT 9102 Series

Bisphenol-A Epoxy Vinyl Ester Resins

DESCRIPTION

The DION® IMPACT 9102 resins are special versions of bisphenol-epoxy vinyl ester resins. They provide a reduced viscosity and 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. This new resin technology produces a very low color which translates to better aesthetics in final composite equipment. Extended shelf life technology reduces concerns over gellation of inventory.

DION IMPACT 9102-70(US) is unique, because it is Certified to NSF/ANSI 61 for use in domestic and commercial potable water applications in both piping and tanks.

APPLICATION

- Can be used in hand lay-up, spray-up and filament winding applications. Adapts to most other methods of fabrication with no additional modifications.

FEATURES	BENEFITS
• Low viscosity and color	• Easier rollout and clarity for better quality parts • Improved glass fiber wet out • More transparent composite which helps eliminate visual defects and aids in inspecting final parts
• Manufactured using statistical process control in ISO-9002 certified plants	• Consistent batch-to-batch performance
• Premium epoxy vinyl ester polymer • Stabilized resin system • Improved reactivity	• Very good high-temperature stability producing tough, crack and stress-fatigue resistant laminates • Extended shelf life, less inventory turnaround • Minimal curing components are required with faster green strength development • Less stressing during cure eliminates micro cracking and allows thicker laminations
• Excellent corrosion performance	• Resists an extensive range of acids, alkalis, bleaching technologies and solvents thru a multitude of temperature ranges. A workhorse class polymer • Long term equipment life and serviceability holds down replacement capital expenses
• Extendible gel time to several hours at ambient temperature without affecting the cure	• Increased productivity which allows for longer pot life and the need for multi-batching to complete laminations
• Compositional components listed under FDA 177.2420, Title 21	• Can be used in components intended for contact with food
• Certified by NSF International to NSF/ANSI Standard 61, Drinking Water System Components	• Can be used in potable (drinking) water systems

TYPICAL PROPERTIES

PHYSICAL DATA IN LIQUID FORM AT 77°F

Viscosity, cps		Gel Time*, Minutes	Specific Gravity	Shelf Life
DION IMPACT 9102-55	400	Unpromoted	1.07	12 months
DION IMPACT 9102-70 (US)	230	Unpromoted	1.05	12 months
DION IMPACT 9102-48	450	18 -22	1.08	6 months

Seta Closed Cup Flash Point of all DION® IMPACT 9102(US) resins is 31.6°C (89°F)

* **See Page 3 for specific initiator and promotion requirements and limits for NSF/ANSI 61 applications**

TYPICAL MECHANICAL PROPERTIES

Properties at 77°F	Unit	1/8" Clear Casting	Test Method
Barcol Hardness, Model 934-1	-	35	ASTM D 2583
Flexural Strength	psi	23000	ASTM D 790
Flexural Modulus, $x10^6$	psi	0.50	ASTM D 790
Tensile Strength	psi	11600	ASTM D 638
Tensile Modulus, $x10^6$	psi	0.46	ASTM D 638
Tensile Elongation (at break)	%	5.2	ASTM D 638
Heat Deflection Temperature (HDT)	°F	220	ASTM D 648

TYPICAL LAMINATE PROPERTIES AT ELEVATED TEMPERATURES

Temp (°F)	Tensile Strength (psi)	Tensile Modulus ($x10^6$, psi)	Flexural Strength (psi)	Flexural Modulus ($x10^6$, psi)
77	19200	1.70	32800	1.17
150	22100	1.70	33100	1.12
200	22700	1.39	25700	0.83
250	14600	0.80	3000	0.37
300	9900	0.80		

Laminate Construction: V-M-M-WR-M-WR-M-M
Glass Content: 42%
Thickness: 0.250 inches

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

DION IMPACT 9102-70(US) COATING SYSTEM CERTIFIED BY NSF INTERNATIONAL

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

DION IMPACT 9102-70(US) is recommended as a coating system in potable water tanks (>=200 gal) and piping (>=16" diameter) at ambient temperature

In potable 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.***

NSF®

Certified to NSF/ANSI 61

COMPONENT	*Percentage*
DION IMPACT 9102-70(US)	97.9% - 98.85%
MEKP by Norac (Norox MEKP-925) or Witco (HiPoint 90)	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., Ashland Chemical	0.0% - 0.5%
50/50 Blend of Styrene & Paraffin Wax (for top coating of air inhibited regions only). Paraffin Wax by Amoco Oil Company Eskar Wax R-35 Styrene by Amoco, Arco, Chevron, GE, Shell Chemical, Sterling Chemicals, Lyondell Chemical, Huntsman Chemical Corp.	1.0% 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 posture of 4 hours at 160°F, followed by 2 hours at 180°F. Equipment must be washed with a non-ionic detergent solution after posture and rinsed with potable water.	
The DION IMPACT 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.	

DION IMPACT 9102-70 and 9102-55 RESINS CURING

The DION IMPACT 9102-70 and 9102-55 products are unpromoted vinyl ester resins for use with cobalt naphthenate, and an aniline accelerator which responds well to MEKP catalyst systems. Other catalysts 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 catalysts.

At temperatures 75°F and below, it may be necessary to add diethylaniline in incremental amounts of 0.05 phr to decrease gel times and enhance cure profiles. For applications at high ambient temperatures (85-95°F) the MEKP catalyst 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 catalyst be maintained at 1.25% - 1.50% and the gel time be adjusted with additions of low levels of 2,4 pentanedione (PDO).

GUIDELINES FOR DION IMPACT 9102-70 and 9102-55 RESINS

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

Temperature	15 ± 5 min	30 ± 10 min	60 ± 15 min
65°F	0.3% Co 6% 0.5% DEA 1.25% HP90	0.2% Co 6% 1.50% HP90	0.1% Co 6% 1.25% HP90
75°F	0.3% Co 6% 0.15% DEA 1.5% HP90	0.2% Co 6% 1.25% HP90	0.1% Co 6% 0.03% PDO 1.25% HP90
85°F	0.2% Co 6% 1.5% HP90	0.1% Co 6% 0.025% PDO 1.25% HP90	0.1% Co 6% 0.055% PDO 1.25% HP90
95°F	0.1% Co 6% 1.25% HP90	0.1% Co 6% 0.05% PDO 1.25% HP90	0.1% Co 6% 0.07% PDO 1.25% HP90

Caution: Excessive cobalt can inhibit cure and degrade corrosion resistance. Do not use more than 0.3% of cobalt 6% naphthenate.

Catalyst:

Witco HiPoint™90 or Norox MEKP-925 *only* for NSF Applications

HiPoint 90, Lucidol™ DHD-9, Norox MEKP-925 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. 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. Minimum catalyst levels should never be lower than 1.0%.

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

To ensure maximum stability and maintain optimum resin properties, resins should be stored in the original closed container at temperature below 24°C/75°F and away from heat ignition sources and sunlight. Resin should be warmed to at least 18°C/65°F prior to use in order to assure proper curing and handling. All storage areas and containers should conform to local fire and building codes. Copper or copper containing alloys should be avoided as containers. Store separate from oxidizing materials, peroxides and metal salts. Keep containers closed when not in use. Inventory levels should be kept to a reasonable minimum with first-in, first-out stock rotation.

Additional information on handling and storing unsaturated polyesters is available in Reichhold's application bulletin "Bulk Storage and Handling of Unsaturated Polyester Resins." For information on other Reichhold resins, additives or initiators, contact your sales representative or authorized Reichhold distributor.

SHELF LIFE

Shelf life is 12 months for the DION® IMPACT 9102-55 and DION® IMPACT 9102-70 (US), 6 months for the DION® IMPACT 9102-48 from date of shipment. Minimum shelf life performance refers to product in the original, unopened container.

STANDARD PACKAGE

This product is available in non-returnable 55-gallon metal drums (452 lbs.) or 42,000 – 44,000-lb. tank truck.

SAFETY

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

Obtain a copy of the material safety data sheet on this product or contact the Reichhold service center prior to use. Material safety data sheets are available from your Reichhold sales representative. Such information should be requested from suppliers of all products and understood prior to working with their materials.

DIRECTLY MIXING ANY ORGANIC PEROXIDE WITH A METAL SOAP, AMINE, OR OTHER POLYMERIZATION ACCELERATOR OR PROMOTER WILL RESULT IN VIOLENT DECOMPOSTION. WHEN ADDING ORGANIC PEROXIDES TO A RESIN SOLUTION, PROMPTLY AND THOROUGHLY MIX THE RESULTING PRODUCT. NEVER ADD ORGANIC PEROXIDES TO A HOT DILUENT OR PROCESS. PREVENT CONTAMINATION WITH FOREIGHN MATERIALS, INCLUDING WITHOUT LIMITATION, ACCELERATORS (SUCH AS DIMETHYL, ANILINE, OTHER AMINES OR COBALT COMPOUNDS), HEAVY-METAL OXIDES OR SALTS (PARTICULARLY THOSE OF COBALT, IRON AND COPPER), STRONG ACIDS AND SANDING DUSTS. USE CLEAN CONTAINERS MADE OF GLASS, POLYPROPYLENE, TEFLON, POLYETHYLENE, OR CERAMIC TO PREVENT CONTAMINATION OF ORGANIC PEROXIDES DURING ITS HANDLING.

TECHNICAL SUPPORT

Reichhold's technical support staff has extensive practical experience with various composites resins, end use performance and manufacturing techniques. Please do not hesitate to request our assistance through your Reichhold sales or technical representative.

Copies of test methods used to determine reported properties are available through your Reichhold representative.

Each user must determine the suitability of this product to his/her particular mode of operation and intended end use application. A Reichhold representative will be available to assist in the proper selection of all Reichhold products available for commercial use.

Properties reported in this bulletin are typical of those obtained in controlled laboratory tests and may vary in actual production; therefore, we require our customers to inspect and test our products before using them to satisfy themselves as to contents and suitability. We warrant that our products will meet our written specifications. **Nothing herein shall constitute any other warranty express or implied, including any warranty of merchantability or fitness for a particular purpose, nor is protection from any law or patent to be inferred.**