DION® 382-05, 382-05A, 382-05AC
BISPHENOL FUMARATE RESINS

REICHHOLD
A DIC GROUP COMPANY

DESCRIPTION

DION® 382-05, 382-05A, and 382-05AC are premium bisphenol-A fumarate resins that demonstrate excellent corrosion resistance in a wide range of aggressive environments.

DION® 382 resins have been used for more than 40 years to manufacture fiberglass-reinforced structures and flakeglass-reinforced coatings mortars for use in pulp and paper, caustic-chlorine, metal treatment and many other chemical industries. This family of resins has long been recognized as the industry standard.

FEATURES	BENEFITS
• Bisphenol-A fumarate polymer	• Resists degradation due to hydrolysis and other forms of chemical attack • Does not foam upon addition of MEKP initiators • Can be mixed using conventional (not hydrophobic) grades of fumed silica
• High crosslink density	• Resists deterioration and deformation in high-temperature environments • No need for expensive multi-veil corrosion barriers
• Pre-accelerated version available	• Provides all of the flexibility of a non-promoted resin without requiring addition of dimethylaniline
• Chemical components listed under FDA 177.2420 Title	• Items properly fabricated with DION® 382 series resins can be used for food, beverage and water storage
• Manufactured using statistical process control in ISO 9002- certified plants	• Consistent batch-to-batch performance

VERSIONS

• DION® 382-05	• Un-promoted	• DION® 382-05
• DION® 382-05A	• Pre-accelerated with DMA	• DION® 382-05A
• DION® 382-05AC	• Pre-promoted with cobalt and DMA	• DION® 382-05AC

PROPERTIES

PHYSICAL DATA IN LIQUID STATE AT 25°C / 77°F

Properties	Unit	Value	Test Method
Non-Volatiles, NV	%	50	18-001 / B070
Viscosity	Cps / mPa·s	475	18-021/ASTM D 2196-86
Specific gravity/Density	g/cm³	1.02	18-030/ISO 2811-2001
Flash point (Seta Closed Cup)	°C / °F	31.6 / 89	
DION® 382-05, DION® 382-05A Shelf life, minimum **	months	6	
DION® 382-05AC Shelf Life, minimum **	months	3	

** Minimum shelf life performance refers to product in the original, unopened container. Shelf life stability is affected by storage conditions.

TYPICAL MECHANICAL PROPERTIES

Properties at 25°C / 77°F	Unit	1/8" / 3.2 mm Clear Casting	Test Method
Hardness Barcol 934-1	-	38	ASTM D 2583-99
Specific Gravity		1.12	
Tensile Strength	psi	10000	ASTM D 638-02
Tensile Modulus, x10^6	psi	0.43	ASTM D 638-02
Tensile Elongation at break	%	2.5	ASTM D 638-02
Water absorption, 24 hours at 25 °C	% weight gain	0.24	ASTM D 570-98
Water absorption, 2 hours at 100 °C	% weight gain	0.66	ASTM D 570-98
Heat Distortion Temperature (HDT) @264 psi	°C / °F	132.2 / 270	ASTM D 648
Flexural Strength	psi	17000	ASTM D 790
Flexural Modulus, x10^6	psi	0.43	ASTM D 790

LAMINATE PERFORMANCE

Properties at 25°C / 77°F	Unit	1/8" / 3.2 mm Clear Casting	Test Method
Tensile Strength	psi	16000	ASTM D 638
Flexural Strength	psi	19000	ASTM D 790
Flexural Modulus, x10^6	psi	0.88	ASTM D 790

Laminate Construction: V/M/M/M/V; Glass Content: 30%; Thickness: 0.125 in.
(V=10-mil C-glass veil; M=1.5-oz chopped strand mat)

ELEVATED TEMPERATURE PERFORMANCE

Temp. (°F)	Flexural Strength (psi)	Flexural Modulus (x10^6, psi)	Tensile Strength (psi)	Tensile Modulus (x10^6, psi)
77	25,500	1.21	18,000	1.45
150	27,000	1.10	21,500	1.40
200	23,500	1.00	21,500	1.35
250	17,500	0.88	20,000	1.20

Laminate Construction: V/M/M/WR/M/WR/M/M Thickness: 0.25 in. Glass Content: 40%
(V = 10-mil C-glass veil, M = 1.5-oz/ft^2 chopped strand mat, WR = 24-oz/yd^2 woven roving)

CURE CONDITIONS – DION® 382-05

TEMP (°F)	GEL TIME (mins.)	DMA-100% (wt%)	CoNaph-6% (wt%)	MEKP (wt%)
40	10-15	0.2	0.6	1.2
	15-20	0.2	0.4	1.2
	35-40	0.1	0.4	1.2
	45-55	0.1	0.2	1.2
50	10-15	0.2	0.4	1.2
	25-30	0.1	0.4	1.2
	45-55	0.2	0.4	0.6

Use DION® 382-05A or DION® 382-05AC for temperatures above 60°F
If benzoyl peroxide is preferred, DMA and tert-butyl catechol-10% (TBC-10) must be added to the resin. The following table suggests additive levels to achieve the gel time at the temperature listed. Do not use less than 0.3% DMA or less than 3% BPO-50%.

TEMP (°F)	GEL TIME (mins.)	DMA-100% (wt%)	TBC-10 (wt%)	BPO-50% (wt%)
60	30-40	0.5	0.4	6.0
	50-60	0.4	0.5	6.0
75	30-40	0.4	0.5	6.0
	50-60	0.3	0.6	6.0
90	30-40	0.4	0.7	6.0
	50-60	0.3	0.8	6.0

CURE CONDITIONS – DION® 382-05A

DION® 382-05A is pre-accelerated and contains enough DMA for use in most situations. Add cobalt naphthenate (6%) and MEKP (9% active oxygen) according to the following table. At temperatures below 60°F, use DION® 382-05.

TEMP (°F)	GEL TIME (mins.)	DMA-100% (wt%)	CoNaph-6% (wt%)	MEKP (wt%)
60	25-35 45-50 60-70	0.1 0.1 0.1	1.0 1.0 0.8	2.4 1.8 1.2
70	30-40 45-55 60-70	none	1.0 1.0 0.8	1.8 1.2 1.2
80	25-35 45-55 60-70	none	1.0 0.8 0.6	1.2 1.2 1.2
90	15-20 40-50 55-65	none	1.0 0.8 0.6	1.2 1.2 1.2

If benzoyl peroxide is preferred, DMA and 10%-tert-butyl catechol (TBC-10) must be added to the resin. Do not use less than 3% 50%-BPO or less than 0.1% **additional** DMA.

TEMP (°F)	GEL TIME (mins.)	DMA-100% (wt%)	TBC-10 (wt%)	BPO-50% (wt%)
60	30-40 50-60	0.4 0.5	0.2 0.6	5.0 5.0
75	30-40 50-60	0.3 0.4	0.2 0.6	5.0 5.0
90	30-40	0.3	0.4	5.0

CURE CONDITIONS – DION® 382-05AC

DION® 382-05AC is fully promoted for the convenience of not having to promote on-site, except in cold weather. However, working time is less flexible than with DION® 382-05 or 382-05A.

TEMP (°F)	GEL TIME (mins.)	DMA-100% (wt%)	MEKP (wt%)
60	25-35 40-50	0.1 0.1	2.4 1.2
70	30-40	none	1.8

TOPCOATS

Even fully cured resin can retain a tacky surface. Surface cure may be improved by incorporating a paraffin wax into the resin used in the final ply. Alternatively, a wax-modified resin can be added as a topcoat once the laminate has hardened.

SUGGESTED TOPCOAT FORMULATION

DION® 382-05A, parts	100.0
10%-Paraffin Wax Solution, wt%	6.0
DMA-100%, wt%	0.3
Cobalt Naphthenate-6%, wt%	1.0
Tween 20 or 80	0.3
MEKP, wt%	1.7
Fumed Silica Thixotrope* (wt%)	1.5
Approximate Gel Time @ 25°C, mins.	15

*Use in sodium hypochlorite environments will result in decreased chemical resistance

STORAGE

This product is available as non-returnable 55-gallon metal drums (450 lb. net) or 40,000-44,000-lb. tank truck.

To ensure maximum stability and maintain optimum resin properties, resins should be stored in closed containers at temperatures below 75°F (25°C) and away from heat sources and sunlight. All storage areas and containers should conform to local fire and building codes. Drum stock should be stored away from all sources of flame or combustion. 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 or initiators, contact your sales representative or authorized Reichhold distributor.

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 prior to use. Material safety data sheets are available from your Reichhold sales representative. Such information should be requested from suppliers of any chemical and understood prior to working with the material.

DIRECTLY MIXING ANY ORGANIC PEROXIDE WITH A METAL SOAP, AMINE, OR OTHER POLYMERIZATION ACCELERATOR OR PROMOTER WILL RESULT IN VIOLENT DECOMPOSITION.

TECHNICAL SUPPORT

Reichhold's technical support staff has extensive practical experience with polyesters and manufacturing techniques. Please do not hesitate to request our assistance through your sales representative.

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