



TECHNICAL DATA SHEET

JOHN C. DOLPH COMPANY

320 New Road
P.O. Box 267
Monmouth Junction, NJ
08852

Ph:(732) 329-2333
Fax:(732) 329-1143
info@dolphs.com
www.dolphs.com

XL[®]-2102

SOLVENTLESS POLYESTER DIP AND VPI RESIN

PRODUCT DESCRIPTION

XL-2102 is one of a new class of high flash point, very low VOC, solventless polyester resins. It is especially recommended for dip and bake or VPI applications. Exceptionally stable, XL-2102 contains no conventional monomers or formaldehyde releasing compounds.

FEATURES & BENEFITS

- Contains no formaldehyde, styrene, vinyl toluene, t-butyl styrene, or diallyl phthalate (DAP)
- Very low weight loss on cure
- High flash-point: >200°F
- Extremely low odor
- Excellent wetting properties
- Low viscosity
- Easy processing, fast cure cycle
- Superior tank stability
- Excellent, tough film and good bond strength
- UL recognized

TYPICAL APPLICATIONS

- Rotors
- Stators
- Inductors
- Random wound coils
- Armatures
- Field Coils
- D.C. Traction coils
- Form wound coils
- Transformers

TYPICAL PROPERTIES

Physical

Color/Appearance	Clear/Amber
Weight per Gallon @ 77°F (25°C), ASTM D 1475, lbs/gal	8.8 – 9.2
Viscosity, Brookfield @ 77°F (25°C), ASTM D 2196, cps	350 – 650
Film Build, ASTM D 115, mils/side	0.5 – 0.7
Gel Time @ 257°F (125°C), ASTM D 3056, minutes	8 – 13
Flash Point, °F	>200
VOC Content, ASTM, D 6053, lbs/gal	0.20

Mechanical

Helical Coil Bond Strength, ASTM D 2519, lbs	@ 25°C @ 150°C	29 9
Twisted Coil Bond Strength, ASTM D 4882, lbs	@ 180°C	19

Electrical

Dielectric Strength, ASTM D 115, volts/mil	Dry Wet	3,250 2,890
Surface Resistivity, ASTM D 257, ohms		1.2×10^{14}
Volume Resistivity, ASTM D 257 ohm-cm		1.4×10^{14}

DIELECTRIC CONSTANT				
Temp. °C	25	50	100	150
100 Hz	4.64	4.99	5.17	6.18
1 kHz	4.13	4.79	5.07	5.27
10 kHz	4.15	4.87	4.89	5.05

DISSIPATION FACTOR				
Temp. °C	25	50	100	150
100 Hz	0.026	0.03	0.115	
1 kHz	0.008	0.028	0.054	0.098
10 kHz	0.012	0.016	0.057	0.034

Thermal Class (UL-1446)

Twisted Pair	Magnet Wire	Temp
	MW16	220
	MW35	180
	MW28	130

Refrigerant Extraction (NEMA RE-2)

R-134a	0.7%
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APPLICATION GUIDELINES

Following is a suggested dip and bake cycle.

1. Preheat parts to 250-325°F to remove moisture.

Note: If thermoset tapes are used, preset tapes according to tape manufacturer's recommendations.

2. Cool to 130°-140°F

3. Dip until bubbling stops (15-30 minutes).

4. Drain between 5-20 minutes

5. Bake in a preheated oven at recommended time and temperature

Suggested Bake Cycles*

1-2 hours @ 325°F

2-3 hours @ 300°F

* Times are taken after unit reaches baking temperature

Vacuum Pressure Impregnation (VPI)

The following cycle has been established as a starting point for using XL-2102 in VPI systems. Adjustments may be required to obtain desired results with your specific application. Please contact the JOHN C. DOLPH Company for more information about processing.

1. Preheat the unit to a temperature of 250° F - 325° F, cool 130° F to 150° F. The time required will depend on the size of the unit.
2. Place the unit in the vacuum chamber and apply dry vacuum at approximately 1-4 mm Hg for 30-60 minutes. For form wound coils use 20 minutes per half lap of tape.
3. Transfer the resin to the chamber still under vacuum. It is best to have the resin flow up around the unit from the bottom of the chamber. Allow the resin to cover the unit by a depth of at least 1 inch.
4. Maintain vacuum for 20-60 minutes. Larger units, and units with more tape layers will require a longer time under vacuum.
5. Release vacuum and apply pressure of 80 - 90 psi for 30-120 minutes.
6. For form wound coils, apply pressure for 15 minutes per half lap of tape. Release pressure.
7. Remove the unit slowly from the resin. A rate of 4 inches per minute is recommended.
8. Better drain will be obtained if the unit is suspended at an angle rather than level.
9. Bake at suggested bake cycles listed above

EQUIPMENT RECOMMENDATIONS AND PRECAUTIONS

XL-2102 may react with copper, copper alloys and natural rubber. Therefore, do not use these materials in the tank or recirculating system. Tanks should be constructed of black iron or stainless steel and flexible fittings should be made of synthetic rubber or plastic.

Bare copper conductor: When used with bare copper, a green discoloration may form. This is more likely to occur when the insulation system has a high moisture content. Windings that include bare copper require longer bake time and/or higher oven temperature. Please contact the DOLPH Company for information on adjusting resin application and cure cycles.

STORAGE AND SHELF LIFE

Shelf life is 12 months from date of shipment from our plant, when stored in closed containers at 70°F/21°C or below.

1. Store in cool, dry place at 70°F/21°C or below.
2. Protect from direct sunlight and sources of heat
3. Keep away from heat, sparks and open flame.

SAFETY AND ENVIRONMENT

Avoid contact with skin and eyes. See Material Safety Data Sheet

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