

**TECHNICAL DATA**

**DOLPHON® XL-2110**

**Low Emissions Polyester Impregnating Resin**



**DESCRIPTION**

The XL-Series is a new generation one-pack 100% reactive solventless polyester resins specifically designed to eliminate emissions of volatile organic compounds (VOC), which are regarded as atmospheric pollutants and significant health hazards, whilst retaining the properties of conventional Polyester resins.

XL-2110 is suitable for application via conventional dip, VPI, trickle or roll-through.

**ADVANTAGES**

- UL Certified – File OBOR2.E317427
- Included in UL Electrical Insulation Systems up to 220°C – File OBJS2.E317429
- Monomer free - contains no vinyl toluene, styrene or DAP
- Low odour, formaldehyde-free resin
- High flash point - low fire risk, lower insurance premiums
- Low viscosity for quick & complete penetration
- Fast curing cycles
- Good bond strength
- Very low weight loss on cure
- Suitable for all impregnation methods
- Not classed as hazardous for transport under ADR regulations

**APPLICATIONS**

- Transformers
- Generators
- Rotors & armatures
- Inductors
- Random wound coils
- Stators
- Traction coils

**PHYSICAL PROPERTIES**

Colour	Clear/Amber
Specific gravity @ 25°C	1140 ± 30g/L
Viscosity, ISO No.6 Cup @ 25°C	80 - 130 seconds
Viscosity, Brookfield @ 25°C	600 - 900 cPs
Flash-point (PMCC)	> 130°C
Gel-time @ 110°C	10 - 20 minutes
Weight loss on cure, 10g resin 1h @ 150°C	< 3.5%
Thermal conductivity	0.25 - 0.30W/mK
Shelf life @ 25°C in original closed containers	18 months
Pack sizes	25, 230 & 1,200Kg
RoHS & REACH SVHC compliant	Yes

**MECHANICAL PROPERTIES (IEC 61033)**

	Temperature	Newton's @ Break
Method B, Bond strength, Helical coil Test performed on MW35 magnet wire Coils double impregnated and baked 1h @ 150°C	25°C	> 130
	80°C	> 82
	155°C	> 45

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Statements, technical information and recommendations contained herein are based on tests we believe to be reliable but they are not to be construed in any manner as warranties expressed or implied. The user shall determine the suitability of the product for their intended use and the user assumes all risk and liability whatsoever in connection therewith.



**ELECTRICAL PROPERTIES**

Electric strength @ 25°C, dry (ASTM D-115)	100 - 120kV/mm
Volume resistivity (IEC 60464-2)	10 <sup>15</sup> ohms/cm
Volume resistivity after 7 days water immersion (IEC 60464-2)	10 <sup>12</sup> ohms/cm
Surface resistance (IEC 60464-2)	10 <sup>15</sup> ohms
Dielectric constant @ 25°C (ASTM D-150)	3.2
CTI (IEC 60112)	600 M

**THERMAL RATING (UL 1446)**

ANSI wire type	Twisted Pairs	Helical Coils
MW 35	200°C	/
UL Electrical Insulation System File OBJ52.E317429	220°C	

**CHEMICAL RESISTANCE**

Water absorption (ASTM D-570)	90 minutes @ 100°C	< 1.5%
	24 hours @ 25°C	< 1%
Resistance to solvent vapours (IEC 60664 pt2)	Xylene	Resistant
	Methanol	Resistant
	Hexane	Resistant
Resistance to chemicals, 7 days immersion (ISO 175)	Sulfuric acid 30%	< 2.5%
	Green gasoline	< 1.5%
	Transformer oil	< 0.5%
	Detergent solution	< 1.5%

**APPLICATION**

XL-2110 is suitable for application via dip at atmospheric pressure, under vacuum (VPI), or for trickle/roll-through.

**DIP IMPREGNATION**

1. Pre-heat unit to 50 - 60°C maximum.
2. Dip units for 30 - 60 minutes.
3. Drain for 1 hour minimum
4. Cure for either 2.5 hours @ 150°C, 2 hours @ 160°C or 75 minutes @ 170°C.

**ROLL-THROUGH**

1. Roll the rotor in the resin at room temperature.
2. Rapidly bring the rotor to 140°C to gel the resin by means of induction.
3. Cure for 30 minutes approximately @ 140 - 150°C.

**TRICKLE**

1. Pre-heat armatures or stators to 115 - 120°C (temperature measured on unit)
2. Trickle the resin onto the unit keeping in slow rotation.
3. Cure for 30 minutes approximately @ 150 - 160°C.

**VPI**

For vacuum pressure impregnation (VPI) or specific impregnation cycles, please consult us.

**NOTE:**

During the polymerisation cycle, the resin can cause a 'greening' effect on bare copper. Anti-Greening Additive 551/D can be added to the tank to prevent this effect.



**STORAGE & STABILITY**

Store drums in a cool place away from direct sunlight and sources of heat. Maximum storage temperature 30°C.

XL-2110 reacts with bare copper, copper alloys and natural rubber. It is therefore not advisable to use these materials in the construction of storage tanks and impregnation equipment.

XL-2110 is very sensitive to UV rays. When the resin is not in use, storage tanks must be covered and protected from sunlight. Exposure to sunlight, even for a few hours may cause partial gelling of the resin surface.

**HEALTH & SAFETY**

Before use, please refer to Material Safety Data Sheets (MSDS).