ELANTAS
Electrical Insulation

Product Information

Electrical Insulation System
Impregnating Varnish

Elmotherm® 073-1010

Universal high build, impregnation varnish with excellent flexibility and stability. Cure product is tough and resilient with good moisture and chemical resistance.

Product description

Elmotherm® 073-1010 is a solvent, specially modified isophthalic varnish, which has an excellent long-term tank stability.
The cured product gives a tough / resilient film with excellent chemical and moisture resistance.
Elmotherm® 073-1010 has a thermal class of 180°C (class `H`) and exhibits compatibility with most types of insulation products and systems (UL class systems are available containing this product) and is ideally suited for processing of transformers, especially where a clean drain characteristic and fast cure is required as well as the impregnation of small stators and coils where flexibility of connection leads has to be maintained.
It is designed for use in applications where high bond strength and good moisture and chemical resistance is required.
Polymerization is initiated by the effect of heat and proceeds as a rapid chain-reaction until a three-dimensionally cross linked, duroplastic cured material is produced.
The product fulfils the directive 2011/65/UE e 2002/95/CE (RoHS).
The raw materials of the product are pre-registered according to directive to CE 1907/2006 and s.m.i. (REACH).
The product does not contain polycyclic aromatic hydrocarbons and substances listed in the SVHC Candidate List.

Areas of application

Elmotherm® 073-1010 is used for windings of varnish and glass fabric-braided wires as well as stationary and rotary windings such as :

- Motors
- Stators
- Transformers
- General use

Properties of cured resin

The tough-hard material has very good mechanical and dielectric properties even under high temperatures. Windings impregnated with Elmotherm® 073-1010 show good bond strength. In addition, the cured material displays good resistance to the effects of liquid chemicals and their vapours.
It is suitable for use up to Class 180°C.

Storage and stability

Under appropriate storage conditions, protected from humidity and solar radiations can be stored in unopened container at 23 °C for 24 months.

Flow time (viscosity)

Elmotherm® 073-1010 is produced with a relative low viscosity: 135-155 sec measured with B4 cup at 21 °C.
The tank viscosity of Elmotherm® 073-1010 should be monitored regularly by reference to the “Viscosity Temperature” graph for this product which is available on request.
The recommended reducer is F 121 available from Elantas along with type B4 viscosity measuring cups. A tank sample testing service is available on request. The kind of processing, e.g. with higher ambient temperatures, leads to rising losses of solvent and increased flow time. In this case it will be necessary to adjust the flow time by addition of reducer.

Processing methods

Elmotherm® 073-1010 can be processed by all conventional impregnating methods, such as dipping or flooding. Processing under vacuum is basically possible, in this case the pressure should not drop below 25-30 mbar to avoid excessive evaporation of solvent and the ensuing negative effect on the penetration.
Elmotherm® 073-1010 displays slow susceptibility to influence of foreign substances, such a punching grease oil or primers.
However, pollution of the varnish should be avoided as much as possible to guarantee impeccable flow time and reliable drying.
After impregnation it follows the drainage that lasts from 15 to 45 minutes, then, starting from room temperature, the next step will be operation with supply of hot air (80-110 °C to let the solvent evaporate). The second step will be the curing; switching over the circulating air the real drying temperature and the indicated drying times will be effective. In order to calculate time and energy consumption it will be advantageous to have available in advance the heating curves for the objects that have to be impregnated. Generally the drying in two steps to remove solvents best is recommended in particular when big objects or similar with complex winding constructions have to be impregnated. As guide value the first step will be 2-4 hours at 120-150 °C. If a second impregnation will be carried out, this first step will be dispensable.
It is absolutely essential to stir up the varnish in the containers carefully every time before using.
It will be necessary to follow the instructions of the Material Safety Data Sheet (MSDS) of this product and reducer F 121.

Properties of varnish as supplied

Properties	Value	Unit
Shelf life at 23 °C	24	Months
Appearance/ Colour	Liquid/ brownish	
Density at 23°C, DIN 51757	0,94-0,97	g/cm^3
Content of binder (1g/1h/130°C), ISO 3251	48-50	%
Flow time at 21°C with B4 cup	135-155	sec
Flash point	29	°C

Curing condition

Temperature		120	130	140	150	160	°C
Curing Time				6-8	5-7	3-4	h

Mechanical properties in dried condition

Test criterion	Condition	Value	Unit
Bond strength, Elantas test following 61083 method (helical coil)	23 °C 155°C 180 °C	> 160 > 80 > 40	N
Mandrel test (3 mm) Elantas test following 60464-3	23 °C	170	°
Adhesion on steel UNI EN ISO 2409 Double application	40 µ	100	%

Temperature Index

Test criterion	Condition	Value
Proof voltage Elantas test following IEC 60172 (twisted pair)	1000 V	190
Bond strength, Elantas test Following IEC 60290 (helical coil)	20 N	205

Dielectric properties in dried condition

Test criterion	Condition	Value	Unit
Volume resistivity after water immersion Elantas test following IEC 60464 part 2	Initial value 7 d storing	$>10^{15}$ $>10^{15}$	Ω × cm
Volume resistivity at elevated temperature Elantas test following IEC 60464 part 2	155°C 180 °C	$>10^{11}$ $>10^{11}$	Ω × cm
Electrical strength, after water immersion Elantas test following IEC 60464 part 2	Initial value 24 h storing	>120	KV/mm
Electrical strength, at elevated temperature Elantas test following IEC 60464 part 2	155 °C 180 °C	> 80 -	KV/mm
Temperature at relative permittivity tang °= 0,1 Elantas test following IEC 60250	50 Hz 1 KHz 10 KHz	> 140 > 150 > 160	°C

Resistance to chemicals

Test criterion	Condition	Value	Unit
Resistance to vapour of solvents Elantas test following IEC 60464 part 2	Acetone Xylene Methanol Hexane Carbone disulphide	resistant resistant resistant resistant resistant	–
Water absorption Elantas test following IEC 62	at 23 °C 0,5 h at 100 °C	< 5 < 10	mg
Resistance to liquids after storing Elantas test following IEC 175	Ammonia solution 10 % Acetic acid 5 % Sodium hydroxide 1% Hydrochloiric acid 10 % Sulforic acid 30 % Iso-octane Toluol Transformer oil BeckFluid 9902 Solution of detergent	<5 <5 <5 <5 <5 <5 <5 <5 <5 <5	mg

Manufacturing site : ELANTAS Italia s.r.l. via San Martino 6, 15028 Quattordio (AL), Italy
www.elantas.com