ELANTAS
Electrical Insulation

Product Information

Electrical Insulation System
Impregnating Varnish

Elmotherm® 009-0008

Anti-tracking, air-drying varnish available in a range of different colors.
Good moisture resistance.

Product description

Elmotherm® 009-0008 is a single component, impregnating varnish based on an alkyd modified resin with long-term tank stability and a thermal rating of 180°C.
The product consists of a polymeric binder, the so-called solid content and a solvent mixture.
Reducer X2 will be available for the dilution of the varnish.
It is designed for use in applications where high bond strength and/or good moisture and chemical resistance are required.
Polymerization is initiated by the effect of heat and atmospheric oxygen 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 and 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

Preferred applications for Elmotherm® 009-0008 are:

- transformers
- stators
- printed circuits
- general use

Properties of cured resin

The tough-hard material displays very good mechanical and dielectric properties even under high temperatures. Windings impregnated with Elmotherm® 009-0008 show good bond strength.
In addition, the cured material displays good resistance to the effects of liquid chemicals and their vapours.
Owing to the high temperature index of 180°C (according to UL= Underwriters Laboratories USA) Elmotherm® 009-0008 can be used for machines in thermal class H (180°C).
UL registered the product under File E171184.

Flow time (viscosity)

Elmotherm® 009-0008 is produced with a relative low viscosity: 100-125 sec measured with B4 cup at 21°C.
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 X2.

Processing methods

Elmotherm® 009-0008 is using as a finishing varnish or as impregnating varnish. In the impregnating process it has to be carried out with a corresponding impregnating material.
The flow time of air-drying varnish in opened container will increase permanently due to the evaporation of solvent, film forming can occur additionally. Therefore the containers should be closed carefully after application, the flow time should be checked frequently and adapted with reducer X2 if required.
Like all solvent based products, Elmotherm® 009-0008 should be stirred up carefully before each application.
Elmotherm® 009-0008 can be applied by dipping, brushing, with flow time when delivered.
When it is used as spray, it is recommended to add 10-20% of reducer X2.
The drying of the varnish will be normally at room temperature, time can be shortened by support of heat, for instance with hot air at 70-90°C.
It will be necessary to follow instructions of Material Safety Data Sheet (MSDS) for varnish and reducer.

Storage and stability

Under appropriate storage conditions protects from humidity and solar radiation Elmotherm® 009-0008 and reducer X2 can be stored in unopened container at 23°C for 24 months.

Properties of varnish as supplied

Property	Value	Unit
Shelf life at 23 °C	24	months
Appearance/color	Liquid/brownish	
Density at 23°C, DIN 51757	940-960	g/l
Content of binder (1g/1h/130°C), ISO 3251	40-44	%
Flow time at 21°C B4 cup	100-125	sec

Drying condition

Surface	23 °C	80°C
Touch-dry	20 min	4 min
Non slip	2 h	1 h
Fully dried	24 h	2 h

Mechanical properties in dried condition

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

Dielectric properties in dried condition

Test criterion	Condition	Value	Unit
Volume resistivity after water immersion Elantas test following IEC 60464 part 2	Initial value 7d storing	$>10^{13}$ $>10^{12}$	$\Omega \times$ cm
Volume resistivity , at elevated temperature Elantas test following IEC 60464 part 2	155 °C	$>10^{11}$	$\Omega \times$ cm

Electrical strength, after water immersion Elantas test following IEC 60464 part 2	Initial value 24h storing	> 55 > 40	KV/mm
Electrical strength, at elevated temperature Elantas test following IEC 60464 part 2	155 °C 180 °C	> 30 > 35	KV/mm
Temperature at relative permittivity tang °= 0,1 Elantas test following IEC 60250	50 Hz 1 KHz 10 KHz	> 40 > 70 > 105	°C

Effect of water

Test criterion	Condition	Value	Unit
Water absorption Elantas test following IEC 62	at 23 °C 0,5 h at 100°C	< 15 < 20	mg mg
Salt spray resistance (UNI EN ISO 7253)	NaCl 5%	> 250	h

General properties

Code	009-0008	109-0008	VA 42	VA 63	VA 39	VA 643
Color	clear	golden	red	black	grey	white
Viscosity (cup B4 21°C, sec)	100-125	100-125	130-150	130-150	130-150	130-150
Spray viscosity application (F3, sec)	30-35	30-35	30-35	30-35	30-35	30-35
Solid content (1,5g/1h/135°C, %)	40-44	40-44	54-60	40-44	54-60	50-54
Curing time at 20°C	24 h	24 h	24 h	24 h	24 h	24 h
Curing time at 80°C	2 h	2 h	2 h	2 h	2 h	2 h
Resistance to tracking drops at 200 V (IEC 60424-2)	145	145	131	128	153	78

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