

Product Information

Electrical Insulation System

Coating varnish

Elmotherm[®] 009-0008

solvented, colourless, air-drying, UL-recognized, thermal class 180 (H)

Product description

Elmotherm[®] 009-0008 is a solvented, air-drying finishing varnish based on alkyd resin, with good dielectric and thermal properties. More easy is the use of a spray can, which is available for the additional following varnish versions:

- Elmotherm[®] VA 39 (grey)
- Elmotherm[®] VA 42 (red)
- Elmotherm[®] VA 63 (black)

(see separate product informations).

Varnish and thinner fulfil the directives 2011/65/EU, 2003/11/EC and 2006/121/EC. The raw materials of the product are pre-registered in Art. 57/Anex XIV 1907/2006/EC (REACH) from 9th of October 2008 (SVHC).

Areas of application

Elmotherm[®] 009-0008 can be applied for the protection of windings and components against the influence of humidity and chemicals, e.g in

- motors and generators
- transformers
- equipments in chemical industry
- electronic components

Excellent film forming and good adhesion lend to very good protection of metal surfaces, too.

Properties of dried material

The varnish shows very good dielectric and thermal properties in dried condition and can be used for thermal class 180 acc. DIN EN 60085 (former: H).

This product has been recognized by UL (Underwriters Laboratories, USA) under File-No. E 171184.

Flow time (viscosity)

The flow time of Elmotherm[®] 009-0008 should be measured with the ISO-cup (6 mm), the varnish is ready to use when delivered. If necessary, the product can be thinned by the addition of the thinner D 100, in particular when applied by spraying.

Processing methods

Elmotherm[®] 009-0008 should be used as a finishing varnish only. An impregnation of windings has to be carried out with an impregnating agent first, otherwise there will be a danger for the inclusion of solvents and following defects.

All air-drying finishing varnishes show rapid changes of the flow time due to the evaporation of solvents in opened containers and, in addition, skin forming can occur. Therefore it is necessary to close the containers clean and carefully and to check the flow time regularly, the flow time can be adjusted by the addition of thinner D 100.

The finishing varnish can be applied by dipping or brushing, when it should be used by spraying, it is recommended to add D 100 for a flow time of 30-35 s (23 °C). The application with a spray can is more easy, but the quality of the film forming by the spraying method can be reduced on complex components.

It is favourable to pre-heat the components up to 50-60°C because then the varnish will dry faster and a second layer can be applied after 10-20 minutes already.

Drying of the varnish will be normally at ambient temperature, time can be shortened by support of heat, for instance with hot air at 70-90°C.

Under appropriate storage conditions, protected from humidity and solar radiation, Elmotherm[®] 009-0008 and thinner D 100 can be stored in unopened containers at 23°C for 12 months.

It is necessary to follow the instructions of the Material Safety Data Sheet (MSDS) for varnish and thinner.

Properties of component as supplied

Property	Value	Unit
Shelf life at 23 °C	12	Months
Appearance	transparent, colourless	-
Content of binder (1,5 g, 2 h / 130 °C), Beck-test T 11 b following ISO 3251	40 ± 2	%
Flow time at 23 °C, Beck-test V 22 following ISO 2431	53 ± 3	s
Viscosity at 23 °C, Beck-test V 18 following DIN 53019	-	mPa·s
Density at 23 °C, Beck-test S 11 following ISO 2811-2	0,96 ± 0,02	g/cm ³

Drying conditions

Surface	23 °C	90 °C
dust-dry	30 min	
touch-dry	2-3 h	
fully dried	24 h	30 min

Mechanical properties in dried condition

Test criterion	Condition	Value	Unit
Mandrel test, Beck-test M 4 following IEC 60464 part 3	23 °C	180	Degree
Porosity, Beck-test M 18	5000 V	0	Pores

Temperature index

Test criterion	Limiting value	TI
Proof voltage, Beck-test M 15 following IEC 60172 (Twisted Pair)	1000 V	194

Dielectrical properties in dried condition

Test criterion	Condition	Value	Unit
Volume resistivity after water immersion, Beck-test M 5 following IEC 60464 part 2	Initial value	> 10 ¹³	Ω·cm
	7 d storing	> 10 ¹²	
Volume resistivity at elevated temperatures, Beck-test M 13 following IEC 60464 part 2	155 °C	-	Ω·cm
Electrical strength after water immersion, Beck-test M 6b following IEC 60464 part 2	Initial value	57	kV/mm
	24 h storing	42	
Electrical strength at elevated temperatures, Beck-test M 6a following IEC 60464 part 2	155 °C	30	kV/mm
Temperature at Relative permittivity tanδ=0,1 , Beck-test M 3b following IEC 60250	50 Hz, 1V	42	°C
	1 kHz, 1 V	72	
	10 kHz, 1V	108	
Comparative Tracking Index, Beck-test M 26 following IEC 60112	test solution B	-	CTI

Effect of liquid chemicals, including water

Test criterion	Condition	Result, Value	Unit
Resistance to vapour of solvents, Beck-test M 7 following IEC 60464 part 2	Acetone	-	-
	Xylene	-	-
	Methanol	-	-
	Hexane	-	-
	Carbon disulphide	-	-
Water absorption, Beck-test M 9 following ISO 62	24 h at 23 °C	12,4	mg
	0,5 h at 100 °C	17	
Effect of liquid chemicals after 7 d storing, Beck-test M 10 following ISO 175	Ammonia solution 10 %	40	mg
	Acetic acid 5 %	10	
	Sodium hydroxide 1 %	40	
	Hydrochloric acid 10 %	0,1	
	Sulfuric acid 30 %	17	
	Iso-octane	8	
	Toluol	-	
	Transformer oil, mineral	6,8	
	Solution of detergent	13	

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