

## **Product Information**

Electrical Insulation System

Coating varnish

# **Elmotherm<sup>®</sup> VA 42**

solvented, red, air-drying, UL recognized, thermal class H

## Product description

Elmotherm® VA 42 is a solvented, red pigmented, air-drying coating varnish, based on alkyd resin. This product shows excellent dielectrical and thermal properties.

There are different variations of this coating varnish available (see the specific product information):

- Elmotherm® 009-0008 (colourless)
- Elmotherm® VA 39 (grey)
- Elmotherm® VA 63 (black)

Coating varnish and thinner fulfil the directives 2011/65/EU, 2003/11/EC und 2006/121/EC. The raw materials of both products are pre-registered acc. to the directive No. 1907/2006/EC (REACH). The products do not contain by recipe substances listed in Art. 57/Anex XIV 1907/2006/EC from 9<sup>th</sup> of October 2008 (SVHC).

## Areas of application

Elmotherm® VA 42 is used for the protection of windings and components against moisture, chemical liquids and their vapours, e.g. for

- motors and generators
- transformers
- electrical equipments in the chemical industry
- electronic assemblies

The pigmentation of the coating varnish makes it possible to see the protective action. In addition, very good film forming and adhesion protects metallic surfaces.

## Properties of dried varnish

After drying the varnish film shows very good dielectric properties, especially excellent tracking resistance.

Due to the thermal properties this varnish can be used for machines and components of thermal class H (180°C).

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

## Flow time (Viscosity)

The flow time of Elmotherm® VA 42 should be measured with the ISO-cup (6 mm) at 23 °C. The varnish is ready to use when supplied. If necessary, the flow time can be reduced by the addition of the thinner D 100, in particular when a spray gun is used.

## Processing methods

Elmotherm® VA 42 should be used as a coating varnish only, but not for impregnation. The real impregnation should be carried out before with an impregnating varnish or resin. Otherwise there is the danger of enclosing solvents in the windings and following faults.

Before using the product it will be necessary to stir it up carefully because like all pigmented products it tends to a sedimentation of the pigments.

In all cases coating varnishes change their flow time by fast evaporation of solvent parts in open containers, a film on the surface can be formed. Therefore it is important to close the containers carefully, and it is recommended to control the flow time frequently.

The coating varnish can be applied by dipping or brushing with the original flow time when delivered.

When using the spray gun it is recommended to add the thinner D 100, getting a flow time of 30 to 35 s (23°C). It is advantageous to pre-heat the objects up to 50-60 °C, then the varnish will dry faster and a second layer can be applied after 10-20 minutes.

The varnish should dry normally at room temperature, the drying time can be reduced by the addition of heat, for instance with hot air at 80-100 °C.

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

### Properties of component as supplied

Property	Value	Unit
Shelf life at 23 °C	12	Months
Appearance	red	-
Content of binder (1,5 g, 2 h / 130 °C), Beck-test T 11 b following ISO 3251	52 ± 2	%
Flow time at 23 °C, Beck-test V 22 following ISO 2431	56 ± 2	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	-	g/cm <sup>3</sup>

### 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	-
Bond strength, Beck-test M 16 following IEC 61033, method B (Helical Coil)	22 N	-

### 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 <sup>13</sup>	Ω·cm
	7 d storing	10 <sup>12</sup>	
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	

### 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	-	-
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 %	-	
	Hydrochloric acid 10 %	0,1	
	Sulforic acid 30 %	17	
	Iso-octane	8	
	Toluol	-	
	Transformer oil, mineral	6,8	
	Solution of detergent	13	

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