

## Product Information

Electrical Insulation System  
Impregnating Varnish

# Elmotherm<sup>®</sup> F93 A + B

2 components, solvent based varnish.  
High chemical resistance, thermal class H.

## Product description

Elmotherm® F93 A+B is a 2 components coating varnish based on modified polyester-imide resin, which cures at ambient temperature by isocyanate groups.

The very low flow time of this varnish does not require thinning, but in individual cases, Verduennung® 217 should be necessary.

This product can be delivered as a pigmented version (see: F93 A+B OXYDROT) too.

It is distinguished by rapid curing at room temperature. Elmotherm® F93 A+B is especially suitable when high temperature resistance and effective protection against chemical are required.

Polymerization is initiated by the effect of isocyanate groups 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

Elmotherm® F93 A+B is preferably used for protecting the following components:

- lift motors
- transformers
- generators
- drive in chemical industry
- general use

## Properties of cured resin

The tough-hard varnish film is distinguished by a very high resistance to moisture, weak acid, benzenes and hydraulic oils. Furthermore, the varnished parts display very good dielectric behaviour and particularly high dielectric strength. A temperature index of 180 enables the varnish to be used for machines and appliances in thermal class H (180°C).

## Flow time (viscosity)

The flow time of Elmotherm® F93 A+B is measured with ISO cup (4mm) acc. ISO 2431. The values are indicated in the table at page 3.

After mixing the components, during the 30 minutes for pre-reaction their flow time is 25-35 sec at 23°C.

## Processing methods

Elmotherm® F93 A+B has to be used as a coating varnish only, not for the impregnation of units. This has to be carried out with an impregnating agent before.

First both components should be mixed in the indicated ratio of 1:1 (A+B) parts by weight.

The mixture needs a pre-reaction time of 30 minutes before application and then can be used by dipping or brushing within max 6 hours.

It is also possible to apply this varnish by spraying but the protective action can be incomplete due to so called spray shadows, then some parts of the object will not be coated.

The time for application by spraying method is limited to 2 hours, because the flow time is increasing slowly, but permanently after mixing.

Coating varnishes with such composition show change of flow time due to the rapid evaporation of solvents from opened containers and a film on the surface can be caused. Therefore it is recommended to close the containers cleaned and carefully after using the varnish. The flow time should be controlled, the moment when it is rising up clearly is a sign of progress in reaction and shows the limit of application.

During storage and processing the temperature should not exceed 25°C, protected from solar radiations. The size of containers should be adapted to the real consumption. The content of started containers has to be processed quickly.

It will be necessary to follow the instructions of Material Safety Data Sheets (MSDS) for both components.

## Storage and stability

Elmotherm® F93 A can be stored in unopened container at 23°C for 18 months; Elmotherm® F93 B can be stored in unopened container at 23°C for 12 months.

### Properties of varnish as supplied

Property	Value	Unit
Shelf life at 23°C	Comp A : 18 Comp B : 12	months
Appearance/color	Comp A : yellowish, clear Comp B : brownish, clear	- -
Density at 23°C, DIN 51757	Comp A : 1,02-1,04 Comp B : 1,03-1,05	g/cm <sup>3</sup>
Content of binder (2g/2h/130°C), ISO 3251	Comp A : 37-39 Comp B : 37-39	%
Flow time at 23°C ISO 4 cup, ISO2431	Comp A : 35-45 Comp B : 14-24	sec

### Curing condition

Surface	23°C	100°C
Touch-dry	50-60 min	3-5 min
Dust-dry	2-3 h	0,5-1 h
Cured	24-26 h	1-2 h

### Mechanical properties in dried condition

Test criterion	Condition	Value	Unit
Bond strength, Elantas test following IEC 61083 (helical coil)	23°C	> 80	N
	155°C	-	
	180°C	-	
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	%

### Temperature Index

Test criterion	Condition	Value
Proof voltage Elantas test following IEC 60172 (twisted pair)	1000 V	-

