

## **Product Information**

Electrical Insulation System

Trickle resin

# **Dobeckan<sup>®</sup> FT 1040/120 A + B**

2 components, high reactivity, tough-hard material, UL-recognized

## Product description

Dobeckan® FT 1040/120 A + B designates an universally usable trickle resin system consisting of two components.

The component A contains a peroxide hardener, component B a cobalt accelerator to shorten curing times.

An unsaturated polyester-imide is used as the base resin. Such base resins are frequently solid or highly viscous and therefore dissolved in reactive thinners. In this case styrene, which reacts in the resultant cured material owing to its reactive double linkage, is used as the reactive thinner.

Polymerization is initiated by mixing the two components and the application of heat and occurs as a rapid chain-reaction until a cured three-dimensionally cross-linked, duroplastic material has been produced.

The product fulfils the directives 2011/65/EU, 2003/11/EC and 2006/121/EC. The raw materials of the product are pre-registered acc. to the directive No. 1907/2006/EC (REACH). The components 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

Dobeckan® FT 1040/120 A + B is preferably used in the electrical engineering for the impregnation of windings in

- universal household machines
- standard motors
- magnet wheels

## Properties of cured resin

The cured resin is a tough-hard material with very good mechanical and dielectric properties.

Dobeckan® FT 1040/120 A + B gives the necessary strength to the windings and offers a very good long-term thermal capacity. In addition, the cured material displays very high resistance to the effect of liquid chemicals and their vapours.

Owing to the high temperature index of 180-220 according to UL (Underwriters Laboratories, USA), Dobeckan® FT 1040/120 A + B can be used for thermal class 180 acc. DIN EN 60085 (former: H). The product has been registered by UL under file no. E 73 288.

## Processing methods

First both components will be mixed thoroughly, a slight divergence from the 1:1 mix ratio (<3 %) gives no effect on the properties of the resin compound or the cured material.

Dobeckan® FT 1040/120 A + B can be processed in all conventional trickling plants, but also by dipping or dip-rolling.

According to the principle of trickle impregnation, the objects will be heated up between 80 and 120 °C to attain short cycle times. The resin compound is then applied in a thin stream to the rotating preheated winding, adopts the temperature of the winding and becomes lower in viscosity. Under these conditions the resin compound is distributed uniformly throughout the winding as a result of rotation and capillary forces. The low viscosity leads to an excellent impregnation.

In the case of using Dobeckan® FT 1040/120 A + B for dipping or dip-rolling, the quantity and the consumption of the resin compound have to be considered due to the short pot life of the compound.

Since the resin compound is a highly reactive system, the temperature in the mixing container of the impregnating plant should not exceed 25 °C. The components and the resin compound have to be kept out of direct sunlight during storage and processing.

Curing of the resin compound should be carried out with current heating or with a convection oven. The indicated curing times are valid after the objects reach the cure temperature.

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

### Properties of component as supplied

Property	Value	Unit
Shelf life of components at 23 °C	6	Months
Appearance of component A	yellowish, transparent	-
Appearance of component B	brownish, transparent	-
Flow time of components at 23 °C, Beck-test V 22 following ISO 2431	-	s
Viscosity of components at 23 °C, Beck test V 18 following DIN 53019	125 ± 10	mPa·s
Density of components at 23 °C, Beck test S 11 following ISO 2811-2	1,07 ± 0,02	g/cm <sup>3</sup>

### Mixing ratio and pot life

Test criterion	Value	Unit
Mixing ratio comp. A : comp. B	100:100	Parts by weight
Pot life of the mixture at 23 °C	12 (40 °C: 36 h)	Days

### Geltime and curing conditions

Temperature	100	120	130	140	150	160	°C
Geltime, Beck-test H17B-1	6 ± 2						min
Curing time			30	15			min

### Mechanical properties in cured condition

Test criterion	Condition	Value	Unit
Condition in thick layer, Beck-test M1 following IEC 60464 part 2	Upper side	S 1	-
	Under side	U 1	
	Interior	I 2.1	
Bond strength, Beck-test M 2 following IEC 61033, method A (Twisted Coil)	23 °C	> 150	N
	155 °C	> 70	
	180 °C	> 50	

### Temperature index

Test criterion	Limiting value	TI
Proof voltage, Beck-test M 15 following IEC 60172 (Twisted Pair)	1000 V	193
Bond strength, Beck-test M 16 following IEC 60290 (Helical Coil)	22 N	221

### Dielectrical properties in cured condition

Test criterion	Condition	Value	Unit
Volume resistivity after water immersion, Beck-test M 5 following IEC 60464 part 2	Initial value	> 10 <sup>16</sup>	Ω·cm
	7 d storing	> 10 <sup>15</sup>	
Volume resistivity at elevated temperatures, Beck-test M 13 following IEC 60464 part 2	155 °C	> 10 <sup>10</sup>	Ω·cm
	180 °C	-	
Electrical strength after water immersion, Beck-test M 6b following IEC 60464 part 2	Initial value	> 115	kV/mm
	24 h storing	-	
Electrical strength at elevated temperatures, Beck-test M 6a following IEC 60464 part 2	155 °C	> 95	kV/mm
	180 °C	-	
Temperature at relative permittivity tanδ=0,1 Beck-test M 3b following IEC 60250	50 Hz, 1 V	> 100	°C
	1 kHz, 1 V	> 155	
	10 kHz, 1 V	> 155	

### 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	resistant	-
	Xylene	resistant	
	Methanol	resistant	
	Hexane	resistant	
	Carbon disulphide	resistant	
Water absorption, Beck-test M 9 following ISO 62	24 h at 23 °C	< 10	mg
	0,5 h at 100 °C	< 20	
Effect of liquid chemicals after 7 d storing, Beck-test M 10 following ISO 175	Ammonia solution 10 %	< 40	mg
	Acetic acid 5 %	< 15	
	Sodium hydroxide 1 %	-	
	Hydrochloric acid 10 %	< 10	
	Sulfuric acid 30 %	< 50	
	Iso-octane	< 5	
	Toluol	< 50	
	Transformer oil, mineral	< 10	
	BecFluid® 9902	-	
	Solution of detergent	< 20	

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