

## **Product Information**

Electrical insulation system  
Impregnating resin

### **Dobeckan® FN 3400 LV**

Single component DAP polyester resin, low VOC, low intrinsic viscosity, small drain losses, thermal class H.

## Product description

Dobeckan® FN 3400 LV is a single component impregnating resin, with low viscosity, showing high filling content on the windings and small drain losses.

As base resin is used an unsaturated polyester which is distinguished by very long term thermal capacity in the cured state. Since base resins are frequently solid or highly viscous they are therefore dissolved in the reactive thinners. In this case as reactive thinner it is used a DAP monomer, which reacts in the resultant cured material owing to its reactive double linkage.

Polymerization is initiated by the effect of heat and proceeds as a rapid chain-reaction until a three-dimensionally cross linked, duroplastic cured material is produced.

The raw materials of the product are pre-registered according to directive N°1907/2006/EC. The product does not contain by recipe substances listed in art.57/Anex XIV 1907/2006/EC from 9 October 2008 (SVCH).

## Areas of application

The best application for Dobeckan® FN 3400 LV is the impregnation of small/medium and big motor up to sizes 180-190, in particular with reciprocating operation.

## Properties of cured resin

The tough-hard material displays very good mechanical and dielectric properties even under high temperatures. Windings impregnated with Dobeckan® FN 3400 LV show good bond strength. In addition, the cured material displays good resistance to the effect of liquid chemicals and their vapours.

Owing to the high temperature index of 180 °C (acc.UL=Underwriters Laboratories USA ) Dobeckan® FN 3400 LV can be used for machines in thermal class H ( 180 °C ).

## Flow time (viscosity) / Gel time

Dobeckan® FN 3400 LV is produced with a flow time of 70-100 sec. measured with cup Ford 4 at 25 °C (ø 4-mm-cup acc. ISO 2431).

A regular circulation of the resin compound is recommended to get best results with reference to the filling content of the windings .

Gel time will be 50-90 minutes ( 100°C ) when the resin compound is produced. During storage and processing this value drops down according to time and temperature.

A gel time > 20 minutes will not be a problem for the stability of the resin compound and for the results of the impregnation, a lower value needs the stabilizer addition.

## Processing methods

Dobeckan® FN 3400 LV can be processed in all conventional impregnating plants used for electrical motors and transformers by dipping and dip-rolling.

It is possible to process it under vacuum, improving the impregnating results in compact windings and heavily bandaged components. It is recommended to fall not under 20mbar during the process. Losses of acrylic monomer should be replaced regularly to ensure an uniform flow time.

With a consumption of 10% per week and the addition of fresh material, Dobeckan® FN 3400 LV can be processed practically unlimited. Since the resin compound is highly reactive system, the temperature during the storage and processing should not exceed 25°.

In front of longer breaks, e.g. company holidays, the resin compound in the tank and storage container should be cooled down to 10-20 °C.

During storage and processing the resin compound should be protected from solar radiations.

Curing of the resin compound should be carried out with a convention oven. The indicated curing times are valid after reaching the temperature of the objects.

It will be necessary to follow the instructions of the Material Safety Data Sheet ( MSDS ) of this product.

### Properties of varnish as supplied

Property	Value	unit
Shelf life at 23 °C	12	Months
Appearance/ Colour	Liquid/ yellowish	
Density at 23°C, DIN 51757	1110-1150	g/cm <sup>3</sup>
Content of binder (1,5 g, 1h/150°C), IEC 464-2	100	%
Flow time at 25°C ISO 2431, 4 mm cup( Ford Cup 4)	70-100	sec
Flash point	160	°C

### Curing condition

Temperature	100	110	120	130	140	150	°C
Gel time Deatech test initial value when product	50-90						min
Curing Time			12	8	6	4	h

### Mechanical properties in dried condition

Test criterion	Condition	Value	Unit
Condition in thick layer, following IEC 60464 part2	Upper side Under side interior	S1 U1 I 1,2	
Bond strength, Deatech test following 61083 method ( twisted coil)	23 °C 155°C 180 °C	>180 >110 >60	N

### Temperature Index

Test criterion	Value	Unit
Proof voltage Deatech test following IEC 60172 (twisted pair)	1000 V	188C
Bond strength, Deatech test Following IEC 60290 (helical coil)	20-22 N	199 C

### Dielectric properties in dried condition

Test criterion	Condition	Value	Unit
Volume resistivity after water immersion Deatech test following IEC 60464 part 2	Initial value 7 d storing	>10 <sup>15</sup> >10 <sup>15</sup>	Ω × cm -
Volume resistivity at elevated temperature Deatech test following IEC 60464 part 2	155°C 180°C	>10 <sup>11</sup> -	Ω × cm -
Electrical strength, after water immersion Deatech test following IEC 60464 part 2	Initial value 24 h storing	>120 >140	KV/mm
Electrical strength, at elevated temperature Deatech test following IEC 60464 part 2	155 °C 180 °C	>100 -	KV/mm
Temperature at relative permittivity $\tan \delta \approx 0,1$ Deatech test following IEC 60250	50 Hz 1 KHz 10 KHz	>100 >155 >155	°C

### Resistance to chemicals

Test criterion	Condition	Value	Unit
Resistance to vapour of solvents Deatech test following IEC 60464 part 2	Acetone Xylene Methanol Hexane Carbone disulphide	resistant resistant resistant resistant resistant	-
Water absorption Deatech test following IEC 62	at 23 °C 0,5 h at 100 °C	< 5 < 10	mg
Resistance to liquids after storing Deatech test following IEC 175	Ammonia solution 10 % Acetic acid 5 % Sodium hydroxide 1% Hydrochloric acid 10 % Sulfuric acid 30 % Iso-octane Toluol Transformer oil BeckFluid 9902 Solution of detergent	< 10 < 5 < 10 < 5 < 5 < 5 < 5 < 5 - < 50	mg

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