SynFlex Elektro GmbH
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Voltatex® 4100 1-component-resin

Voltatex® 4100 is a clear, ready-to-use impregnating resin, thermosetting, yellow-brown glazing, styrene-free 1K dip resin based on unsaturated polyesterimide resins.

Attributes

- single component
- very high capillary activity
- low evaporation losses while processing
- high resin retention in the object
- low draining losses in the oven
- high efficiency due to favourable curing conditionsand
- excellent impregnating results

The cured resin compound is characterized by:

- good resistance against solvent gases and against long term thermal stress
- high bond strength
- low tendency to crack
- tough-elastic compound

Application

- electric motors
- transformers
- suitable for: Insulation systems of thermal class 180 (H)

Standards

Suitable for: Insulating systems up to thermal class H acc. to IEC 60085

- Temperature index according to IEC 60455-3-5: Type 180
- UL file no.: E 101752 (M) Underwriters Laboratories Inc, USA.
- UL approved with enamelled Cu wire:

Twisted Pair	ASTM D2307	MW 30:200
		MW 35:180
Helical Coil	ASTM D2519	MW 30:200

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Electro insulating systems according to UL 1446 (IEC 61858)

Class 130	C190HE
	R150HE
	Z130HE
	Z150HE
Class 155	C290HE
	CZ255HE
	R201HE
	R203HE
	Z200HE

Delivery forms

Voltatex® 4100 is supplied in one-way-cans containing 25 kg.

Storage

In closed original cans the resin can be stored for more than 4 months if provided storage temperature does not exceed 25 °C. Opened containers have to be closed imme diately to protect the material from daylight!

Hardening

In order to minimize evaporation of reactive components while curing the impregnated objects should be heated up to the curing temperature in the shortest possible time. The air flow in the curing oven should be kept to the minimum permitted by safety considerations.

Curing time at 130 °C - 2h

Protection

Cured Voltatex® 4100 is biologically inactive and not dangerous to health. When processing the liquid resin please refer to the Material Safety Data Sheet (MSDS) for Voltatex® 4100.

Processing

The impregnating resin can be applied by using

- all kind of conventional dip & bake equipment
- continuous and vacuum dip processes
- VPI process

Unlimited tank stability can be achieved as long as Voltatex® 4100 is kept below 25 °C and at least 30 % of the tank content is used and replaced
with fresh resin per month.

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Cleaning

Once cured Voltatex® 4100 is almost insoluble. Therefore, application equipment should be cleaned regularly with cleaner Voltatex® T050.

All equipment cleaning and maintenance should be carried out in accordance with the equipment manufacturer's instructions.

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Mechanical	Unit of measure	Conditions	Values	Test method
Bond strength of twisted pairs 25 °C	N		120 ± 10	IEC 60455-2, test method A acc. IEC 61033
Bond strength of twisted coils 130 °C	N		28 ± 5	IEC 60455-2, test method A acc. IEC 61033
Bond strength of twisted coils 155 °C	N		27 ± 4	IEC 60455-2, test method A acc. IEC 61033
Bond strength of twisted coils 180 °C	N		26 ± 4	IEC 60455-2, test method A acc. IEC 61033
Shore-D-hardness		25°C	60 ± 5	IEC 60455-2, test method acc. ISO 868
Bond strength IEC 60317-13	°C	MW 35	209	IEC 61033, method B, final point 22 N

Thermal	Unit of measure	Conditions	Values	Test method
Temperature index	°C		180	IEC 60455-3-5, test method acc. IEC 60216
Testing voltage IEC 60317-8	°C	MW 30	207	IEC 60172
Testing voltage IEC 60317-13	°C	MW 35	196	IEC 60172

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Glass transition temperature	°C	approx. 10-60		
Thermal conductivity	W(m*k)^-1		0.17	acc. DIN 51046

Chemical	Unit of measure	Conditions	Values	Test method
Resistance		transformer oil	resistant	IEC 60455-2, test method acc. ISO 175
Water absorption	%	after 96h at 23 °C	0.6-0.8	IEC 60455-2, test method 1 acc. ISO 62
VOC acc. 31. BImSchV	%		34.9	2010/75/EU

Electrical	Unit of measure	Conditions	Typ. values	Test method
Dielectric strength at 23 °C and 50 % r.h.	kV/mm		66	IEC 60455-2, test method acc. IEC 60243-1
Dielectric strength at 155 °C	kV/mm		70	IEC 60455-2, test method acc. IEC 60243-1
Dielectric strength at 23 °C after 96 h storage at 92 % r.h.	kV/mm		65	IEC 60455-2, test method ac. IEC 60243-1

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Electrical	Unit of measure	Conditions	Typ. values	Test method
Dielectric strength at 105 °C after 168 h oil immersion	kV/mm		94	IEC 60455-2, test method acc. IEC 60243-1
Specific volume resistance at 155 °C	Ω*cm		10^9 - 10^11	acc. IEC 60455-2, test method acc. IEC 60093
Creep resistance			CTI 600 M	acc. IEC 60455-2, test method acc. 6.2 IEC 60112
Loss factor cross section 0.2=200x10^-3	°C		110-150	IEC 60455-2, test method acc. IEC 60250

Liquid phase	Unit of measure	Conditions	Values	Test method
Viscosity	mPas	at 25 °C	250 ± 30	acc. DIN 53019
Flow time	s	at 23 °C	65 ± 8	acc. DIN 53211
Reaction process gel time	min	at 100 °C	6.0-12.0	acc. company standard Energy Solutions-014
Reaction process reaction time	min	at 100 °C	14.0-24.0	acc. company standard Energy Solutions-014

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