SynFlex Elektro GmbH
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Voltatex ® 4130 1-component-resin

Voltatex® 4130 is a cloudy, yellow-brown, vinyl toluene based, styrene-free single-component impregnating resin that is ready to use, 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

The cured resin compound is characterized by:

- high thermal endurance
- excellent bond strength
- high thermal and mechanical stability, especially under extreme long term stress
- tough and hard resin compound

Application

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

Standards

- UL-File-Nr.: E 101752 (M) Underwriters Laboritories Inc., USA
- Isolation-system temperature of thermal class 180 (H) acc. to IEC 60085:2007
- Temperature Index in acc. with IEC 60455-3-5, Type 180, Testing Method in acc. with IEC 60216
- Temperature class acc. to UL 1446:

Twisted Pair ASTM D2307 MW 30:200

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		MW 35:180
Helical Coil	ASTM D2519	MW 30:200

Insulation-system acc. to UL 1446 (IEC 61858):

Class 130	C190HE
	R150HE
	Z130HE
	Z150HE
Class 155	C290HE
	CZ255HE
	R201HE
	R203HE
	Z200HE
Class 180	R342HE

Delivery forms

Voltatex® 4130 is supplied in one-way-cans containing 25 kg.

Storage

In closed original cans the resin can be stored for 6 months if provided storage temperature does not exceed 25 °C.

Hardening

In order to minimize evaporation of reactive components while curing the impregnated objects should be heated up to the curing temperaturein 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: 3h

at 150 °C: 1h

Protection

Cured Voltatex® 4130 is biologically inactive and not dangerous to health. When processing the liquid resin please refer to the Material Safety Data Sheet (MSDS) for Voltatex® 4130 and the regulations of your local authority.

Processing

The impregnating resin can be applied by using

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

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- VPI process

Unlimited tank stability can be achieved as long as Voltatex® 4130 is kept below 25 °C and at least 30 % of the tank content is used and
replaced with fresh resin per month. For optimum process viscosity it is possible to add Voltatex® T032.

Cleaning

Once cured Voltatex® 4130 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 coils	N	Room temperature	230 ± 20	IEC 60455-2, test method A acc. IEC 61033
Bond strength of twisted coils 130 °C	N	130 °C	33 ± 8	IEC 60455-2, test method A acc. IEC 61033
Bond strength of twisted coils 155 °C	N	155 °C	30 ± 5	IEC 60455-2, test method A acc. IEC 61033
Bond strength of twisted coils 180 °C	N	180 °C	30 ± 5	IEC 60455-2, test method A acc. IEC 61033
Shore-D-hardness		room temperature	50 ± 5	acc. IEC 60455-2, ISO 868

Thermal	Unit of measure	Conditions	Values	Test method
Temperature index	°C	IEC 60455-3-5	180	acc. IEC 60216
Testing voltage IEC 60317-13	°C	MW 35	196	IEC 60172
Testing voltage IEC 60317-8	°C	MW 30	209	IEC 60172
Bond strength IEC 60317-13	°C	IEC 61033 / MW 35	214	method B, final point 22 N

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Thermal	Unit of measure	Conditions	Values	Test method
Thermal conductivity	W(m*k)^-1		0.17	acc. DIN 501046

Chemical	Unit of measure	Conditions	Values	Test method
Resistance		Hexane	resistant	Energy Solutions, Voltatex® 019
Resistance		Transformer oil, distilled water, 5 % soap-flock-dilution	resistant	acc. Axalta company standard
VOC acc. 31. BImSchV	%		39.9	2010/75/EU

Electrical	Unit of measure	Conditions	Values	Test method
Dielectric strength at 23 °C and 50 % r.h.	kV/mm	typ. value	74	IEC 60455-2 test method acc. IEC 60243-1
Dielectric strength at 155 °C	kV/mm	typ. value	72	IEC 60455-2, test method acc. IEC 60243-1
Dielectric strength at 23 °C after 96 h storage at 92 % r.h.	kV/mm	typ. value	90	IEC 60455-2 test method acc. IEC 60243-1

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Electrical	Unit of measure	Conditions	Values	Test method
Dielectric strength at 105 °C after 168 h oil immersion	kV/mm	typ. value	130	IEC 60455-2 test method acc. IEC 60243-1
Specific volume resistance at 155 °C	Ω*cm	typ. value	5x10^10	IEC 60455-2 test method acc. IEC 60093
Specific volume resistance at 180 °C	Ω*cm	typ. value	1x10^10	IEC 60455-2 test method acc. IEC 60093
Specific volume resistance after 7 d water immersion	Ω*cm	typ. value	8x10^15	IEC 60455-2 test method acc. IEC 60093
Creep resistance		typ. value	CTI 600 M	IEC 60455-2, test method acc. IEC 60234-1
Dielectric constant at 23 °C between 50 Hz and 1 MHz			3.4 ± 0.5	IEC 60455-2 test method acc. IEC 60250
Loss factor at 155 °C and 50 Hz			100x10^-3 - 300x10^-3	IEC 60455-2 test method acc. IEC 60250
Loss factor cross section 0.2=200x10^-3	°C		145-170	IEC 60455-2 test method acc. IEC 60250

Liquid phase	Unit of measure	Conditions	Values	Test method
Flow time	s	23 °C	75 ± 10	acc. DIN 53211

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Liquid phase	Unit of measure	Conditions	Values	Test method
Reaction process gel time	min	100 °C	7.7	company standard Energy Solutions-014
Reaction process reaction time	min	100 °C	12.9	company standard Energy Solutions-014
Viscosity	mPas	25°C	265 ± 30	acc. DIN 53019
VOC acc. 31. BLmSchV		Mass	approx. 5.2 %	DIN EN 60455-3-5:2006

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