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Voltatex ® 4020 1-component resin

Voltatex® 4020 is a styrene based, thermosetting, ready-to-use, blue-grey pigmented one pack ready-to-use imprgnating resin with high capillary activity, based on unsaturated polyesterimide resins.

Attributes

- single component
- coverage of rust
- improved protection against climate influences
- high efficiency due to favourable curing conditions
- excellent impregnating result at low material consumption

The cured resin compound is characterized by:

- good resistance against solvent gases
- thermal long therm stress

Application

Suitable for:

- Insulation systems of thermal class 200 (N)

Impregnating of:

- transformers
- stabilisers

Standards

- UL-File-Nr.: E 101752 (M) Underwriters Laboritories Inc., USA
- Isolation-system temperature of thermal class 200 (N) acc. to IEC 60085:2007
- Temperature index in acc. with IEC 60455-3-5, Type 200
- Testing Method in acc. with IEC 60216
- **T**emperature class acc. to UL 1446:

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

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

Class 130	C190HE
	R150HE

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Updated 06/24

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	Z130HE
	Z150HE
Class 155	C290HE
	CZ255HE
	R201HE
	R203HE
	Z200HE
Class 180	R342HE

Delivery forms

Voltatex® 4020 is delivered in 20 kg one-way-cans.

Storage

The resin can be stored for up to 3 months at max. 25 °C if sealed correctly in original containers. Opened containers have to be resealed and protected against direct 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 curung oven should be kept to the minimum permitted by safety considertions.

Curing times: at 150 °C: 2-3 h

Protection

Voltatex® 4020 is biologically inactive and safe to health. Implement normal protective measures when processing the liquid dip resin: See the Material safety data sheet (MSDS).

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® 4020 is kept below 25 °C and at least 10 % of the tank content is used and replaced with fresh resin per month. Cooling of the resin is needed provided the ambient temperature is exceeding the recommended maximum temperature. In order to avoid sedimentation of pigments Voltatex® 4020 need to be stirred up in the delivered packaging prior to filling into the tank. Additionally, to keep the material homogneously while processing, a continouos or repetitive stirring schedule has to be set up. It is highly recommended to install a motor-powered stirring unit in the storage tank. For optimum process viscosity it is possible

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to add Voltatex® T031.

Cleaning

Once cured Voltatex® 4020 is almost insoluble. Threfore, application equipment should be cleaned regularly with cleaner
Voltatex® T050. All equipment cleaning and maintenance should be carried out in accordance with the equipment manufacuter's instructions.

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Mechanical	Unit of measure	Conditions	Values	Test Method
Bond strength of twisted coils	N	room temperature	180 ± 30	IEC 60455-2, test method A acc. IEC 61033
Bond strength of twisted coils 130 °C	N		35 ± 10	IEC 60455-2, test method A acc. IEC 61033
Bond strength of twisted coils 155 °C	N		35 ± 10	IEC 60455-2, test method A acc. IEC 61033
Bond strength of twisted coils 180 °C	N		30 ± 10	IEC 60455-2, test method A acc. IEC 61033
Shore-D-hardness		room temperature	37 ± 5	IEC 60455-2, test method acc. ISO 868

Thermal	Unit of measure	Conditions	Value	Test method
Temperature index	°C		200	IEC 60455-3-5 test method acc. IEC 60216
Testing voltage IEC 60317-8	°C	MW 30	210	IEC 60172
Testing voltage IEC 60317-13	°C	MW 35	200	IEC 60172
Bond strength IEC 60317-13	°C	MW 35	211	IEC 61033, method b, final point 22 N

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Chemical	Unit of measure	Conditions	Values	Test method
Water absorption	%	after 96h at 23°C	0.35	IEC 60455-2, test method 1 acc. ISO 62
Impact on enamelled wires			compatible to common enamelled wires	
Resistance		Distilled water, transformer oils, 5% soap-flock-dilution	resistant	
Resistance		Hexane, methanol, oil	resistant	
VOC acc. 31. BLmSchV			29.8 %	2010/75/EU

Electrical	Unit of measure	Conditions	Values	Test Method
Specific volume resistance at 155 °C	Ω*cm		5.0x10^11	acc. IEC 60455-2, test method acc. IEC 60093
Creep resistance		typ. value	CTI 600M	acc. IEC 60455-2, test method acc. point 6.2 IEC 60112
Dielectric constant at 155 °C and 50 Hz			4.0 ± 0.5	acc. IEC 60455-2, test method acc. IEC 60250
Loss factor		120 °C/50 Hz	195x10^-3	IEC 60455-2, test method acc. IEC 60250

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Electrical	Unit of measure	Conditions	Values	Test Method
Loss factor cross section 0.2=200x10^-3	°C		120	IEC 60455-2, test method acc. IEC 60250

Liquid phase	Unit of measure	Conditions	Value	Test Method
Flow time	s	at 23 °C	60 ± 15	acc. DIN 53211
Reaction process gel time	min	at 100 °C	15.0 ± 4.0	company standard Energy Solutions-014
Reaction process reaction time	min	at 100 °C	31 ± 9.0	company standard Energy Solutions-014

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