SynFlex Elektro GmbH
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Voltatex® 4200 1-component-resin

Voltatex® 4200 is a low emission, ready-to-use impregnating 1K dip resin, based on unsaturated polyesterimide resins.

Attributes

- single component
- free of styrene and vinyltoluene
- low emission, VOC-free
- resistant to refrigerants
- not classified as dangerous in the meaning of transport regulations

The cured resin compound is characterized by:

- high thermal and mechanical strength, especially under long-term stress
- good resistance against solvent gases
- good adhesion

Application

- hermetic motors
- transformers, especially with thick wires and shaped conductors
- suitable for: Insulation systems up to thermal class 200 (N)

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 220, Testing Method in acc. with IEC 60216
- Temperature class acc. to UL 1446:

Twisted Pair	ASTM D2307	MW 30:200
		MW 35:220
Helical Coil	ASTM D2519	MW 30:240
		MW 35:220

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

Class 130	C190HE
	R150HE
	Z130HE
	Z150HE
Class 155	C290HE

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	CZ255HE
	R201HE
	R203HE
	Z200HE
Class 180	R342HE
	R342HE2

Delivery forms

The dip resin is delivered in 25 kg and 200 kg one-way-cans. Additionally 1000 kg containers (returnable) are available (not for oversea export).

Storage

The resin can be stored for up to 6 months at max. 25 °C if sealed correctly in original containers. We recommend a storage at 20-25 °C. Opened containers have to be resealed
and protected against direct daylight!

Hardening

Voltatex® 4200 is a low emission product; nevertheless 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 zone should be kept to the minimum permitted by safety considerations.

Curing times (Dip & Bake process):
at 130 °C: 2h
at 150 °C: 1 h
Curing times (trickle process):
at 130 °C: 15-30 min.
at 150 °C: 10-15 min.
In the cooling pool, the temperature change should be limited to max. 5 °C.

Protection

Voltatex® 4200 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

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- VPI process
- Trickling machines
- Hot dipping process
- Electric heating process with "Heat in resin"

Unlimited tank stability with resin Voltatex® 4200 can be achieved as long as the material is kept below 25 °C and at least 20 % of the tank cont ent is used and replaced with fresh resin per month.

Cleaning

Once cured Voltatex® 4200 is almost insoluble. Therefore, application equipment should be cleaned regularly with cleaner Voltatex® T050 or T060.
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	Values	Test method
Bond strength of twisted coils room temperature	N	325 ± 40	IEC 60455-2 test method A acc. IEC 61033
Bond strength of twisted coils 130 °C	N	90 ± 20	IEC 60455-2 test method A acc. IEC 61033
Bond strength of twisted coils 155 °C	N	80 ± 10	IEC 60455-2 test method A acc. IEC 61033
Bond strength of twisted coils 180 °C	N	52 ± 12	IEC 60455-2 test method A acc. IEC 61033
Shore D hardness room temperature		77 ± 5	IEC 60455-2 test method acc. ISO 868

Thermal	Unit of measure	Conditions	Value	Test method
Temperature index	°C		type 220	IEC 60455 test method acc. IEC 60216
Bond strength IEC 60317-8	°C	MW 30	238	IEC 61033, method B, final point 22 N
Bond strength IEC 60317-13	°C	MW 35	229	IEC 61033, method B, final point 22 N
Testing voltage IEC 60317-8	°C	MW 30	212	IEC 60172
Testing voltage IEC 60317-13	°C	MW 35	222	IEC 60172

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Thermal	Unit of measure	Conditions	Value	Test method
Thermal conductivity	W(m*k)^-1	at 23 °C, 130 °C, 155 °C, 180 °C	0.22	ASTM E1530

Chemical	Unit of measure	Conditions	Values	Test method
Resistance		distilled water, transformer oil	resistant	Factory standard Energy Solutions 017
Resistance		Hexane, methanol, acetone, xylol	resistant	Factory Standard Energy Solutions 019
VOC acc. 31. BImSchV	%		1.1	2010/75/EU

Electrical	Unit of measure	Values	Test method
Dielectric strength at 23 °C after 96 h storage at 90 % r.h.	kV/mm	40-90	IEC 60455-2 test method acc. IEC 60243-1
Dielectric strength at 23 °C and 50 % r.h.	kV/mm	70-90	IEC 60455-2 test method acc. IEC 60243-1
Dielectric strength at 155 °C	kV/mm	65-105	IEC 60455-2 test method acc. IEC 60243-1
Dielectric strength at 105 °C after 168 h oil immersion	kV/mm	85-130	IEC 60455-2 test method acc. IEC 60243-1

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Electrical	Unit of measure	Values	Test method
Specific volume resistance at 155 °C	Ω*cm	10^10-10^12	acc. IEC 60455-2 test method acc. IEC 60093
Specific volume resistance at 180 °C	Ω*cm	10^9-10^11	acc. IEC 60455-2 test method acc. IEC 60093
Specific volume resistance at 200 °C	Ω*cm	10^9-10^11	acc. IEC 60455-2 test method acc. IEC 60093
Specific volume resistance after 7 d water immersion	Ω*cm	10^14-10^16	acc. IEC 60455-2 test method acc. IEC 60093

Liquid phase	Unit of measure	Conditions	Values	Test method
Viscosity	mPas	25 °C	1800-2700	acc. DIN 53019
Gel time	min	100 °C	7-13	acc. company standard Energy Solutions-001
Reaction time	min	100 °C	8-16	acc. company standard Energy Solutions-001
Curing time	min	at 150 °C	120	dipping method
Curing time	min	at 130 °C	60	dipping method
Impact on enamelled wires			compatible with all common enamelled wires	

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