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## **Voltatex® 2100 Impregnating varnish**

Varnish composed of polyester imide / phenolic resin.

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### **Attributes**

Voltatex® 2100 is a transparent, ready-to-use and heat-curing impregnating varnish composed of polyester imide/phenolic resin combination.

Particular features:

- fast curing
- hard-elastic bonding
- compatible with all common magnet wires

The cured varnish is resistant to:

- solvent vapours
- transformer oils
- climate-related stress
- mould infestation
- acids, alkalines and ammonia

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### **Application**

Voltatex® 2100 is applicable for:

- insulation systems up to thermal class H, acc. IEC 60085
- in general suitable up to thermal class E-H, depending on curing time and -temperature.
- electric motors
- rotors with thermal and mechanical high stress

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### **Standards**

- Thermal class acc. IEC 216: TI 155-165
- Type acc. E DIN IEC 60646-3-2: type 155
- UL-temperature class: 200

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### **Delivery forms**

Voltatex® 2100 is delivered in 25 kg one-way compounds.

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### **Base**

Polyester imide / phenolic resin

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## Color

Transparent

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## Storage

The resin can be stored for up to 6 months at max. 25 °C if sealed correctly in original containers.

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## Hardening

- Thermal class E: 4-6 h at 120 °C
- Thermal class B: 4-6 h at 130 °C
- Thermal class F-H: 6 h at 150 °C

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## Protection

Cured Voltatex® 2100 is biologically inactive and not dangerous to health. When processing the liquid resin, please refer to the Material Safety Data Sheet (MSDS) for Voltatex® 2100.

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## Processing

Voltatex® 2100 is delivered ready-to-use. The consistency can be lowered if necessary with Voltatex® T022.

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## Cleaning

Cured Voltatex® 2100 is almost insoluble. Therefore, application equipment should be regularly cleaned with cleaner Voltatex® T050 or T060. All equipment cleaning and maintenance should be carried out in accordance with the equipment manufacturer's instructions.

| Mechanical                                      | Unit of measure | Value    | Test method                               |
|-------------------------------------------------|-----------------|----------|-------------------------------------------|
| Bond strength of twisted coils room temperature | N               | 250 ± 30 | IEC 60455-2, test method A acc. IEC 61033 |
| Bond strength of twisted coils 130 °C           | N               | 46 ± 4   | IEC 60455-2, test method A acc. IEC 61033 |
| Bond strength of twisted coils 155 °C           | N               | 34 ± 2   | IEC 60455-2, test method A acc. IEC 61033 |
| Bond strength of twisted coils 180 °C           | N               | 25 ± 2   | IEC 60455-2, test method A acc. IEC 61033 |

| Thermal           | Unit of measure | Condition                    | Value   | Test method         |
|-------------------|-----------------|------------------------------|---------|---------------------|
| Thermal class     |                 | Helical Coil                 | 200     | UL 1446, ASTM D2519 |
| Thermal class     |                 | Twisted Pair                 | 200     | UL 1446, ASTM D2307 |
| Temperature class | °C              | based on dielectric strength | 160-170 | IEC 60216           |
| Temperature index | °C              | based on weight loss         | 155-165 | IEC 60216           |

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| Chemical                  | Unit of measure | Condition                                                     | Value                                      | Test method                    |
|---------------------------|-----------------|---------------------------------------------------------------|--------------------------------------------|--------------------------------|
| Resistance                |                 | mould, test method I (28 days without add. nutrient solution) | range 0 - resistant                        | DIN IEC 68 part 2-10           |
| Resistance                |                 | temperature changes: -55 °C/+130 °C                           | resistant                                  | Test Na acc. DIN IEC 68 part 2 |
| Resistance                |                 | dry heat: +150 °C                                             | resistant                                  | Test Bb DIN IEC 68 part 2      |
| Resistance                |                 | Coldness: -55 °C                                              | resistant                                  | Test Ab acc. DIN IEC 68 part 2 |
| Impact on enamelled wires |                 |                                                               | compatible with all common enamelled wires |                                |
| VOC acc. 31. BImSchV      | %               |                                                               | 50.5                                       | 2010/75/EU                     |

| Electrical                                            | Unit of measure          | Value                    | Test method                                    |
|-------------------------------------------------------|--------------------------|--------------------------|------------------------------------------------|
| Specific volume resistance at 23 °C                   | $\Omega \cdot \text{cm}$ | $\geq 10^{15}$           | acc. IEC 60455-2, test method acc. IEC 60093   |
| Specific volume resistance after 96 h water immersion | $\Omega \cdot \text{cm}$ | $\geq 10^{15}$           | acc. IEC 60455-2, test method acc. IEC 60093   |
| Dielectric strength at 23 °C and 50 % r.h.            | kV/mm                    | $\geq 100$               | acc. IEC 60455-2, test method acc. IEC 60243-1 |
| Dielectric loss factor at (AC, 23 °C, 50 Hz)          |                          | $\leq 20 \times 10^{-3}$ | acc. IEC 60455-2, test method acc. IEC 60250   |

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| Electrical                                           | Unit of measure | Value                     | Test method                                    |
|------------------------------------------------------|-----------------|---------------------------|------------------------------------------------|
| Dielectric loss factor at 155 °C and 50 Hz           |                 | $\leq 100 \times 10^{-3}$ | acc. IEC 60455-2, test method acc. IEC 60250   |
| Dielectric constant at 23 °C between 50 Hz and 1 MHz |                 | $3.0 \pm 0.5$             | nach IEC 60455-2, Prüfverfahren nach IEC 60250 |
| Dielectric constant at 155 °C and 50 Hz              |                 | $5.0 \pm 0.5$             | acc. IEC 60455-2, test method acc. IEC 60250   |
| Loss factor cross section $0.2 = 200 \times 10^{-3}$ | °C              | $\geq 170$                | acc. IEC 60455-12, test method acc. IEC 60250  |

| Liquid phase   | Unit of measure | Condition | Value   | Test method |
|----------------|-----------------|-----------|---------|-------------|
| Binder content | %               |           | 48-52   |             |
| Viscosity      | mPas            | at 25 °C  | 295-365 | DIN 53019   |
| Flow time      | s               | at 23 °C  | 65-95   | DIN 53211   |

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