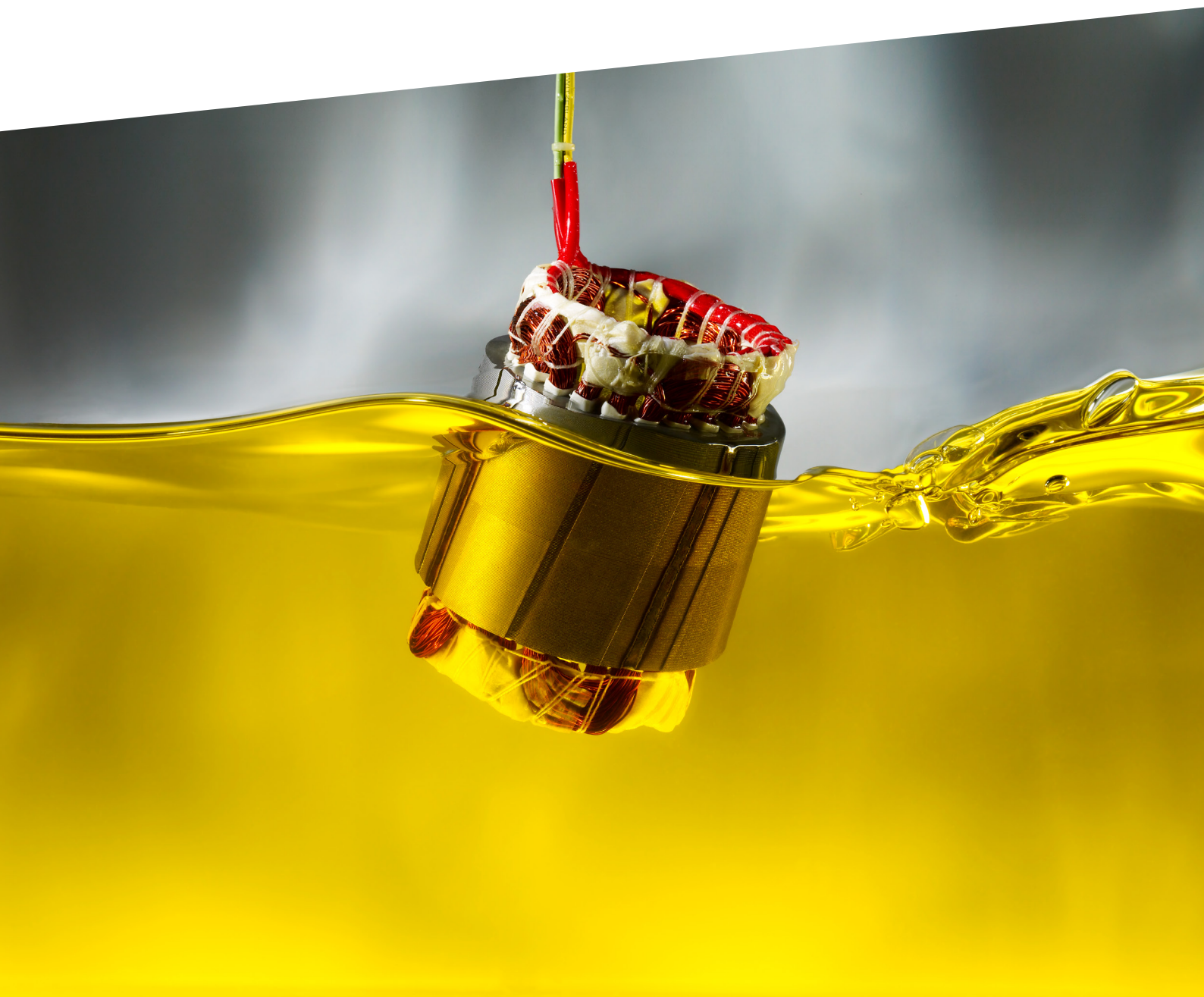


Energy Solutions Impregnating Resins


Voltatex® Product Overview

Low emission/ monomer-free/ epoxide



Energy Solutions - Impregnating Resins

Voltatex® Product Overview

Product Voltatex®	Key Characteristics	Thermal Class (IEC 60085)	UL-Recognition	Viscosity ⁽¹⁾ [mPas/cP]	Gel Time [min]	Curing Loss ⁽²⁾ [%]	Typical Curing Time
4200	Unsat. PEI, one component, low emission	220 (R)	✓	1800 - 2700	7.0 - 13.0@ 100°C	≈1.2	1h @ 150°C
4201	Unsat. PEI, one component, low emission	220 (R)	✓	700 - 1100	7.0 - 13.0@ 100°C	≈2.4	1h @ 150°C
4202	Modified unsat. PE, one-component, low emission	180 (H)	✓	1900 - 2600	9.0 - 15.0@ 100°C	≈2.2	1h @ 160°C
4204 ⁽³⁾	 Unsat. PEI, one component, low emission	180 (H)	✓	265 - 365	7.0 - 12.0@ 100°C	≈1.1	30 min @ 150°C
4210	Modified unsat. PE, one-component, low emission	180 (H)	✓	700 - 1100	6.0 - 12.0@ 100°C	≈0.6	1h @ 150°C
4224 L	Unsat. PEI, one component, low emission	180 (H)	✓	800 - 1200	8.0 - 14.0@ 100°C	≈1.4	30min @ 150°C
4224 M	Unsat. PEI, one component, low emission	180 (H)	✓	1200 - 2000	8.0 - 14.0@ 100°C	≈1.1	30min @ 150°C
4224 H	Unsat. PEI, one component, low emission	180 (H)	✓	2800 - 3800	8.0 - 14.0@ 100°C	≈0.8	30min @ 150°C
4230	Unsat. PEI, one component, low emission	220 (R)	✓	700 - 1300	11.0 - 17.0@ 100°C	≈1.4	1h @ 150°C
4233	Modified unsat. PE, one-component, low emission	180 (H)	✓	300 - 500	20.0 - 40.0@ 100°C	≈1.0	2h @ 150°C
4240	Unsat. PEI, one component, low emission	180 (H)	✗	2300 - 3500	10.0 - 16.0@ 100°C	≈1.2	15min @ 150°C
4241	Unsat. PEI, one component, low emission	180 (H)	✗	900 - 1600	15.0 - 25.0@ 100°C	≈1.3	15min @ 150°C
4250	Unsat. PEI, one component, low emission	220 (R)	✓	1900 - 2600	7.5 - 13.5@ 100°C	≈1.7	1h @ 150°C
4302 M	Unsat. PEI, one component, low emission	180 (H)	✗	5500 - 7700	10.0 - 16.0@ 100°C	≈0.5	1h @ 150°C
4303	Unsat. PEI, one component, low emission	180 (H)	✓	700 - 1100	9.0 - 15.0@ 100°C	≈0.5	1h @ 150°C
4310	Unsat. PEI, one component, low emission	180 (H)	✓	800 - 1200	4.5 - 7.5@ 100°C	≈2.0	15min @ 150°C
4411	Epoxy, two-component, anhydride-free	180 (H)	✗	300 - 500 (mixture)	20.0 - 25.0@ 55°C	0	24h @ 25°C

- ✓ = listed
- ⊙ = pending
- ✗ = not listed

⁽¹⁾ Measured at 25°C, unless otherwise specified
⁽²⁾ Emissions acc. DIN EN 60455-3-5

Shelf Life	Product Description	Typical Application	Dip & Bake (atmospheric)	Vacuum Process	VPI	Hot Dipping	Resistance Heating Process	UV-Curable	Trickle	Roll-Dip
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suitable for:

8 months	Outstanding thermal endurance, resistant to refrigerants	(H)EV-Motors, (Wind) Generators, Industrial Motors	☑	☑	☑	☑	☑	✗	☑	☑
8 months	Viscosity-reduced version of Voltatex® 4200 including ≤ 5% VT	(H)EV-Motors, (Wind) Generators, Industrial Motors	☑	☑	☑	☑	☑	✗	☑	☑
8 months	Suitable for traction motors up to 3.3 kV, very good dielectric properties	Electric-Motors, Traction Motors, Transformers, (Wind) Generators	☑	☑	☑	☑	☑	✗	☑	☑
8 months	Very low viscosity and tendency to crack, excellent penetration of taped conductors (VPI)	(H)EV, Industrial and Traction Motors, (Wind) Generators, Designs >1000V	☑	☑	☑	☑	☑	✗	☑	☑
6 months	Low viscosity and tendency to crack, good stability against oil and humidity	(H)EV-Motors up to 1000 V, (Wind)Generators, Industrial Motors	☑	☑	☑	☑	☑	✗	☑	☑
12 months	Thermally conductive (≈ 0.5 - 0.6 W(m·K) ⁻¹), partial discharge resistant, fast curing	Designs with increased needs of cooling, PD resistance	☑	☑	☑	☑	☑	✗	☑	☑
12 months	Thermally conductive (≈ 0.8 W(m·K) ⁻¹), partial discharge resistant, fast curing	Designs with increased needs of cooling, PD resistance	☑	☑	☑	☑	☑	✗	☑	☑
12 months	Thermally conductive (≈ 1.2 W(m·K) ⁻¹), partial discharge resistant, fast curing	Gelcoating, Hairpin Insulation	✗	✗	✗	☑	✗	✗	☑	✗
5 months	Viscosity-reduced and thixotropic version of Voltatex® 4200 including ≤ 5 % VT	Electric Motors, (Wind) Generators, Large Drives, Transformers	☑	☑	☑	☑	☑	✗	✗	☑
12 months	Low viscosity and tendency to crack, thixotropic, corrosion protection	Transformers, Chokes, Industrial Motors	☑	☑	☑	☑	☑	✗	☑	☑
8 months	Highly thixotropic gelcoat, high film build, thermal conductivity ≈ 0.5 W(m·K) ⁻¹	Gelcoating, Hairpin Insulation	☑	✗	✗	☑	☑	✗	☑	✗
8 months	Viscosity-reduced flexible version of Voltatex® 4240	Gelcoating, Hairpin Insulation	☑	✗	✗	☑	☑	✗	☑	✗
8 months	UV-curable version of Voltatex® 4200	(H)EV-Motors, (Wind) Generators, Industrial Motors	☑	☑	☑	☑	☑	☑	☑	☑
12 months	Monomer free resin, low odour, very low cracking	(Wind) Generators, Large Drives	✗	☑	☑	☑	☑	✗	✗	✗
8 months	Monomer free resin, low odour, low viscosity	Electric Motors, (Wind) Generators Large Drives	☑	☑	☑	☑	☑	✗	☑	☑
4 months	High bond strength, excellent thermo-mechanical endurance	Power Tools	✗	✗	✗	✗	✗	✗	☑	☑
12 months	Ambient curing or at mild elevated temperatures	Stators and Rotors for Electric Motors	✗	✗	✗	✗	✗	✗	☑	✗

- ☑ = recommended
- ☑ = conditionally recommended (please consult us)
- ✗ = not recommended

⁽³⁾ Biobased carbon content (TOC) certified 2024 by independent testing institute (TÜV Rheinland)

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