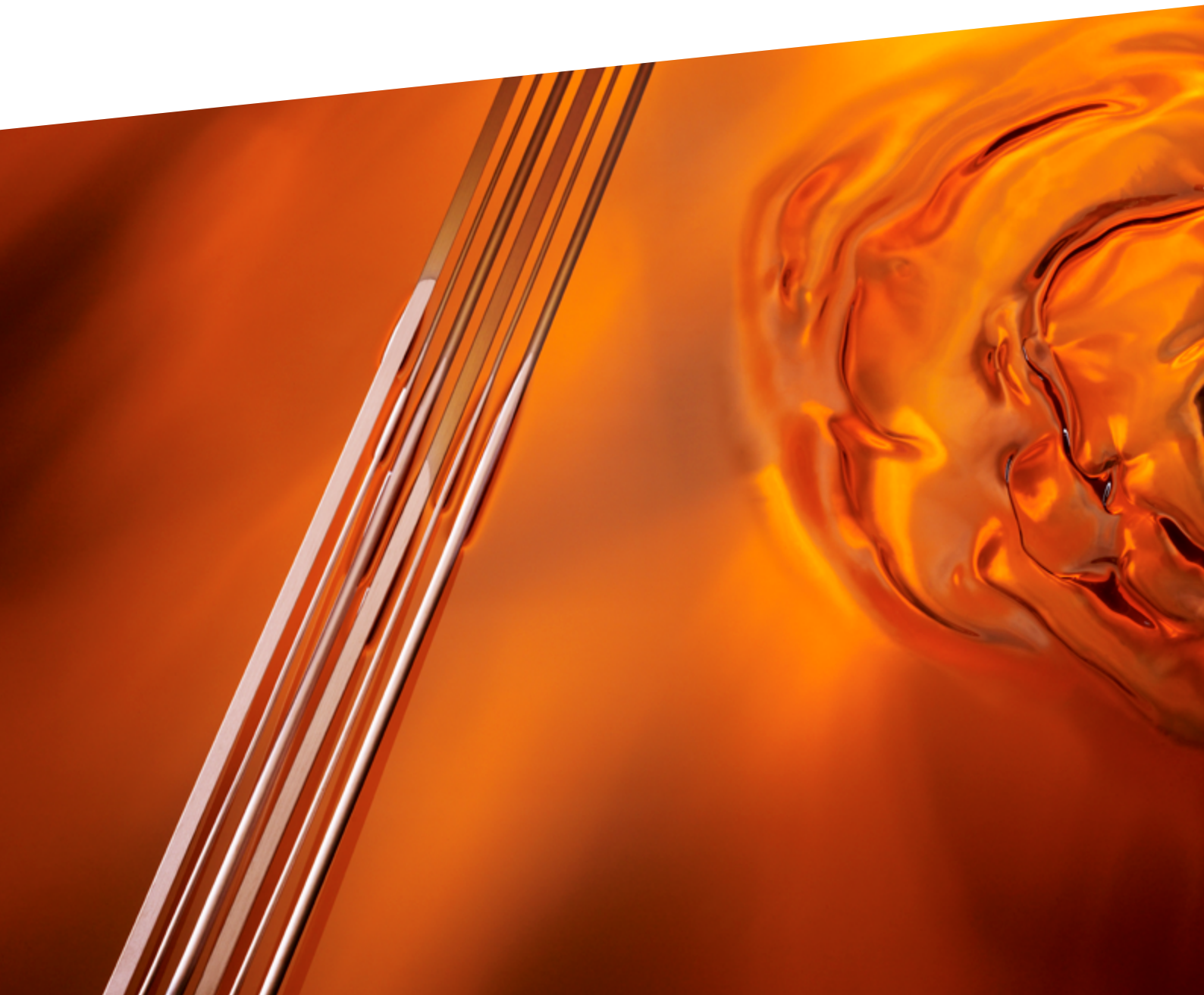
AXALTA COATING SYSTEMS

Energy Solutions Wire Enamels

Product Overview

Voltatex®, Voltron®, ECO LINE



Energy Solutions - Wire Enamels
Voltatex® Product Overview

Chemical Base	Thermal Class (°C)	Product Name	Solid Content (1 g/1 h/180 °C)	Viscosity DIN 53015 DIN 53019	Dimension Range recommended [3]
UL File No. E102069			[%]	[mPa·s] [23°C]	[Ø in mm]
Polyurethane Wire Enamel					
Polyurethane	155	**Voltatex® 6125**	24.0 – 26.0	30 – 40	0.01 – 0.60
		Voltatex® 6129	28.0 – 30.0	60 – 80	
		Voltatex® 6135	34.0 – 36.0	150 – 350	0.30 – 1.00
		Voltatex® 6424	23.0 – 25.0	35 – 50	0.01 – 0.30
		Voltatex® 6424 ECO	**23.0 – 25.0**	**10 – 30**	**0.01 – 0.30**
	180	**Voltatex® 6335 gold**	34.0 – 36.0	500 – 800	0.30 – 1.00
Polyurethane (modified)	200	**Voltatex® 6534**	33.0 – 35.0	440 – 600	0.30 – 1.80
		Voltatex® 6725	24.0 – 26.0	50 – 80	0.01 – 0.80
		Voltatex® 6727	26.0 – 28.0	80 – 120	0.01 – 0.80
Polyester Wire Enamel					
THEIC Polyester (modified)	155	**Voltatex® 7145 A**	44.0 – 46.0	1.800 – 2.200	0.30 – 5.00
Polyesterimide	200	**Voltatex® 7225 AG**	24.0 – 25.0	40 – 55	0.01 – 0.80
		Voltatex® 7236	35.0 – 37.0	300 – 600	0.30 – 2.50
THEIC Polyesterimide (modified)	200	**Voltatex® 7327 A ECO**	**26.0 – 28.0**	**40 – 70**	**0.01 – 0.50**
		Voltatex® 7336 A	35.0 – 37.0	300 – 700	0.30 – >3.00
		Voltatex® 7339 A	38.0 – 40.0	700 – 900	0.30 – >3.00
		Voltatex® 7340 A ECO	**39.0 – 41.0**	**400 – 800**	**0.30 – 3.00**
		Voltatex® 7345 A ECO	**43.0 – 47.0**	**800 – 1.600**	**0.30 – 3.00**
		Voltatex® 7340 AX	39.0 – 41.0	1.100 – 1.600	0.30 – >3.00
		Voltatex® 7329 B	27.5 – 29.5	70 – 90	0.01 – 0.80
		Voltatex® 7336 B	35.0 – 37.0	500 – 700	0.10 – 1.50
		Voltatex® 7342 B	41.0 – 44.0	1.500 – 2.400	0.30 – >3.00
	220 [9]	**Voltatex® 7740**	38.5 – 41.0	2.200 – 3.000 [2]	0.20 – >3.00
Polyamideimide Wire Enamel					
Polyamideimide	220	**Voltatex® 8132**	31.0 – 34.0	500 – 1.000	0.30 – 5.00
		Voltatex® 8137	35.0 – 38.0	1.500 – 2.500	0.50 – 5.00
	240	**Voltatex® 8227**	25.0 – 29.0	1.700 – 2.700	0.50 – 5.00
Polyamideimide (modified)	–	**Voltatex® 8227 SL**	25.5 – 27.5	1.800 – 2.800	0.50 – 5.00
	220	**Voltatex® 8534**	33.0 – 35.0	500 – 1.000	0.20 – >3.00
	200 [1]	**Voltatex® 8536**	34.0 – 37.0	2.000 – 4.500	0.20 – >3.00
Polyamide (Nylon)	–	**Voltatex® 9511**	10.0 – 12.0	480 – 620	–
Polyamideimide Primer					
Polyamideimide (modified)	180	**Voltatex® 9127**	25.0 – 29.0	1.300 – 1.900 [2]	1.00 – 5.00
Polyvinylformal Wire Enamel (Formvar)					
Polyvinylformal (modified)	105	**Voltatex® 9218**	17.0 – 23.0	3.500 – 5.500 [2]	0.30 – >5.00
	120	**Voltatex® 9224**	23.0 – 25.0	4.000 – 6.000 [2]	
Selfbonding Wire Enamel					
Polyamide (aliphatisch)		**Voltatex® 8616 C**	15.0 – 17.0	600 – 800	0.30 – 2.00
Butyral		**Voltatex® 8710**	8.5 – 10.5	50 – 80	0.01 – 0.50
		Voltatex® 8718	16.5 – 18.5	500 – 700	0.20 – 1.00
Epoxy		**Voltatex® 8816 ECO**	**15.0 – 17.0**	**300 – 600**	**0.06 – 3.00**
Impregnating Varnishes for Glass Fibre Covered & Braided Wires					
Polyurethane		**Voltatex® 9848**	47.0 – 49.0	500 – 1.500	–

Voltatex®	Conductor Diameter [4]	Flexibility and Adherence	Solderability temperature/ soldering time	Dissipation Factor recommended [8]	Cut Through Temperature tested (Luscher)	Heat Shock (1xd)
	[Ø in mm]	[1xd]	[°C / sec]	[°C]	[°C]	[°C]
Polyurethane Wire Enamel						
6125	0.10	5 % [5]	320 / <5.0 [6]	135 – 160	220	175 [5]
6129	0.10	5 % [5]	375 / <1.0 [6]			
6135	0.65	5 %	375 / <1.0 [6]			
6424	0.06	5 %	375 / 0.5 [6]	150 – 160	230	175
6424 ECO	**0.10**	**5 %**	**375 / 0.5 [6]**	**150 – 160**	**240**	**175**
6335 gold	0.65	10 %	375 / <2.5 [6]	130 – 150	230	190
6534	0.65	5 %	375 / <2.5 [6]	170 – 190	240	190
6725	0.10	10 % [5]	375 / <4.5 [6]	170 – 190	260	210 [5]
6727	0.65	5 %	375 / <6.0 [6]			
Polyester Wire Enamel						
7145 A	1.00	15 %	-	165 – 180	400	240 [9]
7225 AG	0.10	20 % [5]	470 / <3.5 [7]	185 – 205	320	220 [5]
7236	0.65	15 %	470 / <6.5 [7]	185 – 205	320	200
7327 A ECO	0.10	15 %	–	190 – 215	360	220
7336 A	1.00				380	200
7339 A						
7340 A ECO						
7345 A ECO						
7340 AX						
7329 B	0.30	20 %			370	220
7336 B	0.65	25 %			380	
7342 B						
7740	1.00	5 %		190 – 220		200
Polyamideimide Wire Enamel						
8132	1.00	10 %	–	260 – 290	400	300
8137						
8227				260 – 300		
8227 SL	–	–	–	–	–	–
8534	1.00	5 %	–	240 – 280	400	300
8536	1.00	20 %	–	180 – 210	350	240
9511	Can be applied as overcoat on thermosetting and solderable enameled wire without reducing their solderability.					
Polyamideimide Primer						
9127	1.00	30 %	–	100 – 130	300	300
Polyvinylformal Wire Enamel (Formvar)						
9218	1.00	30 %	–	100 – 120	230	–
9224		10 %	–	110 – 130	240	160
Selfbonding Wire Enamel			Layer thickness[a]	Baking conditions	Bond strength	Resoftening temp.
8616 C	0.315		29 µm + 17 µm	1 h at 170 °C	2.2 N	210 °C
8710	0.315		30 µm + 17 µm	1 h at 140 °C	1.6 N	108 °C
8718						
8816 ECO	**0.315**		**30 µm + 17 µm**	**1 h at 180 °C**	**1.8 N**	**140 °C**
Impregnating Varnishes for Glass Fibre Covered & Braided Wires						
9848	Impregnating varnish without cresylic acid solvent is used for types of glass braided copper wire or strip, single or bonded. High resistance against thermal stress, excellent electrical and mechanical properties, diluent Voltatex® 9959.					

Voltatex®	Temperature Index acc. IEC 172	UL listed (Underwriters Laboratories)	Special Characteristics and Applications
	[°C]	File No. E102069	
Polyurethane Wire Enamel			
6125	174 [5]	yes	Excellent solderable; soldering temperature >320 °C; conform to IEC 60317-20.
6129			
6135			
6424	155		Excellent solderability at temperature of ≥ 320 °C. Pin-hole and crazing resistance to JIS.
6424 ECO			**Voltatex® 6424 ECO is cresol and phenol-free and for high speed application.**
6335 gold	195		Solderable magnet wire; pin-hole and crazing resistant; conform to IEC 60317-51.
6534	210	yes	Solderable magnet wire; pin-hole and crazing resistant; conform to IEC 60317-51.
6725	211 [5]		
6727			
Polyester Wire Enamel			
7145 A	220	yes	THEIC modified Polyester baseoat for aluminium and copper wires.
7225 AG	217 [5]	yes	Solderable above 450 °C, hot staking process possible, good elasticity, good dielectric and mechanical properties, conform to IEC 60317-23.
7236	217		
7327 A ECO	223	yes	**Voltatex® 7327 A ECO is cresol and phenol-free and for high speed application.**
7336 A			Voltatex® 73.. A with improved viscosity / solid content ratio and wide application range.
7339 A			
7340 A ECO			**Voltatex® 73.. A ECO is cresol and phenol-free and for high speed application**
7345 A ECO			
7340 AX	205		Improved heat shock and flexibility, ballasts for fluorescent lamps and hermetic units.
7329 B	215		Among others ballasts for fluorescent lamps and hermetic units with improved heat shock. Practice has shown excellent flexibility results.
7336 B			
7342 B			
7740	213 / 222 [9]	yes	For round conductor, outstanding resistance to partial discharges [10].
Polyamideimide Wire Enamel			
8132	230	yes	Both overcoat and single coat, mainly used as a topcoat in combination with a polyester or polyesterimide basecoat.
8137			
8227	240	yes	
8227 SL	–	–	Self-lubrication effects, mainly used as a last topcoat layer with low coefficient of friction.
8534	225	yes	Overcoat and single coat with outstanding resistance to partial discharges and ATF Oil.
8536	200	no	Overcoat and single coat designed for rectangular and heavy round wire with outstanding resistance to partial discharges.
Polyamideimide Primer			
9127	186	no	Primer for heavy round and rectangular conductor, superior adherence and flexibility.
9218	105	no	With excellent mechanicanl properties. Heavy round and rectangular conductors for use in: hermetic application; transformer oil resistant acc. to IEC60 851-4.
9224	120		
Selfbonding Wire Enamel			
Bond topcoat over polyesterimide or polyurethane basecoat.			
Bonding wire enamel without cresylic acid solvent, bond topcoat over polyurethane.			
Bond topcoat, Epoxy based, cresol free. For round and rectangular wires.			

[1] estimated
[2] measuring temperature: 25 °C
[3] depend on process condition
[4] under normal test conditions on pilot equipment
[5] tested on conductor diameter 0.30 mm
[6] composition of the solder bath: Sn/Pb = 60/40
[7] composition of the solder bath: Pb/Sn = 92/8
[8] depend on wire diameter and process conditions
[9] with PAI Voltatex® topcoat
[10] preferably top coated with Voltatex® 8227

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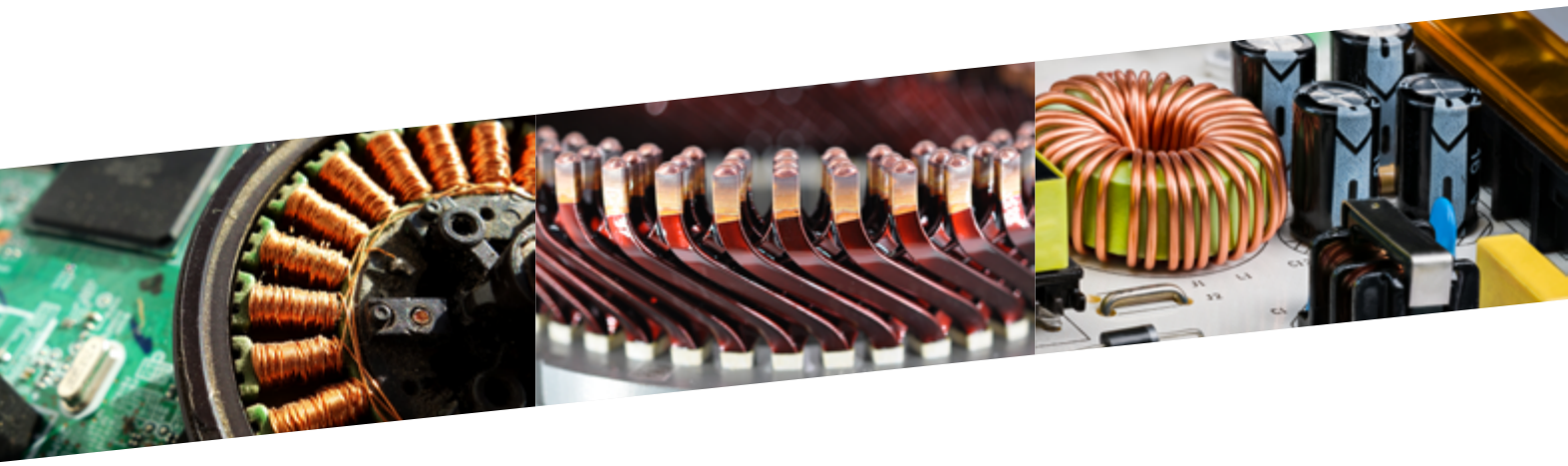
Energy Solutions - Wire Enamels
Voltron® Systems

Coating Systems	Wire Enamel	Ratio of WE	Passes	Magnet Wire Range	Mechanical Stability	Chemical Stability	Partial Discharge Resistance
Voltron® System 1210	Voltatex® 7740 base coat	100 %	> 10	standard round: 0.3 - 2.00 mm	+	+	+++
Voltron® System 1220	Voltatex® 7740 base coat	85.0 % +/- 2.5 %	> 10	standard round: 0.3 - 2.00 mm	++	++	++
	Voltatex® 8227 top coat	15.0 % +/- 2.5 %	> 3				
Voltron® System 1230	Voltatex® 7740 base coat	70.0 % +/- 5.0 %	> 8	standard round: 0.3 - 2.00 mm	++	++	+
	Voltatex® 8227 top coat	30.0 % +/- 5.0 %	> 3				
Voltron® System 1321	Voltatex® 9127 primer	7.5 % +/- 2.5 %	> 1 - 2	heavy round: >2.00 mm"	+++	++	++
	Voltatex® 7740 base coat	77.5 % +/- 5.0 %	> 7				
	Voltatex® 8227 top coat	15.0 % +/- 5.0 %	> 2				
Voltron® System 2230	Voltatex® 7740 base coat	70.0 % +/- 5.0 %	> 7	standard round: 0.3 - 2.00 mm	++	+++	+++
	Voltatex® 8534 top coat	30.0 % +/- 5.0 %	> 3				
Voltron® System 2240	Voltatex® 8534 base coat	100%	> 15	standard round: 0.3 - 2.00 mm	+++	++	+++
Voltron® System 2250	Voltatex® 9127 Primer	7.5 % +/- 2.5 %	1 - 2	rectangular / square	+++	++	+++
	Voltatex® 8536 base coat	92.5 % +/- 2,5 %	> 13				
Voltron® System 3230	Voltatex® 7340 AX base coat	70.0 % +/- 5.0 %	> 7	standard round: 0.3 - 2.00 mm	++	++	+
	Voltatex® 8534 top coat	30.0 % +/- 5.0 %	> 3				



Energy Solutions - Wire enamels
Voltatex® ECO LINE

Based on standard polyurethane and polyesterimide

Free from cresol and phenol

- Parameters comparable to standard wire enamels
- High-speed applications on felts and dies due to excellent viscosity –solid content –ratio
- Combustion heat of the solvents as high as of cresol containing enamels
- Brighter color of Voltatex® eco versions
- Non-toxic
- Pleasant smell

Sample Voltatex® 7340 AX

Sample Voltatex® 7345 A ECO

- Handling far less dangerous for employees and logisticians
- Reduced cleaning effort in coating line
- Higher solid content reduce logistic effort
- UL recognized

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