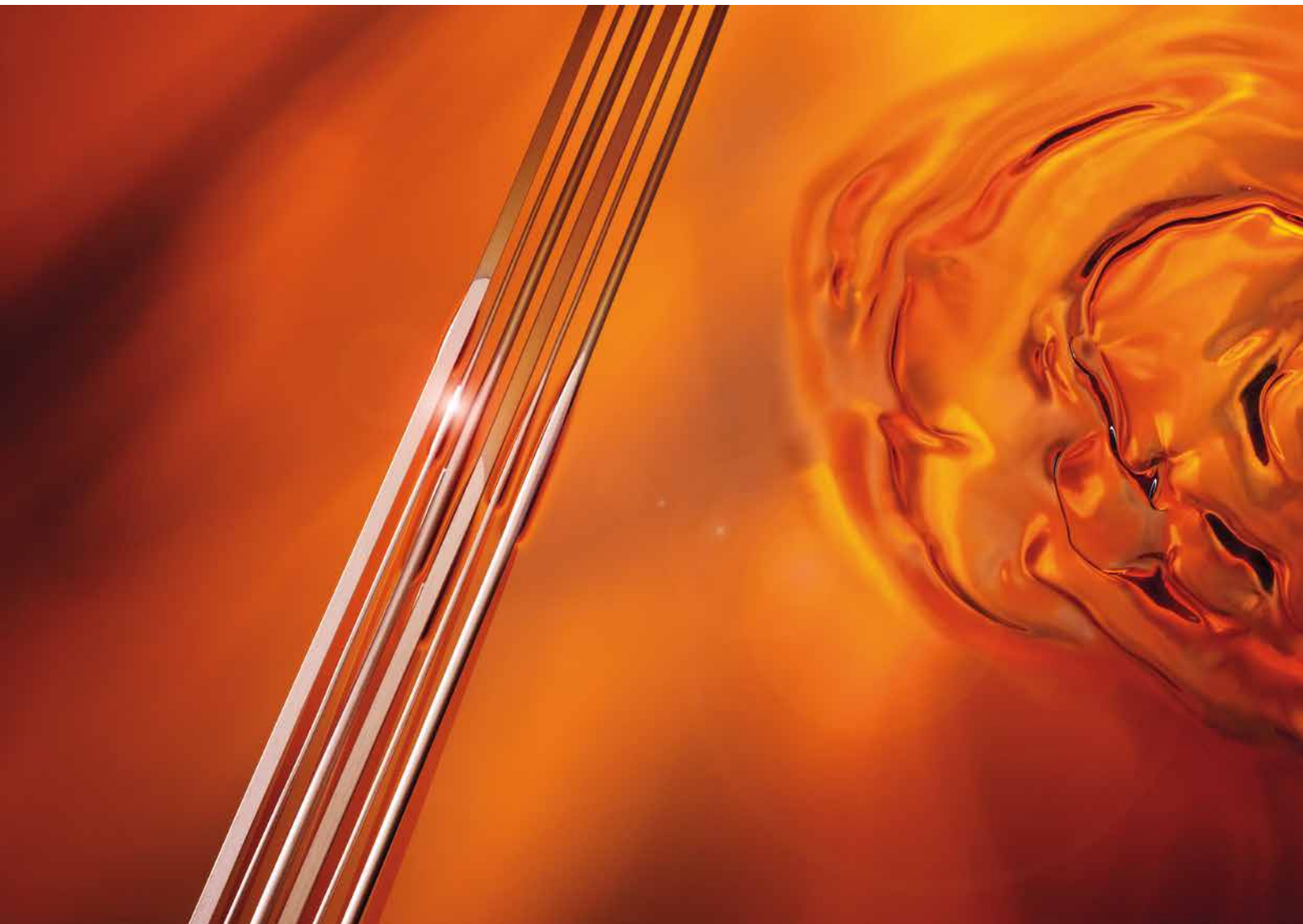
AXALTA COATING SYSTEMS

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 53 015 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	400 – 600	0.30 – 1.00
Polyurethane (modified)	200	**Voltatex® 6534**	33.0 – 35.0	440 – 600	0.30 – 1.80
		Voltatex® 6540	39.0 - 42.0	2.300 - 2.900	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
		Voltatex® 6729	28.0 - 30.0	140 – 220	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
		Voltatex® 7240	39.0 – 41.0	700 – 900	
THEIC Polyesterimide (modified)	200	**Voltatex® 7325 A**	23.0 - 25.0	35 – 50	0.01 - 0.80
		Voltatex® 7327 A ECO	**26.0 - 28.0**	**40 – 70**	**0.01 - 0.50**
		Voltatex® 7336 A	35.0 - 37.0	400 – 800	0.30 – >3.00
		Voltatex® 7339 A	38.0 - 40.0	700 – 900	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® 7342 AX	41.0 - 45.0	1.900 - 2.500	0.30 - 5.00
		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® 7338 B	37.0 - 39.0	650 – 950	0.10 - 1.50
		Voltatex® 7340 B	39.0 - 41.0	900 - 1.200	0.30 – >3.00
		Voltatex® 7342 B	41.0 – 44.0	1.500 – 2.400	0.30 – >3.00
	180	**Voltatex® 7433**	32.0 – 34.0	800 – 1.100	0.50 – >5.00
	220 [9]	**Voltatex® 7740**	38.5 – 41.0	2.200 – 3.000 [2]	0.20 – >3.00
	200	**Voltatex® 7735 FL**	33.5 – 35.0	800 – 2.000	0.50 – >5.00
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® 8327**	26.0 – 28.0	2.100 – 2.900 [2]	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	2200 – 4.500	0.20 – >3.00
Polyamide (Nylon)	–	**Voltatex® 9511**	10.0 – 12.0	480 – 620	–
Polyamideimide Wire Enamel					
Polyamideimide (modified)	180	**Voltatex® 9127**	26.0 – 28.0	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® 8611 C**	10.0 – 12.0	130 – 170	0.03 – 0.50
		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**	15.0 - 17.0	300 – 600	0.30 - 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 (Lüscher)	Heat Shock (1xd)
	[Ø in mm]	[1xd]	[°C / sec]	[°C]	[°C]	[°C]
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
6540	0.65					
6725	0.10	10 % [5]	375 / <4.5 [6]	170 – 190	260	210 [5]
6727	0.65	5 %	375 / <6.0 [6]			
6729	0.65					
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
7240	0.65					
7325 A	0.30	20 %	–	190 – 215	360	220
7327 A ECO	0.10	15 %				200
7336 A	1.00				380	
7339 A						
7345 A ECO						
7340 AX						
7342 AX						
7329 B	0.30	20 %			370	220
7336 B	0.65	25 %			380	
7338 B						
7340 B						
7342 B						
7433	1.00	15 %				180
7740	1.00	5 %		190 – 220		200
7735 FL						180
8132	1.00	10 %	–	260 - 290	400	300
8137						
8227						
8227 SL	–	–	–	260 – 300	–	–
8327	1.00	10 %	–	–	380	300
8534	1.00	5 %	–	240 – 280	400	300
8536	1.00	20 %	–	260 – 290	350	240
9511	Can be applied as overcoat on thermosetting and solderable enamelled wire without reducing their solderability					
9127	1.00	30 %	–	100 – 130	300	300
9218	1.00	30 %	–	100 – 120	230	–
9224		10 %	–	110 – 130	240	160
			Layer thickness	**Baking conditions**	**Bond strength**	**Resoftening temp.**
8611 C	0.315		29 µm + 17 µm	1 h at 170 °C	2.2 N	210 °C
8616 C						
8710	0.315		30 µm + 17 µm	1 h at 140 °C	1.6 N	108 °C
8718						
8816	0.315		30 µm + 17 µm	1 h at 180 °C	1.8 N	140 °C
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	
6125	174 [5]	yes	Excellent solderable; soldering temperature >320 °C; conform to IEC 60317-20.
6129			
6135			
6424	155 [1]		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.
6540			
6725	211 [5]		
6727			
6729			
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		
7240			
7325 A	223	yes	THEIC Polyesterimide for fine wires.
7327 A ECO			**Voltatex® 7327 AX 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			
7345 A ECO			**Voltatex® 7345 AX ECO is cresol and phenol-free and for high speed application.**
7340 AX	205		Improved heat shock and flexibility, ballasts for fluorescent lamps and hermetic units.
7342 AX			
7329 B	215		Among others ballasts for fluorescent lamps and hermetic units with improved heat shock. Practice has shown excellent flexibility results.
7336 B			
7338 B			
7340 B			
7342 B			
7433	187 [9]		Rectangular and heavy round conductors, combined with PAI topcoat [11] is possible.
7740	213 / 222 [9]	yes	For round conductor, outstanding resistance to partial discharges [10].
7735 FL			Specially developed for rectangular conductor, outstanding resistance to partial discharges [13].
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.
8327	232	yes [13]	Both overcoat and single coat for both rectangular and e.g. round conductors.
8534	225	yes	Overcoat and single coat with outstanding resistance to partial discharges [13] and ATF Oil.
8536	200 (expected)	no	Overcoat and single coat designed for rectangular and heavy round wire with outstanding resistance to partial discharges.
9511	Provides exceptionally fine finishes with minimum friction factor.		
9127	186	no	Primer for heavy round and rectangular conductor, superior adherence and flexibility.
			With excellent mechanical properties. Heavy round and rectangular conductors for use in:
9218	105	no	superconductor application.
9224	120		hermetic application; transformer oil resistant acc. to IEC60 851-4.
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
(11) preferably top coated with Voltatex® 8327
(12) 180 in combination with basecoat Voltatex® 7433
(13) as occur e.g. in inverter fed motors mainly used in combination with Voltatex® 7740

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Energy Solutions Wire Enamels
Voltron® Systems

CR Systems	Wire Enamel	Ratio of WE	Passes *	Magnet Wire Range	Mechanical Stability	Chemical Stability	Corona 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 1421	Voltatex® 9127 primer	7.5 % +/- 2.5 %	> 1 - 2	rectangular / square	+++	++	++
	Voltatex® 7735FL 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				

based on standard polyurethane and polyesterimide
free from cresol and phenol

- ✓ parameters comparable to standard Wire Enamels
- ✓ suitable for high-speed applications on felts and dies due to the excellent viscosity –solid content –ratio
- ✓ combustion heat of the solvents is as high as of cresol containing enamels
- ✓ brighter color of Voltatex ECO versions
- ✓ non-toxic, smell

standard products

ECO Line

- ✓ handling is far less dangerous for employees and logisticians
- ✓ higher solid content reduce the logistic effort
- ✓ UL recognized

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