

Technical Data Sheet

Electronic Glass Powders Low Temperature Pb-free Glasses

Application

Ferro's low temperature Pb-free glasses are formulated and processed to meet requirements of RoHS-compliant end products. Like our other low temperature glasses, they encompass a wide range of properties to meet the requirements of an extensive variety of applications. This includes hermetic sealing, encapsulation and coating of metal,

ceramic and glass substrates and components, as well as use as binding agents for metal and ceramic pastes.

Ferro continues active development of Low Temperature Pb-Free glass; please contact our Technical Service team for the most up to date product offerings.

Vitreous Low Temperature Pb-free Glass Powders

Product Code		EG 2967	EG 2735	EG 2964	EG 2922	EG 2934	EG 3018
Composition Family		Zn-B-Si-Al-R2O	Bi-Zn-B	Bi-Zn-B	Bi-Zn-Si	Bi-Zn-B-R ₂ O	Bi-Zn-B-RO
Peak Firing Temperature	°C	590	580	560	550	505	450
Time at Peak Temperature	minutes	15	15	15	15	15	20
CTE at 260 °C	x10 ⁻⁷ /°C	56	60	65	77	86	101
CTE at Set Point	x10 ⁻⁷ /°C	62	64	84.5	85.5	97	112
Softening Point	°C	530	578	510	505	444	405
Annealing Point (T _a)	°C	525	510	500	475	440	390
Glass Transition Temp (T _g)	°C	496	495	480	465	415	370
Powder Density	g/cc	2.86	4.47	4.90	5.80	5.55	7.30
Typical Powder Types		VWG	VWG	VEG	VWG	VWG	VWG
Typical Applications		Alumina & ZnO Overglaze & Sealing	Alumina & ZnO Overglaze & Sealing	Bonding & Sealing Agent	Soda Lime Glass, PD 200	Bonding & Sealing Agent	General

Crystallizing Low Temperature Pb-free Glass Powders

Product Code		EG 2992	EG 2998	EG 3030
Composition Family		Bi-Zn-B	Bi-Zn-B	Bi-Zn-B
Peak Firing Temperature	°C	535	500	475
Time at Peak Temperature	minutes	15	15	20
CTE at 260 °C	x10 ⁻⁷ /°C	77	88.5	102
CTE at Set Point	x10 ⁻⁷ /°C	83.5	98	110
Softening Point	°C	504	435	386
Annealing Point (T _a)	°C	400	400	378
Glass Transition Temp (T _g)	°C	420	405	370
Powder Density	g/cc	5.92	5.65	7.30
Typical Powder Types		VWG	VEG	VWG
Typical Applications		Ferrite Sintering Aid	Lamp Sealing	General

Crystallizing Low Temperature Pb-free Glass Composites

Product Code		EG 2812	EG 2816	EG 2824	EG 2828
Composition Family		Bi-Zn-B Composite	Bi-Zn-B Composite	Bi-Zn-B Composite	Bi-Zn-B Composite
Peak Firing Temperature	°C	505	490	475	460
Time at Peak Temperature	minutes	20 - 30	20 - 30	20 - 30	20 - 30
CTE at 260 °C	$\times 10^{-7}/^{\circ}\text{C}$	62	68	80	90
CTE at Set Point	$\times 10^{-7}/^{\circ}\text{C}$	68	75	87	95
Softening Point ¹	°C	386	386	386	386
Annealing Point (T _a)	°C	378	378	378	378
Glass Transition Temp (T _g)	°C	370	370	370	370
Powder Density	g/cc	5.55	5.87	6.46	6.78
Typical Powder Types		VEG	VEG	VEG	VEG
Typical Applications		Alumina	BeO, Sapphire	Soda Lime Glass PD-200	400 Series SS Titanium, Dumet

¹ Refers to the softening point of the base-glass of the composite



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