

Description: Ferro's Pb-Si-Al Passivation Glasses are designed for use on transistors, thyristors and diodes. These products are formulated and produced to achieve very low alkali and iron levels and can be applied by a variety of techniques including Doctor Blading, Photo-Spin, Sedimentation, Screen Printing and Electrophoresis.

Zinc-Boro-Silicate passivation glasses are used for hermetic passivation of high voltage diodes, thyristors and transistors. They provide high junction temperatures and can be applied to

wafers using electrophoresis and thick film methods. These products also possess low alkali and iron levels.

Ferro's Passivation Glasses are also used for encapsulation of rectifiers using glass beading application methods. IP745 is primarily used for single chip, low to medium voltage rectifiers. IX2443 and EG2730 are crystallizing glasses with thermal expansion closely matched to silicon for use on stacked-chip diodes for high voltage applications.

Pb-Si-Al Based Passivation Glasses

	IP 740	IP 745	IP 760	IP 750	IP 770	IP 820	IP 830	IP 900
Composition Family	Pb-Si-B-Al	Pb-Si-B-Al	Pb-Si-B-Al	Si-Pb-B-Al	Pb-Si-Al	Pb-Si-Al	Pb-Si-Al-B	Si-Pb-B-Al
Glass Type	V	V	V	V	V	V	V	V
Peak Fire Temp (°C)	680	690	710	755	820	910	815	890
Time @ Peak Temp (mins)	10	10	10	10	15	15	15	15
CTE @ 260°C	51	48	48	42.5	45	46	45	37
CTE @ Set Pt	56	53.6	53.8	46.7	47	46	50	38.3
Softening Point	636	630	653	698	780	820	740	785
Ta	490	478	505	500	620	650	571	540
Tg	465	458	475	462	596	632	544	520
DEN	3.89	3.45	3.52	3.29	3.8	3.8	3.54	2.86
Typical Powder Form	RWG	DSD, REG, RWG	TF, REG, RWG	TF, REG, RWG	TF, RWG	REG, RWG	TF, RWG	TF, RWG
Typical Application	Wafer Passivation	Diode Encapsulation	Wafer Passivation	Wafer Passivation	Wafer Passivation	Wafer Passivation	Wafer Passivation	Wafer Passivation

V Vitreous
D Crystallising

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Zn-B-Si-Pb Based Passivation Glasses

	IX 2218	IX 2683	IX 2443	EG 2730
Product Group	Passivation	Passivation	Passivation	Passivation
Composition Family	Zn-B-Si-Pb	Zn-B-Si-Pb	Zn-B-Si-Pb	Zn-B-Si-Pb
Glass Type	V	V	D	D
Peak Fire Temp (°C)	670	690	700	720
Time @ Peak Temp (mins)	10	10	10	10
CTE @ 260°C	48	45	45	44
CTE @ Set Pt	56.9	55	33.0 [#]	37.0 [#]
Softening Point	612	635	618	615
Ta	542	580	542	550
Tg	525	560	531	538
DEN	4.03	3.85	3.96	3.9
Typical Powder Form	REG	DSD	RWG, DSD	TF
Typical Application	Diode Encapsulation	Diode Encapsulation	Wafer Passivation	HV Diode encapsulant

V Vitreous
D Crystallising
Fired Thermal Expansion

For applications requiring thicker layers or on large diameter wafers, composite "L" and "C" versions are available for most products. The addition of low expansion inert fillers generally produce thermal expansions 10-15% lower than the base glass, providing a closer expansion fit to the silicon wafer. This typically requires a 25C higher firing temperature. Composites such as these are typically not suitable for direct application on the junction and so an underlying layer of the glass is recommended.

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