

Powder Glass for Coating, Binding, and Sealing

Powder glass is used to coat a wide variety of substrates and elements. Please make your selection using the coefficient of thermal expansion and softening point as a guide. Powder glass is also used as a binder for thick film paste, conductive paste of solar cells, and ceramic chip devices.

Please make your selection using glass type and softening point as a guide.



Properties

Properties/Glass Code		GA-1	GA-4	GA-8	GA-9	GA-12	GA-13	GA-21	GA-34*	GA-44	GA-47
Coefficient of thermal expansion	$\times 10^{-7}/K$	60	63	81	90	73	66	83	45	117	37
Density	$\times 10^3 \text{kg/m}^3$	4.03	2.70	5.38	5.77	2.95	3.04	5.74	3.93	3.02	2.36
Transformation point	$^{\circ}\text{C}$	445	475	400	360	460	660	375	535	630	645
Deformation point	$^{\circ}\text{C}$	505	545	430	385	505	715	402	560	—	715
Softening point	$^{\circ}\text{C}$	595	625	490	430	560	850	450	635	—	—
Dielectric constant	1MHz, 25 $^{\circ}\text{C}$	8.8	6.2	11.7	14.7	6.7	7.2	—	—	8.5	5.2
$\tan \delta$	1MHz, 25 $^{\circ}\text{C}$	$\times 10^{-4}$	12	20	26	17	17	15	—	40	8
Volume resistivity	250 $^{\circ}\text{C}$	$\Omega \cdot \text{cm}$	13.1	10.8	12.2	11.3	10.4	14.1	—	—	—
Log ρ	350 $^{\circ}\text{C}$	$\Omega \cdot \text{cm}$	11.0	8.0	9.5	—	8.3	12.0	—	—	—
Main composition (Glass type)		PbO · B ₂ O ₃ · SiO ₂	Na ₂ O · B ₂ O ₃ · SiO ₂	PbO · B ₂ O ₃ · SiO ₂	PbO · B ₂ O ₃ · SiO ₂	Na ₂ O · ZnO · B ₂ O ₃	CaO · BaO · SiO ₂	PbO · B ₂ O ₃ · SiO ₂	PbO · ZnO · B ₂ O ₃ · SiO ₂ (devitrifiable)	MgO · B ₂ O ₃ · SiO ₂ (devitrifiable)	Al ₂ O ₃ · B ₂ O ₃ · SiO ₂
Color		White, Black	White	White	White	White	White	White	Pale Purple	White	White

Properties/Glass Code		GA-50	GA-55	GA-59	GA-60	LS-0500	BG-0600	BG-0700	BG-0800	BG-0900	BG-1300
Coefficient of thermal expansion	$\times 10^{-7}/K$	24	87	38	96	83	109	112	98	96	70
Density	$\times 10^3 \text{kg/m}^3$	2.15	4.54	3.80	2.88	3.06	6.96	7.29	5.76	6.74	5.23
Transformation point	$^{\circ}\text{C}$	495	700	550	640	495	365	350	435	390	497
Deformation point	$^{\circ}\text{C}$	600	730	—	—	535	395	385	475	420	546
Softening point	$^{\circ}\text{C}$	825	—	645	—	585	430	410	510	460	615
Dielectric constant	1MHz, 25 $^{\circ}\text{C}$	4.1	26.0	—	7.2	7.6	23.6	25.8	16.2	22.4	13.4
$\tan \delta$	1MHz, 25 $^{\circ}\text{C}$	$\times 10^{-4}$	20	25	35	138	19	27	29	17	17
Volume resistivity	250 $^{\circ}\text{C}$	$\Omega \cdot \text{cm}$	12.4	—	—	9.2	9.3	8.7	10.9	9.7	11.5
Log ρ	350 $^{\circ}\text{C}$	$\Omega \cdot \text{cm}$	—	—	—	7.4	7.4	6.8	8.8	7.9	9.4
Main composition (Glass type)		B ₂ O ₃ · SiO ₂	Nd ₂ O ₃ · TiO ₂ · SiO ₂ (devitrifiable)	ZnO · B ₂ O ₃ · SiO ₂ (devitrifiable)	MgO · B ₂ O ₃ · SiO ₂ (devitrifiable)	Na ₂ O · B ₂ O ₃ · SiO ₂	Bi ₂ O ₃ · B ₂ O ₃	Bi ₂ O ₃ · B ₂ O ₃	Bi ₂ O ₃ · B ₂ O ₃	Bi ₂ O ₃ · B ₂ O ₃	Bi ₂ O ₃ · SiO ₂
Color		White	Pale Green	Pale Purple	White	White	Green	Green	White	Green	Light Brown

* We recommend GA-59 as a Pb-free alternative for GA-34 (low expansion type glass). Please contact us about other types of Pb-free glass.