POWDER GLASS

GLASS PASTE

Frit Products Department, Semiconductor Process Materials Division
Advanced Materials Division, Electronic Materials General Division, Electronics Company
AGC Inc.
1-5-1 Marunouchi Chiyoda-Ku, Tokyo 100-8405 Japan
(AGC Frit HP) http://www.agc.com/en/products/electoric/detail/glass_frit_paste.html
(Phone) +81-3-3218-5433

Manufacturing
AGC Electronics Co., Ltd.
1-8 Machiikedai Koriyama, Fukushima 963-0215
URL http://www.agcel.co.jp/

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The following criteria should govern your selection of Powder Glass:

●Thermal expansion coefficient

It is normally desirable to apply compressive stress to the glass after sealing, so choose a powder glass which has a smaller thermal expansion coefficient than the materials being sealed. The difference is between 0 and 15×10^{-7}/℃.

●Sealing temperature

To form a good seal, the powder glass must properly wet toward the material being sealed, so its temperature above the softening point of the glass should be raised.

●Particle size

Particles of powder glass for molds or paints generally pass 100～150 mesh, while those for screen-printing generally pass 250～325 mesh.
Various types of particle distribution are available by request.

●Privacy Policy

- All properties reported here are representative values.
- All information could be subject to change without notice.
- Lead-free used herein means that lead is not an intentional ingredient.

●Definition

R_2O : R_2 can be any alkali metal (K, Na or Li)

RO : R can be any alkaline earth metal (Mg, Ca, Sr or Ba)

Thermal expansion coefficient(CTE) : The average ratio by which the glass expands when heating per 1℃.

Transition point(Tg) : The temperature at which the glass structure changes, with viscosity of approx. $10^{13.3}$ poise.
(Values are the temperature on the shoulder at the first thermal absorption region on the DTA curve. The exception specified in the list individually.)

Softening point(Sp, Ts) : The temperature at which glass deforms under its own weight, with a viscosity of about $10^{7.6}$ poise.
(Sp values are temperature at the peak of the third thermal inflection point on the DTA curve. Ts values are temperature at the peak the fourth inflection point. The exception specified in the list individually.)

Crystallization temperature(Tc) : The temperature at which the heat of crystallization of a crystalline glass reaches a maximum while it is being heated. (The peak temperature for thermal dissipation on the DTA curve.)

Average particle size : Mean particle diameter. (Permeability method)

Particle size (D50) : Median particle diameter. (Laser diffraction method)

Heat Resistance Temperature :
For crystallized glass: The temperature at which no yield is observed on the TMA curve.
For amorphous glass: Below the glass transition point (Tg).

Be sure to remember the following considerations when using AGC glass powder.

●Product Form

- The products are produced by milling glass material .
- Basically the products are packed in aluminum bag.

●Handling

Glass powder could be used by mixing with ceramic filler or pigment, and also mixed with organic solvent as appropriate.

When the shape of sealing area is fixed, glass powder could be pressed and preform could be made by pressing and casting glass powder.

●Storage locations

Avoid direct exposure to sunlight and store in a cool, well-ventilated place.

Please ask the sales person about expiry date of each pastes.

Powder Glass for Binder (1)

V:Vitreous,D:Devitrifying

Code	Development products	Glass Type	Specific Gravity	Firing Condition (℃-min)	CTE(α)		DTA Properties			Particle Properties	Glass Characteristics	Main Application
					($\times10^{-7}$/℃)	Temp range (℃)	Tg (℃)	Ts (℃)	Tc (℃)	D50 (μm)		
ASF-1094B	-	Bi_2O_3・B_2O_3・SiO_2	5.4	550-10	80	50-350	466	536	-	0.9	V	Electronic parts
ASF-1096	-	Bi_2O_3・B_2O_3	6.7	400-15	120	50-350	355	405	465	1.0	D	Electronic parts
ASF-1097	-	Bi_2O_3・B_2O_3・Al_2O_3	5.2	600-15	70	50-350	520	605	-	2.3	V	Electronic parts
ASF-1098	-	Bi_2O_3・B_2O_3・ZnO	5.5	600-10	54	50-350	441	517	535	3.0	D	Electronic parts
ASF-1099	-	ZnO・Bi_2O_3・B_2O_3	4.7	600-10	42	50-350	475	516	562	3.5	D	Electronic parts
ASF-1100	-	Bi_2O_3・B_2O_3	6.3	460-30	107	50-350	380	440	530	5.2	D	Electronic parts
ASF-1100B	-	Bi_2O_3・B_2O_3	6.3	460-30	107	50-350	382	439	520	1.1	D	Electronic parts
ASF-1109NP	-	Bi_2O_3・ZnO・B_2O_3	5.1	580-5	67	50-350	467	548	-	3.4	V	Electronic parts
ASF-4001B	-	Bi_2O_3・ZnO・B_2O_3	6.8	520-10	90	30-300	406	472	-	0.6	V	Electronic parts
SK231-300	-	Bi_2O_3・BaO・B_2O_3	5.1	620-15	84	30-300	491	580	-	5.8	V	Electronic parts
JM-1705	○	Bi_2O_3・B_2O_3・SiO_2	5.3	650-10	73	50-350	512	611	-	2.4	V	Electronic parts
JM-1718	○	Bi_2O_3・B_2O_3・SiO_2	5.9	700-10	84	50-350	556	661	-	2.3	V	Electronic parts
JM-1724	○	Bi_2O_3・B_2O_3・SiO_2	5.7	700-10	76	50-350	551	654	-	2.2	V	Electronic parts
NTX-2W	○	TeO_2・V_2O_5・Bi_2O_3	5.2	380-10	152	30-250	275	328	-	1.0	V	Electronic parts
ASF-1216	-	PbO・SiO_2	4.3	600-15	63	50-350	468	576	-	1.7	V	Electronic parts
ASF-1290A4	-	PbO・B_2O_3	6.3	430-10	105	30-300	332	394	-	3.9	V	Electronic parts
ASF-1330	-	PbO・B_2O_3	5.6	500-15	92	50-350	380	445	-	2.0	V	Electronic parts
ASF-1370	-	PbO・SiO_2・B_2O_3	3.8	650-15	52	50-350	465	615	-	1.9	V	Electronic parts
JP-1	○	SiO_2・PbO	3.5	865-30	40	50-600	637	829	-	4.0	V	Electronic parts

Powder Glass for Binder (2)

V:Vitreous,D:Devitrifying

Code	Development products	Glass Type	Specific Gravity	Firing Condition (℃-min)	CTE(α)		DTA Properties			Particle Properties	Glass Characteristics	Main Application
					($\times10^{-7}$/℃)	Temp range (℃)	Tg (℃)	Ts (℃)	Tc (℃)	D50 (μm)		
ASF-1317	-	SiO2・BaO・B2O3	3.1	810-10	55	50-350	585	730	-	1.5	V	Electronic parts
ASF-1560	-	SiO2・ZnO・CaO	3.3	850-15	73	50-350	670	780	815	2.2	D	Electronic parts
ASF-1561	-	SiO2・ZnO・CaO	3.4	850-10	75	50-350	640	750	892	3.5	D	Electronic parts
ASF-1620B	-	ZnO・B2O3・SiO2	3.7	850-15	55	50-350	570	656	759	4.5	D	Electronic parts
ASF-1700	-	SiO2・BaO・ZnO	3.6	850-15	72	50-350	680	813	890	2.0	D	Electronic parts
ASF-1702	-	BaO・SiO2・ZnO	3.8	950-15	119	50-350	679	807	911	2.6	D	Electronic parts
ASF-1717B	-	SiO2・BaO・ZnO	3.3	850-10	35	50-350	677	808	846	2.5	D	Electronic parts
ASF-1761	-	SiO2・RO	3.0	1000-15	69	50-350	710	870	-	5.2	V	Electronic parts
ASF-1780	-	SiO2・B2O3・BaO	2.5	850-15	52	50-350	538	783	-	4.9	V	Electronic parts
ASF-1891	-	ZnO・B2O3・SiO2	3.5	800-10	64	50-350	493	586	709	2.8	D	Electronic parts
ASF-1891C	-	ZnO・B2O3・SiO2	3.5	800-10	65	50-350	495	586	711	1.4	D	Electronic parts
ASF-1898B	-	BaO・B2O3・ZnO	3.4	600-10	106	50-350	442	526	710	1.1	D	Electronic parts
ASF-1930	-	SiO2・TiO2・R2O	2.8	800-15	113	50-350	570	660	805	3.0	D	Electronic parts
ASF-1939	-	BaO・SiO2・B2O3	3.7	850-15	88	50-350	620	716	Unclear	1.3	D	Electronic parts
ASF-1941B	-	BaO・SiO2・B2O3	3.7	700-15	90	50-350	591	683	-	1.2	V	Electronic parts
K-304	○	RO・B2O3・SiO2	2.9	490-60	106	30-250	444	525	614	9.0	D	Electronic parts
K-807	○	BaO・SiO2・B2O3	3.5	780-15	74	30-300	657	776	-	6.8	V	Electronic parts
K-808	○	BaO・SiO2・B2O3	3.4	795-15	68	30-300	666	795	-	11.7	V	Electronic parts
K-835	○	ZnO・B2O3	3.8	680-10	36	30-350	544	Unclear	680	7.0	D	Electronic parts
LS-5-300M	-	SiO2・BaO・Li2O	2.9	620-15	105	30-300	490	610	675	10.0	D	Electronic parts
200GF	○	SiO2・R2O・BaO	2.5	750-30	105	50-300	472	649	-	5.9	V	Electronic parts
1724-1.5	-	SiO2・Al2O3・CaO	2.6	950-10	45	50-350	744	913	-	1.6	V	Electronic parts

Powder Glass for Low Temperature sealing

V:Vitreous,D:Devitrifying

Code	Development products	Glass Type	Specific Gravity	Firing Condition (℃-min)	CTE(α)		DTA Properties			Particle Properties	Glass Characteristics	Main Application
					($\times10^{-7}$/℃)	Temp range (℃)	Tg (℃)	Ts (℃)	Tc (℃)	D50 (μm)		
TNS062	○	TeO2・V2O5	4.2	380-10	134	30-250	271	327	-	9.1	V	Low temp sealing
TNS062HS	○	TeO2・V2O5	4.0	360-10	76	50-250	266	332	-	3.8	V	Glass, Al2O3, Si sealing
NTX-2D	○	TeO2・V2O5・Bi2O3	5.2	380-10	153	30-250	274	329	-	22.7	V	Low temp sealing
KFW034HS	○	TeO2・V2O5	4.4	350-10	79	50-250	259	332	-	3.6	V	Glass, Al2O3, Si sealing
KFW071	○	TeO2-V2O5	4.7	350-10	157	50-250	258	302	-	5.3	V	Glass, Al2O3, Si sealing
F-V408	○	TeO2・V2O5	3.9	400-10	91	50-250	287	348	-	3.2	V	Glass, Al2O3 sealing
V408HS	○	TeO2・V2O5	3.8	400-10	46	50-250	288	355	-	2.4	V	Glass,Si,Kovar sealing
KF9173	-	Bi2O3・B2O3・ZnO	6.4	520-10	97	30-300	403	480	-	11.0	V	Seathed heaters
ASF-2511C	-	Bi2O3・ZnO	6.4	500-10	82	30-300	353	425	-	8.0	V	Soda-Lime Glass sealing
KFI0115B	○	Bi2O3・ZnO・B2O3	7.4	440-10	107	30-300	357	414	-	1.2	V	Stainless sealig
YFT-531E	○	Bi2O3・ZnO・B2O3	4.8	590-10	77	50-350	495	583	-	2.8	V	-
ASF-6004A	-	B2O3・SiO2・ZnO	2.5	580-10	72	50-350	474	585	-	2.9	V	-
ASF-1898	-	BaO・B2O3・ZnO	3.4	600-10	106	50-350	433	527	-	4.5	V	Seathed heaters
SG354	○	SiO2・B2O3・RO	3.4	700-10	107	50-350	567	681	-	2.2	V	Metal sealing
KAC-31-N2L	○	SiO2・R2O・RO・Al2O3	2.5	750-30	71	50-350	509	711	-	4.2	V	Al2O3 sealing
1991Y10	○	SiO2・R2O・TiO2	2.8	600-10	151	50-350	418	528	-	5.0	V	Metal sealing
7574	-	ZnO・B2O3・SiO2	3.7	775-30	37	50-500	567	665	-	45.0	D	For Aluminum Nitride
ASF-2851	-	SiO2-B2O3	2.2	-	32	30-330	-	923	-	12.0	V	-
9079-150	-	SnO・P2O5	3.7	480-10	119	30-250	284	360	-	10.7	V	-
FP74	-	SnO・P2O5	3.3	480-10	65	30-250	284	369	-	23.7	V	Ceramics sealing
KP312	○	SnO・P2O5	3.8	430-10	128	30-250	280	352	-	9.0	V	-
KP312E	○	SnO・P2O5	3.5	430-10	71	30-250	280	398	-	20.0	V	Ceramics sealing

Powder Glass for heat resitance

V:Vitreous,D:Devitrifying

Code	Development products	Glass Type	Heat Resistance Temp.	Firing Condition (℃-min)	CTE(α)		DTA Properties			Particle Properties	Glass Characteristics	Main Application
					(×10^{-7}/℃)	Temp range (℃)	Tg (℃)	Ts (℃)	Tc (℃)	D50 (μm)		
CM251-H4	○	RO・B2O3・MgO	900	850-60	97	50-350	604	701	820	8.7	D	SOFC sealing
CM251-ZL	-	La2O3・B2O3・MgO	900	850-60	111	50-350	659	759	892	10.4	D	SOFC sealing
CM251-ZL5	○	La2O3・B2O3・MgO	900	850-60	97	50-350	680	776	894	10.0	D	SOFC sealing
CM251-CS14	○	La2O3・RO・B2O3	900	850-180	106	50-350	662	749	849	6.5	D	SOFC sealing
DSG006La4	○	La2O3・B2O3・ZnO	800	800-60	120	50-350	620	709	820	9.7	D	SOFC sealing
DSG006-S6	○	ZnO・La2O3・B2O3	800	750-60	92	50-350	610	704	795	9.7	D	SOFC sealing
HHR09101	○	RO・SiO2・Al2O3	1000	950-180	91	50-300	730	839	958	10.8	D	SOFC sealing
HHR10071	○	SiO2・RO・Al2O3	1000	1050-15	67	30-300	672	850	952	12.0	D	Al2O3 coating
HHR10072	○	Al2O3・RO・SiO2	1000	1050-60	71	50-500	749	907	1123	20.0	D	Al2O3 sealing
ER001	○	SiO2・ZrO2・R2O	-	900-60	66	50-350	687	893	-	7.0	V	Microreactor sealing
HHR0706	○	ZnO・B2O3・SiO2	700	850-60	43	50-350	573	661	770	4.5	D	For Aluminum Nitride
1724-7	-	SiO2・Al2O3・CaO	700	950-60	46	50-350	740	928	-	7.1	V	For Aluminum Nitride

Powder Glass for Glass-Ceramic Multilayer Substrate

V:Vitreous,D:Devitrifying

Code	Development products	Glass Type	Specific Gravity	Firing Condition (℃-min)	CTE(α)		DTA Properties			Particle Properties	Glass Characteristics	Main Application
					($\times10^{-7}$/℃)	Temp range (℃)	Tg (℃)	Ts (℃)	Tc (℃)	D50 (μm)		
ASF-102M	-	SiO_2・B_2O_3	2.2	850-60	28	50-350	Unclear	790	-	3.3	V	Multilayer substrate
ASF-102X	-	SiO_2・B_2O_3	2.2	850-60	28	50-350	Unclear	762	-	1.1	V	Multilayer substrate
ASF-102Y	-	SiO_2・B_2O_3	2.2	850-60	28	50-350	Unclear	775	-	1.3	V	Multilayer substrate
102-0.3	○	SiO_2・B_2O_3	2.2	850-60	24	50-350	Unclear	729	-	0.3	V	Multilayer substrate
ASF-1700F	-	SiO_2・RO・ZnO	3.6	850-15	67	50-350	671	810	923	1.8	D	Multilayer substrate
FF-201	-	SiO_2・Al_2O_3・RO	2.6	900-30	50	40-750	720	900	1040	17.0	D	Multilayer substrate
DL828	○	SiO_2・B_2O_3・Al_2O_3	2.3	900-60	36	50-350	Unclear	860	-	1.2	V	Multilayer substrate
BAC13	○	SiO_2・B_2O_3・RO	2.2	900-60	34	50-350	Unclear	870	-	1.5	V	Multilayer substrate
BAC13-A6	○	SiO_2・B_2O_3・RO	2.8	900-60	56	50-350	Unclear	885	-	1.8	V	Multilayer substrate
DL5000	○	SiO_2・B_2O_3・RO	2.5	900-15	43	50-350	Unclear	869	-	2.1	V	Multilayer substrate
ASF-1781B	-	SiO_2・B_2O_3・RO	2.2	900-60	33	50-350	Unclear	919	-	1.8	V	Multilayer substrate
DL75ST	○	SiO_2・B_2O_3・CaO	2.4	870-20	55	50-350	646	836	-	1.6	V	Multilayer substrate
DL003B-AC32	○	SiO_2・B_2O_3・RO	-	870-120	41	50-350	654	820	-	2.2	V	Multilayer substrate
FF201-C2X35	○	SiO_2・Al_2O_3・RO	-	870-120	57	50-350	714	808	856	1.1	D	Multilayer substrate

Be sure to remember the following considerations when using AGC glass paste.

● Product Form

- AGC glass pastes consist of glass powder and vehicle and basically designed for screen printing.
- Basically the products are packed in plastic container.

● Mixing

Mix thoroughly before use, taking particular care not to cause air bubbles.

● Adjusting viscosity

Pastes have been prepared for use without further adjustment but, if necessary, recommended thinner can be used to adjust their viscosity.

● Application

Pastes should be applied in a well-ventilated area. Take particular care not to continue breathing the vapor for any considerable length of time, and do not allow the paste to remain in contact with the skin.

● Storage locations

Avoid direct exposure to sunlight and store in a cool, well-ventilated place.

Please use within six months of receipt.

Please ask the sales person about expiry date of each pastes.

Overcoat Glass Paste for Electronic parts

IR : Insulation Resistance BV : Breakdown Voltage V:Vitreous,D:Devitrifying

Code	Development products	Glass Type	Firing Condition (℃-min)	α ×10^{-7}/℃	DTA Properties			Electrical Properties			Paste Viscosity		Particle Properties		Glass Characteristics	Color		Features
					Tg (℃)	Ts (℃)	Tc (℃)	IR (Ω)	ε 1KHz	tanδ (%)	η10 Pa・s	Ratio η10/η50	Average Particle (μm)	D50 (μm)		Paste	Fired	
AP5346	-	SiO2・B2O3・PbO	510-5	71	400	495	-	10e10	8～12	<0.5	178	2.2	1.4	-	V	Green	Green	Excellent Water Resistance
AP5551	-	B2O3・ZnO・PbO	550-5	47	456	-	538	10e10	7～12	<0.5	145	2.0	2.2	1.3	D	Green	Green	High Stregth
AP5840N	-	SiO2・PbO	550-5	61	462	553	-	-	-	-	82	1.4	1.8	-	V	Green	Green	For N2 atomosphere
AP5094D	-	SiO2・B2O3・Bi2O3	520-10	85	452	508	-	-	-	-	111	2.9	-	0.6	V	Yellow	Yellow	Excellent Acid Resistance
5033NF1	○	SiO2・ZnO・Bi2O3	580-10	90	450	565	600	-	-	-	99	1.9	-	1.9	D	Black	Black	Excellent Acid Resistance
1096-P200	○	Bi2O3・B2O3	400-15	120	355	405	465	-	-	-	198	3.3	-	1.0	D	Yellow	Yellow	-
YPT531E	○	Bi2O3・B2O3・ZnO	590-30	77	500	590	-	-	11～13	-	104	2.1	-	2.5	V	White	Clear	High Refraction Index / Transparent
YPT525G	○	SiO2・B2O3・ZnO	580-30	72	474	585	-	-	-	-	103	2.1	-	2.9	V	White	Clear	Low ε / Transparent
5102Y	○	SiO2・B2O3・R2O	850-60	28	Unclear	775	-	-	-	-	101	1.8	-	1.3	V	White	Clear	Excellent Acid & Heat Resistance
200GF-P100	○	SiO2・R2O・BaO	750-30	105	472	649	-	-	-	-	101	2.1	-	5.9	V	White	White	-
1941B-P50	○	BaO・SiO2・B2O3	700-15	90	591	683	-	-	-	-	46	2.8	-	1.2	V	White	White	-
SG354-P	○	SiO2・B2O3・RO	700-10	107	567	681	-	-	-	-	40	-	-	2.2	V	White	White	-
APS-187AS	○	SiO2・B2O3・R2O	800-10	72	535	710	-	-	6.2	14	-	1.5	-	1.6	V	White	Clear	For Al2O3 (800℃), Acid-alkali resistance
CM251-ZL-P70	○	La2O3・B2O3・MgO	850-60	111	659	759	892	-	-	-	71	1.3	-	10.4	D	White	White	-
CM251-ZL5-P70	○	La2O3・B2O3・MgO	850-60	97	680	776	894	-	-	-	72	1.2	-	10.0	D	White	White	-
DSG006-S6-P70	○	ZnO・La2O3・B2O3	750-60	94	611	705	806	-	-	-	77	1.3	-	10.0	D	White	White	-

Dielectric Cross over Paste for Hybrid IC

IR : Insulation Resistance BV : Breakdown Voltage

V:Vitreous,D:Devitrifying,P:Partially

Code	Development products	Glass Type	Firing Condition (℃-min)	α ×10^{-7}/℃	DTA Properties			Electrical Properties				Paste Viscosity		Particle Properties		Glass Characteristics	Color		Features
					Tg (℃)	Ts (℃)	Tc (℃)	IR (Ω)	BV (V)	ε 1KHz	tanδ (%)	η10 Pa・s	Ratio η10/η50	Average Particle (μm)	D50 (μm)		Paste	Fired	
AP5576VE	-	SiO2・ZnO・RO	850-10	52	668	-	829	1.4×10e12	2670	13.5	0.07	185	2.3	1.6	-	D	Orange	White	High Voltage Resistance
AP5577	-	SiO2・ZnO・RO	850-10	52	668	775	829	2.0×10e12	2532	13.6	0.07	176	1.8	1.6	-	D	Blue	Blue	High Voltage Resistance
AP5700C	-	SiO2・ZnO・RO	850-10	72	673	810	884	>10e12	3000	9.5	0.17	175	2.3	1.3	-	P	Orange	White	High Voltage Resistance
AP5701C	-	SiO2・ZnO・RO	850-10	72	680	815	890	1.7×10e12	2971	9.4	0.17	176	2.3	1.3	-	P	Blue	Blue	High Voltage Resistance

Dielectric Paste for Al2O3 Substrate Glazing of Print Head

V:Vitreous

Code	Development products	Glass Type	Firing Condition (℃-min)	α ×10^{-7}/℃	DTA Properties			Surface Roughness		Paste Viscosity		Particle Properties		Glass Characteristics	Color		Features
					Tg (℃)	Ts (℃)	Tc (℃)	Ra (μm)	Rz (μm)	η10 Pa・s	Ratio η10/η50	Average Particle (μm)	D50 (μm)		Paste	Fired	
AP5761D	-	SiO2・B2O3・RO	1275-60	70	698	863	-	-	-	170	2.5	-	5.2	V	Orange	Clear	For Flat Glaze / Smooth
AP5762D	-	SiO2・RO	1270-30	65	763	920	-	-	-	156	2.0	-	5.2	V	Blue	Clear	For partial Glaze / Smooth

Overcoat Glass Paste for Print Head

V:Vitreous,D:Devitrifying

Code	Development products	Glass Type	Firing Condition (℃-min)	α ×10^{-7}/℃	DTA Properties			Electrical Properties	Fired Thickness (μm)	Surface Roughness		Paste Viscosity		Particle Properties		Glass Characteristics	Color		Features
					Tg (℃)	Ts (℃)	Tc (℃)	BV (V)		Ra (μm)	Rz (μm)	η10 Pa・s	Ratio η10/η50	Average Particle (μm)	D50 (μm)		Paste	Fired	
AP5349C	-	PbO・B2O3・SiO2	810-10	64	460	591	-	3121	-	-	0.3	107	2.7	1.5	-	V	Gray	Brown	For Heater / Smooth & High Voltage Resistance
AP5316A	-	SiO2・B2O3・RO	810-10	55	588	733	-	3435	-	-	0.9	91	1.6	-	1.8	V	Gray	Gray	For Heater / Smooth & High Voltage Resistance
SATO-31H3	-	SiO2・B2O3・RO	810-10	69	632	803	-	＞1500	46	-	＜0.8	132	2.2	-	-	V	Gray	Gray	For Heater / Smooth & High Voltage Resistance
KATO-18R	○	SiO2・B2O3・RO	810-10	69	638	794	-	-	-	＜0.1	-	109	2.6	-	-	V	White	Clear	For Thermal Head / Smooth / Excellent light blockng
AP5564WC	-	SiO2・B2O3・PbO	830-10	51	Unclear	680	-	-	-	0.2	-	102	2.6	-	0.9	V	Orange	Clear	For Thermal Head / Smooth
AP5565WB	-	SiO2・PbO	830-10	56	Unclear	677	-	-	-	0.2	-	130	3.2	0.8	1.1	V	Blue	Clear	For Thermal Head / Smooth
AP5568C	-	SiO2・PbO	830-10	59	555	765	-	-	-	0.1	-	93	2.6	-	0.8	V	White	Clear	For Thermal Head / High Wear Resistance
AP5352C	-	PbO・B2O3・SiO2	810-10	60	460	550	-	-	-	0.1	-	111	2.2	-	1.5	V	Black	Black	For Image Sensor / Excellent light blockng
5317B1	○	SiO2・B2O3・RO	850-10	55	585	730	-	-	-	-	＜0.8	91	1.7	-	1.5	V	Gray	Gray	For AlN Top layer
AP5717B	-	SiO2・ZnO・RO	850-10	32	672	803	839	-	-	-	-	153	1.4	-	2.6	D	White	White	For AlN Bottom layer

Sealing Glass Paste

V:Vitreous,D:Devitrifying

Code	Development products	Glass Type	Firing Condition (℃-min)	α ×10-7/℃	DTA Properties			Paste Viscosity		Paste Viscosity		Particle Properties	Glass Characteristics	Color		Features
					Tg (℃)	Ts (℃)	Tc (℃)	η10 Pa・s	Ratio η10/η50	η25 Pa・s	Ratio η5/η50	D50 (μm)		Paste	Fired	
P-V408HS	○	TeO2・V2O5	400-10	47	288	355	-	114	1.6	-	-	-	V	Brown	Black	Glass,Si,Kovar sealing
AP4290D1	-	SiO2・B2O3・PbO	430-10	78	332	405	-	137	2.7	94	2.7	3.8	V	White	White	-
AP4115AB	-	Bi2O3・ZnO	440-10	79	345	403	-	-	2.3	92	2.5	-	V	Yellow	Yellow	-
KFI0115B-P200	○	Bi2O3・ZnO・B2O3	440-10	107	357	414	-	199	2.0	-	-	1.2	V	Yellow	Yellow	-
HFR-05	○	Bi2O3・SiO2・B2O3	650-10	72	513	612	-	117	2.1	-	-	2.3	V	Gray	Clear	For Al2O3 (650℃), Acid-fluorine acid resistant
HFR-24	○	Bi2O3・SiO2・B2O3	720-10	76	551	654	-	109	2.0	-	-	2.3	V	Gray	Clear	For Al2O3 (700℃), Acid-fluorine acid resistant
AR-A312	○	SiO2・R2O	820-10	71	509	711	-	116	1.6	-	-	4.2	V	White	Clear	For Al2O3 (850℃), Acid-alkali resistance