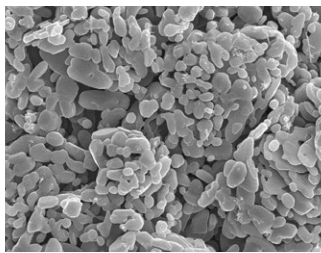


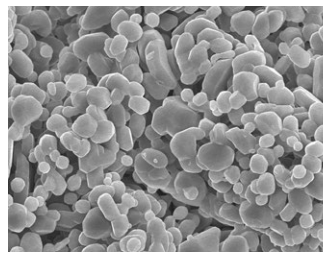
Low Soda Alumina

Low soda alumina features excellent chemical stability, electric insulation, heat resistance, thermal conductivity, hardness and mechanical strength. It is widely used in electronic devices, spark plugs and mechanical parts as well as engineering ceramics. We make sure that the

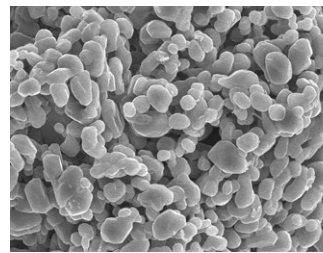
sintering characteristics such as firing shrinkage are controlled to meet individual applications. The quality of LS-20 series is precisely controlled. LS-719 is a product of controlled particle size distribution with a special grinding method.



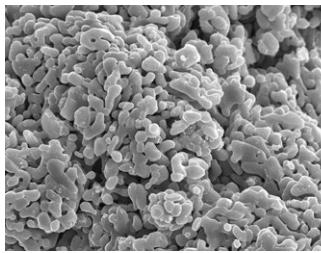
LS-11



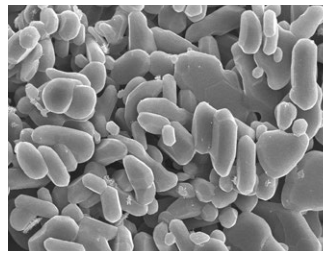
LS-12



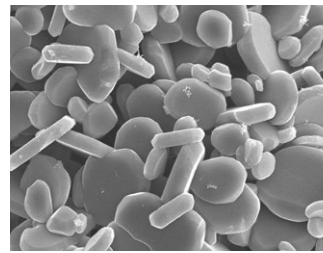
LS-13



LS-20



LS-22



LS-21

Typical Properties (Unmilled)

Grade	SLS-13	LS-11	LS-12	LS-13	LS-20	LS-22	LS-21
LOI (%)	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Na ₂ O (%)	0.04	0.03	0.03	0.02	0.05	0.05	0.06
SiO ₂ (%)	0.07	0.06	0.05	0.05	0.02	0.02	0.02
Fe ₂ O ₃ (%)	0.02	0.03	0.03	0.03	0.02	0.02	0.02
Al ₂ O ₃ (%)	99.9	99.9	99.9	99.9	99.9	99.9	99.9
Ave. Particle Size (µm)	110	55	55	55	20~40	20~40	20~40
α-Crystal Size (µm)	-	1~2	1~3	2~4	2~3	2~3	3~5
BET Specific Surface Area (m ² /g)	-	1.4	1.2	1.0	1.5	1.0	0.6
Green Density (g/cm ³)*	-	2.03	2.10	2.12	2.03	2.10	2.26
Fired Density (g/cm ³)*	-	3.79	3.80	3.78	3.81	3.81	3.78
Linear Shrinkage (%)*	-	19.2	18.7	17.7	19.0	18.0	15.9

*LS-11, LS-12 and LS-13: with 4% flux after grinding. Pressed at 49.03MPa{500kgf/cm²}, Fired at 1590°C for 3hrs

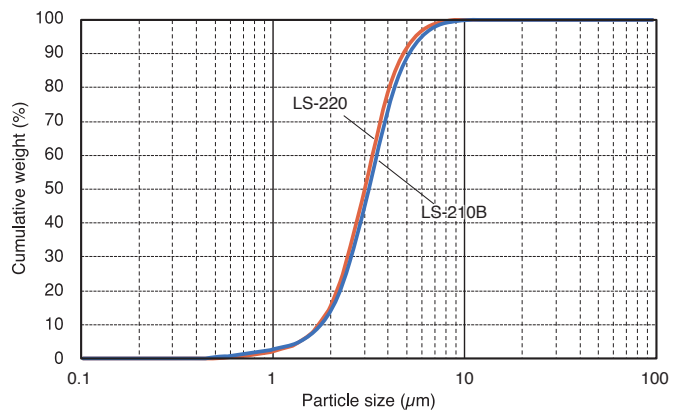
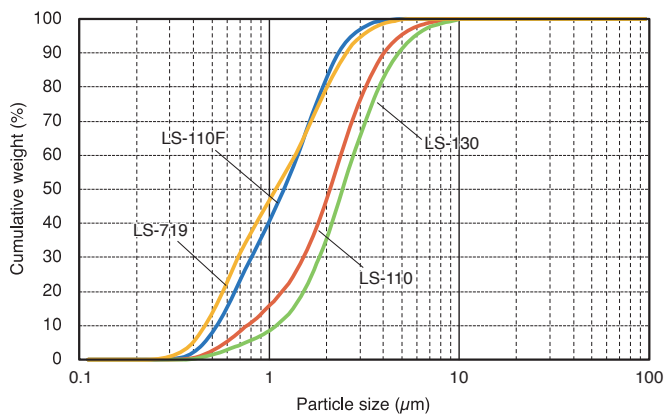
*LS-20, LS-21 and LS-22: with 4% flux after grinding. Pressed at 49.03MPa{500kgf/cm²}, Fired at 1640°C for 3hrs

Typical Properties (Milled)

Grade	LS-110	LS-130	LS-110F	LS-220	LS-210B	LS-719
LOI (%)	0.02	0.02	0.08	0.03	0.04	0.24
Na ₂ O (%)	0.03	0.02	0.03	0.05	0.06	0.08
SiO ₂ (%)	0.06	0.06	0.07	0.02	0.03	0.01
Fe ₂ O ₃ (%)	0.03	0.03	0.03	0.02	0.02	0.02
Al ₂ O ₃ (%)	99.9	99.9	99.9	99.9	99.9	99.9
Ave. Particle Size (μm)	2.1	2.4	1.2	3.0	3.2	1.1
α-Crystal Size (μm)	1~2	2~4	1~2	2~3	3~5	0.4~0.6
BET Specific Surface Area (m ² /g)	1.6	1.4	3.1	1.4	1.4	4.4
Bulk Density (Pressed) (g/cm ³)*	2.27	2.30	2.31	2.22	—	—
Green Density (g/cm ³ **)	2.13	2.23	2.33	2.17	—	—
Fired Density (g/cm ³ **)	3.78	3.78	3.89	3.81	—	—
Linear Shrinkage (%)	18.0	16.7	15.7	17.5	—	—

*Pressed at 98.07MPa{1000kgf/cm²} **With 4% flux, Pressed at 49.03MPa {5000kgf/cm²}, Fired at 1640°C for 3hrs

Particle Size Distribution

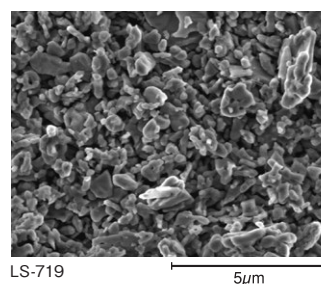
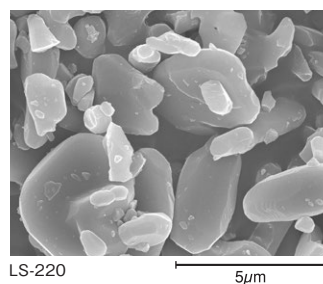
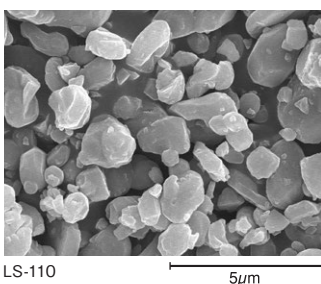


Applications

- (1) Spark plug
- (2) Electronic parts (IC substrates, capacitors)
- (3) Engineering ceramics for semiconductor manufacturing equipment
- (4) Laboratory apparatus
- (5) Mechanical parts
- (6) Special refractories
- (7) Catalyst carriers
- (8) Abrasives

Packing

- Flexible container bag (500kg and 1000kg)
- Paper bag (25kg)

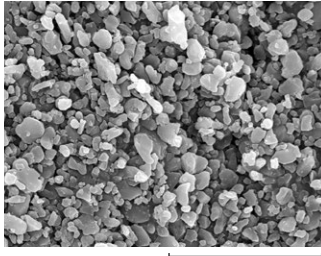


Reactive Alumina

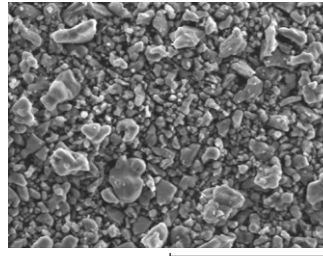
Low Shrinkage Alumina

Our reactive aluminas can be easily sintered to high density at lower temperature and are suitable for fine ceramics requiring high mechanical strength and good surface finish. LS-711CB, further limiting soda content, is mainly used in

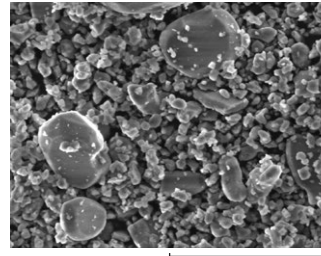
applications that require high reliability. An alumina with high green density provides low shrinkage after firing and is suitable for precision ceramics.



LS-711



LS-710C



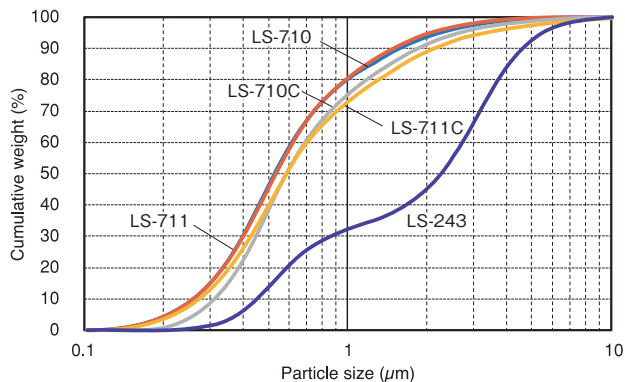
LS-243

Typical Properties

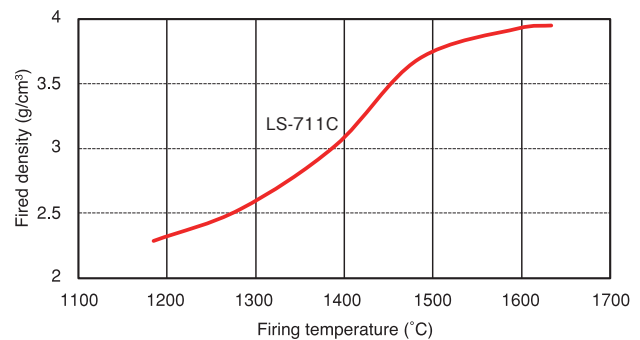
Grade	LS-711	LS-711C	LS-711CB	LS-710	LS-710C	LS-243
LOI (%)	0.38	0.32	0.30	0.38	0.32	0.05
Na ₂ O (%)	0.08	0.08	0.03	0.08	0.08	0.07
SiO ₂ (%)	0.02	0.02	0.05	0.02	0.02	0.03
Fe ₂ O ₃ (%)	0.02	0.02	0.02	0.02	0.02	0.02
MgO (%)	0.05	0.05	0.05	—	—	0.02
Al ₂ O ₃ (%)	99.8	99.8	99.9	99.9	99.9	99.8
Ave. Particle Size (µm)	0.5	0.6	0.6	0.5	0.6	2.3
α-Crystal Size (µm)	0.5	0.5	0.5	0.5	0.5	0.5~5.0
BET Specific Surface Area (m ² /g)	6.6	5.6	5.7	6.6	5.6	3.8
Green Density (g/cm ³)	2.15	2.13	2.15	2.16	2.15	2.58
Fired Density (g/cm ³)	3.94	3.94	3.94	3.90	3.89	3.82
Linear Shrinkage (%)	18.3	18.4	18.4	17.9	17.9	12.4

* Pressed at 34.32MPa {350kgf/cm²}, Fired at 1600°C for 3hrs without flux
 LS-243 : Pressed at 98.07MPa {1000kgf/cm²}, Fired at 1700°C for 2hrs without flux

Particle Size Distribution



Sintering Properties



Application

- (1) Mechanical parts
- (2) Special refractories
- (3) Parts for semiconductor manufacturing apparatus

Packing

- Flexible container bag (500kg and 1000kg)
 Paper bag (25kg)