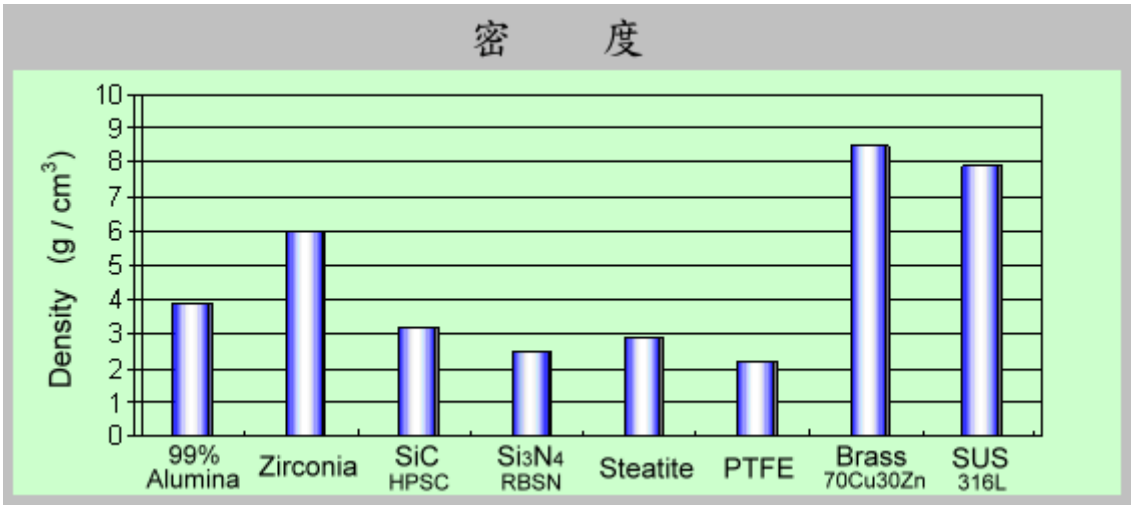
ALUMINA PROPERTY

TALCON NEW CERAMICS

The Alumina（Aluminum Oxide）ceramics is advanced ceramics which is most of using quantities and wide range of application. Its melting point is 2040℃, the Vickers Hardness can get up to 1800HV, and it has excellent character of Physics, Chemical, Electrical & Mechanical.

We can manufacture the 90, 92, 96, 99.5, 99.7 high purity of precise Alumina components according to your demand.

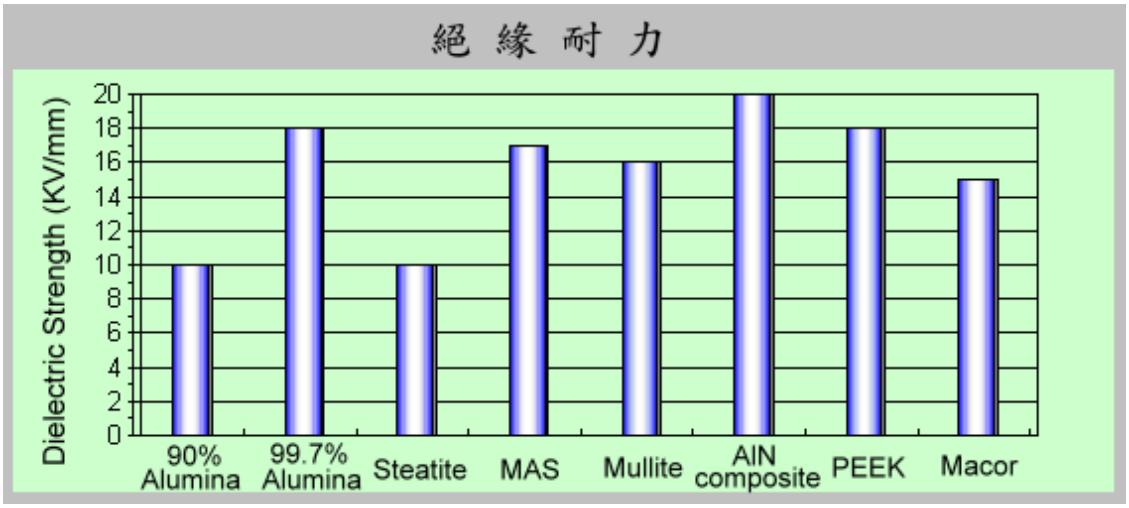


Electrical Insulators

The best one of wide range of applications for Alumina is high frequency of Electrical Insulators.
It's very strong to combine Al with O atom, hence the dense Alumina has very high Dielectric breakdown strength which is between 10 and 18kv/mm in according to purity 90~99.7%.

Except the over 99.5% of purity, the alumina material of common industry contains a little impurity of Na, Si... That Na_2O contains merely 0.03~0.1%, but it's still aggravated the dielectric loss. Fortunately, the relative content of SiO_2 can whittled down Na_2O's ill effects. For our Alumina, the dielectric loss factor is very low at high frequency; it has dense & non-absorbent of microstructure, hence the dielectric loss factors will not multiple increases because of making damp in the air.

At room temperature, the Alumina's volume resistivity is about $10^{13}\Omega$.cm (99%), it will change by purity variation, and also it will decrease due to the temperature rise. It still has $10^{6}\,\Omega$.cm even though the temperature goes up to 1000℃.

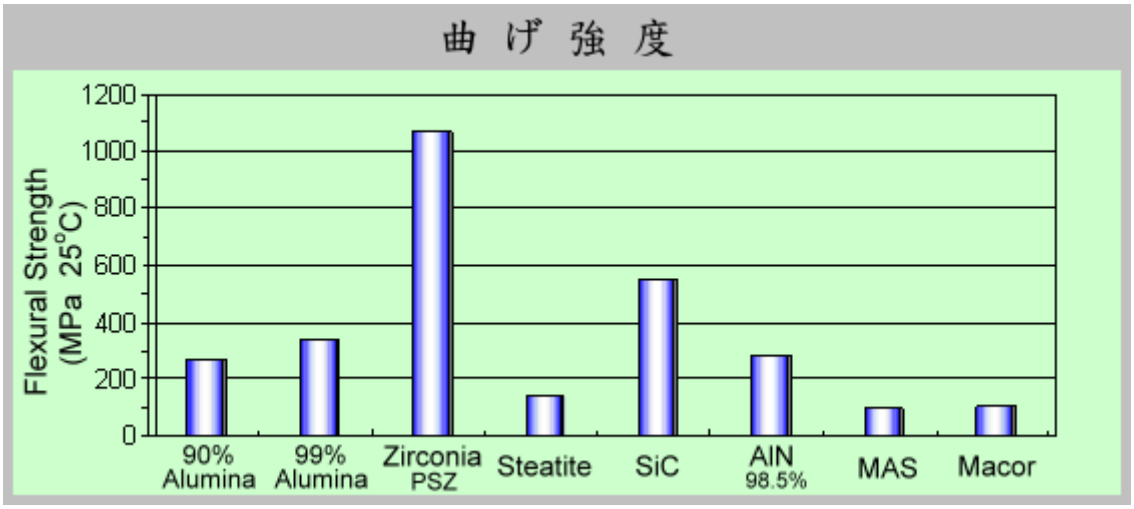


Mechanical Strength

The Chemical structure of Alumina is very stability and firm, it's composed of 60% of ionic bonds and 40% of covalent bonds; so, its hardness & strength are very strong.
The grain size, porosity and distribution affect the flexural strength very large. Therefore, it's very important to has well-distributed and of structure.

After high temperature sintering the Alumina will be stable state of hexagonal α -Al_2O_3, the micros-structure is sturdy and meticulous; It has the character of Gas tight and high temperature stability.
It's still maintaining high mechanical strength at high temperature. When the temperature goes up over to 1100℃, the flexural strength will just obviously drop. At 1200℃, the strength is just half of the time of room temperature.

Beside, the compression strength is about 7~9 times the flexural strength.



Corrosion Resistance

Alumina is an Advance material which is man-made, high purity & inert. At highest temperature and demanding circumstance, it has excellent chemical stability. Its max use temperature is more than engineering plastic of PTFE, PEEK, and PPS. It isn't like metal materials which can be contaminated by auto-corrosion. The chemical transportation uses it a great many.

The capability of corrosion resistance is raise with content increasing. Alumina only can not resist the corrosion by Hydrofluoric acid (HF), the corrosion range is in direct proportion to SiO_2 content; The Cold Hydrochloric acid (HCl) is almost not to cause reaction. But, the 90℃ of Hydrochloric acid of hot & high consistency has more erosion.

There are just slight of differ range of erosion to Sulfuric acid (H_2SO_4), Nitric acid (HNO_3), Sodium Hydroxide (NaOH). Alumina is not caused reaction with almost of melt metal; nonetheless it has more corrosion to Li & Ti.

耐 薬 品 性 Chemical Resistance

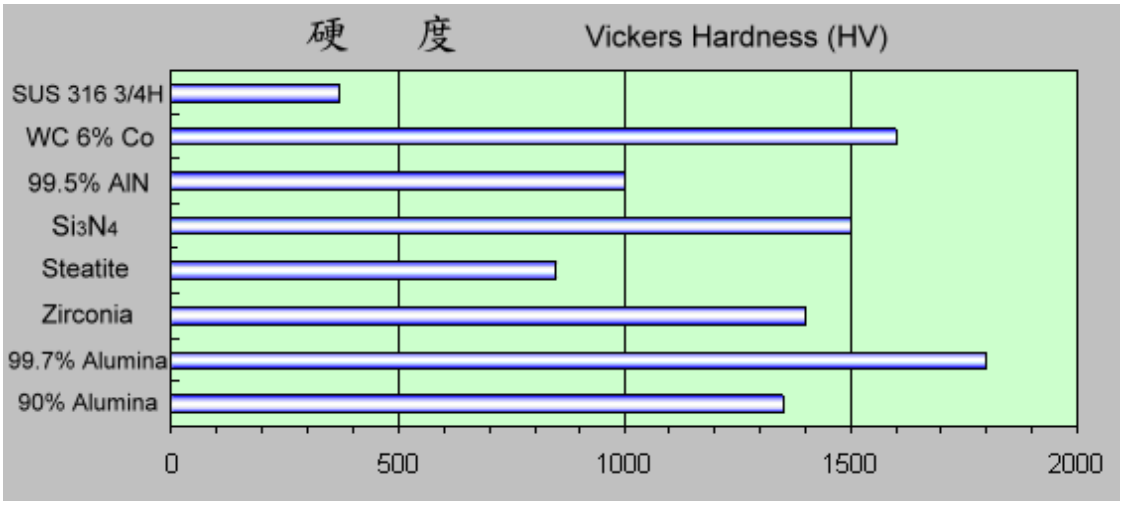
	Temp.	92 % Alumina	99.5 % Alumina	Zirconia
H_2SO_4 95 % 硫 酸	95℃	0.7	0.3	0.04
HNO_3 60% 硝 酸	90℃	0.32	0.1	0.01
NaOH 30% 力性ソー ダ	80℃	0.94	0.21	0.08

Weight loss (mg / cm^2 / day)

Wear Resistance

Alumina is a high hardness of material; the hardness is between 1350HV and 1800HV according to 90~99.7% of different composing. In general, the alumina content is more and its hardness is stronger, also its wear resistance is more endure. However, the sintering temperature is higher, relative to the material cost is increasing by a Wide Margin.

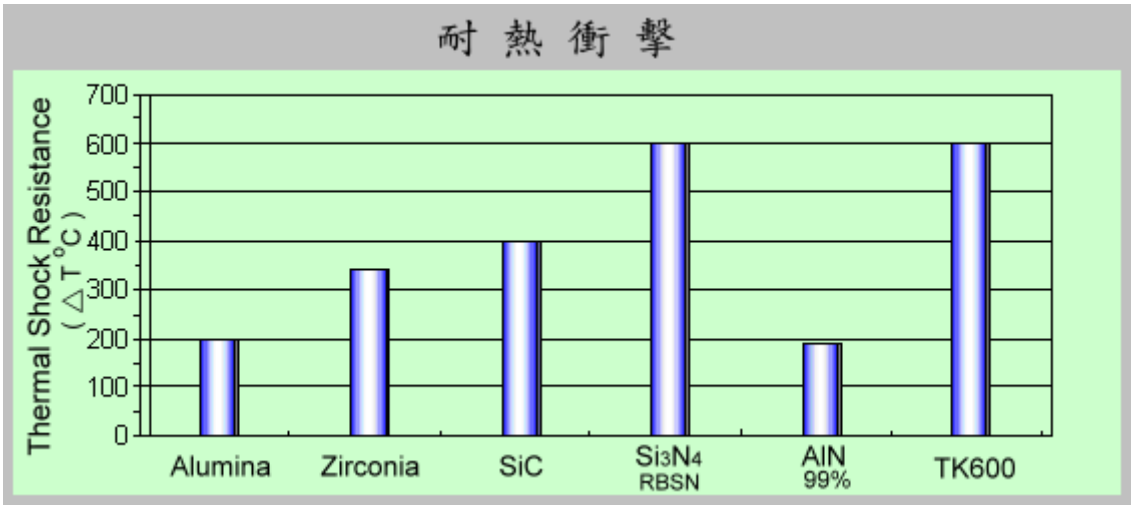
It also can add slight of Chrome Oxide (Cr_2O_3) to make the crystal more fineness, therefore the toughness & hardness is increased to make the wear resistance more endure. Such the pink Alumina is very common & extensively used by the textile industry.

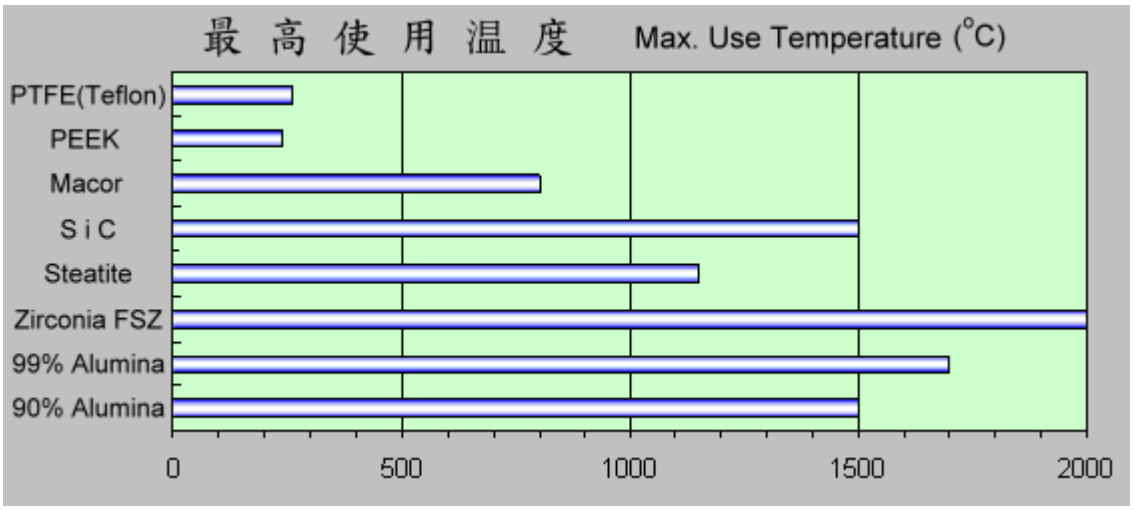


Max. Use Temperature

The capacity of high temperature resistance for advanced technologic ceramics is that the all kinds of metal or high polymer of materials can not compare. The max. use temperature of our alumina is about 1700℃. (Please refer ceramics property)

The defect of ceramic materials is resisting worse to thermal shock. In general, Alumina can be resist to the thermal shock temperature is about 200℃.
We offer TK600 which is special compound material and its resistance capacity of thermal shock can be increasing by 3 times, the temperature exceed more than 600℃.





Mainly Characters:

Excellent electrical insulation properties
Very low dielectric loss
Strong acid & alkali corrosion resistance
Good mechanical strength
Good wear resistance
Good thermal conductivity
Non-magnetic

Mainly Application:

High temperature resistance parts
Variety pads, seal rings & liners
Electrical insulator bases
H.F.-H.V electronic parts
Electronic substrates
Electron tube accessories
Wafer Fabrication
Laser system parts
Ceramic screw, nut & washer
Furnace accessory
Thermocouple protection tubes
Variety alumina plate, rod & tube

If your company has the demand for the Alumina, we are willing to receive your sketch. We will provide the satisfactory, excellent quality and reasonable price of precise parts for you.