

Sapphire(α -Al₂O₃) Substrate

Sapphire is a single crystal of aluminum oxide (α -Al₂O₃). It is a colorless, transparent insulator with high crystal quality and purity. We have been dealing with sapphire for more than 75 years, and we offer our services based on our deep knowledge and rich experience. We would be delighted if this could be of help to your research.

【Features】

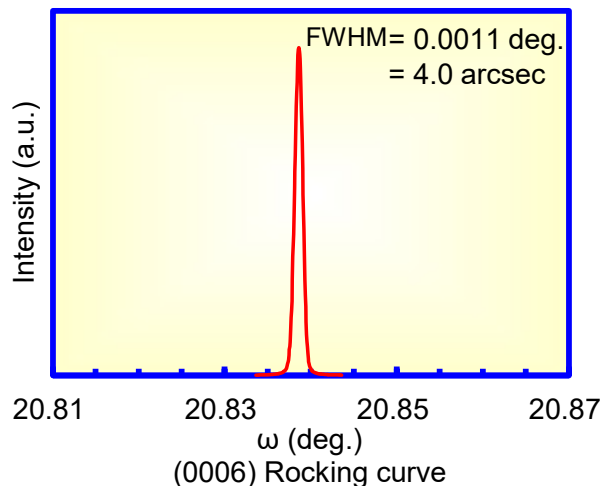
- Crystals with both high crystallinity and high purity
- Optically usable due to their transparency
- Stable surface quality (compatible with STEP substrates)
- Also ideal for use as insulating plates



Detail site

【Characteristics】

Crystal system	Trigonal (Rhombohedral)
Crystal structure	Corundum
Space group	$R\bar{3}c$
Lattice constant	$a = 0.47588 \text{ nm}$, $c = 1.2992 \text{ nm}$ (As hexagonal)
Melting point	2040 °C
Density	3.987 g/cm ³
Dielectric constant	(//c axis) 9.41 at 30GHz
Dielectric loss	(//c axis) 3×10^{-5} at 30GHz
Thermal expansion	(at 200 °C, c axis) $7.63 \times 10^{-6} / ^\circ\text{C}$ (at 200 °C, a axis) $6.93 \times 10^{-6} / ^\circ\text{C}$ (at 1000 °C, c axis) $9.97 \times 10^{-6} / ^\circ\text{C}$ (at 1000 °C, a axis) $8.89 \times 10^{-6} / ^\circ\text{C}$



【Standard Specifications】

Purity	>99.99%
Orientation	c(0001), a(11-20), r(01-12), m(10-10) -plane Tolerance $\pm 0.5^\circ$
Size	10 × 10 mm or 15 × 15 mm Tolerance $\pm 0.1 \text{ mm}$
Thickness	0.5 mm Tolerance $\pm 0.05 \text{ mm}$
Polishing	One-side / Both-side
STEP	Available for : c-plane, a-plane, r-plane
Surface roughness	$R_a \leq 1.0 \text{ nm}$
Flatness	$< 1 \mu\text{m}$

If you are looking for other specs, please contact us.

All figures in graph and table are typical data (not guaranteed).

Sapphire Model List

Size (mm)	Polishing	Surface treatment	c-plane (0001)	a-plane (11-20)	r-plane (01-12)	m-plane (10-10)
10x10x0.5	One-side	Normal	★	○	○	○
"	Both-side	"	○	○	○	△
"	One-side	STEP	○	○	△	—
15x15x0.5	One-side	Normal	★	△	△	△
"	Both-side	"	△	△	△	△
"	One-side	STEP	△	△	△	—

★ : Planed inventory

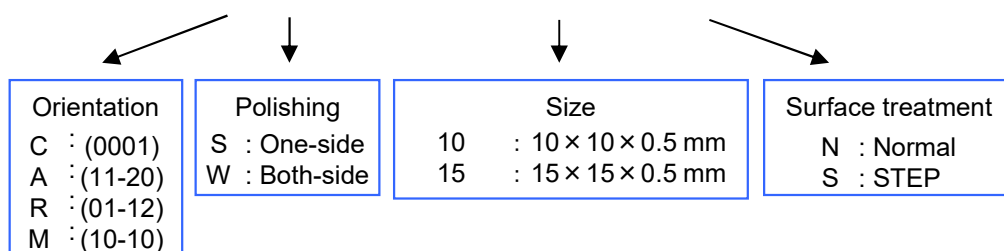
○ : Standard

△ : Made-to-order

Planned inventory: Production is regularly managed to ensure prompt delivery.
(Please note that specifications may change without prior notice.)
We also accept orders for different sizes and off-spec substrates.
Please contact us for details.

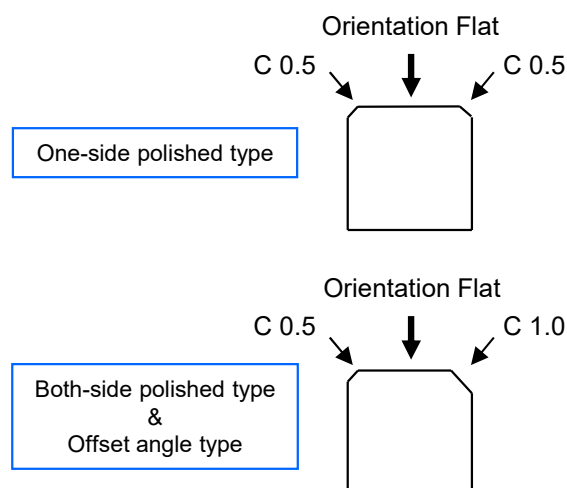
Model Number

AO — CS — 10N



Orientation Flat

Substrate Orientation	Orientation Flat
c-plane (0001)	(11-20)
a-plane (11-20)	(0001)
r-plane (01-12)	(11-20)
m-plane (10-10)	(11-20)



<Visual check note>

We pass over the following:

- (a) Chips within 0.2mm from the circumference of substrates
- (b) Chips on the edge strip under 1/2 size of substrate thickness
- (c) Scratches and blemish on the back side of single-side polished substrates