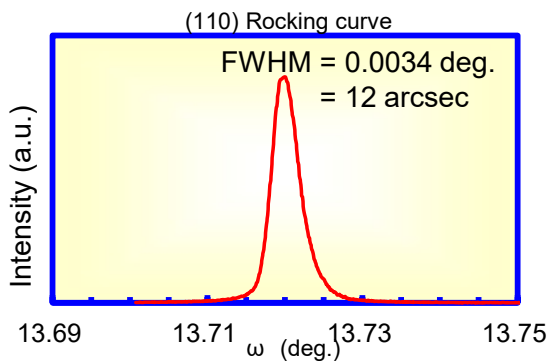
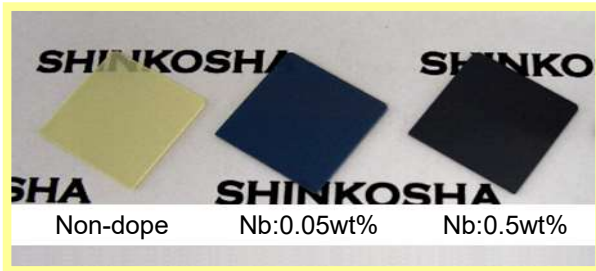
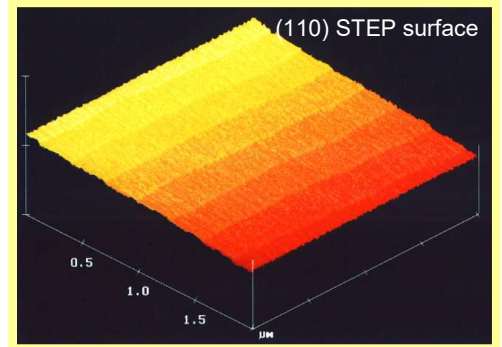


TiO₂(Rutile) Substrate

We offer rutile-type TiO₂ crystals in their high-temperature stable phase. These crystals provide stable crystallinity and surface quality, and can be made conductive through doping. We hope they will be useful for your research.

【Features】

- Available in various surface orientations of tetragonal crystals
- Stable surface quality (compatible with STEP substrates)
- Electrical conductivity can be introduced by doping with Nb
- Suitable for optical applications due to its transparency



Detail site

【Characteristics】

Crystal system	Tetragonal
Crystal structure	Rutile
Space group	P4 ₂ /mnm
Lattice constant	a = 0.45935 nm c = 0.29580 nm
Melting point	1840 °C
Density	4.252 g/cm ³ (20°C)
Dielectric constant	113 (1MHz)
Thermal expansion	(// a-axis) 7.81 × 10 ⁻⁶ /°C (// c-axis) 10.1 × 10 ⁻⁶ /°C
Band gap	3.0 eV
Refractive index	n _o = 2.5490 n _e = 2.8226 (at 706.5nm)

【Standard Specifications】

	TiO ₂	Nb:TiO ₂	
Nb concentration	0	0.05wt% (0.04at%)	0.5wt% (0.43at%)
Resistivity	>10 ⁷ Ω·cm	2.5~10 Ω·cm	0.20~0.35 Ω·cm
Orientation	(100) , (001) , (110) Tolerance : ±0.5°		
Size	10 × 10 × 0.5 mm , 15 × 15 × 0.5 mm Tolerance (outside dimension) : ±0.1 mm Tolerance (thickness) : ±0.05 mm		
Polishing	One-side / Both-side		
STEP	Available for (100), (110)		
Surface roughness	Ra ≤ 1.0nm , Rmax ≤ 5.0nm		
Flatness	10 × 10 × 0.5 mm : ≤λ , 15 × 15 × 0.5 mm : ≤1.5λ (λ=632.8 nm)		

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

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

TiO₂ Model list

Doping	Size (mm)	Polishing	Surface treatment	Orientation		
				(100)	(110)	(001)
None	10x10x0.5	One-side	Normal	★	★	★
	"	Both-side	"	△	△	○
	"	One-side	STEP	△	△	—
	15x15x0.5	One-side	Normal	○	○	○
	"	Both-side	"	△	△	○
	"	One-side	STEP	△	△	—
Nb:0.05wt%	10x10x0.5	One-side	Normal	○	○	△
	"	Both-side	"	△	△	△
	"	One-side	STEP	△	△	—
	15x15x0.5	One-side	Normal	○	○	△
	"	Both-side	"	△	△	△
	"	One-side	STEP	△	△	—
Nb:0.5wt%	10x10x0.5	One-side	Normal	○	○	△
	"	Both-side	"	△	△	△
	"	One-side	STEP	△	△	—
	15x15x0.5	One-side	Normal	○	○	△
	"	Both-side	"	△	△	△
	"	One-side	STEP	△	△	—

★:Planned inventory

○:Standard

△:Made-to-order

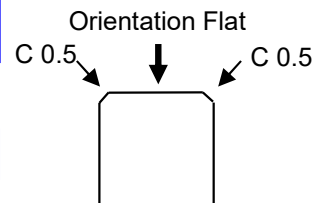
Orientation Flat

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.



One-side polished type

Model Number

Polishing
S : One-side
W : Both-side

Surface treatment
N : Normal
S : STEP

TO – AS – 10N – N05

Orientation
A : (100)
D : (110)
C : (001)
E : (101)
G : (111)

Size
10 : 10 × 10 × 0.5 mm
15 : 15 × 15 × 0.5 mm

Dopant
No entry : Non doped
N05 : Nb 0.05wt%
N50 : Nb 0.5wt%

<Visual check note>

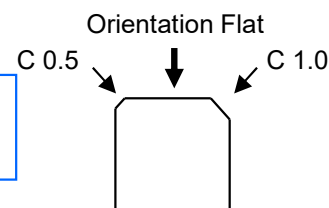
We pass over the following:

(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

Both-side polished type
&
Offset angle type



Substrate Orientation	Orientation Flat
(100)	(001)
(110)	(110)
(001)	(110)
(101)	(100)
(111)	(110)

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