

# 薄膜用スモース基板

## Thin Film Substrates

京セラは薄膜用サブストレートとして、優れた平滑性を有する99.6%アルミナのA-493、A-494を取り揃えています。

For thin film deposition, we have 99.6% alumina substrates (A-493, A-494) which offer excellent surface smoothness.

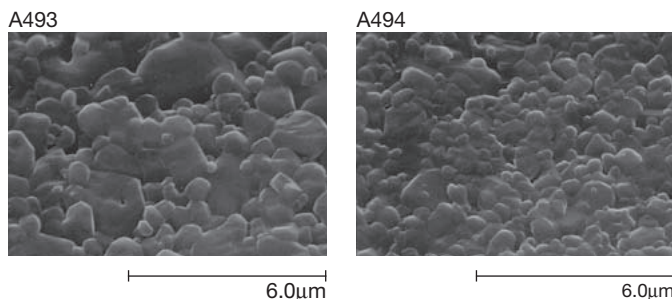
### ■特性表 Characteristics of Material Unit: Inch (mm)

項目 Item	単位 Unit	A-493	A-494
表面粗さ Surface Roughness	Side A: CLA $\mu$ inch	3.0 (.08)	2.0 (.05)
	Side B: (Ra $\mu$ m)	5.0 (.125)	4.0 (.10)
見掛密度 Bulk Density	kg/m <sup>3</sup>	$3.6 \times 10^3$	$3.86 \times 10^3$
平均粒径 Grain Size Average	$\mu$ m	<1.5	<1.0
アルミナ含有量 Alumina Content	Wt%	99.6	
呈色 Color	—	White	
吸水率 Water Absorption	—	Nil	
誘電率 Dielectric Constant	1MHz	9.9 $\pm$ .2	
誘電正接 Dielectric Loss Angle	1MHz	$2 \times 10^{-4}$	
体積固有抵抗 Volume Resistivity	$\Omega \cdot$ cm	$>10^{14}$ (25 $^{\circ}$ C)	
熱伝導率 Thermal Conductivity	25 $^{\circ}$ C	33	
	300 $^{\circ}$ C	30	
	500 $^{\circ}$ C	25	
線膨張係数 Coefficient Of Linear Thermal Expansion	per $^{\circ}$ C		
	25 to 300 $^{\circ}$ C	$7.2 \times 10^{-6}$	
	25 to 600 $^{\circ}$ C	$7.4 \times 10^{-6}$	
	25 to 800 $^{\circ}$ C	$8.2 \times 10^{-6}$	
曲げ強度 Flexural Strength	MPa	550	

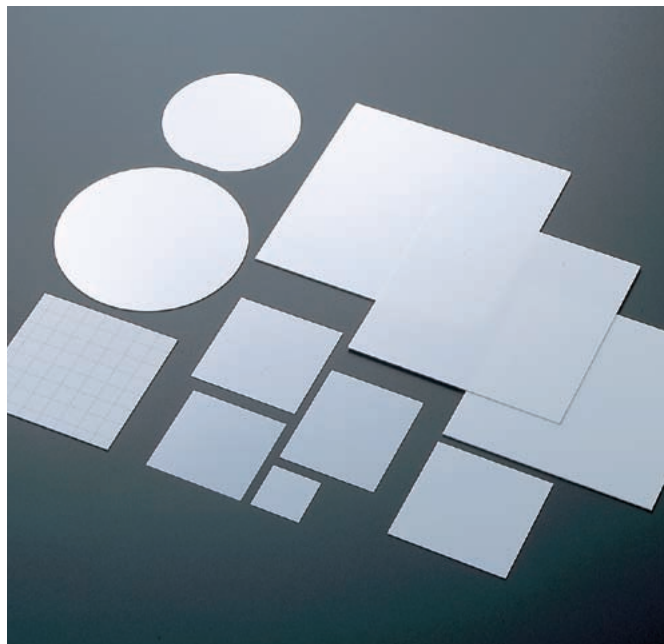
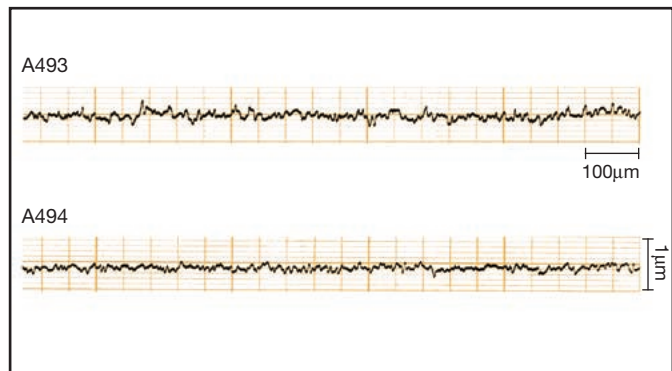
※これらの値はテストピースの測定による参考値です。特性値は製品の形状や使用条件により異なる場合があります。

※The values are typical material properties and may vary according to products configuration and manufacturing process. For more details, please feel to contact us.

### 電子顕微鏡写真 SEM



### 表面加工データ Surface Roughness



### デザインガイドライン Design Guideline

厚み Thickness Unit: Inch (mm)

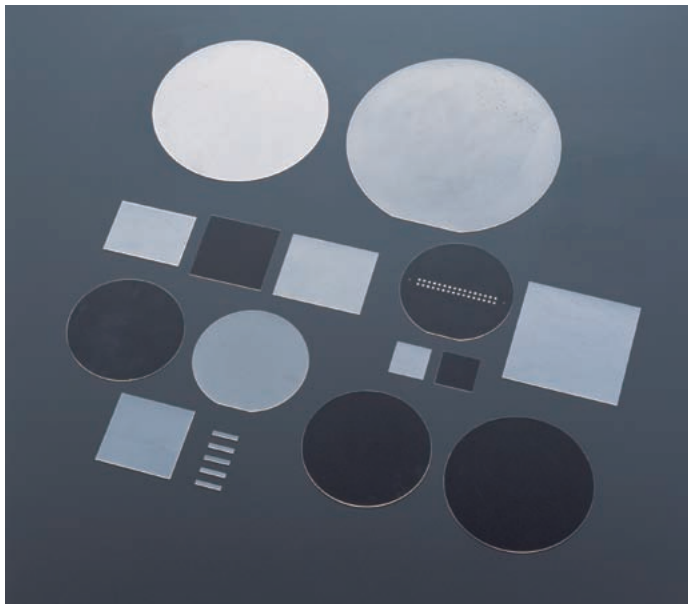
厚み Thickness	標準 Standard: .010 (0.25), .015 (0.38), .025 (0.635) 最小 Minimum: .005 (0.127) 最大 Maximum: .040 (A493), .027 (A494)
公差 Tolerance	標準 Standard: $\pm 10\%$ NLT $\pm$ .002 (0.05) プレミアム Premium: $\pm 5\%$ NLT $\pm$ .0008 (0.02)

### 外形 Length, Width

項目 Item	金型品 Green Score	レーザー品 Laser Score
最大 Max Size	4.7" $\times$ 4.7" (120 $\times$ 120)	
公差 Tolerance	Standard: (0.10) $\pm 0.8\%$ NIL $\pm$ .004" Premium: $\pm 0.5\%$ NIL $\pm$ .003" (0.08)	Standard: +.008"/-.002" (+0.2/-0.05) Premium: (厚み0.5mm以下) (Thickness: 0.020" or LESS) $\pm$ .004"/-.002" (+0.1/-0.05)
直角度 Perpendicularity		
直線度 Straightness		
	Standard: a=L $\times$ 0.5% b=L $\times$ 0.5% Premium: a=L $\times$ 0.3% b=L $\times$ 0.3%	.002"

## SAPPHIRE PRODUCTS

### Substrate



#### Application

- (1) High Brightness LED
  - (2) HB-LED Semiconductor, Piezoelectric Semiconductor, Superconductor, Thin Film Substrate.
  - (3) MR Sensor, Precision Resistor
  - (4) Optical Devices
  - (5) Thin Film HIC
- Single Crystal Sapphire is widely used substrate material for blue, green, ultraviolet and white LEDs. It has excellent features as a base substrate for GaN deposition and great mass-productivity. In addition, it can meet future larger-size demand.
  - Single Crystal Sapphire is used as a base substrate in thin film deposition because of its lattice alignment match with a variety of semiconductor materials combined with excellent thermal and chemical stability.

#### 2"-8" substrate for Optical Devices



#### Standard Dimension and Tolerance

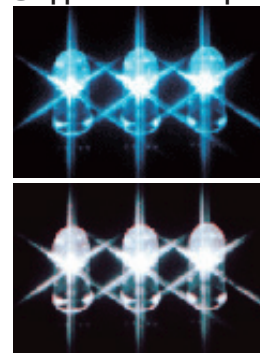
	Size	O.F. Length
8"	$\phi 200 \pm 0.25 \times 0.725 \pm 0.05$	55~60
6"	$\phi 150 \pm 0.25 \times 0.625 \pm 0.05$	45~50
5"	$\phi 125 \pm 0.25 \times 0.625 \pm 0.05$	40~45
4"	$\phi 100 \pm 0.25 \times 0.53 \pm 0.05$	30~35
3"	$\phi 76.2 \pm 0.25 \times 0.43 \pm 0.05$	19~25
2"	$\phi 50.8 \pm 0.25 \times 0.33 \pm 0.05$	13~19

※ Specifications other than above are available.

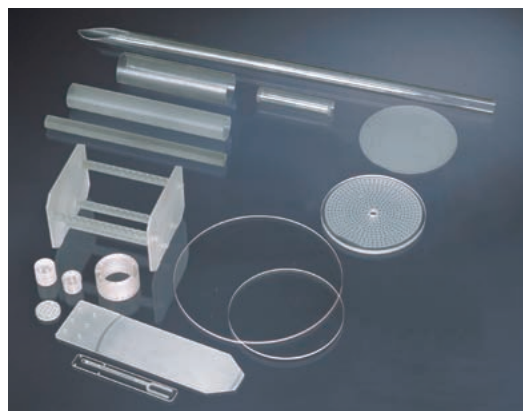
※ Available sizes are dependent on a crystal orientation.

Sizes and tolerances other than the above table are also available under customer requirements. Please contact or send your requirements to Kyocera.

#### Application Examples



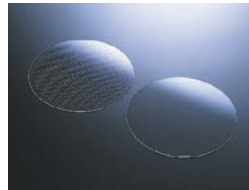
### Semiconductor Process Equipment Parts



#### Application

- (1) Carrier Plate
- (2) Microwave Entrance Tube
- (3) Dummy Water
- (4) Handling Arm
- (5) Vacuum Chuck
- (6) Window

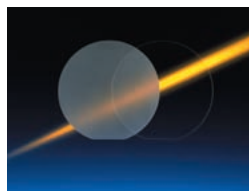
- It is used as various Semiconductor Process Equipment due to its high anti-plasma and high anti-heat characteristics.



(1)



(2)



(3)



(4)