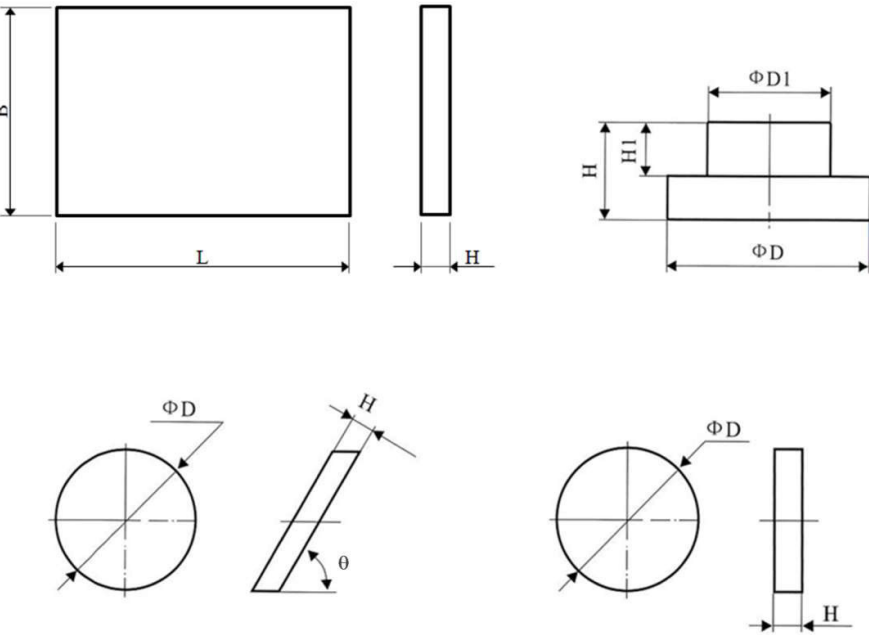


Windows for Various Applications



Precision for Your Application

We supply windows produced using a variety of materials, although sapphire windows are the most popular due to material properties suited to stability in environments where thermal, optical and mechanical wear resistance are important.



Item	Ø D: Diameter	H: Thickness
Size (mm)	Ø 0.40 ~ Ø 200.00	0.05 ~ 200.00
Tolerance (mm)	0.005 ~ 0.10	+/- 0.01

MATERIALS

Synthetic sapphire / ruby
Verneuil
Czochralski (CZ)
Kyropolus (KY)
Edge Film Growth (EFG)
Silica
Quartz
Crystallite glass
BK glass

WINDOW MOUNTINGS

Brass
Titanium
Stainless steel
Carbon steel

ADVANTAGES INCLUDE

Pressure or vacuum applications
Scratch and wear resistant
Ideal for optical applications
Excellent insulating properties
Chemically resistant and inert to virtually all chemicals
Thermal stability

Technical Data Sapphire / Corundum

Properties	Units	Value
Chemical Formula		Al ₂ O ₃
Purity		>99.99%
Density	g/cm ³	3.98 to 4.1
Hardness	Moh's	9
Tensile Strength	MPa [kpsi]	190 [28]
Compressive Strength	GPa [kpsi]	2.1 [305]
Modulus of Elasticity	GPa [kip/in ²]	340-380 [49312 – 55114]
Friction Coefficient		0.10 (Coefficient of dry friction on steel)
Chemical Resistance		Inert to most chemical agents, even at high temperatures attacked by HF at 300°C.
Coefficient of Linear Expansion PARA to C Axis, 20°C	°C ⁻¹	6.2x10 ⁻⁶
Coefficient of Linear Expansion PERP to C Axis, 20°C	°C ⁻¹	5.4x10 ⁻⁶
Specific Heat	J/kg-K	753 J/(K·kg) at 301°K
Thermal Conductivity, 20°C	W/m-K	41.9
Melting Temperature	°C [° F]	2030 °C [3686 °F]
Maximum Useable Temperature	°C [° F]	1950 °C [3542 °F]
Dielectric Constant (Er) at 1 MHz		7.5 to 10.5
Resistivity (25°C)	Ohm-cm	> 10 ¹⁶
Ne (refraction index to λ = 589.3 nm)		1.760
No (refraction index to λ = 589.3 nm)		1.769

SPECIFICATIONS

C-Axis deviation: +/- 0.1°
Surface quality: S/D 10/5;
S/D 20/10; S/D 40/20;
S/D 60/40; S/D 80/50
Orientation: random, zero°
Flatness: 633nm per 25.4mm

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