

Sapphire Window Capabilities

Sapphire (Al_2O_3) is an incredibly hard crystal ($\text{HK}1370\text{kg/mm}^2$), second only to diamond. It has high mechanical strength, thermal and chemical resistance and is scratch resistant, making it very desirable for operating in harsh conditions.

The material transmits between the UV and IR at $0.15\text{-}5.5\mu\text{m}$, and has a high refractive index of 1.75. Sapphire is ideal for use as a window where high radiation resistance is required from the UV to about $5\mu\text{m}$.

Knight Optical's most frequently requested specifications for sapphire windows are as follows:

Diameter Range	less than 5mm to 300mm
Diameter Tolerance	better than $\pm 0.1\text{mm}$
Centre Thickness	up to 50mm
Centre Thickness Tolerance	better than $\pm 0.05\text{mm}$
Clear Aperture	90%
Centration Tolerance	better than 1 arc minute
Form Error	better than $\lambda/4$ (633nm) over aperture
Surface Radius Tolerance	less than 1 fringe over aperture
Linear Dimension	up to 120mm
Linear Tolerance	better than $\pm 0.1\text{mm}$
Angular Tolerance	better than 5 arc minutes
Edge Finish	ground, blacked
Chamfer	$0.3 \times 0.3 @ 45^\circ$
Surface Quality	40-20 scratch/ dig
Coatings	BBAR coating @ $1\text{-}5\mu\text{m}$ Diamond-Like carbon (DLC) coating @ $1\text{-}5\mu\text{m}$



Our capabilities are always expanding so if your requirement is not mentioned above please enquire as we have many years of experience in this field.

To keep up with the latest scientific developments, we guarantee that our in-house Metrology and Quality Assurance departments will not only deliver premium, individually inspected and tested optical components to your business, but should there be a need, can deliver bespoke optics designed to your exact specifications.

For more information on any of our optical services, to discuss your requirements or place a direct order with one of our technical sales team, please contact Knight Optical by Email: info@knightoptical.com or call direct on +44 1622 859 444 (UK, EUR or ROW) +1 401 583 7846 (USA & Canada).

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www.knightoptical.com | info@knightoptical.com | usasales@knightoptical.com

