

FELIX OPTICAL GLASS

DOUBLE-SIDE AR COATED SAPPHIRE WINDOW

Technical Data Sheet | S1/S2 Broadband Anti-Reflection Coating

1. Finished Window Specifications

Product Parameter	Representative / Proposed Specification
Product	Double-Side AR Coated Sapphire Optical Window
Material	Optical-grade single-crystal sapphire (Al ₂ O ₃)
Crystal orientation	C-plane typical; A-plane / R-plane available by project
Geometry	Round, square, rectangular or custom drawing-based shape
Thickness	2.0 mm reference; custom thickness available
Dimensional tolerance	Drawing-dependent / precision machining available
Clear aperture	Typically ≥90%; customizable
Surface quality	60-40 typical; 40-20 / 20-10 available by project
Surface flatness	Up to λ/10 subject to size/thickness/specification review
Parallelism	Precision parallelism available according to drawing
Edge treatment	Fine ground, polished, chamfered or beveled

2. Double-Side AR Coating Specifications

AR Coating Parameter	Representative / Proposed Specification
Coated surfaces	S1 + S2 / both optical surfaces
Coating type	Hard dielectric broadband anti-reflection coating (BBAR)
Reference design band	400–700 nm
Reference AOI	0° / near-normal incidence
Polarization	Unpolarized reference
Target average transmission	Tavg ≥98% @ 400–700 nm
Representative peak transmission	~99% around center of visible design band
Reference reflectance	Ravg <1% per coated surface over design band
Other coating bands	850 nm, 1064 nm, 1550 nm, VIS-NIR, SWIR/MWIR and custom designs available
Durability / adhesion	Defined according to customer drawing and required test standard

3. Representative Spectral Transmission Data

Wavelength	Representative Finished-Window Transmission
400 nm	~97.2%
450 nm	~98.5%
500 nm	~99.0%
550 nm	~99.2%

Wavelength	Representative Finished-Window Transmission
600 nm	~99.1%
650 nm	~98.8%
700 nm	~97.8%
400–700 nm	Tavg ≥98% target

4. Sapphire Substrate Properties

Sapphire Material Property	Typical Reference Value
Chemical composition	Single-crystal Al ₂ O ₃
Density	~3.97 g/cm ³
Mohs hardness	9
Refractive index	~1.77 in visible; wavelength/orientation dependent
Birefringence	~0.008 in visible; orientation dependent
Useful optical range	UV to mid-IR; commercial window range commonly ~0.33–5.5 μm
Key benefits	High hardness, wear resistance, thermal stability and broad optical transmission

Engineering note: The 400–700 nm values above represent a feasible reference/target BBAR design for a double-side coated sapphire window and are intended for website, quotation and preliminary engineering use. They are not lot-specific spectrophotometer measurements. Final guaranteed T/R values must be defined for the actual substrate thickness, crystal orientation, AOI, polarization and coating design, then verified on the finished production lot.

Custom Sapphire Optical Window Manufacturer

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