

SAPPHIRE (Al₂O₃) COMPONENTS

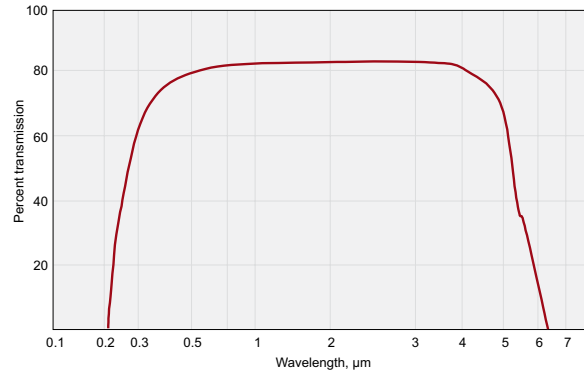
- The hardest of the oxide crystals
- Excellent transparency and thermal properties
- Chemically inert and insoluble
- Can be safely made much thinner than windows from glass or other crystals

Single crystal sapphire combines excellent optical, physical and chemical properties. Chemically inert and almost insoluble, sapphire in many ways is a superior material for windows. It is transparent from 150 nm up to 6 μm in the middle infrared.

Sapphire exhibits anisotropy in many optical and physical properties. Difference in the index of refraction in orthogonal directions is 0.008.

The high index of sapphire makes magnesium fluoride almost an ideal single layer anti-reflection coating.

Exact parameters depend on the orientation of optical axis or c-axis relative to the surface.



External transmission of Al₂O₃ window of 1 mm thickness.

PHYSICAL PROPERTIES

| | |
|----------------------------|--|
| Crystal type | Hexagonal |
| Density, g/cm ³ | 3.97 |
| Melting point, °C | 2040 |
| Refractive index | @ 0.3 μm, n = 1.814 @ 5 μm, n = 1.623 |
| Transmission range, μm | 0.17 – 5.5 |

SPECIFICATIONS FOR SAPPHIRE WINDOWS

| | |
|---------------------|--------------------------------------|
| Material | Al ₂ O ₃ |
| Surface quality | 60-40 scratch & dig (MIL-PRF-13830B) |
| Clear aperture | 80% of the diameter |
| Diameter tolerance | +0.0 -0.13 mm |
| Thickness tolerance | ±0.2 mm |
| Surface flatness | 1 λ per inch @ 633 nm |
| Parallelism | 3 arcmin |
| Orientation | C-cut |

| Catalogue number | Diameter, mm | Thickness, mm | Price, EUR |
|------------------|--------------|---------------|------------|
| 550-7121 | 12.7 | 1 | 25 |
| 550-7122 | 12.7 | 2 | 25 |
| 550-7123 | 12.7 | 3 | 25 |
| 550-7200 | 20.00 | 0.5 | 35 |
| 550-7201 | 20.0 | 1 | 35 |
| 550-7202 | 20.0 | 2 | 35 |
| 550-7250 | 25.4 | 0.5 | 45 |
| 550-7251 | 25.4 | 1 | 45 |
| 550-7252 | 25.4 | 2 | 45 |
| 550-7253 | 25.4 | 3 | 45 |
| 550-7382 | 38.1 | 2 | 109 |
| 550-7502 | 50.0 | 2 | 157 |
| 550-7503 | 50.0 | 3 | 165 |

Please contact us for other size, shape or precision requirements. Coatings are available upon request.

HOUSING ACCESSORIES

Mirror / Beamsplitter
Mount 840-0036

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