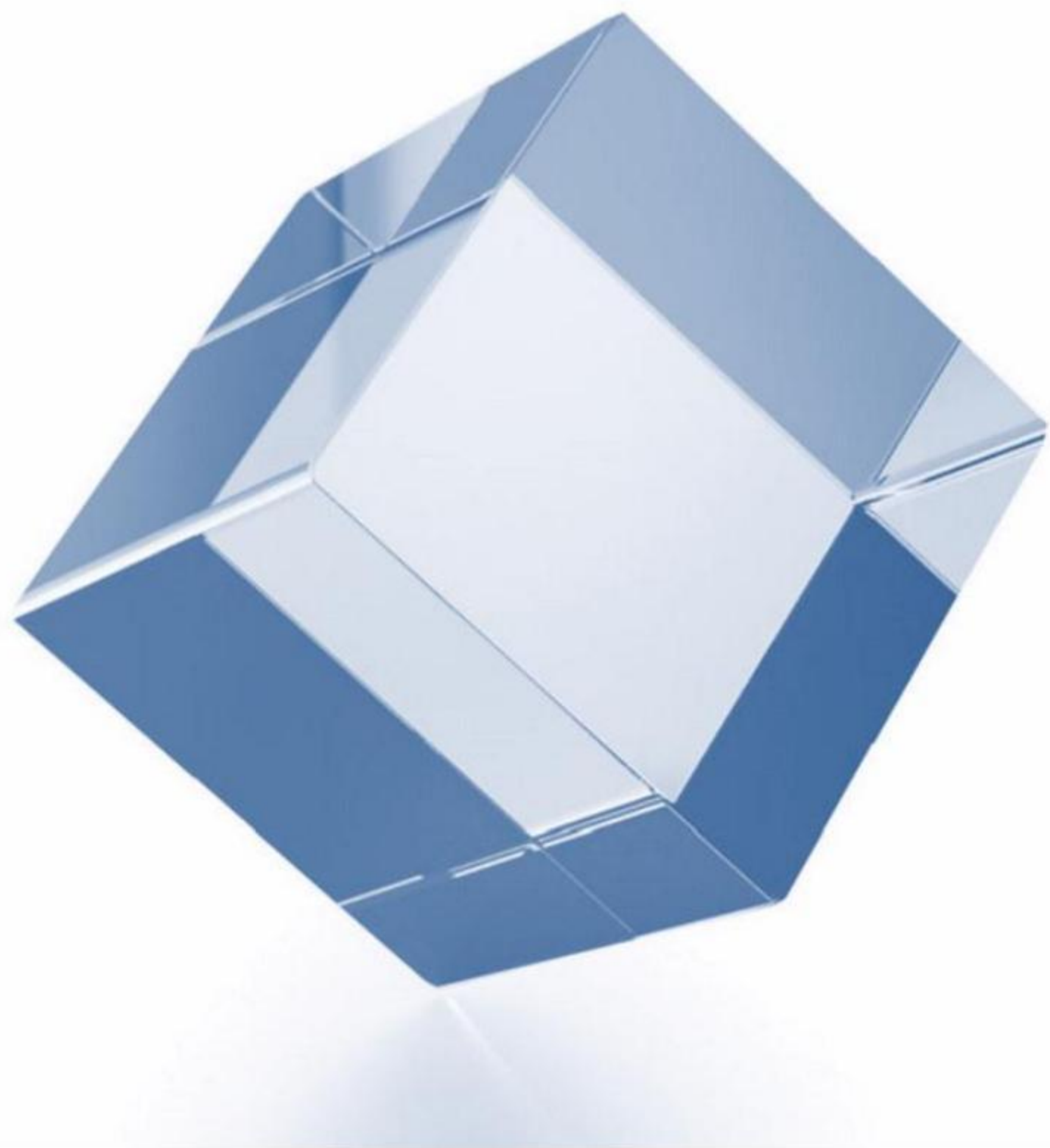


Barium Fluoride

BaF₂ Datasheet



DESIOPTOE is a professional manufacturer of fluoride crystals.

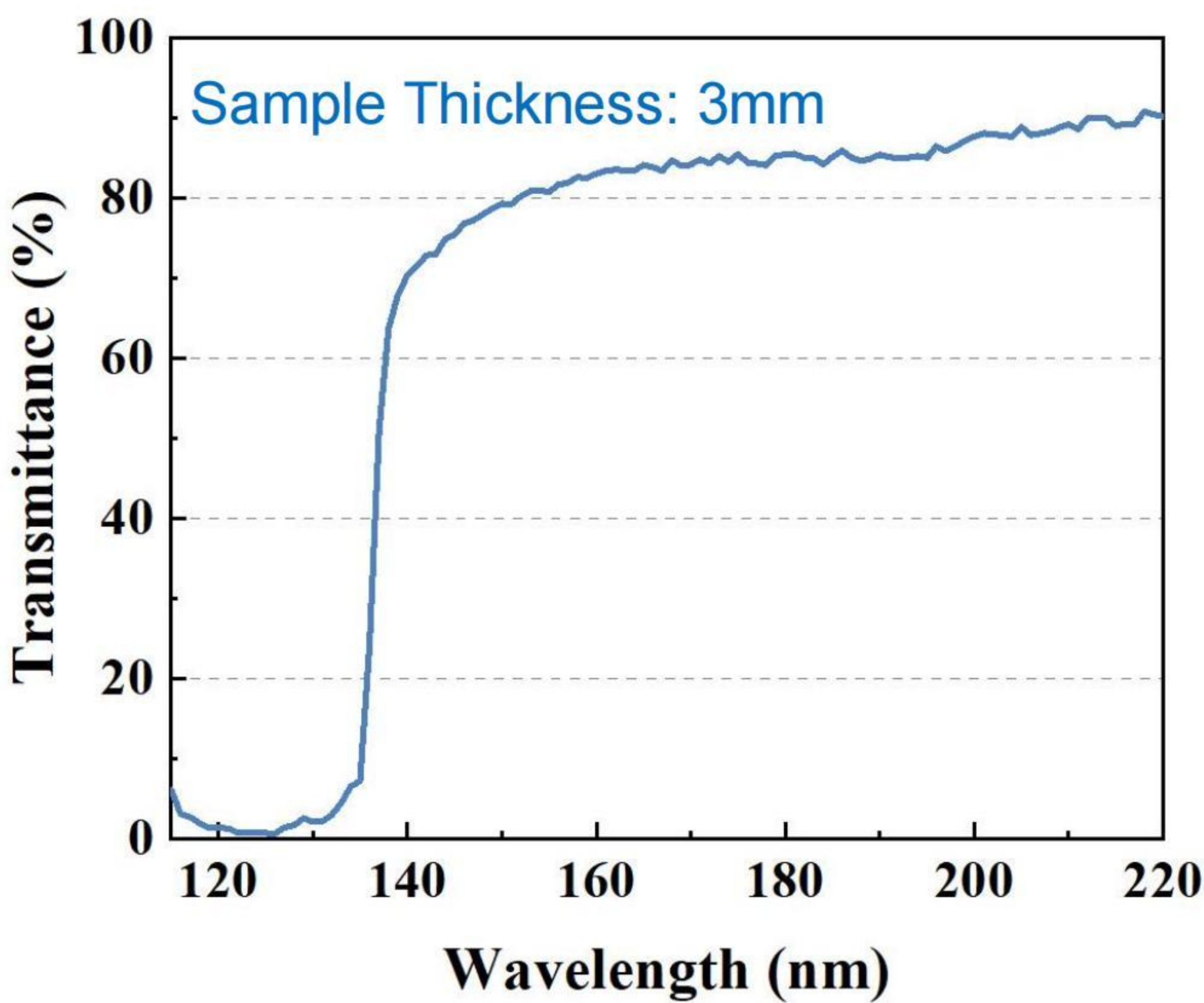
With our superior crystal growth technology, BaF₂ crystals manufactured by **DESIOPTOE** have good optical transmittance performance, enabling their wide application in thermal imaging, night vision, and broadband surveillance imaging detectors (integrating applications VIS-IR).

The low spectral dispersion of BaF₂ makes it an excellent material choice for aberration and color correction. BaF₂ is an excellent scintillation crystal and performs well under high-energy γ radiation.

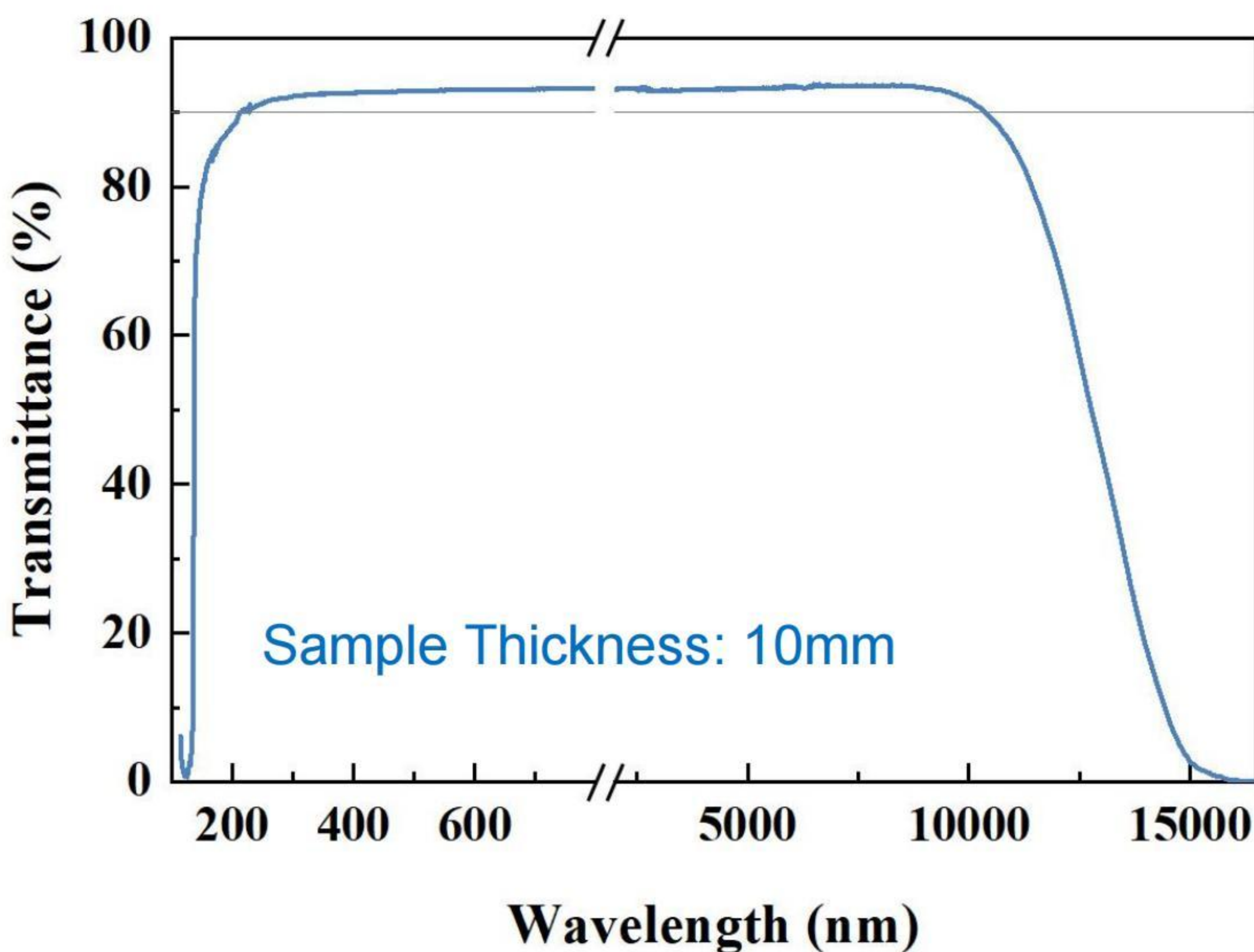
DESIOPTOE can supply BaF₂ crystal blanks and optical components in various specifications within 300mm, supporting customization of different crystal orientations for customers.

KEY ADVANTAGES

- Low Refractive Index
- Low Spectral Dispersion
- Scintillator Crystal
- High Transmittance in the VIS/Near-IR/Mid-IR Range



VUV Transmittance



Full-Spectrum Transmittance

General Grades

Material Grade	Crystal Structure	Stress Birefringence	Recommended Wavelength
BAF-A	Single Crystal/ Monocrystal	≤10nm/cm on request	Optical Grade
BAF-B	Polycrystal		Optical Grade
BAF-C	Polycrystal		IR Windows

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Physical Properties

Crystal Structure	Cubic
Cleavage Plane	(111)
Lattice Constant	a=0.6196 Å
Molecular Mass	175.3 g/mol
Density	4.89 g/cm³
Melting Point	1386 °C
Solubility	1.6 g/L (20 °C)
Abbe Number	
Vd=81.61	Ve=81.02

Thermal Properties

Heat Capacity	410 J/(kg · K)
Thermal Conductivity	11.72 W/(m · K)
Linear Thermal Expansion Coefficient	18.1 × 10 ⁻⁶ /K

Mechanical Properties

Bulk Modulus	(GPa)	56.4
Shear Modulus	(GPa)	25.4
Young's Modulus	(GPa)	53.07
Poisson's Ratio		0.343
Mohs Hardness		3
Knoop Hardness		82

Optical Fabrication Capacity

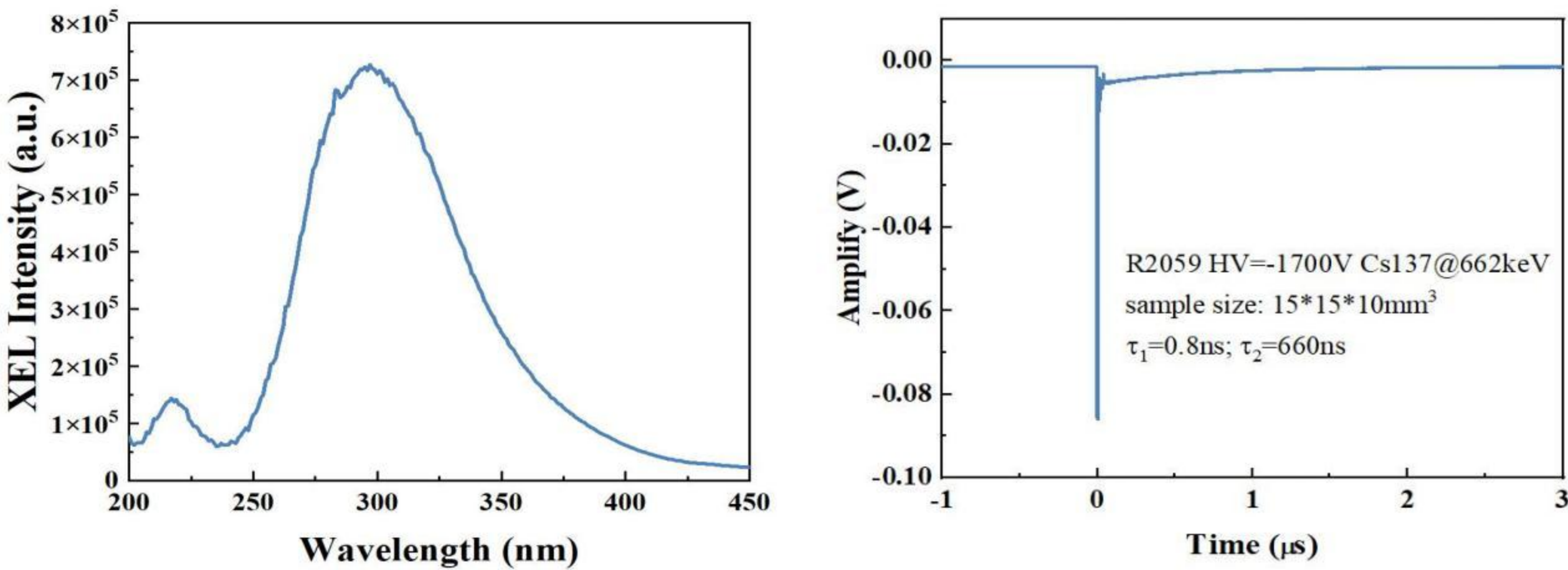
DESIOPTOE can provide various types of optical fabrication, such as grinding, polishing, and coating.

Bubbles/Inclusions	ISO 10110 – 1 x 0.02
Scratch/Dig Limit	40-20
Micro-roughness Limit	≤ 0.35nm
Wavefront Errors Limit	λ/10
Crystal Orientations	(111) (001) (100) orientations are offered
Surface Finishing	TSK/ Wire Cutting, Fine Grinding, Precision Polishing, Coating
Optical Components	Window, Wedge, Prism, Plano-Convex Lens, Plano-Concave Lens, Biconvex Lens, Biconcave Lens, Meniscus Lens
Coatings	Anti-Reflection, High-Reflection

Refractive Index @ 19 °C

λ[nm]	n	λ[nm]	n
265.2	1.51217	1014	1.46847
280.4	1.50668	1128.7	1.46779
289.4	1.5039	1367.3	1.46673
296.7	1.50186	1529.5	1.46613
302.2	1.50044	1681	1.46561
313	1.49782	1701.2	1.46554
325.5	1.49521	1970.1	1.46472
334.1	1.49363	2152.6	1.4641
340.4	1.49257	2325.4	1.46356
346.6	1.49158	2576.6	1.46262
361.1	1.48939	2673.8	1.46234
366.3	1.48869	3243.4	1.46018
404.7	1.48438	3422	1.4594
435.8	1.48173	5138	1.45012
486.1	1.47855	5343	1.44878
546.1	1.47586	5549	1.44732
589.3	1.47443	6238	1.44216
643.8	1.47302	6633.1	1.43899
656.3	1.47274	6855.9	1.43694
706.5	1.47177	7044.2	1.43529
852.1	1.46984	7268	1.43314
894.4	1.46942	9724	1.40514
		10346	1.39636

Scintillation Performance



Radioluminescence Spectrum of BaF₂ Crystal

Scintillation Decay Time Spectrum of BaF₂ Crystal

Fast/Slow Ratio	1:5
Radioluminescence Peak Wavelength (nm)	220/300
Absolute Light Yield (ph/MeV)	7128
Decay Time (ns)	0.8/660