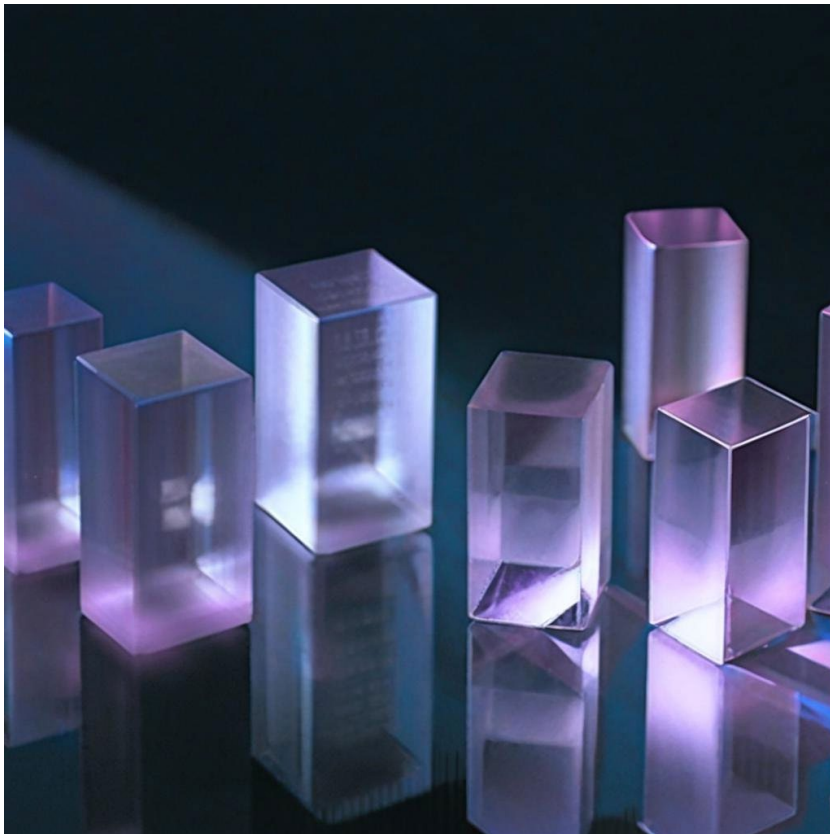


POC-OC-122467-a-BBO Crystal Datasheet

1 Main Features

- Wide transparency range: 190 nm - 3500 nm.
- High UV transmittance with low bulk absorption.
- Large birefringence for optical applications.
- High damage threshold: >1 GW/cm².
- Stable physical and mechanical properties, ideal for high-power laser systems.



2. Material General Description

Alpha-Barium Borate (a-BBO, BaB₂O₄) is a negative uniaxial crystal with a broad transparency range extending from UV (190 nm) to IR (3500 nm). Its large birefringence and low absorption make it an excellent choice for UV and high-power laser applications. a-BBO is mechanically and thermally stable, offering advantages in environments requiring high durability. However, due to its central symmetry, a-BBO does not exhibit nonlinear optical properties and is not suitable for nonlinear laser operations.

The crystal is widely used for optical elements like polarizers, wave plates, and other UV optical components, where birefringence and high transmission are essential.

3. General Applications and Examples

The a-BBO crystal serves critical roles in numerous high-precision and high-power optical applications, including:

- **Polarizers and Wave Plates:** Ideal for use in UV polarizers and wave plates due to its wide transparency and birefringence.
- **Laser Systems:** Functions effectively in high-power UV laser systems where high damage thresholds are critical.
- **Spectroscopic Instruments:** Suitable for UV and IR spectrometers, where high transmittance and low absorption are required.
- **Optical Communication Systems:** Used in devices requiring stable birefringence for wavelength management and beam displacement.

4. Chemical, Physical, and Structural Properties

Property	Value
Crystal Structure	Trigonal
Transparency Range	190 nm - 3500 nm
Density	3.85 g/cm ³
Hygroscopic Susceptibility	Low
Mohs Hardness	4.5
Thermal Expansion Coefficient	-9.3 × 10 ⁻⁶ /°C (C-axis)
	-9.5 × 10 ⁻⁶ /°C (A-axis)
Damage Threshold	>1 GW/cm ²
Refractive Indices (532 nm)	n _e = 1.6776, n _o = 1.5534
Refractive Indices (1064 nm)	n _e = 1.6579, n _o = 1.5379
Sellmeier Equation (A in μm)	n ² = 2.7471 + 0.01878/(λ ² - 0.01822) - 0.01354λ ²

5. Optical and Laser Properties

Property	Value
Birefringence	High
UV Transmittance	>90%
Refractive Index Range	Varies with wavelength
Damage Threshold	>1 GW/cm ² for high-power lasers
Applications	UV spectrometers, wave plates

6. Spectrum Transmission Curve

The transparency curve highlights high UV transmittance across 190-3500 nm, with minimal absorption losses, making it suitable for UV and IR applications.

7. Coating Specification

- AR Coating: Available for UV and high-power laser applications.
- Coating Quality: <0.2% reflection at specific wavelengths (e.g., 1064 nm, 532 nm).
- Custom coating options available upon request.

8. Standard Fabrication Specifications

Specification	Value
Size	Aperture up to <50 mm and length up to 40 mm
Surface Quality	10/5 to MIL-PRF-13830B
Flatness	1/4 @ 633 nm
Optical Axis Orientation	±6 arc min
Parallelism	20 arc sec
Clear Aperture	>90%

9. POC Strength and Capabilities

Photonics On Crystals (POC) is renowned for producing high-quality a-BBO crystals, leveraging advanced manufacturing technologies and rigorous quality control:

- Customizable crystal dimensions and coating options.
- High damage threshold capabilities for UV and high-power applications.
- Precision in orientation and surface flatness to meet the highest industry standards.
- Expert technical support for application-specific requirements.

10. Standard Products and Customization

Face Dimensions	Length	Coating	Price (USD)
10 × 10 mm ²	20 mm	AR-coated (UV)	Request
20 × 20 mm ²	30 mm	P-coated (532)	Request
Custom	Custom	Custom Coatings	Request

Note: Custom sizes and coatings are available upon request to meet application-specific needs. Contact POC for a personalized solution.