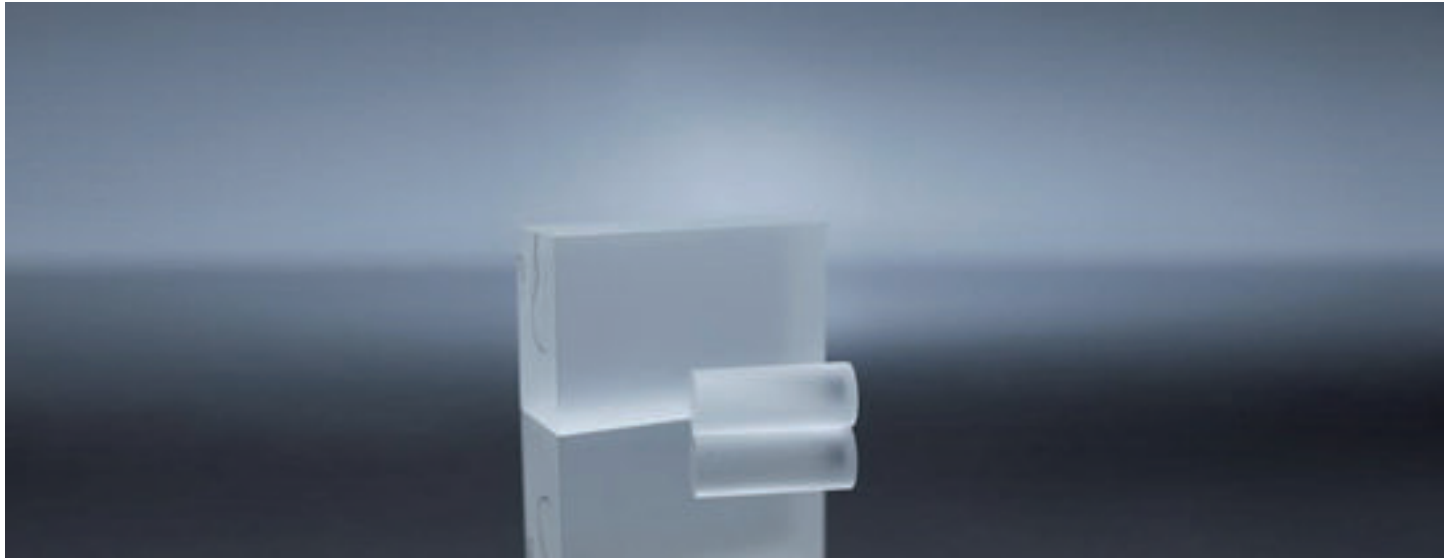


# BBO



## DESCRIPTION

BBO crystal, also known as barium metaborate crystal with the chemical formula  $BaB_2O_4$ , is an electro-optical crystal and nonlinear crystal with excellent overall performance. It has a wide range of applications in related fields such as the third, fourth, and fifth harmonics of Nd:YAG lasers (355nm, 266nm, and 213nm, respectively), the second and third harmonics of Ti:Sapphire amplifiers (400nm and 266.7nm), etc. BBO crystal has an extremely wide transmission range, a very low absorption coefficient, a weak piezo-electric ringing effect, and a higher extinction ratio compared to BBO crystals have a higher extinction ratio, larger phase matching angle, higher damage resistance threshold, broadband temperature matching, and excellent optical uniformity, which are conducive to improving the stability of laser output power, especially in the triplet frequency of Nd:YAG lasers with a wide range of applications. It can also be used in OPO configurations, optical parametric oscillators, and electro-optical applications from near-infrared to deep-ultraviolet.

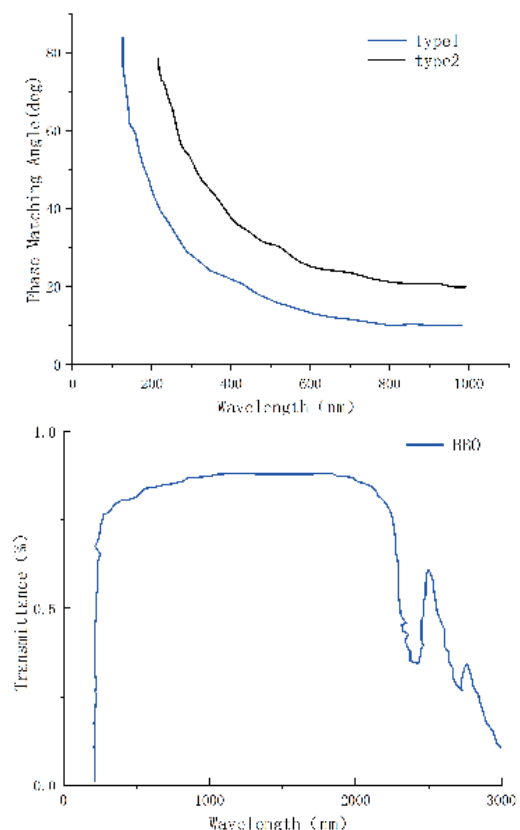
## APPLICATIONS

- Electro-optical crystals for Pockels cells
- 266nm laser for material processing
- 532nm laser for medical applications

## FEATURES

- Excellent physical properties
- Appropriate mechanical properties
- Temperature bandwidth approx. 55°C
- High optical uniformity
- Transmission range from 190 nm to 3500 nm
- Phase matching range from 6 nm to 3500 nm

## SPECTRA



# BBO

## CRYSTAL SPECIFICATIONS

Dimensional Tolerance	(W±0.1mm) × (H±0.1mm) × (L±0.2mm)
Angular Tolerance	$\Delta\theta < 0.5^\circ$ , $\Delta\phi < 0.5^\circ$
Surface quality	20/10 S/D
Clear Aperture	>90% central area
Surface flatness	$< \lambda/8 @ 633\text{nm}$
Wavefront distortion	$< \lambda/4 @ 633\text{nm}$
Parallelism	$< 20$ arc sec
Perpendicularity	$< 5$ arc min
Chamfering	$< 0.1\text{mm} @ 45^\circ$

## CRYSTAL PHYSICAL PROPERTIES

Properties	Numerical value
Chemical formula	BaB <sub>2</sub> O <sub>4</sub>
Crystal Structure	Triangular crystal system, 3m
Lattice parameters	a=b=12.532Å, c=12.717Å, Z=6
Mass density	3.85 g/cm <sup>3</sup>
Mohs Hardness	4
Melting point	Approx. 1095°C
Thermal conductivity	1.2 W/m/K (⊥c); 1.6 W/m/K (//c)
Coefficient of thermal expansion	a: $4 \times 10^{-6}/\text{K}$ ; c: $36 \times 10^{-6}/\text{K}$
Birefringence	Negative Single Axis

## CRYSTAL OPTICAL PROPERTIES

Launch range	196-2200nm		
Refractive index	@1064nm	1.6551(n <sub>o</sub> )	1.5425(n <sub>e</sub> )
	@532nm	1.6749(n <sub>o</sub> )	1.555(n <sub>e</sub> )
	@266nm	1.75711(n <sub>o</sub> )	1.6146(n <sub>e</sub> )
Sellmeier's equation	$n_o^2 = 2.7359 + 0.01878 / (\lambda^2 - 0.01822) - 0.01354\lambda^2$		
	$n_e^2 = 2.3753 + 0.01224 / (\lambda^2 - 0.01667) - 0.01516\lambda^2$		
Thermal light coefficient (10 <sup>-6</sup> /°C)	dn <sub>o</sub> /dT = -9.3	dn <sub>e</sub> /dT = -16.6	
Absorption coefficient	a < 0.1%/cm @ 1064nm		
Half wave voltage	48kv(1064nm)		
Electro-optical coefficient	r <sub>11</sub> = 2.7pm/V, r <sub>21</sub> , r <sub>31</sub> < 0.1r <sub>11</sub>		
Damage Threshold@1064nm	5GW/cm <sup>2</sup> (10ns) ; 10GW/cm <sup>2</sup> (1.3ns)		
Damage Threshold@532nm	1GW/cm <sup>2</sup> (10ns) ; 7GW/cm <sup>2</sup> (250ps)		
Coefficient of thermal expansion	a: $4 \times 10^{-6}/\text{K}$ ; c: $36 \times 10^{-6}/\text{K}$		
Birefringence	Negative Single Axis		

