BBO crystals

BBO is a new ultraviole frequency doubling crystal.

Features of BBO Crystals:

- Broad phase matchable range from 409.6 nm to 3500 nm;
- Wide transmission region from 190 nm to 3500 nm;
- Large effective second-harmonic-generation (SHG) coefficient about 6 times greater than that of KDP crystal;
- High damage threshold;
- High optical homogeneity with δn ≈10-6/cm;
- Wide temperature-bandwidth of about 55℃.

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Technical parameters	
Dimension tolerance	(W±0.1mm)x(H±0.1mm)x(L+0.5/-0.1mm) (L≥2.5mm)(W±0.1mm)x(H±0.1mm)x(L+0.1/-0.1mm) (L<2.5mm)
Clear aperture	central 90% of the diameterNo visible scattering paths or centers when inspected by a 50mW green laser
Flatness	less than L/8 @ 633nm
Wavefront distortion	less than L/8 @ 633nm
Chamfer	≤0.2mm x 45°
Chip	≤0.1mm
Scratch/Dig	better than 10/ 5 to MIL-PRF-13830B
Parallelism	≤20 arc seconds
Perpendicularity	≤5 arc minutes
Angle tolerance	≤0.25
Damage threshold[GW/cm 2]	>1 for 1064nm, TEM00, 10ns, 10HZ (polished only) >0.5 for 1064nm, TEM00, 10ns, 10HZ (AR-coated)>0.3 for 532nm, TEM00, 10ns, 10HZ (AR-coated)

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Basic properties	
Crystal Structure	Trigonal，Space Group R3c
Lattice Parameter	a=b=12.532Å,c=12.717Å,Z=6
Melting Point	About 1095℃
Mohs Hardness	4
Density	3.85 g/cm3
Thermal Expansion Coefficients	α11=4 x 10-6/K; α33=36x 10-6/K
Thermal Conductivity Coefficients	⊥c: 1.2W/m/K; //c: 1.6W/m/K
Transparency Range	190-3500nm
SHG Phase Matchable Range	409.6-3500nm (Type I) 525-3500nm (Type II)
Thermal-optic Coefficients (/℃)	dno/dT=-16.6x 10-6/℃dne/dT=-9.3x 10-6/℃
Absorption Coefficients	<0.1%/cm(at 1064nm) <1%/cm(at 532nm)
Angle Acceptance	0.8mrad·cm (θ, Type I, 1064 SHG)1.27mrad·cm (θ, Type II, 1064 SHG)
Temperature Acceptance	55℃·cm
Spectral Acceptance	1.1nm·cm
Walk-off Angle	2.7° (Type I 1064 SHG)3.2° (Type II 1064 SHG)
NLO Coefficients	deff(I)=d31sinθ+(d11cos3Φ- d22 sin3Φ) cosθq deff (II)= (d11 sin3Φ + d22 cos3Φ) cos2θ
Non-vanished NLO susceptibilities	d11 = 5.8 x d36(KDP)d31 = 0.05 x d11d22 < 0.05 x d11
Sellmeier Equations(λ in μm)	no2=2.7359+0.01878/(λ2-0.01822)-0.01354λ2ne2=2.3753+0.01224/(λ2-0.01667)-0.01516λ2
Electro-optic coefficients	γ22 = 2.7 pm/V
Half-wave voltage	7 KV (at 1064 nm,3x3x20mm3)