

## BGO SCINTILLATION CRYSTAL BLANK SPECIFICATIONS

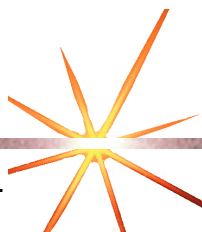
### Physio-Chemical Properties

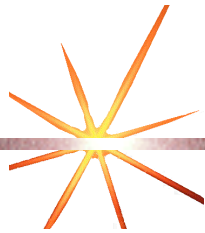
Chemical Name:	Bismuth Orthogermanate
Chemical Formula:	$\text{Bi}_4(\text{GeO}_4)_3 = \text{Bi}_4\text{Ge}_3\text{O}_{12}$
Density (g/cm <sup>3</sup> )	7.13 (X-ray); 7.00 (Weigh-Expt.)
Effective Atomic No.	75.1
Type	Single Crystal
Structure	Cubic, Eulytine
Optical Quality	Clear
Index of Refraction	2.15
Mechanical Behavior at Room Temp.	Brittle
Cleavage	None
Hardness (Mho)	5 Est.
Rugged	Yes
Hygroscopic	No
Melting Point (°C)	1050

### Radiation-Scintillation Properties

Relative light yield, PH (%) -PMT	>15 usually 16-23 (compared to NaI(Tl))
Photon Yield/Mev (PMT Sensor)	10,600
Photon Yield/Mev (Si-PD Sensor)	10,000
Is/Id(amps)PMT-Relative to NaI(Tl)	10

$\Delta E/E$ -% FWHM for Dia. = Ø3.0" x 3.0" L	<b>≤ 9.0 BEST MEASURED</b>
Emission Peak Wavelength (nm)	480
Decay Constant At Room Temp. (ns)	300
Afterglow at 3 msec (%)	<0.005
Rise Times-ns (10%-90%)	2.3
Linear Attenuation Coeff. (cm <sup>-1</sup> )	0.993 (for 500 Kev)
Radiation Length (cm)	1.12
Radiation Hardness To $\gamma$ Ray (rad)	>105





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Dimensions: Length\_\_\_\_\_ Width\_\_\_\_\_ Height\_\_\_\_\_

OR

Diameter\_\_\_\_\_ Length\_\_\_\_\_

OR For Other Geometries Attach a Drawing or Sketch

Tolerances: All dimensions  $+.25/-0.00\text{mm}$  ( $+.010"/-.000"$ )

Resolution: For **Dia. = Ø2.0" x 2.0" Length ≤** to 12% FWHM @ 662Kev for Cs137\*

Appearance: Crystal blanks are to be water white with NO visual imperfections. Such imperfections typically include flock & inclusions, striae, edge cracks due to heat fractures, etc. - The crystal blank should be free from these defects.

\*As measured with a catalog spec. Hamamatsu R-1306 2" PMT or equivalent

It is not necessary to measure each and every blank. A representative sample cut from the same boule or ingot-section should meet this performance criteria.

All surfaces supplied be at minimum industry-standard scintillation polish, unless otherwise specified.

