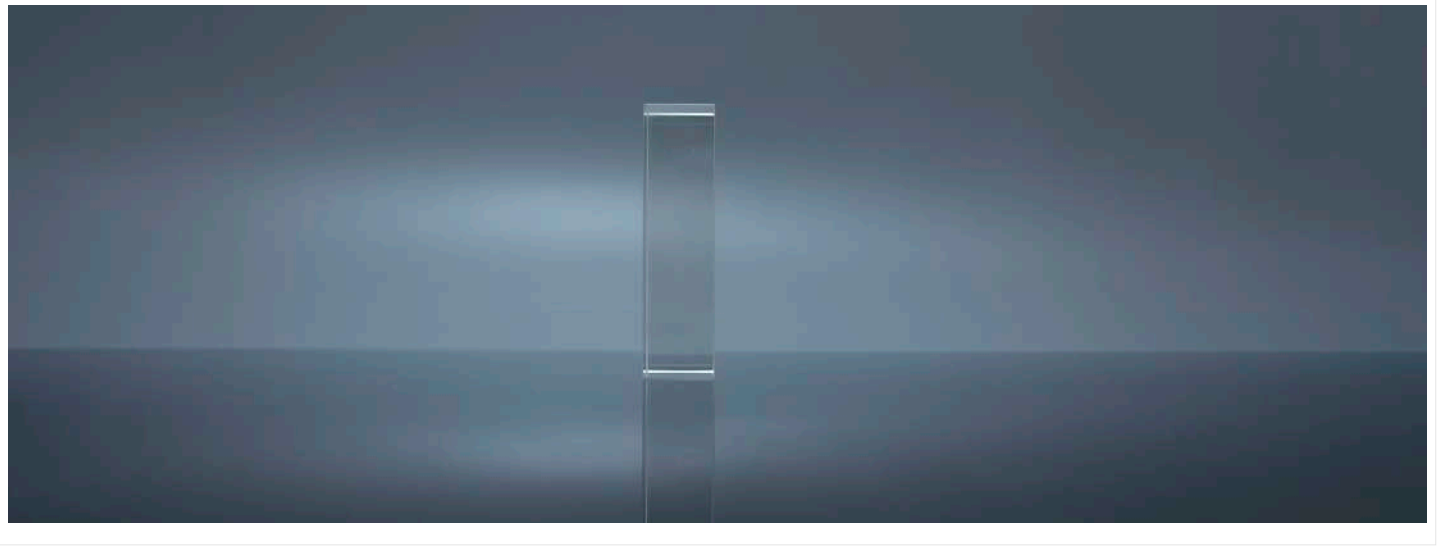


# LaBr<sub>3</sub>



## DESCRIPTION

Lanthanum Bromide, or LaBr<sub>3</sub>(Ce), is one of the new generation of inorganic scintillation gamma-ray detectors. Lanthanum Bromide scintillation material has been the reference for excellent energy resolution combined with fast emission and good linearity. Its comprehensive performance beyond the traditional high output with platinum nai scintillation crystals, is one of the best so far found flashing performance crystal, can be widely used in nuclear medicine imaging, geological exploration, oil well logging, space physics and nuclear radiation detection field.

**LaBr<sub>3</sub>:Ce is a promising scintillator for gamma-ray spectroscopy.**

LaBr<sub>3</sub> introduces an enhanced set of capabilities to a range of gamma spectroscopy radioisotope detection and identification systems used in the homeland security market. Important requirements for the scintillation crystals used in these applications include high light output, high stopping efficiency, fast response, low cost, good linearity, and minimal afterglow. LaBr<sub>3</sub> has attractive scintillation properties such as very high light output (~60,000 photons/MeV), and fast principle decay constant (30 ns). Based on these properties, LaBr<sub>3</sub>:Ce is a promising scintillator for  $\gamma$ -ray spectroscopy

## APPLICATIONS

- Security – cargo inspection
- Medical – SPECT
- Industrial – Well logging
- Nuclear and high energy physics – specialist applications
- Oil & Gas Exploration – well logging
- Industrial – Coal/mineral assay

## FEATURES

- Fast decay times – 25nsec
- High light outputs – 63,000 Photons/MeV
- The capability to achieve excellent Energy Resolution(e.g. c.2.6%@662keV, 2” Dia./2” Long)
- Optical outputs with good linearity with temperature
- The capacity to deal with high count rates
- Excellent radiation hardness



# LaBr<sub>3</sub>

## PARAMETERS

### Material and Specifications

Materials	LaBr <sub>3</sub>
Coordination geometry	Tricapped trigonal prismatic
Crystal structure	hexagonal
Space group	P63/m, No.176
Appearance	white solid, hygroscopic

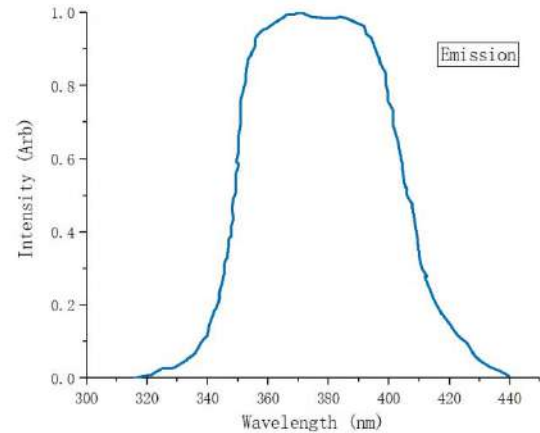
### Physical and Chemical Properties

Density (g/cm <sup>3</sup> )	5.2
Melting point (°C)	1116
Hardness (Mohs)	3
Molar mass	378.62 g/mol
Melting point	783 °C (1,441 °F; 1,056 K)
Boiling point	1,577 °C (2,871 °F; 1,850 K)
Solubility in water	Very soluble

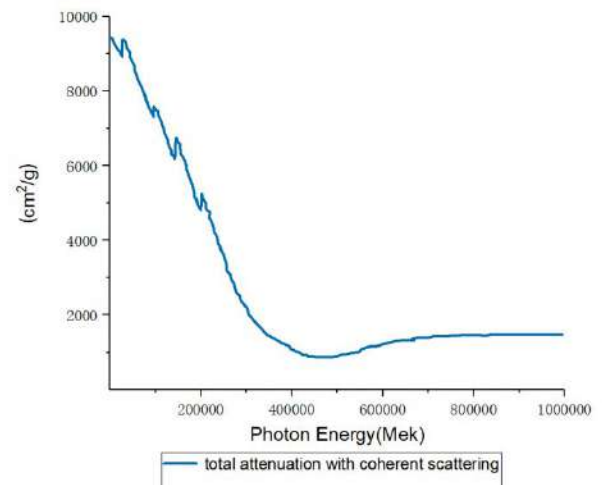
### Optical and Spectral Properties

Decay time (ns)	25
Light yield (photons/keV)	63
Radiation length (cm)	1.881
Attenuation(mm)@511keV	22
Emission peak wavelength(nm)	370
Refractive index @ emission max	~1.9
Reflection loss/surface (%)	6.8
Radiation Length(g·cm <sup>-2</sup> )	9.95
Moliere Radius(cm)	2.816
Energy resolution(%)@662keV	2.9

### Spectrum



LaBr<sub>3</sub> Emission Spectra



LaBr<sub>3</sub> attenuation with coherent scattering

