BC-418, BC-420, BC-422 Premium Plastic Scintillators

BICRON®

The premium plastic scintillators described in this data sheet are intended for use in ultra-fast timing and ultra-fast counting applications. BC-418 and BC-422 are recommended for use in small sizes, i.e. when any dimension is less than 4" (100mm). BC-420 is substantially less expensive than BC-418.

General Technical Data –

Base ..... Polyvinyltoluene

Density ..... 1.032 g/cc

Refractive Index 1.58

Coefficient of Linear Expansion ..... 7.8×10^{-5} below 67°C

Light Output Temperature Dependence: at +60°C = 95% of that at +20°C; independent of temperature from -60°C to +20°C

Vapor Pressure . May be used in a vacuum

Solubility ..... Soluble in aromatic solvents, chlorine, acetone, etc. Insoluble in water, dilute acids, lower alcohols, silicone fluid, grease and alkalis.

Scintillation Properties –

	BC-418	BC-420	BC-422
Light Output, % Anthracene	67	64	55
Rise Time, ns	0.5	0.5	0.35
Decay Time, ns	1.4	1.5	1.6
Pulse Width, FWHM, ns	1.2	1.3	1.3
Wavelength of Max. Emission, nm	391	391	370
Light Attenuation Length, cm*	NA**	140	NA**
Bulk Light Attenuation Length, cm	100	110	8

Atomic Composition –

No. H Atoms per cm^3 ($x10^{22}$)	5.21	5.21	5.19
No. C Atoms per cm^3 ($x10^{22}$)	4.74	4.74	4.71
Ratio (H:C) Atoms	1.100	1.100	1.102
No. of Electrons per cm^3 ($x10^{22}$)	3.37	3.37	3.34

* The typical 1/e attenuation length of a 1x20x200cm cast sheet with edges polished as measured with a bialkali photomultiplier tube coupled to one end.

** Scintillator recommended for use in small sizes; therefore, the 1/e attenuation length values are not applicable.

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