

BC-400,BC-404,BC-408,BC-412,BC-416

Premium Plastic Scintillators

The premium plastic scintillators described in this data sheet include those with the highest light output, as well as the most economical (BC-416). The chart below will direct you to the scintillator suitable for your energy application.

| | BC-400 | BC-404 | BC-408 | BC-412 | BC-416 |
|---|-----------------|---------------|----------------|------------|--------------------|
| Radiation Detected | | | | | |
| <100keV X-rays | | | X | | |
| 100keV to 5MeV gamma rays | | | | X | |
| >5MeV gamma rays | X | | | | X |
| Fast neutrons | | | | X | X |
| Alphas, betas | | X | X | | |
| Charged particles,cosmic rays, muons, protons, etc. | | | X | X | X |
| Principal Uses/Applications | general purpose | fast counting | TOF large area | large area | large area economy |

Scintillation Properties –

| | BC-400 | BC-404 | BC-408 | BC-412 | BC-416 |
|-----------------------------------|--------|--------|--------|--------|--------|
| Light Output, %Anthracene | 65 | 68 | 64 | 60 | 38 |
| Rise Time, ns | 0.9 | 0.7 | 0.9 | 1.0 | – |
| Decay Time (ns) | 2.4 | 1.8 | 2.1 | 3.3 | 4.0 |
| Pulse Width, FWHM, ns | 2.7 | 2.2 | ~2.5 | 4.2 | 5.3 |
| Wavelength of Max. Emission, nm | 423 | 408 | 425 | 434 | 434 |
| Light Attenuation Length, cm* | 160 | 140 | 210 | 210 | 210 |
| Bulk Light Attenuation Length, cm | 250 | 160 | 380 | 400 | 400 |

Atomic Composition –

| | BC-400 | BC-404 | BC-408 | BC-412 | BC-416 |
|--|--------|--------|--------|--------|--------|
| No. H Atoms per cc (x10 ²²) | 5.23 | 5.21 | 5.23 | 5.23 | 5.25 |
| No. C Atoms per cc (x10 ²²) | 4.74 | 4.74 | 4.74 | 4.74 | 4.73 |
| Ratio H:C Atoms | 1.103 | 1.100 | 1.104 | 1.104 | 1.110 |
| No. of Electrons per cc (x10 ²³) | 3.37 | 3.37 | 3.37 | 3.37 | 3.37 |

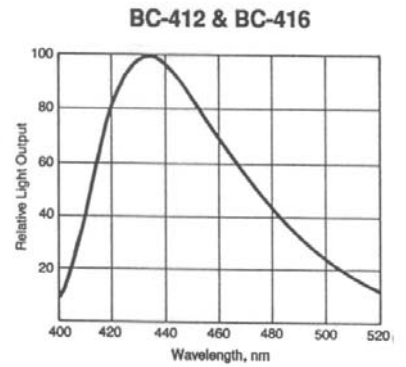
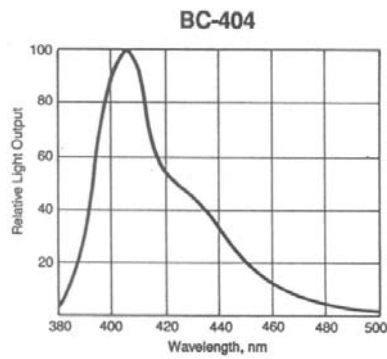
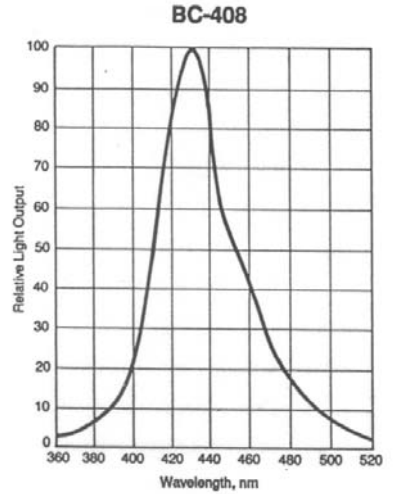
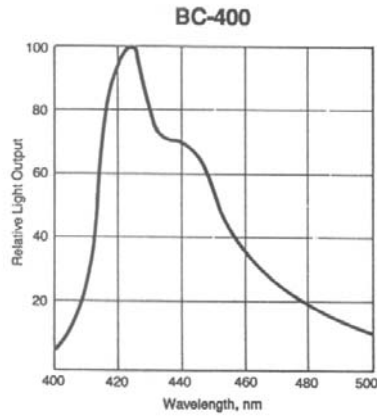
*The typical 1/e attenuation length of a 1x20x200cm cast sheet with edges polished as measured with a bialkali photomultiplier tube coupled to one end.

General Technical Data –

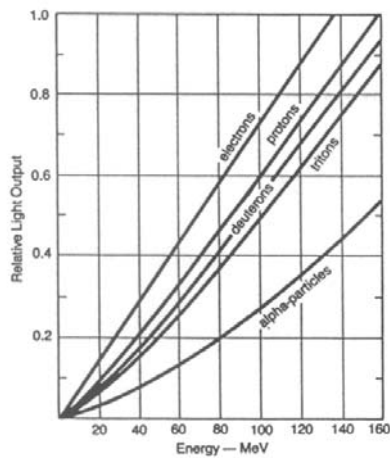
| | |
|--------------------------------------|--|
| Base | Polyvinyltoluene |
| Density (g/cc) | 1.032 g/cc |
| Refractive Index | 1.58 |
| Expansion Coefficient (per°C,<67°C): | 7.8X10 ⁻⁵ |
| Softening Point | 70°C |
| Vapor Pressure | May be used in vacuum |
| Solubility | Soluble in aromatic solvents, chlorinated solvents, acetone, etc. Unaffected by water, dilute acids, lower alcohols, alkalis and pure silicone fluids or grease. |
| Light Output | At +60°C = 95% of that at +20°C. Independent of temperature from -60°C to +20°C |

BC-400, BC-404, BC-408, BC-412, BC-416 Premium Plastic Scintillators

Emission Spectra



Premium Plastic Scintillators Response to Atomic Particles



Range of Atomic Particles in Premium Plastic Scintillators

