

# BC-440,BC-440M,BC-448,BC-448M

## Premium Plastic Scintillators

The BC-440 series are made from a specially modified polyvinyltoluene base and are intended to bring the premium scintillator performance characteristics of BC-408 and BC-412 to high temperature environments. This family of scintillators provides the high temperature characteristics of polystyrene based scintillators without the diminished light yield associated with such formulas. The base formulas have a softening point of 99°C, while formulas with the “M” designation are crosslinked and they are designed for use at temperatures up to 150°C. At high temperatures the “M” series will soften and become rubber-like, but retain their shape. Some deformation may occur if the scintillators are subjected to external forces. When the scintillators are intended for use at temperatures above 80°C for long periods of time, they should be protected from air to prevent oxidation.

### Scintillation Properties –

|                             | BC-440 | BC-440M | BC-448 | BC-448M |
|-----------------------------|--------|---------|--------|---------|
| Light Output, % anthracene  | 60%    | 60%     | 64%    | 64%     |
| Decay Time, ns              | 3.3    | 3.3     | 2.1    | 2.1     |
| Wavelength of Max. Emission | 434nm  | 434nm   | 425nm  | 425nm   |
| Bulk Attenuation Length     | >400cm | >400cm  | 380    | 380     |

### Atomic Composition –

|                         |                       |                       |                       |                       |
|-------------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| No. H Atoms per cc      | 5.23x10 <sup>22</sup> | 5.23x10 <sup>22</sup> | 5.23x10 <sup>22</sup> | 5.23x10 <sup>22</sup> |
| No. C Atoms per cc      | 4.74x10 <sup>22</sup> | 4.74x10 <sup>22</sup> | 4.74x10 <sup>22</sup> | 4.74x10 <sup>22</sup> |
| No. of Electrons per cc | 3.37x10 <sup>23</sup> | 3.37x10 <sup>23</sup> | 3.37x10 <sup>23</sup> | 3.37x10 <sup>23</sup> |

### General Handling –

The scintillators are soluble in aromatic solvents, chlorine, acetone, etc. They are insoluble in water, dilute acids & alkalis, lower alcohols, silicone fluid, grease. Scintillators

with the “M” designation are more resistant to aromatic solvents, but some swelling of the base and leeching of the scintillation solutes are likely.

### General Technical Data –

|  |                      |
|--|----------------------|
| Base .....                                 | Polyvinyltoluene     |
| Density (g/cc): .....                      | 1.03                 |
| Refractive Index: .....                    | 1.58                 |
| Softening Point:                           |                      |
| BC-440 .....                               | 99°C                 |
| BC-440M .....                              | **                   |
| BC-448 .....                               | 99°C                 |
| BC-448M .....                              | **                   |
| Specific Gravity: .....                    | 1.58                 |
| Expansion Coefficient (per°C,<70°C): ..... |                      |
| .....                                      | 7.4x10 <sup>-5</sup> |
| Tensile Strength (MPa <sub>+4</sub> ):     |                      |
| BC-440 .....                               | 34                   |
| BC-448 .....                               | 34                   |
| Flexural Strength (MPa <sub>+6</sub> ):    |                      |
| BC-440 .....                               | 50                   |
| BC-448 .....                               | 50                   |
| Tensile Modulus (MPa <sub>+300</sub> ):    |                      |
| BC-440 .....                               | 2600                 |
| BC-448 .....                               | 2600                 |
| Radiation Length (cm): .....               | 43                   |

Scintillation Products  
Organic Scintillators



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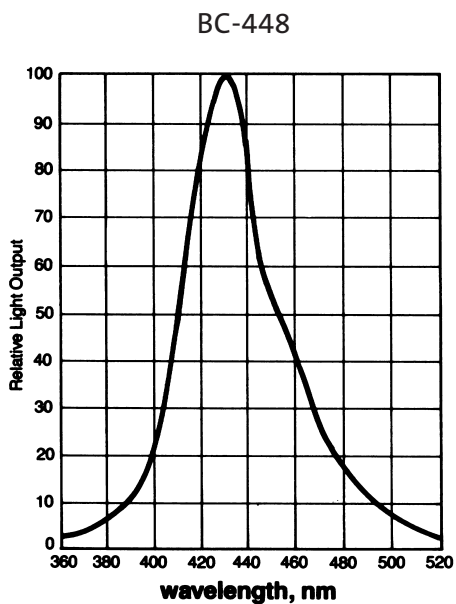
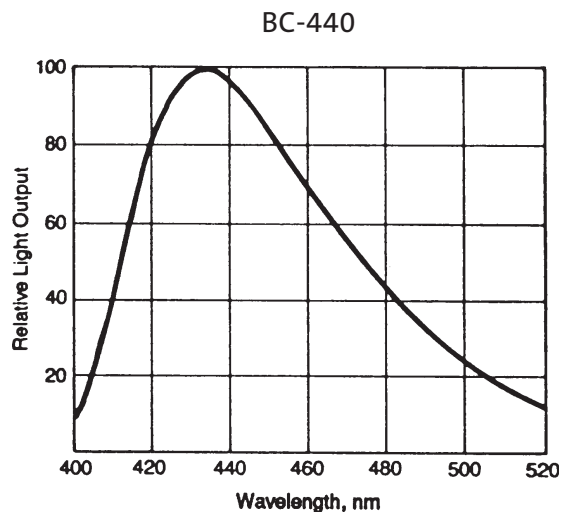
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Emission Spectrum –



Manufacturer reserves the right to alter specifications.

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