BC-490 Plastic Scintillator Casting Resin

BC-490 is a partially polymerized plastic scintillator that is cured to full hardness by the end user. The scintillator thus formed is clear with scintillation and mechanical properties similar to those of SGC's general purpose plastic scintillators. It is most frequently used in applications which require other materials to be imbedded in the scintillator, and which require the casting of unique shapes (often in special holders).

BC-490 is supplied in complete kits with detailed instructions. Each kit contains three parts: partially polymerized scintillator resin, catalyst, and catalyst solvent. Kits are available in pint, quart and gallon (0.5, 1 and 3.8 liter) sizes.

Scintillation Properties of Hardened BC-490	
Light Output, %Anthracene	55
Decay Time (ns)	~2.3
Wavelength of Max. Emission, nm	425
Atomic Composition	
No. of H Atoms per cc ($x10^{22}$)	5.23
No. of C Atoms per cc ($x10^{22}$)	473
Ratio H:C Atoms	1.1
No. of Electrons per cc ($x10^{23}$)	3.37

General Technical Data –

Base	Polyvinyltoluene
Density [g/cc]	1.032
Expansion Coefficient (per°C,<67°C)	~$7.8X10^{-5}$
Refractive index	1.58
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

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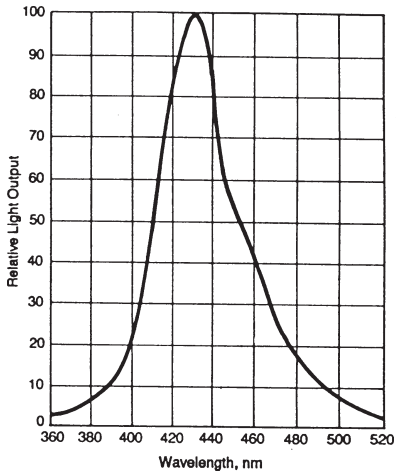
Emission Spectra



Instructions for Use –

This material is supplied in three parts, consisting of:

1. Resin — the prepolymerized plastic phosphor
2. Catalyst
3. Solvent — vinyltoluene monomer to be used for dissolving the catalyst.

The suggested method for preparing an ingot suitable for machining to a 2" X 2" sample is set out below. The quantities may be increased or decreased for different sizes of sample but should be used in the same proportions.

Suitable molds for preparing samples may be made from glass, galvanized iron, tin, Teflon®, or aluminum. Copper and brass are to be avoided.

1. Measure out 250ml of Resin (this allows 15-20% for contraction)
2. Weigh out 1.25g of catalyst (0.5% of the resin volume).
3. Dissolve catalyst in solvent making a 10% solution (12.5ml in this example). The solution should be clear.
4. Add this solution to the resin and mix thoroughly. Allow air bubbles to rise out of the stirred resin. Vacuum techniques may be employed.
5. Pour into mold. Again remove air bubbles.
6. Place mold in water bath and leave for 14 days at 47°C or until the plastic is not dented when a knife or pencil is pressed into it, then post cure for about 8 hours at 80°C. Best results are obtained if the material is polymerized in an oxygen-free atmosphere. Employ a nitrogen atmosphere when possible. If a glass mold is used, cool with running water and break glass. Metal molds may be cut and peeled off.

If a tapered Teflon® mold is used, cool with running water and break glass. 90% of the machining is eliminated if a tapered Teflon® mold is used.

Note: If plastic is not sufficiently hard before being post-cured, there is a strong tendency for bubbles to form.

Machine to size and mount.

All materials should be stored in a dark, cool place. If possible, keep in a refrigerator. Shelf life is 4-5 weeks.

SAINT-GOBAIN

Saint-Gobain Crystals

www.crystals.saint-gobain.com

Manufacturer reserves the right to alter specifications.

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