Handling and Cleaning Plastic Scintillators

Handling Procedures –

1. Keep the factory-applied, protective masking material on the scintillator as long as possible. Avoid wetting the protective paper as this may cause the paper to come off and leave the adhesive attached to the scintillator.

2. When handling bare scintillator, wear clean soft cotton gloves. If this is not possible, wash your hands to remove any oils. The normal body oils of some people can damage the scintillator.

3. Protect the scintillator from exposure to most organic solvents and their vapors. The one exception to this rule is the lower alcohols: methanol, ethanol and isopropanol. Use only reagent grade alcohols. Isopropanol is preferred because of the less intense cooling that accompanies evaporation.

4. Clean water and soapy water followed by a clean rinse are the best solvents for cleaning the scintillator, especially when cleaning large areas. A solution of about 10 grams of Alconox in a gallon of water is recommended. After water washing, the scintillator may be blown dry with oil-free compresed air or gently patted dry with clean, soft, non- abrasive cloths or paper towels.

   Alcohols are best employed to clean areas such as around epoxy joints. Avoid wiping motions where possible. Never use alcohols to clean holes bored or drilled in the scintillator.

Sanding –

Remove turning lines by hand, rubbing at right angles using #240 grit silicon carbide waterproof paper with water. Follow with #400 and #600, also with water. Each step should be at right angles to the previous one until all previous lines are removed.

Hand Polishing –

On small areas and holes, use polishing aluminas, finishing with a particle size of 9 microns. On a flannel cloth, form a paste with water. Rinse away the polishing alumina and use a general purpose non-abrasive plastic polishing liquid (available at plastic supply companies) for final cleaning. Use a clean, soft flannel cloth in this final process. Avoid using polishing liquids on drilled holes or heat bent pieces.

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General Information –

Premium plastic scintillators are shipped with a protective masking paper, or, on request, with a clear plastic film applied to the scintillator surfaces. This protective layer should be left on the scintillator during all handling until just before it is wrapped with reflective light tight covers prior to installation in your detector system.

These protective materials adhere to the scintillator by means of a low-tack adhesive which leaves little or no residue when the mask is removed. The adhesive is sufficiently weak so that, once it is removed, the masking tape will not stick to the scintillator again.

The scintillators and light guides are machined without the use of standard cutting oils. Water is usually the only lubricant employed. After being polished, the scintillators and light guides are cleaned thoroughly to remove all residues of polishing compounds and optical cements.

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Clamping –

For turning and milling, clamp lightly using suitable wood or plastic blocks to spread the pressure over a larger area or to avoid sharp pressure points. Avoid trapping dirt between the scintillator an other surfaces.

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