SciCron Technologies

Technical Information

Technical Bulletin SP-01
Fabrication of C-300™ Coated Plastics

SciCron Technologies C-300™ static dissipative plastic substrate has a polymeric, crosslinked coating which exhibits excellent clarity, chemical resistance, and mar resistance. C-300 coated plastics can be fabricated into a wide variety of flat surface configurations including windows, doors, partitions, enclosures, desiccators, and control panels. However, the hard, cured C-300 coating is **not designed for heat bending.** Attempts to bend C-300 coated plastics usually result in cracking and crazing of the static dissipative surface. For applications requiring heat formed or bent configurations, plastic substrates with SciCron Technologies C-350™ bending grade coatings are recommended.

This Bulletin suggests fabrication guidelines for C-300 coated plastic sheet products.

General Precautions

Although the C-300 coated surface is more abrasion resistant than the base plastic, the coating is only approximately one micron thick, making it susceptible to damage if the plastic sheet is handled roughly or carelessly. As a general rule, all fabrication of C-300 coated plastics should be undertaken as carefully and gently as is practical to avoid unintended damage. Whenever possible, fabrication procedures should be carried out with the protective masking left on the sheet surfaces to minimize the possibility of damage. Work surfaces should be free of chips and debris which might scratch the plastic.

Note: Some plastic substrates occasionally contain internal stresses which can cause cracks or crazing during fabrication. In such cases, it may be necessary to anneal the plastic before fabrication.

Cutting and Machining

The C-300 coated surface is very thin making it unlikely that its presence would necessitate any significant change in typical cutting and machining procedures during fabrication. Generally, the same techniques, cutting blades, machining tools and tool speeds are used as would be used normally with the base plastic. Wet sanding, buffing and scraping procedures can be used for edge finishing but flame polishing is not recommended for finishing C-300 coated plastics.

Caution!

1.0 Use of inappropriate equipment and tools, not designed for plastic fabrication, can result in melting, cracking, or shattering of the plastic substrate during fabrication procedures. This can damage the plastic permanently and could result in serious injury to equipment operators. **Always observe appropriate safety precautions when fabricating SciCron Technologies products.** Contact SciCron Technologies or your distributor for information about appropriate equipment and fabrication procedures.

2.0 Procedures that excessively heat the plastic, like laser cutting and flame polishing of cut edges, can induce stresses in the plastic. This can cause cracking or crazing at the cut edges if the edges subsequently come into contact with solvents. Therefore, these fabrication techniques should be avoided if the edges are to be glued with a solvent cement, or coated, as with SciCron Technologies Trim Fluid™.

Solvent Welding

Because the C-300 coated surface is very chemical resistant it is not softened or removed by short-term contact with solvents commonly used in solvent based cements. As a result, the C-300 coated surface **must be mechanically removed** from the substrate to achieve a good adhesive bond. Light sanding with very fine grit sandpaper is all that is normally required to prepare the substrate surface for a solvent cement. Other mechanical techniques, such as routing, can also be effective.

Acrylic and polycarbonate substrates can be bonded with methylene chloride based cements while PVC substrates can be bonded with cements containing acetone, methyl ethyl ketone (MEK) and tetrahydrofuran (THF).

Note: Welding techniques using 100% solvent welding liquids (e.g. 100% methylene chloride) often do not yield strong bonds due to rapid evaporation of the solvent. For improved bond strengths, the cement can be formulated with some dissolved plastic content. This slows evaporation allowing the solvent time to bite into the substrate to make the bond.

For best results, note the following recommendations:

- **Observe appropriate safety precautions when using solvent cements. Provide adequate ventilation during application.**
- Cut edges should be flat, square and smooth and should fit together well. If the edges contain stresses induced by cutting or machining it may be necessary to anneal the plastic before allowing the stressed edges to come in contact with a solvent cement.

(continued below)

Solvent Welding (continued)

- Clean the surfaces to be bonded with isopropyl alcohol (IPA), if necessary, to remove any residue.
- Apply the welding liquid to both surfaces. Join quickly (a few seconds) after application.
- Clamp the pieces together and hold for one to three hours allowing the bond to develop some green strength. The length of time needed to achieve enough green strength to move the pieces will vary with cement type and ambient conditions. Although high bond strength is achieved in 24 to 48 hours, the bond continues to strengthen for several weeks.