

## Technical Bulletin MP-01

### Fabrication of Mar-Con® 600 Abrasion Resistant Coated Plastics

SciCron Technologies Mar-Con® 600 abrasion resist plastic substrate has a crosslinked coating which has excellent abrasion resistance, chemical resistance, and clarity. Mar-Con 600 coated plastics can be fabricated into a wide variety of flat surface configurations including glazing, partitions, doors, enclosures, shields and access panels. They can also be used for fabricated items such as boxes, displays, display cases, and key pads. However, the cross-linked, cured, Mar-Con 600 coating is **not designed for heat bending**. Attempts to bend Mar-Con 600 coated plastics usually result in cracking and crazing of the abrasion resistant coating. For applications requiring heat formed or bent configurations, plastic substrates with SciCron Technologies Forming Grade Mar-Con® 551 coating are recommended.

This Bulletin suggests fabrication guidelines for Mar-Con® 600 coated plastic sheet products.

#### General Precautions

Although the Mar-Con® 600 surface is much more abrasion resistant than the base plastic, the polymer coating can be damaged if the plastic sheet is handled roughly or carelessly. As a general rule, all fabrication of Mar-Con 600 coated plastics should be undertaken as carefully 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

It is unlikely that the presence of the Mar-Con® 600 coating 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 Mar-Con 600 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, particularly if the edges are to be glued with a solvent cement. Flame over-spray during flame polishing can also cause immediate cracking or crazing of the coating at the sheet edge leading to delamination of the coating at that edge.

#### Solvent Welding

Because the Mar-Con® 600 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 Mar-Con 600 coating **must be mechanically removed** from the substrate to achieve a good adhesive bond. Sanding or routing techniques can be used to remove the Mar-Con 600 coating and prepare the substrate surface for a solvent cement.

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.**

(continued below)

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#### Solvent Welding (continued)

- 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.
- 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.