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## TECHNICAL GUIDE

### Bonding

**Many adhesives are available that can bond Berman Resin products. The following are recommendations; however, formal tests should be done prior to engaging in final installation.**

#### **Bonding Methods**

Solvent-bonding is generally preferred when the components to be joined are made from the same resin. When joining dissimilar materials, however, or considerations such as part size, bond flexibility, or bond appearance prevail, adhesives or mechanical fastening may be needed. Recommended adhesives include cyanoacrylates, two-part acrylics, two-part polyurethanes, and two-part epoxies.

#### **Adhesive-Bonding**

When joining dissimilar materials, solvent bonds are rarely strong and durable, so use of adhesives is often recommended for this purpose. The adhesive selected must be compatible with each material involved. If the materials being joined expand or contract at different rates, a flexible bond may be required. Take this into account when selecting the adhesive formula. If expansion and contraction are a major concern, consider the use of mechanical fastening.

#### **Adhesive Characteristics**

A variety of adhesives are available for joining dissimilar plastic materials. As a result, it is difficult to make general observations. Unlike solvents, which evaporate, an adhesive layer remains a functional part of the finished assembly. Hence, the performance and appearance of the finished part may depend primarily on the characteristics of the adhesive layer. For example, the selection of a brittle adhesive or one that contains aggressive chemicals may lower the impact strength of the sheet. Several characteristics to consider when selecting an adhesive are:

- Chemical compatibility with the parts being joined.
- Aesthetics of the finished joint
- Expansion/Contraction with temperature changes
- Brittleness/rigidity/flexibility
- Weatherability, if required
- Durability/service life
- Adhesive strength (adhesion to the plastic)
- Cohesive strength (resistance to internal tearing)
- End-use requirements

#### **Adhesive-Bonding Procedure**

Joined surfaces must fit well without forcing and must have no visible gaps. The surfaces to be bonded should be smooth but not polished. Sand the surfaces to be joined with 120 grit or finer paper. Diamond-wheel polishers, jointer/planers, or other mechanical devices can produce excellent results. However, soft polishing wheels or flame-polishing are not recommended as these can round the edges, causing gaps and improper fit.

# Joel **Berman** Glass Studios

## **Adhesive Shrinkage**

Some adhesives with a volatile component may shrink while curing. To compensate for this, cut the joint on an angle, providing space for the joint to be slightly overfilled to compensate for shrinkage. Consult your adhesive suppliers' literature for specific information on shrinkage.

## **Can Do's**

Use an adhesive system to bond Acrylic sheets to other materials such as acrylic or polycarbonate:

For bonding sheets made with JBGS Acrylic or PETG to itself, use:

- Weld-On 58
- Weld-On 55
- Weld-On 42
- Scotch-Weld DP-100 Durabond 105CL
- Light Cure 3104
- Light Cure 3105
- Ultra Light-Weld 3072
- Plastic Welder 11.1

For bonding sheets made with JBGS PETG to a sheet of Acrylic use:

- Weld-On 42
- Durabond 105CL
- Light Cure 3104
- Light Cure 3105
- Ultra Light-Weld 3094
- Ultra Light-Weld 3072
- Plastic Welder 11.1

For bonding sheets made with JBGS PETG to a sheet of polycarbonate, use:

- Weld-On 58
- Weld-On 55
- Durabond 105CL
- Light Cure 3104
- Light Cure 3105
- Ultra Light-Weld 3094
- Ultra Light-Weld 3072
- Plastic Welder 11.1

## **Bonding Process:**

Use the following procedure:

1. Start with a flat surface.
2. Prepare the sheet properly
3. Remove all foreign particles
4. Wipe surface with a 50:50 mixture of isopropyl alcohol and water
5. Allow surface to dry thoroughly before bonding
6. Sanding with fine-grit sandpaper to lightly roughen the surfaces to be bonded may improve bond strength
7. Apply the two-component system to one surface.
8. Place the two surfaces in desired bonded position.
9. Fill joints completely with adhesive so that no voids remain.
10. Use a jig or fixture to securely hold parts being bonded together while curing.
11. Follow manufacturer's recommendations for proper pressure and time needed for the adhesive to cure.