

Imagicor!

By Designed Images, Inc.

Fabrication & Installation Manual

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Introduction

*Imagicor!*TM is a polymer product that can have the reflective gloss and beauty of hand-lacquered surfaces or a rich hand rubbed look of a fine veneer. The deep surface visuals combined with the rich finishes makes these products one of the most elegant, practical, stain resistant decorative surfacing materials on the market today.

Imagicor! is ideal material to use for vertical applications, including fixtures and furniture, cabinetry and millwork, case-goods, wall treatments, showers, elevators and signage.

Imagicor! is available in solid, metallic, and pearlescent colors and printed woodgrains, abstracts and photographic files provided by you.

Imagicor! fabrication is very similar to high-pressure laminate fabrication. After a surface substrate is smoothed *Imagicor!* is then cut slightly over size. Both the substrate and the *Imagicor!* are coated with a clear contact adhesive, the two pieces are then laminated, rolled, routed to size, and finished.

This manual is written primarily to assist fabricators and installers in the best techniques to use when working with Designed Images' *Imagicor!*. Architects, interior designers and builders will also find valuable product information to help them take full advantage of this innovative product.

The fabrication techniques discussed in this manual are very straightforward. **However, because of the unique attributes of sheet polymers, Designed Images strongly recommends that you read this manual before you begin working with these products.**

You must take caution when performing some of the steps and ensure that you follow all the critical techniques discussed in the manual.

Before starting a job, use a 2' x 2' trial piece of *Imagicor!* to learn about and become familiar with the products' characteristics.

YOU are responsible for accepting shipments without damage. Check all shipments for top, bottom and edge damage. We recommend opening all shipments before accepting.

NOTE: *Imagicor!* should not be used for kitchen countertops or other high wear applications.

Warranty Information

LIMITATION OF WARRANTY AND LIABILITY

Limited Warranty: Seller warrants that the products sold shall be of merchantable quality and shall conform to Seller's standard specifications. Buyer assumes all risk as to the results of the use of the products purchased, whether used singly or in combination with other materials or in any process.

Limitation of Claims: At Seller's option, Seller will replace, without additional charge, products that do not comply with the warranty or, upon return of the products at Seller's expense, refund the purchase price.

Seller makes no warranty, express or implied, based on any course of dealing or usage of trade or of fitness for particular use or otherwise, other than that stated herein or required by applicable law. Seller's liability for any loss or claim whatsoever, including a claim for breach of the warranty merchantability, shall be limited solely and exclusively to replacement of defective or non-conforming products or, at the election of seller, to return of the products and repayment of the purchase price. In no event shall seller be liable for any other actual damage or any special, incidental, consequential or exemplary damages.

Buyer is responsible for inspection of the product upon receipt and prior to any cutting or fabrication. Any claim by Buyer for breach of warranty shall be deemed waived to the extent it could have been determined by such inspection, unless presented in writing to the Seller within ten days from the day of receipt of the products to which such claim relates. In any event, claims not made within two months after receipt are deemed waived. Products are shipped with a protective film to protect product during transit and storage. All such products must be inspected for defects prior to cutting or fabrication. Surface must then be protected during cutting and fabrication. Failure to remove the protective film to inspect for defects prior to cutting or fabrication is at Buyer's risk.

Any question concerning this warranty should be directed to: Designed Images, Inc., 10121 Stafford Road, Unit C, Chagrin Falls, OH 44023 – 440-708-2526.

Required Tools & Supplies

There are tools and supplies that are specifically designed for fabricating decorative acrylics and polycarbonates. However, most of the tools and supplies that are required are usually found in a professional cabinet shop.

- ▶ DA Orbital (palm) sander – 10,000 rpm or higher. We use a pneumatic orbital by Dynabrade, Model 59020 3/16 orbit
- ▶ Routers: 7/8 to 1-3/4 HP – more powerful routers will damage the material
- ▶ Carbide router bits with ball bearing guide. Only use new sharp bits - relegate the used one's to wood or high pressure laminate.
 - 1) Flush for trimming or sizing (2 flute). 3 flute work, but create more heat, which can matte/melt the surface of the acrylic.
 - 2) 45° and 22-1/2°, 2 flute chamfer bit or a radius roundover bit
- ▶ Polishing Pads for DA sander from 3M (3M 5700 pad)
- ▶ Polishing Compounds – Any good quality compound. We use:
 - Nu Finish Scratch Doctor (Good general purpose available at Walgreen's)
 - 3 M Finesse-it™ Plastic Polish and 3M Imperial Finishing Compound
 - Any good Swirl remover for final polish (only necessary on very dark *Imagicor!*)
- ▶ Circular carbide tip blades. Triple chip grind with minimum carbide overhang
 - 1) 12" x 100 tooth with 1 - 5° positive rake.

We use :

 - Blade TLL121004 (this number is recognized by most saw blade manufacturers)
 - Thin Kerf
 - Low Melt
 - Triple Chip Modified Plastic Saw Blade
 - 2) 10" x 80 tooth with 1 - 5° positive rake
We use :
 - Blade TLL10804 (this number is recognized by most saw blade manufacturers)
 - Thin Kerf
 - Low Melt
 - Triple Chip Modified Plastic Saw Blade

Our supplier is: Cleveland Tool & Cutter
14181 Foltz Industrial Parkway
Strongsville, Ohio 44149
Tele:440-238-5770 Ask for Mike Franklin
- ▶ Sandpaper to fit the DA Sander
 - 1) 180 grit
 - 2) 400 grit
 - 3) 30 micron Available from 3M
 - 3) 60 micron from 3M

Required Tools & Supplies Continued

- ▶ Edgebanders
Set the trimmer on your edgebander for the accurate thickness and check the automatic feed roller. If you have a prick roller, feed the sheet through the edgebander by hand to prevent puncturing the back of the sheet. Most edgebanders will not handle .030 polycarbonate.

- ▶ Adhesives
 - Use only water-based adhesives on *Imagicor!*
 - Translucent (non-pigmented) adhesives produce an inconspicuous glue line, which provides the best results. **Do not use pigmented adhesives (green, red, etc.).**

- ▶ Solvent used to clean adhesive over spray.
 - This should be minimal because you should leave the protective film on the *Imagicor!* surface.
 - **Only** use Mineral Spirits or VM&P Naptha. Be careful not to get the solvent on the adhesive line.

- ▶ Cleaners

| | |
|---|-----------------------------------|
| 1) Non-ammoniated cleaners | 2) Windex® with Vinegar D |
| 3) SOS™ Glass Cleaner with Vinegar | 4) Like Magic Type N1-5 |
| 5) Tend-Anti static Cleaner | 6) Metrix Anti-Static #79 Cleaner |
| 7) Kleenmaster® (Brilliance) | 8) Chemprize Repel |
| 9) Soft Cloth or sponge with mild soap and water. | 10) Micro-Pel® |

Do not use alcohol or solvent-based cleaners for they will craze the acrylic.

Critical Fabrication Rules

- 1) Precondition all materials (*Imagicor!*, substrates, laminate and adhesives) to the same temperature and humidity for a minimum of 48 hours before fabrication
- 2) Cut sheets with the saw teeth entering onto the **back** of the *Imagicor!*. On almost all saws that means that the back of *Imagicor!* is up.
- 3) Use a high quality medium density fiberboard (MDF) or particleboard. Do NOT apply directly to plastered walls, gypsum, wallboard or concrete walls.
- 4) Apply water-based adhesives lightly and evenly (spraying is preferred). The adhesive should dry on both the decorative acrylic and the substrates before laminating. In order to prevent blistering or delamination, do NOT let the adhesive “skin over”, entrapping moisture from water-based adhesives. If you think it is **dry wait 5 more minutes**.
- 5) Use VM&P Naphtha or mineral spirits to remove excess adhesive. Do NOT use alcohol or solvents, such as lacquer thinners, acetone, MEK, toluene and methylene chloride, since these attack the decorative acrylic and cause delamination.
- 6) Keep laminated sheets intact after adhesive is applied. Moving or pulling a laminated sheet apart after lay up adversely affects the back of the decorative acrylic sheet. If you do need to reposition the *Imagicor!* use VM&P Naphtha in squirt bottle very gently lifting the edge with a blade. THIS IS ONLY IN EXTREME EMERGENCIES.
- 7) To prevent stress cracks in acrylic *Imagicor!* plan a 20” minimum radius for .118” acrylic grade and a 10” maximum radius for .060” acrylic material - cold bends. To fabricate a 6” minimum radius using .060” acrylic material, you must use heat to prevent stress cracks. All radiuses must have a minimum 2” tangent. Heating blankets or an oven with controlled temperature should be used in this application. NOTE: When bending *Imagicor!* acrylic grade, you are inducing stress in the sheet. Rough cuts (chips or nicks) on the edges are stress risers, and failure (stress cracks) is possible. Clean the edges to remove all chips and nicks that resulted in cutting pieces to size on a table saw.
- 8) To produce smaller radii use polycarbonate *Imagicor!*. A 6 inch radii can easily be produced using .060 polycarbonate. A 3 inch radii can easily be made using .030 Polycarbonate. A hold down or a 2-inch tangent is still required.
- 9) Use a router to flush trim inside cutouts and round all the 90° angles to prevent stress cracking and chipping. A minimum 1/16” radius is recommended. Please note that a 1/8” router bit produces a 1/16” radius on a 90° inside corner cutout.
- 10) Sand all edges to remove chatter that can cause stress cracking. Polish all edges to bring out the product’s full depth and appearance.
- 11) Use soap and water, non-ammonia glass cleaner or vinegar for routine cleaning. A soft white 100% cotton cloth, such as a t-shirt or towel, or a sponge should be used to wipe surfaces. We find that the yellow polishing cloths obtained at the local auto stores work best.
- 12) Leave protective covering on the decorative surface through final installation.

Imagicor! Storage

Storage Precautions

Imagicor! sheets are covered with a clear masking that protects the sheet from dirt and moisture. While the sheets are stored, the masking must be left intact to prevent scratching the surface of the material.

Store the sheets vertically in a covered A-frame rack at an angle of approximately 10°.

If it is necessary to store sheets horizontally stack the larger sheets at the bottom to avoid sagging or unsupported overhang.

Prevent the masking from tearing to keep dirt from scratching the acrylic sheets.

In addition, you must take the following precautions:

- Do NOT store the sheets near radiators, steam pipes or other heat sources, since heat can soften and deform the sheets.
- Do NOT store sheets near spray-painting booths.
- Do NOT expose sheets to solvent vapors, which may penetrate the protective peel masking and damage the sheet's surface.
- Do NOT slide several sheets together – Move one sheet at a time to prevent scratches.

Safety Precautions

Safety Precautions

Work in a well-ventilated area. Cutting, routing, sanding and edge buffing generate nuisance dust. Use tools with dust collectors and wear a dust mask.

Always wear eye protection when cutting, sanding or routing.

Use care when handling *Imagicor!* sheets – sharp or burred edges can cause cuts.

Fabrication Principles

Adhesives

Contact your adhesive supplier for specific recommendations, product data and material safety data sheets (MSDS).

Before using an adhesive for full-scale production, Designed Images recommends testing it to determine its suitability for specific projects and operating conditions.

➤ Contact Adhesives

Water base **WARRANTED** any type. **Be sure to let dry!!!**

Tried & true: 3M: PL 2000 NF -- Spray able -2-part system

3M: 30 NF-- Brush able 1-part system

DAP Weldwood Non-flammable water based

NOTE: Water based adhesive has a high solid content compared to solvent-based adhesive. A very light coat of water-based adhesive is sufficient.

With water base contact adhesives, all of the water must evaporate (flash off) before laminating. If the adhesive is not completely dry before laminating, a strong bond is not created and delaminating may occur. Most water base adhesives have low levels of solvents that can blister the back coating if not properly dried.

The drying time for water based contact cement is significantly effected by variations in atmospheric/humidity conditions. It is important to take these conditions into account. Manufacturers' recommended open and set-up times should be followed. **It is up to you to ensure that the adhesive on the decorative sheet and the substrate is completely dry before laminating.** To determine if the contact is dry place a clean finger on the contact. It should not lift or feel wet.

Solvent base Flammable type only!

NO Methylene Chloride based non-flammable – this is the main ingredient in Strip Ease and it does it's job very well!

BE SURE TO LET DRY!!!! When you think the contact is dry let it dry another five minutes!!

To determine if the contact is dry place a clean finger on the contact adhesive. It should not lift or feel wet.

Adhesives (continued)

- **Pressure Sensitive** - apply with roll laminator to *Imagicor!*
 - Avery Fasson UHF Acrylic Hi temp PS
 - 3M 9456 DC Tissue 5 Mil High Performance – smooth surface
 - 3M VHB 4950 (.45 foam) and 4920
 - 3M 9472 LE wide surface application

- **Other Mastics and Adhesives**
 - Westech Aerosol (In BBQ Propane type cylinders) HS-Mac1827C High Temp. **Be sure to let adhesive dry!!!!**
Telephone 1-770-985-1907 Ray Carter, Kentec Inc

 - Rugby Products (Imperial Adhesives) Hi Temp 107 Permagrip
Be sure to let adhesive dry!!!!
Telephone: 1-800-378-2016

 - Hinkle Adhesives PC 107 High Temp
Be sure to let adhesive dry!!!!
Telephone: 954-761-1744

- **Sealants-** Showers - Any good grade Silicone will work
 - Tried & True: Laticrete Call for info- Colored Silicone sealants
1-800-359-3297

- **Mirror Mastic** for Imagiflex Mirrors
 - 3M 4323 Mastic Moveable and re-positionable

Bonding

- Spraying is the best method for application. Properly applying adhesive to the back of the decorative acrylic and the substrate is critical to the success of the project. When adhesive is brushed or rolled, it may be applied too heavily. Heavy application of adhesives can cause skinning, where water or solvent can not evaporate. This, in turn, can causes adhesive blisters and can affect the *Imagicor!*
- Only a light coating of adhesive is required on the *Imagicor!* since there is no absorption of the adhesive. The substrate however, may require several light coats to attain a film on the surface.
- If application of the adhesive must be manual, application should be done with a smooth natural bristle brush, applying in long smooth strokes. Adhesive should be applied in one direction. Be sure not to have any globs of adhesive, as these will not dry completely and will negatively affect the *Imagicor!*
- After applying the adhesive, check to make sure there are no blobs or heavy build-up. Make sure the adhesive is applied evenly, since an uneven application causes a thick glue line, which is noticeable on the seam.
- When the adhesive on the decorative sheet and the substrate is dry, laminate the two together. To ensure a strong bond, apply pressure evenly across the sheet with a J-roller or squeeze roller. **Applying pressure with your hand does not ensure a tight bond.**

Free Standing Panels/Doors

Avoiding warp can be done via four different methods, just the same as high-pressure laminate panels. Different types of panel construction, their descriptions and how they are rated according to structural soundness, labor and material costs are shown in Table 1, below.

| Description | Acrylic Back | High Pressure Laminate (HPL) Back | MDO Plywood | Mealamine one side/ MDF |
|----------------------|----------------------|--|------------------|-------------------------|
| Construction | Balanced composition | Semi-Balanced Composition | Semi-Balanced | Semi-Balanced |
| Front | <i>Imagicor!</i> | <i>Imagicor!</i> with .050" Backer Sheet | <i>Imagicor!</i> | <i>Imagicor!</i> |
| Middle | 5/8" Substrate | 5/8" Substrate | 5/8" to 3/4" | 5/8" to 3/4" |
| Back | <i>Imagicor!</i> | .048" HPL | .038" Backer | One Side Melamine MDF |
| Structural Soundness | High | Moderate/High | Moderate/Low | Moderate/Low |
| Labor Costs | Moderate | High | Moderate | Low |
| Material Costs | High | Moderate | Low | Low |

Panel Construction Description and Ratings

Lay-out

- Plan edge pieces so they are in the proper direction on woodgrains.
- Edge Seams should be on the less conspicuous edge. On top doors the seam should be on the top and bottom. Bottom doors should have the seam on the sides and bottom. That means on a top door the top and bottom edges are done first, finished flat then the sides are bonded. On the bottom door, the bottom edge is bonded then the two sides, routed square, smoothed and the top edge is done last.

Fabrication Techniques

Follow the steps described in this section to build *Imagicor!* panels. If you decide to use a method other than the Semi-Balanced Construction, you may skip some of the steps, when noted in the text. Make sure all materials are stored for at least 48 hours at the same temperature before they are exposed to extreme temperature and humidity changes.

CUT PANELS

1. Use a saw with a circular carbide tip saw blade to cut the right size panels and strips. Cut sheets with the saw teeth entering onto the **back** of the *Imagicor!*. On almost all saws that means that the back of *Imagicor!* is up to protect the back from damage. See Figure 1.
2. Leave a 1/8" to 1/4" overhang on both the panels and strips to allow flush trimming

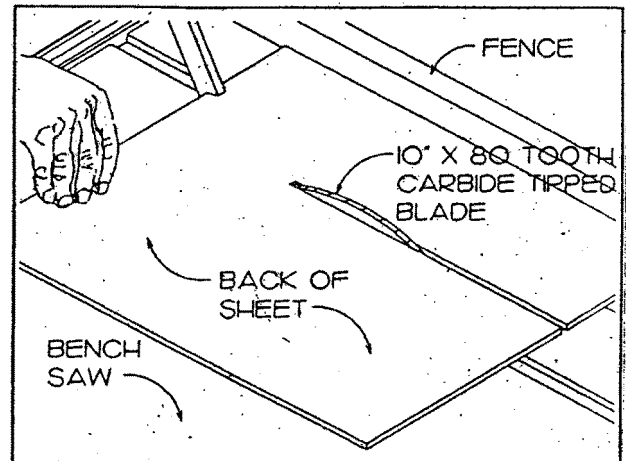


Figure 1

ADHERE BACKER/BACK SHEETS

Apply adhesive to the substrate facing and the .050 backer/balance sheet and adhere them together. (The substrate used between the *Imagicor!* sheet and the backer sheet must be sanded on both sides.)

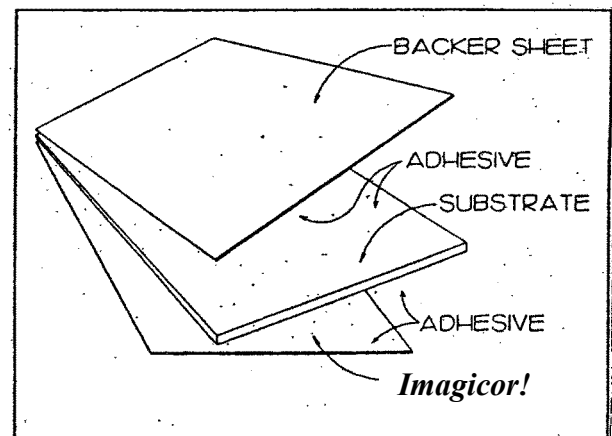


Figure 2

See Figure 2.

Skip this step if you are using another construction method.

Fabrication Techniques

APPLY EDGES

- Apply adhesive to the edge strip material and to the substrate edges. Allow overhang on all edges. See Figure 3.
- Read section on Bonding

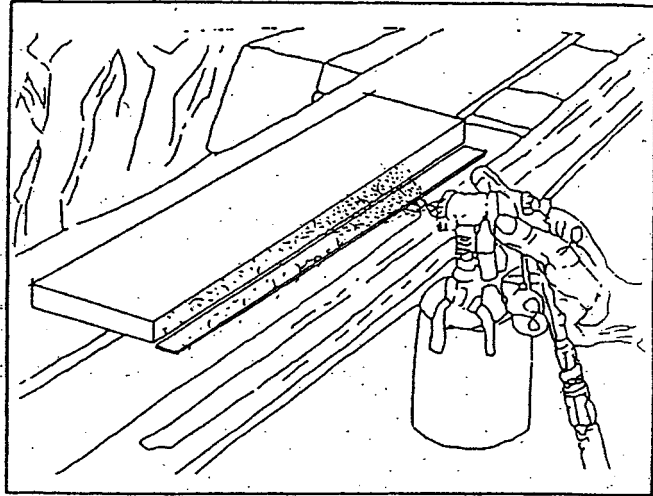


Figure 3

- Adhere the edge strips to the substrate by hand, using a J-Roller or a high quality edgebander (no pricks). If you use an edgebander, set its trimmer for the accurate thickness and check the automatic feed roller. A prick roller can puncture the back of the sheet, therefore, feed the sheet through the edgebander by hand. You can also use hot melt adhesive with an edgebander. See Figure 4.

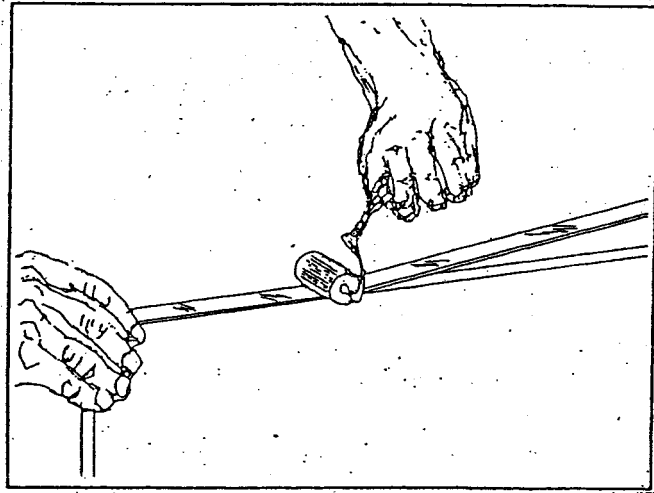


Figure 4

ROUTE EDGES SQUARE

- Use a router bit with a 2 flute cutter head with a ball bearing guide to flush trim the strips to the edge of the substrate. If you see the particles from the router sticking together decrease the feed speed—GO Slower! Use a new bit. Relegate dull bits to woodworking. They are still really sharp! Re-mask the edges before routing if the film has come off or is wrinkled. See Figure 5.

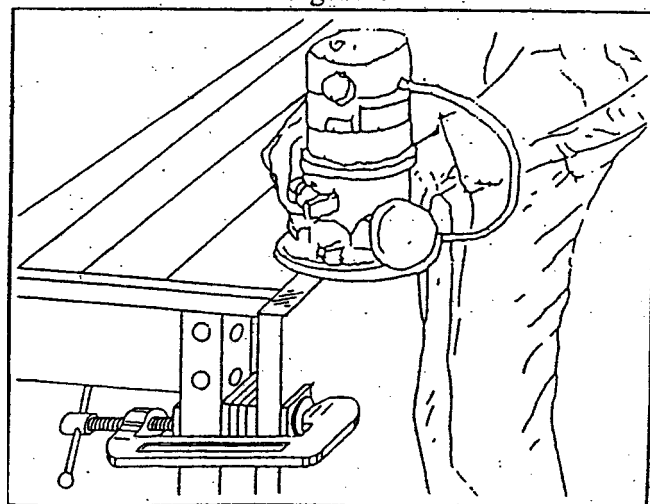


Figure 5

Fabrication Techniques

Lightly sand the front and back edges to ensure the strips are even with the substrate.

See Figure 6.

A metal file pushed from the outside face toward the adhesive works well. Do not file in a direction to remove the *Imagicor!*

Make sure you do not scar or mar the decorative sheet on the backside.

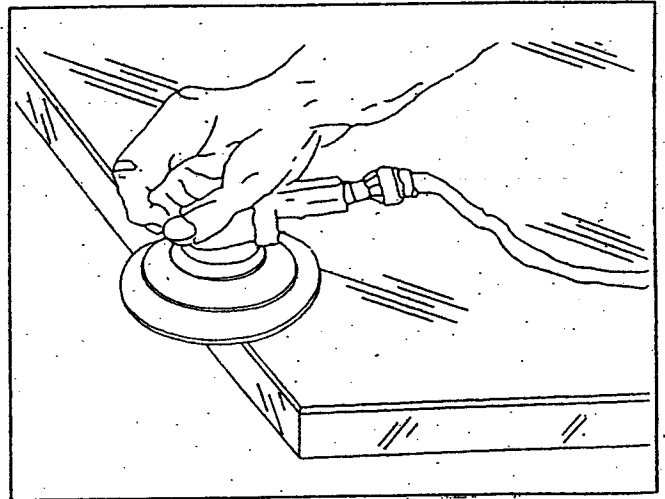


Figure 6

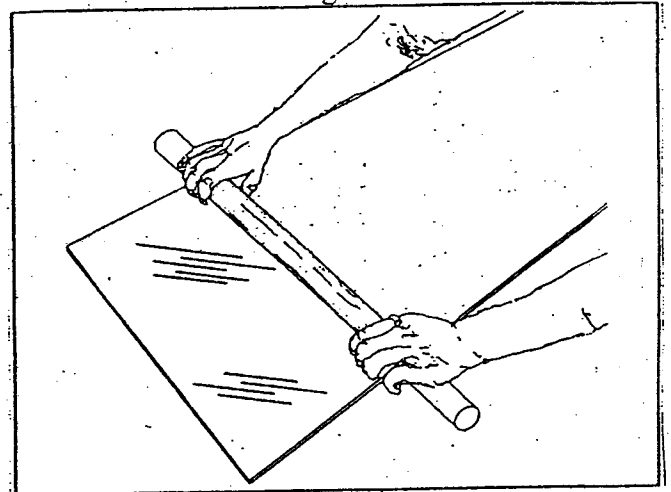


Figure 7

APPLY *Imagicor!* FACING TO SUBSTRATE

1. Do not remove the protective film from the decorative side of the *Imagicor!* sheet.
2. Spray or roll the adhesive on the substrate facing and back of the *Imagicor!* panels. Remember, the adhesive must be completely dry before laminating the decorative acrylic panel to the substrate.
3. NOTE: Water based adhesive has a high solid content compared to solvent based adhesive. A very light coat of water based adhesive is sufficient. See Figure 7 & 8.
4. Read section on Bonding

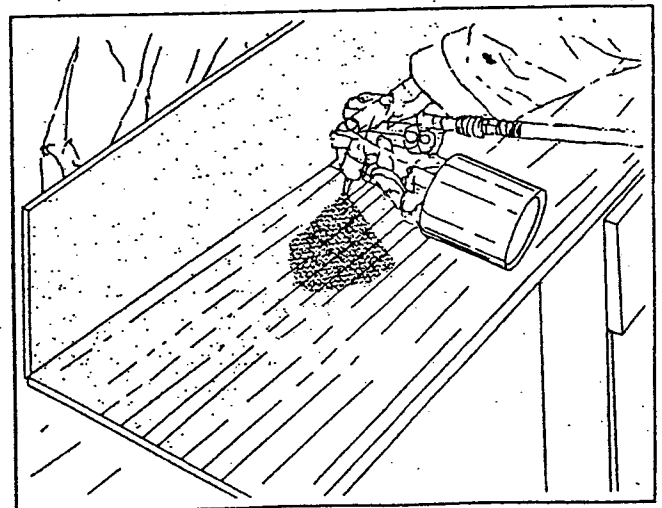


Figure 8

Fabrication Techniques

- Adhere the *Imagicor!* face panel to the substrate. See Figure 9.
- Larger pieces will require temporary separation dowels so the contact does not touch until the piece is positioned

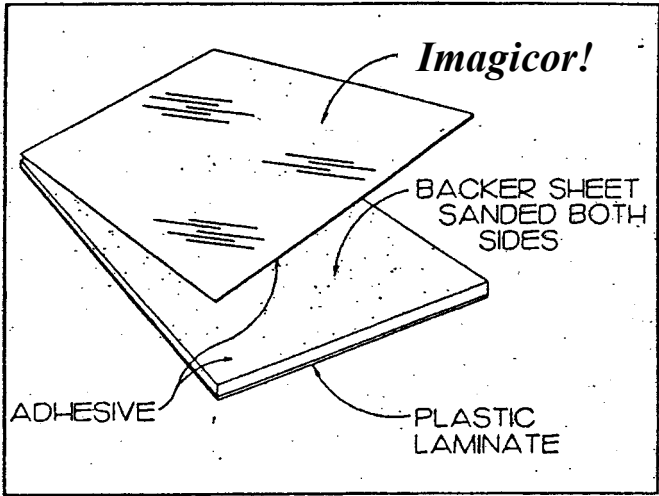


Figure 9

ROUTE *Imagicor!* FACING SQUARE TO SUBSTRATE

ROUTING

When routing, you must use a router bit with a ball bearing guide. Rout the edges using a flush-cut router carbide bit. Because of its thickness, decorative acrylic takes more time to rout than laminates, therefore do NOT rush. See Figure 10 and 11

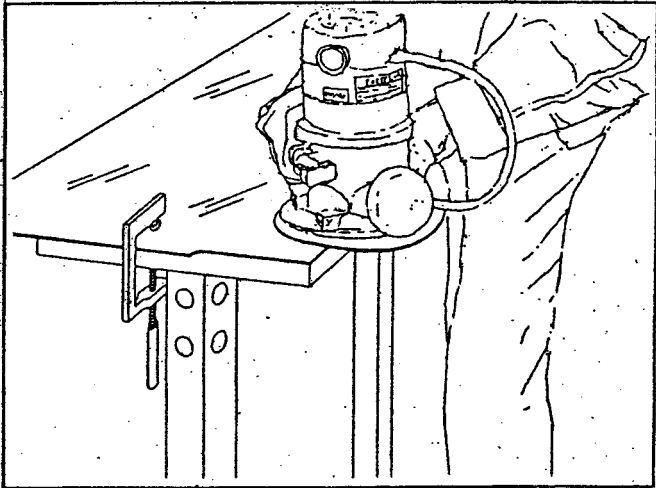
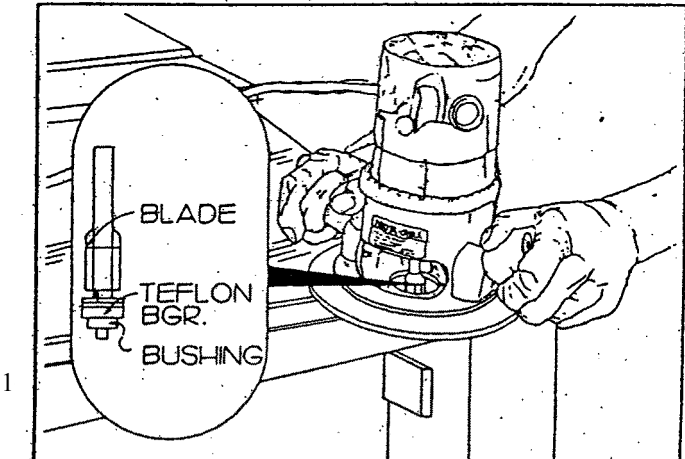


Figure 10



Fabrication Techniques

PROFILE EDGES

The ability to create a smooth, highly polished profile edge is one of the many advantages *Imagicor!* provides over other materials. Profiling an *Imagicor!* edge involves routing, sanding and polishing/buffing to produce a clear, high gloss finish.

DO NOT SKIP ANY OF THE STEPS LISTED BELOW.

- Bevel edges using either a 22-1/2° or 45° carbide, 2 fluted chamfer bit or a 1/8" radius round over ball bearing guide bit. **Use a bit that is the same thickness as the *Imagicor!* sheet.** See Figure 12

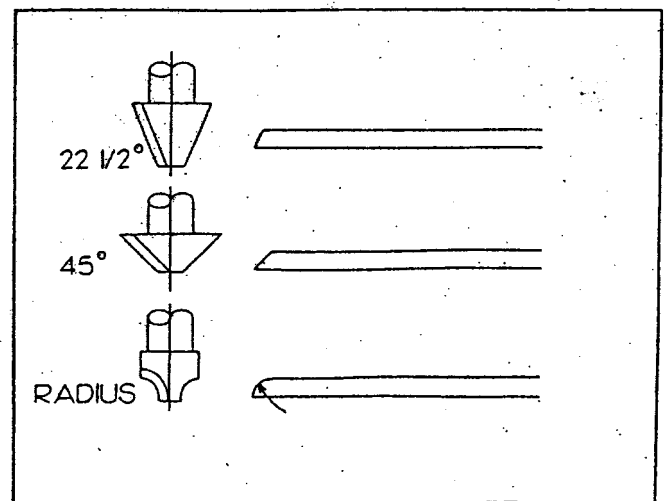


Figure 12

Fabrication Techniques

SANDING *Imagicor!* Acrylic

Use a 10,000-RPM dual action or orbital sander with a hard or stiff sanding pad. If there is a lot of router chatter, follow the sanding sequence below. However, if there is only a small amount of chatter, you can skip sanding with 120 grit and go straight to the second sanding step. See Figure 13.

1. Sand using 220 grit paper. Be sure to remove all chatter and over hang. You should continue using this paper until the piece is exactly the way you want it. Take special care not to touch the sides or top of your piece—only the edge should be sanded. Clean and wipe off edge to remove all traces of the 220 grit.
2. Sand using a new piece of 30-micron paper or used 60-micron paper. Take special care not to touch the sides or top of your piece. Only the edges should be sanded. Clean and wipe off edge to remove all traces of the grit.

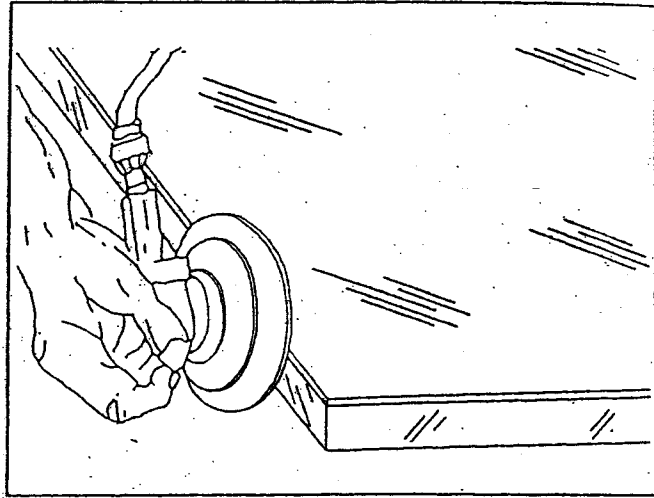


Figure 13

POLISHING/BUFFING

1. Apply only a small amount of the polishing compound to the buffing pad on the DA sander.
2. Buff until sanding marks are completely removed and the beveled edge is polished to a high gloss.
3. Remove the excess polishing compound with a clean cotton rag.

Fabrication Techniques

DRILLING

To attach hardware to an *Imagicor!* panel, drill holes with a carbide drill bit that is designed specifically for acrylic and that has a sharp 60° to 80° angle. While a standard high speed drill bit can be used, a drill bit with a 60° angle is the best since it goes into the material gradually, which prevents chipping and cracking. Absolutely the best drill is a step drill, which looks like a Christmas tree. Be careful to smooth the hole with a file.

Holes should always be a minimum of 1/16" larger than the screw. Drilling holes that are the same size or smaller can cause cracking in the acrylic.

See Figure 16.

YOU MUST FOLLOW PROPER DRILLING TECHNIQUES TO PREVENT IRREGULAR HOLES, CHIPPING OR MELTING.

1. Clamp or hold the decorative panel firmly to a worktable to provide support. Supporting the decorative acrylic panel prevents a blow out when the drill exits the material. A small piece of scrap acrylic under the drilling area will also protect the exit area.
2. Use any commercially available portable drill, drill press, or automatic multiple-spindle drilling unit fitted with a drill bit that has a sharp 60° angle to prevent chipping.
3. Drill, using a slow feed rate to let the bit gradually enter the material. This prevents chipping.
4. Slow the feed rate when the bit exits the bottom surface to prevent chipping.
5. Insert the screw, making sure not to over tighten. **Over tightening the screws may cause cracking.** See Figure 17.

| SCREW SIZE | DRILL BIT SIZE |
|------------|----------------|
| 1/8" | 3/16" |
| 3/16" | 1/4" |
| 1/4" | 5/16" |
| 5/16" | 3/8" |
| 3/8" | 7/16" |

Figure 16

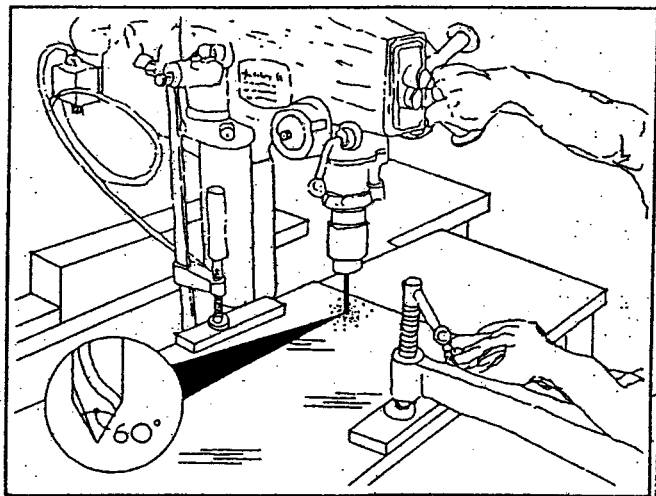


Figure 17

Fabrication Techniques

MAKING INSIDE CUTS

Inside cuts are used in bookshelves, wine racks, electrical outlets, picture frames and cabinet face frames.

To make inside cuts, follow these steps:

1. Cut or drill a pilot hole into the decorative acrylic. Make the hole large enough to accommodate the router.
2. Make the appropriate size cutout with a router and template.
3. Round out all 90° angles to a 1/8" radius, minimum, to prevent stress cracking and chipping.

See Figure 18.

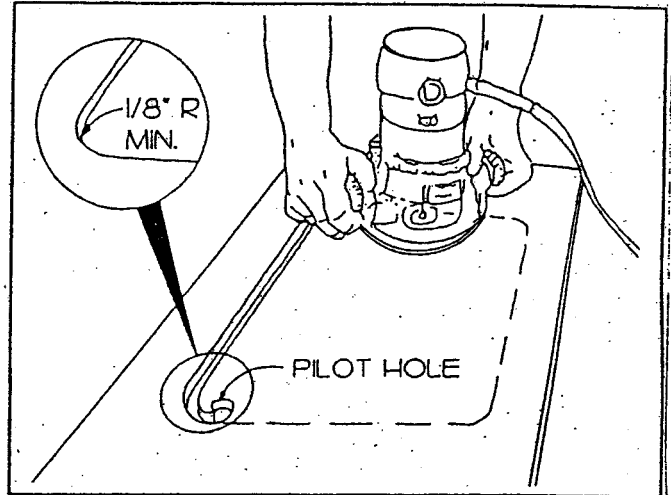


Figure 18

SEAMING

When joining decorative acrylic sheets, use either a V-Groove edge or a Strip/Reveal edge. Flat seams and butt joints are not recommended for decorative acrylics, since it is impossible to eliminate slight variances in thickness between sheets and growth of the substrate.

REMEMBER TO LEAVE THE PROTECTIVE MASKING ON THE DECORATIVE SURFACE OF THE ACRYLIC SHEETS.

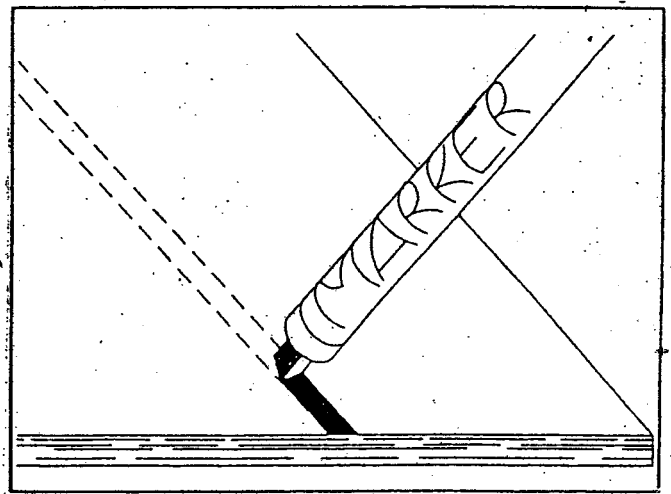


Figure 19

V-Groove Bevel Edge

1. Paint the substrate joint with a marking pen to camouflage the seam. See Figure 19.
2. Cut and bevel the *Imagicor!* edges with a router.
3. Perform the three-step sanding procedure according to the instructions on page 16.
4. Polish/buff edges, following the steps on page 16.
5. Apply contact cement to both surfaces. Let it dry.
6. Adhere sheet to substrate leaving a 1/16" gap between the two polished edges of the two sheets. See Figure 20.

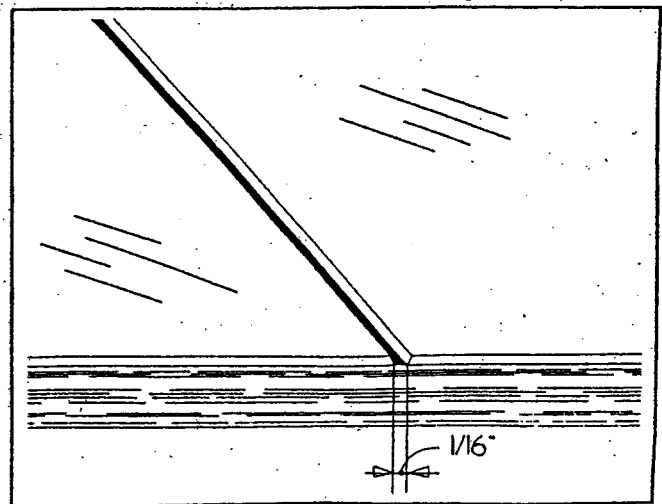


Figure 20

Fabrication Techniques

STRIP/REVEAL WITH BEVELED EDGE

1. Apply adhesive to the panels and the substrate. Let it dry.
2. Adhere the panels to the substrate, leaving a 1/16" gap between the two sheets.
3. Cut a strip the length of the seam.
4. Rout a 22-1/2°, 45° or radius round over edge on each side of the strip using the appropriate bit.
5. Sand and polish all edges on the strip according to the instructions.
6. Apply silicone onto the back of the strip reveal and place it over the gap. Apply masking tape over the strip reveal to hold it in place until the silicone sets.

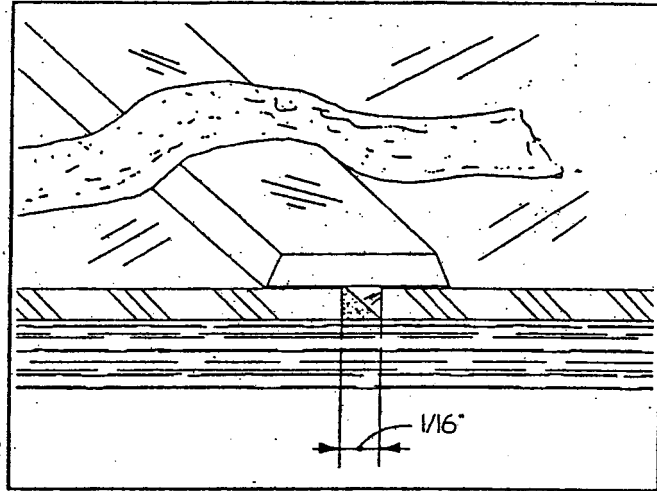


Figure 21

See Figure 21.

Fabrication Techniques

BENDING RADII

The grade and size of the decorative acrylic sheet determines the type of radius bending method you use.

The radius limits are as follows:

Distance

| Beyond Material | Method | Radius | Tangent |
|--------------------|-----------|---------|---------|
| .118 Grade greater | Cold Bend | 18"-20" | 2" or |
| .060 Grade greater | Heat Bend | 6" | 2" or |
| .060 Grade greater | Cold Bend | 9" | 2" or |
| .030 Grade greater | Cold Bend | 3" | 2" or |

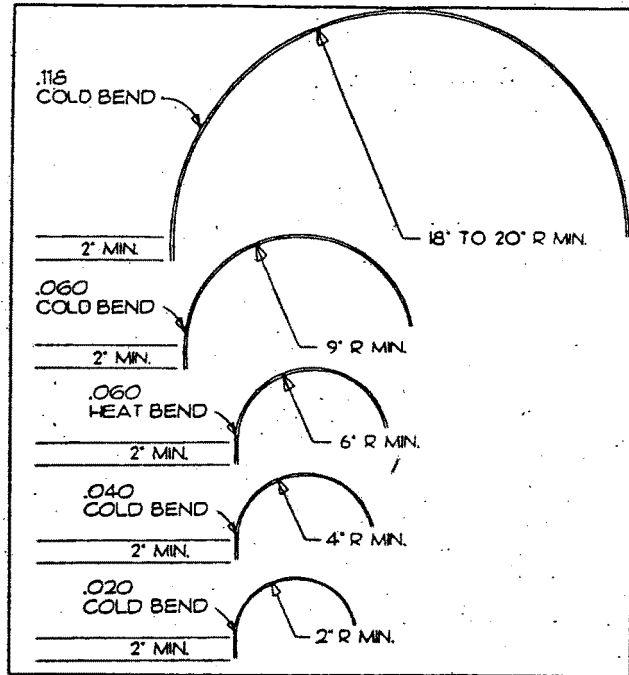


Figure 22

See Figure 22.

COLD BEND METHODS

Follow these steps to fabricate radii.

1. Cut panels or strips 1/16" oversize.
2. Rout or file cut edges to eliminate cracking caused by the bending process.
3. Work in sections. Bend the decorative acrylic by extending the sheet past the radius onto a flat beyond the tangent by to 2".
4. Apply adhesive lightly and evenly only to the surface of the section you are working on and clamp into place.

HEAT BEND METHODS

You must apply consistent heat (190° to 210° F) to the surface area of a panel when creating a radius. The larger the panel the more important it is to use the proper heating equipment. For example, to create a 6" radius from a 3' W x 5' H panel you must use heating equipment, such as blankets or ovens.

- 1 Practice with a 2' x 4' sheet of decorative acrylic before using heat to create the radius on your project.
- 2 Use the following heat methods to create a 6" radius:
 - a. Heat guns are recommended when the surface heating distance does not exceed 24". Distances beyond this point cause uneven heat distribution and may result in sheet pull back or cracking.
 - b. Silicone heat strips, available in the following range of sizes: 1"x51" to 6"x52"; provide the best surface heat consistency.
 - c. Heat ovens designed for solid surfacing or acrylics.
- 3 Prevent stress cracking after heat bending the radius by using a heat-absorbing blanket to gradually cool down the decorative acrylic.

Fabrication Techniques

FINAL CLEAN-UP AND REPAIR

You can easily repair minor scratches. However, deep scratches and scratches that cover the entire surface are extremely difficult to repair, especially on dark patterns.

After your project is completely fabricated, if you need to clean the surface and make repairs, follow these steps:

1. Remove the protective masking.
2. Inspect the surface for scratches. If there are no scratches, clean the surface with a soft white 100% cotton cloth or towel or a sponge and mild soap and water. A non-ammoniated spray glass cleaner may also be used. **DO NOT USE DENATURED ALCOHOL OR AN ABRASIVE PAD.** (Refer to Cleaning Care on page 27.)
3. Repair the minor scratches using any good grade polishing compound. Initially try hand polishing with a pad and polishing cloth of 100% cotton no seams. Sand scratches too deep for polishing by using a DA sander with a 3M 968 Polishing Film a small amount of liquid polishing /rubbing compound to produce a smoother finish. Polish very lightly and quickly to avoid melting the acrylic.
4. If polishing does not remove the scratch, try sanding in this order:
 - Sanding Pads
 - 30 Micron 3M 4860 Wet or Dry /Trimite paper
 - 60 Micron 3M 4860 Wet or Dry /Trimite polishing paper.
 - 400 grit Wet or dry.
 - If melting is a problem try using a little water.
5. Polish area using a polishing pad (3M 968M Polishing Film) with liquid polish / rubbing compound. If Imagitor is dark; repeat process with black swirl remover (very fine compound) available from your local auto store

Always work backwards when removing abrasions and very light scratches.

Example: Start with the liquid polish, if that does not work, go to the 30 micron paper, if that does not work go up the ladder to the next step. What you don't want to do is be over aggressive in removing scratches or abrasions. This will cause you unnecessary labor to restore the finish to its original luster.

Cleaning Care

CLEANING CARE

Use a soft white 100% cotton cloth or towel, or a sponge, and soapy water to clean decorative acrylics. I find that the yellow polishing cloths obtained at the local auto stores work best. Avoid using sewn edges.

A non-ammoniated spray glass cleaner, such as Windex® with Vinegar D by Drackett Products, S.O.S.™ Glass Cleaner and Vinegar Glass Works by Miles, Inc. may also be used. **Never** use nylon or polyester blend cloths, paper towels, abrasive pads or abrasive cleaners since they will scratch the surface.

To prevent damage to the entire surface, test the cleaner on an unobtrusive area using the same concentration and technique planned for the entire job.

Some scratches can be removed with Nu Finish Scratch Doctor (general purpose available at Walgreen's) or any good hand-polishing compound available at local auto stores. "Swirl Remover" is recommended for dark colors and polycarbonate.

Recommended Handling and Fabrication of *Imagicor!* Polycarbonate

Most of the fabrication techniques used for Designed Images' polycarbonate *Imagicor!* flexible grade are similar to those when working with acrylic *Imagicor!* However, there are procedures unique to the material that is required to ensure a quality-finished product.

YOU are responsible for accepting shipments with out damage. Check all shipments for top, bottom and edge damage. We recommend opening all shipments before accepting shipment.

CUTTING

Due to its thickness, flexible grade can be cut to size with a variety of cutting equipment. However, we recommend a table/panel saw, with the appropriate saw blades (see page 5). In both cases, the material must be supported to prevent fluttering as it enters the blade. When using a table saw the tabletop must be free of burrs. The free space between the blade and the table insert should be minimized. Overlaying a piece of acrylic or Masonite sheet is advisable. *Imagicor!* Should be cut with the saw teeth progressing into the back coating. This is usually with the backside of the *Imagicor!* up.

All blades should be carbide tipped, with a minimum blade clearance. Rip blades or blades with fewer teeth will tend to tear the material and actually pull it into the saw. Be very careful!

Preparation of the substrate is similar to substrates used with high-pressure laminate. The substrate's surface must be free of dust, oil, and release agents. The surface should not have the ability to transfer its surface characteristics to the flexible grade overlay. High quality substrates such as medium density fiberboard, no. 1 or Grade A 45 lb. Particleboard are recommended. Because the flexible grade material is thin, substrate roughness can telegraph to the surface. To ensure that telegraphing does not occur: select the proper substrate, properly prepare the substrate, and do not allow any particle to get on ,in or between lamination

Do NOT use sheet rock, gypsum board or any masonry product as a substrate to laminate *Imagicor!*

BONDING- FOLLOW ABOVE PROCEDURES FOR ACRYLIC *Imagicor!*

TRIMMING

Trimming the excess material is the same procedure and tooling as trimming high-pressure laminate. A standard laminate trimmer with a carbide flush-trim bit is recommended, two flutes with pilot bearing is sufficient. Solid carbide, single flute flush-trim bit without a pilot bearing is not recommended due to risk of damaging the vertical plane of the flexible grade of *Imagicor!*. Smooth trimmed edges with a sanding block remembering to file in a downward motion into the surface of the material.

Finishing

- On the .030 Polycarbonate a good edge finish can be produced using very fine sandpaper on a block to "rub" the corners together. Hold the block at a 45-degree angle and quickly smooth the edge.
- .060 Polycarbonate follow directions for *Imagicor!* acrylic in the preceding directions.

Procedures for Repairing Deep Scratches in Polycarbonate

Work in this order if results are limited go to the next step:

- 1) Hand polish with 3M Imperial Hand Polish
- 2) Using a 3M 5700 polishing pad on the DA sander use 3M Finesse-it II
- 3) Using 3M polishing pad use Imperial Finishing compound
- 4) Using the DA sander use 9 micron 3M paper
- 5) Using the DA sander use 15 micron paper

Quality Assurance Checklist

| FABRICATION STEPS | KEY ITEMS | POTENTIAL PROBLEMS |
|------------------------------|---|--|
| Applying to Substrate | <p>Use No. 1 grade MDF or grade A, minimum 45 lb., particleboard. Remember to balance free panels.</p> <p>Precondition substrate, adhesives, <i>Imagicor!</i> and laminate for 48 hours at the same temperature and humidity (78° and 45% relative humidity.)</p> <p>Do NOT apply material to plastered walls, gypsum, wallboard or concrete.</p> | Warping from low-grade substrate or failure to precondition all materials. |
| Cutting Material | <p>Cut the sheet with the decorative side face down.</p> <p>Use 10" x 80 tooth or 12" by 100 tooth, 0 to 5° positive rake, triple chip grind, low melt blade.</p> | Blow out, cracking. |
| Bonding | <p>Use water base contact adhesives only.</p> <p>Remember, drying times are affected by variations in atmospheric/humidity conditions.</p> <p>Spraying adhesives is preferred.</p> <p>Spray adhesive evenly on both the <i>Imagicor!</i> and the substrate. Some substrates need more adhesive.</p> <p>Make adhesives are dry before bonding.</p> <p>Apply pressure with a 3" J-roller to ensure a strong bond.</p> | <p>Delaminating with no coating separation indicates poor adhesive bond.</p> <p>Skinning can occur when adhesive is applied too heavily when water does not evaporate (flash off). This, in turn, can cause blisters or delaminating after the job is installed.</p> |
| Finishing Edges | <p>Trim edges with flush cut/router carbide bit (2 flutes).</p> <p>Profile edges with 45° or 22-1/2°, 2 flute carbide chamfer bits or 1/8" round over carbide bit.</p> <p>Sand edges to remove chatter marks: 1st pass – 220 grit; 2nd pass –60 micron; 3rd pass –30 micron.</p> <p>Polish edges using a plastic polishing compound until sanding marks are removed</p> | <p>Unbeveled edge may cause stress cracks.</p> <p>Unfinished rough edges will crack.</p> |
| Drilling & Mounting Hardware | <p>Drill holes at least 1/16" larger than the screw.</p> <p>Use drill bits with sharp 60° to 90° angles to prevent slipping.</p> <p>Do NOT over tighten screws.</p> | Stress cracks can occur if the drill hole is too small. |

Quality Assurance Checklist Continued

| FABRICATION STEPS | KEY ITEMS | POTENTIAL PROBLEMS |
|---------------------------|---|--|
| Making Inside Cuts | Round out all 90° angles to a 1/8" radius. | Stress cracks can occur in 90° angles that are not rounded. |
| Seaming | Join V-groove edges or strip/reveal edges. Do NOT attempt to fabricate flat seams and butt joints. Leave a 1/16" gap between edges. Camouflage gap with matching paint or marking pen. | Cracking or delaminating due to expansion & contraction of the material. Thickness variation of material produces uneven seams, if flat seams or butt joints are used. |
| RADIUSING | Use proper technique for each grade of material. Extend material beyond 2" tangent. Heat material to 190° to 210° maximum temperature. Use ovens for large panels. Bend with male-female wooden molds. Use a heat-absorbing blanket to cool down material for at least 15 to 20 minutes. Use silicone heat strips (recommended) or heat guns for areas no greater than 24" long and 6" wide. Cool down material for at least 15 to 20 minutes using a heat-absorbing blanket. Apply heat for concave panels that do not exceed beyond 9" radius. | Delaminating or cracking can occur if the recommended radius is exceeded. Stress cracking can occur if material is under heated. Delaminating can occur if material is over heated. Stress cracking from too rapid cool down. |
| Cleaning & Maintenance | Use a soft white 100% cotton cloth or towel or a sponge. Do NOT use paper towels, nylon or polyester blend cloths or towels or abrasive pads. Use mild soap and water or a non-ammoniated spray glass cleaner such as Windex Vinegar D or S.O.S. Glass Cleaner Vinegar. Remove minor scratches with a plastic polish such as Novus Plastic Polish, 3M Finesse-it or NuFinish Scratch Doctor (Available at Walgreens). Remove fingerprints with anti-static cleaners such as Kleenmaster (Brilliance), Like Magic Type n1-5, or Novus. Remove glue with VMP Naptha or mineral spirits. | Abrasive materials and pads will scratch. Ammoniated cleaners will craze acrylic Over polishing may enhance scratches. |

Quality Assurance Checklist Continued

| FABRICATION STEPS | KEY ITEMS | POTENTIAL PROBLEMS |
|----------------------|---|---|
| CLEANING | <p>The cleaning agent that is readily available to remove adhesive over spray is Mineral Spirits.</p> <p>To remove the oily residue left from the mineral spirits, window cleaners without Ammonia can be used.</p> | <p>Solvents such as contact adhesive solvent, acetone, paint thinner, lacquer thinner etc. are not recommended. Use of these solvents will immediately attack the surface of Designed Images' <i>Imagicor!</i>, which will not be repairable.</p> |
| MAINTENANCE | <p>Care and cleaning of <i>Imagicor!</i> is not difficult, providing one uses the proper cleaning agents. Use only soft cotton clothes (old tee shirts, diapers, etc.) with agents such as vinegar base window cleaners.</p> <p>There are commercial cleaner/polishes available on the market; and many have anti-static agents to minimize static cling.</p> | <p>Watch seams in Rags as some have thread that can scratch polycarbonate. Paper towels are not recommended, as paper contains micron particles of sand that could damage the surface of the material.</p> |

RECOMMENDED CLEANING AND POLISHING PRODUCTS

Cleaner Polishes:

Kano "Glit"
Kano Laboratories
Nashville, TN 37211
615-833-4101

Kleenmaster Brillianize

Manufactured by Chemical Products,
Omaha, Nebraska 68102

Scratch & Scuff Repair:

Nu Finish Scratch Doctor (Good general purpose available at Walgreen's)

Novus #1 and #2

Manufactured by Novus Inc.,
Minneapolis, MN 55438
1-800-548-6872

If you have any additional questions concerning the fabrication of Designed Images' *Imagicor!*, or further explanation of the above content, you may contact:

Designed Images, Inc.
440-708-2526

Specifications

| PROPERTY | STANDARD | DESIGNED IMAGES' <i>Imagicor!</i> GRADES | | | |
|---|---------------|--|-----------------------------|---------------------------------|--------------------------------|
| | | .118" Acrylic ±.012" | .060" Acrylic ±.006" | .060 Polycarbonate ±.006" | .030 Polycarbonate ±.003 |
| Bending when proper heat applied | | | | | |
| Hot Bending | | 12" radius | 6" radius | Not rated | Not rated |
| Cold Bending | | 18" radius | 9" radius | 6" radius | 3" radius |
| Impact | | | | | |
| | NEMA LD3-3.8 | (test conducted on <i>Imagicor!</i> laminated to particleboard) | | | |
| .25 lb. Steel ball | | 36" | --- | <8" | <8" |
| .50 lb. Steel ball | | 12" | <10" | <10" | <10" |
| Stain Resistance | NEMA LD3-3.4 | No effect from any reagents test except: Acetone Amyl Acetate (Nail Polish Remover) Lacquer Thinner Toluene | | | |
| Light Stability | NEMA LD3-3.3 | No effect | No effect | No effect | No effect |
| Dimensional Change | NEMA LD3-3.11 | No effect | No effect | No effect | No effect |
| Coefficient of Thermal Expansion | ASTM E228 | 4.0 x 10 ⁻⁵ in/in/F | | 3.75 x 10 ⁻⁴ in/in/F | |
| High Temperature Resistance | NEMA LD3-3.6 | Severe surface disturbance to all grades. | | | |
| Radiant Heat Resistance | NEMA LD3-3.7 | (cigarette at <60 seconds) Moderate surface disturbance to all grades. | | | |
| Abrasion Resistance | | | | | |
| Using Taber Abrasion 100 Revolutions (CS10F Wheel 500gm) | | 50% | (% equals increase in haze) | | 50% |
| | | 50% | 50% | 50% | 50% |
| Hand Rubbed Steel Wool | | (Using five strokes with moderate pressure) | | | |
| | | Severe | Severe | Severe | Severe |
| <p>Note: It is inherent in the manufacturing of methacrylate sheets that slight surface imperfections may exist. All <i>Imagicor!</i> sheets meet or exceed federal specifications LP-391-D Type III.</p> | | | | | |