Stained Glass Overlay, Inc.

2006 Edition Franchisee Product Manual

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Stained Glass Overlay Product Manual

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Introduction:

Over 20 years of research and development have gone into our SGO film products. Several processes and products have contributed to Stained Glass Overlay's beauty, and durability, but none is quite so exciting to work with as the unique color film that makes every window not only beautiful but brilliant!

With a wide range of colors, textures and SGO's technique, jewel-like windows can be created in a short time.

Specifications:

- Film: Optically clear polyester (2mil.)
- Adhesive: Permanent acrylic pressure sensitive adhesive (.8 to 1.0 mil.). Complies with adhesive durability requirements of the ANSI Z97.1 1984 specifications section 4.4.2.1 and 4.4.2.2. Testing shows after equivalent to 10 years of ultraviolet exposure average peel strength actually improved.
- Liner: 90# Poly lay flat liner (6.7 mil)
- Physical Data: Melting point 480 degrees F. Fire rating – UL 94 VTM-2.
- Service Temperature: –40 degrees F to +300 degrees F.
- Impact Strength: Complies with safety glass impact, tensile strength, and adhesive durability requirements of the ANSI Z97.1-1984 specifications, i.e., glass surface covered entirely with SGO materials meets this National Safety Glass Guideline.
- UV Resistance: Absorbs 85 to 99 percent of ultraviolet light, as tested in accordance with criteria set forth in ASTM E903.

- Fade Resistance: 6,000 hours (equivalent to 20 years) of direct solar ultraviolet exposure as specified in ASTM G-23 caused modest or no color fading in the samples submitted.
- Temperature Tolerance: When subjected to extremely high and low temperatures as set forth in the ASTM E773-E774 specifications, temperatures from minus 15 degrees F. to plus 135 degrees F. (as might be experienced with insulated glass units) did not cause a breakdown in materials or adversely affect the insulated glass unit.
- Maintance: Resists detritus effects for 5,000 cleaning cycles (equivalent to 50 years, under normal conditions).
- Expected Life: Interior Application was field tested to a 20 year life span. Warranted for 10 years.

Characteristics:

Our films are a handmade color product. It is common to experience some settle imperfections in this process. Clients may regard these as flaws or defects, but in reality are characteristic of their creation. The gentle shading and imperfections in this film should not be regarded as defects. They are characteristic of the fine handcrafted work, which gives this film its beauty and dramatic texture. We offer this general statement for such time:

"The gentle shadings and imperfections in this film should not be regarded as defects. They are characteristic of the fine handcrafted work which gives this film its beauty and dramatic texture."

Keep in mind, it is the nature of being in a color-related business to experience dye lot variations from time to time. Recent government regulations in regard to lead content in paints and pigments have also contributed to the problem. Constant checks are done to maintain color consistency but, there will be occasional variations from lot to lot. To avoid potential customer problems, be certain to have enough color film of one dye lost before starting a project.

FCA Series: Cathedrals

- Hand painted film
- No sheet will be the same
- Lots of variation in one sheet
- Various shades of the same color, some white
- Random spots of translucent or opaque
- Great to use for establishing motion

FSO Series: Standard Opaque

- Used to block out sun and reduce direct light
- Great for privacy issues

FST Series: Standard

- Translucent, introduces tint to glass
- Use in small amounts to introduce some light in an opaque design
- Needs light to bring out true color

FSV Series: Standard Vein

- Translucent tints with shades of veins
- Needs light to bring out true color
- Good for introducing tints with light shades of variation

FSW Series: Standard Wispy

- Very soft translucent shades
- Some darker broad veining
- Great for pastel designs

FTC Series: Traditional

- Opaque, light blocking colors
- Some have specks of different colors

FTV Series: Traditional Vein

- Translucent shades with veining

FCR Series: Crystal Textures

- Used as backgrounds and borders
- Most created by hand
- Each sheet will vary in design

FTX Series: Textures

- Used as backgrounds and borders
- Some work for privacy

Storage:

Even though SGO color film stays bright in all weather conditions, some care should be exercised in storage of film. A cool, dust-free environment is essential. Two years of shelf life can be expected when stored at 70ºF and 50% relative humidity. Heat may cause bubbles and poor adherence. The film's static electricity attracts dust, lint and hair which can mar the appearance of the finished product. Color sheets should be stored flat; bowed shelves will cause creases. When film is stacked color to color, bonding may result.

If you notice wrinkles or tunnels in your color film, the room you are storing the film in may be too dry. During the winter months, dry warm air from your heater will dehydrate the release paper, causing to shrink. Since the polyester film will not

shrink, the shrinking release paper creates a wrinkle or tunnel in the film. The solution is to maintain a relatively stable humidity in your color storage area all year round. All textured film should be stored face down.

Application:

SGO Colored and textured films are designed specifically for application to interior glass windows. The adhesive side of the film must always face the exterior light source, as the adhesive incorporates UV inhibitors to protect the film and the color. Failure to do so will void warranty. See the product application section for details.

Care and Cleaning:

Now that the installation of your Stained Glass Overlay ("SGO") is complete, please read these Care & Cleaning instructions carefully. If followed, you will be able to enjoy the beauty of your SGO for many years to come.

Do not clean SGO until seven (7) days after application.

To clean the surface of your SGO, use a soft cloth and common household window cleaner. Apply the window cleaner to the cloth, and then clean your SGO piece. Do not use a squeegee.

Warranty:

SGO Corporate offers a ten year limited warranty on our film. Please refer to the warranty card for specific details.

Options:

Our standard film size measures 20" x 27". Actual color or texture printing can yield approximately a half inch of waste around the perimeter of each sheet of film. Many of our colors and textures can be produced in an oversize sheet measuring

27" x 38". Some of our miscellaneous and textured films are produced in roll form. Consult the current SGO price list for details.

Important Film Tips

- The adhesive on the film has UV inhibitors, thus the protection for the color is in the adhesive. ALWAYS face the PRINTED side of the film to the INSIDE of the building with the ADHESIVE facing the OUTSIDE of the building.
- An SGO piece that has been installed with the printed side of the film facing the outside is not covered by the warranty.
- Never install an SGO entirely outside, so that both sides of the film are exposed to the elements, i.e. free-standing signs.
- Dark and opaque colors retain more heat than light, translucent colors and clear textures. When designing a large piece, always incorporate clear textures and light colors with dark, opaque shades.
- This is true especially if the window faces west or south, or in a skylight installation.

LEAD

Introduction:

SGO's lead has been specially selected for its excellent performance in all weather conditions, resistance to extreme temperatures, and for ease of application.

Specifications:

Adhesive Type: Permanent adhesive that has passed the BSI (British Standards Institute) testing specifications, report #BG 000558 12/93, and attained BS5713 certification. Performance temperature range: Minus 22 ° F. to plus 212 ° F. (Successfully tested to 240 ° F.).

Physical Data: 99.5 % pure lead with antimony. Boiling point 3,164 ° F.

Characteristics:

Coated lead styles are available in Brass, Antique, Platinum, Antique Satin, and Brass Satin. Slight color variances will be noticed when comparing different production dye lots. The color coated leads are surface coated only! Brass coated leads should never be used on an exterior (direct environment exposure) application. Currently this product is suitable for interior use only.

Storage:

SGO Lead adhesive has a 2-year shelf life if stored at room temperature 70°f and normal humidity (50% - 70% Relative Humidity).

To maintain consistent quality; store unused lead inventory in a cool, dry, dust free environment.

Application:

When deciding what type of lead to use on a project, regular or color coated, keep in mind several things: 1) existing hardware 2) animals and or small children 3) food area. A customer will appreciate suggestions as to which lead would be more appropriate for their particular SGO application. Humidity will affect the adherence of adhesive to glass. For best application, surface area needs to be dry and clean. Abrasive cleaning products, and solvent or alcohol based cleaners are not recommended, as they will affect coating durability. Application techniques and tools used on coated leads may need to be modified to prevent premature coating breakdown. Do not stretch the coated leads! Stretching of the coated leads will breakdown the surface coating which can be responsible for premature fading and loss of color luster.

Exterior color coated lead applications, exposed to direct sunlight and the outside environment, will typically display a gradual loss of color brilliance over a period of time. Severity is based on intensity of UV exposure. Exterior Brass color coated lead applications are not warranted.

Care and Cleaning:

Clean with a soapy liquid and soft rag. Chemicals of any nature are not recommended.

Warranty:

SGO Corporate offers a ten year limited warranty on our film. Please refer to the warranty card for specific details.

Options:

Selection of lead size is determined by glass size, thickness, and design complexity. Do not use lead with a width less than the thickness of the glass. Lead adhesive should not be exposed to direct UV. The following sizes are available and in stock. 1/8" widths are kiss cut dual strand width.

Lead Styles	1/8" Oval	3/16" Oval	1/4" Oval	1/4" Flat	3/8" Oval	1/2" Oval	1/2" Colonial
Antique	X	X	X		X	X	X
Ant. Satin		X	X				
Brass	X	X	X		X	X	
Brass Satin		X	X				
Platinum	X	X	X	X	X	X	
Regular	X	X	X	X	X	X	

Safety:

Lead is a stable metal but the correct handling of the product is important to avoid inhalation or ingestion. Under normal application conditions the most important precaution relates to personal hygiene, i.e. washing hands after application.
Do not allow lead to come in contact with open cuts or sores. Never put boning pegs, razor blades or other leading apparatus in your mouth. Wash hands thoroughly before eating or smoking and after handling. Do not eat or smoke in lead production areas. Do not leave pieces of lead behind, at onsite locations, especially if there may be a potential for small children or animals to ingest small bits of lead.

Silicone Usage:

Silicone Usage around lead: It has been discovered that if a High Modulus Silicone is used to install an SGO panel that has color coated Brass Lead on it, the Brass coating will curl up and disintegrate. As you can see, by the enclosed information, certain silicones will cause an extreme reaction to the lead. For those of you that use silicone in your installations, this is very important to know.
Our research has shown the following list of silicones did not show signs of the above mentioned deterioration.

Dow Corning	RTV Sealant #737 Neutral Cure Silicone Technical Data Information (800) 248-2481 Distributor – Essex (800) 805-4636
Dap	Alex Plus Acrylic Latex Plus Silicone Technical Data Information (800) 327-1044
CRL	Work Site RTV Industrial Silicone #RTV408 Technical Data Information (213) 588-1281
Red Devil	Window & Door #0876 Odorless Silicone Technical Data Information (918) 825-5744 Distributor – Home Depot
GE	Silicone II Window & Door #5000 RTV Technical Information (800) 255-8886 Distributor – Home Depot

Lead Oxidation (Regular Lead):

Oxidation is a natural process, which affects many materials including lead, when exposed to varying environmental conditions. Those conditions, rain, snow or any other weather cycle will determine the degree of severity of oxidation and the time scale over which it will occur.

Oxidation is far more likely to occur during winter conditions, with the weather attacking the shiny surface of the lead strip, when first applied to glass. The natural color of lead is a matt grey, so it is both normal and inevitable that discoloration will occur. This process, although common knowledge to most people within the industry, may not be familiar with the homeowner or contractor.

Questions always arise about oxidation, the most common being “How long will it take my lead to oxidize and look like my neighbor’s?” The answer cannot be given truthfully by anyone. Only the weather conditions can determine this.

During the oxidation process, it is not uncommon for different colors of blue, bronze, or even gold to become visible. Once this has happened, it is a sign that the lead strip is forming its own protective barrier.

The application of a patina oil to new lead before exposure to the elements provides an extra barrier to weather conditions. This allows the lead to react naturally without the discoloration process becoming visible.

Like any natural lead product exposed to the environment, leads appearance will undergo certain 'atmospheric' transformation. This is perfectly natural and it will eventually settle down to take on the traditional 'weathered lead' appearance that is so admired in old churches and the leaded windows of stately houses. During this process however, especially in the early stages, some people may become concerned at the changes they see occurring.

WHY DO CHANGES OCCUR?

All lead profiles are made from refined, almost pure lead and, although this has been alloyed to improve performance, when it is exposed to the atmosphere for the first time it becomes subject to a process called oxidation.

Chemists define the process of oxidation on lead as:

"a chemical reaction instigated by the exposure of lead to the atmosphere in which insoluble lead compounds such as lead sulfate (PbSO), lead sulfide (PbS) or lead oxides are formed on the surface."

Put in more simple terms it means that when lead profile first comes into contact with the atmosphere, the surface gradually oxidizes to form a natural protective film called a patina, and it is this which eventually produces the familiar grey color.

During the initial stages of oxidation the lead can appear to take on various colors such as blue, bronze, gold and green. This effect is purely optical and is usually due to the angle of light. The effect is similar to the colors seen when oil is spilled onto a wet road surface. Gradually, however, these colors will fade away to leave the final protective grey patina.

There is another side-effect of oxidation which can occasionally give rise to concern. When lead first comes into contact with moisture (rainwater or condensation) it may result in temporary discoloration, spotting and even the appearance of white powdery deposits (basic lead carbonate), which in wet weather can run onto the glass. Again, this is perfectly natural and the temporary blemishes will eventually disappear as the oxidation process continues.

The powder can safely be wiped off from time to time until the natural oxidation process is fully developed.

Important Lead Tips

- Long runs of lead can buckle due to the expansion and contraction of the substrate. It is recommended to keep lead strips at 24" or less, if at all possible. Extremely long strips of lead, i.e. 60" or greater, should never be used.
- Do not stretch the lead! Only pull enough to straighten. The adhesive has a memory and will return to its original size, eventually.
- Lead in single sided application, which allows the lead adhesive to be exposed to UV rays, is not covered by the warranty. The adhesive on the lead does not have UV inhibitors, so the continuous exposure to UV will cause the adhesive to ultimately break down, i.e. skylight or one-sided thermal pane applications, where the adhesive has been installed facing the outside.
- Color coated leads
    - Are surface coated only. Sharp tools, abrasive cleaning products and solvent or alcohol-based cleaners are not recommended, as they will affect the Color coated durability.
    - Over stretching the Color coated leads will breakdown the surface coating an can be responsible for a loss of color luster.
    - Application techniques my need to be modified for Color coated fabrication to prevent coating breakdown. Do not use tools that are sharp enough to cut through the coated service.
    - Brass Film does not have UV inhibitors in the coloring; do not install facing to the outside of the building.

Bevels

Introduction:

The sparkling effect that is created with the addition of bevels is spectacular. Bevels come in an array of shapes, sizes, single pieces and clusters. Almost any design can be created or accentuated with the use of bevels. Our current offering of RegaBevels, consists of over 450 different styles. The construction consists of 5mm float glass with a thin edge of 1.8mm. This creates the perfect low edge for the application of our lead strip. The recommended application method is UV glues using the UV-Tek bonding method.

Colored:

Some designs offer a blue, green and bronze option that change in density when viewed from different angles.

Glue Chip:

The surface of the bevel is textured and the beveled edges are clear giving a sparkling visual effect. These bevels offer almost total obscurity making them ideal for use in door panels and other applications where privacy is important.

Multi Faceted and Double Faceted:

These feature bevels add extra prisms to the light refraction and glitter more than the standard bevel edges.

Special Designs:

The following special categories are available, be sure to check them out.

- Alphabet & Numbers
- Southwestern
- Wildlife
- Replacement Centers
- Extension Sets

Jewels

Introduction:

Glass Jewels are hand made in Germany. They are currently available in round sizes of 25mm, 30mm, 35mm and 40mm. An exciting advantage in using jewels, besides the sparkle and texture, is that they are also available in color. The current color range includes Amber, Amethyst, Aqua, Blue, Clear, Green and Red.

Fusion Tiles

Introduction:

The Fusion collection of fused glass tiles opens up a whole new world of possibilities for decorative glass.
This innovative range consists of small pieces of colored glass, which can be bonded to flat glass to create stunning decorative effects in door panels, glazed partitions and furniture.

The Fusion tiles are especially attractive when used in conjunction with Sandblast / Etched Glass or Brilliant Cutting. No lead is required to cover the edges. The tiles are manufactured from top quality “Spectrum” Fusing Compatible Glass to ensure consistency of color, clarity and repeatability. Each tile is made from 3mm clear glass cut to shape. The design is heat fused onto the top of colored glass. The recommended application method is special Fusion UV glue using the UV-Tek method.

GLASS

Introduction:

SGO installations can be done on a myriad of glass sizes, shapes, thickness, and textures. Whether you're working on site or in your own shop, it's important to recognize the common types of glass and to become familiar with their special uses.

Check your local building codes for guidelines; there are not only practical reasons for choosing one type of glass over another but legal considerations, too. Ordinary window glass, for instance, won't meet most construction standards for use in shower doors. Tempered glass is usually required for applications where impact or breakage might cause severe injury.

When working with glass for an SGO application tempered is always recommended. Tempered glass is a safer and more durable. Depending on the size of the glass project and type of installation, thickness of glass is always a factor. Keep in mind that 1/8" has a tendency to become wavy during tempering process but 3/16" remains stable.

Examine the glass very carefully for scratches or chips before you start, and when working with unframed glass make sure the edges are seamed or polished. Minor imperfections may not affect the finished product, but never work on glass that is cracked. Always point out any flaws to the customer before you begin work on their glass.

Your glass dealer is your best source of information, so establish a good working relationship with your local supplier.

For quick reference, some general characteristics of frequently used glass types are listed on the following pages, along with instructions for special handling.

Types of Glass:

SINGLE STRENGTH: 1/16" (SS):	Application of SGO to an existing single-strength window multiplies its strength without the additional expense of new glass installation. Not recommended unless impossible to replace with DS.
DOUBLE STRENGTH: 1/8" (DS):	Most Windows.
DS TEMPERED:	Ideal for smaller sized windows.
TEMPERED:	For doors, side entries, sliders, skylights, samples, shower doors. Unlike traditional stained glass, SGO can be applied to tempered glass, making it suitable for shower doors, entry lights, and skylights.
LAMINATED:	For automobile windows, some shower doors, and skylights. (Two pieces of glass held together by an adhesive laminate.)
3/16" & 3/16" TEMPERED:	Recommended thickness for anything over a span of 24".
PLATE ·":	For storefronts and any application where the expanse would be too great for double strength or 3/16" glass.
BEVELED:	For door windows and alternative window treatments, screens, and framed hangings. Typical beveled glass is 3/16" or ·" plate and beveled on one side only.
MIRROR:	For screens or frames, over wet-bars, in cabinet doors, as backdrops and for gifts. Inexpensive 1/8" mirrors are preferred for SGO. Large pieces of 1/8" mirror can distort image. Order 3/16" if available.
GLUE CHIP:	A handmade, one-sided textured glass typically used in traditional stained glass. The term "glue chip" is literal. A thick glue is applied to clear or colored glass, and dried to "chip" the glass.

How to Handle Glass:

You have entered an exciting industry! Your first business is SGO or Stained Glass Overlay, but another stop on the ladder is a larger world called, "Art Glass". Art Glass encompasses; traditional stained glass, leaded/beveled, carved and etched glass itself. Most of your work will be on glass, annealed or tempered. The differences are reflected in strength, handling and cost factors.

Annealed, or raw glass is typical for window glass. The cost is less than tempered and is available in different thickness. Annealed glass breaks into sharp shards. No matter what thickness, annealed glass should be handled with more care. There are a few installations where annealed glass is a good choice, but more often tempered is the better choice. Local building codes often mandate tempered glass. Tempered glass has many advantages, such as safety and durability. When tempered glass breaks it crumbles into small pieces, like a car window. Because of its shatter resistant quality, using tempered for a project is good for the customer and for you.

Here are a few tips when handling annealed or tempered glass.

- Use rubberized gloves to pick up glass
- For large pieces, always get help.
- Never set glass directly on metal or concrete. As a support use rubber, cardboard, wood, or carpet.
- Glass scratches very easily, never slide glass horizontally on any surface.
- When flipping glass, pull to the edge of the work table, at least halfway. Using the edge of work area, tip the glass while supporting the bottom until you have a firm grip on the entire piece.
- Use a soft brush to wipe dust or sand from the glass before cleaning with a rag.

- If a razor blade is needed to clean glass, always use a new blade and wet surface well.
- When stacking glass use a cork or rubber bumper to separate.
- Tempered glass is more sensitive at the edges and corners, annealed on the surface.
- A “bug” (logo), will be displayed on the bottom right corner of tempered glass. Some tempering plants will produce no bug, or ask for Cobb or small logo.
- When ordering glass, ask for seamed edges.

Important Glass Tips

- Use tempered glass wherever possible.
- Low E glass is heat retentive. DO NOT put SGO film directly on Low E glass. If Low E glass is part of an insulated unit, the SGO panel must be on tempered glass.
- In a skylight installation, all glass must be tempered or laminated. Heat buildup in a skylight will cause raw, annealed glass with SGO to crack. If the skylight is an insulated unit with SGO as one part of the unit, the second piece of glass can crack if not tempered.

Substrate Materials

ACRYLICS:

Introduction:

Cast acrylic resin is somewhat flexible. Its heat expansion is eight times that of glass, and some acrylics emit a gas. Therefore, a few precautions are in order. While overlay is ideal for acrylic ceiling panels illuminated by cool fluorescent tubes, we do not recommend using it in any other installation. Exposed to intense heat from strong sunlight or incandescent light bulbs, acrylic will expand and contract. Both heat and escaping gas will cause color film to bubble on acrylic, but this problem can be prevented easily by

- Selecting acrylics for use only in areas protected from direct sun or other light-heat sources;
- Using only high-quality, domestic acrylics that do not emit gas;
- Using only "MC" grade acrylics, "CAST" or "GM" grade acrylics allow gas to escape, creating a blistering affect. When opacity is desired, Stained Glass Overlay film can be used as background for the design or acrylic defuse panels can be used.

Application:

For general use, 3/16" thickness is recommended. 1/4" is necessary for extremely large ceiling panels. There are two looks of acrylic materials clear or milky white. Displays of both should be shown in studio for customer's selection. Lead and color applications on acrylics are almost the same as glass, with these differences:

1. Color wetting solution must be adjusted to allow easy movement for placement. Mix an extra 1 to 2 drops of mild liquid soap in a bottle of filtered water.

2. Color will dry much quicker on acrylics. Do not use any heat source to dry acrylics or do not set outside in the sun to dry, either may cause blistering.
3. Caution should be exercised when cutting color film on acrylics, the product scratches easily.
4. Before leading, clean the entire panel with a Windex type product.
5. If you are creating a ceiling panel, only one will require lead.
6. When using alcohol to clean acrylic, wipe immediately or spots will appear and be difficult to remove.

PLEXIGLAS*

Specifications:

All grades and colors of Plexiglas are classified as a C-2 light transmitting thermoplastic material under the Model Building Codes.

Typical Values for Plexiglas are:

TEST METHOD		PLEXIGLAS VALUE	CODE REQUIREMENT
ASTM D1929	Self Ignition Temperature	740 to 880 F	>650 F
ASTM D2843	Smoke Density Rating	4 to 12	>75
ASTM D635	Horizontal Burn Rate	1.1 to 1.9 In/Min.	>2.5 In/Min.

Note: These are small-scale test and should not be used to predict how a material will behave in an actual fire.

All Three Model Code Organizations Issue Research Reports on materials qualifying them for use as allowed in the Code.

The BOCA Research Report for Plexiglas is No. 77-76

The ICBO Research Report for Plexiglas is No. 1084

The SBCCI Research Report for Plexiglas is No. 8354

Many State and City Authorities have issued letters of acceptance for Plexiglas under the local codes as well.

*Tradename of Rohm and Haas Company

Working With Acrylic Sheets:

IMPORTS.....DOMESTICS.....GASES.....EXPANSION.....CONTRACTION

BUBBLES.....BUBBLES.....BUBBLES

"I think I'll stick with the glass!"
Let's lay to rest some myths about acrylic sheets?

According to Rohm and Haas, a high quality domestic manufacturer of acrylic sheets, there are many grades of acrylic sheets, including:

- Commodity glazing,
- UV light absorbing,
- Military applications,
- Cast (somewhat higher quality)

The two most common grades in the market place are "commodity glazing", and "cast".
Rohm and Haas refers to their "commodity glazing" grade is "Plexiglas MC Acrylic Sheets" and their "cast" grade as "Plexiglas GM Acrylic Sheets", hereafter referred to as "MC" and "GC", respectively.
The "MC" grade is available with two protective masking:

- "MCM" – Paper Masking
- "MCF" – Polyethylene Masking

The "MC" grade contains lower residual volatiles (gases).
Use only the "MC" grade or any other high-quality, domestic acrylic with lower residual volatiles.

The “GM” grade is used in certain manufacturing processes, and is more expensive than the “MC” grade. Many acrylic sheet dealers import “cast” sheets at a reduced price.

The “cast” or “GM” grade contains higher levels of residual volatiles.

DO NOT USE THE “CAST” GRADE, WHETHER DOMESTIC OR IMPORTED.

Important Acrylic Tips

- Do not use acrylic as the substrate for SGO if there is any possibility of heat buildup. Acrylic will expand and contract with changes in temperature. This expansion will affect the SGO materials.
- For light lenses, ONLY florescent lights can be used. NEVER use incandescent bulbs behind acrylic panels.
- NEVER use acrylic with SGO on the outside of a building.
- When using acrylic as a substrate, use only US manufactured, high quality acrylic that does not emit gas. Recommended manufacturers of acrylic are:
    - Dupont
    - Rohm & Haas
    - Cyro
- Do not accept acrylic with clear plastic backing material. Paper backing is used by the above-recommended manufacturers and generally denotes a higher quality material.

Design Concepts

Designs

Introduction:

Beautiful SGO windows begin with beautiful design. Because the finished product is no less lovely than the pattern from which it was created, it's worth taking a little time to learn what makes "good" design. Whether you select a plan from an SGO pattern book or create something unique of your own, it helps to recognize some of the elements that distinguish first-rate design from mediocre. There are a number of essential elements in any successful design, but three fundamentals will be considered: contrast, balance and proportion.

Contrast:

A window without a contrast is flat, dull, and boring. By playing off bright and dark colors against each other; by weaving the lead close together in some areas and spacing it farther apart in others; by juxtaposing round suns above angular sails and small flowers against large ones, you can make a window come alive.
Color, shape, size, and texture can be used to create strong or subtle contrasts. Three or four colors are usually sufficient for the contrasts you desire, and should include a mix of transparent and opaque. And don't forget that lead is also a "color".
Use color combinations you've used successfully in the past, and keep them in mind for future jobs. Whenever you are unsure, go with past experience.
Often when coordinating with customer's fabric, wall coverings, carpeting or tile, the color scheme will be established. Learn from the pleasing effects you see in these items.

Balance:

Each element in a window has "weight", which must be kept in equilibrium. Symmetry is an easily recognized balance that works by aligning objects equal in size, color, or shape. Sometimes asymmetry is more interesting, because unequal elements create a balance. A small bright object, for example, may offset a large dark one. Because the brightness of transparent color film has more visual weight than opaque film, they should be used in unequal proportions; about 75% opaque to 25% transparent is a good rule. Simplicity is also a good rule, as too much "busy-ness" can spoil a design. As designers say, "LESS IS MORE"

Proportion:

Good proportion is pleasing and interesting – it is not square! If you're stuck with a window of uninteresting dimensions, create your own proportion with new borders – use ovals, form rectangles inside squares, or make a series of circles. Just remember to keep your design in scale - - in a small bathroom, a bouquet may be more appropriate than a redwood forest!

Design Sources:

SGO, Inc. provides pattern books and hundreds of overlay photos to help you get started, but inspiration for designs can be found everywhere. Photographs, paintings, wallpaper books, ceramic tiles, linoleum flooring, fabrics, craft books, and quilt patterns are just a few of the possible sources available. When you don't find exactly what your customer wants in a pattern book or photo, use your imagination to create your own. The Internet is a treasure chest of pattern ideas. Try google.com or consider hiring art students at a community college, their services are relatively inexpensive.

Some designs have been copyrighted, but you may be able to obtain permission to use them by applying in writing to copyright owner (a fee may be charged). When this isn't feasible, try changing the copyrighted design to create a new "original".

Borders:

Borders are to a design as a mat is to a frame. Borders can establish the predominant color in the window. Always use at least a little of the border color in the design itself. The border color should also tie in with the room some way. Use several borders of darker shades on narrow windows. It will make the window look narrower. Try extending the central design over the border in various places, to create an interesting effect. Always use various width metal rulers to draw your patterns. Those same rulers can be used to cut your color film.

We hope these hints will inspire you to do a little research on your own (an excellent way to learn about design is by observing other franchisees' successful windows).

SGO Application

Hand Cutting Method:

Introduction:

After the pattern, glass size, SGO film colors and textures have been chosen, the following applies.

HINTS: Perfect your touch to cut the film without cutting through to the glass. If you over cut the area you are going to apply, take care not to cut through the backing as this can stretch the glass.

SGO Film Solution:

24 oz. Spray Bottle

Distilled or filtered water

1 to 2 drops of liquid soap or shampoo (No Additives)

1 ounce of alcohol (99% Isopropyl Commercial Strength)

Shake Well

Preparation and Application (In Studio):

Depending on glass size, decide which surface you will be using, horizontal or upright. Remove any stickers and bumpers. Clean side 1 thoroughly with glass cleaner and alcohol. Attach the pattern to the glass with masking tape. If the pattern is large, use tape in the center of the pattern as well. Flip the glass over. Clean side 2 and remove any debris. When flipping glass, never stand glass on glass or concrete, you risk chipping or breaking.

Inspect and replace worn out tools and dull cutting utensils (squeegees can be sharpened on a wet-belt sander). You are ready to lead! Take a moment to look over your design. If the size of lead has not been determined this is the time to do so.

To run straight lines of lead, secure one end of lead on center of your pattern line. Remove backing tape to no more than 2-3 ft. Slightly tug lead to straighten. Secure second end of lead to end of pattern line. Run boning peg or finger along lead between first and second point.

Apply lead with a steady firm pressure. Do not pull backing tape too far ahead of the lead, the moisture and oils from your hands will affect the lead adhesive. Continue throughout the entire panel until all lead is applied. Remember that the piece is at a semi-fragile stage. The lead needs to be boned and to be properly sealed to the glass. Using a variety of boning tools, make sure each piece of lead is pushed down, along with the edges and joints being sealed.

Most pieces will need a bonding strip (this step may be skipped due to the style of installation). 1/4, 3/8 or 1/2" lead is run around the perimeter of the design. This ensures the protection of all ends of lead in the design.

Use window cleaner to clean the panel thoroughly. Alcohol is not needed.

Flip the glass. A light source is now needed to complete the piece.

Spray with water and squeegee the glass before starting.

Using sheets or bits of film, with lights on, cut color to fit the area specified on pattern or work-order. With water solution, spray and squeegee where you are going to apply the film. Remove film from backing, spray film and place in appropriate area. Squeegee the film to glass. Use caution when working with small pieces of film, they have a tendency to move when you squeegee. When entire piece is complete with film, allow to set for 24 hours. After the piece has set; gently clean panel with window cleaner. Now you can begin to re-lead. With lights on you will lead side 2. This step is very important; make sure you are looking straight on the lead so side 2 will match up exactly with side 1. After all leading is complete, bone the lead as you did side 1. Clean with window cleaner. Use alcohol on a rag to remove any adhesive.

On Site Application:

Even though your pattern has been correctly measured and carefully drawn, it's best not to rely on the pattern alone when you begin work on a window. Because windows and frames are not always precisely plumb, you may need to make minor adjustments in your design for a flawless fit, if straight-line borders are part of the design.

Use a Sharpie/china marker and or ruler perforated at one-inch intervals (border tool) to mark borders and straight lines directly on the glass. On large windows, use a chalk line, and for arches, bow a metal yardstick.

When borders are marked, tape a pattern in place on the inside of the window, and you're ready to begin applying the lead to the outside.

Window Preparation (On Site):

Clean class thoroughly with alcohol or Windex type glass cleaner. Glass must be wet when cleaning with a new razor blade. Scrape with a new razor to remove any debris, and dry with a rag. Begin applying lead only when glass is perfectly dry. You can clean again with alcohol; this will help the lead stick better. (It's possible to work in rainy weather, but only if rain does not fall directly on the glass.)

Leading (On Site):

Proceed by choosing lead size desired. If 1/8" or double flat (1/4") leads are being used, these double-strand spools of lead have been pre-scored, for your convenience. The lead only needs minimal stretching. Be careful not to stretch lead too much when you handle it. Excessive stretching breaks down the adhesive structure and will not adhere well.

Apply lead with a steady, firm pressure to ensure a strong bond. Don't handle lead too much on adhesive side, as body oils will minimize performance. Avoid touching glass too much for the same reason.

Use boning peg to anchor lead in place or a small hard rubber roller.

Bond the lead. Again, using steady, firm pressure, press-boning peg along each side of lead until it is smooth, well defined and securely bonded. Highlight all joints with boning peg.

When leading is complete, there should be no exposed ends. If the project cannot be finished in one day, do not leave until all leading applied has been boned and the window has been wiped clean.

After project has been leaded and thoroughly boned, clean with appropriate window cleaner and a soft cloth rag.

A properly boned panel will ensure lack of moisture reaching the adhesive.

Coloring (On Site):

Keep color film free of dust and lint.
Cover area beneath the window with a drop cloth to protect the customer's floor and keep the window clean while you work. Caution should be used when using ladders not to stand ladder on throw rugs or loose drop cloths. Wrap ends of ladder with padding to protect paint and wallpaper.
Clean window using glass cleaner and scrape with razor blade, cleaning off all paint and silicone. Be careful not to scratch window with razor blade.
Clean window well and frame. Where rough wood is used to frame window, you may need to tape the inside edge.
Prepare the area thoroughly before you start. If needed hang a sheet between the window and its light source to cut down on glare and shadow; drape windowsill and floor beneath to protect from drips; clean section to be colored immediately before applying film.

Textured Film Application Tips:

Working with textured films will create elegant finished works of art. The nature of these films are made up of peaks and valleys, which have a tendency to trap air and water. Below are a few steps for producing the best application.

1) The first and most important step is making sure your glass surface is clean and free from any debris. Clean hands thoroughly. This will eliminate any dirty fingerprints when handling the films.
2) Using bottled, filtered, or distilled water is best. Water straight from the tap can produce an unsatisfactory appearance. Use recommended SGO solution.

3) After glass has been cleaned, wet glass thoroughly. Carefully remove the release liner from the film, wetting the film as you separate the liner. Wet the glass surface again. Start by positioning the top edge of film to the top of the glass. Hold the bottom of the film and carefully pull up towards you. Wet the glass and film as you roll it into place. Film should be flat, make sure you do not trap any air or water pockets. Be generous with the water, you can never use too much.

4) Before you squeegee, wet the surface of the film. Starting at the top, use medium, even pressure pulling horizontally from right to left in a traversing motion until you reach the bottom of the film sheet. Repeat this step by wetting the surface once more and following the squeegee instructions using greater pressure

Following these steps will give you the best application of the textured films.

*Note – If you experience a foggy look under the Crystal textures, add 1 oz alcohol to the standard SGO solution.

Cutting (On Site):

For perfect fitting and minimal waste, follow the pattern precisely. Using a new blade, apply gently pressure to cut the film. It's most efficient to cut several pieces at a time when applying coloring, and to cut letters and small pieces in rough fashion first. Make final cuts just after applying. Plan ahead before you cut, it helps cut down on waste and eliminates extra work. Be sure to trim overlapping color film closely to avoid bubbles along the edges.

Re-leading (On Site):

Use Windex type glass cleaner or, if Sharpie/china marker was used, clean with alcohol. Follow previous lead application instructions. Line up lead lines carefully, so that inside and outside are perfectly matched. Make sure you use the same size lead on both sides. (Check appearance from both sides).

Finishing Up (On Site):

The last step in every SGO installation is cleaning up. The completed window should be spotless, and any leftover supplies or trash picked up. Take trash with you; don't leave it for your customer to dispose of. If furniture has been moved, it should be put back in place.

When you finish cleaning, take a photograph of the window for your sales album. Leave your business card and a Care and Cleaning card. Follow-up is important, too. Call the customer in a few days to answer any questions and to make sure the job is completely satisfactory, or mail a SGO Thank you card and photo of their window.

Special Effects

Overlapping color films:

A variety of new colors and effects, that are not available, can be created by overlapping color films. Only use transparent and translucent colors, as they will allow the light to pass through and blend two or more different colors into one new one. Do not overlap smooth films on top of textured ones. You can, however, overlap textures on top of smooth films.

Framing:

As a final touch for some of your products, you may want to add a frame. You can make frames yourself, or use a cabinetmaker, framing shop or art supply store. It's more economical to work with a few standard sizes, but some jobs may justify the extra time and expense of custom framing.

You might try making your own frames. There are classes through adult education and hobby centers if you need instruction. For installation, your glass dealer is the best source of advice. Just remember to put the caulking inside of the frame for the best results.

Doubling SGO Film:

Doubling two films can create interest, additional shades, and special effects. Small or large pieces can be doubled. Remember you can double texture on smooth, smooth on smooth but never smooth on texture.

If you have small areas in a project to double, you can apply your first smooth film to the area then apply the second film on the top. Always check to make sure all bubbles have been properly squeegee out.

If you wish, you can double your film before applying to the project. The following method can be used on a flat or horizontal work area.

1) Clean smooth area you will be using, glass is best

2) Lightly mist the area so the film will not slip around while you are working.

3) Place the bit or full sheet, with backing still on, to wet area and squeegee flat.

4) Lightly mist 1 sheet then squeegee off. If necessary use a small amount of alcohol on rag to clean any fingerprints or bits of adhesive.

5) Take sheet 2 and gently peel back and fold about · of the backing sheet.

6) Spray the exposed adhesive on sheet 2, also spray the surface of sheet 1.

7) Carefully align sheet 2 to sheet1, squeegee the area where the backing has been peeled back.

8) Where the backing is still attached to sheet 2 gently pull back and remove the backing. Take care not to let sheet 2 attach to sheet 1.

9) Generously spray the remaining exposed adhesive of sheet 2 and the top of sheet 1. Now gently lay down sheet 2 to 1.

10) Spray the top of sheet 2, starting from the area already squeegee down and begin to squeegee remaining area.

SGO Mirror Application:

STEP 1 - Select and draw paper pattern for mirror.

STEP 2 - Select desired color films to be used on mirror.

STEP 3 - Gather necessary tools for mirror application; Squeegee, Utility knife, Grease Pencils (light and dark), Black Sharpie Felt Marker (med. point), Masking Tape, SGO Application Solution, and a light table with an area to cut out color film.

STEP 4 - Take paper pattern and secure it to the surface of light table glass using the tape.

STEP 5 - Take a clear sheet of Mylar film and trim so it is 1 inch wider and 1 inch longer than the paper pattern.

STEP 6 - Position the clear piece of film; do not remove liner, on top of the paper pattern taped on light table. Center the clear so there is one half inch of clear film border around paper pattern. Secure clear piece of film with masking tape. Turn on the lights where pattern and clear film are secured to the glass. You are now ready for color film application.

STEP 7 - The color application is the same as the acrylic method. Coloring is done first, on top of the clear film using the pattern behind for positioning and placement. It is important that the drawing and cutting of color shapes and sizes are as close to the pattern as possible for best fit. Note: Lead size must be

determined before color application. Make sure that the gaps between color film pieces are not greater than the lead size.

STEP 8 - Once the color film shapes have been drawn and cut, carefully apply them to the clear film surface following the pattern lines behind. Once all pieces have been applied to the clear film, outline the design with small felt marker dots. Keep dots proportionally spaced and to a minimum. This step allows you to lead the design after the clear and color film has been applied to the mirror.

STEP 9 - When all color shapes have been applied to the clear film surface, check for bubbles and water pockets.

STEP 10- Remove colored clear design sheet (decal) from light table. While removing, check to make sure that all needed design dots have been drawn on the decal. If you missed a line or two, you can draw them on the color film surface for reference when leading.

STEP 11- Use scrap pieces of film to cover the back side of mirror. DO NOT CUT OR TRIM SCRAP FILM ON BACK OF MIRROR. THIS WILL CAUSE SCRATCHES AND LIGHT SPOTS. This application protects the mirror from damage.

STEP 12 - Get mirror ready for design transfer. Clean mirror surface thoroughly before applying film mist with water and squeegee off.

STEP 13 - Apply the colored design sheet to the mirror surface; position and center on the mirror.

STEP 14 - Squeegee the colored design sheet onto the mirror surface, working all water and bubbles out. Trim off excess edge film.

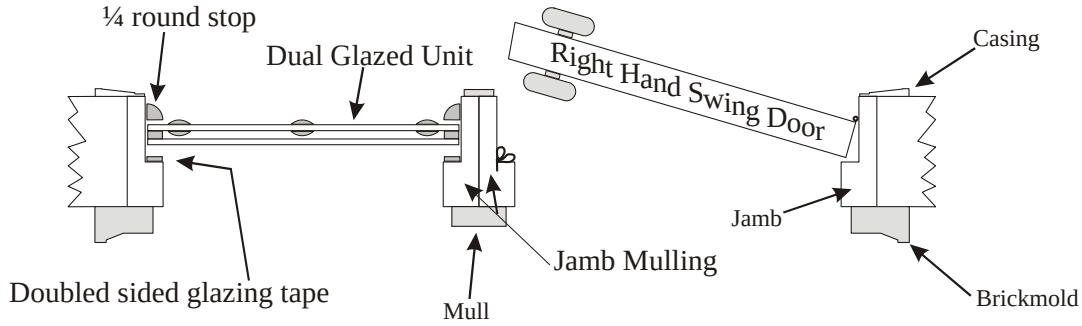
STEP 15 - After removing excess moisture, carefully cut around the color film edges to remove excess clear film.

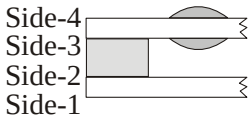
STEP 16 - When all 15 steps have been completed, allow mirror to thoroughly dry before leading. Carefully clean the backside of the mirror of paper and tape only after you have leaded.

Installation

General Information:

Inside

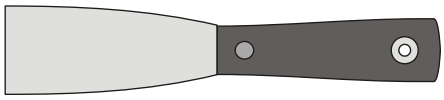




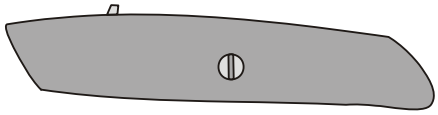
Outside

* It is possible for stops to be on the inside or the outside.

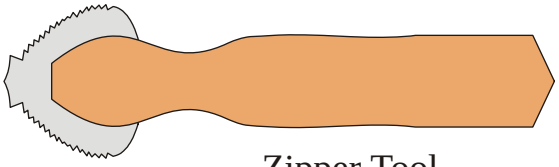
Removing glass from a vinyl or aluminum frame



Stiff Blade Putty Knife

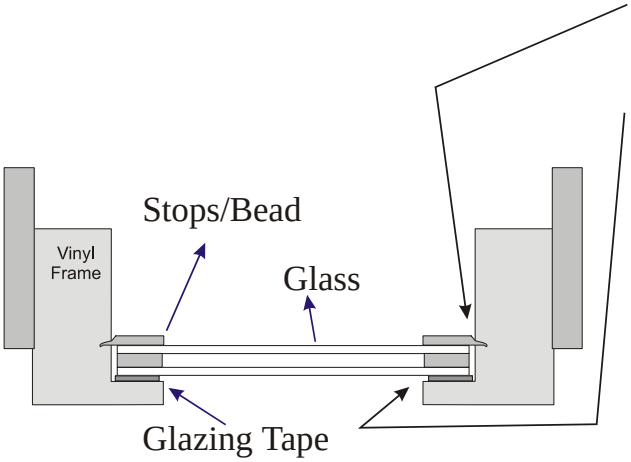


Utility Knife



Zipper Tool

1. Remove the stop or bead around the unit. This can be accomplished by placing a stiff putty knife blade in the groove between the vinyl frame and the bead and with careful twist pops the bead loose.

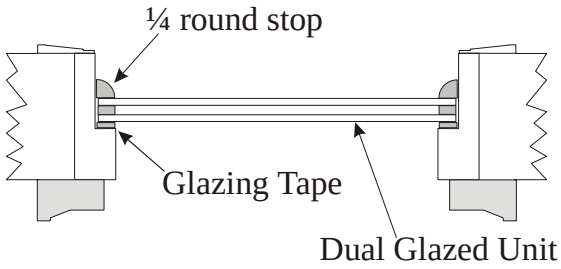


2. Taking your zip tool cut the glazing tale loose. You do this by inserting the edge of the zipper tool between the frame and the glass. Once inserted drag the tool all the way around the glass

NOTE: Make sure you have control of the glass when using the zipper tool. Cut the top section last, this will hold the glass in place until you are ready.

NOTE: Do not use the zipper tool before you remove the bead. This can apply too much pressure on the glass and cause breakage.

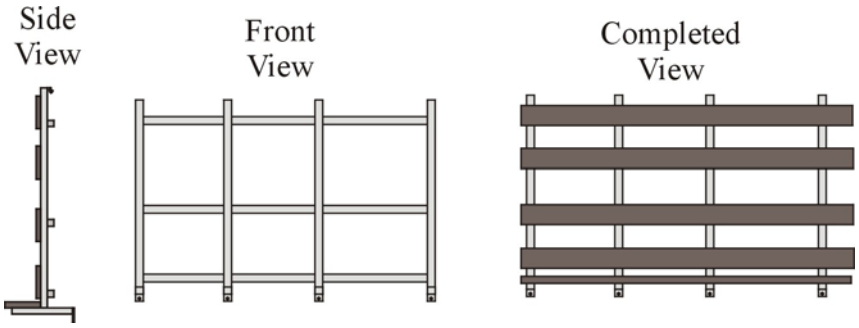
3. Remove existing glass from frame



The only difference for a wooden frame is the removing of the stops.
1. Using your stiff putty knife insert the blade between the frame and the stop to loosen the stop.

NOTE: Before removing the stop it may be wise to use your utility knife and score the edge of the stop next to the frame. You do this to prevent extra peeling away of paint or varnish. Do this very carefully to not damage the wood finish.

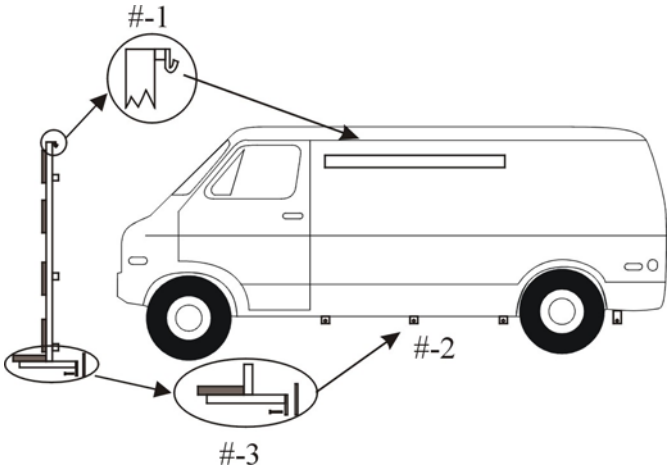
Glass Rack



Suggest using 1”x 1” steel for rack frame.

All joints are welded.

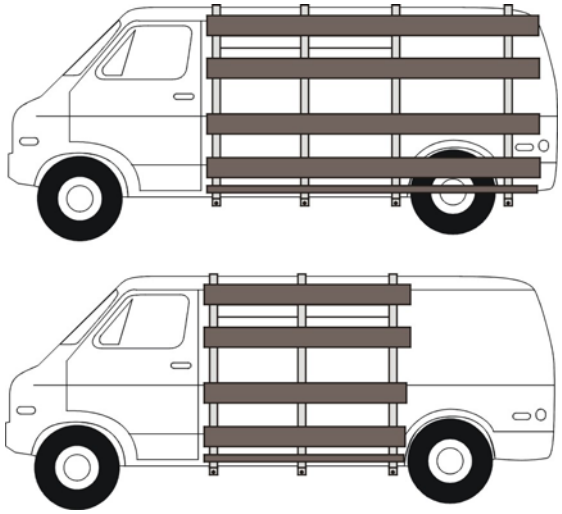
Attach wood slats to frame



#1- sits into the rain gutter (suggest using a piece of rubber inner tube for this to sit on)

#2- Weld a flat piece of steel to the underside of the body frame.

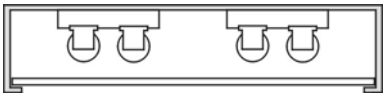
#3- Fit rack into the rain gutter and drill a hole for a bolt in the lower section. This is CRITICAL, for keeping the rack in the rain gutter.



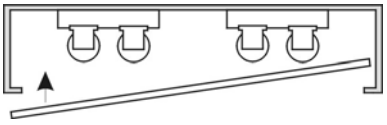
The rack can be fabricated to your specs.

Because of the way the rack attaches to the van it takes only about 5-10 minutes to put on and or take off.

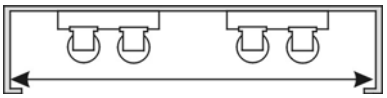
Working With Ceiling Panels



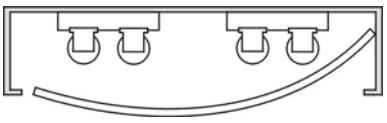
Quite often the framework for ceiling light panels is quite close to the light fixture (4 inches or less).



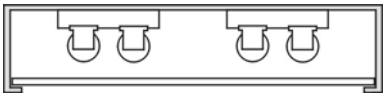
As a result, it is very difficult to maneuver the SGO panel to insert it into the frame.



As with windows, measure all sides and at the mid-point both ways, then deduct 1/8” both ways when ordering the acrylic. 1/8” acrylic can be used for panels of 4 sq. ft. or less. Use 3/16” for 5 to 12 sq. ft. Anything over 12 sq. ft. will need to be1/4” think.

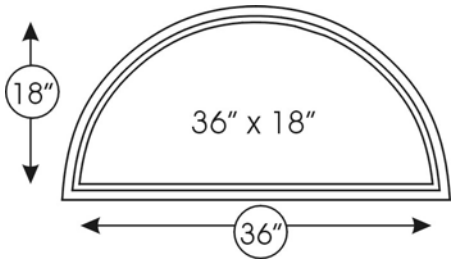


Acrylic is the choice for ceiling panels in SGO if the lights are florescent. It can be bent slightly when installing.

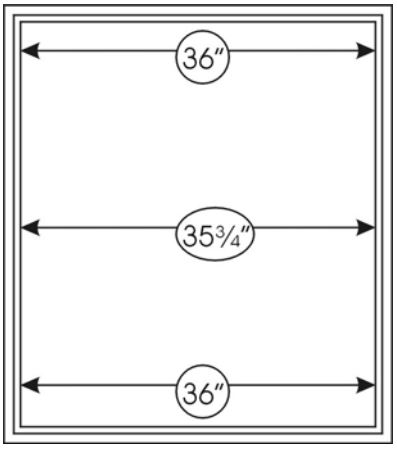


Measuring

How To Measure



When measuring any window, always state the width first, then the height. If you get used to being consistent about width then height, there will never be any doubt when ordering glass or drawing the pattern.



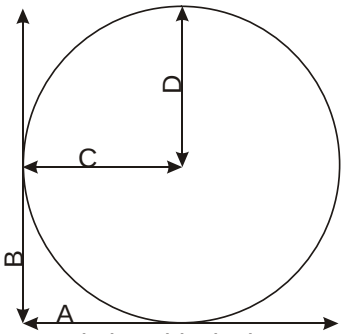
Always measure a "tight" measurement across and up and down the window, at the corners and in the middle. Then use the smallest measurement, each way. Make deductions according to installation method to be used.

Also, CR Lawrence has"Tele-Tape Measuring Stick" #TTE-158 & TTE-197. This is a great tool for those difficult overhead or hard to reach measurements. Stand it on end or against any surface were you need an inside measurement and extend the telescoping stick. It gives extremely accurate measurements that are easily read from the reading scale on the base.

TTE-158 measures 28"-158"

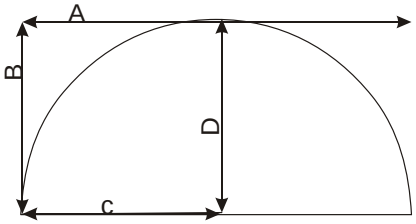
TTE-197 measures 34"- 197"

Odd Shaped Glass



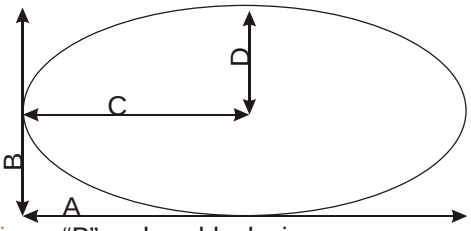
"A" times "B" = total glass block size

"C" times "D" divided by 144 times by 3.14 = total S.F.



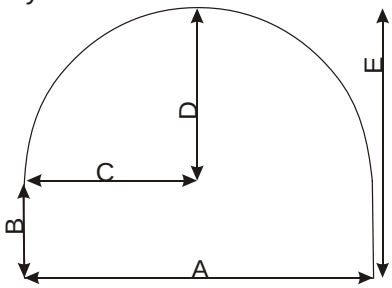
"A" times "B" = total glass block size

"C" times "D" divided by 144 times by 3.14 then divided by 2 = S.F.



"A" times "B" = glass block size

"C" times "D" divided by 144 times by 3.14 = S.F.

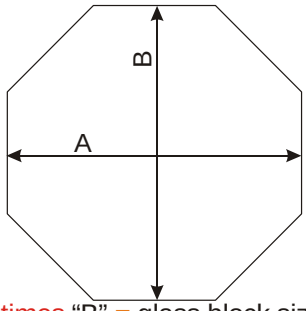


"A" times "E" = glass block size

"A" times "B" = Lower section

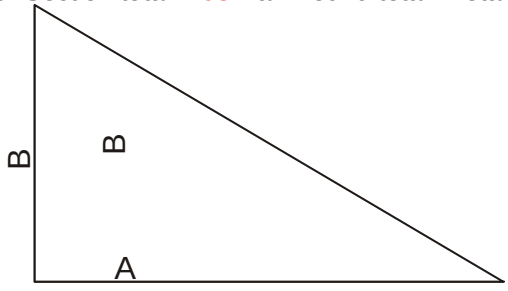
"C" times "D" = Figure as a Half Round

Lower Section total Plus Half Round total =Total S.F.



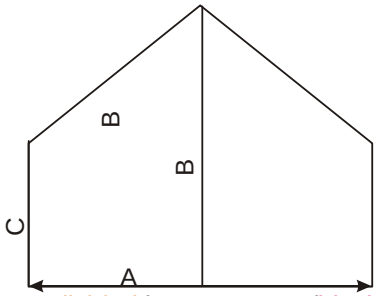
"A" times "B" = glass block size

Figure as a full circle for total S.F.



"A" times "B" divided by 144 = S.F. (block size)

Divide the block glass size by 2 for total S.F.



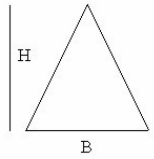
"A" times "B" divided by 144 = S.F. (block size)

"A" times "C" divided by 144 = S.F. (lower section)

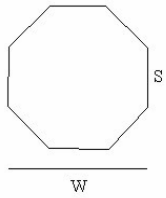
take that total and divide by 2 and add that total to the lower section total for total S.F..

Measure glass in inches to utilize the following formulas. Block sizes (used by glass suppliers) are always figured using the longest measurement in both directions.

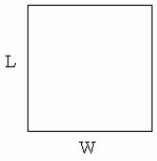
Using a calculator, enter the calculations in order shown (e.g. Triangle/H = 24"; B = 18" would be 24 x 18 = 432 -:- 2 = 216 -:- 144 = 1.5 sq. ft.).



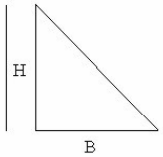
Triangle
H x B -:- 2 -:- 144 = sq. ft.
H = Height
B = Base



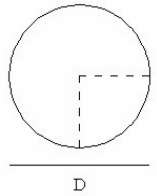
Octagon
S x 2 x W -:- 144 = sq. ft.
S = Short side
W = Width



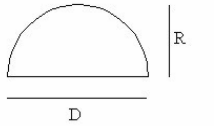
Squares & Rectangles
L x W -:- 144 = sq. ft.
L = Length
W = Width



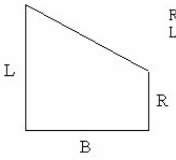
Triangle
H x B -:- 2 -:- 144 = sq. ft.
H = Height
B = Base



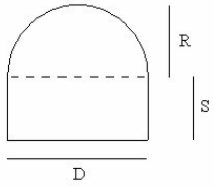
Circle
R x R x 3.14 -:- 144 = sq. ft.
R = Radius
D = Diameter



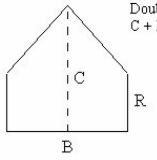
Circlehead
D -:- 2 x R x 3.14 -:- 144 = sq. ft.
D = Diameter
R = Radius



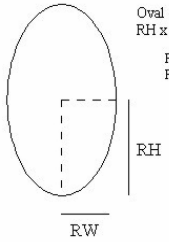
Rakehead
L + R x B -:- 2 -:- 144 = sq. ft.
L = Left side
R = Right side
B = Base



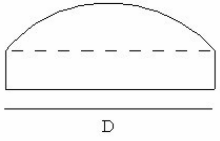
Extended Circlehead
D -:- 2 x R x 3.14 -:- 144 = sq. ft. of arch
D x S -:- 144 = sq. ft. of bottom
add arch and bottom together for total sq. ft.
D = Diameter
R = Radius
S = Side



Double Rakehead
C + R x B -:- 2 -:- 144 = sq. ft.
C = Center Height
R = Right side (or short side)
B = Base



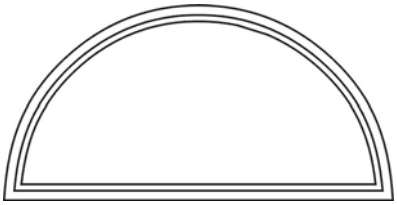
Oval
RH x RW x 3.14 -:- 144 = sq. ft.
RH = Radius Height
RW = Radius Width



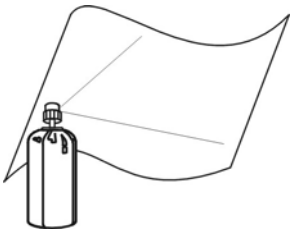
Eyebrow
D -:- 2 x R x 3.14 -:- 144 = sq. ft. of top
D x S -:- 144 = sq. ft. of bottom
add arch and bottom together for total sq. ft.
D = Diameter
R = Radius
S = Side

Making Templates

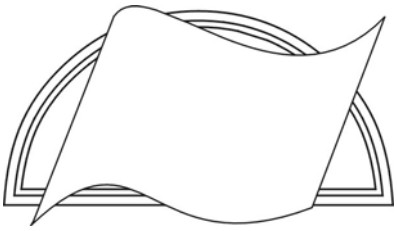
Spray Adhesive Template



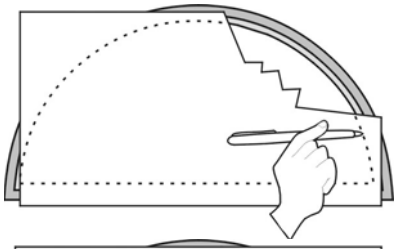
The easiest, most accurate way to make a template of an odd-shaped window is to use Low-Tack spray adhesive on the back of pattern paper.



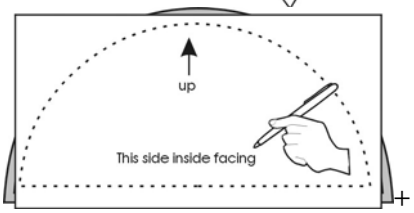
Cut the paper to just slightly larger than the window to be measured. Spray the adhesive on the paper.



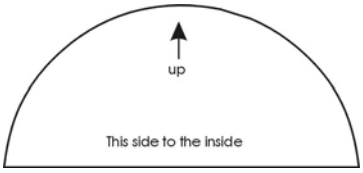
Place the adhesive side against the window and smooth the paper all the way to the edges of the window.



With the point of a ballpoint pen, mark the edges, all the way around.

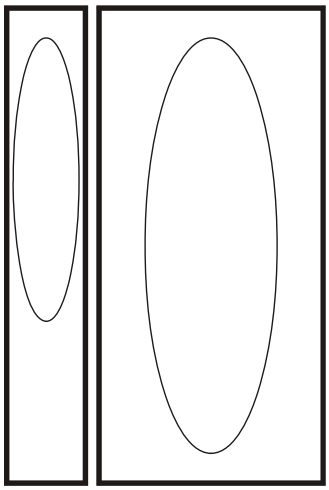


While the paper is still in place write arrows pointing up and "top – inside facing".

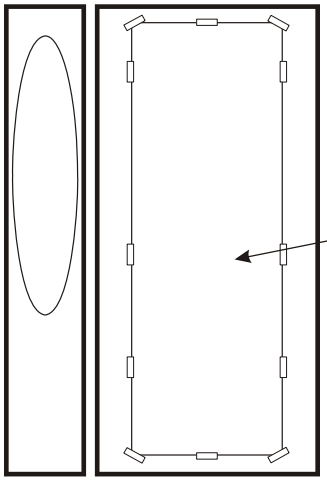


Carefully peel the pattern from the window. After cleaning the pattern up and making any deductions necessary for installation method, make a second pattern to be sent to the glass tempering plant. Mark your company name and phone number on the pattern, along with the thickness of the glass desired.

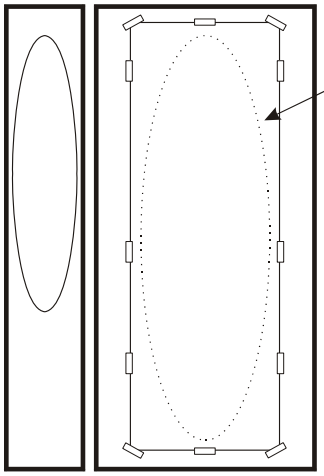
Alternative Template



Another method of creating a template for odd shaped windows



1.- Tape a piece of paper over the whole opening making sure the paper stays tight



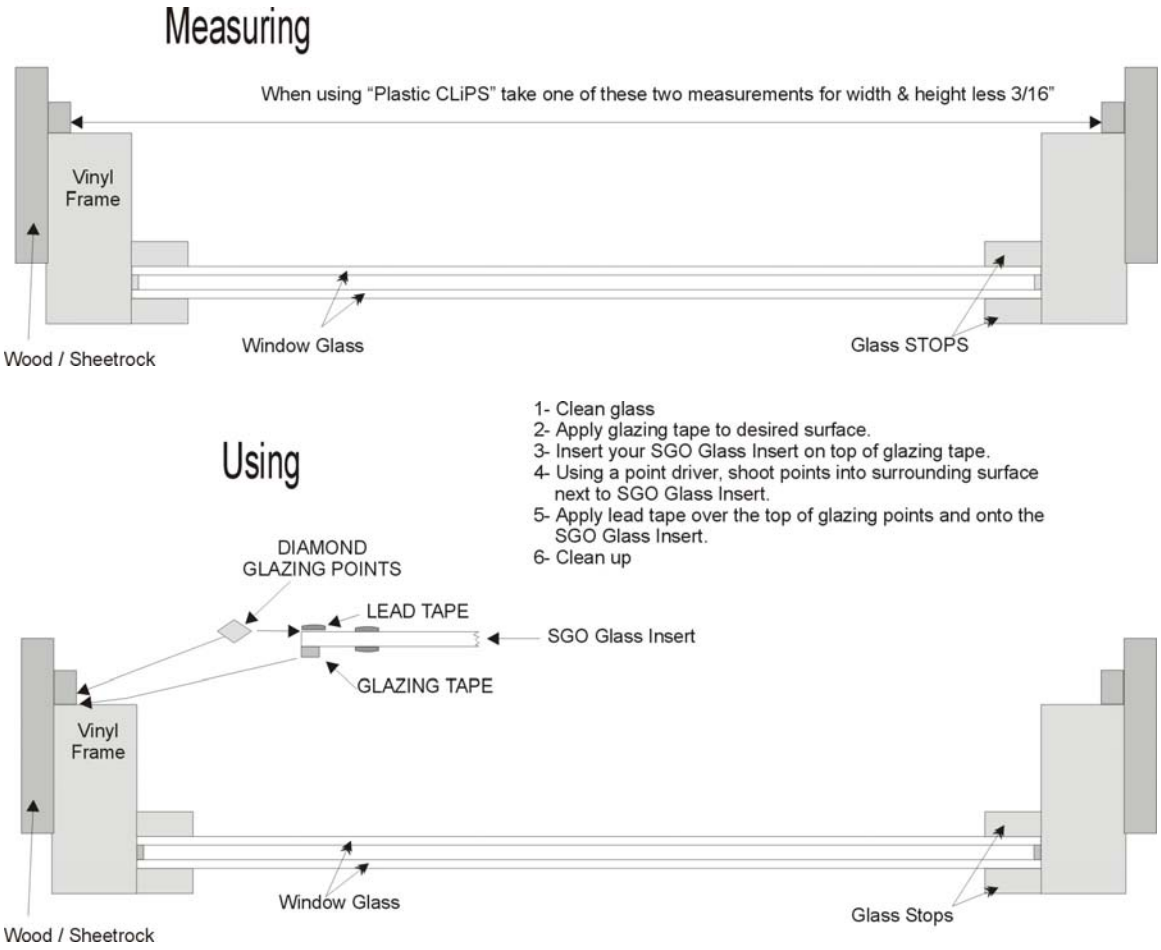
2.- Take your thumb and press it against the edge of the opening on the paper and run it all the way around the opening.

3.- This will create a crease on the paper to the exact size of the opening.

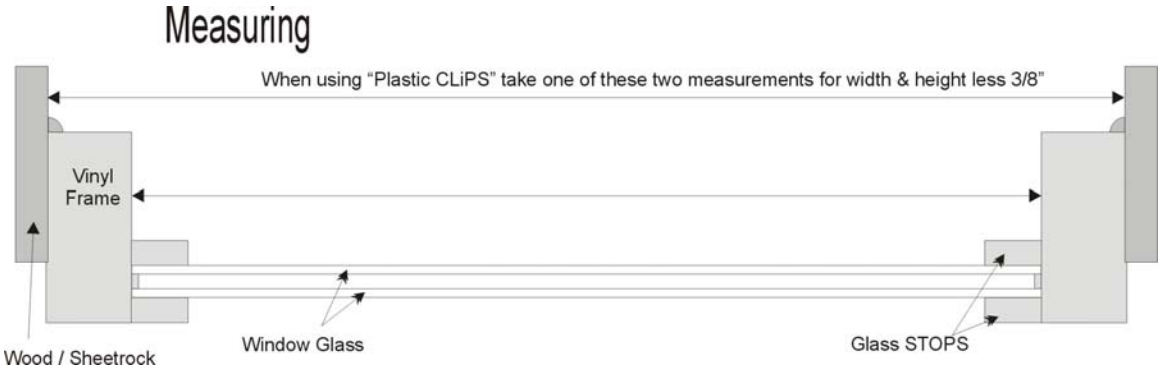
4.- Don't forget this is an exact size, you will need to deduct an amount to archive the desired glass size.

Installation Procedures

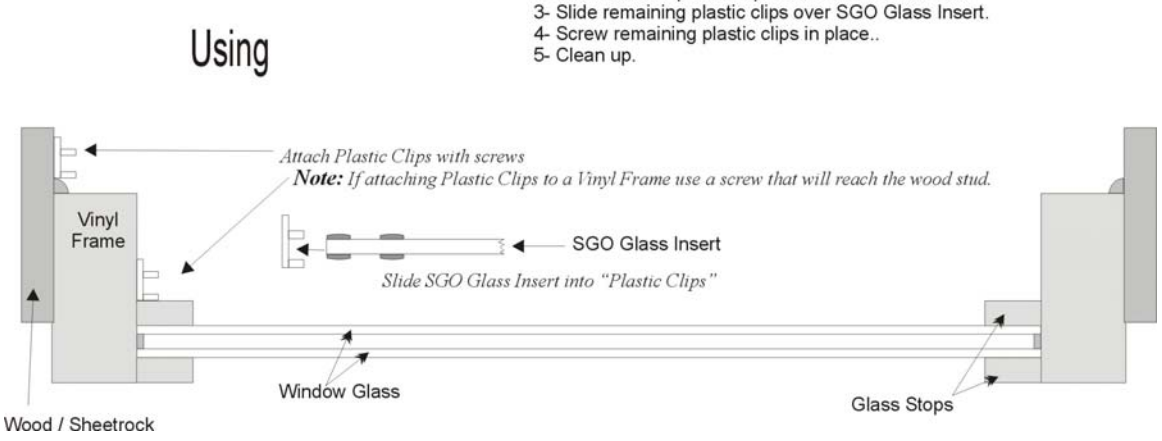
Using Diamond Glazing Points



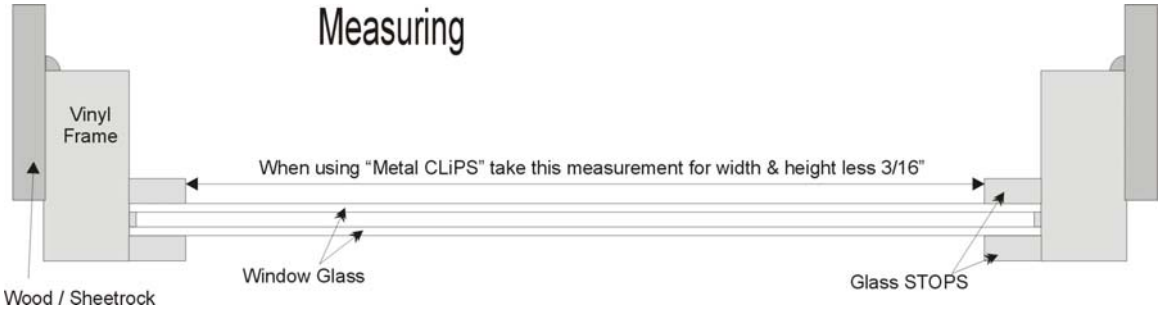
Using Plastic Clips



1- Clean glass
2- Screw bottom plastic clips at the desired location.
3- Slide remaining plastic clips over SGO Glass Insert.
4- Screw remaining plastic clips in place..
5- Clean up.

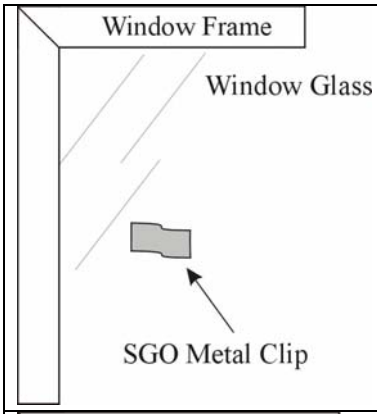


Using Metal Clips

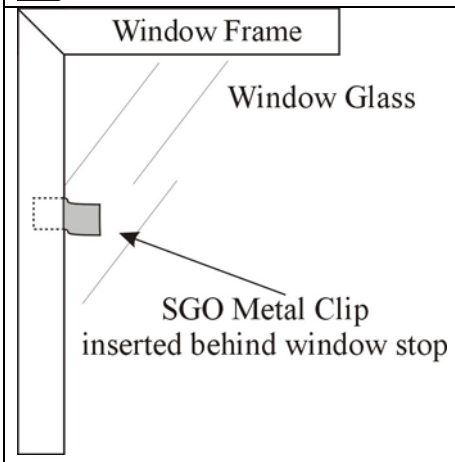


1- Clean glass
2- Insert clips under glass stops
3- Apply glazing tape around window glass surface next to glass stops.
4- Bend exposed part of clips out and insert your SGO Glass Insert on top of glazing tape (be careful, tape is very sticky).
5- bend clips back over SGO Insert.
6- Apply lead tape over clips and around edge of SGO Insert.
7- Clean up.

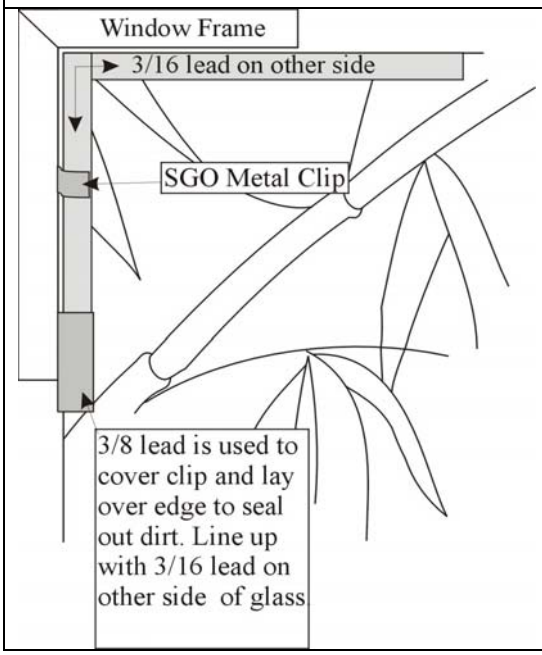
Using The SGO Metal Clip



Depending on your installation it may be necessary to trim it for a better fit.

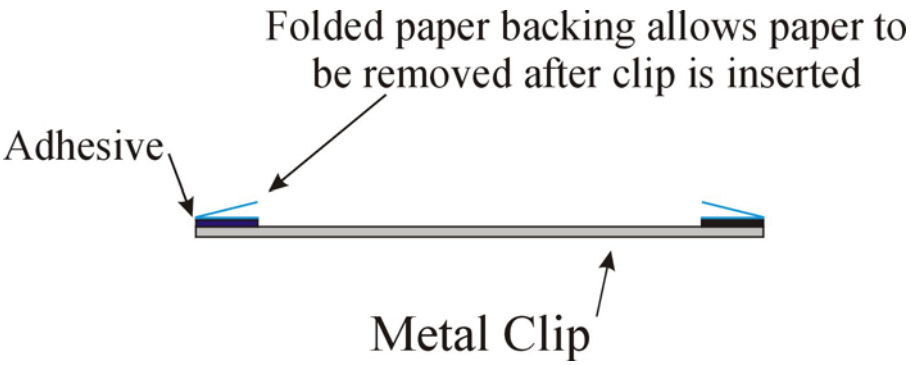


Once you have inserted the metal clip behind the stop and the SGO window is in place take your boning peg and push against the edge of the clip towards the stop. This will cause the clip to lay tighter against the glass so the bump under the final lead is flatter.



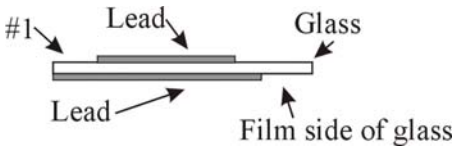
Once your SGO window is in place with the correct number of clips take 3/8” lead and apply it all the way around the window making sure to line up with the lead on the opposite side. The excess lead is wrapped over the edge of the window to seal out any dirt and to give your window that finished look.

Suggestion on using clips:
Windows that move need more clips on the bottom as well as the sides.


Folded paper backing allows paper to
be removed after clip is inserted
Adhesive
Metal Clip

Insulated Windows

Using "Super Spacer" To Seal Your Own Glass

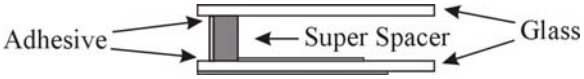


1. Trim back all the lead on the non-film side of the glass giving you a ½ inch of clean glass all the way around the window.

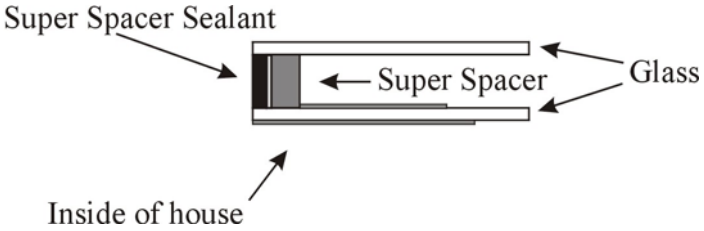
2. Take extra care in cleaning sides 2 and 3 of the unit, once the glass is sealed it's too late.

3. The Super Spacer comes with a self-sticking adhesive on both sides. With the shinny side of the spacer facing to the outside of the glass, remove the bottom protection strip from the adhesive and apply it to the glass. This can be done in one of two different methods. (A) You can purchase a tool that will aid in applying the Super Spacer as well as cut the corners when making turns. (B) Using the cut lead as a guide, position the spacer on the glass next to the lead. When making turns cut a "V" cut into the spacer using your razor blade, making sure you don't cut through the coated outside layer.

4. Remove the protection strip from the top of the Super Spacer and apply the 2nd sheet of glass making sure they are square to each other.



Suggested Method: (A) After applying the Super Spacer place this glass on your upright light table. Use the shelf as a straight edge for keeping the glass square to each other. Making sure that BOTH pieces of glass are CLEAN, position the 2nd sheet of glass next to the first. Make sure they don't touch each other until they are square.



5. After the two pieces of glass have been joined together, lay it on top of some 2x4 blocks to keep it raised off your flat tabletop. The sealant, which can be purchased from CRL or Summer and Maca, can be applied using a caulking gun. Guides that attach to the end of the nozzle are also available which will make this task almost error free. Once the sealant is applied it is suggested that you take a putty knife smooth out the sealant. This will fill in any areas that may nee additional sealant and also remove any excess. Any mess can be cleaned up after it sets up using rubbing alcohol.

Warranty Information

Procedure

1. Customer informs Franchisee:
   a. Information Received
   b. Information Submitted to Corporate Office
2. Customer Informs Corporate Office:
   a. Repair Request Form, Letter & Current Warranty Information sent to Customer
   b. Completed Repair Request Form received by Corporate
   c. Franchise Contacted with Information
   d. Franchise sets-up Inspection
   e. Inspection & Report Completed with pictures of failure
   f. Inspection Report with Pictures Received by Corporate
   g. Authorization to begin Repair is given
   h. Materials Ordered
   i. Repair Completed
   j. Repair Report Form Completed & Filed with Corporate
   k. Credit Issued to Accounting Department
   l. Credit applied to Materials Account (non-negotiable)

Basic Warranty Information

- If Customer contacts you regarding warranty issue please: Take Customers information (Name/Street Address/Phone #) and call Julie McDonald
- Please submit all correspondence regarding Warranty claims to the attention of:

  Julie McDonald
  1827 North Case Street
  Orange, CA 92865
  Fax: 1-800-260-5187 / 1-714-262-6514

- The following forms are available through: Franserv, Order Desk (Julie McDonald), & this manual.
  - **Repair Request Form:** This form must be signed by the customer prior to or at the time of inspection of window(s)
  - **Inspection Report Form:** Filled out by franchise at the time of inspection and submitted to Corporate Office
  - **Material Order Form:** Filled out by franchise to order materials for repair
  - **Repair Report Form:** Filled out by franchise and submitted to Corporate office upon completion of repair

- At the time repair work has been completed:
  - Please remember to make sure your customer understands and has received a copy of the current Warranty card. Make sure your franchise information is on the warranty card
- When submitting forms please remember:

- All forms must be filled out completely to ensure there are no delays in the repair procedure
- A picture must accompany your inspection report.

Guidelines For Handling A Customer Complaint On A Warranty

1. At The Inspection Appointment:
   a. Evaluate the SGO panel and fill out an inspection Report with all application information
   b. Measure accurately
   c. Take pictures
   d. Explain the costs / what we are responsible for and what customer is responsible for.
   e. If duplicating a pattern, you may want to do a rubbing of the lead.
   f. Give a basic glass (tempered) and installation quote in writing.
   g. Explain any additional costs (i.e. pattern charge for pattern change).

2. Once Window Fabrication is Complete:
   a. Set up glass shop to install if not installing yourself
   b. Please be present at time of installation
   c. Have customer sign paper work
   d. Make sure customer is completely satisfied

3. Once Repair is Complete:
   a. Submit all paper work to SGO Corporate for credit

CERTIFICATE OF LIMITED WARRANTY

Stained Glass Overlay, Inc. ("SGO") warrants to its authorized SGO Franchisees its film and lead, under normal use and when properly installed by an SGO Franchisee, to be free from any and all inherent defects causing peeling, cracking, bubbling or fading. This warranty shall continue in effect for a period of ten (10) years from date of purchase, provided that the glass or acrylic surface on which the film and/or lead is applied has not been damaged or destroyed, and extends only to claims made by the original owner, who purchased the film and/or lead as a finished product from an SGO Franchisee for end-use and not resale. SGO will only honor warranty claims of those original owners identified in royalty reports timely submitted by Franchisee to SGO in accordance with the Franchise Agreement. This warranty is void if SGO film or lead is combined with a finished product with any other materials from a source other than SGO.

SGO assumes no liability for damage to the film and/or lead due, in whole or part, to improper application or installation, abuse or improper care of treatment. SGO also assumes no liability for breakage or other loss or damage to the glass or acrylic surfaces on which the film and/or lead has been applied, regardless of the cause.

SGO's obligation under this warranty is limited to furnishing replacement film and/or lead, which SGO determines to be defective. In no event shall SGO be liable for the installation costs of said replacement film and/or lead or for any special, direct, incidental or consequential damages.

SGO MAKES NO WARRANTY OF MERCHANTIBILITY OR FITNESS FOR ANY PURPOSE, NOR ANY OTHER WARRANTY, ORAL OR WRITTEN, EXPRESS OR IMPLIED EXCEPT AS SPECIFICALLY SET FORTH IN THIS CERTIFICATE. No contractor, including the Franchisee, has any authority or power to alter or extend the limited warranty of SGO contained in this Certificate.

In order for Franchisee to make any claim under this Warranty, Franchisee must provide to SGO documentation indicating the name, address and telephone number of the customer and date on which the project was done.

THIS LIMITED WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES OR LIMIATION ON HOW LONG AN IMPLIED WARRANTY LASTS SO THAT THE ABOVE LIMITATIONS AND/OR EXCLUSIONS MAY NOT APPLY TO YOU. This warranty or any part of it is void where prohibited by law.

Warranty Forms

SGO Repair Request Form

Please complete form, sign, and mail in pre-addressed stamped envelope

CONSUMER NAME: _____

MAILING ADDRESS: _____

CITY, STATE, ZIP: _____

CONTACT PHONE: _____

I am the Original Owner of the SGO Window? [ ] Yes [ ] No

REPAIR REQUEST IS FOR:

[ ] Stained Glass Overlay (Film / Lead combined)

[ ] Lead Only

Number of Windows Affected:

Size(s) of Window(s) _____x _____ _____x _____

_____x _____ _____x _____

Original Installation Date: _____

Original Designer Studio Name & Location: _____

Please include a copy of your original purchase agreement or sales receipt

Please Read and Sign Below:

*I hereby understand that the product warranty covers the SGO **lead** and **film only**. The labor to replace and repair the defective materials will be provided by the local representative. I agree to cover any other expenses deemed necessary to complete the work.*

*I understand that any repair work completed to this window is guaranteed from the **original** date of purchase as stated in the SGO warranty card.*

Signature: _____

Date: _____

Inspection Report

Inspection Date: _____

SGO ACCOUNT #: _____ SGO OF: _____

CONSUMER NAME: _____

SITE ADDRESS: _____

CITY, STATE, ZIP: _____

Original Work Completed By: _____

Original Date of Installation: _____

DESCRIPTION OF FAILURE: _____

_____

_____

Window is Located On the structures: **Exterior [ ]*** Interior [ ]

*** If Exterior, which direction is it facing:**

Adhesive Side of Film Faces: Exterior: [ ] Interior: [ ]
Lead Application: Single Sided Application: [ ] Double Sided Application: [ ]

Is SGO part of a Insulated Unit? Yes [ ]* No [ ]
*If Yes, what was the position of the SGO portion?
Side 1 [ ] (pane on outside of structure)
Side 2 [ ]
Side 3 [ ]
Side 4 [ ] (pane facing interior of room)

I would rate the design in this window as: Complicated [ ] Moderate [ ] Simple [ ]

To the best of my knowledge this repair will require approximately:

_____ Sheet(s) of assorted film*

_____ Feet of assorted lead

This customer's location is :

[ ] Less than 50 miles from my studio

[ ] More than 50 miles from my studio

To the best of my knowledge this repair is:

[ ] Failure of SGO product

[ ] Not caused by a failure of SGO products*

*Reason for conclusion:

_____

_____

_____

_____

_____

Reminder: Please include a photo(s) when submitting this report.

SGO Repair Order Form

Date: _____

SGO Account #: _____

Customer Name: _____

Ship Via: [ ] FedEx Ground [ ] UPS Ground

*All Repair orders are shipped ground

Quantity	Item/Part#	Description (optional)

SGO Repair Report

REPORT DATE: _____

SGO ACCOUNT #: _____ SGO OF: _____

CONSUMER NAME: _____

REMEDY OF REPAIR WAS AS FOLLOWS: _____

_____

_____

_____

To the best of your knowledge was the customer satisfied with the repair?* YES [ ] NO [ ]
**Please note: We reserve the right to call customer as part of our follow-up service*
During the repair process the customer was explained and/or handed the current warranty informaton /care and cleaning card with Your Franchise information and explained the warranty coverage is from **original** date of purchase. Yes [ ]

DATE OF COMPLETED REPAIR: _____

HOURS TO COMPLETE REPAIR: _____
(Hourly Rate Credited is $15.00 per hour)

If Mileage Credit has been pre-approved please indicate Miles driven: _____
(Current rate of re-imbursement will be used, 0.45 per mile)

Did SGO Corp. provide the lead in advance for this repair: Yes [ ] No* [ ]
*If No, please fill out below:

Lead

Part #	Quantity

TO ENSURE CREDIT TO YOUR MATERIALS ACCOUNT, PLEASE MAKE SURE THIS FORM **IS COMPLETELY FILLED OUT.**

Please Fax or Mail form to the attention of: Julie McDonald
SGO, INC.
1827 N. Case St. Orange, CA 92865
Phone: 1-800-522-2922 / 714-282-6513 Fax: 1-800 260-5184 / 714-232-6514

Product Testing Data Sheets

1655 Scott Boulevard
Santa Clara, CA 95050-4169
United States Country Code (1
(408) 985-2400
FAX No. (408) 296-3258
http://www.ul.com

Underwriters Laboratories Inc.®

R20780, 01SC15049 December 7, 2001

Mr. Mike Kyne
Stained Glass Overlay
(West Coast & Associates)
1827 N. Case St.
Orange, CA 92865

Subject: Special Services Investigation for Surface Burning Characteristics on Simulated Stained Glass Building Units

Dear Mr. Kyne:

This letter summarizes results of the Surface Burning Characteristics Tests conducted in accordance with UL 723, "Test for Surface Burning Characteristics of Building Materials, (ASTM E-84).

The information covered by this Report is intended for submittal only to North Carolina Department of Labor Elevator and Amusement Division to answer a one time only request.

Information conveyed by this Report applies only to the specimens actually involved in the tests. UL has not established a subsequent produced material, nor has any provision been established to apply any Registered Mark of UL to such material.

The issuance of this Report in no way implies Classification, Listing or other Recognition by UL and does not authorize the use of UL Listing, Classification or Recognition marks or any other reference to Underwriters Laboratories Inc. on or in connection with the product or system.

In no event shall UL be responsible to anyone for whatever use or non-use is made of the information contained in this Report and in no way shall UL, its employees or its agents incur any obligations or liability for damages, including, buy not limited to, consequential damages, arising out of or in connection with the use, or inability to use, the information contained in this Report.

PRODUCT COVERED

Stained Glass Overlay provided the test samples consisting of colored polyester laminate, adhered to tempered glass to simulate stained glass.

Underwriters Laboratories Inc. did not witness the production of the test samples; therefore, we are not able to verify the identification of the component materials used in the manufacture of the test samples or whether it was representative of the finished assembly. The test results apply only to the samples tested.

The products covered by this Report are intended for use as a building material as permitted by the authorities having jurisdiction.

SAMPLES

The sample consisted of a nominal 3/16 in. thick tempered glass faced on one surface with a colored polyester laminate adhered to glass with an adhesive.

The test consisted of twelve panels 24 by 24 in totaling 24 ft. The panels were laid across the tunnel width, their edges resting on the tunnel ledges and their ends butt-jointed to form a continuous 24 ft. test surface. A 14 by 24 in., 16 ga. uncoated steel plate was placed upstream of the burners to complete the 25 ft. tunnel length. Since the sample did not have sufficient rigidity to support itself, the samples were supported on 2 in. hexagonal wire with 1/4 in. steel rods spanning the tunnel at 2 ft. intervals. The polyester laminate surface was exposed to the flame during the testing.

TEST METHOD

The test was conducted in accordance with UL 723, "Test for Surface Burning Characteristics of Building Materials", (ASTM E-84).

The test determines the surface burning characteristics of test materials, specifically the flame spread and smoke developed indices when exposed to fire. This test provides the basis of comparing the surface burning characteristics of different material. The test evaluates the performance of the product during the test exposure. The maximum distance along the length of which the flame spreads from the end of the ignition flame was determined by observation. The flame spread value is derived by plotting the progression of the flame front on a time-distance basis; no allowance is made for flame front recession.

The flame spread index is calculated according to the following:

A. Flame Spread Index = 0.515 A_t, when A_t is less than or equal to 97.5 min-ft.

B. Flame Spread Index = (4900)/(195-A_t), when A_t is greater than 97.5 min-ft.

Where A_t = total area under the distance time curve expressed in min-ft.

The smoke developed during the test is monitored by a photoelectric current operating across the furnace flue. The curve is developed by plotting values of light obscuration as measured in decrease cell output versus time. The smoke developed value is obtained by expressing the area under the curve developed for the sample material as a percentage of the area under the curve developed for untreated red oak.

The smoke developed index value is expressed as follows:

$$\text{Smoke Developed Index} = \frac{Am}{Aro} \times 100$$

Where: Am = Area under the curve of the test material.
Aro = Area under the curve of untreated red oak.

RESULTS

Data on the flame spread and smoke developed indices appear in the following tabulation:

Material Description	Calculated for Flame Spread Index	Calculated Smoke Developed Index
Colored polyester film applied to 3/16 in. temper glass	0	23.2

SUMMARY

The data developed with respect to the tests conducted provided the following summarization rounded to the nearest 5.0 value.

The flame spread index developed for the simulated stained glass panels was 0 with a smoke developed index of 25.0.

Very truly yours,

HANS HANSEN (Ext. 32215)
Lead Engineering Associate
Conformity Assessment Services
Section 3015PSCL

Reviewed by:

GARRETT TOM (Ext. 32438)
Associate Manager
Conformity Assessment Services
Section 3015PSCL

Catherine Barale
General Manager
Conformity Assessment Services

HH:ar

NATIONAL TESTING STANDARDS INC.
RESEARCH AND TESTING LABORATORIES

Report No. 20737

January 31, 1986

Client: Stained Glass Overlay, Inc.
151 Kalmus Drive, Suite J-4
Costa Mesa, Calif. 92691

Subject: Radiation Resistance of Coated Glass

Reference: Conference with Mr. Mike Ludlum

Sample Description:

Eleven samples of clear-coated glass were submitted by the Client and identified as listed in the "Results" section.

Request:

Subject the submitted samples to the equivalent of twenty years of solar ultra-violet radiation.

Method:

The samples were subjected to 6000 hours of ultra-violet radiation in an Atlas W-52 Weather/Fade-O-Meter, as specified in ASTM G-23, in accordance with the Client's instructions. This is equivalent to a 20 year average outdoor exposure in the USA.

Continued...

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Report No: M85-2266-1

Date: November 20, 198

Page: 1 of 2

IRL

INSPECTION AND RESEARCH LABORATORY, INC. 4749 W. State St., Bldg. H, Ontario, California 91761/(714) 591-1789

TESTED FOR

STAINED GLASS OVERLAY
151 Kalmus Drive, J-4
Costa Mesa, CA 92626

1.0 PURPOSE

The purpose of this report is to present the testing procedures used and the test results obtained during the performance of the S.G.O. Inc. Adhesive Backed Lead.

2.0 TEST REFERENCES

2.1 All samples were subjected to the testing procedures set forth in the following ASTM Specifications.

2.2 ASTM E773-83, Test for Seal Durability of Sealed Insulating Glass Units.

2.3 ASTM E774-84a, Specification for Sealed Insulating Glass Units.

3.0 SAMPLES SUBMITTED

Two (2) lites of glass were submitted for testing. Each lite measured 14" x 20" x 1/8" annealed glass with a 4" x 8" diamond shaped glass bevel adhered to each sample.

4.0 TEST PROCEDURES

All samples were subjected to an Accelerated Weathering Test for 140 cycles in accordance with the ASTM E773-E774 guidelines. Each cycle consisted of 6 hours of continuous weathering. During the first hour, decrease the temperature from room temperature to -15°F. Maintain temperature at -15°F for one hour, then turn on the heating and allow temperature to rise from -15°F to room temperature over a period of one hour. Over a period of another hour, start the water spray and ultraviolet lamps and control the temperature rise from room temperature to 135°F. Turn off the water spray after thirty (30) minutes to allow the temperature to rise to 135°F. The temperature is then maintained at 135°F and ultraviolet exposure continues for a period of one hour. Humidity remains very high during this hour. Over the last one hour period, decrease the temperature from 135°F back to room temperature and continue ultraviolet exposure. At the end of this period, turn off ultraviolet exposure and start the cycle over again. After samples had completed the weathering test, they were then removed from the weatherometer for evaluation.

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IRL

INSPECTION AND RESEARCH LABORATORY, INC.

5.0 TEST RESULTS

No irregularities were found with the lead process or adhesive properties.

INSPECTION AND RESEARCH LABORATORY, INC.

H. Stanley Espenship, P.E.
President

Fred Moreno
Manager, Safety Glazing
and S.I.G. Testing

FM/lt

IRL

Report No.: M85-2154

Date: 14 February 1985

INSPECTION AND RESEARCH LABORATORY, INC. 4749 W. State St., Bldg. H, Ontario, California 91761/(714) 591-1789

TESTED FOR
Stained Glass Overlay
151 Kalmus Drive, J-4
Costa Mesa, CA 92626

1.0 PURPOSE

The purpose of this report is to present the testing methods employed and the test results obtained during the performance of a glass impact test in accordance with the ANSI Z97.1-1984 Specification.

2.0 SAMPLES SUBMITTED

Four (4) lites of Organic Coated Glass were submitted for testing. Each lite measured 34" wide by 76" high by 3/16 thick. A 3 mil. thick sheet, identified as Mylar® Color Film was applied to the back of each lite

3.0 SUMMARY

The samples submitted were found to be in compliance with the impact requirements of the ANSI Z97.1-1984 Specification.

4.0 TEST PROCEDURES AND RESULTS

4.1 ANSI Z97.1-1984 Specification

Each specimen shall be struck once at the center with the impactor swinging in a pendulum arc from a drop height of 12 inches above the centerline of the specimen. When no breakage occurs, the same specimen shall be impacted at a drop height of 18 inches, and if no breakage occurs, again at 48 inches.

4.2 Laboratory data sheet with test results is attached.

INSPECTION AND RESEARCH LABORATORY, INC.

Francis Pickell Sr.
Francis Pickell, Sr., P.E.
Technical Director

Fred Moreno
Department Head

REGISTERED PROFESSIONAL ENGINEER
FRANCIS PICKELL, SR.
QU 1224
QUALITY
STATE OF CALIFORNIA

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REPORT NO. M85-2154

PAGE 2 of 2

IRL

INSPECTION AND RESEARCH LABORATORY, INC.

SAFETY GLAZING TEST DATA SHEET

PAPER LABEL NO: N/A TEST DATE: 14 February 1985

FINGERPRINT SEAL? N/A TONG MARKS: No M.J.O. NO: M85-2154

CUSTOMER: Stained Glass Overlay MANUFACTURER: Stained Glass Overlay

MATERIAL TESTED: TT TC TTP TCP LAM PLAS WIRE ORGAN MIRROR

SIZE OF SAMPLE: 34" x 76" THICKNESS: 3/16"

WEIGHT OF PATTERN LITE: N/A

SPECIFICATION(S): ANSI Z97.1-1984 CATEGORY: N/A

SAMPLE NO.	BREAK HEIGHT	WEIGHT OF TEN LARGEST PARTICLES	BACKING THICKNESS	GLASS	OPENING SIZE	PASS/ FAIL
1-	12"	N/A	0.003"	0.187"	5/8"	Pass
2-	12"	N/A	0.003"	0.181"	0	Pass
3-	12"	N/A	0.003"	0.183"	0	Pass
4-	12"	N/A	0.003"	0.185"	0	Pass
5-						
6-						
7-						
8-						

FORM NO: N/A SHIPPER:

Backing

PATTERN NAME: Mylar® Color Film

NOTES: 3 mil.

LABEL FACSIMILE

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NATIONAL TESTING STANDARDS INC.
RESEARCH AND TESTING LABORATORIES

Report No. 17658

April 26, 1985

Client: Stained Glass Overlay, Inc.
151 Kalmus Drive, Suite J-4
Costa Mesa, Calif. 92641

Subject: Adhesion and Tensile Testing of Overlay Material

Reference: Conference with Mr. Mike Ludlam

Sample Description:

The Client submitted six plates of clear glass to which samples of stained glass overlay had been applied.

Request:

Subject three of the submitted samples to 3000 Hours of accelerated weathering/Ultra Violet exposure. Compare the adhesive strengths and tensile strengths of the exposed specimens with the initial specimens.

Method:

The submitted samples were tested in accordance with the procedures set forth in ANSI Z97.1-1975 sections 4.4.2.1 and 4.4.2.2.

Results:

Adhesion Test: 4.4.2.1

Average Peel Strengths (p. p. i.)

Initial	After Exposure	Minimum Requirement	
4.0	4.1	3.6	Pass

Tensile Test: 4.4.2.2

Average Tensile Strengths (p. s. i.)

Initial	After Exposure	Minimum Requirement	
14,600	12,250	10,950	Pass

Continued...

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NATIONAL TESTING STANDARDS INC.

Report No. 17658

April 26, 1985
Page 2

Stained Glass Overlay, Inc. (con't...)

Comment:

The submitted samples meet or exceed the requirements set forth in ANSI Z97.1-1975 for Tensile Strength and Adhesion.

NATIONAL TESTING STANDARDS

John W. Innis

by John W. Innis

Ref: 140042

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Report No.: M84-2075

Date: 29 October 1984

Page: 1 of 2

IRL

INSPECTION AND RESEARCH LABORATORY, INC. 4749 W. State St., Bldg. H, Ontario, California 91761(714) 591-1789

TESTED FOR: STAINED GLASS OVERLAY
151 Kalmus Drive, J-4
Costa Mesa, CA 92626

1.0 PURPOSE

The Purpose of this report is to present the testing procedures used and the test results obtained during the performance of a weathering test on sealed insulating glass units incorporating the Stained Glass Overlay Process.

2.0 TEST REFERENCE

2.1 ASTM E773-81 Test for Seal Durability of Sealed Insulating Glass Units.

2.2 ASTM E774-81 Specification for Sealed Insulating Glass Units.

3.0 SAMPLES SUBMITTED

Three (3) Sealed Insulating Glass Units were submitted for testing. Each unit measured 14" x 20" x 1/8" annealed glass, 1/4" anodized aluminum spacers and zinc corner keys. Each unit was dual sealed. The primary sealant was a Polyisobutylene and the secondary sealant being Polysulfide. Each sample, as identified by the manufacture was of an Overlay Process.

4.0 TEST PROCEDURES

All samples were subjected to an Accelerated Weathering Test for 60 cycles in accordance with the ASTM E773-E774 guidelines. Each cycle consisted of 6 hours of continuous weathering. During the first hour, decrease the temperature from room temperature to -15°F. Maintain temperature at -15°F. for one hour, then turn on the heating and allow temperature to rise from -15°F to room temperature over a period of one hour. Over a period of another hour, start the water spray and ultraviolet lamps and control the temperature rise from room temperature to 135°F. Turn off the water spray after thirty (30) minutes to allow the temperature to rise to 135°F. The temperature is then maintained at 135°F and ultraviolet exposure continues for a period of one hour. Humidity remains very high during this hour. Over the last one hour period, decrease the temperature from 135°F back to room temperature and continue ultraviolet exposure. At the end of this period, turn off ultraviolet

IRL

INSPECTION AND RESEARCH LABORATORY, INC.

4.0 TEST PROCEDURES - Continued

--exposure and start the cycle over again. After samples had completed the weathering test, they were then removed from the weatherometer for evaluation.

5.0 TEST RESULTS

The final frost points of all three samples were below -90°F. This is an excellent reading. No irregularities were found in the Overlay Process and the Overlay Process did not affect either the primary or secondary sealants of the insulating glass units.

INSPECTION AND RESEARCH LABORATORY, INC.

Francis Pickell, Sr.

Francis Pickell Sr., P.E.
Technical Director

Fred Moreno
Department Head

REGISTERED PROFESSIONAL ENGINEER
FRANCIS PICKELL, SR.
QU 1224
QUALITY
STATE OF CALIFORNIA

NATIONAL TESTING STANDARDS INC.
RESEARCH AND TESTING LABORATORIES

Report No. 17420

December 5, 1984

Client: Stained Glass Overlay Inc.
151 Kalmus Drive Suite J-4
Costa Mesa, Calif. 92691

Subject: Absorbance of Ultraviolet Light by Stained Glass Overlays

Reference: Conference with Mr. Mike Ludlam

Sample Description:

Twelve pieces of stained glass overlay samples and one clear glass sample were submitted by the Client and identified as shown in the "Results" section.

Request:

Measure the ultraviolet light absorbance of each of the twelve submitted stained glass overlay samples mounted on clear glass.

Method:

The submitted samples were tested in accordance with a modification of criteria set forth in ASTM E 903.

Continued...

NATIONAL TESTING STANDARDS INC.

Report No. 17420

December 5, 1984
Page 2

To: Stained Glass Overlay Inc.

Results:

ABSORBANCE OF STAINED GLASS OVERLAY SAMPLES AT 380 MIN.

SAMPLE	TOTAL ABSORBANCE OF STAINED GLASS OVERLAY
S-5?	85%
S-5	≥99%
SV-17	≥99%
SV-25	≥99%
SO-32	≥99%
SO-31	≥99%
SW-7	88%
SW-5	≥99%
207	98%
220	≥99%
305	≥99%
304	≥99%

Where ≥ is equal to or greater than.

NATIONAL TESTING STANDARDS

Lewis F. West

by Lewis F. West

ref: 138043

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NATIONAL TESTING STANDARDS INC.
RESEARCH AND TESTING LABORATORIES

Report No. 20259

July 29, 1985

Client: Stained Glass Overlay
151 Kalmus J-4
Costa Mesa, Calif. 92626

Subject: Scrub Resistance of Overlay

Reference: Conference with Mr. Mike Ludlum
Purchase Order No. 9412

Sample Description:

The Client submitted one 4" x 12" pane of brown coated glass.

Request:

Determine the number of scrub cycles required to abrade through the stained glass overlay material.

Method:

The scrub panel was abraded with a hog bristled brush and a paste solution of water and Bon Ami. The abrasive stroke was approximately seven inches long, and was applied at the rate of 80 strokes (40 cycles) per minute.

Results:

The scrub panel withstood 4000 cycles of scrubbing before exposing the glass plate.

NATIONAL TESTING STANDARDS

John W. Innis

by John W. Innis

Ref: 140108

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NATIONAL TESTING STANDARDS INC.
RESEARCH AND TESTING LABORATORIES

Report No. 20737

January 31, 1986

Client: Stained Glass Overlay, Inc.
151 Kalmus Drive, Suite J-4
Costa Mesa, Calif. 92691

Subject: Radiation Resistance of Coated Glass

Reference: Conference with Mr. Mike Ludlum

Sample Description:

Eleven samples of clear-coated glass were submitted by the Client and identified as listed in the "Results" section.

Request:

Subject the submitted samples to the equivalent of twenty years of solar ultra-violet radiation.

Method:

The samples were subjected to 6000 hours of ultra-violet radiation in an Atlas W-52 Weather/Fade-O-Meter, as specified in ASTM G-23, in accordance with the Client's instructions. This is equivalent to a 20 year average outdoor exposure in the USA.

Continued...

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NATIONAL TESTING STANDARDS INC.

Report No. 20737

January 31, 1986
Page 2

Results:

A	Antique	no effect
B	TC - 220	no effect
C	SV - 10	modest fading
D	SW - 7	modest fading
E	SW - 4	modest fading
F	S - 8	very slight darkening
G	S - 6	very slight fading
H	CA - 406	slight fading
I	CA - 400	modest fading
J	CA - 408	very slight fading
K	SO - 34	very slight darkening

NATIONAL TESTING STANDARDS

by John W. Innis

ref: 143083

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NATIONAL TESTING STANDARDS INC.
RESEARCH AND TESTING LABORATORIES

Report No. 25407

August 26, 1994

Client: Stained Glass Overlay
1827 N. Case St.
Orange, CA 92624

Reference: Mr. Bill Fletcher
Purchase Order No. 5190

Subject: Temperature Cycling of YL365 Adhesive on Low E Glass.

Sample Description:

One sheet of plate glass with several strips of gray metal attached was submitted by the Client and identified as Sungate 500 low E glass. The gray metal strips were identified as Yorkshire leading in widths of 3/16", 1/4", and 1/2". The adhesive was identified as YL365.

Request:

Expose the submitted glass plate to 200°F for twelve hours per day. Allow the sample to cool to room temperature during the remaining twelve hours per day.

Repeat this cycling for fourteen days. Examine the glass plate, the lead strips and the adhesive for evidence of deterious effects.

Method:

The submitted sample was exposed to the requested cycling for fourteen days using a Blue M air circulating oven with a saturation type controller.

Results:

After fourteen days of temperature cycling, none of the lead strips exhibited any blistering, peeling, cracking or other evidence of adhesive failure.

NATIONAL TESTING STANDARDS

Lewis F. West

by Lewis F. West

ref: 154110

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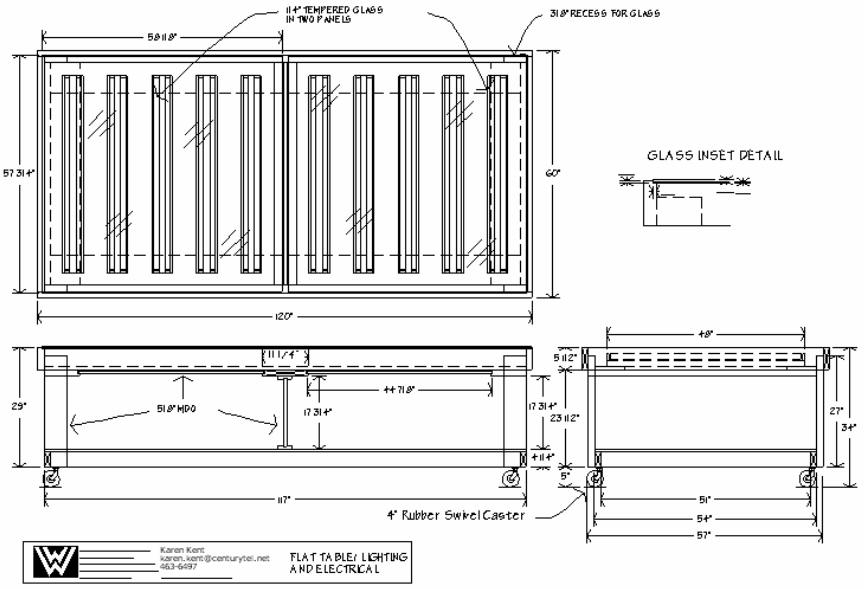
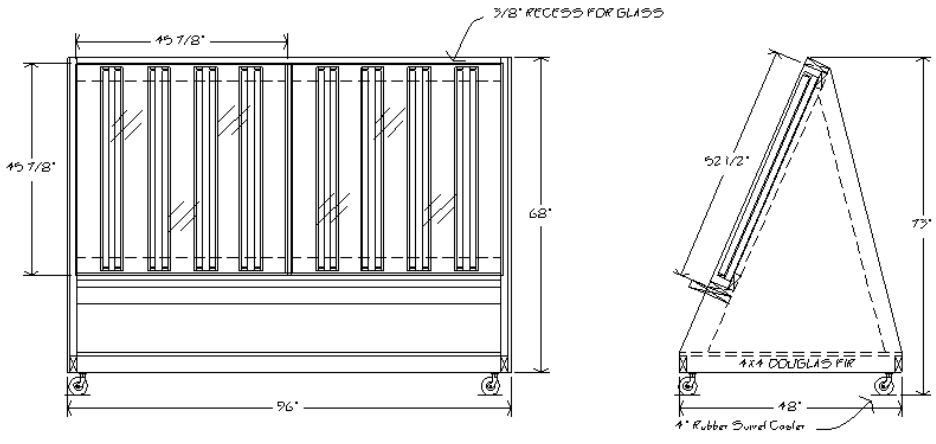
Fabrication Equipment Specs

Light Tables:



Notes
Tempered glass panels caulked in for structural stability
Sliding panels on back for reflection and changing light tubes



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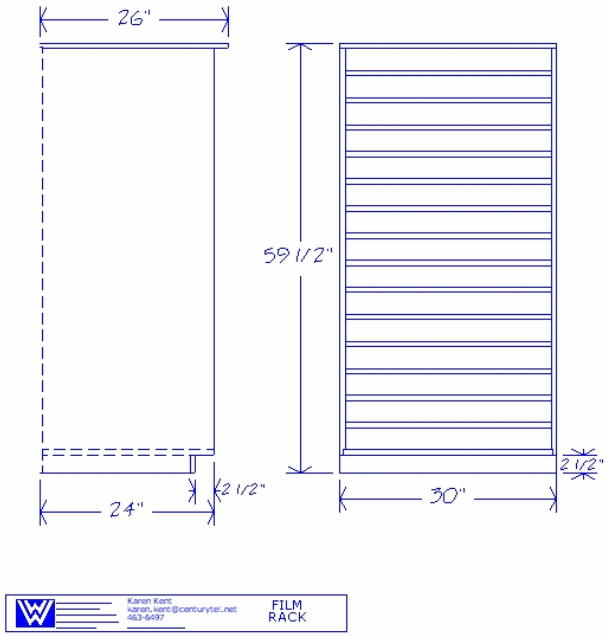
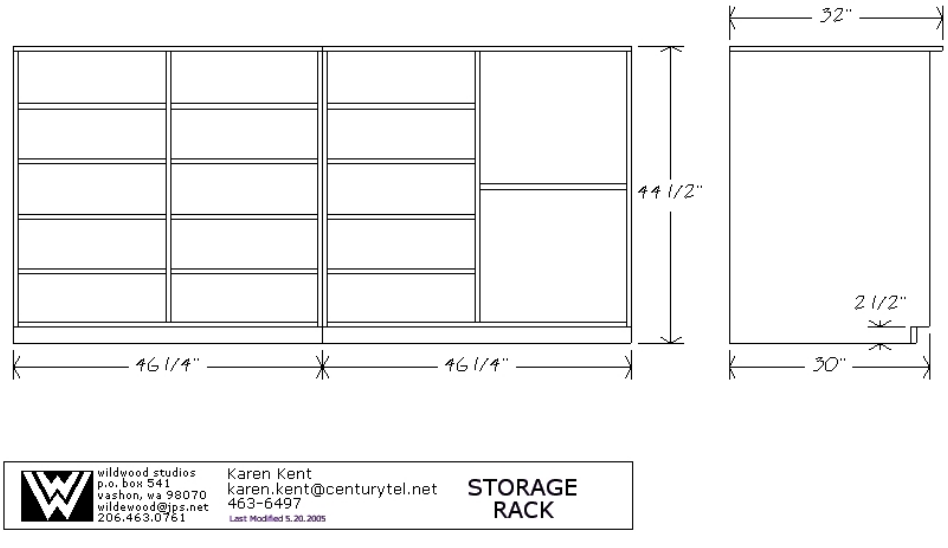

26"
59 1/2"
2 1/2"
24"
2 1/2"
30"
Karen Kent
karen.kent@centurytel.net
463-6497
FILM
RACK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44 1/2"
46 1/4"
46 1/4"
2 1/2"
30"
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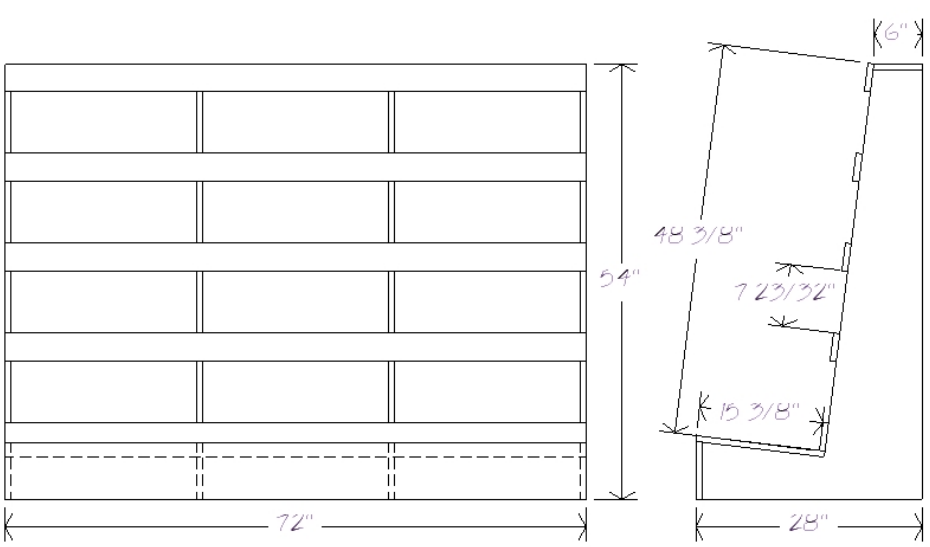
STORAGE
RACK

Storage Specs:



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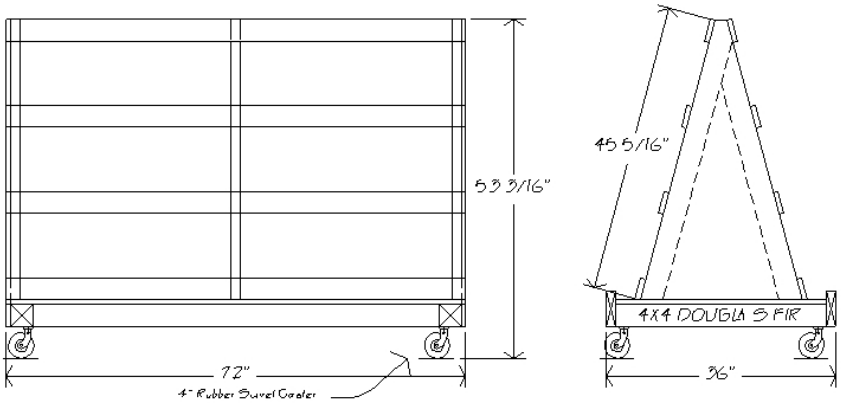
STATIONARY RACK



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GLASS CADDY