BASIC
INSULATING GLASS
MANUAL

With Photographs, Diagrams, Terms, Techniques, Procedures, and Products to Help Fabricate Top Quality Insulating Glass Units

CAT. NO.
GM15

CRL
U.S ALUMINUM

C.R. LAURENCE COMPANY
Worldwide Manufacturer and Supplier
Glazing, Architectural, Railing, Screen, Construction, Industrial, and Automotive Supplies

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Fabricating Quality Insulating Glass is Easy!

Welcome. We are pleased to provide you with these guidelines for assembling your own insulating glass units. We have compiled these basic, easy to follow instructions for first time fabricators, as well as those who are experienced and may be considering alternate methods of production.

CRL Insulating Glass Supplies and Equipment

- • Widest Selection of Insulating Products Available Anywhere
- • Equipment to Support Fabrication of 1 to 500 Units Per Day

Heat loss and solar gain costs money and energy, but it can be prevented. Insulating glass is the single most effective product that you can provide for your customers to save energy and cut their heating and cooling costs.

In the recent past, the windows of a building were a great source of heat loss (more than half of the total building). The same situation applied to solar gain. In an effort to check heating and cooling costs, while upgrading the value and quality of a window unit, most window manufacturers have turned to the production of insulating glass for their window and door lines. And the resulting need for replacement insulating glass continues to grow.

The concept of insulating glass as a measure of conserving heat has been in existence since the late 1940's; however, insulating glass did not become popular until the late 1960's and early 1970's. Following the energy crisis of the 1970's, the residential and commercial construction markets witnessed a tremendous surge in the need for insulating glass products and fabricators. This increase in demand continues today as more legislation is passed every year requiring more efficient forms of energy conservation.

To meet these requirements, the glass and window industry is continually developing new methods and products to reduce heating and air conditioning costs. Rising energy costs and government mandated rebate programs continually urge consumers and contractors to search out the most energy efficient products the market has to offer.

The fabrication of quality insulating glass units is not a mysterious process that only a few fabricators can achieve. Over the years CRL has introduced hundreds of our customers to the profitable business of fabricating and installing new and retrofit insulating glass units. Once you discover the simplicity of fabricating insulating glass you will agree that this is a part of the energy conservation business that you can be part of with little prior experience and only a moderate investment in supplies and tools.

And CRL can help you at every step, from planning your workstations, to stocking your supplies, and making sales presentations to prospective customers. We have a complete program to make insulating glass a part of your successful business.

• Insulating Glass Components and Sealants

The fabrication of quality insulating glass units is dependant upon the right materials, and CRL offers only the components and sealants that meet our strict standards. Be assured that the insulating glass materials we stock in our network of distribution facilities have been thoroughly tested, and will stand up to even the harshest of environmental conditions. Your reputation, and ours, depends on providing your customers with only the best insulating glass units, and that starts with the best materials.

• Insulating Glass Production Line Design

To profitably fabricate insulating glass units in quantity, you need the right tools and equipment. If you are planning to fabricate them in production-level quantities, working with the right tools and shop equipment will make the difference between a profitable unit and one that costs more than you anticipated.

Contact our Technical Sales to discuss your plans. We will work with you to design a new production line or upgrade your existing one. Call (800) 421-6144 in the U.S., (877) 421-6144 from Canada, or (323) 588-1281 International. Ask for the Door and Window Department at Ext. 7520.

• Insulating Glass Consultation Service

The best part of gearing up to fabricate insulating glass units is that you don't have to go it alone. CRL has decades of experience in the field of insulating glass, and trained Technical Sales personnel to provide assistance in selecting the fabrication methods, supplies, and equipment that will best suit your needs and fit your budget.

Contact them at (800) 421-6144 in the U.S., (877) 421-6144 from Canada, or (323) 588-1281 International. Ask for the Door and Window Department at Ext. 7520. You can also send e-mail from the home page of **crlaurence.com**. Click on Contact Us, and then click on Technical Sales for Door and Window Products.
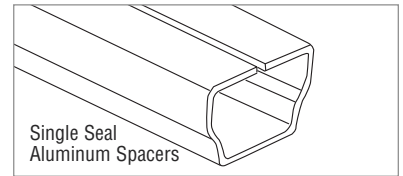
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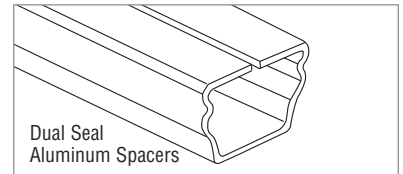
Spacers and Corners

Single Seal Spacers

Single Seal Aluminum Spacers have a single shoulder to accept the sealant deep enough to allow for adequate sealant penetration. Single Seal Spacers are available in clear and bronze anodized finishes.

Single Seal Aluminum Spacers

Dual Seal Spacers

Dual Seal Aluminum Spacers are designed with two sets of shoulders. The shoulders on the inside face of the spacer accept a polyisobutylene (PIB) primary seal. The shoulders on the exterior face accept the secondary seal, and allow for adequate sealant penetration. Dual Seal Spacers are available in clear anodized finish only.

Dual Seal Aluminum Spacers

Spacer Corners

Spacer Corners are used to join spacer frames together by inserting the legs of the corner into the spacer frame. The most widely used corners are made of nylon and can be used with hot melt butyl and all cold applied sealants. CRL Flex Corners (nylon) are available for the fabrication of round and trapezoid-type units. Metal (galvanized) corners are soldered ultrasonically. Corners must match spacer design.
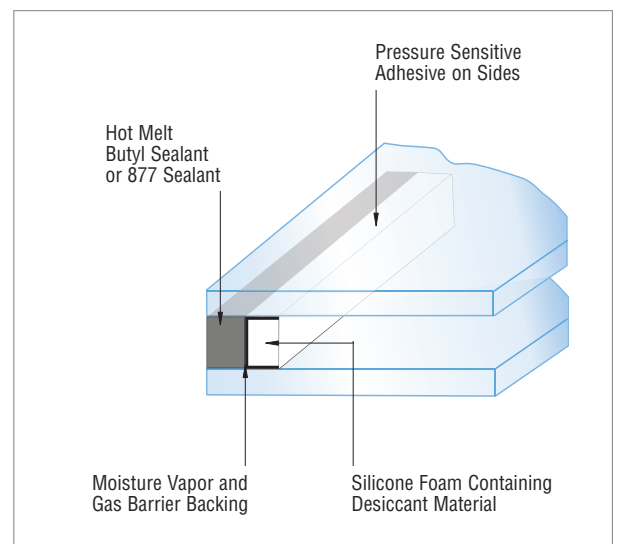
Spacer Corners
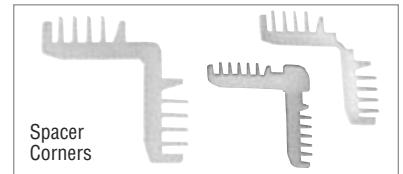
CRL Edgetech Super Spacer®

Edgetech Super Spacer® is made from superior insulating silicone foam and is used in place of traditional metal spacers. The silicone foam reduces thermal conductivity at the insulating glass unit edge. The spacer essentially eliminates perimeter edge condensation because the silicone foam contains its own high quality low-deflection molecular sieve desiccant. The permeability of the foam allows for fast moisture pick-up. To reduce moisture vapor and gas transmission, the silicone spacer is backed by a high-performance, multi-layer barrier film.

Because of the unique design features of this spacer, there are advantages in using the product for the fabrication of specialized insulating glass designs, including curved and odd-shaped units, sound insulating units, and triple-glazed units that have art-glass inserts.

Recommended sealants for use with this type of spacer are Hot Melt Butyl, 877 Silicone Foam, and Metal Spacer I.G. Sealant. Silicone foam spacer is packaged in foil bags. You can minimize waste by cutting off only what you need to fabricate I.G. units.

Pressure Sensitive Adhesive on Sides

Hot Melt Butyl Sealant or 877 Sealant

Moisture Vapor and Gas Barrier Backing
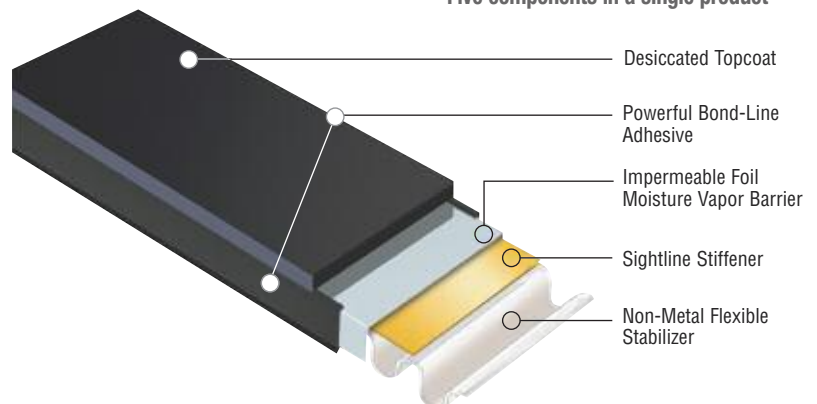
Silicone Foam Containing Desiccant Material

CRL TruSeal® Duralite®

Duralite® has a patented technology that incorporates unique materials and a breakthrough in continuous composite manufacturing processes. This advanced technology offers a higher performance spacer system at a competitive price. Duralite® takes optimum advantage of laminates and adhesives to reduce thermal conductivity, while improving surface and corner appearance over other insulating glass spacers.

A single spacer system for both standard and special units has become an important factor in today's competitive marketplace where a high percentage of manufactured units are non-rectangular. Duralite® allows the window fabricator to produce Insulating Glass units with one spacer system. The fabricator can increase productivity and flexibility, while eliminating customer concerns over having dissimilar spacers in special versus standard windows.

Duralite®, The All-In-One Warm Edge Insulating Glass System With Non-Metal Spacer

Five components in a single product

Desiccated Topcoat

Powerful Bond-Line Adhesive

Impermeable Foil Moisture Vapor Barrier

Sightline Stiffener

Non-Metal Flexible Stabilizer

Super Spacer, TruSeal, and Duralite are registered trademarks of Quanex Building Products Corporation.

Adsorbents

Molecular Sieve (MSD)

Molecular Sieve has an excellent capacity for adsorbing water and chemical vapors, and is the most economical adsorbent on a cost-per-unit basis. MSD provides insulating glass fabricators with superior protection against fogging for a longer lasting unit.

MSD is suitable for both cool and warm climates, and can be used for residential, institutional, and commercial applications. It is also excellent for all types of display cases.

Molecular Sieve has a weight of 6.5 grams per foot in a 1/4" (6.4 mm) square channel. At 77°F (25°C) room temperature and a dew point of 60°F (16°C), 100 pounds (45 kg) of Molecular Sieve would adsorb approximately 11-1/2 pounds (5.2 kg) of water. MSD is cost effective because it costs less per drop of water removed than any other adsorbent. This provides you with significant savings in unit production.

It is only necessary to fill two long legs of the spacer frame. Fill only one long and one short leg when the long side is greater than 2-1/2 times the length of the short side.

Low Deflection Molecular Sieve

A newer type of Molecular Sieve has recently been developed with high capacity for both moisture and solvent vapor. Longer unit life results from the minimization of unit seal stress and deflection. Two types of desiccants are mixed to achieve these characteristics.

As with standard Molecular Sieve, only the two long sides of the spacer frame should be filled. Fill only one long leg and one short leg when the long side is greater than 2-1/2 times the length of the short side.
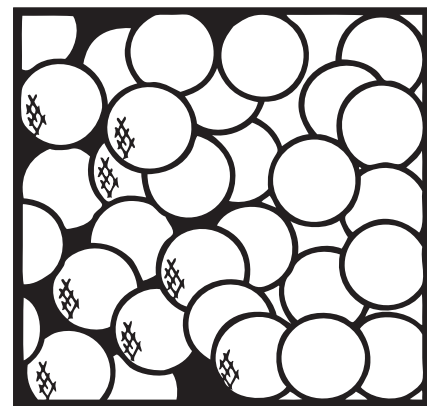
Glass

The glass to be used in the unit must be clean and free of flaws and scratches. It may be clear, tinted, obscure, reflective or heat adsorbent. The tinted lite of an insulating glass unit must be glazed to the outside of the building. The obscure lite of an insulating glass unit must be fabricated with the smooth surface to the air space, and glazed with the obscure lite to the outside of the building. Reflective and heat adsorbent glass must be fabricated to meet manufacturer's recommendations.

Insulating Glass Sealants

An insulating glass unit is only as good as the workmanship and materials that go into it. Of these materials, the sealant can be the critical factor of an extended service period. The sealant's function is to maintain a structural bond between two or more lites of glass, provide adhesion to the spacer, and prevent moisture penetration into the air space between the lites of the glass. It is essential that the sealant be elastomeric and possess a good resistance to weathering, ultraviolet radiation, aging, and environmental chemicals. The risk of failure because of ultraviolet radiation can be reduced by the appropriate design of the glazing system and proper installation of the insulating glass unit. Various types of sealants are now available for sealing insulating glass units. We will discuss some of the advantages and disadvantages of each.

Hot Melt Butyls

Hot Melt Butyl sealants are polymer-based, 100% thermoplastic solids that develop immediate strength upon cool-down. Specifically formulated to adhere to glass and metal, they have an excellent low vapor transmission rate and do not emit gases. Hot Melt Butyls also have a low shrinkage rate and as much as a 1,000% elongation rate. The low shrinkage and absence of gassing is evident because cross-linked Hot Melt Butyls are 100% solids and contain no solvents. One of the most meaningful aspects of having no solvent is the absence of unpleasant odors because of solvent dissipation. Hot Melt Butyl sealants form a flexible seal, and provide good resistance to weathering and ultraviolet radiation breakdown and, consequently, offer long-range stability. These sealants also exhibit good flow properties when heated to an application temperature of approximately 390°F (199°C). Once applied to the insulating glass unit, the sealant will cool within five minutes to form a strong, resilient seal. An economic feature of these sealants is the virtual lack of waste. Any excess sealant can be trimmed off the insulating units and reused by simply returning it to the dispensing equipment.

The disadvantages of Hot Melt Butyl systems are: (a) Care must be exercised in the selection of bedding and glazing compounds. These compounds must be made in accordance with precise instructions or the units will fail prematurely. All bedding and glazing compounds should be tested thoroughly for compatibility before installation in the field; (b) Overlapping shear strength is not as good as other sealants on the market; (c) Hot Melt Butyl has poor resistance to creep and flow; (d) Hot Melt Butyl sealants require higher energy costs for application at 390°F (199°C).

Two-Part Polysulfides and Urethanes

For the purpose of sealing insulating glass units, Polysulfide and Urethane sealants are two-component thixotropic compounds that polymerize to a thermoset elastomeric rubber upon mixing. These sealant systems can be used at room temperature and will cure to a resilient rubber at 75°F (24°C).

Two-part sealant consists of a base compound and a premeasured proportionate amount of accelerator. The accelerator is the curing agent and contains a plasticizer for easy blending with the base compound. Proper mixing and correct proportioning of base and accelerator are important for obtaining optimum sealant properties.

After mixing, Polysulfide systems have a work life from 15 minutes to one hour at 75°F (24°C), depending on the sealant system purchased. The cut-apart time of two-part Polysulfides can range from one to 12 hours at 75°F (24°C), again depending on which system is purchased. For faster production cut-apart and curing times, a 95°F to 100°F (35°C to 38°C) heated room is recommended. Polysulfide and Urethane sealant systems have a low enough viscosity at 75°F (24°C) to lend themselves well to gun, trowel or brush application procedures. After curing to a resilient rubber, the sealant exhibits adhesive strength that can endure long exposure to expansion, contraction, vibration, temperature extremes, and moisture. They offer good resistance to weathering and aging. Polyurethane sealants are especially useful in units using films or coated glass.

When compared to Hot Melt Butyl sealants, Polysulfide and Urethane sealants have a higher moisture vapor transmission rate, slower cure rate, higher waste factor, and aging is not as good. Because Hot Melt Butyl sealants are one component systems, they emit less odor than Polysulfide systems, and have an indefinite shelf life at room temperature.

Compared to silicone sealants, Polysulfides and Urethanes show less ultraviolet radiation resistance, about the same aging characteristics, less flexibility at low temperatures, less heat resistance, lower peel strength adhesion to glass, and are compatible with fewer bedding and glazing materials.

Silicone Foam and Metal Spacer I.G. Sealant

CRL 877 Silicone Foam and Metal Spacer I.G. Sealant is a single component Urethane for the fabrication of single seal insulating glass units. The special low-solvent formulation is made to be compatible with the Super Spacer® adsorbent, and does not require a primary seal of Polyisobutylene (PIB). CRL 877 may also be used to build insulating glass units with desiccant filled aluminum spacers.

Packaged in standard sized cartridges, Silicone Foam and Metal Spacer I.G. Sealant does not require special pumping equipment. A standard manual, electric or air caulking gun and a sealant guide matched to the spacer width is all that is needed. An overnight cure is required before the insulating glass unit can be trimmed and installed.

Silicones

For the purpose of sealing insulating glass units, Silicone sealants are available in one or two-part systems. Both systems are recommended for dual sealing only; that is, a primary seal of Polyisobutylene and a secondary seal of Silicone.

The one-part Silicone system has been in the field in Europe for more than 30 years. It is a non-flowing Silicone elastomer that does not require the addition of plasticizing agents or catalysts to achieve optimum properties. Newer two-part Silicones are non-flowing, and have a silicone rubber-based compound and activator. One-part Silicones are available in tubes, pails or drums. Two-part Silicones are available in drums only. Silicone sealants have a one-year shelf life, a 20 to 30 minute work life for one-part Silicone systems, and more than two hours for a two-part system.

Silicone sealants possess excellent resistance to ultraviolet radiation, climatic variations and resistance to ozone. They also have excellent adhesion to glass and aluminum. On the whole, Silicone sealants are unaffected by cold and heat. Two-part Silicones have a low enough viscosity at room temperature to lend themselves to gun, trowel or brush applications.

Compared to Polysulfide, Urethane and Hot Melt Butyl sealants, Silicones have a much higher moisture vapor transmission rate, and consequently are not recommended for single-sealed insulating glass units. Silicone sealants typically cost more than other sealants.

Polyisobutylene (PIB) Primary Seal

Polyisobutylene is used as the primary seal for dual-seal systems, whether they are Polysulfide, Urethane, Hot Melt Butyl or Silicone. PIB is a one-part, non-drying, non-hardening polyisobutylene-based material that has a low moisture vapor transmission rate. Polyisobutylene has excellent adhesion to glass and metal; excellent resistance to water, ozone, ultraviolet light and aging; and excellent low-temperature flexibility. PIB is packaged in slug form, or in bead form on a roll.

Glazing Sealants

Glazing sealants are used when installing insulating glass units into the sash. They are used with the tape glazing method, tape and wet seal units, and wet glaze method. These sealants *must be* compatible with the I.G. edge seal sealants to prevent breakdown and moisture infiltration. Most acrylic latex and neutral-cure silicones are compatible because they do not contain corrosive solvents. Call CRL for a current list of other compatible products.

Other Tools and Materials

- Glass Cleaner (non-sudsing type cleaners with no release agents; invisible film type)
- Lint-free Gloves
- Lint-free Shop Wipes
- Easel (flat black in color for cleaning and inspecting the glass)
- Clamps with Plastic Coated Tips
- Wide Flexible Putty Knife (application of Polysulfide)
- Caulking Guns (application of cartridge sealants)
- Hot Melt Extruder (application of Hot Melt Butyl)
- Brass Tips for Hot Melt Extruder
- Razor Blades and Holder
- Insulating Glass Hot Trim Knife (for Hot Melt Butyl only)
- Chlorinated Solvent (for cleaning spacers)
- Power Miter Saw with Fine Tooth Blade
- Neoprene Setting Blocks (for glazing)
- Insulating Glass Adapter Channel (for glazing)
- Spacer Bending Device (to bend spacers into circles and arcs)
- Muntin Bars and Clips (for creating multiple pane effect)
- Molecular Sieve Test Kit

Super Spacer is a registered trademark of Quanex Building Products Corporation.

Washing Glass

Detergent Selection

Automatic glass washing machines require a special detergent for flat glass. CRL Cat. No. 155X or "Low-e" Washing Machine Detergents mix quickly, and are compatible with any brand of washer currently in use. If, however, you are washing glass by hand or using an additional cleanser to remove dirt or spots after coming through your washing machine, then extreme care must be taken in the selection of cleansers.

Many commercial cleansers on the market do an excellent job, however, some manufacturers incorporate a release agent to prevent future dirt pickup. These agents are good if you are cleaning windows, but if they are used in the area in which you expect adhesion with your sealant, problems will occur.

Sealants will not adhere to release agents, and you will have failures after the unit is put into service. Be certain that the glass cleaner does not contain these additives, and do not use the product if a statement such as "leaves an invisible film on the glass" appears on the label. CRL Cat. Nos. 3371100 and 695 for hand washing, and Cat. Nos. 155X or 3379046 "Low-e" for automatic glass washers, have been tested and found to be ideal.

Hand Washing

After glass is cut to desired size, place on a flat black easel positioned under a well-lit area. Glass should be washed in the vertical position, starting at the top and working down.

Glass cleaner should be non-sudsing and non-filming (no release agents) to assure no streaking and good adhesion of sealant to glass. The glass must be cleaned with CRL 1550 Lint-Free Wipes, and should be handled with Cat. No. NG171 Lint-Free Gloves to prevent oily fingerprints and/or contamination. Clean both sides of the glass.
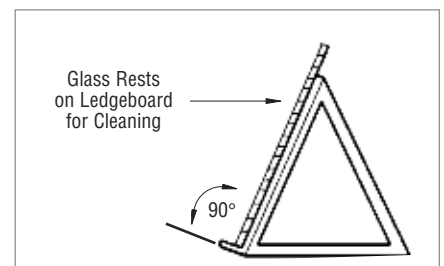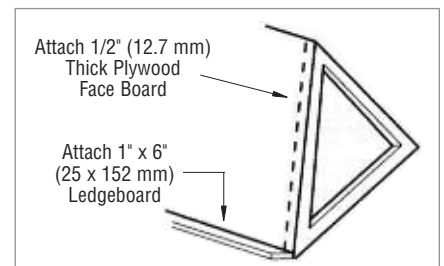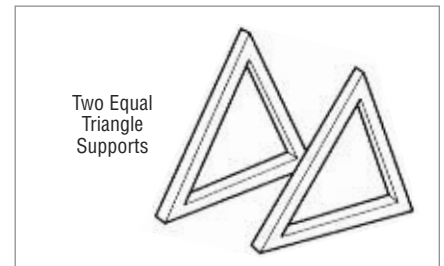
Automatic Machine Washing

Position two fluorescent bulbs below the takeoff rollers of your washer for quick inspection of your glass for water spots or other marks. Most washing machines will clean glass sufficiently on both sides, however, remember that you need just one clean side if you flip the top lite of each unit.

Handle glass with Cat. No. NG171 Lint-Free Gloves, never with bare hands. Bare hands could affect the adhesion of the sealant.

In some outlying areas in which well water is used, the water's high mineral content may make it almost impossible to get spot-free glass. In this case, deionizing tanks may be necessary for your water line before it enters the automatic washer.

Glass Washing Easel

An easel for hand washing glass may be fabricated easily in your shop. Make your easel at least the size of the largest unit you will fabricate. For the ends of the easel, construct two triangular frames of 2" x 3" (51 x 76 mm) boards. Make sure their sizes match. Cut a 1/2" (12.7 mm) plywood face and assemble with screws to the triangular supports. For a lip to support the glass, attach a 1" x 6" (25 x 152 mm) board at a 90 degree angle to the bottom edge of the face surface. Be sure to drill a few drain holes in the ledgeboard. One can of flat black paint will be needed to paint the easel.

Two Equal Triangle Supports

Attach 1/2" (12.7 mm) Thick Plywood Face Board

Attach 1" x 6" (25 x 152 mm) Ledgeboard

Glass Rests on Ledgeboard for Cleaning

90°

Metal Spacer Insulating Glass Units

This section is a guideline, not a specification. As a manufacturer, you should determine what types of units you want to produce, then design a system that will efficiently generate quality insulating glass units.

The choice of proper materials and equipment will have a great bearing on the quality of the unit that you will fabricate. First, decide what type of unit you wish to produce - a single seal or dual seal unit. Next, you must select the type of spacer, adsorbent, and sealant you are going to use.

After making these decisions, you are ready to start assembling insulating glass units.

If you need assistance in the selection of components please contact our Technical Sales at (800) 421-6144 in the U.S., (877) 421-6144 from Canada, or (323) 588-1281 International and ask for the Door and Window Department at Ext. 7520, or e-mail **glazing@crlaurence.com**.

Fabrication of Spacer Frame

Generally speaking, spacers should be cut to be a minimum of 7/8" (22 mm) shorter than the overall dimensions of the glass. This allowance will vary depending on the spacer width; wider spacers may need to be undercut more than 7/8" (22 mm).

Spacer should be set back from edge of glass to accept a layer of sealant. If uniform set-back is not available on all edges of unit, the spacer frame may have to be disassembled and shortened slightly to provide adequate set-back.

Spacers should be handled with Cat. No. NG171 Lint-Free Gloves to avoid leaving contaminants from hands.

Cut spacers with a 100-150 tooth saw blade without oil coolant, then wipe clean with an oil-free solvent.

Corner Keys should then be inserted in one end of the spacer leg. Be sure spacers are free of burrs. When installing corners, be sure to fully insert them into the spacer for a proper fit.
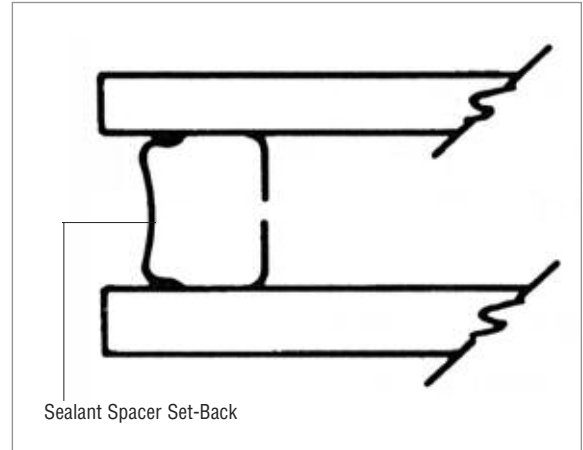
Completing Spacer Frame

At this time, the legs of the spacer are ready to be filled with an adsorbent. Adsorbent should be kept in a sealed container and stored in a warm, dry area to prevent contamination. Fill spacers with adsorbent no more than one hour before applying edge seal.

Finish the assembly of the spacer frame by joining the legs to the corner keys. Be sure to use the right size corner key to fit the spacer you are using. Corner keys that are too large will be difficult to insert, and will cause deformation of the spacer frame at the corner.
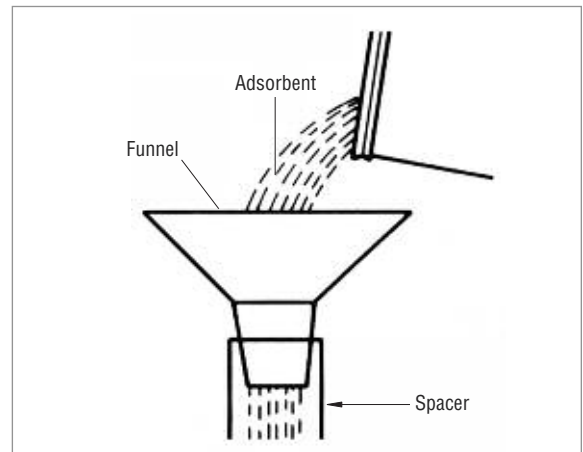
CRL Nordic Carbide Tipped Saw Blades

• For Thin Wall Aluminum Extrusions

Tooth Pattern

Triple Chip Design
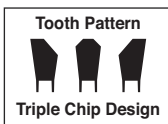
CRL Nordic "ATX" thin extrusion (spacer frame) cutting saw Blades are built with a maximum number of teeth to give clean, burr-free cuts. They are hollow ground to prevent kickback, and the teeth are inserted to give maximum tip strength. The material must be held down securely while cutting and should be dry cut.
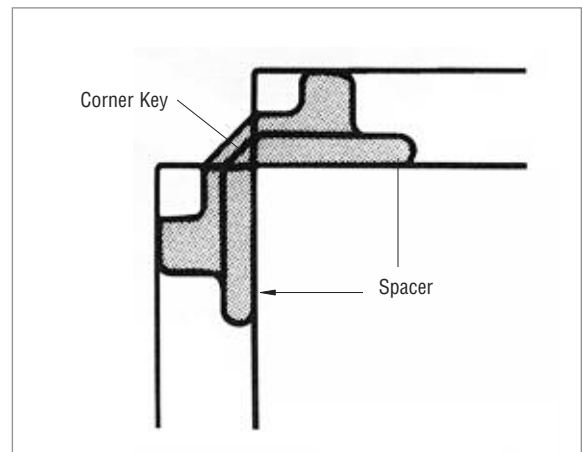
CAT. NO.	DIAMETER	ARBOR	NO. OF TEETH
CSB10X144ATX	10" (254 mm)	5/8" (16 mm)	144
CSB12X150ATX	12" (305 mm)	5/8" (16 mm)	150

Minimum order: 1 each.

Sealant Spacer Set-Back

Adsorbent

Funnel

Spacer

Corner Key

Spacer

Silicone Foam Spacers

The Cat. No. SSHN Super Spacer® Hand Notcher is designed to speed up the manual application of Super Spacer®. It simplifies corner notching and assures constant placing of the foam spacer strip at a distance of 3/16" (5 mm) from the glass edge. Preferably, this hand tool is used in combination with a Cat. No. LCS3084 Rotating Suction Cup Indexing Table.

3/16"
(5 mm)
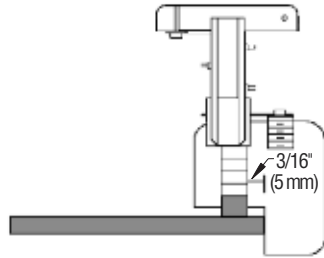
Application Method

1. Insert Super Spacer® in bottom groove of the SSHN Hand Notcher with moisture barrier (shiny foil surface) facing outward from glass sheet.

2. Position Notcher near middle upper-side of glass lite.

3. Peel protective liner strip from bottom side of foam spacer so that the length of foam adhesive is sufficient to reach the corner.

4. Using the Hand Notcher, locate Super Spacer® at least 3/16" (5 mm) from glass edge. Using the overhang, gently press the Hand Notcher into position. Glide the Hand Notcher along the edge of the glass toward the corner.

5. At the first corner, use the spring loaded punch to cut out a semi-circular notch in the foam spacer. Remove the cut out piece and bend spacer around the corner. Care should be taken not to cut the moisture barrier foil on the back face of the foam spacer.

Corner Cut Out

6. Peel more protective liner from underside of Super Spacer® and, using the Hand Notcher, position Super Spacer® along the second glass edge.

7. Repeat steps 4 and 5 until all four sides have been completed.

8. At the junction between the two ends, gently lay the spacer over the first length. Make a clean right-angled cut through the back spacer with a razor blade using the front spacer as a guide. For best results, slightly compress the final spacer length into the beginning length so that the end butt joint will be virtually invisible after repositioning the final spacer length.

End Butt Joint

9. Strip protective liner off top spacer sides and, using locating pegs or fences as necessary, place and match a second glass lite. To wet out adhesive, firmly press both glass sheets by hand on all four edges. The assembled unit is now ready for Hot Melt Butyl Sealant or 877 Sealant application.

NOTE: CRL Super Spacer® contains desiccant and should not be left exposed to the atmosphere for any length of time. Unused material should be repacked in the foil bag then placed in a ziplock bag or other airtight container.
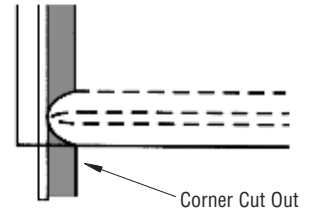
Composite Laminate Spacers

CRL Duralite® takes optimum advantage of laminates and adhesives to reduce thermal conductivity, while improving surface and corner appearance over other insulating glass spacers.
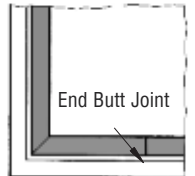
Application Method

Duralite® application may be completed effectively either manually, with a Duralite® Peak Tool, a Duralite® Pro Tool, or by a robotic applicator. Manual application may be more appropriate for very small units, while the Peak Tool, Pro Tool, and robotic application will provide a faster, more consistent, and higher quality application for standard size units.

1. When beginning the application, ensure that the Duralite® is cut squarely.

2. For air filled units start the Duralite® application approximately 1/4" to 5/16" (6 to 8 mm) from the edge of glass, as shown in Figure A. Starting the application too far from the edge can hinder the final corner closure, while starting the application too close to the edge can prevent proper unit venting during compression.

3. Apply the Duralite® parallel to the glass edge and with an inset from the glass edge such that, after pressing, the outer edge of the Duralite® is flush with the edge of the glass. The Duralite® tape should be applied 90 degrees to the glass surface, and checked prior to topping the I.G. unit. This ensures that the stabilizer will properly maintain the unit's air space. **NOTE:** When applying to the glass edge with any of the Peak or Pro Tools, the Duralite® should be lightly held (not stretched), slightly above and outside the edge of the glass. This allows the vertical guide wheels and pressure wheel to consistently perform their functions.

4. To form and apply a corner, back the Tool away from the corner, hold the corner point and rotate the glass to bring the next edge to the front of

Figure A

Figure B

the application table while using your other hand to pull the Duralite® from the reel. First, tack the Duralite® firmly onto the glass, just before the corner. Next, bend the Duralite® back to the corner, as shown in Figure B. Then, fold the Duralite® so it points to the opposite corner, and pinch the backside of the Duralite® to form a sharp corner as shown. Set the Duralite® firmly on the glass to secure the finished corner. Bring the Peak or Pro Tool up to the corner, pivot it around the corner and continue application along the next edge.

5. Continue with tool application around the straight sides and corners until the final corner is reached. At the final corner, ensure that 1/32" to 1/16" (.75 to 2 mm) gap remains to minimize bond-line shearing as the unit's last corner is closed. Trim the Duralite® flush with the glass edge, as shown in Figure C. **NOTE:** When joining two ends together, always make the joint at a corner.

Figure C

6. After applying heat and pressure to bond the glass to the tape, pinch the corner closed to complete the seal.

Super Spacer, and Duralite are registered trademarks of Quanex Building Products Corporation.

Encapsulating Art Glass With Super Spacer®

Making specialty art glass windows energy efficient has become increasingly popular by encapsulating the panels within the air space of an insulating glass unit.

Care should be made to allow adequate clearance between the art glass and the outboard lites so that during periods of contraction and expansion of the air space, contact is not made between these components. It is also important that all grouting materials used in fabricating the art glass be fully cured as to not entrap any solvents within the unit which could possibly fog later.

Insulating glass units of this type start by creating a guide groove in the Super Spacer® with a Cat. No. LCSG1 Groove Tool. Then "tack" on the Super Spacer® to the art glass panel every two or three inches (51 or 76 mm) with an instant adhesive such as our Cat. No. 40140, using the groove as a centering guide. Remove the release liner on one side of the Super Spacer® and lower the panel centered on the first lite of glass. Remove the remaining release liner and index the second lite of glass directly over the first lite. Seal the unit with Hot Melt Butyl or Cat. No. 877 Sealant.

CAT. NO. LCSG1
Groove Tool
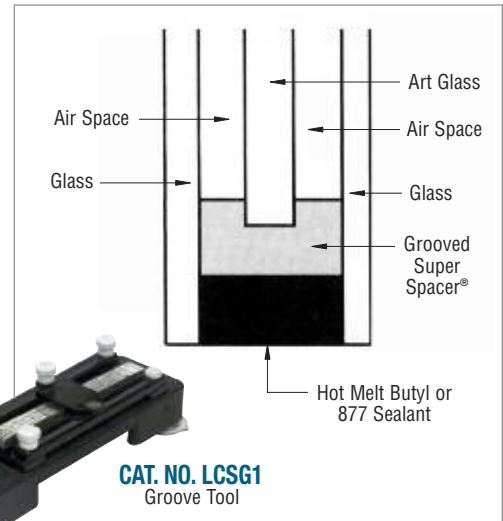
Fabricating Muntin Grids

For colonial style insulating glass units, install muntin grids at this point in the process. Muntin Bars should be cut to length using the inside measurements of the spacer frame.

As with spacer frame fabrication, Muntin Bars should be cut with a fine 100 to 150 tooth saw blade without oil or coolant. It is also recommended that CRL Cat. No. NG171 Lint-Free Gloves be worn while handling Muntin Bar lengths.

Measure and mark the cross points of muntins. Notch each of the muntins with the CRL MMBN1 Manual Muntin Notcher or CRL APMN1 Air Powered Muntin Notcher with appropriate die and punch.

After press fitting the Muntin Bar grid together, insert the appropriate Muntin Bar Clips. Larger Muntin Bar grids may require the use of internal muntin joiners. Drill or punch the spacer frames at the connecting points of spacer and Muntin Bar Clips. Use an electric hand drill, drill press or the CRL MBKP1 Muntin Bar Keeper Punch.

Finished Muntin Bar grids then are assembled into the spacer frame. Clean Muntin Bars before sealing unit with CRL 1973 Glass Cleaner. Do not use MEK, alcohol, or similar chemicals. Apply primary and/or secondary insulating glass sealant in the usual manner. For rounded or insulating glass units installed in an archway, the CRL Cat. No. MMBD1 Muntin Bender will bend your Muntin Bars to the exact radius needed to fit each window. Our Cat. No. AM601 Sunburst Muntin Joiners for 3/16" x 5/8" (4.8 x 15.9 mm) Muntins will assist in the fabrication.

NOTE: In situations where fabrication requires extended exposure of inside surfaces, use a hair dryer or hot air gun to blow dust particles or other contaminants from the exposed surfaces.
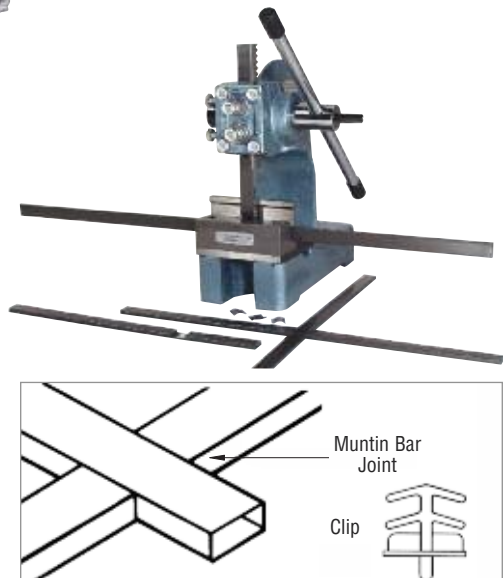
Breather Tubes
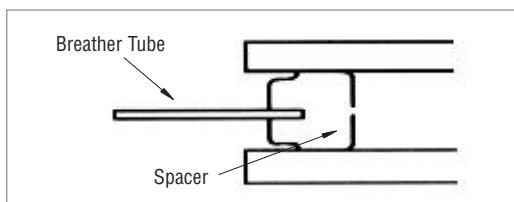
If unit is to be shipped from low elevations to elevations of 5,000 feet or higher (or vice versa), CRL Cat. Nos. 3003 or CT12C Breather Tubes should be installed into the spacer frame at this point of production (see page I151).

Make a tiny hole in the spacer frame using an awl, center punch, nail or drill. Insert Breather Tube in the hole, and apply sealant around the base of the tube.

Primary Seal Application
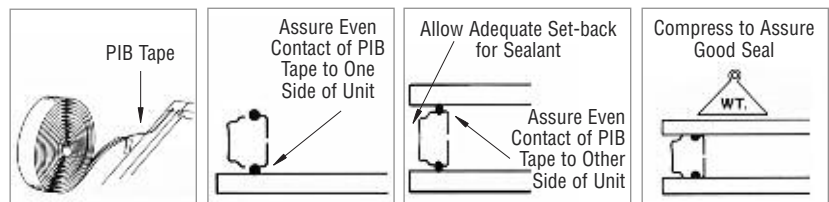
If fabricating a dual-seal unit, apply CRL Cat. No. 2132559 Polyisobutylene (PIB) Primary Seal to the spacer.

PIB Tape comes in strips on waxed paper rolls. Pull the release paper from below the PIB strip, and place the PIB strip on one side of the assembled spacer frame. Double-seal spacers have a formed groove to accept the PIB strip. Press PIB strip into the corners to prevent moisture infiltration. Use only one PIB strip at a time.

Set the second lite of clean glass on the spacer, being sure the corners are squared and even. Use weights over the spacer to compress the PIB strip and assure a good seal.

Super Spacer is a registered trademark of Quanex Building Products Corporation.

Sealant Application for Single Sealed Units

Two-Part Polysulfide, Two-Part Urethane 877 Silicone Foam, and Metal Spacer I.G. Sealant

Using a spatula or low-speed mechanical mixer, thoroughly mix base compound and accelerator to the ratio set by the sealant manufacturer's specifications for two-part materials. Use only the amount of base and accelerator needed for the number of units to be assembled. Material can be mixed on a weight basis using a scale. Once material is mixed, it normally has a one hour application life at 70°F (21°C).

CRL 877 Sealant requires no mixing and is ready to dispense directly from the cartridge.

Glass units should be clamped on all sides to assure a tight seal using CRL Cat. No. JC3202HT Spring Clamps with vinyl-coated jaws.

If sealing multiple units, they may be stacked by using wood blocks as separators, starting with the largest unit on the bottom. The separators should be placed approximately 1" (25 mm) from the edge and 4" (102 mm) from the ends.
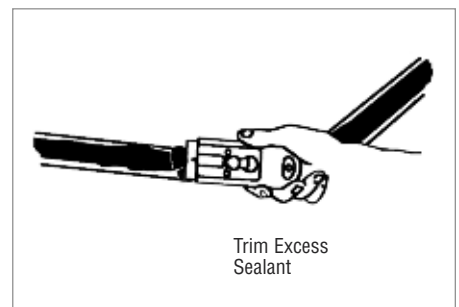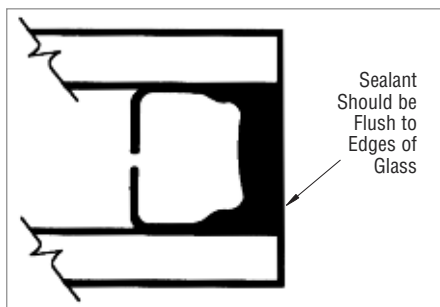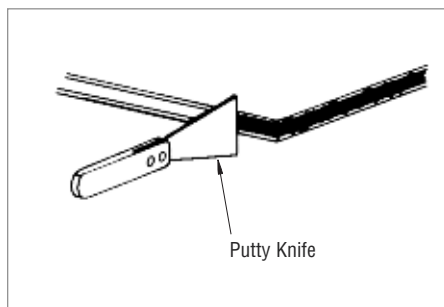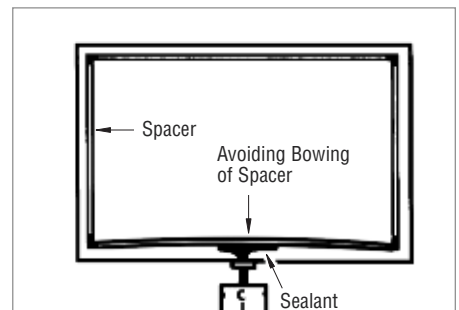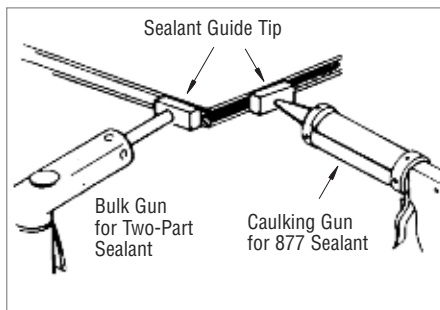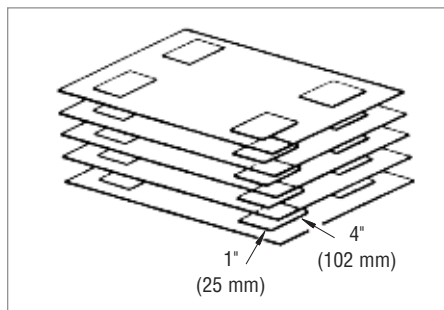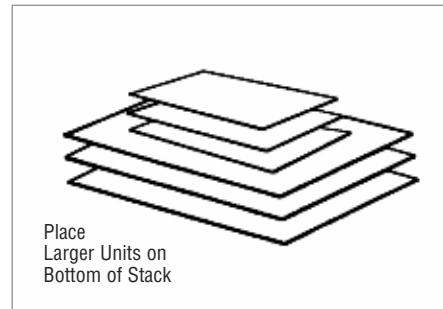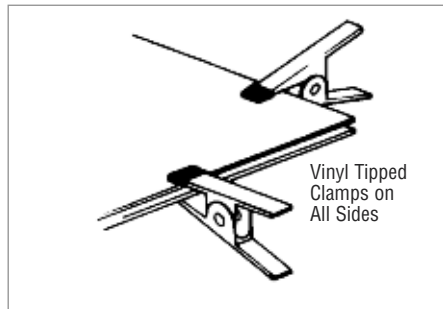
On smaller double-hung window sizes, where all the units are the same size, one large piece of paper should be placed between each unit. With large units, stacks of 15 would be the maximum.

If using a bulk gun, load the sealant into the gun and apply to the edges of the unit. Make sure enough sealant is applied to penetrate into the shoulders of the spacer and assure a proper seal. Make sure you do not use so much sealant that it moves the spacer. However, as much

sealant as possible should be applied to the corners, the most vulnerable area of the unit.

If applying two-part sealants by hand, use a putty knife to apply the sealant to the edges, using the same precautions. CRL 877 Sealant is applied using a caulking gun and a sealant guide tip. Remove excess sealant using a razor blade after it has cured. Be sure sealant has completely filled, sealant back-set, and is flush to glass edges.

Check the bottom units of the stack for rainbow effect in center of the unit. This is called a "Newton Ring" and is caused by the two pieces of glass being in contact. Affected units should be flipped upright and repaired before transport to avoid permanent rub marks.

Vinyl Tipped Clamps on All Sides

Place Larger Units on Bottom of Stack

1" (25 mm)   4" (102 mm)

Sealant Guide Tip

Bulk Gun for Two-Part Sealant

Caulking Gun for 877 Sealant

Spacer

Avoiding Bowing of Spacer

Sealant

Putty Knife

Sealant Should be Flush to Edges of Glass

Trim Excess Sealant

Hot Melt Butyl Method

Whether using bulk sealant or a butyl rope extruder gun, allow sufficient time for the gun and sealant to heat to the manufacturer's recommendations.

Glass units should be clamped on all sides to assure a tight seal using CRL Cat. No. JC3202HT Spring Clamps with vinyl-coated jaws.

Multiple units may be stacked, separating the units with wood blocks or paper. Use wood blocks when the units are different sizes. Start with the largest unit on the bottom and place blocks approximately 1" (25 mm) from the edge and 4" (102 mm) from the ends. With larger units, stack no more than 15 units maximum.

If using a bulk hot extruder gun, load the sealant into the gun and apply to the edges of the unit. Make sure enough sealant is applied to penetrate into the shoulders of the spacer and assure a proper seal, but not so much that the sealant moves the spacer. However, as much sealant as possible should be applied to the corners, as this is the most vulnerable area of the unit. Remove excess sealant using CRL Cat. No. 1BK990 Hot Trim Knife. Be sure sealant has completely filled, sealant back-set and is flush to glass edges.

Check the bottom units of the stack for rainbow effect in center of the unit. This is called a "Newton Ring" and is caused by the two pieces of glass being in contact. Affected units should be flipped upright and repaired before transport to avoid permanent rub marks.
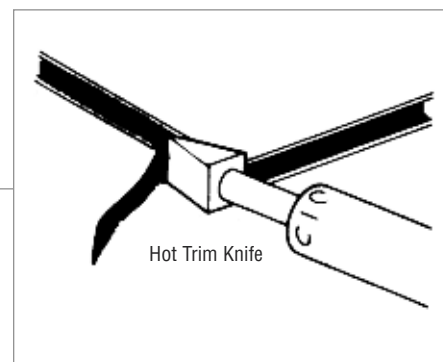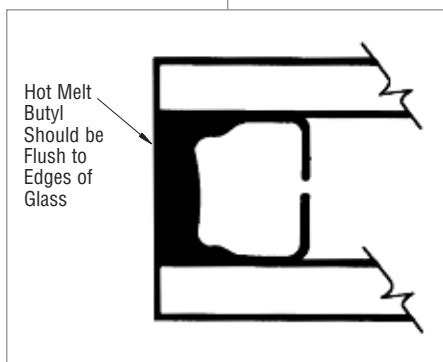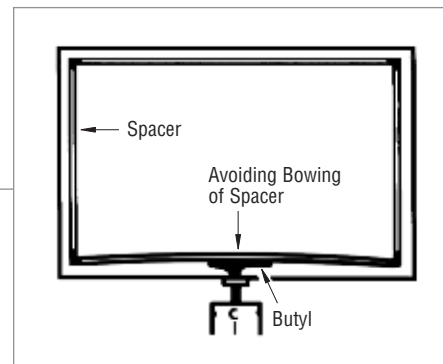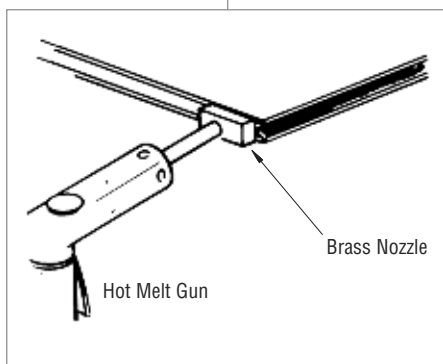
Vinyl Tipped Clamps on All Sides

Place Larger Units on Bottom of Stack

4" (102 mm)

1" (25 mm)

Brass Nozzle

Hot Melt Gun

Spacer

Avoiding Bowing of Spacer

Butyl

Hot Melt Butyl Should be Flush to Edges of Glass

Hot Trim Knife

Sealant Application for Dual Seal Units
Polyisobutylene Primary Seal, Two-Part Polysulfide, and Urethane Secondary Seal Method

If fabricating a dual seal unit, PIB Tape should be applied to one side of the assembled spacer frame as described on page I108.

Set the spacer on the first lite of clean glass. Maintain minimum 3/16" (5 mm) between spacer and edge of glass.

Apply PIB Tape to the facing side of the spacer. Be sure to maintain an even sight line.

Set the second lite of clean glass on the spacer, being sure the corners are square and even. Use weights over the spacer to compress the PIB Tape to assure a good seal.

Thoroughly mix base compound and accelerator to the ratio set by the sealant manufacturer's specifications, using a spatula or low-speed mechanical mixer. Use only the amount of base and accelerator needed for the

number of units to be assembled. Material can be mixed on a weight basis using a scale. Once material is mixed, it normally has a one hour application life at 70°F (21°C).

Glass units should be clamped on all sides to assure a tight seal, using CRL Cat. No. JC3202HT Spring Clamps with vinyl-coated jaws.

Multiple units may be stacked, separating the units with wood blocks or paper. Use wood blocks when the units are different sizes. Start with the largest unit on the bottom and place blocks approximately 1" (25 mm) from the edge and 4" (102 mm) from the ends. Use paper when all the units are the same size, placing one large piece in the center of each unit. With larger units, stack no more than 15 units maximum.

If using a bulk gun, load the sealant into the gun and apply to the edges of the unit. Make sure enough sealant is applied to penetrate into the shoulders of the spacer and assure a proper seal. Make sure you do not use so much sealant that it moves the spacer. However, as much sealant as possible should be applied to the corners, as this is the most vulnerable area of the unit. Remove excess sealant using a razor blade after it has cured. Care should be taken not to cut into edge seal when separating stacked units with a razor blade.

Check the bottom units of the stack for rainbow effect in center of the unit. This is called a "Newton Ring" and is caused by the two pieces of glass being in contact. Affected units should be flipped upright and repaired before transport to avoid permanent rub marks.

PIB Tape

Assure Even Contact of PIB Tape to One Side of Unit

Compress to Assure Good Seal

WT.

Vinyl Tipped Clamps on All Sides

Place Larger Units on Bottom of Stack

1" (25 mm)

4" (102 mm)

Sealant Guide Tip

Bulk Gun for Sealant

Spacer

Avoiding Bowing of Spacer

Two-Part Sealant

Polyisobutylene Primary Seal

Two-Part Secondary Seal Should be Flush to Edges of Glass
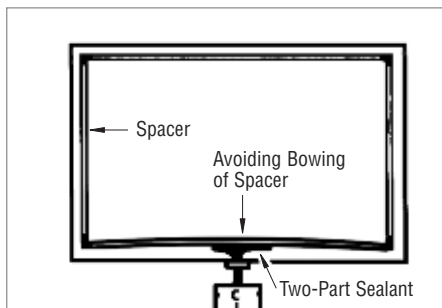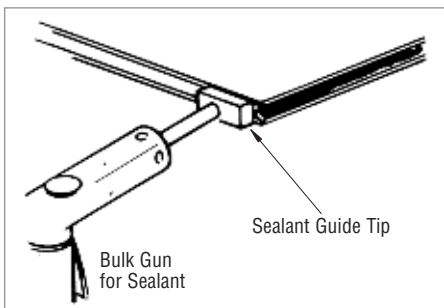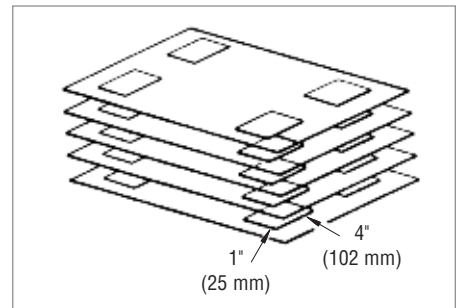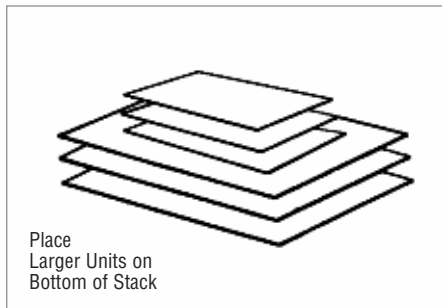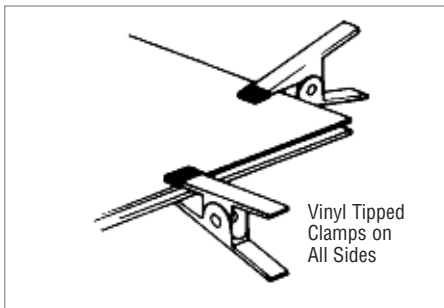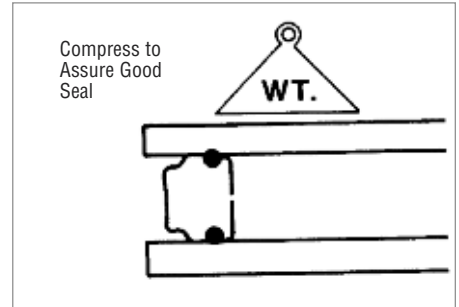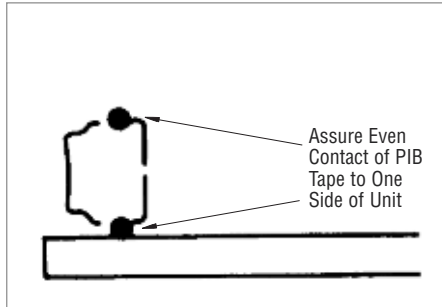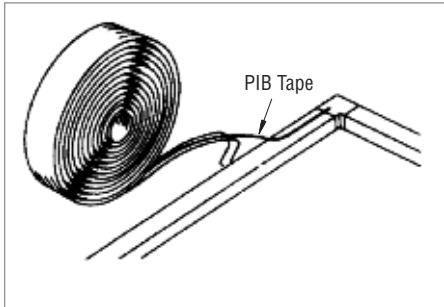
Polyisobutylene Primary Seal and Hot Melt Butyl Secondary Seal Method

If fabricating a dual sealed unit, PIB Tape should be applied to one side of the assembled spacer frame as described on page I108.
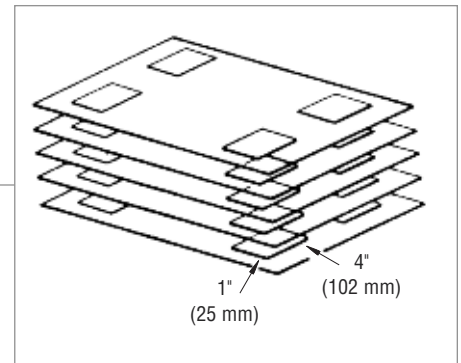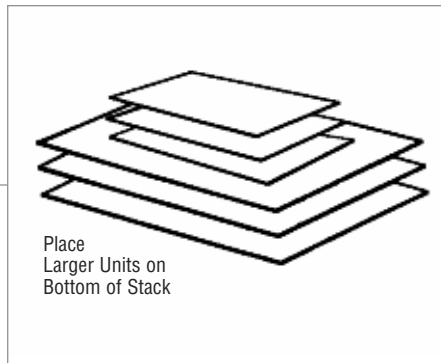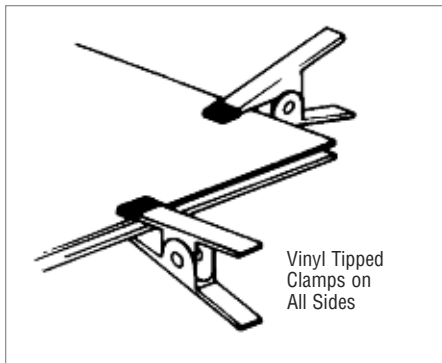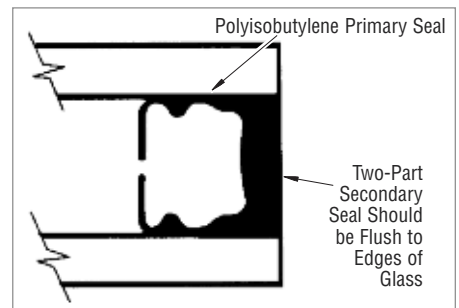
Whether using bulk sealant or a butyl rope extruder gun, allow sufficient time for the gun and sealant to heat to the manufacturer's recommendations.

Glass units should be clamped on all sides to assure a tight seal, using CRL Cat. No. JC3202HT Spring Clamps with vinyl-coated jaws.

Multiple units may be stacked, separating the units with wood blocks or paper. Use wood blocks when the units are different sizes. Start with the largest unit on the bottom and place blocks approximately 1" (25 mm) from the edge and 4" (102 mm) from the ends. Use paper when all the units are the same size, placing one large piece in the center of each unit. With larger units, stack no more than 15 units maximum.

Using a hot extruder gun, apply Hot Melt Butyl Sealant to the edges of the unit. Apply enough sealant into the shoulders of the spacer to assure a proper seal, but not so much that the sealant moves the spacer. However, as much sealant as possible should be applied to the corners, as this is the most vulnerable areas of the unit. Remove excess sealant using CRL Cat. No. 1BK990 Hot Trim Knife. Be sure sealant has completely filled the backset and is flush to glass edges.

Check the bottom units of the stack for rainbow effect in center of the unit. This is called a "Newton Ring" and is caused by the two pieces of glass being in contact. Affected units should be flipped upright and repaired before transport to avoid permanent rub marks.

PIB Tape

Assure Even Contact of PIB Tape to One Side of Unit

Compress to Assure Good Seal

WT.

Vinyl Tipped Clamps on All Sides

Place Larger Units on Bottom of Stack

1" (25 mm)

4" (102 mm)

Sealant Guide Tip

Hot Melt Gun

Spacer

Avoiding Bowing of Spacer

Butyl

Polyisobutylene Primary Seal

Two-Part Secondary Seal Should be Flush to Edges of Glass

Hot Trim Knife

Newton Ring
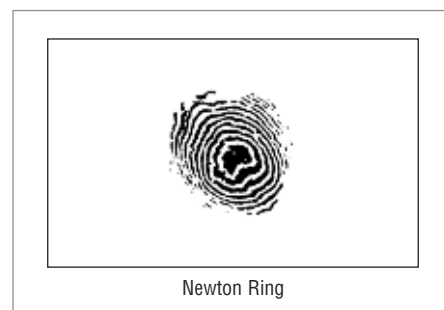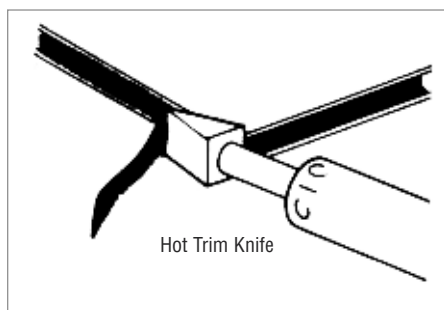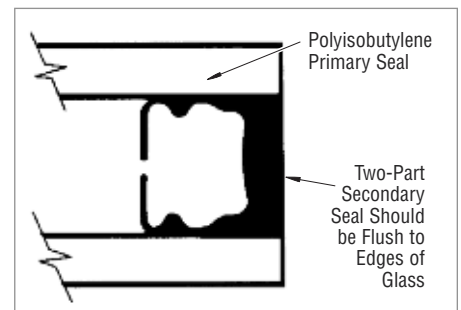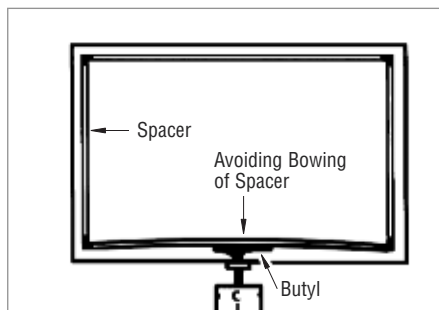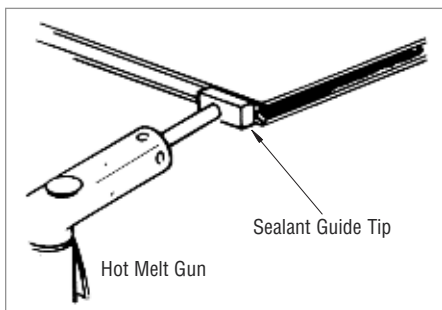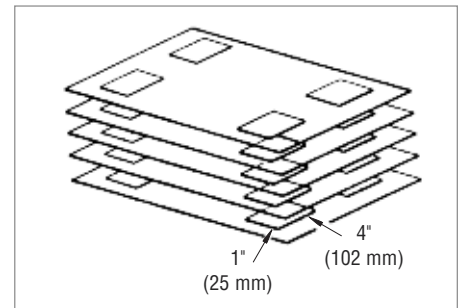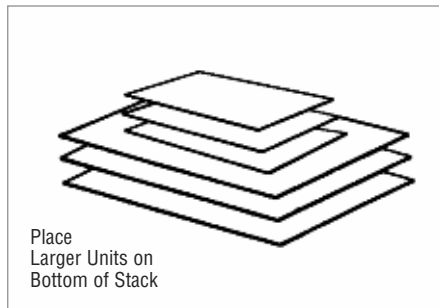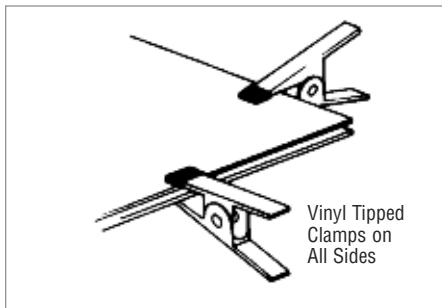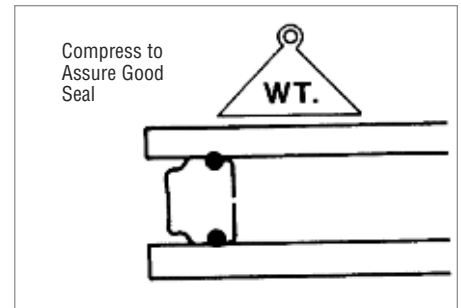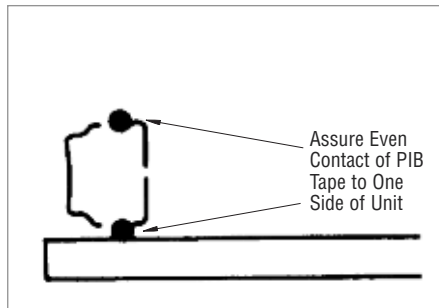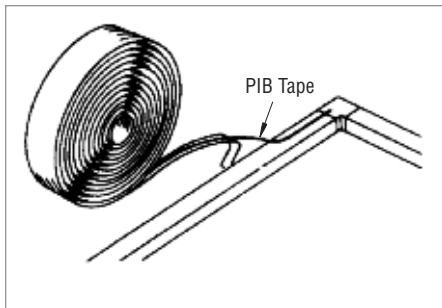
Polyisobutylene Primary Seal and One-Part Silicone Secondary Seal Method

If fabricating a dual sealed unit, PIB Tape should be applied to one side of the assembled spacer frame as described on page I108.

Silicone Insulating Glass Sealant Cat. No. 9542 is available in 1/12 of a gallon cartridges and can be applied with a standard caulking gun. Silicone for insulating glass can only be used in a dual seal system.

Glass units should be clamped on all sides to assure a tight seal, using CRL Cat. No. JC3202HT Spring Clamps with vinyl coated jaws.

Multiple units may be stacked, separating the units with wood blocks or paper. Use wood blocks when the units are different sizes. Start with the largest unit on the bottom and place blocks approximately 1" (25 mm) from the edge and 4" (102 mm) from the ends. Use paper when all the units are the same size, placing one large piece in the center of each unit. With larger units, stack no more than 15 units maximum.

Use a caulking gun to apply Silicone to the edges, making sure enough sealant is applied to penetrate into the shoulders of the spacer and assure a proper seal. Make sure you do not use so much sealant that it moves the spacer. However, as much sealant as possible should be applied to the corners, as this is the most vulnerable area of the unit. After it has cured, remove excess Silicone sealant using a razor blade.

Check the bottom units of the stack for rainbow effect in center of the unit. This is called a "Newton Ring" and is caused by the two pieces of glass being in contact. Affected units should be flipped upright and repaired before transport to avoid permanent rub marks.

PIB Tape

Assure Even Contact of PIB Tape to One Side of Unit

Compress to Assure Good Seal

WT.

Vinyl Tipped Clamps on All Sides

Place Larger Units on Bottom of Stack

4" (102 mm)

1" (25 mm)

Sealant Guide Tip

Caulking Gun

Spacer

Avoiding Bowing of Spacer

Silicone Sealant

Polyisobutylene Primary Seal

One-Part Silicone Secondary Seal Should be Flush to Edges of Glass

Trim Excess Sealant

Newton Ring
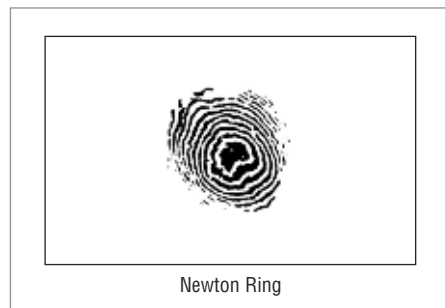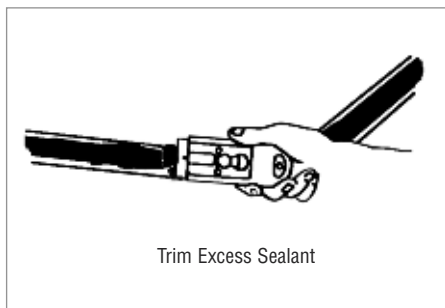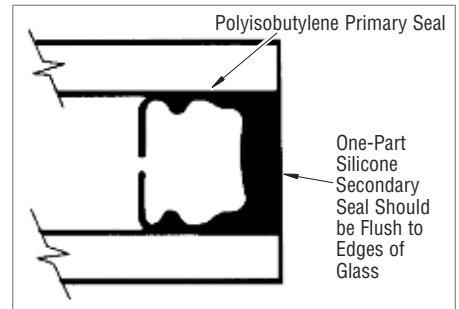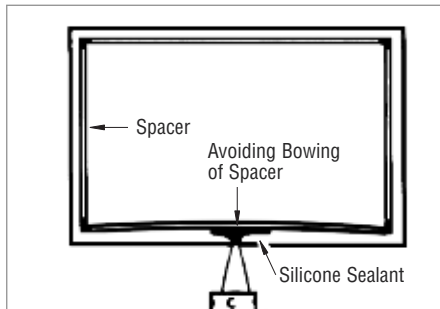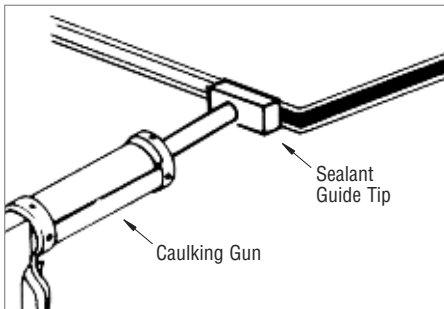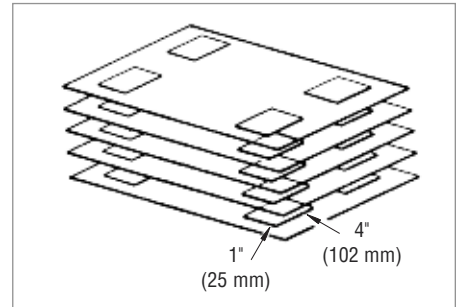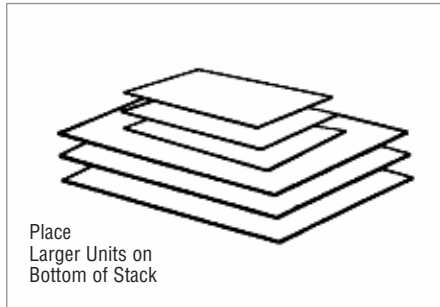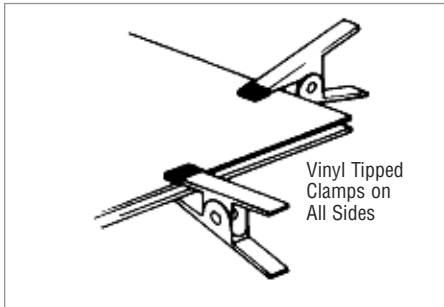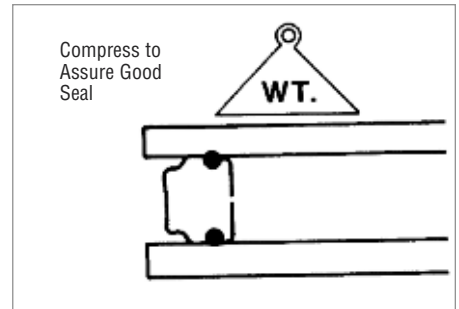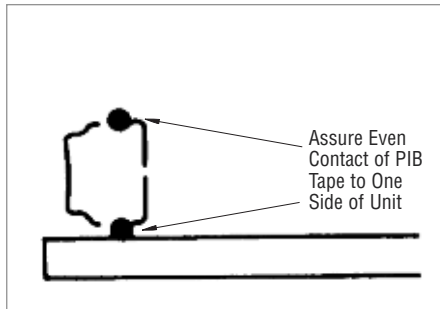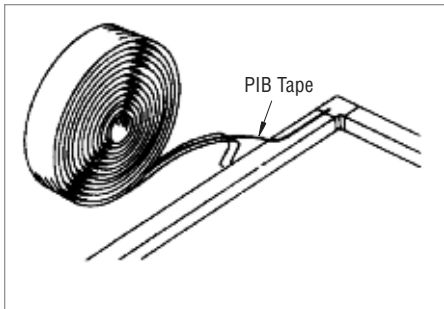
Argon Gas Filling and Low-e Glass

Filing the dead air space between glass lites with argon gas increases the efficiency of insulating glass units by approximately 15%.

Units are sealed in the usual manner, then stood up vertically. Two holes are bored (top and bottom) on the side of the unit. Argon is pumped into the lower hole and when a sniffer device detects the gas escaping from the upper hole, the gas is shut off and the unit resealed.

Using Low-e (low emissivity) coated glass alone also increases the efficiency of the unit, and when combined with argon gas filling, can improve insulating glass unit performance up to 44%.

Triple-Glazed Units

The fabrication process is basically the same as fabricating a dual-glazed unit, with a few additional steps: Assembly of the glass cutting process is critical, no edge imperfections are allowed, and edges should be swiped.

Separating Two-Component Sealed Cured Units

Everyone making insulating glass units is familiar with glass breakage, which is caused by many factors. The particular area we are addressing is the cracking and chipping that can occur when two-component sealed units are cut apart after being sealed in stacks.

In many operations, utility knives are used with blades that have a thickness of approximately .020 inch. This does not seem like much, unless you have watched the unit raise when the blade protrudes too far between the lites. Cracking can occur if the knife is twisted slightly.

One way to reduce this problem is to use our standard 51S Single Edge Razor Blade, which has a thickness of only .005 inch. Be sure to safely hold single edge razor blades in a safety razor blade holder, allowing no more than 1/8" (3 mm) penetration between units.

Storing Finished Units

Completed units should always be stored on a base with a 90 degree angle so that the weight of the two lites of glass is distributed evenly. This protects against failure by "shearing", or having one piece of glass slip downward from the other due to the pull of gravity. A modified "A" or "L" frame is ideal for storage. Felt or cork pads should be used between units to protect against surface scratches.

Must be 90°

Shearing Can Be Caused By Uneven Support of Both Lites
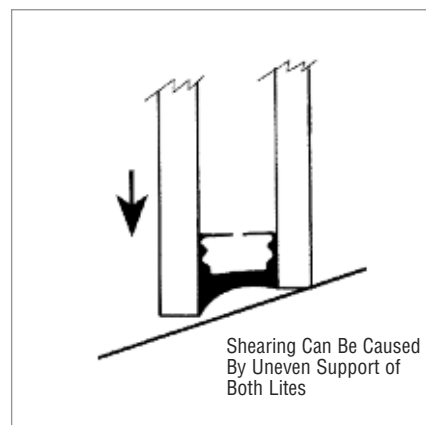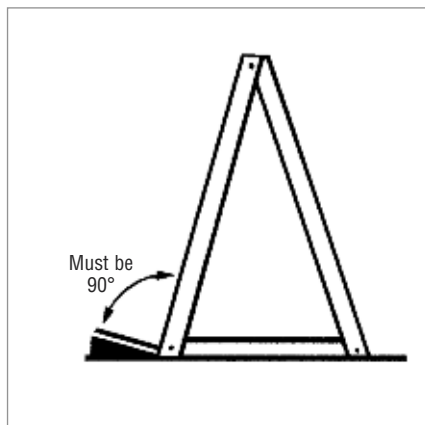
Quality Control and Safety

Certain steps should be taken to assure that you consistently and safely produce quality units, including:

- Keep All Doors and Windows in the Fabricating Area Closed

- Keep the Fabricating Area and Equipment Free From Dust and Dust-Gathering Equipment

- Keep Temperature in Curing Room Above 72°F (22°C)

- Check Aluminum Spacers for Damage and Deformities, and See That They are Clean and Oil-Free

- Check Tolerances Between Spacers and Glass Edges

- Check the Adsorbent for Moisture Contamination and Store Adsorbent in Sealed Containers

- Check Glass for Oily Film or Water Spots

- Be Familiar With Sealant Application Methods

- Check Sealants for Shelf Life

- Check Cured Material on Completed Units for Air Bubbles

- Prepare Training and Safety Procedures for All Persons Working in the Fabrication Area

- Work Only With Clean Hands, Lint-Free Gloves, and Safety Glasses

- Use Appropriate Handling Tools and Gloves When Moving and Cutting Glass for Fabrication

- Assure Vertical Storage Racks Have a 90 Degree Angle at the Base to Prevent Shearing of Units

Work Areas and Equipment for Higher Production

Sealing and Spacer Assembly Room

Insulating glass units should be fabricated in as clean and dry an area as possible. Try to maintain a relative humidity of approximately 40%. An enclosed room is ideal, as the humidity can be controlled.

For example, the highly humid air from the glass washing machine can be partitioned off, with only the machine's takeoff rolls protruding into the sealing area and spacer assembly room. Also, the room shields the washer and glass from factory dust. Controlled temperatures during the hot summer months will give you a greater working time if you are using two-part sealants, thus saving on materials. The room should also be pressurized with filtered air to help keep dust and other contaminants from entering.

Use this room for all spacer assembly and storage of any opened adsorbent containers. Cover adsorbent when not in use. The least amount of exposure to air by the adsorbent is desirable. Another benefit of having this area closed off is to reduce visits by curious non-involved workers.

The room's dimensions and general layout should receive serious consideration. C.R. Laurence engineers are available to assist in making these decisions and are prepared to make recommendations for every phase of the proposed operation, including the training of your production staff. Drawings of various layouts are available at no charge by contacting our Door and Window Department at (800) 421-6144 in the U.S., (877) 421-6144 in Canada, or (323) 588-1281 International. Ask for Ext. 7520.

Carts for Stacked Units

Carts should be capable of holding units weighing up to 2,000 pounds (907 kg) without bowing. Large wheels should be used to reduce the vibrations from cracks or other floor imperfections. Floors should be level and all cracks or spoiled areas patched with epoxy/sand compounds or other mixes that can withstand high weights. A coat of porch and deck enamel will help keep the concrete floor from dusting.

Guidelines

The most effective means of extending the performance life of your insulating glass units is to use good glazing practices and compatible quality materials. Poor glazing techniques and the use of incompatible glazing and/or back bedding materials are prime reasons for unit failure.

The main causes of these failures are edges of units standing in water, thermal breakage caused by expansion resulting from absorption of solar energy, and insufficient clearances in the glazing system.

The primary function of the glazing materials is to achieve and maintain a flexible, watertight seal that allows sufficient clearances during periods of expansion and contraction.

The purpose of glazing and bedding insulating glass units is to:

(1) Prevent moisture penetration to the inside of the unit.

(2) Prevent moisture from collecting in the sash (Fig. 1).

(3) Prevent loss of heat or air conditioned
    air through the sash and insulating unit.

(4) Cushion the unit in the sash to ensure units are
    not fitted with direct glass to metal contact (Fig. 2).

Additional Guidelines

Here are a few general points that have not been covered previously, yet are also important to ensure the longevity of an insulating glass unit.

1. Immediately after setting the unit, remove any paper labels that may be on the unit. Failure to do so could result in the staining of the glass and/or thermal breakage. Application of stickers or decals also may cause breakage.

2. Always glaze the tinted or reflective glass to the exterior of the building. See manufacturer's instructions.

3. Be sure that the glass framing members are plumb and square.

4. Do no lean the insulating glass unit at an angle other than 90 degrees from its base support. Otherwise shearing of the two unit lites may occur.

5. Do not allow units to be installed directly over heat outlets behind shades, blinds or closed draperies. Entrapped warm air may result in thermal breakage. (Fig. 3)

Remember: The life and performance of an insulating glass unit is dependent upon the use of good glazing compatibility of the glazing materials you choose.

Starting on the next page are brief descriptions of the glazing techniques used in the installation of insulating glass.

1

Moisture

2

Do Not Glaze
Metal to Glass

3
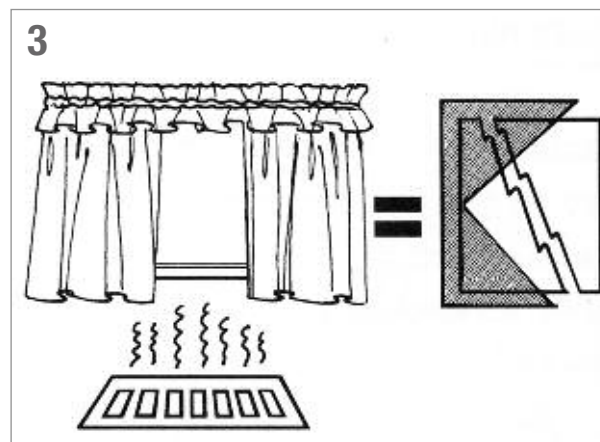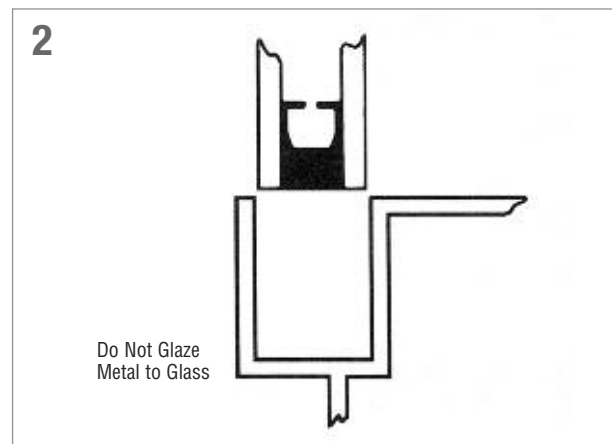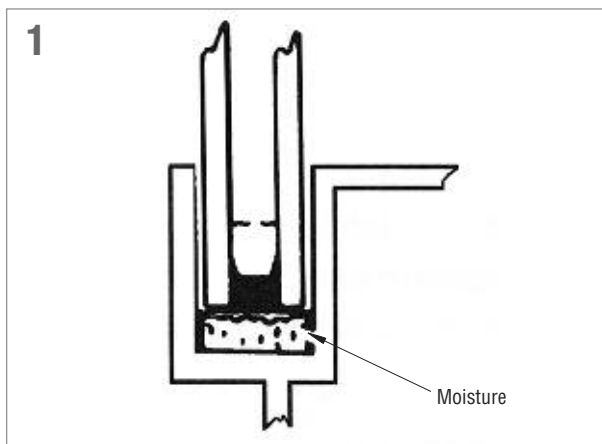
Tape Glazing Method

This method is used primarily for high-rise construction. Glazing tapes come either pre-shimmed or shimless. Select a tape that is uniform and has good adhesion.

Apply glazing tape to the stationary leg of the sash. Apply a continuous heel bead of compatible bedding compound to the removable stop area. Set the insulating unit on neoprene setting blocks that are placed at the quarter points, with weep holes in the sash going to the exterior of the building. Apply the removable stop to the sash section. Use of spacer shims in the tape is recommended when the unit exceeds 100 united inches (2.5 m).
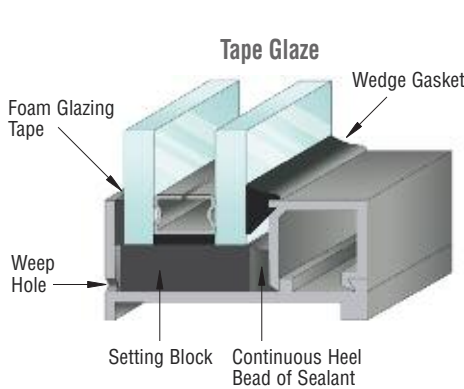
Tape and Wet Seal Method

This method is used for high and low-rise construction, and is considered to be one of the best methods for glazing insulating glass units. The tape and wet seal method is similar to the tape glazing method.

Apply glazing tape to the stationary leg of the sash. Apply a continuous heel bead of compatible bedding compound to the removable stop area. Set the insulating unit on neoprene setting blocks that are placed at the quarter points, with weep holes in the sash going to the exterior of the building. Apply the removable stop to the sash section. When stops are in place, apply a wet seal to the sash and bevel it away from the glass to assure proper drainage or runoff. Weep holes to the exterior are essential.
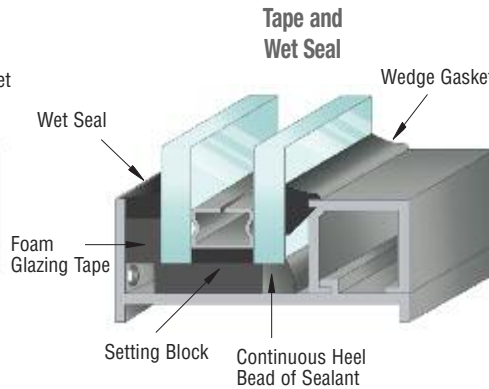
Elastomeric Wet Glaze Method

This method is most commonly used in low-rise or storefront applications.

Place spacer shims on the face of the stationary leg of the sash at intervals not exceeding 18" (457 mm) on center. Set the insulating unit on neoprene setting blocks placed at the quarter points. Apply spacer shims to the face of the insulating glass unit at intervals not exceeding 18" (457 mm) on center; then apply glazing stops, using a heel bead to assure a good seal. Apply a bead of neutral cure silicone between the exterior leg of the sash and glass. Tool the bead to form a watershed. Be sure to incorporate weep holes to the exterior of the sash.

Tape Glaze

Foam Glazing Tape — Wedge Gasket — Weep Hole — Setting Block — Continuous Heel Bead of Sealant

Tape and Wet Seal

Wet Seal — Wedge Gasket — Foam Glazing Tape — Setting Block — Continuous Heel Bead of Sealant

Wet Glaze

Wet Seal — Wedge Gasket — Shim — Setting Block — Continuous Heel Bead of Sealant
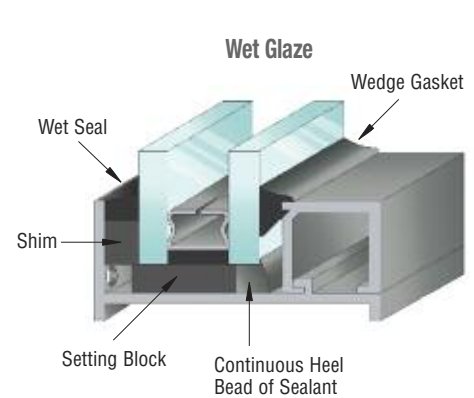
Glazing Compounds

During the past several years we have tested various back-bedding and bedding compounds that are 100% compatible with organically sealed units. We also tested many compounds that were not compatible.

The recommendation that you use a neutral cure silicone or acrylic latex compound is not a guarantee of safety. Each sealant should be tested and certified individually. Compatible sealants for insulating glass glazing from C.R. Laurence are Cat. No's: 95C and RTV408 Neutral Cure Silicones, as well as 321 and 800 Siliconized Acrylic Latex Caulks.

We cannot stress enough how important it is that insulating glass units be set and glazed with proper compounds and methods to eliminate many problems that have troubled the industry in the past. Manufacturers of non-captive units should send the glazing spec, with a copy of the sealant compatibility list, to their customers to help end the problem of failures attributed to improper setting and glazing.

Wrap-Around Vinyl Glazing Method

This method is used primarily for aluminum sliding windows and patio doors. Two vinyl gasket options are available: a gasket that has corners that may be clipped at the 90 degree bend, or a gasket with a perforated face. These perforations are necessary to ensure proper drainage to the sash. It is essential that the vinyl be applied uniformly to achieve and maintain a watertight seal. Setting blocks are not necessary in this method, but do not forget the weep holes to the exterior in the sill of the sash.

Structural Glazing Gasket Method

This method is extremely popular for commercial glazing. The gaskets are manufactured to precise sizes and come equipped with weep holes. The width dimension of the gasket is critical. The insulating glass unit must be set on neoprene setting blocks at the quarter points. Apply a secondary wet seal to the inside lip of the exterior side of the gasket, and an optional secondary seal to the inside lip of the interior side of the gasket.

Special precautions must be taken when using metal band units. These units may require a special gasket. Use care that the metal band at the edges of the unit does not bind the gasket.

Setting blocks must be made of lead or neoprene with a shore "A" hardness of 70 to 90 durometer. Always use at least two setting blocks placed at the quarter points of the unit. The setting blocks must be wider than the thickness of the unit, and the length of the setting blocks must be sufficient to support the weight of the unit.

The face clearance on units of up to 12 ft^2 (1.1 m^2) should be 1/16" (1.6 mm) minimum, and on units from 12 to 70 ft^2 (1.1 to 6.5 m^2) the minimum face clearance should be 1/8" (3.2 mm). We also recommend using 1/8" (3.2 mm) minimum face clearance when working with gun grade glazing materials and for all commercial and high-rise applications. The aforementioned face and edge clearances do not necessarily pertain to "squeeze glazing" applications.

Adapter Glazing

This is a popular method for the conversion of single glazed wrap-around vinyl aluminum sliding windows to dual glazed insulating glass units. The extruded aluminum adapter channel is designed to be glazed into the 1/8" (3.2 mm) and 3/16" (4.8 mm) glazing channels of the original frame. For residential windows, glaze a 1/2" (12 mm) insulating unit that is 1/8" (3.2 mm) smaller than the exposed glass area (inside sight line) in to the Adapter Channel, using a 1/2" (12 mm) glazing vinyl. Patio door and large picture windows can be adapter glazed using wider channels and glazing vinyl shown on pages I162-I165. Apply a bead of Neutral Cure Silicone sealant to mitered corners of the adapter frame to complete the assembly.

Insulating Glass Unit

Adapter Channel

Original Single Glazed Channel
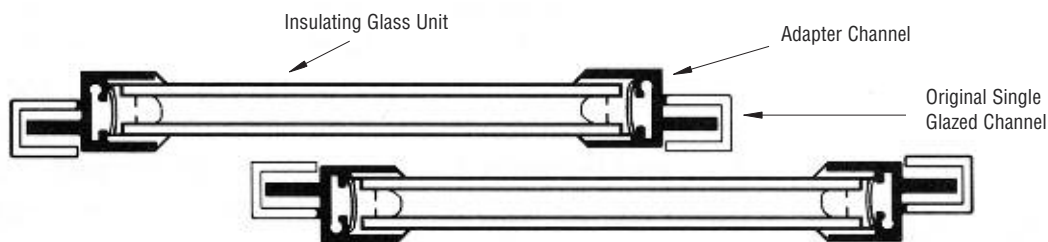
Adapter Glazing of Insulating Glass Units into Bypassing Doors or Windows

Accelerator

A chemical that is added to a polymer to affect a cure.

Adhesion

The clinging or sticking together of two surfaces. The state in which two surfaces are held together by force at the interface.

Adhesion Buildup

Occurs during the first five to seven days after fabrication of two-part and silicone sealant units. Although the sealant will appear to be cured in three hours or so, maximum adhesion is not obtained at this point. After initial cure, however, adhesion is sufficient to move the unit to fabricate or crate and ship. If complete testing is to be done, seven days are necessary to have the sealant work and obtain maximum adhesion values. Also, freshly mixed sealant 'wets' the surface better than material that has passed its application life and will provide better adhesion. For maximum results, the properly mixed sealant must be applied to clean, dry glass and oil-free spacers.

Adhesive

A substance capable of holding materials together by surface attachment.

Adhesive Failure

The type of failure characterized by the adhesive or sealant pulling loose from the substrate.

Adsorbent

A material having the capacity or tendency to adsorb. Also referred to as desiccant.

Adsorption

Adherence of atoms or molecules of gas or liquid to the surface of another substance called the adsorbent.

Back Fill

Putting material into the opening between glass and glazing stops.

Bead

A continuous strip of caulking or glazing material.

Bedding

Setting a glass or insulating glass panel into a sealing compound.

Blend

A physical mixture of Silica Gel and 4-A Molecular Sieve. For purposes of this manual, all blends are assumed to be a 50-50 mixture (by weight) of the two components.

Bond

The attachment at an interface between two substrates.

Breather Tube

A small diameter .030" (.76 mm) I.D. tube placed into the spacer through the perimeter wall for the purpose of equalizing the air pressure within the unit when shipping over different elevations (over 5,000 feet).
NOTE: Breather tubes should be crimped and sealed at final destination.

British Thermal Unit (BTU)

A unit of heat energy; the amount of heat needed to raise the temperature of one pound of water one degree Fahrenheit.

Buttering

Application of a putty of sealant compound to the flat surface of some member before placing the member in position, such as the buttering of a removable stop before fastening the stop in place.

Butt Joint

A joint having the edge or face of one member spaced from and sealed to the edge or face of another without overlap.

Butyl Rubber

A copolymer of Butylene (98%) and Isoprene (2%). As a sealant, it has a low recovery and slow cure, but good elongation.
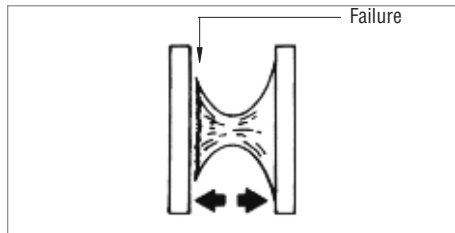
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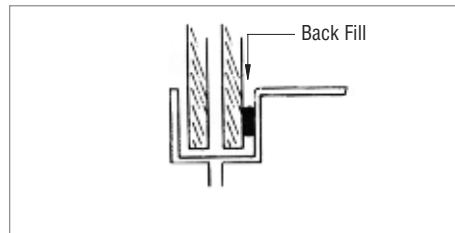
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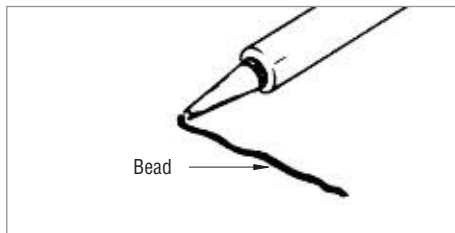
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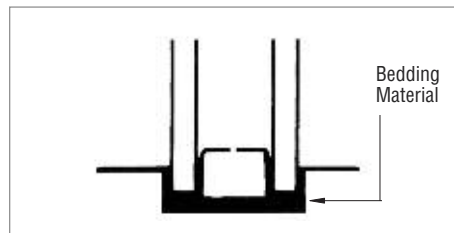
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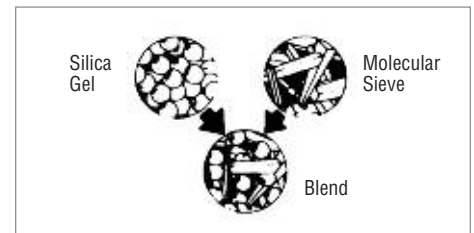
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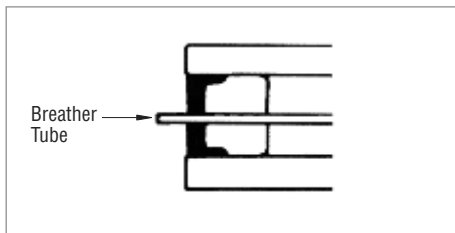
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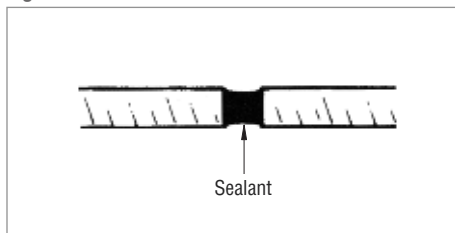
Butt Joint

Capillary Attraction
The force of adhesion between a solid and a liquid by capillary attraction.

Capillary Tube
A very small diameter .021" (.533 mm) I.D. tube placed into the spacer through the perimeter wall for the purpose of equalizing the air pressure within the unit when shipping over different elevations (over 5,000 feet). **NOTE:** Crimping and sealing of capillary tubes at final destination is optional but not required.

Catalyst
Activator used to cure or set up a two-part material.

Caulk
Material to fill voids around panels, windows, doors, and so forth.

Caulking Compound
A sealant with a relatively low (less than 10%) movement capability.

Channel
A U-shaped opening in a sash or frame to receive glass or insulating glass unit.

Channel Glazing
The sealing of the joints around lites or panels set in the channel using removable stops.

Chemical Cure
Curing by chemical reaction - usually involves the cross-linking of a polymer.

Coefficient of Expansion
The amount a given material increases or decreases in size with temperature changes.

Cohesion
The molecular attraction that holds the body of a sealant or adhesive together; the internal strength of an adhesive or sealant.

Cohesive Failure
If adhesive materials remain on both surfaces and separate, then the unit has a cohesive failure.

Cold Flow
A property exhibited by cured Polysulfides: the ability of the rubber to conform to irregular shapes. This is good in insulating glass usage. In a glazing channel, if it is not true, the rubber will allow one lite to move without destroying the seal. In stacking units, however, they must be stacked at 90 degrees to the support, or one lite will cold flow out of plane. This is why softer sealants are used. They will cold flow a bit more, but will move more easily in stress, and in moving will not crack the glass.

Condensation Resistance Factor (CRF)
A numerical value determined for a window or door following AAMA 1502.4-197 tests for thermally improved aluminum prime windows and sliding glass doors. The test measures the heat transfer through a unit under conditions of 68˚F (20°C), 25% relative humidity (RH) on the inside and 18˚F (-8°C) with a 15 mile per hour wind on the outside. The numerical value can be used to determine under what conditions condensation will form on the inside of a window. The higher the number, the greater the resistance. A window must have a minimum CRF of 30 to be considered thermally improved.

Consistency
Degree of softness or firmness of a compound as supplied in the container. This varies according to method of application.

Cure Time
The time necessary for the mixed compound to develop to a state that can be handled in production and moved without distorting the sealant. The longer the work life, the longer the cure time. Heat facilitates the cure, as it speeds up the chemical activity of the compound. Humidity also helps. Temperatures below 70˚F (21°C) lengthen work life and greatly lengthen cure time.

Curing Agent
A chemical that is added to effect a cure in a polymer.

Degree Day
The number of days in the heating season times the difference between an inside temperature of 65˚F (18°C) and the average outside temperature when below 65˚F (18°C).

Desiccant
A substance having a great affinity for water. Used as a dying agent to adsorb moisture. Also referred to as adsorbent.

Detergents
Specially formulated liquid or powdered agents used not only to clean the glass, but also containing such ingredients as delimer, low-foam, and Low-e compatible material.

Dew Point
The point at which air is saturated with respect to a condensable component, such as water vapor.
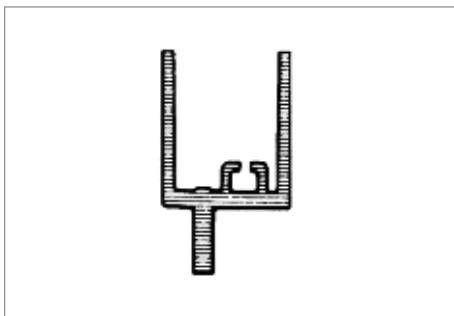
Channel
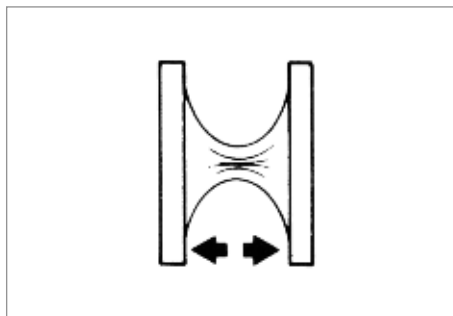
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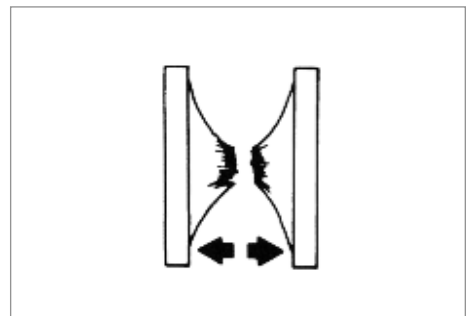
Cohesive Failure

Dual Glazing
Glazing consisting of two panels of glass separated by an air space. Used to provide protection against heat loss and noise.

Durometer
A machine gauge to measure shore hardness of a compound, such as neoprene.

Elasticity
The ability of a material to return to its original form or state following deformation. Also referred to as 'Memory' or 'Recovery'.

Elastomer
A rubbery material that returns to approximately its original dimensions in a short time after a relatively large amount of deformation.

Elongation
Ability of a material to stretch or become longer.

Exothermic
A chemical reaction that gives off heat.

Extender
An inexpensive material, usually added to reduce cost in a sealant compound.

Extrudability
The ease or difficulty with which a materal may be gunned or pushed through an orifice.

Face Glaze
A bead of glazing compound applied after the glass or insulating glass unit has been installed.

Fatigue Failure
Failure of a material because of rapid or prolonged cyclical deformation.

Filler
An additive to provide bulk and retard slump, improve adhesion, cohesion, elongation and so on in a sealant compound.

Gasket
A deformable material placed between two surfaces to seal the union between the surfaces.

Gas Filled Units
Insulating glass units with a gas other than air in the air space to decrease the unit's thermal conductivity U-value, and to increase the unit's sound insulating value.

Glazing
Installing glass in sash, frames, and window walls.

Hardness
The resistance a material offers to change, usually expressed in "Shore A," and measured with a durometer.

Heel Bead
A bead of material applied between the glass and frame.

Hermetically Sealed
A double section (two pieces) of glass sealed with an air space between. Thermopane, for example.

Hypalon
A synthetic rubber-like material (an elastomer).

IGMA (Insulating Glass Manufacturer's Alliance)
A voluntary organization whose membership includes manufacturers of insulating glass units, and suppliers of component materials used in the units.

Interface
The common boundary surface between two substances, such as where the insulating glass unit meets the channel.
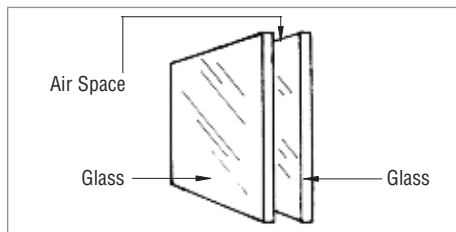
Dual Glazing
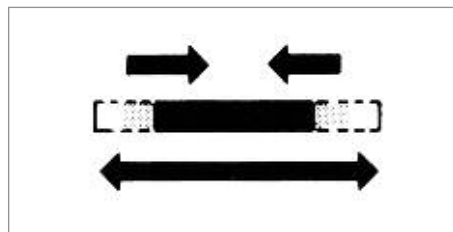
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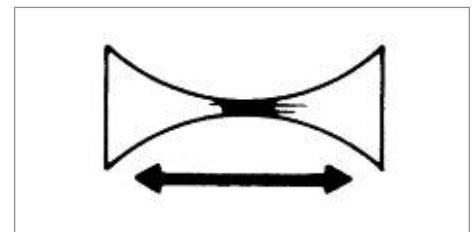
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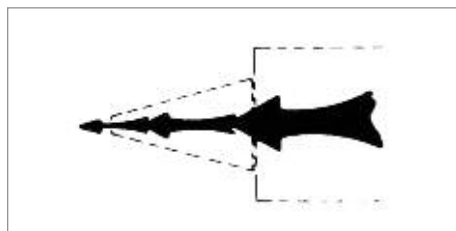
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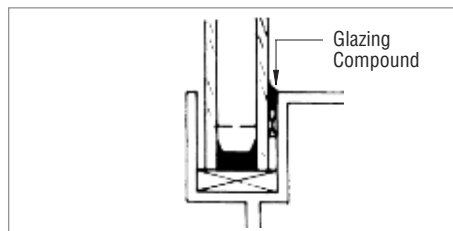
Face Glaze
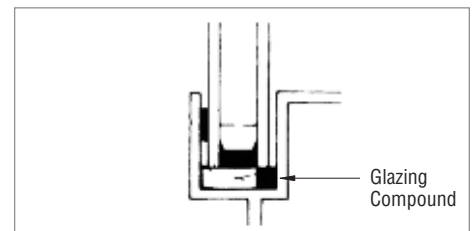
Heel Bead

Isotherm

A graph of adsorption capacity versus varying adsorbate (water concentration at a constant temperature).

Kicker

Same as catalyst; used to start the curing of a two-part material.

Lite

In glazing, refers to a piece of glass or unit of insulating glass.

Low Emissivity Glass (Low-e)

Glass with a transparent metallic or metallic oxide coating applied onto or into a glass surface. The coating reflects long-wave infrared energy and thus improves the U-value.

Mastic

A viscous adhesive compound that is applied with a knife, trowel or heated applicator.

Modulus

The ratio between stress and strain; a low-modulus material stretches easily.

Moisture Cure

A material that cures or sets by using moisture present in the air.

Moisture Vapor Transfer Rate (MVTR)

Rate at which moisture passes from atmosphere into the sealed space between the sealed unit lites.

Molecular Sieve (13-X Variety)

An adsorbent; any of a class of zeolites having small, precisely uniform pores in their crystal lattices that can adsorb molecules that are small enough to pass through the pores. The cage structure is such that the pore openings are approximately 10 angstroms. An angstrom is one ten-millionth of a millimeter.

Molecular Sieve (4-A Variety)

Same as 13-X Variety but with a crystalline cage structure such that pore openings are approximately four angstroms.

Neoprene

A synthetic rubber material commonly used as a setting block for glazing.

Nozzle

The projecting end of a cartridge or dispenser gun from which sealant is applied.

Oxidation

The drying of oils upon exposure to oxygen in the air.

Plasticizer

A material that softens a sealant or adhesive by solvent action.

Polyisobutylene Primary Seal (PIB)

A 100% solid sealant material based on Polyisobutylene rubber. PIB rubber is a non-curing hydrocarbon elastomer that features a low moisture vapor transmission rate, making it an ideal insulating glass moisture barrier.

Polymer

The resulting chemical compound obtained from a monomer combining with itself. Base of sealant compound (i.e., Silicone, Polysulfide).

Polysulfide Rubber

A synthetic polymer usually obtained from Sodium Polysulfide. Polysulfide rubbers make excellent sealants.

Pot Life

The period of time after mixing during which a sealant or adhesive can be properly applied.

Primary Seal

The seal closest to the air space. In a dual-seal unit, the primary seal would be the PIB moisture barrier.

Isotherm

Humidity
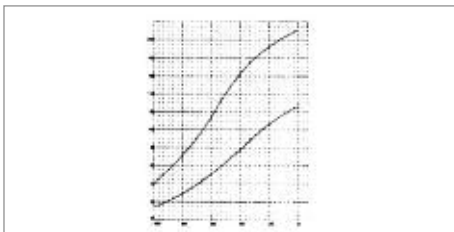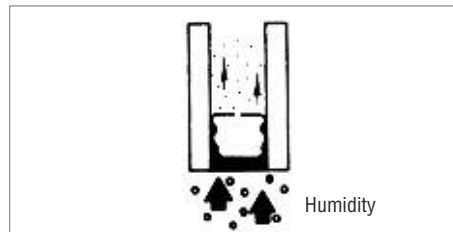
MVTR (Moisture Vapor Transfer Rate)

Nozzles

PIB Seal
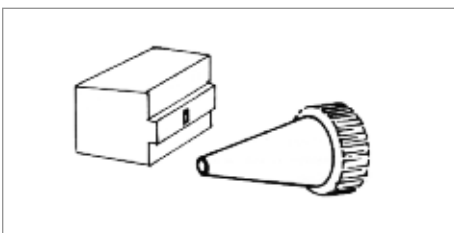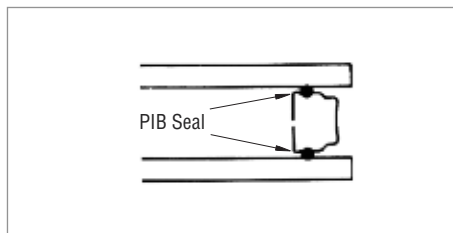
Polyisobutylene Primary Seal

Primer

Promotes adhesion between substrate and sealant, and provides adhesion for many materials.

Putty

Air-hardening type of glazing materials, usually oil-based.

Relative Humidity (RH)

The percentage relationship between the actual amount of water vapor in a given volume of air at a specific temperature, and the maximum amount of water that would be present if the air were saturated with water vapor at a specific temperature.

R. Values

R. Values refer to the resistance a material has to heat flow. Higher numbers indicate greater insulating capacity.

Sagging

Sagging occurs when a material cannot support its own weight.

Sealant

An elastomeric material with movement capability greater than ± 10% which has adhesive and cohesive properties to form a seal to keep out moisture, air, and dirt.

Sealer

A surface coating generally applied to fill cracks, pores or voids in the surface.

Secondary Seal

The seal farthest from the air space. In a dual-seal unit, the secondary seal would be the perimeter seal.

Setting Blocks

Placed on the bottom and/or each side of lites or panels to center them in the channel and maintain uniform width of sealant beads. Prevents excess sealant distortion.

Shading Coefficient

The amount of solar energy that passes through specified material.

Shear

The back and forth or lateral sliding action two surfaces exert on the sealant.

Shore A

Standard test for sealant hardness based on a scale of 1 to 100: soft gum rubber is approximately 5 to 10; tire rubber may be 70 to 80.

Shore Hardness

Measure of firmness of a compound by means of a durometer hardness gauge.

Silica Gel

An adsorbent. An amorphous porous form of silica dioxide having a large internal surface area and range of pore sizes.

Silicone Rubber

A liquid applied curing compound based on polymer(s) of polysiloxane structures. Silicone rubbers are used widely as sealants and coatings.

Sill

The bottom member of sash, frame or door.

Heat
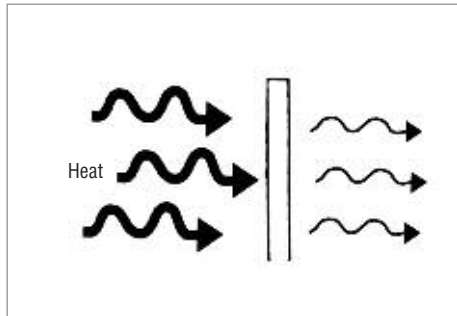
R. Values
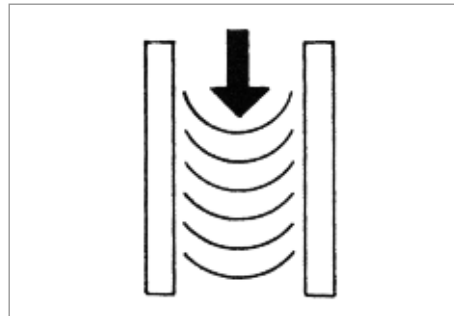
Sagging
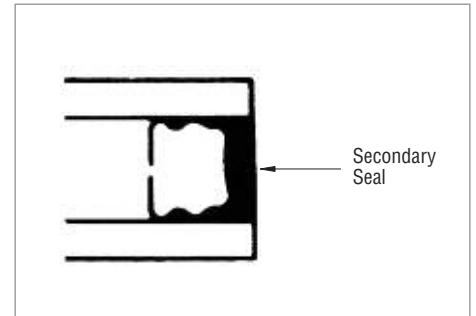
Secondary Seal

Secondary Seal
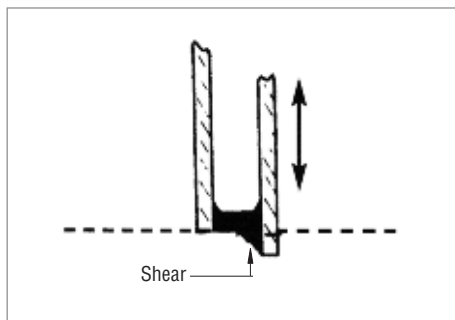
Shear

Shear
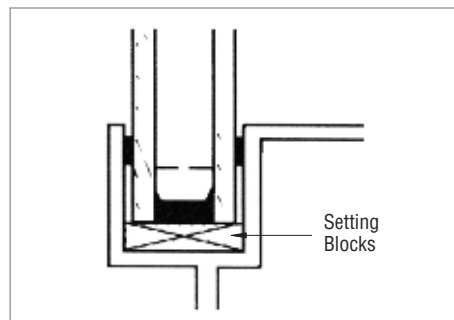
Setting Blocks

Setting Blocks

Skin
The outer surface that first forms on sealant compounds during cure.

Skin Bead
Putting a surface of material in a joint but leaving a void underneath.

Solvent
A thinner that is used to lower viscosity; may be Xylocol, mineral spirits, or similar.

Spacers
A hollow shape used to provide a fixed air space between two pieces of glass to obtain thermal or acoustical properties. Usually filled with desiccant.

Strain
Deformation per unit of length; to pull or push with force. The strain factor is determined by the change in length divided by the original length of a test specimen.

Stress
Force per unit area, usually expressed in pounds per square inch. The opposing reaction of cohesiveness of a body resisting such force.

Stretch
The elongation of a sealant.

Substrate
The surface to which a sealant or adhesive is bonded.

Sweat
Condensation that forms when warm moist air meets cold glass or metal.

Tear Strength
The load required to tear apart a sealant specimen, expressed in pounds.

Tensile Strength
Resistance of a material to tensile force (stretch). The cohesive strength of a material, expressed in psi (pounds per square inch).

Thermal Break
A material with a low thermal conductance used to separate exterior and interior materials. The thermal break is intended to stop the flow or transfer of heat.

Thermal Conductance (C Value)
The amount of heat conductance through a specific thickness of material. C Value is determined from K Factor.

Thermal Conductivity (K Factor)
The amount of heat transfer per unit area in a given period of time of a homogeneous material. The lower the number, the lower the conductivity.
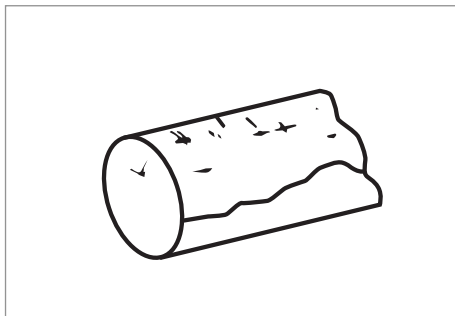
Skin
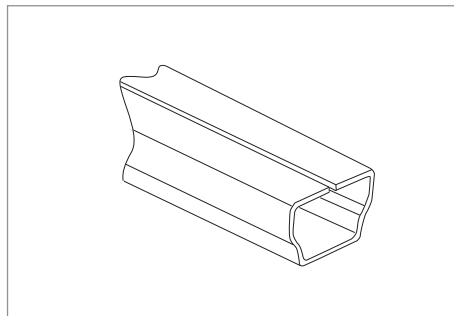
Standard Spacer
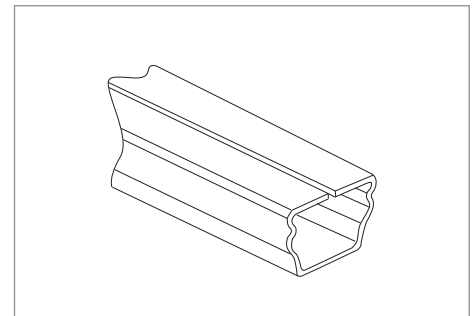
Dual Seal Spacer
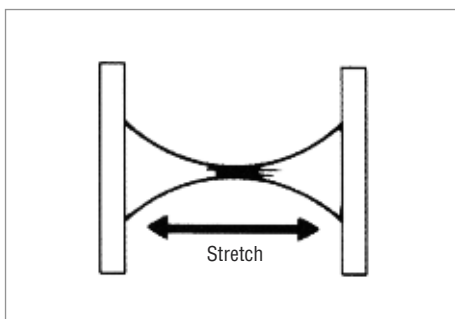
Stretch
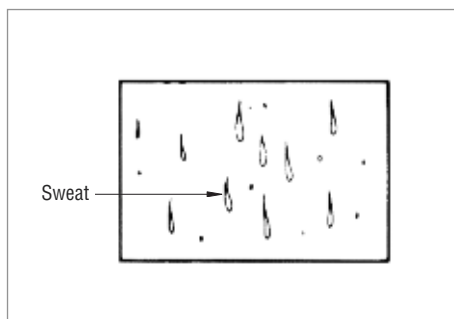
Sweat
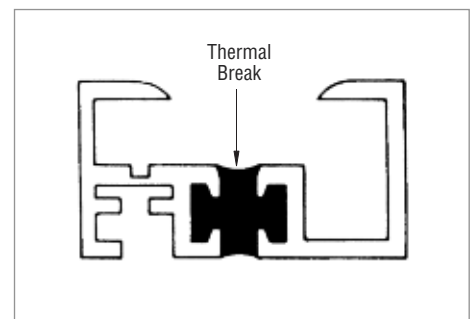
Thermal Break

Thermal Transmittance (U-Value)

The overall coefficient of heat transfer. U-Values refer to the total heat flow through the complete heat barrier from room air to outside air. Low numbers indicate greater insulating capability.

Thermoplastic

A material that can be softened repeatedly by heating. Thermoplastics generally have little or no chemical cross linking.

Thixotropic

Non-sagging. A material that maintains its shape unless agitated. A thixotropic material can be placed in a joint in a vertical wall and will maintain its shape without sagging during the curing process.

Toe Bead

A bead of material applied at the apex between the glass stop and horizontal frame member into which the lite is set.

Tooling

To force material against the backing and surfaces of a joint to provide a smooth finished look.

Ultraviolet Light (UV)

Part of the light spectrum. Ultraviolet rays can cause chemical changes in rubbery materials.

Unit

Term normally used to refer to one single lite of insulating glass.

Urethane

A family of polymers ranging from rubbery to brittle. Usually formed by the reaction of a diisocyanate with a hydroxyl.

U-Values

U-Values refer to the total heat flow through the complete heat barrier from room air to outside air. Low numbers indicate greater insulating capability.

Viscosity

The resistance of a material flow. The more viscous a material, the thicker it is in consistency.

Vulcanization

Improving the elastic properties of a rubber by chemical change; treating crude rubber with sulphur or its compounds and subjecting it to heat.

Warm Edge Technology

"Warm Edge" is defined as the reduction or elimination of condensation at the interior interface between the glass unit and the frame of a window unit.

Weeping

Extruding or sweating out of solvents or oils.

Work Life

Indicates how much time you have to easily apply the sealant after it has been mixed. Also known as Pot Life.

ABBREVIATIONS

AAMA
American Architectural Manufacturer's Association

BTU
British Thermal Unit

CRF
Condensation Resistance Factor

FGMA
Flat Glass Marketing Association

IG
Insulating Glass

IGCC
Insulating Glass Certification Council

IGMA
Insulating Glass Manufacturer's Alliance

MSD
Molecular Sieve Desiccant

MVTR
Moisture Vapor Transfer Rate

NGA
National Glass Association

PIB
Polyisobutylene

RH
Relative Humidity

UV
Ultraviolet
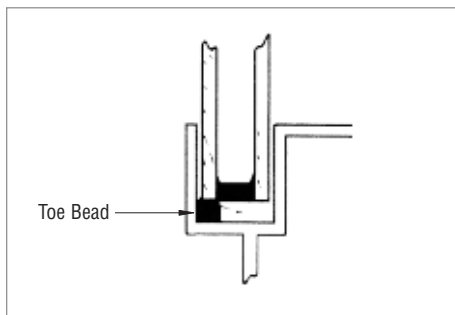
Toe Bead
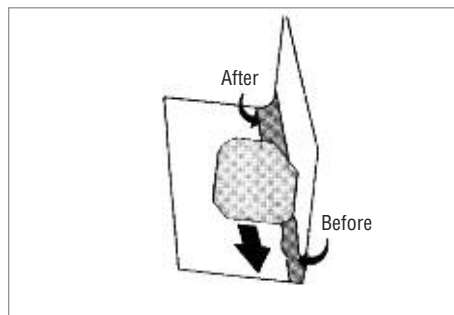
Tooling
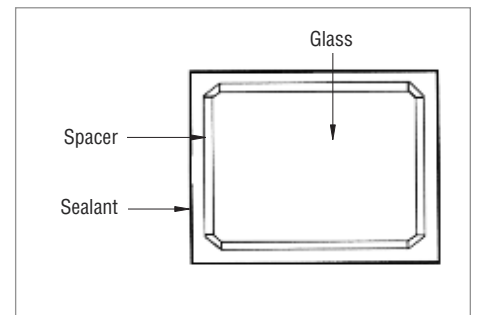
Unit

CRL Sales Demonstration Tools for Insulating Glass Units

• **High-Tech Aids to Show Your Customers the Benefits of Your Energy-Efficient Insulating Glass Units**

   Convincing prospective customers to select your Insulating Glass units can be made easier with the proper demonstration aids. These Meters help you show your customers that installing high performance Insulating Glass units will make a difference in the energy consumption costs and the comfort of their home.

   Telling your customers how good your units are is one thing, but actually demonstrating it with the help of these precision meters will give you the edge over your competition. Choose our complete Sales Demo Kit (below) or individual meters (see opposite page). For additional information on these helpful sales tools go to **crlaurence.com**.

CRL Solar/UV Sales Demo Kit

• **Kit Includes Window Energy Profiler**

   The CRL Solar/UV Sales Demo Kit can bring your Insulating Glass presentation to life, and help you convince prospective customers to select your energy efficient Insulating Glass units. This kit features the 4-in-1 Powerful Window Energy Profiler, which simultaneously reads the Solar Heat Gain Coefficient (SHGC), UV Transmission Percentage, Visible Light Transmission, and Infrared Transmission Values. This is the perfect sales tool to evaluate your customer's existing windows and compare them to your sales samples to confirm their need for new Insulating Glass units. The Kit comes with a Window Energy Profiler, an Infrared Heat Lamp, and Temperature Gun. The soft-sided Carrying Case has padded locations to hold your own insulating glass samples, and a set of factory glass samples for comparison. Additional details are available at **crlaurence.com**. Minimum order is one each.

CAT. NO. SK1740

CRL Window Energy Profiler

- Tests Windows in Frame Without Removal
- Simultaneously Displays Percentage of Allowable UV Transmission, Percentage of Visible Light, Percentage of Infrared Light Transmission, and Solar Heat Gain Coefficient

The CRL Window Energy Profiler is the latest in high-tech testing meters to determine the energy efficiency of dual glazed window and door glass. This meter simultaneously displays the four most important values to determine a glass panel's energy efficiency: UV Light Transmission, Visible Light Transmission, Infrared Light Transmission, and the "SHGC" (Solar Heat Gain Coefficient). Contractors and Building Inspectors can quickly tell if new windows and doors being installed meet code requirements.

This is a great tool to use during home sales demonstrations for potential clients to show the difference between their current windows and the newer types of energy efficient Low-e glass. One of the best features of the Energy Profiler is its design. The "U" shaped body allows a glass panel to be tested without having to remove it from the sash or frame. The Profiler calibrates itself automatically, and powers down automatically, prolonging the life of the single 9V DC Battery. The unit comes complete with a padded Carrying Case. Additional details are available at **crlaurence.com**. Minimum order is one each.

CAT. NO. WP4500

CRL Spectrum Detective Energy Transmission Meter

- Simultaneously Displays Three Measurements at Once: UV Transmission, Visible Light, and Percentage of Infrared Transmission Values
- Tests Single, Double, or Triple Panes

UV Transmission %

Visible Transmission %

Infrared Transmission %

The CRL Spectrum Detective Energy Transmission Meter provides a convincing test to show the energy efficiency of your Insulating Glass units. Three performance values are displayed simultaneously: UV Energy, Visible Light, and Infrared Energy. Simple to operate and completely portable, it requires no additional light sources or power cords. Comes with a protective Carrying Case and 9V DC Battery. Additional details are available at **crlaurence.com**. Minimum order is one each.

CAT. NO. SD2400

CRL Strengthened Glass Detector

- Identifies Glass That has Been Heat-Strengthened
- Tests Single or Double Panes
- Indicates Thickness of the First Pane of Glass

The Strengthened Glass Detector will allow users to confirm if glass has been heat strengthened. The Detector can test single panes of glass or multiple panes in a window at a single time, and from a single side. The glass can be tested in the factory, or after being installed in the field. This portable, battery-powered unit is convenient and simple to use. Simply slide the meter across the glass and conveniently watch the reflections from the glass head on. As the meter crosses stress lines in the glass (caused by the strengthening process), the resulting surface reflections from our wide array of light sources will change color.

The special optics of the SG2700 provides a robust change in color, and is great for applications where the stress lines are more difficult to view. The SG2700 Detector can even identify the thickness of the first piece of glass in the window. Conveniently portable size with a protective Carrying Case. Comes with a 9V DC Battery. Additional details are available at **crlaurence.com**. Minimum order is one each.

CAT. NO. SG2700

CRL Heat Strengthened Glass Detector Kit

- Instantly Determines Heat Strengthened Glass
- Illuminates Stress Areas
- Simple and Reliable
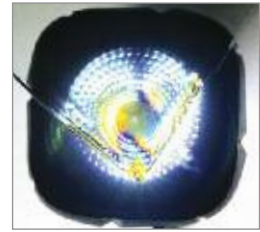
The CRL Heat Strengthened Glass Detector Kit provides a simple and reliable means of determining whether glass panels are heat treated by illuminating the stress zones created by the heat strengthened process. By shining the specially filtered, battery operated light source on the reverse side of the glass, and observing through the special glasses included with the kit, stress zones become rainbows of color. Annealed glass will remain clear when viewed using this technique.

Kit comes complete with Flashlight Light Source, Filtered Glasses, two "D" Cell Batteries, and a padded Carrying Case along with detailed instructions. You will want extra kits for your service department personnel and your quality control specialists. Minimum order is one each.

CAT. NO. HSGD1

CRL Digital Surface Resist Meters

- Four Point Sheet Resistance Meters
- 9-Volt Battery Included

new

CAT. NO. RC2175

CAT. NO. RC3175

The resistance of a thin film coating is directly proportional to the resistivity and is an important quality control component of a coating. Therefore, resistivity may be the largest single item to determine the repeatability and function of a coating. Sheet resistance has the units of ohms, but it is convenient to refer to it in ohms per square since the sheet resistance produces the resistance of the coating within any square area. This parameter is therefore measured using the 4-point technique. Pocket Size Protection for Production and Quality Assurance personnel who must know their products are "coated" properly.

CAT. NO.	RANGE	RESOLUTION
RC2175	0 - 20,000 ohms/sq.	0 - 2,000 = 1 ohm 2,000 - 20,000 = 10 ohms
RC3175	0 - 199.9 ohms/sq.	0.1 ohm

Minimum order: 1 each.

CRL UV Transmission and Power Meter

- Checks Strength of UV Curing Lamps
- Displays UV Transmission Percent or Power Readings
- Measures Temperature in F° or C°

This CRL UV Transmission and Power Meter is the most versatile product available for measuring UV. You can measure UV intensities (irradiance), and UV Transmission percentage. Perfect for checking the output of your UV curing lamps to set benchmarks or you can even confirm the protection level of your UV spectacles, goggles, and facemasks. An added feature allows you to also measure temperatures in Fahrenheit and Celsius. Unlike other UV products on the market, this Meter is extremely simple to operate. The digital display is continually updated with real-time readings. Powered by a 9-volt battery (included). Minimum order is one each.

CAT. NO. UV1365

CRL Glass-Chek PRO

Glass Thickness Meter and Low-e Coating Detector

- Triple Pane Thickness Measurement
- Full Low-e Detection Capabilities
- Enhanced Compatibility Means More Applications

GC3000 Glass-Chek PRO measures glass, air space and overall IG thickness of triple pane windows, all with a single test from one side of the window. It works with single and double pane applications as well.

The GC3000 is a fully equipped Low-e Coating Detector capable of locating a Low-e coating on any surface of a double pane window from a single side. This is a major time saver for testing multi-story buildings where you only have access to the inside of the window.

No other meter in the world can handle the same combination of applications. With an expanded thickness range to 1-1/2" (38 mm), the Glass-Chek PRO is compatible with residential and commercial glass. It is also compatible with new Low-e coatings, suspended film (i.e., Heat Mirror), tinted glass, laminated glass with Low-e against the laminate layer, and most commercial reflective glass. Minimum order is one each.
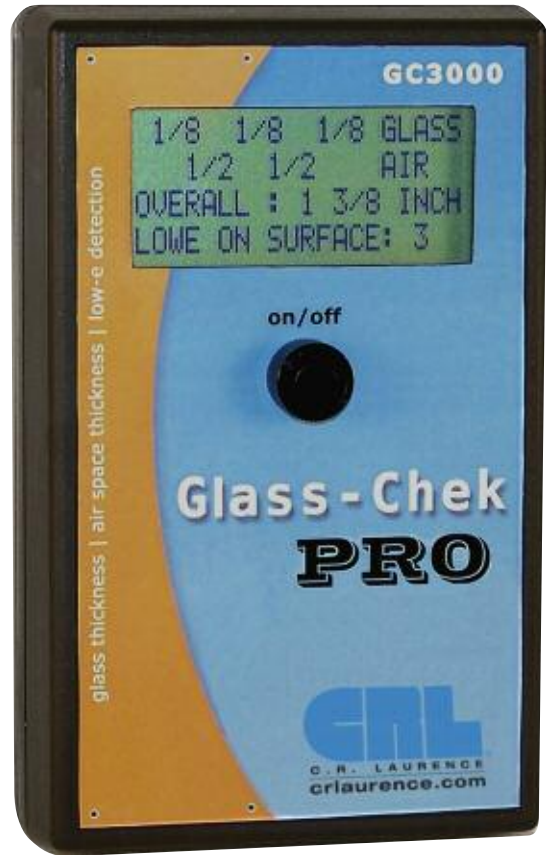
- Reduces Measurement Errors
- Measures Glass Deflection in Sealed IG Window Assemblies
- Uses a 9-Volt Battery – Common and Easily Replaceable
- Protective Carrying Case is Included
- Simple to Use, Suitable for New or Experienced Window Installers, Production Personnel, Building Inspectors or Surveyors
- Made in the U.S.A.

CAT. NO. GC3000

Choose from Multiple Display Formats
You can set up the Glass-Chek PRO to display measurement results in the format that works best for you. Choose from actual values or rounded (to ASTM Standards) to fractions of an inch, thousandths of an inch, decimals of an inch, millimeters, and more.

Glass Thickness Capabilities Illustration
Measure the thickness of each pane, each air space, and the total IG thickness in single, double, and triple pane windows.
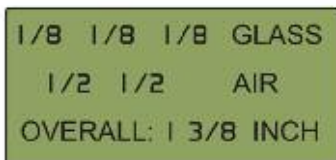
Display example outlining the glass, air space, and overall thickness of a triple pane window. Example shows readings in fractions of an inch, but the meter can be easily set up to display readings in other formats.

Total Thickness
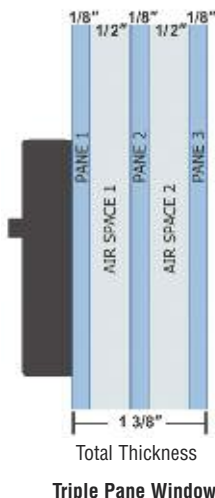
Triple Pane Window

Low-e Coating Detection Illustration
Detect the presence and location of Low-e coatings on any surface of the first two panes. The meter will specify whether the coating is on surface one, two, three/four or "CLEAR" if no coating is present.

Display example indicates the Low-e coating is on surface 3 of the window. This means the coating is on the inside surface of the second pane. The GC3000 will detect coatings on any of the surfaces of a double pane window and most triple pane windows.
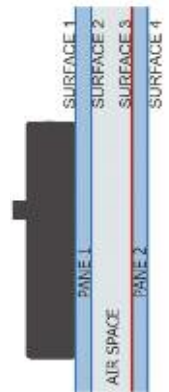
Double Pane Window

CRL Glass Thickness Laser

- Measures Thickness of Air Space in Sealed Insulating Glass Units and Overall Unit Thickness

- Measures From Inside of the Building – No Glass Removal is Necessary

- Uses Laser Technology for Exact Measurements

- Calculates Thicknesses of Insulating, Laminated, Bullet Resistant, and Single Lite Float Glass

- Simple to Use – Just Press a Button and Read the Measurements

- Fractional Inch and Metric Measurement Models

The CRL Glass Thickness Laser is a breakthrough in glass measuring devices. It will give you the same exacting readout as digital units costing hundreds more. Not only does the MG1500 measure standard Insulating Glass units, but it will also measure triple-glazed I.G. units, laminated glass, Low-e surfaces, and multi-layer bullet resistant glass. Best of all, the MG1500 is accurate from either side of the unit, so removal of the panel is not required. This is especially convenient in multiple-story buildings.

Designed for use in the field, glaziers and inspectors alike can easily carry it in their shirt pocket, on their belt, or just about anywhere the convenient carrying case will fit. The MG1500 is powered by two AAA batteries, which are included.

IMPORTANT NOTE: Avoid looking into laser beams at all times, as they can cause damage to your eyes.

Overall Insulating Glass Thickness Scales
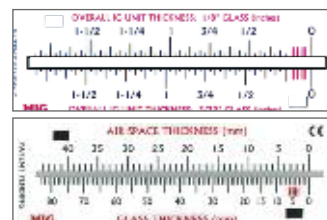
Fractional Inch and Metric Scale Sets are Interchangeable

CAT. NO.	DESCRIPTION
MG1500	Fractional Inch Laser
MG1500MM	Metric Laser
MG1500SS	Fractional/Metric Scale Set Only

Minimum order: 1 each.
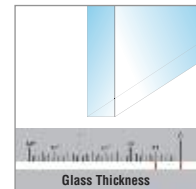
Glass Thickness
Float Glass and Mirror
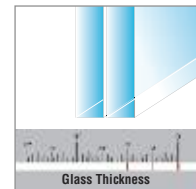
Glass Thickness
Laminated Glass (Any Thickness)
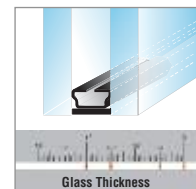
Glass Thickness
Double and Triple Glazed I.G. Units
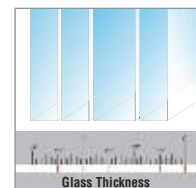
Glass Thickness
Bullet Resistant Glass (Any Combination of Thicknesses)

CRL Glass-Chek+ Digital Glass Thickness Meter With Low-e Sensor

- Measures Insulating Glass Units – Thickness of Lite, Air Space, and Overall Thickness Up to 1-1/2" (38.1 mm)

- Detects Low-e Coating and Compatible With Tinted Glass

- Factory Calibrated, Needs No Field Adjustments

- Digital Readout in Decimal, Fractional, and Metric

The CRL Glass Chek+ Digital Glass Thickness Meter with Low-e Sensor is descended from the single pane Low-e coating detector, however the GC2001 is now able to differentiate whether the Low-e is on Surface 1 or Surface 2 of the glass. Another one of the biggest improvements is its ability to test tinted glass and the newest Low-e coatings that have been introduced in the past few years. This unit is capable of testing the thickness of single or double pane windows. Simply press the Glass-Chek Meter against a single lite of glass, or a dual lite window assembly, push the button and hold it until the measurements are digitally displayed. The thickness of each lite of glass, the air space, and the overall thickness of the unit will simultaneously appear on the two-line liquid crystal display. Unit can be read in decimal, fractional and metric. For best results, clean the window prior to testing. Uses one 9V DC battery (included). Minimum order is one each.

CAT. NO. GC2001
Glass-Chek+

1/8"   1/8"
SURFACE 1 SURFACE 2 SURFACE 3 SURFACE 4
1/2"
PANE 1   PANE 2
AIR SPACE
3/4"
Total IG Thickness
Double Pane Window

CRL INSULATING GLASS TOOLS
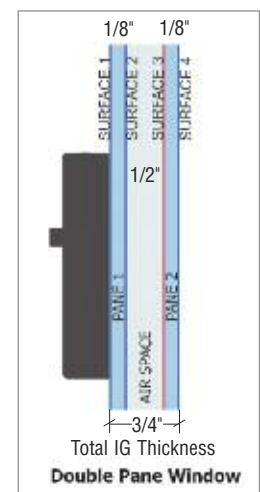
CRL Insulating Glass Caliper

- Measures Insulating Glass Unit Thickness in Sliding Windows and Doors
- Quick and Easy to Use
- Fractional or Metric Scales on Both Sides
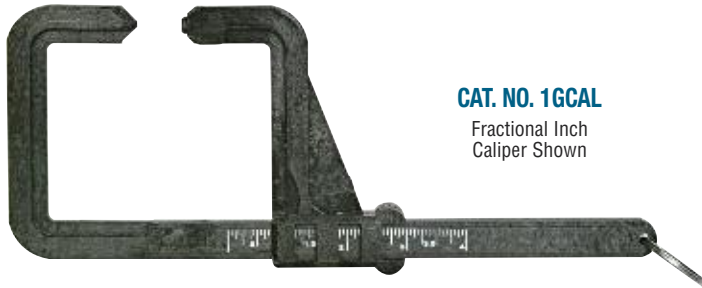
CAT. NO. 1GCAL
Fractional Inch
Caliper Shown

The CRL Insulating Glass Caliper makes it easy to measure the overall thickness of insulated glass panels in sliding windows and doors even when the panels have been glazed into a sash frame. This useful tool will measure up to 4" (102 mm) thick panels. The calibrated scale appears on both sides for quick and convenient measurements. Made of a high impact resistant composite material for durability.

CAT. NO.	DESCRIPTION
1GCAL	Fractional Inch Caliper
1GCALMM	Metric Caliper

Minimum order: 1 each.

CRL Insulating Glass Thickness Gauge

- Works on Dual or Triple Glazed Units From 7/16" to 1-1/4" (11 to 32 mm) Thick
- No Opening or Disassembly of Windows Required
- Also Measures Thickness of Single Pane Windows
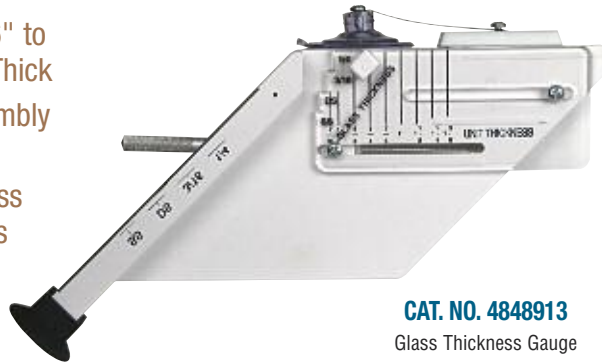
CAT. NO. 4848913
Glass Thickness Gauge

The CRL Insulating Glass Thickness Gauge is a precise tool designed to accurately measure the glass thickness and overall unit thickness of multiple glazed windows in fractional increments. It works on any clear glass unit from 7/16" to 1-1/4" (11 to 32 mm) overall thickness. There is no need for exposed edges or openings, as the Gauge works by reflections, using a line-of-sight viewer that targets the exact thickness of the unit. The supplied reflector unit is held in place by a suction cup base. It is a time and money saver for anyone in the Insulating Glass field. Minimum order is one each.

CRL Glass Thickness Gauges

The CRL Glass Thickness Gauge measures single pane thickness even when it is not possible to measure the glass from the edge. Place the long edge of the Gauge against the glass and tilt the Gauge upward to a 45 degree angle to the glass surface. Look into the glass at the reflection of the Gauge and compare each short line with the long continuous line. Pick the one short line that is shown in the reflection within the same plane as the long line, and read the glass thickness measurement as indicated above that line. This is your glass thickness. Minimum order is one each.
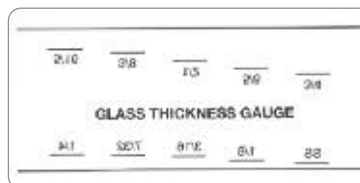
CAT. NO. G1340
Fractional Gauge
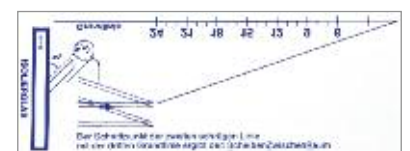
CAT. NO. GTG1
Metric Gauge

CRL Merlin Lazer Glass Measuring Gauge

- Quickly and Accurately Identify Laminated Glass
- No Glass Removal Necessary
- Available Only in Europe

Our CRL Merlin Lazer Glass Measurement Gauge is a very simple but effective precision measurement instrument that provides accurate measurement of single glass and air gap thickness in single, double, and triple glazed units. It is also able to identify laminate interlayers at a touch of a button. All readings can be taken from one side without the need to remove the glass. Minimum order is one each.

Available Only in Europe

CAT. NO. 0480

CRL Pilkington® K Glass™ Detectors

- Identify Low Emissivity Low-e Coated Glass
- For Single and Double Glazed Glass
- Comprehensive Instructions Included

- Available Only in Europe

Available Only in Europe

Our CRL Pilkington® K Glass™ Detectors have been developed to distinguish low emissivity coated glass from ordinary float glass. These units are available for single glazed or double glazed units.

CAT. NO.	DESCRIPTION
0472S	Single Glazed Glass
0472D	Double Glazed Glass

Minimum order: 1 each.

CAT. NO. 0472S   **CAT. NO. 0472D**

CRL Low-e Coating Detectors

Available Only in Europe

- Reduce Costly Mistakes in Manufacturing
- Identify Low-e Coating in the Field Quickly
- Available Only in Europe

The CRL Low-e Glass Detector senses the presence (or absence) and location of thermally resistant coatings used on single strength and double strength energy efficient glass (maximum air space of 1/2 inch [12.7 mm]). This helps to ensure windows are manufactured correctly. Simple indicator lights check clear, near, or far surfaces. Minimum order is one each.

CAT. NO. AE3600

CRL Merlin Lazer Low-e Coating Detector

Available Only in Europe

- Easily Identify Low-e Glass at the Touch of a Button
- Ideal for Checking Document L Compliance
- Available Only in Europe

The CRL Merlin Lazer Low-e Coating Detector is a dual-purpose tester designed to detect Pilkington® K Glass™ and all other low emissivity coatings on single and double glazed units, and to indicate on which surface it is present. Installers and inspectors can verify the presence of the coating and the correct orientation of the unit. Minimum order is one each.

CAT. NO. 0482

CRL Merlin Lazer Toughened Glass Indicator

- Quickly Verify Whether Glass Has Been Toughened
- Identify From One Side Only
- Available Only in Europe

Available Only in Europe

The CRL Merlin Lazer Toughened Glass Indicator is able to indicate toughened glass in single and multi-pane units from one side only at the touch of a button. This makes it an ideal solution to safely determine whether glass has been toughened or not. Minimum order is one each.

Pilkington is a registered trademark of Pilkington Group Limited Corp.

CAT. NO. 0481

CRL Double-Pane Low-e Coating Detector

- Detects Invisible Low-e Coatings
- Ensures Windows are Installed Correctly
- Wide Temperature Stability
- Low-Battery Indicator

The CRL Low-e Glass Coating Detector senses the presence (or absence) and location of thermally resistant coatings (Low-e) used on single strength and double strength energy efficient glass from a single side. This helps to ensure windows are installed correctly.

This second generation tool offers enhanced reliability and temperature stability over its predecessor. Simple indicator lights check clear, near, or far surfaces. The unit requires one 9V DC Battery, which is included. The low-battery sensor causes the indicator lights to blink when the battery needs replacing. Minimum order is one each.

CAT. NO. AE1601

CRL Low-e Coating Contact Meter

- Detects Hard or Soft-Coat Low-e Applications
- Reduces Costly Mistakes in Manufacturing
- Economically Priced

The CRL Low-e Coating Contact Meter is a simple instrument that detects any conductive surface, including Low-e coatings, on a single sheet of glass. The Meter has four non-scratch pads on the reverse side that you press against the glass to determine if that surface has any conductive Low-e coatings.

The CM1030 is the ideal tool to use during the manufacture of Low-e Insulating Glass units. You can easily check glass surfaces for coatings without any extensive training. If the Meter detects a coating on the surface, an indicator lights up to signal its presence. One 9V DC Battery is included. Minimum order is one each.

CAT. NO. CM1030

CRL Solar Transmission and BTU Power Meters

new

- Demonstrate Your Product's Solar Performance
- Displays Solar Transmission and BTU Power Readings

Lamp and Test I.G. Unit Not Included

These innovative CRL Solar Transmission and BTU Power Meters demonstrate both the solar transmission percentage of your window and, with the press of a button, the BTU values. The SP1065 reads radiant solar power in BTU's or watts. The SP2065 also can be switched to transmission mode to read solar transmission percentage. The SP2065 is included in the Cat. No. SK1740 Sales Demo Kit (shown on page I126), or you can order it separately. Meters come with a 9V DC Battery. Additional details are available online at **crlaurence.com**. Minimum order is one each.

CAT. NO. SP1065   **CAT. NO. SP2065**

CRL Digital Tin Side Detector

- Digital Technology
- Easy-to-Read Meter Identifies the Tin Side of Float Glass
- UV Lamp is Not Required

   The CRL Digital Tin Side Detector determines the tin side of float glass without the use of an ultraviolet bulb. There are several advantages to using digital technology to determine the tin side, such as being able to use this meter on either side of the glass. Just position up to the glass surface and depress the button, the large display clearly states if the meter is on the tin side, or if the tin is on the opposite side. With this new technology, the user no longer has to interpret the reflection of the UV light to make a subjective guess as to which surface is the tin side. There is no need to replace UV bulbs with this new Digital Meter, and the digital technology makes this meter very rugged, portable, and more energy efficient than other models. Operates on one 9V DC Battery. Minimum order is one each.

CAT. NO. TS2300

CRL UV Lamp Tin Side Detector

- Battery Powered UV Lamp Identifies the Tin Side of Float Glass
- Includes UV Protective Spectacles

   The CRL Tin Side Detector can identify the tin side of any piece of float glass by using short-wave ultraviolet light. This special lamp causes the tin to become visible in a milky white color. When the lamp is held to the air side, no color change takes place, just a dull image of the UV lamp is reflected. The short-wave UV light cannot transmit through the glass, therefore no change is noticed in the reflection and the milky color is not present. Some applications include auto glass fabrication, glass tempering, and the manufacture of mirror and other types of coated glass. The detection of the tin side is necessary in the processing of these types of glass. Note: Requires four "AA" Batteries, which are not included. Minimum order is one each.

CAT. NO. UVG4

CRL Commercial Tin Side Detector

new

- The Solution Glass Processors Have Been Waiting for
- More Rugged Design
- Includes UV Protective Spectacles

   The new Commercial Tin Side Detector has a momentary power switch which allows users to pulse the lamp, making it much easier to see the tin side glow. Also included is the patent-pending stencil insert that mounts behind the lamp. With the removable stencil in place, it is possible to read the words "TIN SIDE" on the edge of the glass when placed on the tin surface - even in well-lit environments. When placed on the tin side of glass, the flourescent lamp image glows visibly. When placed on the non-tin side, the lamp image appears normal. Powered by three AA batteries (included). Minimum order is one each.

CAT. NO. TS1320

CRL Tin Side Detector

new

- A Valuable Tool for Tempered Glass, Laminated Glass, Screen Printing, and Specialty Coating Applications
- Includes UV Protective Spectacles

   The CRL Tin Side Detector allows you to determine the tin side of float glass. The instrument can test clear float glass or glass that has other specialty coatings applied to it in most applications. When the lamp is placed on the tin side of the glass, the fluorescent lamp image glows visibly. When placed on the non-tin side, the lamp image appears normal. This new design is powered by three AA batteries (included), however, it runs 50% longer than competing models. This new instrument is centered around a custom designed UV source that is more rugged and efficient than previous models. Minimum order is one each.

CAT. NO. TS1301

CRL Conductive Coating Detector

- Red Indicator Lights Up On Contact With Low-e
- Edge Stop Restricts Use to Edge of Glass, Prevents Scratching
- Small Enough to Fit in Your Shirt Pocket

The CRL Conductive Coating Detector provides positive identification of the Low-e coated side of glass upon direct contact with the glass surface. This tool will prove itself invaluable to insulating glass fabricators who need to verify coatings and assure correct assembly procedures using Low-e glass. With edge stops designed into the housing, there is less chance of accidental scratching in the center viewing area. Window fabricators and quality control departments can verify that no Low-e surface is inadvertently exposed. Minimum order is one each.

new

CAT. NO. CD1

CRL Non-Contact Detector

- Single Button Activation
- Visual Red LED Indicator and Audible Signal Announces Coating Found
- Helps Assure Manufacturers and Customers that Coating is Present
- Slips Comfortably into Shirt Pocket or Briefcase

The CRL Non-Contact Detector is a durable, dependable tool for use by fabricating, sales, and service personnel who need to verify the presence of Low-e glass coatings. Lay the CD2 against the glass surface and push the button to activate. A red LED indicator light and an audible signal will announce the presence of a Low-e coating on either surface one or two. Minimum order is one each.

new

CAT. NO. CD2

CRL Dual Purpose Detector

- Switches Between Direct Contact and Non-Contact Modes
- Visual and Audible Signals Indicate Low-e Presence
- Maintains Calibration at All Times
- Compact, Reliable, and Efficient

The CRL Dual Purpose Detector combines the features of the CD1 and CD2 Low-e Detectors in one convenient, compact tool. The CD3 switches between direct contact mode and indirect presence mode to identify which side of the glass lite has received the Low-e coating. It is ideal for in-shop quality assurance personnel, field service crews, sales people, building inspectors, and code enforcement staff. Minimum order is one each.

new

CAT. NO. CD3

CRL Pocket Reference Book

- Tool and Construction Specs; Info on Paints, Finishes and Adhesives; Metric Conversions; and Lots of Useful Information

The CRL Pocket Reference Book is a wealth of information. Use it for tool and construction specs; get info on paints, adhesives and finishes; convert metric measurements; get electrical ratings and equivalents; solve math, geometry, and chemistry problems; look up area codes, and much more! It even has a 12 year perpetual calendar! There's a ton of useful data in this over 500 page reference that fits on your desk or in your glove compartment.
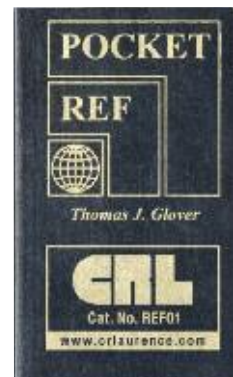
CAT. NO. REF01

We Make it Easy to Get Started With Our Insulating Glass Starter Kits

- Save Money and Time by Building Your Own Insulating Glass Units
- Eight Kits to Choose From - Basic to Deluxe
- Kits Available for Single Seal and Dual Seal Metal Spacers, Super Spacer®, and Duralite®

- Produce Units When Your Customers Need Them
- No Long Waits for Custom or Odd Shape Windows
- A Variety of Sealing Systems - Hot Melt Butyl, One-Part and Two-Part Polyurethanes, Two-Part Polysulfide, Silicone Sealant, and Duralite®

CRL Deluxe Insulating Glass Hot Melt Starter Kit

- An Easy Way to Start Producing Quality Insulating Glass Units
- Kit Comes With Everything Needed for Production of Insulating Glass Units (Except the Glass)
- The SS96 is Our Most Popular Sealant Extruder

CAT. NO. D1GK7

This CRL Deluxe Insulating Glass Hot Melt Starter Kit comes with everything needed (except the glass) to produce quality Insulating Glass units. This Kit is ideal for anything from limited production to job site fabrication. Using our Hot Melt Butyl Dispensing Machine with standard Aluminum Spacers and Corners, quality Insulating Glass units can be produced within minutes of warming up the machine.

Aluminum Spacers (see pages I148 and I149) come in widths from 3/16" (4.8 mm) to 3/4" (19 mm), giving you the flexibility to fabricate Insulating Glass units in a variety of widths. This Kit comes with Spacers in the three popular widths, but others can be used.

The SS96 Hot Melt Butyl Extruder Machine is our best-selling hot melt gunning system. It dispenses our CRL30703 Hot Melt Butyl Cakes (see page I143) to create a reliable edge seal. Brass Tip Nozzles apply the sealant evenly to assure uniformity and reduce waste. **NOTE:** For a 240V Australia only Hot Melt Butyl Extruder Machine order Cat. No. AU96.

For more information, contact our Door and Window Department, or go online at **crlaurence.com**.

KIT NO. D1GK7 INCLUDES:

CAT. NO.	DESCRIPTION	QUANTITY
SS96	Hot Melt Butyl Extruder Machine 110V AC	1 Each
CRL30703	Hot Melt Butyl Cakes	96 lbs (43.5 kg)
MSD50B	55 Pound (25 kg) Box Molecular Sieve	1 Box
3935	1/4" (6.3 mm) Single Seal Aluminum Spacer	50 each 12'8" Lengths
3937	3/8" (9.5 mm) Single Seal Aluminum Spacer	25 each 12'8" Lengths
3939	1/2" (12.7 mm) Single Seal Aluminum Spacer	50 each 12'8" Lengths
6265	1/4" (6.3 mm) Single Seal Spacer Corners	200 Each
6267	3/8" (9.5 mm) Single Seal Spacer Corners	100 Each
6269	1/2" (12.7 mm) Single Seal Spacer Corners	200 Each
1550	Lint Free Wipes	1 Case (900 Wipes)
695	Concentrated Glass Cleaner	1 Gallon (3.785 l)
DB21	Plastic Spray Bottles	2 Each
1BK990	Hot Melt Butyl Trim Knife 110V AC	1 Each
BN4	1/4" (6.3 mm) Brass Nozzle	1 Each
BN6	3/8" (9.5 mm) Brass Nozzle	1 Each
BN8	1/2" (12.7 mm) Brass Nozzle	1 Each
NG171	Lint Free Gloves (Large)	1 Dozen Pairs
321W	White Siliconized Acrylic Latex Glazing Sealant	10 Cartridges
321GRY	Gray Siliconized Acrylic Latex Glazing Sealant	10 Cartridges
JC3202HT	Plastic Tipped Handy Clamps	12 Each
GM15	Basic Insulating Glass Manual	1 Each

Minimum order: 1 each. Must ship common carrier only.

Super Spacer and Duralite are registered trademarks of Quanex Building Products Corporation.

CRL Deluxe Super Spacer® Insulating Glass Starter Kit

- A Great Way to Get Started With "Warm Edge" Technology
- Easily Adapts to All Shapes and Sizes of Glass
- Great for Art Glass Panels

This state-of-the-art kit comes with everything you need (except the glass) to build Insulating Glass units, whether they are square, rectangular, or even circular, all without the use of a spacer bending machine.

Super Spacer® is one of the best materials to use in manufacturing Insulating Glass units because of its superior insulating foam. This foam essentially eliminates perimeter edge condensation and substantially reduces overall window heat loss. This flexible spacer also accommodates glass bowing and thermal movement. Excellent sound insulation properties add to the list of Super Spacer's attributes. Finally, there is no adsorbent to add because there is a high quantity of 3A molecular sieve already inside of Super Spacer's quality silicone foam.

The Kit also comes with a CRL SS96 Hot Melt Butyl Dispensing Machine, which is the fastest way to produce Insulating Glass units. We include 96 pounds of CRL30703 Butyl, which is the only butyl recommended for use in this machine. The SS96 features an all-mechanical system which doesn't use any air, so there is less down time and more production. The 8' (2.4 m) dispensing hose heats from 350-450°F (177-232°C), delivering the butyl at optimum temperature.

NOTE: For a 240V Australia only Hot Melt Butyl Extruder Machine order Cat. No. AU96.

CAT. NO. D1GK88

KIT NO. D1GK88 INCLUDES:

CAT. NO.	DESCRIPTION	QUANTITY
SS96	Hot Melt Butyl Extruder Machine 110V AC	1 Each
CRL30703	Hot Melt Butyl Cakes	96 lbs. (43.5 kg)
SS1466	1/4" (6.3 mm) Super Spacer® 66' (20 m) roll	8 Rolls
SS3866	3/8" (9.5 mm) Super Spacer® 66' (20 m) roll	4 Rolls
SS1266	1/2" (12.7 mm) Super Spacer® 66' (20 m) roll	8 Rolls
SSHN	Super Spacer® Hand Notcher	1 Each
1550	Lint Free Wipes	1 Case (900 Wipes)
695	Concentrated Glass Cleaner	1 Gallon (3.785 l)
DB21	Plastic Spray Bottles	2 Each
1BK990	Hot Melt Butyl Trim Knife 110V AC	1 Each
BN4	1/4" (6.3 mm) Brass Nozzle	1 Each
BN6	3/8" (9.5 mm) Brass Nozzle	1 Each
BN8	1/2" (12.7 mm) Brass Nozzle	1 Each
NG171	Lint Free Gloves (Large)	1 Dozen Pairs
GM15	Basic Insulating Glass Manual	1 Each

Minimum order: 1 each. Must ship common carrier only.

CRL "Hardman" Gun and Hot Melt Butyl Insulating Glass Starter Kit

- Hardman Hot Melt Butyl Gun is Portable, and Lets You Use Only What You Need

This Kit is perfect for the glass shop that needs to produce Insulating Glass units on an occasional "as needed" basis, or for someone who needs to do their work in different locations from time to time. The CRL "Hardman" Insulating Glass Hot Melt Butyl Starter Kit is also a great way to start a small production system for fabricating Insulating Glass units.

CAT. NO. D1GK913

KIT NO. D1GK913 INCLUDES:

CAT. NO.	DESCRIPTION	QUANTITY	CAT. NO.	DESCRIPTION	QUANTITY
HEG522	"Hardman" Extruder Gun 110V AC	1 Each	695	Concentrated Glass Cleaner	1 Gallon (3.785 l)
N415	Hot Melt Butyl Rope	8 Rolls	DB21	Plastic Spray Bottles	2 Each
RH522	Hot Melt Butyl Rope Holder	1 Each	E9133	Brass Nipple	1 Each
MSD5	5 Pound (2.2 kg) Can Molecular Sieve	2 Cans	BN4	1/4" (6.3 mm) Brass Nozzle	1 Each
3935	1/4" (6.3 mm) Single Seal Aluminum Spacer	50 Each 12'8" Lengths	BN6	3/8" (9.5 mm) Brass Nozzle	1 Each
3937	3/8" (9.5 mm) Single Seal Aluminum Spacer	25 Each 12'8" Lengths	BN8	1/2" (12.7 mm) Brass Nozzle	1 Each
3939	1/2" (12.7 mm) Single Seal Aluminum Spacer	50 Each 12'8" Lengths	NG171	Lint-Free Gloves (Large)	1 Dozen Pairs
6265	1/4" (6.3 mm) Single Seal Spacer Corners	200 Each	321W	White Siliconized Acrylic Latex Glazing Sealant	10 Cartridges
6267	3/8" (9.5 mm) Single Seal Spacer Corners	100 Each	321GRY	Gray Siliconized Acrylic Latex Glazing Sealant	10 Cartridges
6269	1/2" (12.7 mm) Single Seal Spacer Corners	200 Each	JC3202HT	Plastic Tipped Handy Clamps	12 Each
1550	Lint Free Wipes	1 Case (900 Wipes)	GM15	Basic Insulating Glass Manual	1 Each

Super Spacer is a registered trademark of Quanex Building Products Corporation.

Minimum order: 1 each. Must ship common carrier only.

CRL Silicone Foam and Metal Spacer Insulating Glass Sealant Starter Kit With Super Spacer®

- Includes Everything Needed to Fabricate High Quality Insulating Glass Units
- Comes Complete With Over 300 Feet (91 m) of Super Spacer®
- Easily Adapts to All Shapes and Sizes of Glass

CAT. NO. S1GK877

KIT NO. S1GK877 INCLUDES:

CAT. NO.	DESCRIPTION	QUANTITY
877	Silicone Foam and Metal Spacer I.G. Sealant	12 Cartridges
SS1466	1/4" (6.3 mm) Super Spacer® 66' (20 m) roll	2 Rolls
SS3866	3/8" (9.5 mm) Super Spacer® 66' (20 m) roll	1 Roll
SS1266	1/2" (12.7 mm) Super Spacer® 66' (20 m) roll	2 Rolls
SSHN	Super Spacer® Hand Notcher	1 Each
1550	Lint Free Wipes	1 Case (900 Wipes)
695	Concentrated Glass Cleaner	1 Gallon (3.785 l)
DB21	Plastic Spray Bottles	2 Each
SGT14	1/4" (6.3 mm) Sealant Guide	1 Each
SGT38	3/8" (9.5 mm) Sealant Guide	1 Each
SGT12	1/2" (12.7 mm) Sealant Guide	1 Each
GM15	Basic Insulating Glass Manual	1 Each

Minimum order: 1 each.

• Our Most Popular Starter Kit

This CRL Silicone Foam and Metal Spacer Insulating Glass Sealant Starter Kit with Super Spacer® contains everything needed to produce condensation-free perimeter edges which substantially reduces overall window heat loss. Super Spacer® allows you to build Insulating Glass units in shapes not permitted by metal spacers. The silicone foam contains a high quantity (40% by weight) of 3A molecular sieve desiccant, and the permeability of the foam allows for fast moisture pick up. Our 877 Sealant forms an airtight seal and is compatible with units fabricated with Super Spacer®.

CRL Single Seal, Two-Part Polysulfide Insulating Glass Starter Kit

- Apply Two-Part Polysulfide With Brush, Gun, or Trowel
- Hardens as it Cures
- Easy to Assemble and Use

CAT. NO. S1GK550

KIT NO. S1GK550 INCLUDES:

CAT. NO.	DESCRIPTION	QUANTITY
N400G15	Two-Part Polysulfide Sealant (1.5 Gallon Pail)	4 Pails
MSD5	5 Pound (2.2 kg) Can Molecular Sieve	2 Cans
3935	1/4" (6.3 mm) Single Seal Aluminum Spacer	50 Each 12'8" Lengths
3937	3/8" (9.5 mm) Single Seal Aluminum Spacer	25 Each 12'8" Lengths
3939	1/2" (12.7 mm) Single Seal Aluminum Spacer	50 Each 12'8" Lengths
6265	1/4" (6.3 mm) Single Seal Spacer Corners	200 Each
6267	3/8" (9.5 mm) Single Seal Spacer Corners	100 Each
6269	1/2" (12.7 mm) Single Seal Spacer Corners	200 Each
1550	Lint Free Wipes	1 Case (900 Wipes)
695	Concentrated Glass Cleaner	1 Gallon (3.785 l)
DB21	Plastic Spray Bottles	2 Each
NG171	Lint Free Gloves (Large)	1 Dozen Pairs
321W	White Siliconized Acrylic Latex Glazing Sealant	10 Cartridges
321GRY	Gray Siliconized Acrylic Latex Glazing Sealant	10 Cartridges
JC3202HT	Plastic Tipped Handy Clamps	12 Each
GM15	Basic Insulating Glass Manual	1 Each

Minimum order: 1 each. Must ship common carrier only.

This CRL Single Seal, Two-Part Polysulfide Insulating Glass Starter Kit is one of the most economical ways to start fabricating Insulating Glass units. Simply insert corners into the spacer, fill spacers with molecular sieve, add your glass, clamp together, apply the CRL Two-Part Polysulfide, let cure overnight and you're ready for installation. With this system any demand can be responded to immediately; simply measure, fabricate, allow the sealant to cure, and install the next day.

Super Spacer is a registered trademark of Quanex Building Products Corporation.

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crlaurence.com | usalum.com

CRL Dual Seal Silicone With Polyisobutylene Insulating Glass Starter Kit

CAT. NO. S1GK344

- Fabricate Units With Two High Performance Sealants
- Dual Seal Systems Withstand Intense Weather Conditions

This CRL Dual Seal Insulating Glass Starter Kit has all the components necessary to fabricate Dual Seal Insulating Glass units. Polyisobutylene, a one-part, non-drying, non-hardening ribbon material with exceptionally low vapor transmission and non-fogging characteristics, forms the primary seal. Insulating Glass Silicone (applied with a standard caulking gun), specifically formulated for bonding and sealing Insulating Glass units, makes the secondary seal. The Dual Seal Spacer is grooved on the shoulder, allowing it to accept the Polyisobutylene Tape, while the taper below the shoulder will accept the silicone secondary seal.

KIT NO. S1GK344 INCLUDES:

CAT. NO.	DESCRIPTION	QUANTITY
2132559	Polyisobutylene Tape	1 Case
9542	Insulating Glass Silicone	48 Cartridges
MSD5	5 Pound (2.2 kg) Can Molecular Sieve	2 Cans
99125	1/4" (6.3 mm) Dual Seal Aluminum Spacer	50 each 12'8" Lengths
99127	3/8" (9.5 mm) Dual Seal Aluminum Spacer	25 each 12'8" Lengths
99129	1/2" (12.7 mm) Dual Seal Aluminum Spacer	50 each 12'8" Lengths
92175	1/4" (6.3 mm) Dual Seal Spacer Corners	200 Each
92177	3/8" (9.5 mm) Dual Seal Spacer Corners	100 Each
92179	1/2" (12.7 mm) Dual Seal Spacer Corners	200 Each
1550	Lint Free Wipes	1 Case (900 Wipes)
695	Concentrated Glass Cleaner	1 Gallon (3.785 l)
DB21	Plastic Spray Bottles	2 Each
NG171	Lint Free Gloves (Large)	1 Dozen Pairs
321W	White Siliconized Acrylic Latex Glazing Sealant	10 Cartridges
321GRY	Gray Siliconized Acrylic Latex Glazing Sealant	10 Cartridges
JC3202HT	Plastic Tipped Handy Clamps	12 Each
GM15	Basic Insulating Glass Manual	1 Each

Minimum order: 1 each. Must ship common carrier only.

CRL Polyurethane Sealant Insulating Glass Starter Kit With Super Spacer®

- Everything You Need to Fabricate Quality Insulating Glass Units Using Super Spacer®
- Comes Complete With Over 300 Feet (91 m) of Super Spacer®
- Uses Two-Part Polyurethane Sealant

CAT. NO. S1GK600

KIT NO. S1GK600 INCLUDES:

CAT. NO.	DESCRIPTION	QUANTITY
N600G15	Two-Part Polyurethane Sealant 1.5 Gallon Pail	1 Pail
SS1466	1/4" (6.3 mm) Super Spacer® 66' (20 m) roll	2 Rolls
SS3866	3/8" (9.5 mm) Super Spacer® 66' (20 m) roll	1 Roll
SS1266	1/2" (12.7 mm) Super Spacer® 66' (20 m) roll	2 Rolls
SSHN	Super Spacer® Hand Notcher	1 Each
1550	Lint Free Wipes	1 Case (900 Wipes)
695	Concentrated Glass Cleaner	1 Gallon (3.785 l)
DB21	Plastic Spray Bottles	2 Each
MX40	Sealant Mixer	1 Each
4104	1-1/2" (38 mm) Putty Knife	1 Each
GM15	Basic Insulating Glass Manual	1 Each

Minimum order: 1 each.
Super Spacer is a registered trademark of Quanex Building Products Corporation.

This CRL Insulating Glass Starter Kit features CRL Super Spacer®, the superior insulating foam that eliminates perimeter edge condensation and substantially reduces overall window heat loss. CRL Super Spacer® allows you to build Insulating Glass units in shapes not permitted by metal spacers. The silicone foam contains a high quantity of 3A molecular sieve desiccant, and the permeability of the foam allows for fast moisture pickup. Our Two-Part Polyurethane Sealant forms an airtight seal, and is compatible with units fabricated with Super Spacer®.

CRL Insulating Glass Starter Kit With Duralite®

- Includes Everything Needed to Fabricate High Quality Insulating Glass Units
- Comes With 330 Feet (100 m) of Duralite®
- Easily Adapts to All Shapes and Sizes of Glass

This CRL Insulating Glass Starter Kit With Duralite® contains everything needed to produce condensation-free perimeter edges that substantially reduce overall window U-Value. It is a complete package that will get you into the business of producing high-quality Insulating Glass units to meet the demands of your customers.

Duralite® allows you to build Insulating Glass units in shapes not permitted by metal spacers. The patented technology incorporates unique materials and a breakthrough in continuous composite manufacturing processes.

This advanced technology offers a higher performance spacer system at a competitive price. Duralite® takes optimum advantage of laminates and adhesives to reduce thermal conductivity while improving surface and corner appearance over other Insulating Glass spacers.

CAT. NO. S1GKDS66

Apply Duralite® to clean glass surface with DSPT1 Applicator or by hand.
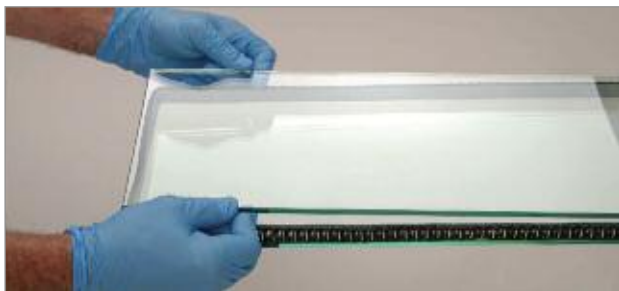
Index second piece of clean glass and press on to Duralite®.

Apply spring clamps or mechanical press with heat lamp to seal the unit.

Duralite is a registered trademark of Quanex Building Products Corporation.

KIT NO. S1GKDS66 INCLUDES:

CAT. NO.	DESCRIPTION	QUANTITY
DS6614	1/4" (6.3 mm) Duralite® 66' (20.1 m) Roll	2 Rolls
DS6638	3/8" (9.5 mm) Duralite® 66' (20.1 m) Roll	1 Roll
DS6612	1/2" (12.7 mm) Duralite® 66' (20.1 m) Roll	2 Rolls
DSPT1	Duralite® Peak Tool Applicator	1 Each
TL2	Duralite® Quartz Heat Lamp 110V AC	1 Each
1550	Lint Free Shop Wipes (900 per Case)	1 Case
695	Concentrated Glass Cleaner	1 Gallon (3.785 l)
DB21	Plastic Spray Bottles	2 Each
NG171	Lint Free Gloves (Large)	1 Dozen Pairs
JC3202HT	Plastic-Tipped 6" Handy Clamps	24 Each
M3R	Straight Cut Snips	1 Each
GM15	Basic Insulating Glass Manual	1 Each

Minimum order: 1 each.
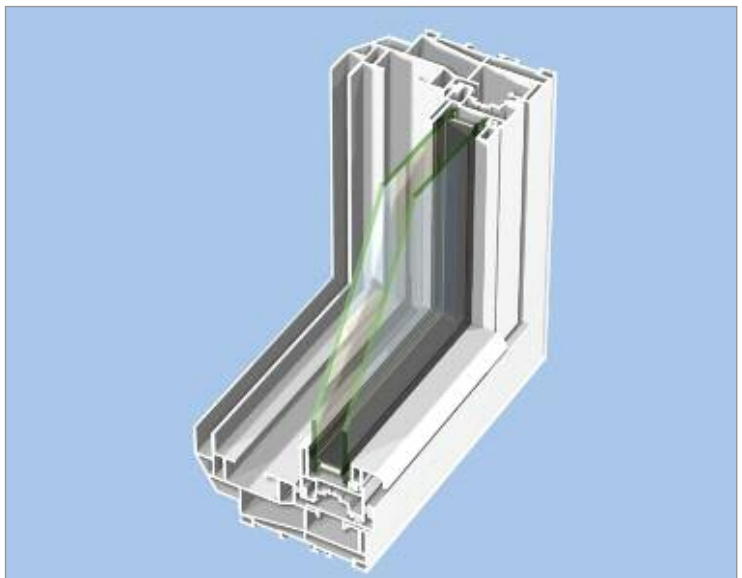
CRL SS96 Hot Melt Butyl Gunning System

- An Efficient Machine for Insulating Glass Fabrication
- Dispenses CRL30703 Hot Melt Butyl Cakes
- Includes 8' Flexible Hose and Handgun
- Our Most Popular Model

Handgun Assembly
(Included with SS96)

The CRL Hot Melt Butyl Gunning System is compact and versatile. Its unique pumping action eliminates entrapped air in the sealant. The pump has a 10 pound (4.53 kg) tank capacity with a temperature range from 100°F to 425°F (37°C to 217°C). CRL Hot Melt Butyl can be added while gunning, and an adjustable flow control valve knob regulates the sealant output.

An 8' (2.4 m) Flexible Hose with variable 350°F to 450°F (177°C to 232°C) temperature control is coupled with a lightweight, heated handgun that features a swivel and trigger lock action. Two adjustable temperature controllers located inside the electrical enclosure regulate the temperature of the melting tank and the handgun/hose assembly. The SS96 does not use compressed air, and operates quietly. The mechanical and electrical systems contain few moving parts, resulting in less down time and low maintenance operation. Total shipping weight, including wood crate, is 120 pounds (54 kg).

8' (2.4 m) Heated Hose
(Included with SS96)

CAT. NO.	DESCRIPTION
SS96	Hot Melt Butyl Gunning System
SS26263N	8' (2.4 m) Replacement Heated Hose
SS75085000	Replacement Handgun Assembly

Minimum order: 1 each. SS96 must ship common carrier only.

SS96 SPECIFICATIONS

ELECTRICAL
Voltage - 115 VAC, 60 Hz with ground
240V Models Available on Special Order
Wattage - 1265 Watts
Motor Rating - 1/6 hp, gearbox
38 rpm output
Warm-Up Time - 45-60 minutes

FUNCTIONAL
Melt Rate - 8 lbs. (3.6 kg)/hour
Pump Output Rate (Maximum) - 40 lbs. (18.1 kg)/hour
Tank Temperature Range - 100-425°F (37-217°C)
Tank Capacity – 10 Lb. (4.5 kg)
Gun/Hose Temperature Range - 350-450°F (177-232°C)

CRL Insulating Glass Hot Trim Knife

- Speeds Up I.G. Unit Production
- Works on Standard 110V AC Power
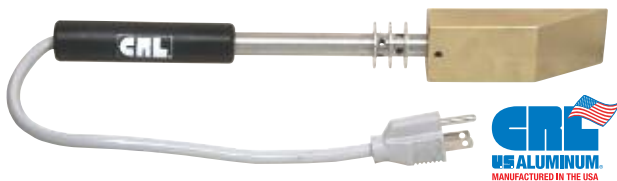
The CRL Insulating Glass Hot Trim Knife trims excess hot melt butyl from single or stacked units. It's the fast and efficient way to finish off single or dual sealed hot melt butyl units. This light, easy to handle Knife also can be used to cut up large slugs of hot melt butyl sealant for faster melting in a thermal extruder system.

Replacement Tips are available when the current Tip on your Hot Trim Knife becomes worn and caked with excess butyl. Made from solid brass, these Tips can be used for quite a long time before they need to be replaced.

CAT. NO.	DESCRIPTION
1BK990	Hot Trim Knife With Tip
RT90	Replacement Tip

Minimum order: 1 each.

CRL Brass Tip Nozzles

- Speeds the Application of Insulating Glass Sealant
- Made From Solid Brass

CRL Brass Tip Nozzles may be used with almost all automated sealant dispensing systems. These Nozzles have a ridge that fits between the lites of glass to make the application of hot melt butyl much smoother. Nozzles may be used with our HEG522 or SS96, and all other hot melt extruders.

Brass Tip Nozzle

BRASS TIP NOZZLES

CAT. NO.	SIZE
BN3	3/16" (4.8 mm)
BN4	1/4" (6.3 mm)
BN5	5/16" (7.9 mm)
BN6	3/8" (9.5 mm)
BN7	7/16" (11.1 mm)
BN8	1/2" (12.7 mm)
BN10	5/8" (15.9 mm)
BN12	3/4" (19 mm)

Minimum order: 1 each.

Brass Pipe Nipple
CAT. NO. E9133

The CRL Brass Pipe Nipple works with the Cat. No. HEG522 Hot Extruder Gun and allows for the attachment of CRL Brass Tip Nozzles. Minimum order is one each.

CRL Aztech Mini Hot Melt Butyl Dispensing System

- Fast Heat-Up Time; 200°F to 400°F Operating Range
- Used to Dispense CRL30703, CRL30706, and N420LB Chunk or Chip Form Hot Melt Butyl

The CRL Aztech Mini Hot Melt Butyl Dispensing System is a compact table-top hot melt gunning unit designed for production rates of up to 50 pounds (22.7 kg) of hot melt sealants or adhesives per day. The pot holds approximately 20 pounds (9 kg) of material. Additional material may be added to the pot at any time during production. A heavy-duty progressive cavity pump provides a uniform, pulse free adjustable flow rate for hand gunning or automatic dispensing. Operating range from 200 to 400° F (93 to 204° C). An 8' (2.4 m) heated gunning hose and a trigger actuated hand gun with a swivel coupling is supplied with the unit. A variety of nozzles and dispensing heads are available. Clean up is minimal. The power is simply turned off when the equipment is no longer needed, and reheated when required. Heat-up time is approximately one hour. Minimum order is one each. F.O.B. Somerville, New Jersey.

Stand with Casters Sold Separately. CAT. NO. ATXS

CAT. NO. ATXM1

MEASUREMENTS
Width: 19" (482 mm), Height: 16" (406 mm)
Length: 24" (609 mm), Weight: 90 Lbs. (40.8 kg)

CRL Aztech II Hot Melt Butyl Dispensing System

- For Heating and Dispensing CRL30706 and N420LB Hot Melt Butyl in Chip, Chunk, or Slug Form
- Adjustable Temperature Control

This CRL Aztech II Hot Melt Butyl Dispensing System extrudes chunk, slug or chip-form hot melt butyl sealants from a heated hopper-type pot that also serves as the body of the positive displacement extruder pump. The extruder pump is driven by a 1/2 HP motor mounted on a direct drive gear reducer that is coupled to the pump drive shaft by a double-belt pulley. An internal screw auger moves material into the mouth of the pump. The pot holds approximately 30 pounds (14 kg) of material, and the system is designed for production rates of up to 200 pounds (90.7 kg) of hot melt sealants or adhesives per day. The heated 12' (3.7 m) hose is steel braided with a spring guard to prevent excessive flexing. Separate rheostats for hose and pot range up to 400°F (204°C). Operates on 220 Volts. Minimum order is one each. F.O.B. Somerville, New Jersey.

Stand with Casters Sold Separately. CAT. NO. ATXS

CAT. NO. ATX11

MEASUREMENTS
Width: 30" (762 mm), Height: 19" (482 mm)
Length: 31" (787 mm), Weight: 180 Lbs. (81.6 kg)

CRL Hot Melt Clamp Table

- Clamp Units Up to 4" Thick
- Aids in the Assembly of Insulating Glass Units

The CRL Hot Melt Clamp Table has heavy-duty tubular steel construction. This tubular framed clamping unit consists of a stabilizer unit in the bottom, which is a horizontal bar powered by a 4" (102 mm) bore x 2" (51 mm) stroke pneumatic cylinder actuated by a hand lever on the frame. The clamping head has a horizontal bar lined with a 1" square (25 mm square) strip of closed cell, 40 durometer shore "A" neoprene rubber; powered by a 2" (51 mm) bore x 8" (203 mm) stroke pneumatic cylinder actuated by a foot pedal. The stabilizing bar comes up from the bottom and the clamp head comes down from the top to secure glass and spacer along one edge for sealant application. The clamping unit must be released and the unit rotated and reclamped to seal each side. Requires 100 psi and seven cfm air supply. F.O.B. Red Oak, Texas. Minimum order is one each.
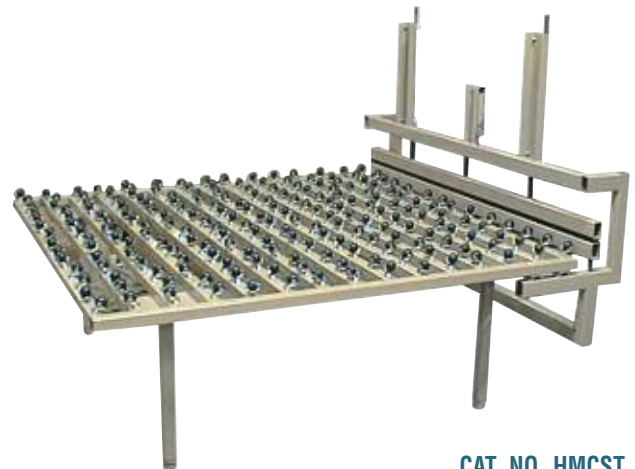
CAT. NO. HMCST

CRL Hot Melt Butyl

CRL Hot Melt Butyl Insulating Glass Sealant is a 100% solids, hot applied butyl-based sealant designed to give tenacious adhesion to glass and aluminum for a moisture proof seal in Insulating Glass units. The product is a one-component sealant system with lower moisture vapor transmission rates than current polysulfide, silicone, or polyurethane systems. It has been formulated to support the operation of multiple application guns from a single pump station. This easy to apply sealant offers exceptional performance under environmental exposure to ultraviolet light, temperature extremes, and moisture. It exceeds ASTM E-773/E-774 specifications. Technical Data is available at **crlaurence.com.**

- Hot Applied for Exceptional Flow
- Low Moisture Vapor Transmission Rate
- Excellent Adhesion to Glass and Metal
- Packaged in a Variety of Forms to Suit Your Application System

TECH DATA FOR CRL307 SERIES HOT MELT BUTYL

Color .... Black
Moisture Vapor Transmission Rate .... 0.35 g/m²/24 hr.
Suggested Application Temperature .... 350 to 400°F (175 to 204°C)
Brookfield Thermosel Viscosity at 374°F (190°C) .... 275,000 cps
Shear Strength (Aluminum/Aluminum) .... 50 psi cohesive failure
Average Setting Time .... Window units may be moved after 3 minutes cooling time
Weight per Gallon .... 9.91 Lbs. (4.5 kg)

CRL Hot Melt Butyl Cakes

- Convenient Cake Form is Easy to Use

CRL Hot Melt Butyl Cakes are easy to use in CRL SS96, Aztech ATXM1, and ATX11 dispensing systems.

CAT. NO.	APPROX. SIZE	WEIGHT/CASE
CRL30703	7-1/2" x 4" x 2-1/2" (190 x 102 x 63.5 mm)	48 lbs (22 kg)

Minimum order: 48 pounds. Must be ordered in increments of 48 pounds.

CRL Hot Melt Butyl Chunks

- Fit All Large Hot Melt Butyl Dispensers

CRL Hot Melt Butyl in chunk packaging is for larger dispensers, such as CRL Aztech Mini (Cat. No. ATXM1) and Aztech II (Cat. No. ATX11). The Chunks are dropped into the melting pots whole. **NOTE:** Hot Melt Butyl is dispensed at operating temperatures of 400°F (204°C). Wear the proper safety gear including gloves, arm guards, and protective eyewear to avoid burns and other injuries.

CAT. NO.	APPROX. SIZE	WEIGHT/CASE
CRL30706	2-1/2" x 6" x 7-1/2" (63.5 x 152 x 190 mm)	48 lbs (22 kg)
N420LB	3" x 6" x 7-1/2" (76 x 152 x 190 mm)	50 lbs (23 kg)

Minimum order: 48 pounds for CRL30706 and 50 pounds for N420LB. Must be ordered in those increments.

CRL Hot Melt Butyl in Pails

- For Five Gallon Pail Hot Melt Butyl Dispensers

CRL Hot Melt Butyl in five gallon pails applies with any hot melt pumping system for five gallon pails.

CAT. NO.	CONTAINER	NET WEIGHT
CRL30705	5 gal. (19 l) Pail, net 4 gal. (15 l) Butyl	41 lbs (18.5 kg)

Minimum order: 1 pail.

CRL Hot Melt Butyl in Drums

- For 55 Gallon Drum Hot Melt Butyl Dispensers

CRL Hot Melt Butyl in 55 gallon drums applies with any hot melt pumping system for 55 gallon drums.

CAT. NO.	CONTAINER	NET WEIGHT
CRL52055GL	55 gal. (208 l) Drum, net 48 gal. (182 l) Butyl	485 lbs (220 kg)

Minimum order: 1 drum.

CRL Hot Melt Extruder Gun

- Variable Extrusion Rates to 1/2 Pound Per Minute
- Two to Three Minutes Start-Up Time
- Lightweight and Portable

This CRL Hot Melt Extruder Gun is a specially designed portable gun for applications requiring the use of hot flow materials, such as Hot Melt Butyl Sealant for the fabrication of Insulating Glass units. The Gun features a heated barrel with a trigger control, hydraulic pressure for constant uniform flow without pulsing or air gaps, and a quick-refilling capacity to reduce your down time.

The conical design within the sealant chamber allows trapped air to bleed backward to maintain a uniform material flow. By attaching the optional Cat. No. RH522 CRL Butyl Rope Holder (not included), this unit will hold one roll of CRL Hot Melt Butyl Rope.

Variable temperature setting from 200 to 400°F (93 to 204°C) with the 610 Watt heater. The Gun weighs only 11 pounds (5 kg) for easy maneuverability.

Power: 8.5 Amps; 110V AC; single phase; 50/60 Hz. 240V model available on special order.

110V AC
Hot Melt Extruder Gun
CAT. NO. HEG522

Optional
Hot Melt
Butyl Rope Holder
CAT. NO. RH522
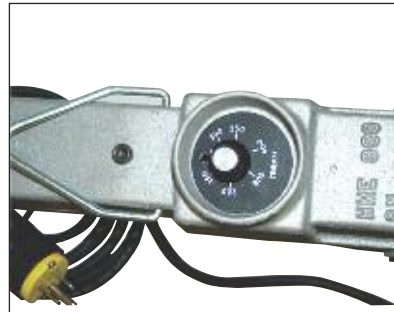
Variable Temperature Settings

Hot Melt Butyl Rope Holder (Optional Accessory)

CRL Hot Melt Butyl Rope

- Rope Form for Use in CRL HEG522 Hot Melt Extruder Gun

CRL Hot Melt Butyl Rope is insulating glass sealant in rope form. It is made to use in our Cat. No. HEG522 Hot Melt Extruder Gun (sold separately see above).

For ease of use we suggest the optional RH522 Butyl Rope Holder (see above).

CRL Hot Melt Butyl in Cartridges

- For Use With Thermal Extruder Guns

This is our one-part cross-link CRL Hot Melt Butyl Insulating Glass sealant in 11 ounce (325 ml) metal cartridges for use with thermal extruder guns. 100% solids content features low moisture vapor transfer rate, excellent adhesion to glass and metal, low shrinkage, high performance under all weather conditions. The sealant cools within five to 10 minutes to form a strong resilient seal. Cartridges require pre-heating prior to application.

CAT. NO.	PACKAGING	ROLLS/CASE
N415	4.5 Lbs. (2 kg) Rolls, Approximately 551' (16.8 m) Long	8

Minimum order: 1 roll.

CAT. NO.	CONTENTS	CTG/CASE
N415TU	11 Fl. Oz. (325 ml)	24

Minimum order: 1 each. All cartridge sealants can be combined for quantity pricing.

CRL Two-Part Polysulfide Insulating Glass Sealant

- Compatible With Aluminum Spacers
- Resistant to Weather, Ozone, Sunlight, Heat, and Cold
- Cures Rapidly to Permit Easy Cutting and Handling

CRL Two-Part Polysulfide Insulating Glass Sealant seals insulating glass units against moisture, cold, and heat. It out performs competitive polysulfide sealants in resistance to moisture, sunlight, aging, and weathering. CRL Two-Part Polysulfide Insulating Glass Sealant maintains outstanding adhesion to glass, aluminum, and other spacer and corner materials under the most severe weather conditions. Cures rapidly to permit easy cutting and handling within four to 12 hours at room temperature, or even less time at elevated temperatures. High strength and low cost make it attractive for single and dual seal units. Sealant passes SIGMA specifications for durability of Insulating Glass units.

SPEC. DATA
MSDS

CAT. NO. N4005GL

CAT. NO. N400G15

CAT. NO. N40055GL

ACTIVATOR
BASE
A Complete Kit
In One Pail

CAT. NO.	COLOR	CONTENTS
N400G15	Black	1-1/2 Gallons (5.7 l)
N4005GL	Black	5 Gallons (18.9 l)
N40055GL	Black	55 Gallons (208.2 l)

Minimum order: 1 each. N40055GL ships via common carrier F.O.B. Delaware.
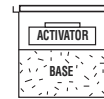
CRL Two-Part Polyurethane Insulating Glass Sealant

- Compatible With Edgetech Super Spacer®
- Low Moisture Vapor Transfer Rate
- Can Be Used With Adsorbent Filled Aluminum Spacers

SPEC. DATA
MSDS

ACTIVATOR
BASE
A Complete Kit
In One Pail

CAT. NO. N600G15

CAT. NO. N60055GL

CRL Two-Part Polyurethane is an effective edge seal used for fabricating Insulating Glass units. Best when mixed by weight, using only as much as you need. Correct proportioning mixing ratio by weight is 14.8 to 1. Mix with a portable drill mixer and apply with a flexible blade putty knife. This Two-Part Polyurethane Sealant contains no solvents, allowing it to be used safely with Super Spacer®. Set time is three hours when properly mixed.

CAT. NO.	COLOR	CONTENTS
N600G15	Black	1-1/2 Gallons (5.7 l)
N60055GL	Black	55 Gallons (208.2 l)

Minimum order: 1 each. N60055GL ships via common carrier F.O.B. Delaware.

Insulating Glass Compatible Sealants

CRL RTV408 Neutral Cure Silicone

SPEC. DATA
MSDS

- Compatible for Insulating Glass Glazing
- Designed for Primerless Adhesion
- Low Odor, Non-Acetic Cure Formula
- AAMA Approved

CAT. NO.	COLOR
RTV408C	Clear
RTV408AL	Aluminum
RTV408BL	Black
RTV408BRZ	Bronze
RTV408BGE	Beige
RTV408DT	Dark Tan
RTV408T	Tan
RTV408W	White

Minimum order: 1 each. All cartridge sealants can be combined for quantity pricing.

Get full details at **crlaurence.com**

CRL 321 Acrylic Latex With Silicone

SPEC. DATA
MSDS

- Suitable for Glazing Insulating Glass Units in Wood Frames
- Paintable With Oil or Latex Based Paints
- Mildew Resistant

CAT. NO.	COLOR
321C	Clear
321W	White
321BRZ	Bronze
321GRY	Gray
321ALM	Almond

Minimum order: 1 each. All cartridge sealants can be combined for quantity pricing.

Get full details at **crlaurence.com**

Super Spacer is a registered trademark of Quanex Building Products Corporation.

CRL Polyisobutylene Primary Seal

- Used to Manufacture Dual Seal Insulating Glass Units
- Exceptional Low Vapor Transmission
- Keeps Units From Fogging

CRL Polyisobutylene is used as the primary vapor seal in dual sealed Insulating Glass units. It is a one-part, non-drying, non-hardening material for dual seal fabrication in either tape or slug form. Primarily used in conjunction with CRL Insulating Glass Silicone, Polyisobutylene adheres to glass and metal, and resists water, ozone, and ultraviolet light.

The tape form is applied by hand to the sides of Dual Seal Spacer. Slugs are used in automated machines for application to the Spacer. CRL Polyisobutylene is made under the highest quality control conditions possible. With 100% solid content, it's compatible with any secondary seal.

Tape Form

Carefully Compress PIB to Assure a Good Seal

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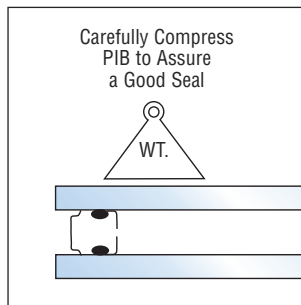
Slug Form

POLYISOBUTYLENE TAPE

CAT. NO.	ROLL LENGTH	ROLLS/CASE	FEET/CASE
2132559	210' (64 m)	10	2100' (640 m)

Minimum order: 1 case.

POLYISOBUTYLENE SLUGS

CAT. NO.	SIZE	WEIGHT	SLUGS/CASE
BK129	7-1/2" Dia. (190 mm) x 9" (229 mm)	15 lbs. (6.8 kg)	4

Minimum order: 1 case.

CRL 3" Flexible Knife

- High-Carbon Flexible Steel Blade
- Large Soft Grip Handle

Our CRL Flexible Blade Knife features a high-carbon steel blade set in a large soft grip handle. Blade width is 3" (76 mm). Overall length is 9" (229 mm). Excellent for hand application of Two-Part Insulating Glass Sealants. Minimum order is one each.

CAT. NO. HW035

CRL 6" Deluxe Handy Clamp

- Evenly Spreads Force Over Insulating Glass Unit
- Vinyl Tips and Grips

CRL Deluxe Handy Clamps hold Insulating Glass Spacers in place during the sealing process. The modern design of the Clamp minimizes the spread between handle ends, and makes the "grip" more comfortable for the user. Heavily plated steel Clamps have smooth, bright finish to resist corrosion. Maximum jaw opening is 2" (51 mm). Minimum order is one each.

CAT. NO. JC3202HT

CRL 9542 Insulating Glass Silicone Sealant

- Specially Formulated for the Manufacture of Dual Seal Insulating Glass Units
- Excellent Glass-to-Glass Adhesion
- Resistance to UV Light and Weather Extremes

CRL 9542 Insulating Glass Silicone is a single component, neutral cure silicone glass sealant specifically designed for producing long lasting insulating glass units when used with a primary seal of polyisobutylene (page I146). 9542 contains adhesion promoting additives for excellent glass-to-glass adhesion, and is resistant to ultraviolet light and weather extremes. CRL 9542 has a functional temperature range of -80°F to 400°F (-62°C to 204°C).

It is available in easy-to-use 10.3 fl. oz. (305 ml) cartridges or 52 gallon drums for bulk dispensing. This product is black in color. Tack-free time is 30 minutes; fully cures 1/8" (3 mm) thickness in 24 hours. Units may be cautiously moved after 24 hours. Full strength is obtained in seven days. See page I145 for Neutral Cure Silicone to be used as a compatible bedding sealant for I.G. units.

SPEC. DATA

MSDS

10.3 Fl. Oz. (305 ml);
30 Cartridges per Case,
1440 Cartridges Per Pallet;
Screw-On Nozzle

Additional Nozzles Available Cat. No. S1LN0Z

TECHNICAL DATA: Meets or exceeds Federal Specifications TT-S-1543A, Class A (COM-NBS) for silicone building sealants; TT-S-00230C, Class A (COM-NBS) for one-component silicone sealants; ASTM C-920 for elastomer joint sealants, Type S, Grade NS, Class 25, Use NT, G, A; CGSB 19GP-13.

CAT. NO.	COLOR	CONTENTS
9542	Black	10.3 Fl. Oz. (305 ml)
954252GL	Black	52 Gallons (197 L)

Minimum order: 1 each. 954252GL must ship common carrier.

CRL 12 Volt DC Variable Speed Cordless Cartridge Caulking Gun for Lightweight Sealants

- Variable Speed Trigger Controls Flow of Sealant
- Use to Dispense Lightweight Sealants Such as Silicones and Acrylic Latex
- Complete With 12 Volt Battery, One Hour Charger, and Molded Plastic Carrying Case

This CRL 12V DC Cordless Cartridge Caulking Gun operates on a 12 volt Rechargeable Battery and comes with a One Hour Charger. The variable speed control is in the trigger for easy adjustments in speed. It is ideal for glazing contractors, building contractors, roofers, cabinet makers, OEM fabricators, window manufacturers, or anyone who applies a lot of silicone or acrylic latex sealants and wants an easier, more professional way of getting the job done, without the restrictions of cords or hoses. Affordable and effective, this gun also comes with a 90 day warranty. For uninterrupted production, you can order additional LD188B 12 Volt Battery Packs.

WARNING: Not for use with high viscosity automotive urethane adhesives and construction polyurethane sealants. Use Only to dispense lightweight sealants such as silicone and acrylic latex.

CAT. NO.	DESCRIPTION
LD188	12 Volt Cordless Cartridge/Caulking Gun Kit
LD188B	12 Volt DC Battery Pack
LD188C	One Hour Battery Charger
LD188AU	240 Volt Caulking Gun Kit-Australia
LD188C240VAU	240 Volt Battery Charger-Australia
LD188EU	240 Volt Caulking Gun Kit-Europe
LD188C240VEU	240 Volt Battery Charger-Europe

Minimum order: 1each.

CRL 12 to 1 Ratio Strap Frame Caulking Gun

- Low to Medium Viscosity Materials
- Smooth Rod With Thumb Release

This CRL 12:1 Ratio Caulking Gun has the smooth operation of a friction rod, plus a large handle and trigger. Perfect for dispensing low to medium viscosity materials, such as silicones and acrylic latex sealants. The strap frame rotates to move the nozzle tip where needed. The spring release plunger lets you load and dispense quickly and easily. The thumb-activated instant pressure release button prevents sealant run-on. Includes a built-in ladder hook. Minimum order is one each.

CAT. NO. GA1203

CRL Aluminum Air Powered Caulking Gun

- Holds Standard Cartridges
- Air Regulator Pressure Adjuster

A superb quality, lightweight aluminum air powered gun. The 2" x 10" (51 x 254 mm) drawn aluminum barrel holds all standard size cartridges. Gun dispenses materials smoothly and uniformly with just a trigger squeeze, and connects to standard 1/4" (6.4 mm) hose fittings. It has an instant release valve to stop material flow, true air regulator, and can operate at up to 100 psi maximum. Minimum order is one each.

CAT. NO. WG61001

All Caulking Guns can be combined for quantity pricing.

The Aluminum Spacer Fabrication Method

Heat loss costs money and energy, but it can be prevented. Insulating glass is the most effective product that you can provide for your customers to save energy and cut their heating and cooling costs.

Traditional metal spacers for the fabrication of Insulating Glass units are available in both single and dual seal type. Single Seal Spacers have a single shoulder to accept the sealant deep enough to allow for adequate sealant penetration. Dual Seal Spacers accept a polyisobutylene primary seal while the exterior facing shoulders are designed to accept the secondary seal and allow for adequate sealant penetration. Both Single and Dual Seal Spacers utilize Spacer Corners to join them together to form frames.
NOTE: Corners must match spacer design.
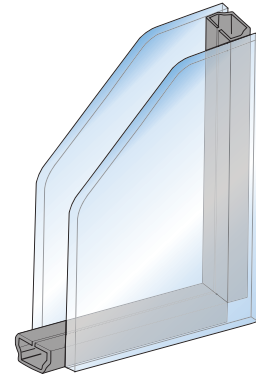
CRL Single Seal Aluminum Spacers

- Laser Welded Spacers Are Available in Two Finishes
- Manufactured to Meet and Exceed Rigid Test Standards

CRL Single Seal Insulating Glass Spacers have a proven record for utility and satisfaction over many years of use. Single Seal Spacers have a single shoulder to accept the sealant, and this shoulder is deep enough to allow for excellent sealant penetration.

Clear Anodized

Bronze Anodized

SINGLE SEAL SPACER
Universal Thickness for these
Single Seal Spacers is .325" (8.3 mm)
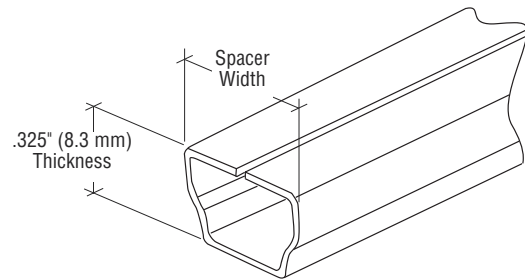
CLEAR ANODIZED CAT. NO.	BRONZE ANODIZED CAT. NO.	SPACER WIDTH	QTY/CASE
3934	3934BRZ	3/16" (4.8 mm)	500
3935	3935BRZ	1/4" (6.3 mm)	350
3936	3936BRZ	5/16" (7.9 mm)	250
3937	3937BRZ	3/8" (9.5 mm)	200
3938	3938BRZ	7/16" (11.1 mm)	175
3939	3939BRZ	1/2" (12.7 mm)	175
3940	3940BRZ	9/16" (14.3 mm)	170
3941	3941BRZ	5/8" (15.9 mm)	150
3941A	3941ABRZ	11/16" (17.5 mm)	150
3942	3942BRZ	3/4" (19 mm)	150

Minimum order: 20 stock lengths per size and color. Sizes can be combined for quantity pricing. Stock lengths are 12'8" (3.8 m). Must ship common carrier, unless you specify we cut them for U.P.S. A Cutting Charge will apply.

Spacer Width

.325" (8.3 mm) Thickness

CRL Corners for Single Seal Spacer

- Long Fin Design Holds Corners in Place
- Made From Durable Nylon

CRL Nylon Corners are designed to fit tightly into CRL Single Seal Spacers for a proper seal. High quality material resists cracking and aging. Quantity per case is 1000. Sold in increments of 100.

CAT. NO.	SIZE
6262	3/16" (4.8 mm)
6265	1/4" (6.3 mm)
6266	5/16" (7.9 mm)
6267	3/8" (9.5 mm)
6268	7/16" (11.1 mm)
6269	1/2" (12.7 mm)
6270	9/16" (14.3 mm)
6271	5/8" (15.9 mm)
6271A	11/16" (17.5 mm)
6272	3/4" (19 mm)

Minimum order: 100 each. Must be ordered in increments of 100. Sizes can be combined for quantity pricing.

CRL Flex Corners for Single Seal Spacer

- Used to Make Variable Angle Frames
- Made From Durable Nylon

CRL Flex Corner Keys for Single Seal Spacers are a low-cost, effective method of producing variable angle Insulating Glass unit frames. The long fin design ensures extra strength and a positive fit. Quantity per case is 1000. Sold in increments of 100.

CAT. NO.	SIZE
6222	3/16" (4.8 mm)
6225	1/4" (6.3 mm)
6226	5/16" (7.9 mm)
6227	3/8" (9.5 mm)
6228	7/16" (11.1 mm)
6229	1/2" (12.7 mm)
6230	9/16" (14.3 mm)
6231	5/8" (15.9 mm)
6231A	11/16" (17.5 mm)
6232	3/4" (19 mm)

Minimum order: 100 each. Must be ordered in increments of 100. Sizes can be combined for quantity pricing.

CRL Low Profile Dual Seal Aluminum Spacers

- For the Fabricator Who Prefers a Dual Seal Insulating Glass Unit
- Laser Welded Spacers With Clear Anodized Finish

This CRL Low Profile Dual Seal Spacer was designed for fabricators of Insulating Glass who prefer a dual seal system. The groove on the shoulder is designed to accept the CRL Polyisobutylene Primary Seal (see page I146), while the taper below the shoulder will accept the secondary seal. The uniform size and shape of this Spacer will assure you the close tolerances required for dual seal fabrication.

Clear Anodized
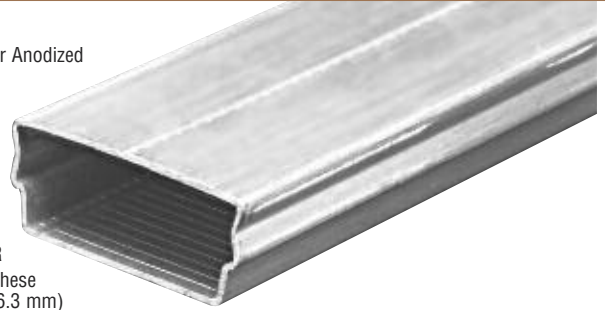
DUAL SEAL SPACER
Universal Thickness for these Dual Seal Spacers is .250" (6.3 mm)

Spacer Width

.250" (6.3 mm) Thickness
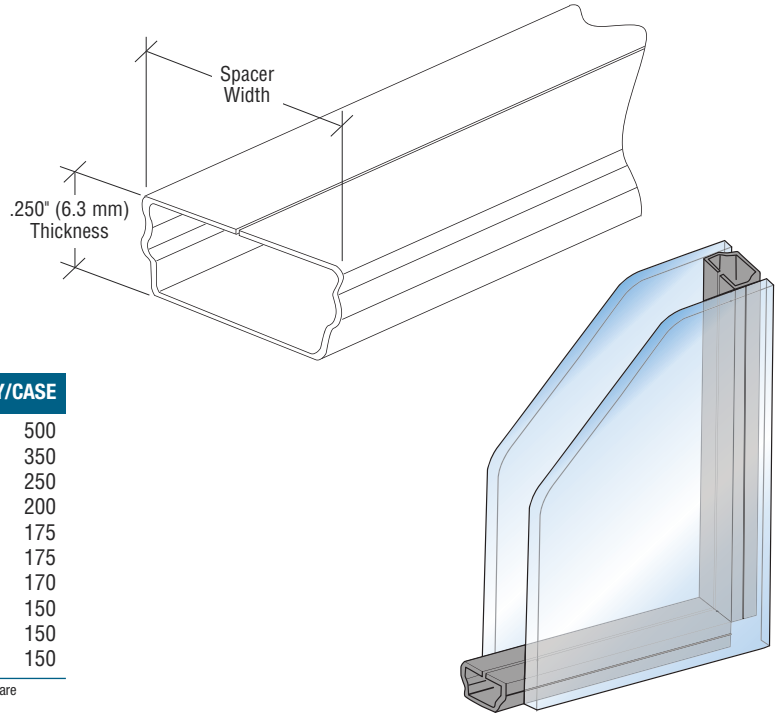
CAT. NO.	FINISH	SPACER WIDTH	QTY/CASE
99124	Clear Anodized	3/16" (4.8 mm)	500
99125	Clear Anodized	1/4" (6.3 mm)	350
99126	Clear Anodized	5/16" (7.9 mm)	250
99127	Clear Anodized	3/8" (9.5 mm)	200
99128	Clear Anodized	7/16" (11.1 mm)	175
99129	Clear Anodized	1/2" (12.7 mm)	175
99130	Clear Anodized	9/16" (14.3 mm)	170
99131	Clear Anodized	5/8" (15.9 mm)	150
99131A	Clear Anodized	11/16" (17.5 mm)	150
99132	Clear Anodized	3/4" (19 mm)	150

Minimum order: 20 stock lengths per size and color. Sizes can be combined for quantity pricing. Stock lengths are 12'8" (3.8 m). Must ship common carrier, unless you specify we cut them for U.P.S. A Cutting Charge will apply.

CRL Corners for Dual Seal Spacer

- Used Exclusively With CRL Dual Seal Spacer
- Made From Durable Nylon

This CRL Nylon Corner for dual seal units has a patented design which allows it to lock tightly into the Spacer to assure a positive seal. Made from nylon, these Corners won't crack or deteriorate over time. Use with CRL Low Profile Dual Seal Spacer only (see above). Quantity per case is 1000. Sold in increments of 100.

CAT. NO.	SIZE
92174	3/16" (4.8 mm)
92175	1/4" (6.3 mm)
92176	5/16" (7.9 mm)
92177	3/8" (9.5 mm)
92178	7/16" (11.1 mm)
92179	1/2" (12.7 mm)
92180	9/16" (14.3 mm)
92181	5/8" (15.9 mm)
92181A	11/16" (17.5 mm)
92182	3/4" (19 mm)
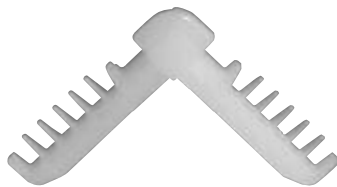
Minimum order 100 each. Must be ordered in increments of 100. Sizes can be combined for quantity pricing.

CRL Lint Free Nylon Gloves

- A Must for Insulating Glass Fabrication
- Keeps Fingerprints Off Glass

CRL Lint Free Nylon Gloves are perfect for handling glass or mirrors without oily fingerprints or other contaminants. An absolute must for handling glass during Insulating Glass fabrication. Two sizes available to fit most anyone's hands.

CAT. NO.	SIZE
NG170	Small
NG171	Large

Minimum order: 1 dozen pairs.

The Importance of Adsorbents

Molecular Sieve (MSD) has an excellent capacity for adsorbing water and chemical vapors, and is the most economical adsorbent on a cost-per-unit basis. MSD provides Insulated Glass fabricators with superior protection against fogging for a longer lasting unit. MSD is suitable for both cool and warm climates, and can be used for residential, architectural, and commercial applications.

MSD has a weight of 6.5 grams per foot in a 1/4" (6.3 mm) square channel. At 77°F (25°C) room temperature and a dew point of 60°F (16°C), 100 pounds (45 kg) of MSD would adsorb approximately 11-1/2 pounds (5.2 kg) of water. MSD is cost effective because it costs less per drop of water removed than any other adsorbent. This provides you with significant savings in unit production.

NOTE: It is only necessary to fill the two long legs of the spacer frame. Fill only one long and one short leg when the long side is greater than 2-1/2 times the length of the short side.
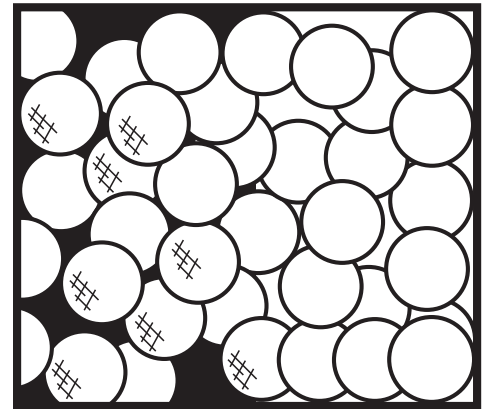
CRL MSD Molecular Sieve Adsorbent

- Standard Formula Removes Moisture From I.G. Units
- Three Standard Packaging Sizes
- Ask About Our High Volume Special Pricing

This CRL MSD Type Molecular Sieve is an all-purpose adsorbent for use in the fabrication of Insulating Glass units. It has an excellent capacity for adsorption of water and chemical vapors. MSD provides Insulating Glass fabricators with superior protection against fogging for a longer lasting unit.

MSD is suitable for both cool and warm climates, and can be used for residential, architectural, and commercial applications. CRL Molecular Sieve Adsorbent is cost effective because it costs less per drop of water removed than any other adsorbent. This means significant savings in unit production.

NOTE: Avoid prolonged skin contact when working with this product.

CAT. NO. MSD50B

CAT. NO. MSD325

CAT. NO. MSD5

CAT. NO.	CONTENTS	APPROXIMATE SHIPPING WEIGHT
MSD5	5 Pound (2.2 kg) Can	6 Pounds (2.7 kg)
MSD50B	55 Pound (25 kg) Box	57 Pounds (26 kg)
MSD325	325 Pound (147.4 kg) Drum	335 Pounds (152 kg)

Minimum order: 1 each. MSD325 must ship common carrier only.

CRL Low Deflection Molecular Sieve Adsorbent

- Low Deflection Formula Removes Moisture from I.G. Units
- Ask About Our High Volume Special Pricing

This CRL Low Deflection Molecular Sieve Adsorbent is a uniform bead product with a high capacity for both moisture and solvent vapor. MSD LDA features low deflective characteristics and benefits in both economy and performance. Longer unit life results from the minimization of unit seal stress and deflection. Two convenient packages are available, both designed to protect the product during shipment and storage.

NOTE: Avoid prolonged skin contact when working with this product.

CAT. NO. MSD50BLDA

CAT. NO. MSD325LDA

CAT. NO.	CONTENTS	APPROXIMATE SHIPPING WEIGHT
MSD50BLDA	55 Pound (25 kg) Box	57 Pounds (26 kg)
MSD325LDA	325 Pound (147.4 kg) Drum	335 Pounds (152 kg)

Minimum order: 1 each. MSD325LDA must ship common carrier only.

CRL INSULATING GLASS SUPPLIES

CRL Desiccant Filling Machine

- 12 Gallon Storage Container
- Fills Up to 35 Spacers at Once
- Visit **crlaurence.com** for Additional Insulating Glass Machinery

The CRL Desiccant Filling Machine is a fast, effective, and space-saving alternative for spacer bar filling. Fills up to 35 spacers at one time. The unit features all steel construction, and has a 12 gallon (45.4 l) storage capacity container for the desiccant. Its special spacer seal barrier and electric vibrator assure complete filling of the spacers. It can handle spacers of all sizes at the same time. Easy to operate and completely adjustable to a comfortable working height. Only one 110V AC source is required for the operation of the vibrator. Shipped knocked down F.O.B. Red Oak, TX. Minimum order is one each.

- **Adjustable Working Height**

SPECIFICATIONS:
Height: 96" (2438 mm)
Length: 48" (1219 mm)
Width: 20-1/2" (520 mm)
Weight: 255 lbs. (116 kg)

CAT. NO. EDFM

CRL Aluminum Breather Tubes

- Equalizes Pressure in I.G. Units
- Larger Inside Diameter
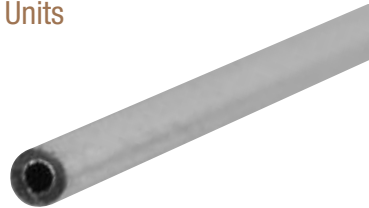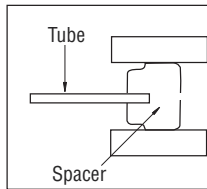
Tube
Spacer

If your Insulating Glass units are transferred from low to high altitudes, or vice versa, install these CRL Breather Tubes into the spacer frame to equalize pressure. Upon arrival at the installation point, simply snip off the Tube below sealant surface, crimp the end and then seal. The larger inside diameter of the tube allows the unit to equalize the pressure faster. Available in two lengths.

CAT. NO.	LENGTH	I.D.	O.D.	QTY/PKG
3003	6" (152 mm)	.030" (.76 mm)	.050" (1.27 mm)	100

Minimum order: 100 each.

CRL Stainless Steel Capillary Tubes

- Equalizes Pressure in I.G. Units
- Does Not Have to be Crimped
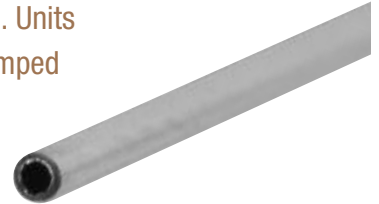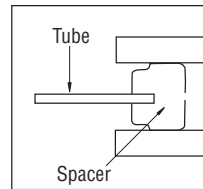
Tube
Spacer

If you transport Insulating Glass units from low to high altitudes, or vice versa, install these CRL Capillary Tubes into the spacer frame to equalize pressure. The smaller inside diameter of the Tube and longer length does not allow as much moisture to travel up the Tube. At the destination point the Tube does not have to be crimped and sealed, just bent over along the frame at the top of the unit.

CAT. NO.	LENGTH	I.D.	O.D.	QTY/PKG
CT12C	12" (305 mm)	.021" (.533 mm)	.031" (.787 mm)	100
CT12M	12" (305 mm)	.021" (.533 mm)	.031" (.787 mm)	1000

Minimum order: 100 each for CT12C; 1000 each for CT12M

CRL Test Kit for Molecular Sieve

- Used to Determine Freshness of MSD
- Easy to Use

Since the useful life of any adsorbent is reduced by excessive exposure to the atmosphere, daily testing of inventory with the CRL MSD Test Kit is recommended. The Kit lets you measure residual moisture quickly and easily. Kit contains two measuring glasses, one thermometer, one reference graph, and one instruction sheet. Minimum order is one each.

NOTE: Read instructions carefully and use caution when using this Test Kit. Work in an open area with good ventilation. A chemical reaction takes place when using.

CAT. NO. MSDTK

Easy Steps to High Quality Insulating Glass Muntin Bar Fabrication

- **Muntin Bars Produce a Distinctive Divided Lite Appearance for Colonial Style Insulating Glass Units**

For "Colonial" style Insulating Glass units, install CRL Muntin Bars cut to length using the inside measurements of the spacer frame. As with spacer frame fabrication, Muntin Bars should be cut with a fine 100 to 150 tooth saw blade (see page I106) without oil or coolant. It is also recommended that Cat. No. NG171 Lint Free Gloves be worn while handling Muntin Bar lengths to reduce contamination (see page I149).

Measure and mark the cross points of Muntin Bars. Notch each bar with Cat. No. MMBN1 Manual Muntin Bar Notcher with the appropriate die and punch (see page I154).

After press fitting the Muntin Bar grid together, insert the appropriate Muntin Bar Clips. Larger Muntin Bar grids may require the use of internal Muntin Joiners. Drill or punch the spacer frames at the connecting points of spacer and Muntin Bar Clips. Use an electric hand drill, drill press or Cat. No. MBKP1 Muntin Bar Keeper Punch (see page I155). Finished Muntin Bar grids then are assembled into the spacer frame.
NOTE: Clean Muntin Bars before sealing unit with 1973, 3371100, or S50 Glass Cleaner (see page I166). Do not use MEK, alcohol, or similar chemicals.

CRL Muntin Bars

- **Fit Inside Spacer Frame to Create Colonial Style Insulating Glass Units**

- **Easy to Fabricate**

CRL Muntin Bars add a distinctive flair to your Insulating Glass units. They are ideal for the fabrication of "Colonial" style windows. Muntin Bars are cut to size, and then assembled with CRL Muntin Bar Clips before being placed inside the unit.

For a professional 'crisscross' effect, use the CRL Manual Muntin Bar Notcher (see page I154) and secure with the proper CRL Internal Muntin Joiners (see page I153).

Stock lengths of Muntin Bars are 12' 8" (3.9 m). There are two finishes that will complement the trim of most any home.

CAT. NO. 36006BRZ

CAT. NO. 36009BRZ

CAT. NO. 36012W
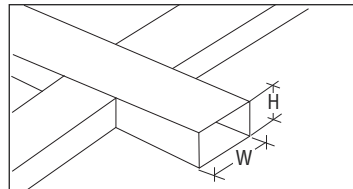
CAT. NO. 36004W

WHITE CAT. NO.	BRONZE CAT. NO.	SIZE HEIGHT X WIDTH	QTY/CASE
36006W	36006BRZ	3/16" x 13/16" (4.8 x 20.6 mm)	50
36009W	36009BRZ	3/16" x 9/16" (4.8 x 14.3 mm)	50
36012W	36012BRZ	3/16" x 5/8" (4.8 x 15.9 mm)	50
36004W	36004BRZ	3/16" x 3/4" (4.8 x 19 mm)	50

Minimum order: 1 stock length. A Packing Charge will be added to orders fewer than 20 combined lengths. Stock lengths longer than 98" (2.49 m) must ship common carrier, unless you specify we cut them for U.P.S. A Cutting Charge will apply. Sizes and colors can be combined for quantity pricing.

CRL Universal Muntin Clips

- **Fit Rectangular Spacer Widths 1/4" to 3/4" (6 to 19 mm)**

- **Flexible to Fit Any Angle**

- **Solid Centering Foot**

- **No Spacer Punching Required**

- **Works With Aluminum Spacers, Super Spacer®, and Duralite®**

new
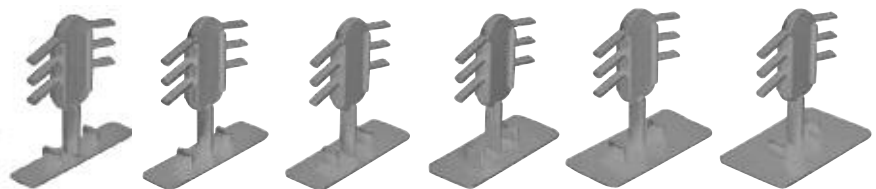
These CRL Universal Muntin Clips will fit all rectangular muntin bars up to 3/4" (19 mm) wide. The side fins help to center and lock the Clip inside the muntin bar, and the small nubs on the base keep the muntin from twisting when installed. Thin, flexible stem allows Clip to work with virtually any mitered angle. Clip base is slightly undersized so as not to interfere with the glass. Molded from grey resin to blend in with spacer color. No spacer punching required.

Super Spacer and Duralite are registered trademarks of Quanex Building Products Corporation.

CAT. NO.	AIR SPACE	BASE DEPTH
UMC14	1/4" (6 mm)	.220" (5.6 mm)
UMC516	5/16" (7.9 mm)	.295" (7.5 mm)
UMC38	3/8" (9.5 mm)	.360" (9.1 mm)
UMC12	1/2" (12.7 mm)	.485" (12.3 mm)
UMC58	5/8" (15.9 mm)	.605" (15.4 mm)
UMC34	3/4" (19.1 mm)	.734" (18.6 mm)

Minimum order: 100 each. Must be ordered in increments of 100. All Muntin supplies can be combined for quantity pricing.

CRL INSULATING GLASS SUPPLIES

CRL Muntin Clips

- Designed to Work With CRL Muntin Bars
- Made From Durable Nylon
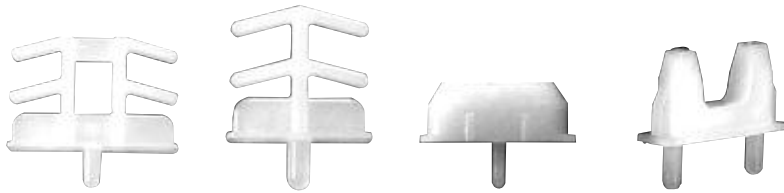
CAT. NO. 61071 **CAT. NO. 61070** **CAT. NO. 61072** **CAT. NO. 61073**

CRL Muntin Clips are designed to fit tightly in CRL Muntin Bars to properly secure the Muntin Assembly within the air space of an Insulating Glass unit.
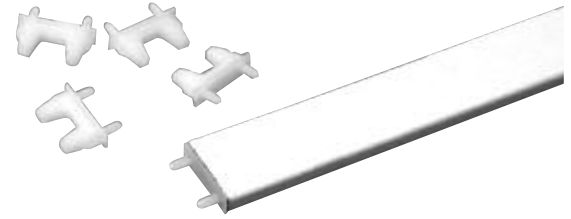
CAT. NO.	FITS BAR	PRONGS	QTY/BOX
61071	36006	1	100
61070	36009	1	100
61072	36012	1	100
61073	36004	2	100

Minimum order: 100 each. Must be ordered in increments of 100.
All Muntin supplies can be combined for quantity pricing.

CRL Internal Muntin Joiner

- For Joining Notched Muntin Bars

The CRL Internal Muntin Joiner holds the notched bar intact during the grid and frame assembly. It makes assembling Muntin Bars easier and more manageable, especially for larger sized Insulating Glass units. Two sizes fit most applications.
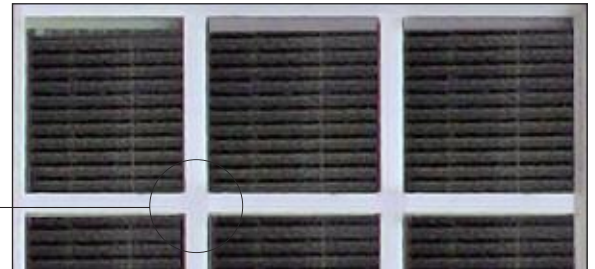
CAT. NO.	FITS BAR	QTY/BOX
AM04	36004/36006	100
AM609	36009/36012	100

Minimum order: 100 each. Must be ordered in increments of 100.
All Muntin supplies can be combined for quantity pricing.

CRL Flexible Muntin Locator

- Secures Sunburst and Wagon-Wheel Windows

Use the CRL Flexible Muntin Locator to secure sunburst and wagon-wheel windows in their frames. The flexible end pin helps eliminate unsightly gaps. They are an excellent aid in the fabrication of Insulating Glass units.

CAT. NO.	FITS BAR	QTY/BOX
AM06	36004/36006	100
AM12	36009/36012	100

Minimum order: 100 each. Must be ordered in increments of 100.
All Muntin supplies can be combined for quantity pricing.

CRL Sunburst Muntin Joiner

- For Circle Top Windows
- Use With 36012 Muntin Bars Only

CRL Sunburst Muntin Joiners make half and full-circle windows easy to fabricate. The white, flexible nylon holds the muntin bar securely, producing great looking wagon-wheel windows. These Joiners are made for use with CRL 36012 Muntin Bars only.

CAT. NO.	FITS BAR	QTY/BOX
AM601	36012	100

Minimum order: 100 each. Must be ordered in increments of 100.
All Muntin supplies can be combined for quantity pricing.

CRL Manual Muntin Bar Notcher and Die Sets

- **Each Precision Machined Unit is Made to Customer's Specifications**

- **Interchangeable Dies**

This CRL Manual Muntin Bar Notcher will notch most Muntin Bars quickly and smoothly. Each Die Set is custom fabricated from hardened and ground tool steel. The Notcher comes with one Die Set. If you are using CRL Muntin Bar, no sample is required; simply provide the CRL Catalog Number of the Muntin being used. Otherwise, four sample pieces of your Muntin Bar, 24" (610 mm) long, are required in order to fabricate the Dies properly. Contact CRL Technical Sales for machine details and specifications.

Each CRL Die Set for the Muntin Bar Notcher is made from the finest heat-treated tool steel, and to your exact specifications. **NOTE:** To ensure a proper fit you must specify the distance between the mounting holes and the blade tip of your existing Die Set to match the new Blade and Die Set. Minimum order is one each.

CAT. NO. MMBD1E
Die Set for Muntin Bar Notcher

CAT. NO. MMBN1
Manual Muntin Bar Notcher

CRL Air Powered Muntin Bar Notcher and Punch and Die Sets

- **For Fast Notching of Muntin Bars**

- **Excellent for Production Work**

This CRL Air Powered Muntin Bar Notcher provides an accurate burr-free notch cut, and requires no hand cleaning. The guide bar has a graduated rule and a sliding stop for accurately spacing notches along the bar. All die sections are fabricated from hardened and ground tool steel.

The Notcher comes with a hand-operated Switch, Air Hose, Cutting Chart, and one Punch and Die Set. The machine requires 50 to 250 psi of air pressure for operation. A sample of the Muntin Bar to be used is required when ordering, and extra Punch and Die Sets are available. Also, Multiple Head Muntin Notchers (up to five heads) are available for larger production shops. Contact our Customer Service Department for machine details and specifications. F.O.B. Canton, Michigan.

CAT. NO. APMN1
Air Powered Muntin Bar Notcher

Punch and Die Set

CAT. NO.	DESCRIPTION
APMN1	Air Powered Muntin Notcher
APDS916	9/16" (14.3 mm) Punch and Die Set for CRL 36009 Muntin Bar
APDS58	5/8" (15.9 mm) Punch and Die Set for CRL 36012 Muntin Bar
APDS34	3/4" (19 mm) Punch and Die Set for CRL 36004 Muntin Bar
APDS1316	13/16" (20.6 mm) Punch and Die Set for CRL 36006 Muntin Bar

Minimum order: 1 each.

CRL Muntin Bar Router

- **Made Especially to Cut Notches in Muntin Bar Prior to Fabrication**

- **Air Operated Hold Down Clamp**

- **Adjustable Cut-Off Gauge**

The CRL Muntin Bar Router makes notches in Muntin Bars prior to Insulating Glass unit fabrication. The welded steel constructed table has a 3/16" (4.8 mm) thick aluminum top measuring 18" x 120" (457 mm x 3.04 m). An adjustable cut-off gauge is mounted on the table to line up the Muntin Bars prior to routing. The Router is mounted on a linear slide plate and will route a groove in a 15" (381 mm) wide gang of Muntin Bars, which are held in place by a pneumatic-actuated bar assembly. It comes complete with 110V AC Router. Contact our Customer Service Department for machine details and specifications. F.O.B. Red Oak, Texas. Shipping weight: 500 pounds (227 kg). Minimum order is one each.
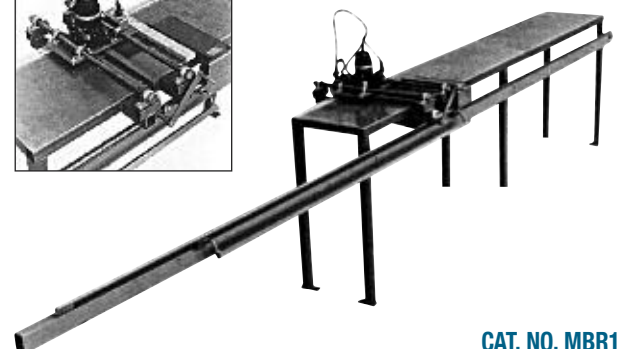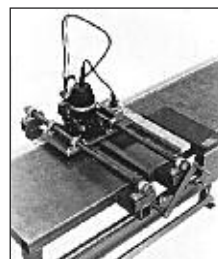
CAT. NO. MBR1
Muntin Bar Router

CRL Deluxe Spacer Bender

• Can Be Made to Accommodate Almost Any Size Spacer Bar

• Custom Manufactured by CRL

This machine is designed to bend Spacer Bars to any radius allowable by the design of the Spacer. Manually operated, the CRL Spacer Bender uses a pressure drive roller with two forming die rollers. As the Spacer is forced through the forming dies, the degree of bend is increased through higher pressure from the drive roller with each successive pass, until the desired radius is attained. Quick interchanging of the forming die rollers allows total versatility in bending of different size Spacers.

Unit includes Dies for 3/16", 1/4", 5/16", 3/8", and 1/2" (4.8, 6.4, 7.9, 9.5, and 12.7 mm) standard height CRL, All Metal, and Nichols Homeshield Spacer profiles. **NOTE:** Will not work with Slim Line/Narrow profiles. Different widths, other Spacer brands, and all Slim Line Narrow profiles require Custom Die Sets. These Custom Dies are manufactured to customer samples. Contact our Customer Service Department for machine details and specifications. F.O.B. Los Angeles, California. Minimum order is one each.

CAT. NO. DSBD1

CRL Muntin Bar Bender

• For Fabricating Curved Insulating Glass Units

• Each Unit is Custom Made By CRL

The CRL Muntin Bar Bender easily bends Muntin Bar for Insulating Glass units with arched sunset patterns, as well as circular units. Any width of 3/16" (4.8 mm) thick Muntin Bar can be shaped with just a few quick passes. It has an easy-to-read indicator dial for quickly and accurately making repetitive bends.

The MMBD1 includes one set of Dies. If additional widths of muntins are going to need bending then an additional set of Dies will need to be ordered. If using Muntin Bars not sold by CRL then three each 36" (914 mm) samples of muntin must be sent to CRL. This is due to the tight machining tolerances needed to produce this precision piece of equipment. If you are using CRL brand Muntin Bar just specify the CRL catalog number that the Dies should be made to work with. Contact our Customer Service Department for machine details and specifications. F.O.B. Los Angeles, California. Minimum order is one each.

CAT. NO. MMBD1

CRL Air Powered Muntin Clip Punch

• Accommodates 3/16" to 7/8" Aluminum Spacers

• For Single or Two-Prong Muntin Bar Clips

This CRL Air Powered Muntin Clip Punch is designed to accommodate 3/16" to 7/8" (4.8 to 22.2 mm) Spacers, and will punch holes for single or two-prong Muntin Bar Clips. It operates on air pressure from 50 to 250 PSI, and comes with a computer print-out Muntin Bar Spacing Chart. The chart shows machine stop settings for muntins up to 80" (2.03 m) long and up to six openings.

The Punch comes complete with a Stop Bar, one size Air Spacer Die, and one size Muntin Spacing Chart. When ordering, specify spacer and muntin sizes. Air Spacer Dies are available in all standard sizes. Specify centerline or off-center muntin clip holes when ordering Spacer Dies.

There are three available models to choose from, depending on what type of Muntin Bar Clip you are using. Customers ordering the MBKP1 will receive one Punch and Die with the unit. Spacer width and brand name must be designated. Additional widths of spacers require additional Dies. Customers must provide samples of their muntin clip (6 each) and spacer (4 each 6" [152 mm] long), unless they are using CRL components. Multiple Head Muntin Clip Punches (up to five heads) are available for larger production shops. Contact our Customer Service Department for machine details and specifications.
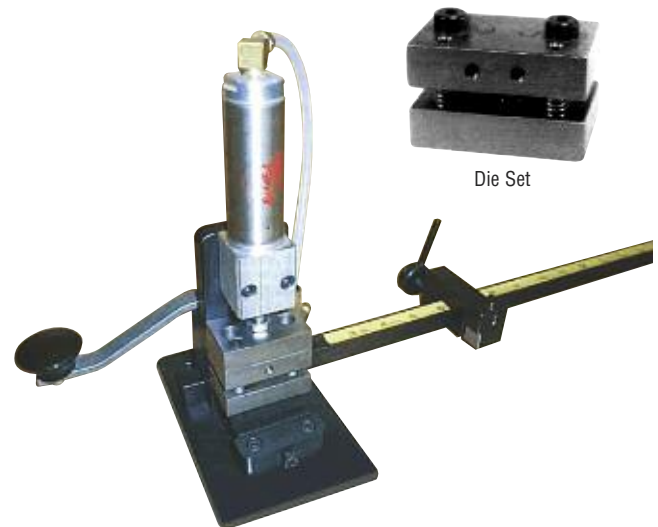
Die Set

Air Powered Muntin
Clip Punch

CAT. NO.	DESCRIPTION
MBKP1	Air Powered Muntin Clip Punch
MBKPD1E	Die Set for the MBKP1

Minimum order: 1 each. F.O.B. Canton, Michigan

Fabricating Insulating Glass Units With Alternatives to Aluminum Spacers

Super Spacer® and Duralite® are the Latest Technology for High Performance Insulating Glass, Offering the Fabricator:

- Low Start-Up Costs Because No Special Tools Are Required to Begin Using Either System
- Reduced Assembly Times Because There are No Aluminum Spacers to Cut or Fill With Desiccant
- Reduced Storage Space Because There are No Long Stock Lengths, Just Convenient Rolls
- Flexibility of Design, Since Insulating Glass Units of Any Shape Can Now Be Fabricated

As buildings become ever-more complex, with radical architecture and the intentions of owners to make their environments more energy-efficient, it's nice to know that you can meet their needs for high performance Insulating Glass units in places where traditional aluminum spacers can't be used. Windows with curved tops or corners that don't meet at 90 degree angles are not a design problem when using a spacer system that is flexible, and capable of following their shape.

CRL offers two such spacer systems, Super Spacer® and Duralite®, and on the next few pages you'll discover how both of them can improve your Insulating Glass unit fabrication process, and the ability to accommodate your customers' needs.

Super Spacer® is available
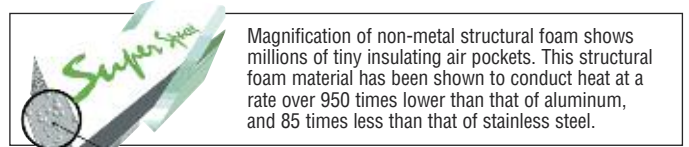in nine widths

Duralite® is available
in eight widths

- Super Spacer® and Duralite® are the Answer to the Problem of Fabricating Insulating Glass Units for Irregularly Shaped Windows

Super Spacer and Duralite are registered trademarks of Quanex Building Products Corporation.
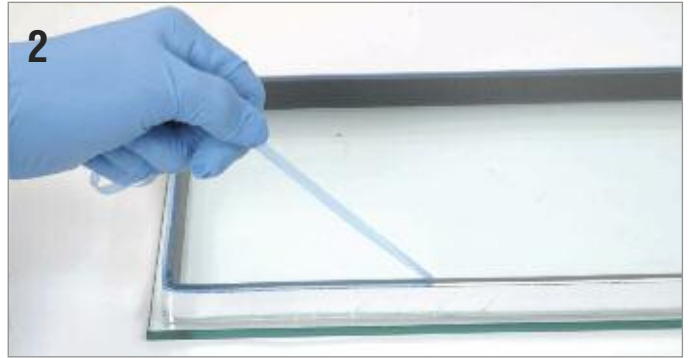
CRL Edgetech Super Spacer®

- The Most Versatile Spacer Available
- Allows Simultaneous Production of Regular and Special Shaped Insulating Glass Units
- Save Production Time - No Desiccant Beads to Add or Corner Keys to Assemble
- No Metal Spacer – Dramatically Reduces Condensation
- No Heat Compression Required
- Low Profile Spacer is Only 1/4" (6 mm) Thick
- Multi-Layer Vapor Barrier is Continuous at Corners
- Available in Gray or Black

Magnification of non-metal structural foam shows millions of tiny insulating air pockets. This structural foam material has been shown to conduct heat at a rate over 950 times lower than that of aluminum, and 85 times less than that of stainless steel.

Convenient 66 Foot (20.1 m) Roll Package

1 Apply Super Spacer® to clean glass surface with SSHN Hand Notcher or SSAPA Shuttle Applicator as release liner is removed.

2 Remove second release liner.
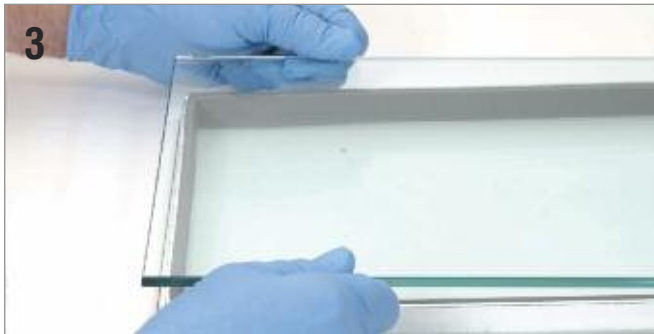
3 Index second piece of clean glass and press on to Super Spacer®.

4 Apply CRL Hot Melt Butyl or Cat. No. 877 Sealant to seal the unit.

CRL Edgetech Super Spacer® is made from superior insulating silicone foam. The spacer essentially eliminates perimeter edge condensation and substantially reduces overall window heat loss. Because of the unique design features of Super Spacer® there are advantages in using this product for the fabrication of specialized insulating glass designs, including curved and odd shaped units, sound insulating, and triple-glazed units with art glass inserts.

For long-term durability, UV resistant silicone material is used to prevent spacer degradation. The flexible foam spacer accommodates glass bowing and thermal movement, and also helps ensure improved edge seal. The permeability of the foam allows for fast moisture pickup with the 40% desiccant composition. To reduce moisture vapor transmission and inert gas loss, the Super Spacer® is backed by a high performance, multi-layer barrier film.

Rolls are 66' (20.1 m) long. Other colors and bulk rolls are available on special order. **NOTE:** Super Spacer® cannot be used without an edge sealant. We recommend CRL Hot Melt Butyl or CRL 877 Sealant (see page I159).

Super Spacer is a registered trademark of Quanex Building Products Corporation.

CAT. NO.	COLOR	WIDTH	ROLL LENGTH
SS31666	Gray	3/16" (4.8 mm)	66' (20.1 m)
SS1466	Gray	1/4" (6.3 mm)	66' (20.1 m)
SS51666	Gray	5/16" (7.9 mm)	66' (20.1 m)
SS3866	Gray	3/8" (9.5 mm)	66' (20.1 m)
SS71666	Gray	7/16" (11.1 mm)	66' (20.1 m)
SS1266	Gray	1/2" (12.7 mm)	66' (20.1 m)
SS91666	Gray	9/16" (14.3 mm)	66' (20.1 m)
SS5866	Gray	5/8" (15.9 mm)	66' (20.1 m)
SS3466	Gray	3/4" (19 mm)	66' (20.1 m)
SS1466BL	Black	1/4" (6.3 mm)	66' (20.1 m)
SS3866BL	Black	3/8" (9.5 mm)	66' (20.1 m)
SS1266BL	Black	1/2" (12.7 mm)	66' (20.1 m)
SS91666BL	Black	9/16" (14.3 mm)	66' (20.1 m)
SS5866BL	Black	5/8" (15.9 mm)	66' (20.1 m)
SS3466BL	Black	3/4" (19 mm)	66' (20.1 m)

Minimum order: 1 roll. Colors and sizes can be combined for quantity pricing.

CRL Super Spacer® Hand Notcher

- Easy-to-Use Tool Simplifies Corner Notching

- Assures Consistent Placement of Super Spacer®

The CRL Super Spacer® Hand Notcher is designed to speed up the manual application of Super Spacer®. It simplifies corner notching and assures consistent placement of the foam Super Spacer® strip at a distance of 3/16" (4.8 mm) from the glass edge. Can be used with sizes ranging from 1/4" to 3/4" (6.3 to 19 mm) in width. Minimum order is one each.

CAT. NO. SSHN

CRL Super Spacer® Super Shuttle™ Applicator

- Hand Held Pneumatic Tool Speeds Application of Super Spacer®

The hand held CRL Super Spacer® Super Shuttle™ Applicator makes precision laying, notching, cornering, and splicing a simple one-step process in the manufacture of Insulating Glass units. The Applicator glides on the Super Spacer®, eliminating contact with the glass, which prevents marking of the vision area.

The CRL Super Shuttle ensures straight sightlines, perpendicular to the glass, and is fully adjustable for Super Spacer® sizes of 3/16" to 15/16" (4.8 to 23.8 mm) and set back distances of either 3/16" (4.8 mm) or 1/4" (6.3 mm). Requires 100 cfm to operate. Minimum order is one each.

CAT. NO. SSAPA

CRL Super Spacer® Groove Tool

- Cuts Groove in Super Spacer® for the Insertion of Leaded Glass Panels

Uncut Shallow Cut Deep Cut

The CRL Super Spacer® Groove Tool allows you to create your own grooved spacer for leaded and stained glass insert panels. By adjusting the centering guide to widths from 1/4" to 1" (6.3 to 25.4 mm) and pulling material across the blade, perfect grooves are quickly made. An adjustment screw on the bottom of the unit adjusts the blade for making either shallow or deep cuts. Two blades are included, and Cat. No. BK1056 Replacement Blades can be ordered separately. Minimum order is one each.

CAT. NO. LCSG1

CRL Bulk Reel Super Spacer® Stand

- Positioned for Speed

- Accommodates Any Bulk Size of Super Spacer®

This CRL Super Spacer® Stand is designed to accommodate any size Super Spacer® in bulk reels. The Stand features a unique base and cover for totally enclosing the Super Spacer®, thereby preserving its quality by keeping it airtight during application. Minimum order is one each.

Optional items for use with the Stand include a two-roll lid and two-roll arm. Contact Technical Sales regarding special order Bulk Roll pricing. **NOTE:** Not for use with standard 66' (20.1 m) rolls.

CAT. NO. LRS22

CRL Super Spacer® Seminar DVD

- Demonstrates Proper Use of Super Spacer® and Accessories

This DVD demonstrates proper use of CRL Super Spacer®, showing how to make Insulating Glass units effectively using the product. It also shows different types of sealing methods to use with Super Spacer®. Minimum order is one each.

CAT. NO. DVDSS1

Super Spacer is a registered trademark of Quanex Building Products Corporation.

CRL INSULATING GLASS SUPPLIES

CRL Silicone Foam and Metal Spacer I.G. Sealant

- One-Part Fast Cure Urethane With Low Solvent Formula Compatible With Super Spacer®

- Easy, Inexpensive Way to Make Low Production, High Quality Insulating Glass Units

SPEC. DATA

MSDS

Cat. No. 877 Silicone Foam and Metal Spacer I.G. Sealant is a single component urethane for the fabrication of quality single seal insulating glass units. Simply attach a SGT Polyethylene Sealant Guide to match your Super Spacer® width and backfill to the edge of the glass. Cat. No. 877 is a special low-solvent formulation that is made to be compatible with Super Spacer's adsorbent, and does not require a polyisobutylene primary seal. Cat. No. 877 may also be used with adsorbent filled aluminum spacers.

877 Silicone Foam and Metal Spacer I.G. Sealant works best for assembly of Insulating Glass units when temperature is over 40°F (5°C), and when humidity is more than 40%. Tack free time is 45-60 minutes at 77°F (25°C). Cure time is 3/16" (4.8 mm) per 24 hours. **NOTE:** Insulating Glass units should be totally sealed with Cat. No. 877 within one hour of exposing Super Spacer® adsorbent or adsorbent filled aluminum spacers to the atmosphere. Minimum order is one each. All cartridge sealants can be combined for quantity pricing.

Cat. No. 877 Silicone Foam and Metal Spacer I.G. Sealant → Super Spacer®

10.3 Fl. Oz. (304 ml); 12 Cartridges per Case
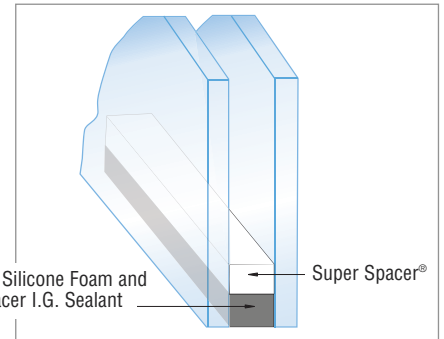
CAT. NO. 877

CRL Polyethylene Sealant Guides

- Fit on Tapered Nozzles for Insulating Glass Sealants

- Sizes From 3/16" to 3/4" (4.8 to 19 mm)

CRL Polyethylene Sealant Guides fit on the end of tapered cartridge nozzles for Insulating Glass sealants. The SGT Guide is designed to force sealant into the space between the two pieces of glass. Simply push the SGT Guide onto your nozzle and it is ready to use.

SGT Polyethylene Sealant Guide

Cartridge Nozzle

Super Spacer®

877 Silicone Foam and Metal Spacer I.G. Sealant

Polyethylene Adapter Nozzle   **CAT. NO. 989**

The CRL Polyethylene Adapter Nozzle allows you to use SGT Sealant Guides with many different bulk sealant dispenser systems. Minimum order is one each.

Polyethylene Sealant Guides and Adapter Nozzles never need cleaning, because sealants will peel off when dry.
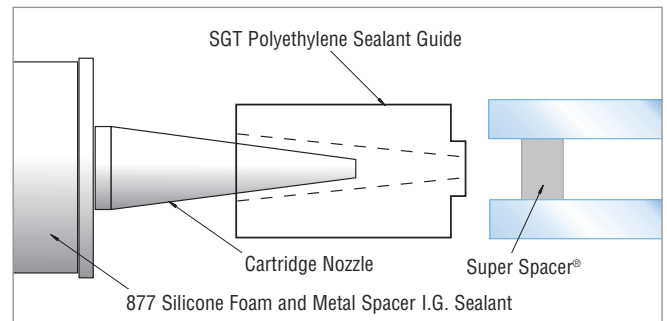
SGT Polyethylene Sealant Guide

POLYETHYLENE SEALANT GUIDES

CAT. NO.	SIZE
SGT316	3/16" (4.8 mm)
SGT14	1/4" (6.3 mm)
SGT516	5/16" (7.9 mm)
SGT38	3/8" (9.5 mm)
SGT12	1/2" (12.7 mm)
SGT58	5/8" (15.9 mm)
SGT34	3/4" (19 mm)

Minimum order: 1 each. Sizes can be combined for quantity pricing.

CRL Super Spacer® Desiccant Activity Test Kit

- Ensure Quality of Units Made

- Test Previously Opened Packages

CRL Super Spacer® contains at least 40% of desiccant material by weight and, prior to unit fabrication, it is critical that this desiccant material is not pre-loaded with moisture before sealing the unit. Use this Test Kit to test the remainder of previously opened packages of Super Spacer®, and any unopened packages of Super Spacer® older than 36 months.

Any unused material can be repackaged in the flat roll bags with the foil packaging being heat-sealed or taped for desiccant protection. The unused, repackaged material must be stored elevated from the floor and away from any exterior walls. Minimum order is one each.

Super Spacer is a registered trademark of Quanex Building Products Corporation.

CAT. NO. DTK1

CRL TruSeal® Duralite®

- Complete Spacer and Sealant in One Tape
- Contains No Metal for Improved Warm Edge Thermal Performance
- EnergySTAR® Labeled Technology
- Improved Condensation Resistance
- Reduced Total Window U-Value
- Superior Argon Gas Retention
- Same Spacer Used for Standard and Specialty Windows

SPEC. DATA

MSDS

Spacer Sub-Assembly
A unique multi-component spacer that is bendable yet incompressible and stable

Bondline Adhesive
Proprietary high performance adhesive providing exceptional resistance to gas and moisture vapor transmission

Desiccated Topcoat
Desiccant concentrated in the top layer provides rapid dew point suppression

Apply Duralite® to clean glass surface with Applicator or by hand

Index second piece of clean glass and press on to Duralite®.

Apply Spring Clamps or Mechanical Press with Heat Lamp to seal the unit

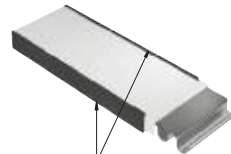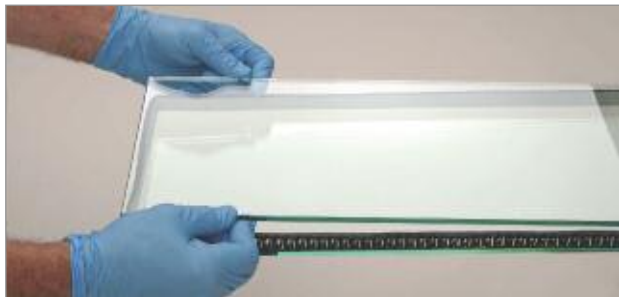TruSeal and Duralite are registered trademarks of Quanex Building Products Corporation.
EnergySTAR is a registered trademark of the United States Environmental Protection Agency.

Duralite® patented technology incorporates unique materials and a breakthrough in continuous composite manufacturing processes. This advanced technology offers a higher performance spacer system at a competitive price. Duralite® takes optimum advantage of laminates and adhesives to reduce thermal conductivity, while improving surface and corner appearance over other insulating glass unit spacers.

A single spacer system for both standard and special units has become an important factor in today's competitive marketplace where a high percentage of manufactured units are non-rectangular. Duralite® allows the window fabricator to produce Insulating Glass units with one spacer system. The fabricator can increase productivity and flexibility, while eliminating customer concerns over having dissimilar spacers in special versus standard windows.

Other colors and sizes of Duralite® are available on special order. Swiggle/Edgetherm DS and FS is available for our customers in Australia. Contact CRL Technical Sales or go to **crlaurence.com** for additional information.

DURALITE® STANDARD ROLLS

CAT. NO.	COLOR	WIDTH	ROLL LENGTH
DS6614	Gray	1/4" (6.3 mm)	66' (20.1 m)
DS66516	Gray	5/16" (7.9 mm)	66' (20.1 m)
DS6638	Gray	3/8" (9.5 mm)	66' (20.1 m)
DS66716	Gray	7/16" (11.1 mm)	66' (20.1 m)
DS6612	Gray	1/2" (12.7 mm)	66' (20.1 m)
DS66916	Gray	9/16" (14.3 mm)	66' (20.1 m)
DS6658	Gray	5/8" (15.9 mm)	66' (20.1 m)
DS6634	Gray	3/4" (19 mm)	66' (20.1 m)

Minimum order: 1 roll. Sizes can be combined for quantity pricing.

DURALITE® BULK ROLLS

CAT. NO.	COLOR	WIDTH	ROLL LENGTH
BDS14	Gray	1/4" (6.3 mm)	2640' (805 m)
BDS516	Gray	5/16" (7.9 mm)	2500' (762 m)
BDS38	Gray	3/8" (9.5 mm)	2240' (683 m)
BDS716	Gray	7/16" (11.1 mm)	2030' (619 m)
BDS12	Gray	1/2" (12.7 mm)	1750' (533 m)
BDS916	Gray	9/16" (14.3 mm)	1630' (497 m)
BDS58	Gray	5/8" (15.9 mm)	1520' (463 m)
BDS34	Gray	3/4" (19 mm)	1310' (399 m)

Minimum order: 1 roll. Sizes can be combined for quantity pricing.

CRL Duralite® Quartz Heat Lamp

- Use With Deluxe Handy Clamps for Proper Compression of Duralite®
- Softens and Wets Out Adhesive

The CRL Duralite® Quartz Heat Lamp provides softening and wetting of the Duralite® adhesive. The powerful 600 watt Quartz Lamp provides plenty of heat. Hold at least 12" (305 mm) away from the glass edge to achieve approximately 120°F (49°C) of heat required which allows for adequate compression when used with Deluxe Handy Clamps. Requires 115V AC. Includes dark glasses to protect eyes from glare. For replacement bulbs, order Cat. No. TL2BULB. Minimum order is one each.

(Clamps not included)

CAT. NO. TL2

CRL Duralite® Peak Tool

- Aids in Consistent Application of Duralite®
- Indexes Edge of Glass for Improved Sightlines

The CRL Duralite® Peak Tool is a hand tool that aids in the manual application of Duralite® for proper indexing of the material to the edge of the glass. It helps you make straighter sightlines, improving the overall appearance and quality of your Insulating Glass units. Rolls of Duralite® are fed through the Peak Tool by hand, which eases application. Training is minimal, and all widths of Duralite® can be used. Minimum order is one each.

CAT. NO. DSPT1

CRL Duralite® Pro Tool

- Aids in Application of Duralite® on Air Flow Tables
- Eliminates Operator Contact With Glass Surfaces

The CRL Duralite® Pro Tool helps maintain consistent, high quality Insulating Glass unit production by eliminating all operator contact with glass surfaces. This helps to ensure a clear vision area and create an attractive, straight sightline. The precision-made Duralite® Pro Tool features a pivot pin enabling the applicator to form uniform 90 degree corners. Rubber protected guide wheels help to prevent chipping of the glass. Minimum order is one each.
NOTE: For information about air flow tables contact the CRL Customer Service Department.

CAT. NO. SPT501

CRL 6" Deluxe Handy Clamp

- Evenly Spreads Force Over Insulating Glass Unit

You can use these CRL 6" Deluxe Handy Clamps to apply the required compression for a proper seal while producing Duralite© Insulating Glass units. Position the Clamps every 6" (152 mm) around the unit's perimeter for even pressure and a uniform seal. Maximum jaw opening is 2" (51 mm). Minimum order is one each.

CAT. NO. JC3202HT

CRL Straight Cut Snips

- Easily Cuts Duralite® Spacer

Use these Straight Cut Snips to cut and trim Duralite® during fabrication of Insulating Glass units. Maximum cut length is 1-3/8" (35 mm). Overall length is 9-3/4" (248 mm). Minimum order is one each.

CAT. NO. M3R

Duralite is a registered trademark of Quanex Building Products Corporation.

CRL Center Set Aluminum Insulating Glass Adapter Channel

- For Converting Single Glazed Windows and Doors Into Energy-Saving Insulating Glass Units
- Eliminates Purchasing New Windows and Doors
- Quick and Easy Installation

There is a growing demand for energy-saving retrofit products, such as Insulating Glass to insulate from heat gain, heat loss, and to reduce sound transmission. CRL Center Set Aluminum Insulating Glass Adapter Channel is a popular system for converting most single glazed center set fixed door lites and large fixed windows to energy efficient Insulating Glass units. With this Center Set Adapter Channel it is possible to convert many fixed door lites and windows without altering the frame. This is possible because the Center Set Adapter Channel is available with a center leg to position the depth of the Insulating Glass unit to the center, as illustrated at right. CRL Center Set Aluminum Insulating Glass Adapter Channel is available in two finishes. Accessory Glazing Vinyl and Adapter Corners are available for fabrication (see below).

Insulating Glass Unit

PDV3867 Vinyl

PA200BRZ Channel

Window Frame
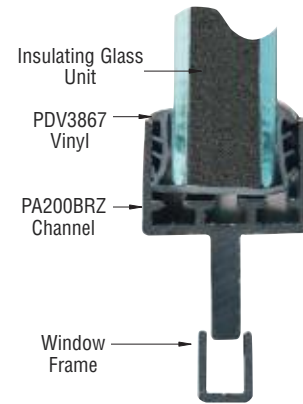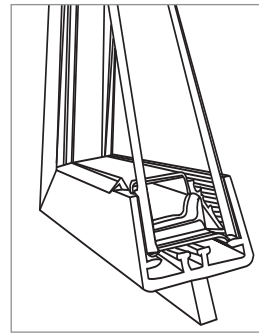
Center Set Insulating Glass Adapter for Fixed Windows and Doors

CRL 7/8" Center Set Insulating Glass Adapter Channel for 3/4" (19 mm) Insulating Glass Units

- For the Retrofit Conversion of Single Glazed to Dual Glazed Center Set Fixed Windows and Door Lites

CRL PA200 Center Set Insulating Glass Adapter Channel is used to replace most single glaze center set fixed door lites and large fixed windows with a 3/4" (19 mm) sealed Insulating Glass unit. All components of the existing window frame will be reused.

CRL PA200 Center Set Adapter Channel uses Cat. No. PDV3867 Glazing Vinyl. Fasten mitered corners by using Cat. No. AC1 Adapter Corners, and apply a thin bead of Cat. No. RTV408 Neutral Cure Silicone Sealant (see page I145) to seal.

7/8" (22.2 mm)

1/2" (12.7 mm)

3/16" (4.8 mm)
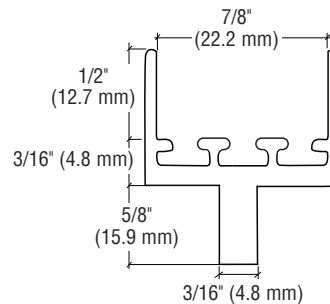
5/8" (15.9 mm)

3/16" (4.8 mm)

CAT. NO.	LEG LENGTH	LEG WIDTH	LENGTH	FINISH
PA200A	5/8" (15.9 mm)	3/16" (4.8 mm)	12' (3.66 m)	Clear Anodized
PA200BRZ	5/8" (15.9 mm)	3/16" (4.8 mm)	12' (3.66 m)	Bronze Anodized

Minimum order: 1 stock length. All I.G. Adapter Channel can be combined for quantity pricing. A Packing Charge will be added to orders of fewer than 10 combined lengths. Stock lengths longer than 108" (2.74 m) must ship common carrier, unless you specify that we cut them for U.P.S. A Cutting Charge will apply.

CRL Insulating Glass Glazing Vinyl for PA200 Adapter Channel

- For Easy Installation of Insulating Glass Units

3/8" (9.5 mm)

This black CRL Insulating Glass Glazing Vinyl is 100% extruded virgin vinyl used to repair, reglaze, or manufacture windows. Vinyl wraps around sealed Insulating Glass units for easy installation into CRL Adapter Channel, new windows, and existing Insulating Glass units.

CAT. NO.	ADAPTER CHANNEL	CHANNEL WIDTH	GLASS THICKNESS
PDV3867	PA200 and PA300	7/8" (22.2 mm)	3/4" (19 mm)

Minimum order: 100 feet. Must order in increments of 100 feet. All Adapter Vinyls can be combined for quantity pricing.

CRL Corners for PA200 Insulating Glass Adapter Channel

- Helps Join I.G. Adapter Channel for a Tight Fit

These Corners for CRL Insulating Glass Adapter fit tightly to join the frame at the mitered corners. A thin bead of Cat. No. RTV408 Neutral Cure Silicone Sealant (see page I145) should then be applied for a good seal.
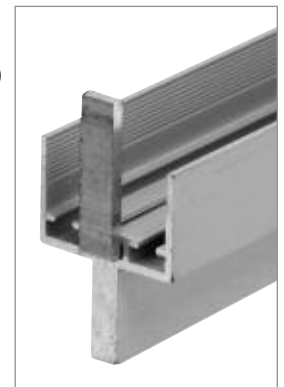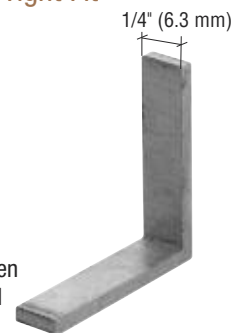
1/4" (6.3 mm)

CAT. NO.	WIDTH	FOR USE WITH ADAPTER CHANNEL
AC1	1/4" (6.3 mm)	PA200, WA100, and WA150

Minimum order: 100 each. Must order in increments of 100. All widths can be combined for quantity pricing.

CRL 5/8" Offset Aluminum Insulating Glass Adapter Channel

- **For Converting Single Glazed Windows Into Energy-Saving Insulating Glass Units**
- **Eliminates Purchasing New Windows**
- **Quick and Easy Installation**

CRL 5/8" Offset Aluminum Insulating Glass Adapter Channel is a popular system for converting most single glazed windows, steel casement, wood stop, and wood putty windows to 1/2" (12.7 mm) energy efficient Insulating Glass units. With this Offset Adapter Channel it is possible to convert many windows without altering the frame or sliding mechanism. This is possible because the Offset Adapter Channel is available with an offset leg to position the depth of the Insulating Glass unit to the outside on the outside panel, and to the inside on the inside panel, as illustrated at right. CRL Offset Aluminum Insulating Glass Adapter Channel is available in two finishes. Accessory Glazing Vinyl and Adapter Corners are available for fabrication (see below).

Insulating Glass Unit

PDV3866 Vinyl

WA100A Channel

Window Frame
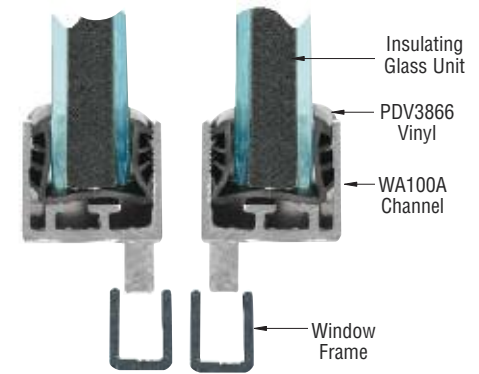
Offset Set Insulating Glass Adapter Channel for Sliding Bypassing Windows and Doors

CRL 5/8" Offset Insulating Glass Adapter Channel for 1/2" (12.7 mm) Insulating Glass Units

- **For Energy-Saving Conversion to Insulating Glass Sliding Windows**

CRL WA100 and WA150 Insulating Glass Adapter Channels are used to replace most single glaze windows with a 1/2" (12.7 mm) sealed Insulating Glass unit. The WA150 Adapter has a longer leg for window frames with deeper glazing channels. All components of the existing window frame will be reused.

Both WA100 and WA150 Adapter Channels use Cat. No. WV3866 Glazing Vinyl. Fasten mitered corners by using either Cat. No. AC1 Adapter Corners or Cat. No. 8X114PHPSMS #8 x 1-1/4" (31.7 mm) Pan Head Phillips Sheet Metal Screws. Apply a thin bead of Cat. No. RTV408 Neutral Cure Silicone Sealant (see page I145) to seal mitered corners.

1/4" (6.3 mm)

CAT. NO. AC1

CAT. NO. WA100 — 5/8" (15.9 mm), 7/16" (11.1 mm), 3/16" (4.8 mm), 3/8" (9.5 mm), 1/8" (3.2 mm)

CAT. NO. WA150 — 5/8" (15.9 mm), 7/16" (11.1 mm), 3/16" (4.8 mm), 3/4" (19 mm), 1/8" (3.2 mm)

CAT. NO.	LEG LENGTH	LEG WIDTH	LENGTH	FINISH
WA100A	3/8" (9.5 mm)	1/8" (3.2 mm)	12' (3.66 m)	Clear Anodized
WA100BRZ	3/8" (9.5 mm)	1/8" (3.2 mm)	12' (3.66 m)	Bronze Anodized
WA150A	3/4" (19 mm)	1/8" (3.2 mm)	12' (3.66 m)	Clear Anodized
WA150BRZ	3/4" (19 mm)	1/8" (3.2 mm)	12' (3.66 m)	Bronze Anodized
AC1	-----	-----	-----	Mill Corner

Minimum order: 1 stock length. All I.G. Adapter Channel can be combined for quantity pricing. A Packing Charge will be added to orders of fewer than 10 combined lengths. Stock lengths longer than 108" (2.74 m) must ship common carrier, unless you specify that we cut them for U.P.S. A Cutting Charge will apply. Mill Corners minimum order: 100 each. Must order in increments of 100. All widths can be combined for quantity pricing.

CRL Insulating Glass Glazing Vinyl for WA100 and WA150 Adapter Channel

- **For Easy Installation of Insulating Glass Units**

This black CRL Insulating Glass Glazing Vinyl is 100% extruded virgin vinyl used to repair, reglaze, or manufacture windows. Vinyl wraps around sealed Insulating Glass units for easy installation into CRL Adapter Channel, new windows, and existing Insulating Glass units.
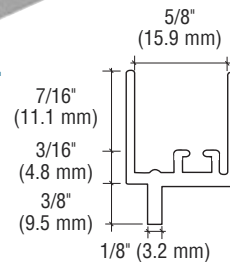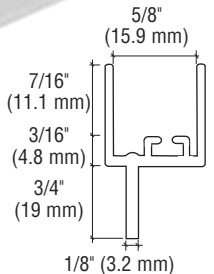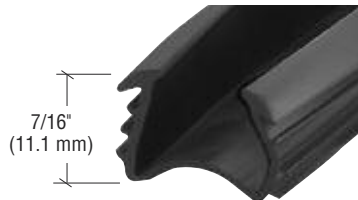
7/16" (11.1 mm)

CAT. NO.	ADAPTER CHANNEL	CHANNEL WIDTH	GLASS THICKNESS
WV3866	WA100 and WA150	5/8" (15.9 mm)	1/2" (12.7 mm)

Minimum order: 100 feet. Must order in increments of 100 feet. All Adapter Vinyls can be combined for quantity pricing.

CRL 1/2" Reduction Vinyl for WA100 and WA150 Adapter Channel

- **1/2" Insulating Glass Channels Reduced to DS Single Pane Glazing**

This CRL 1/2" Reduction Vinyl is a solid black profile that converts older channels designed for 1/2" (12.7 mm) insulating glass to DS single pane glazing. Ideal for temporary repairs or permanent conversion. Vinyl is sold in rolls of 150 feet (45.7 m).

7/16" (11.1 mm)

CAT. NO.	ADAPTER CHANNEL	CHANNEL WIDTH	GLASS THICKNESS
3800078	WA100 and WA150	5/8" (15.9 mm)	1/8" (3 mm)

Minimum order: 1 roll. All Adapter Vinyls can be combined for quantity pricing.

CRL 7/8" Offset Aluminum Insulating Glass Adapter Channel

- **For Converting Single Glazed Windows and Doors Into Energy-Saving Insulating Glass Units**
- **Eliminates Purchasing New Windows and Doors**
- **Quick and Easy Installation**

There is a growing demand for energy-saving retrofit products, such as Insulating Glass to insulate from heat gain, heat loss, and to reduce sound transmission. CRL Offset Aluminum Insulating Glass Adapter Channel is a popular system for converting most single glazed doors and windows to energy efficient Insulating Glass units. With this Offset Adapter Channel it is possible to convert many sliding doors and windows without altering the frame or sliding mechanism. This is possible because the Offset Adapter Channel is available with an offset leg to position the depth of the Insulating Glass unit to the outside on the outside panel, and to the inside on the inside panel, as illustrated at right. CRL Offset Aluminum Insulating Glass Adapter Channel is available in two finishes. Accessory Glazing Vinyl and Adapter Corners are available for fabrication (see below).

Insulating Glass Unit
PDV3867 Vinyl
PA300A Channel
Window Frame
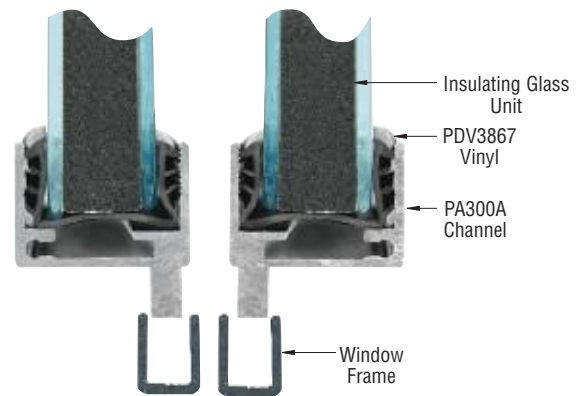
Offset Set Insulating Glass Adapter for Sliding Bypassing Windows and Doors

CRL 7/8" Offset Set Insulating Glass Adapter Channel for 3/4" (19 mm) Insulating Glass Units

- **For the Retrofit Conversion of Single Glazed to Dual Glazed Offset Set Windows and Doors**

CRL PA300 Offset Set Insulating Glass Adapter Channel is used to replace most sliding door lites and sliding windows with a 3/4" (19 mm) sealed Insulating Glass unit. All of the components of the existing window frame will be reused.

CRL PA300 Offset Set Adapter Channel uses Cat. No. PDV3867 Glazing Vinyl. Fasten mitered corners by using either Cat. No. AC2 Adapter Corners or Cat. No. 6X34PHPSMS #6 x 3/4" (19 mm) Pan Head Phillips Sheet Metal Screws. Apply a thin bead of Cat. No. RTV408 Neutral Cure Silicone Sealant (see page I145) to seal mitered corners.

7/8" (22.2 mm)
1/2" (12.7 mm)
3/16" (4.8 mm)
5/8" (15.9 mm)
3/16" (4.8 mm)
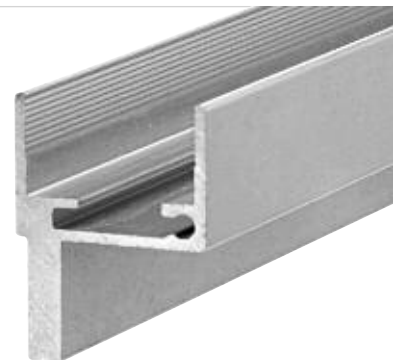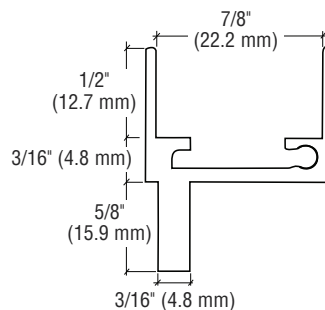
CAT. NO.	LEG LENGTH	LEG WIDTH	LENGTH	FINISH
PA300A	5/8" (15.9 mm)	3/16" (4.8 mm)	12' (3.66 m)	Clear Anodized
PA300BRZ	5/8" (15.9 mm)	3/16" (4.8 mm)	12' (3.66 m)	Bronze Anodized

Minimum order: 1 stock length. All I.G. Adapter Channel can be combined for quantity pricing. A Packing Charge will be added to orders of fewer than 10 combined lengths. Stock lengths longer than 108" (2.74 m) must ship common carrier, unless you specify that we cut them for U.P.S. A Cutting Charge will apply.

CRL Insulating Glass Glazing Vinyl for PA300 Adapter Channel

- **For Easy Installation of Insulating Glass Units**

3/8" (9.5 mm)

This black CRL Insulating Glass Glazing Vinyl is 100% extruded virgin vinyl used to repair, reglaze, or manufacture windows. Vinyl wraps around sealed Insulating Glass units for easy installation into CRL Adapter Channel, new windows, and existing Insulating Glass units.
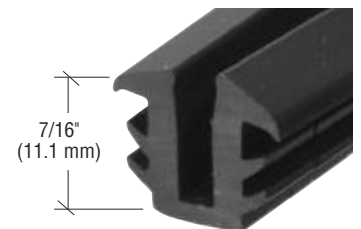
CAT. NO.	ADAPTER CHANNEL	CHANNEL WIDTH	GLASS THICKNESS
PDV3867	PA200 and PA300	7/8" (22.2 mm)	3/4" (19 mm)

Minimum order: 100 feet. Must order in increments of 100 feet. All Adapter Vinyls can be combined for quantity pricing.

CRL Corners for PA300 Insulating Glass Adapter Channel

- **Helps Join I.G. Adapter Channel for a Tight Fit**

These Corners for CRL Insulating Glass Adapter fit tightly to join the frame at the mitered corners. A thin bead of Cat. No. RTV408 Neutral Cure Silicone Sealant (see page I145) should then be applied for a good seal.
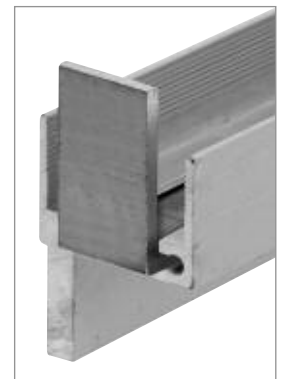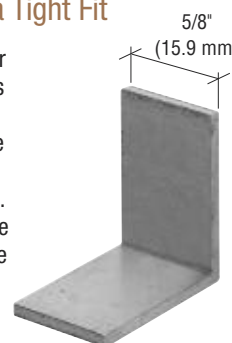
5/8" (15.9 mm)

CAT. NO.	WIDTH	FOR USE WITH ADAPTER CHANNEL
AC2	5/8" (15.9 mm)	PA300

Minimum order: 100 each. Must order in increments of 100. All widths can be combined for quantity pricing.

CRL 1" Offset Aluminum Insulating Glass Adapter Channel

- For Use With Double or Triple Glazed Units
- Eliminates Purchasing New Windows
- Quick and Easy Installation

CRL 1" Offset Aluminum Insulating Glass Adapter Channel is a popular system for converting most single glazed windows, steel casement, wood stop, and wood putty windows to 7/8" (22.2 mm) energy efficient Insulating Glass units. With this Offset Adapter Channel it is possible to convert many windows without altering the frame or sliding mechanism. This is possible because the Offset Adapter Channel is available with an offset leg to position the depth of the Insulating Glass unit to the outside on the outside panel, and to the inside on the inside panel, as illustrated at right. CRL Offset Aluminum Insulating Glass Adapter Channel is available in two finishes. Accessory Glazing Vinyl and Adapter Corners are available for fabrication (see below).

Insulating Glass Unit

WV3868 Vinyl

WA175A Channel
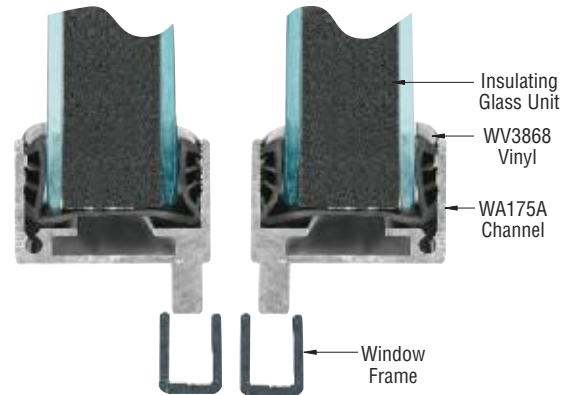
Window Frame

Offset Set Insulating Glass Adapter Channel for Sliding Bypassing Windows and Doors

CRL 1" Offset Insulating Glass Adapter Channel for 7/8" (22.2 mm) Insulating Glass Units

- For Use With Double or Triple Glazed Units
- Uses Existing Window Frame Components

CRL WA175 Insulating Glass Adapter Channel is used to replace most single glaze aluminum sliding windows, plus steel casement, wood stop, and wood putty windows with a 7/8" (22.2 mm) sealed Insulating Glass unit. All of the components of the existing window frame will be reused.

CRL WA175 Adapter Channel uses Cat. No. WV3868 Glazing Vinyl. Fasten mitered corners by using either Cat. No. AC3 Adapter Corners (sold separately), or Cat. No. 8X114PHPSMS #8 x 1-1/4" (31.7 mm) Pan Head Phillips Sheet Metal Screws. Apply a thin bead of Cat. No. RTV408 Neutral Cure Silicone Sealant (see page I145) to seal mitered corners.

11/16" (17.5 mm)

1" (25.4 mm)

1/2" (12.7 mm)

3/16" (4.8 mm)
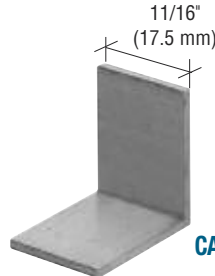
3/8" (9.5 mm)

1/8" (3.2 mm)

CAT. NO. AC3
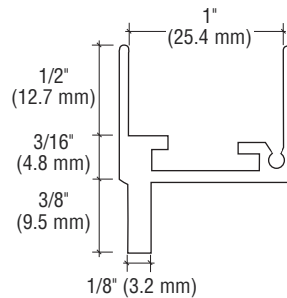
CAT. NO. WA175

CAT. NO.	LEG LENGTH	LEG WIDTH	LENGTH	FINISH
WA175A	3/8" (9.5 mm)	1/8" (3.2 mm)	12' (3.66 m)	Clear Anodized
WA175BRZ	3/8" (9.5 mm)	1/8" (3.2 mm)	12' (3.66 m)	Bronze Anodized
AC3	-----	-----	-----	Mill Corner

Minimum order: 1 stock length. All I.G. Adapter Channel can be combined for quantity pricing. A Packing Charge will be added to orders of fewer than 10 combined lengths. Stock lengths longer than 108" (2.74 m) must ship common carrier, unless you specify that we cut them for U.P.S. A Cutting Charge will apply. Mill Corners minimum order: 100 each. Must order in increments of 100. All widths can be combined for quantity pricing.

CRL Insulating Glass Glazing Vinyl for WA175 Adapter Channel

- For Easy Installation of Insulating Glass Units
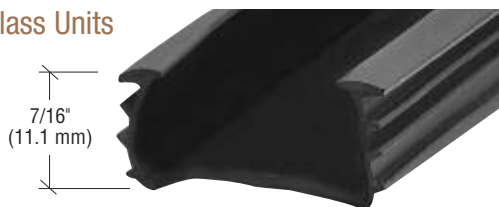
7/16" (11.1 mm)

This black CRL Insulating Glass Glazing Vinyl is 100% extruded virgin vinyl used to repair, reglaze, or manufacture windows. Vinyl wraps around sealed Insulating Glass units for easy installation into CRL Adapter Channel, new windows, and existing Insulating Glass units.

CAT. NO.	ADAPTER CHANNEL	CHANNEL WIDTH	GLASS THICKNESS
WV3868	WA175	1" (25.4 mm)	7/8" (22.2 mm)

Minimum order: 100 feet. Must order in increments of 100 feet. All Adapter Vinyls can be combined for quantity pricing.

CRL 3/4" Reduction Vinyl for WA175 Adapter Channel

- Reduces 3/4" Openings to DS Glass

This CRL 3/4" Reduction Vinyl is a solid black profile that quickly converts insulating glass windows and patio doors to single pane glazing. Unique webbed profile will compress to 5/8" (15.9 mm) opening and allow for DS glass. Great for emergency repairs or permanent conversion. Sold 250 feet (76.2 m) per roll.

7/16" (11.1 mm)
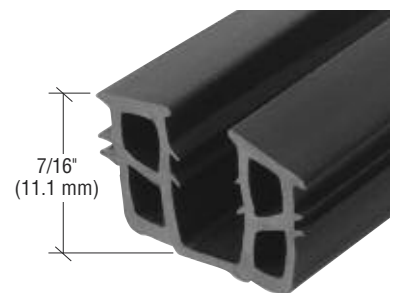
CAT. NO.	ADAPTER CHANNEL	CHANNEL WIDTH	GLASS THICKNESS
3800908	WA175	1" (25.4 mm)	3/16" (5 mm)

Minimum order: 1 roll. All Adapter Vinyls can be combined for quantity pricing.

The Importance of Working With Clean Glass

In the making of Insulating Glass units, it is imperative that the glass be clean. Many commercial cleansers on the market do an excellent job; however, some manufacturers incorporate a release agent to prevent future dirt buildup. These agents are good if you are cleaning windows, but if they are used in the area in which you expect adhesion with your sealant, problems will occur.

Sealants will not adhere to release agents, and you will have failures after the unit is out in the field. Be certain that the glass cleaner does not contain these additives, and do not use the product if a statement such as "leaves an invisible film on the glass" appears on the label. CRL Glass Cleaners 1973, 3371100, 695, and 895 for washing by hand, or CRL 155X, and 3379046 for automatic glass washers, have been tested and found to be ideal. **NOTE:** If washing the glass by hand, it must be cleaned with Lint Free Wipes such as CRL Cat. No. 1550 (see page I167), and all cleaned glass should only be handled with Cat. No. NG171 Lint Free Gloves (see page I149), to prevent oily fingerprints and/or contamination.

CRL 1973 Glass Cleaner

- A Long Time Favorite of the Glass Industry
- Low-Ammoniated Formula
- Pleasant Aroma

Sprayway®

CRL 1973 Glass Cleaner, a long time favorite of CRL customers, is a low ammoniated glass cleaner that is packaged in original 19 ounce (539 g) cans and new 4 ounce (113 g) Mini cans. 1973 features effective cleaning agents and a pleasant aroma, with the added feature of Sprayway's logo, so your customers will be able to identify the quality of this product. Minimum order is one case of 12 cans.

NOTE: Also available with your Logo or Private Label right on the can. Contact CRL Customer Service for details and pricing for this unique service.

Comfort-Use Finger Pad Nozzle

CAT. NO. 1973
19 oz. (539 g)

CAT. NO. 1973M
4 oz. (113 g)

CRL Hi-SHEEN® Glass Cleaner

- Industrial Strength Cleaner
- Lifts Residues From Non-Porous Surfaces
- Won't Leave Streaks, Blurs or Rainbows

CRL Hi-SHEEN® Glass Cleaner has been faithfully cleaning commercial and residential glass since 1970. It's dependable, no-nonsense aerosol formula is the reason, year after year, CRL Hi-SHEEN® is always a popular product! Having an effective, reliable glass cleaner is just as important today as it was 40 years ago. This is a great resale item for glass shops. Minimum order is one case of 12 cans.

NOTE: Also available with your Logo or Private Label right on the can. Contact CRL Customer Service for details and pricing for this unique service.

Resale Display Carton

CAT. NO. 3371100
19 oz. (539 g)

CRL S50 Sprayway® Glass Cleaner

- Ammonia Free Formula
- Fast Evaporation Rate, Just Spray and Wipe Clean

CRL S50 is Sprayway's® leading glass cleaner. The formula includes perfume-grade alcohols, which are the best cleaning agents you can use. It also has a fast evaporation rate, which keeps it from leaving a film and adversely interacting with other materials. Large 19 ounce (539 g) cans are packed 12 per case. Minimum order is one case.

NOTE: Also available with your Logo or Private Label right on the can. Contact CRL Customer Service for details and pricing for this unique service.

CAT. NO. S50
19 oz. (539 g)

CRL Concentrate Glass Cleaner

- One Gallon of Concentrate Makes 10 Gallons of Strong Cleaning Fluid

The most popular Glass Cleaner for in-shop and on-the-job use. It's easy to use and leaves no film or smears on glass. It's easy to mix – one gallon makes ten gallons of strong, safe cleaning fluid. Use it with less water for those extra tough cleaning jobs. 695 is also available in 55 gallon drums for industrial users.

CAT. NO.	CONTENTS
695	1 Gallon (3.785 l) Bottle
69555GL	55 Gallon (208 l) Drum*

Minimum order: 1 each. *55 gallon drum must ship common carrier.

CRL Ready Mix Glass Cleaner

- Ready Mix Bulk Liquid
- Available in Private Label for Your Resale

Our professional strength Ready Mix Glass Cleaner is also available for bulk filling of your spray dispensers. It's precisely formulated to give great glass cleaning results without the effort of mixing it yourself. It is also available for resale in containers with your private label.

CAT. NO.	CONTENTS
895GL	1 Gallon (3.785 l) Bottle

Minimum order: 1 case of four bottles.

CRL Low-e Washing Machine Detergent

- Self-Adjusting pH to Water Conditioners
- De-Limer to Help Keep the Machine Free of Dirt Build-Up
- Biodegradable and Approved for Use in All Drainage and Septic Systems

CRL Low-e is a specially formulated liquid detergent for use with all Glass Washing Machines. It has been field tested to yield better results when cleaning Low-e soft coat glass. One gallon of concentrate will treat over 1000 gallons of water. Listed on H.B. Fuller "Acceptable List" for sealant adhesion performance.
NOTE: Do not use on mirrors.

CAT. NO.	CONTENTS
3379046	1 Gallon (3.785 l) Bottle
3379048	55 Gallon (208 l) Drum*

Minimum order: 1 each. *55 gallon drum must ship common carrier.

CRL Glass Washing Machine Detergent

- Compatible With All Glass Washing Machines
- Will Not Leave a Film
- Biodegradable

Automatic glass washing machines require a special detergent for flat glass. CRL Glass Washing Machine Detergent mixes quickly, and is compatible with any brand of washer currently in use. It is composed of a unique combination of inhibitors with synthetic detergents to provide effective soil removal at low concentrations. This detergent is biodegradable, and does not contain additives (release agents), which will inhibit adhesion of sealants to the glass.

CAT. NO.	CONTENTS
155X	5 lbs. (2.2 kg)
155X40	40 lbs. (18.1 kg)
155X400	400 lbs. (181.4 kg)*

Minimum order: 1 each. *400 pound drum must ship via common carrier.

CRL Lint Free Glass Wipes

- Strong, Four-Ply White Paper Wipes are Virtually Lint Free
- Reinforced Nylon Scrim in Both Directions So They Work Great Wet or Dry
- Convenient Pop-Up Dispenser Box

CAT. NO. 1550
900 Wipes Per Case

- Six Pop-Up Boxes in Each Case

Extra-tough CRL Lint Free Glass Wipes bring the absorbing power you need in a lighter weight material that's reinforced with a nylon scrim for extra strength. The ripple texture makes them easy to hold during use, and provides just the right amount of surface area for cleaning solutions to do their work.

CRL Lint Free Glass Wipes have no adhesives or binders so they leave nothing behind except clean, lint free surfaces. Besides glass, they are ideal for your most demanding shop clean up tasks.

CRL Lint Free Glass Wipes measure a big 16-1/2" x 9-3/4" (419 x 248 mm). Each case has six pop-up boxes containing 150 Wipes each for a total of 900 Wipes per case.

CAT. NO. BX15
150 Wipes Per Box

CAT. NO.	DESCRIPTION
1550	Case of 900 Wipes
BX15	Box of 150 Wipes

Minimum order: 1 case of 1550 or 1 box of BX15.

CRL Glass Washers for Every Application

- Vertical Washers Automatically Adjust for Glass Thickness
- Speeds From 18' (5.5 m) Per Minute With Electronic Speed Adjustment
- Uses Less Floor Space Than a Horizontal Washer
- Clean Glass Up to 3/4" (19 mm) Thick
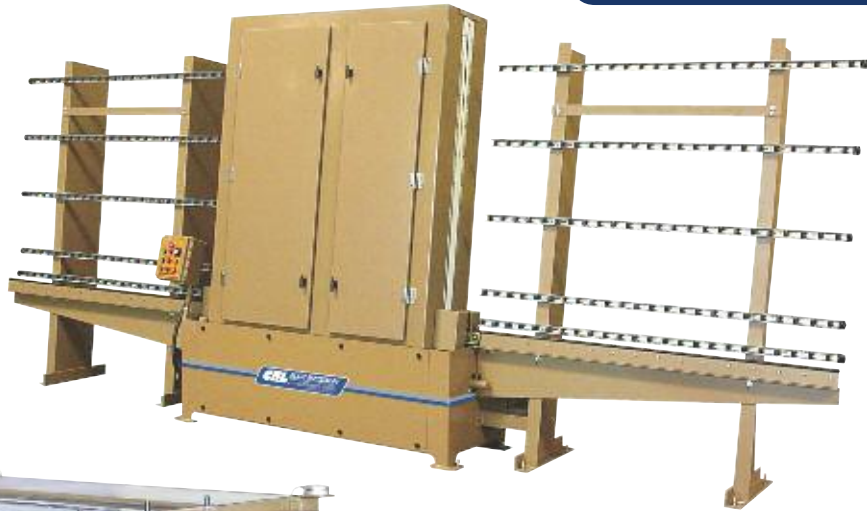
- Over 60 Years of Experience and 1200 Machines Produced
- Horizontal Washers Have Tops That Tilt for Service
- Stainless Cabin Components Resist Corrosion
- Fastest Speed of Any Standard Four or Six Brush Washer - 35 FPM

C.R. Laurence Offers a Complete Line of Horizontal Glass Washers From 12" (305 mm) to 144" (3658 mm) Wide and Vertical Glass Washers That Handle Glass From 4" x 16" (102 x 406 mm) to 120" (3048 mm) Tall*

* On Open Top Washers, in Two Passes

HORIZONTAL WASHERS

Our line of Horizontal Glass Washers have the latest design features. Conveyor speed has been increased up to 35' (10.6 m) per minute, and we can fabricate machines to process glass at any speed you need. Horizontal Glass Washers have a tilt-top design, which can be supplied with an optional hydraulic lifting device. In fact, the top can be lifted straight off with an overhead crane. Easy access to the inside of the machine is important to perform proper maintenance. Glass fabricators will be interested in our patented rapid height adjustment system. This option allows the machine operator to raise the upper section from 1/4" to 1/2" (6 to 12 mm) glass in one second. To adjust 1/2" to 3/4" (12 to 19 mm) glass also takes only one second. Corrosion resistance of horizontal machines has been enhanced by adding stainless steel to the spray compartment walls and to the brush and roller journals. We also use non-corrosive recirculating pumps, and have located all bearings outside the wet area. To enhance the drying capability, the air blast drying system has been completely redesigned. As a result, glass can be loaded on the conveyor in a squared position and dried. Some competitive washers require the glass be loaded on the conveyor in a diagonal position so the trailing edge can be dried.

VERTICAL WASHERS

Our Vertical Washers offer many options and configurations for a perfect fit into your operation. Whether you build ten units per day or operate three shifts, we have a Glass Washer that can do the job. Open Top 60" (1524 mm) Washers (VEW60 and VHDW60) can process up to 120" tall (3048 mm) glass in two passes. Frame components that come into contact with water are stainless steel. Standard features like recirculated heated detergent, recirculated miser rinse, and a fresh water solenoid valve can save water and make your Washer more efficient. The VEW60 Washer includes inspection lights on the outgoing conveyor, and all machines have brushes for cleaning Low-e and coated glass. Vertical Washers require less floor space than Horizontal Washers. Water naturally runs off of vertical glass panels, requiring less electrical power for drying. The interiors of our Vertical Washers are easily accessible for inspection or service.

CRL VEW60 Open Top Vertical Glass Washer

IN STOCK READY TO SHIP

CRL GREEN PRODUCT

- Open Top Runs Glass Up to 120" (3048 mm) Tall in Two Passes
- Standard Recirculating Detergent and Miser Rinse
- Standard Final Rinse Solenoid Water Saver
- Easy to Set Up and Maintain
- Easy to Use Operator Control Station
- Lighted Inspection Station on Outgoing Conveyor
- Available for Purchase or Lease

CAT. NO. VEW60

Packed With All the Standard Features Needed for I.G. Manufacturing

The CRL 60" (1524 mm) Open Top Vertical Glass Washer can wash glass up to 60" (1524 mm) in one pass, and up to 120" (3048 mm) in two passes. The machine will operate from 4 to 18 feet per minute (1.2 x 5.5 mpm), and has a load capacity of 300 lbs. (136 kg). You can wash glass from single strength to 1/2" (12 mm) thick, and from a minimum size of 4" x 16" (102 x 406 mm). Frame components in contact with the washing areas are made of stainless steel. Recirculated heated detergent, recirculated miser rinse, and a fresh water electric solenoid valve are standard. Also included are glass inspection lights on the exit conveyor. The four brushes are Low-e compatible. Set-up and maintenance is easy, without a factory service technician.

CAT. NO.	BRUSHES	BRUSH MOTOR HP	MACHINE WEIGHT
VEW60	4	2 HP	2200 lbs. (998 kg)

Minimum order: 1 each. F.O.B. nearest CRL Service Center. Must ship common carrier.

Controls
All controls are built to OSHA requirements, utilizing CE, CSA and UL Certified components. Wired for three phase, 60 cycle, 230V AC power.

Utilities
Electrical: 5 Motors, Total 7 HP (8.7 kw*)
*includes Blower
Voltage: Three Phase, 60 Cycle, 230V AC
Power: 40 AMP @ 230V AC
Water: 1/2" NPT inlet thread connection

Converter available to operate the VEW60 Washer at Single Phase, 60 Cycle, 220V AC.

European Union

Australia

CRL VEW60
Three Phase, 50/60 Hz Export Model

An export version of the VEW60 can be built to operate on Three Phase, 50/60 Hz power. Contact the Machinery Division with your power requirements.

Blower
60" (1524 mm)

222" (5639 mm)

Glass Travel
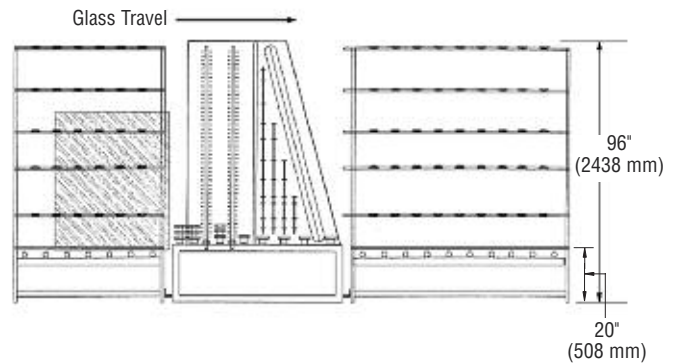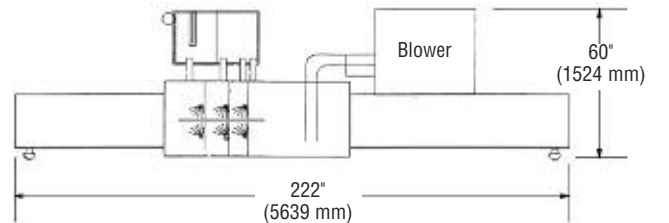
96" (2438 mm)

20" (508 mm)

SPECIFICATIONS:
Height: 96" (2438 mm)
Footprint: 222" x 60" (5639 x 1524 mm)
Roller Conveyor Height: 20" (508 mm)

Optional installation and training by a CRL Technician is recommended

CRL 360 Degree Rotary Work Table

- Speeds Production of Insulating Glass Units
- 2' x 3' (610 x 914 mm) Carpeted Surface
- Holds Units Up to 5' x 7' (1524 x 2134 mm)

The CRL Rotary Work Table speeds production of Insulating Glass units while creating a safer work place. The glass is held in position by a 6" (152 mm) vacuum cup on a 24" x 36" (610 x 914 mm) carpeted surface. Vacuum Cup system is powered by a continuous-flow vacuum generator which requires a 35 psi air supply (not supplied) regulated at the table. A 360 degree air driven braking system stops and holds the table-top in any rotational position. Both the vacuum hold-down and braking systems are controlled via tandem foot-pedal controls. Swing-out support arms expand the top surface to 60" x 84" (1524 x 2134 mm). Work surface height is 36" (914 mm). Shipping weight: 140 pounds (63.5 kg). Made in the U.S.A. Minimum order is one each.

CAT. NO. LCS3084

CRL Power Rotating Sealing Table

- 360 Degree Rotating Table
- Extendable Arms Handle Large Insulating Glass Units

The CRL Power Rotating Sealing Table seals single or stacked Insulating Glass units weighing up to 400 pounds (181 kg). The tabletop is raised and lowered by a 5" (127 mm) bore x 8" (203 mm) stroke pneumatic cylinder. Vacuum cups are raised and lowered by two 1" (25 mm) bore x 1" (25 mm) stroke pneumatic cylinders. Table rotation is powered by a DC drive motor with speed control. The directional rotation switch and speed control are mounted on a control panel on the table frame. All other controls are actuated by a foot pedal. Table rotates only in raised position. F.O.B. Red Oak, Texas. Shipping weight: 900 pounds. (408 kg). Minimum order is one each.
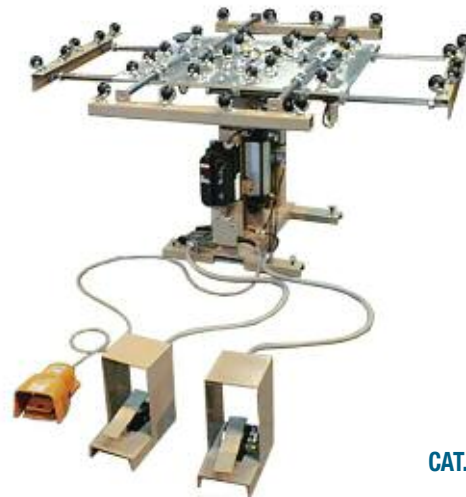
CAT. NO. PRST

CRL Positioner Vacuum Cup Work Stand

- 360 Degree Rotation
- Safely Handles Work Loads to 150 Pounds (68 kg)

This CRL Positioner Vacuum Cup Work Stand is designed to hold glass or other non-porous materials up to 150 pounds (68 kg) in the position you set. The stand is great for window manufacturers when attaching hardware, assembling small I.G. units, or for anyone who needs to repetitively hold glass in a pre-determined position. It has full 360 degree edgewise rotation and a 90 degree forward tilt. A small, quiet 115V AC pump supplies constant vacuum to the 9" (228 mm) cup. Positioners feature adjustable pad height, foot valve vacuum release, 9" (228 mm) cup, vacuum pump, clamp and base. Shipping weight: 100 pounds (45 kg). Minimum order one each. F.O.B. Laurel, Montana.

CRL Positioner Vacuum Cup Work Stand with Table Mount Clamp

CAT. NO. P0SB1P9AC

CRL Positioner Vacuum Cup Work Stand with Pedestal Base

CAT. NO. P0SF1P9AC

CRL Low-e Glass Edge Deletion Table

- Manual Table Easily Removes Glass Coatings
- Tubular Steel Construction With Adjustable Legs
- 2" (51 mm) Non-Marking Roller Balls Allow Glass to Move Easily

Glass lites with Low-e coatings must have the coating removed from the edge that will be sealed. The EDT60X84 Edge Deletion Table makes removing Low-e coating fast and easy. An operator moves one edge of the coated glass through the abrasive wheel, then runs the other three edges through the wheel and passes the finished sheet on to the next step. A HEPA Vacuum is included to collect particles from the edge wheel. Motor is 3/4 HP, single phase, 50/60 Hz, 220V AC. Made in the U.S.A.

CAT. NO.	TABLE TOP SIZE
EDT60X84	60" x 84" (1.5 x 2.13 m)

Minimum order: 1 each. F.O.B. Cicero, Illinois. Must ship via common carrier.

CRL Power Ball Caster Tilt Tables

- Aids Transfer of Insulating Glass Units or Single Lites of Glass
- Raises and Lowers by Pneumatic Cylinder Action
- All Tubular Steel Construction With Adjustable Legs

For more information on Insulating Line Production Equipment and Services, call our Machinery Division at (866) 583-1377, or e-mail to **machinery@crlaurence.com.**

The CRL Power Ball Caster Tilt Table tilts to a vertical position for the lateral transfer of single sheets of glass or Insulating Glass units. Its heavy 2" (51 mm) square by 1/8" (3 mm) thick tubular steel construction supports any size load. The neoprene Casters are 2" (51 mm) in diameter, spherical balls that will not scratch the glass. The table height can be adjusted from 34" to 36" (863 to 914 mm). **NOTE:** 100 psi, seven cfm air supply is required for operation. Made in the U.S.A.

CAT. NO.	TABLE TOP SIZE
PBCTT84X120	84" x 120" (2.13 x 3.05 m)
PBCTT84X144	84" x 144" (2.13 x 3.66 m)
PBCTT84X156	84" x 156" (2.13 x 3.96 m)
PBCTT84X168	84" x 168" (2.13 x 4.27 m)
PBCTT84X192	84" x 192" (2.13 x 4.88 m)

Minimum order: 1 each. F.O.B. Cicero, Illinois. Must ship via common carrier.

CRL Ball Caster Transfer and Inspection Tables

- Exclusive Neoprene Spherical Ball Casters
- Tubular Steel Construction With Adjustable Legs
- Available in 60" (1.52 m) Width on Special Order

Inspection Table

Transfer Table

These CRL Ball Caster Tables are for lateral transfer and inspection of single lites of glass and single or multiple Insulating Glass units. The legs and base are made from 2" x 3" (51 x 76 mm) tubular steel which can be adjusted for heights from 34" to 36" (864 to 914 mm). The table tops are constructed from 2" (51 mm) square tube steel. The 2" diameter neoprene Ball Casters won't scratch glass. Ball Casters are mounted on 12" (305 mm) centers. Custom 6" (152 mm) center mounts are available by special order. Inspection Tables are built with a cutout to allow an operator to get closer to the glass. All Tables are MIG welded and finished in industrial enamel to resist oxidation. Made in the U.S.A.

CAT. NO.	TABLE TYPE	TABLE TOP SIZE
BCT84X60	Transfer	84" x 60" (2.13 x 1.52 m)
BCT84X84	Transfer	84" x 84" (2.13 x 2.13 m)
BCT84X120	Transfer	84" x 120" (2.13 x 3.05 m)
BCT84X156	Transfer	84" x 156" (2.13 x 3.96 m)
BCT84X168	Transfer	84" x 168" (2.13 x 4.27 m)
BCT84X192	Transfer	84" x 192" (2.13 x 4.88 m)
B6212100	Inspection	84" x 60" (2.13 x 1.52 m)
BCT24XT12	26" x 31" (660 x 787 mm) Extensions for B6212100 - Set	
BC1NPT84X156	Inspection	84" x 156" (2.13 x 3.96 m)
BC1NPT84X192	Inspection	84" x 192" (2.13 x 4.88 m)

Minimum order: 1 each. Cat. No. BCT24XT12 is 1 set. F.O.B. Cicero, Illinois. Must ship via common carrier.

CRL Glass Cutting Tables

- Wide Variety of Sizes
- Manual and Hydraulic Operated
- All Models Include Carpeted Tops
- Four In-Stock Options

CAT. NO. 2402500

CAT. NO. 2402522

CRL Glass Cutting Tables are the first step in Insulating Glass production. Every custom Insulating Glass fabricator must be able to cut glass lites to size from stock sheets. CRL Glass Cutting Tables range in size from the 6' x 8' (1.83 x 2.44 m) tilting table (Cat. No. 2402500) to the 9' x 12' (2.44 x 3.66 m) Hydraulic Tilting Table with Air Float and Breaker Bar (Cat. No. 2402522). The most common style, counter-balanced tilt top, is stocked by CRL in four popular sizes, ready for shipment from your local CRL warehouse.

Available options include Air Flotation to aid in moving sheets across the table surface, X and Y Breaker Bars to aid in running cuts in stock sheets, and Stab In or Roller Toes. These CRL Glass Cutting Tables are proudly manufactured in the U.S.A. and all but one are fabricated at the CRL Machinery Division in Cicero, Illinois. Get full details in our CRL73R Tools, Machinery, and Equipment Catalog, or online at **crlaurence.com**.

CRL Insulating Glass Storage and Handling Equipment

- Mobile Harp Racks and A-Frame Carts
- Various Sizes for Components and Finished Units

CRL Insulating Glass Storage and Handling Equipment include various sizes of Mobile Harp Racks that are designed either for organizing individual glass lites before assembly, or for staging completed units after assembly. CRL A-Frame Carts are fabricated with true 90 degree deck angles to eliminate shearing problems that can occur with some Insulating Glass sealant systems. These Carts are ideal for staging product prior to pick-up or delivery. Most have locking casters and pull bars to facilitate loading and unloading, as well as movement from production to storage. Get full details in our CRL73R Tools, Machinery, and Equipment Catalog, or online at **crlaurence.com**.

CAT. NO. R55RACK

CAT. NO. HDSC5448

CRL Multi-Purpose Glass Storage System

- Fixed Post System for Storage of Wood Cases, Glass Packs, and Loose Lites
- Rated Up to 4000 Pounds (1814 kg) Between Posts
- Customize for Your Space Using Individual Components or Choose From a Selection of Storage Packages

CRL Multi-Purpose Glass Storage Systems are designed for the upright storage of glass cases, glass (stoce) packs, and loose lites. All components are protected with a hot dip galvanized finish.

Low friction EZ Slide option with Center Rail provides for easy handling and edge protection for loose lites and glass (stoce) packs. Standard Case Storage Packages are intended for wooden case storage only, and do not include Center Rail or EZ Slide materials. EZ Slide Glass Pack Packages can be used for wooden cases, glass packs or loose lites. Get full details in our CRL73R Tools, Machinery, and Equipment Catalog, or online at **crlaurence.com**.

CAT. NO. 2005434

Vacuum Handling Equipment

- Large Sheet Movement
- Special Soft Grip Edges
- Small Lite Handling

The easiest and safest way to handle any delicate sheet is by vacuum device. CRL can supply the exact product for your specific need. Power frames are expandable. They can include tilting and rotation functions, as well as soft lip pads for delicate panels. Small pieces can be moved quickly without being touched by workers' hands. See the entire selection in our CRL73R Tools, Machinery, and Equipment Catalog, or online at **crlaurence.com**.

General Cleaning and Maintenance

- Glass, Plastic, and Metal Cleaners
- Wipes and Towels
- Vacuums

High-grade industrial cleaning supplies are a must for every industry, especially those involving glass or clean room manufacturing.

CRL has a product for every cleaning need. All CRL cleaning and maintenance supplies are available in the CRL03 Catalog, or online at **crlaurence.com**.

Safety and Personal Protective Gear

- Hard Hats
- Gloves
- Sleeves
- Glasses
- Aprons
- Leggings

Safety of production personnel is a priority for every manufacturer. CRL stocks hundreds of items dedicated to worker protection: Stylish and functional glasses; latex, cloth, nitrile, leather, and rubber gloves; back and wrist supports; sleeves, jackets, and chaps made from canvas or Kevlar; ear plugs, respirators, and hard hats.

CRL can help protect your company and your employees. Review our entire line of protective gear in the CRL73R Catalog, or online at **crlaurence.com**.

CRL's Insulating Glass Design and Fabrication Assistance

• Insulating Glass Production Line Design

To profitably fabricate Insulating Glass units in quantity you need the right tools and equipment. If you are planning to fabricate them in production-level quantities, working with the right tools and shop equipment will make the difference between a profitable unit and one that costs more than you anticipated.

Contact Technical Sales to discuss your plans and we will work with you to design a new production line or upgrade your existing one. Call (800) 421-6144 in the U.S., (877) 421-6144 from Canada, or (323) 588-1281 International. Ask for the Door and Window Department at Ext. 7520.

• Insulating Glass Consultation Service

The best part of gearing up to fabricate Insulating Glass units is that you don't have to go it alone. CRL has decades of experience in the field of Insulating Glass, and trained Technical Sales personnel to provide assistance in selecting the fabrication methods, supplies, and equipment that will best suit your needs and fit your budget.

Contact them at (800) 421-6144 in the U.S., (877) 421-6144 from Canada, or (323) 588-1281 International. Ask for the Door and Window Department at Ext. 7520. You can also send e-mail from the home page of **crlaurence.com**. Click on Contact Us, and then click on Technical Sales for Door and Window Products.

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