



POLYVISION™

Switchable Privacy Glass

by



Polytronix, Inc.

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Fax: 972-231-4052

www.polytronix.com/privacyglass.htm

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COMPANY

FOUNDED: 1980

EMPLOYEES: 120

LOCATION: Richardson, Texas (U.S.A.)

BUSINESS: Design, manufacture, and market standard and customized liquid crystal displays (LCD)

MAJOR PRODUCTS: Specialized/Customized liquid crystal displays and devices

Avionic cockpit displays, modules, and subassemblies

Polymer-Dispersed Liquid Crystal Displays (PDLC)

Polyvision™ Switchable Privacy Glass

Polymagic LED Glass

Polyholo Glass

Polyflush Glass

Polynano Glass

Polyow-E Glass

PolyLens Glass

LiteGlow Glass

OEM LCD Glass and Modules



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POLYVISION™ BY POLYTRONIX, INC.

DEVELOPMENT:

Obtained license from Kent State University in 1988
Developed reliable formulations and processes
Designed its own equipment for production

Commercialized PDLC film in 1990
Commercialized PDLC glass in 1994
Low Haze version in 2005
Wide Angle version in 2007
Low Voltage version and new PDLC patent pending in 2009

PRODUCT TYPE:

Polyvision™ PDLC switchable privacy glass
Polyvision™ PDLC film sheet

APPLICATIONS:

Through Polyvision™, you will see things in a whole new light! At the flick of an electrical switch, Polyvision™ becomes transparent from a cloudy-white translucent state.

Polyvision™ provides creative design for architects and other technical applications.

Bathrooms/Shower enclosures

Clinics

Conference rooms

Hospital (nurseries, emergency rooms, ICUs, operation rooms)

Hurricane resistant windows

Optical shutters

Projection displays

Residential enclosures

Security windows

Skylights



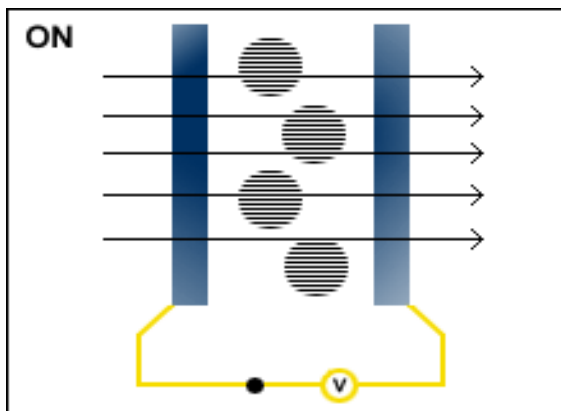
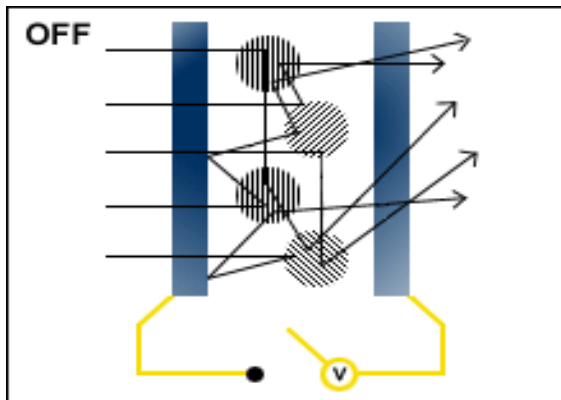
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TECHNOLOGY

PRINCIPLE: When the power is off, the liquid crystal molecules are randomly oriented that scatters incident light and Polyvision™ becomes opaque.

When electricity is applied, the liquid crystal molecules line up, the incident light passes through, and Polyvision™ looks clear.

PDLC Light Scattering Mechanism





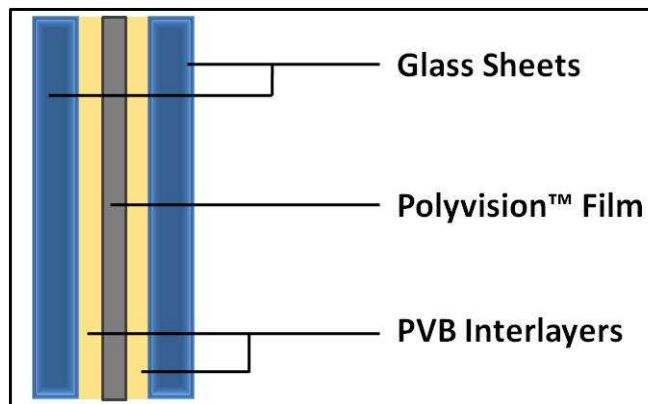
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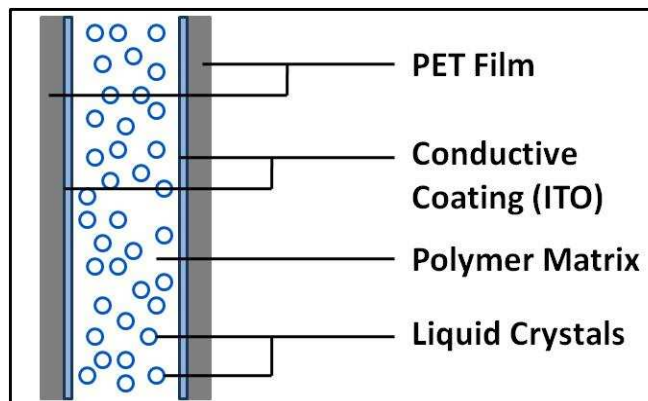
MANUFACTURING

Polytronix is the only switchable privacy PDLC film and glass manufacturer in the United States. Polyvision™ was field tested and lasted for more than 10 years.

The Polyvision™ Privacy Film is made of two layers of transparent conductive films sandwiched with PDLC material. The film is then laminated between two pieces of glass. When electricity is applied to the film the liquid crystals line up and the window is clear. When the power is turned off, the liquid crystals return to their normal scattering positions and turn the glass from clear to translucent.



The liquid crystal privacy film is sandwiched between the glass makeup in a way similar to the construction of laminated glass. The outside skins are made up of glass (normally 5 or 6 mm annealed glass) each side, then a PVB interlayer is inserted on each side to trap and hold the liquid crystal privacy film.



The liquid crystal privacy film is made up of electrically conductive coatings, a polymer matrix and liquid crystals. This film has electrical wiring to be connected to a transformer to supply power for the "on" (clear state) mode.



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TECHNICAL DATA (POLYVISION™ PRIVACY GLASS)

GLASS COLOR:	Clear, bronze, gray, green tint	
GLASS TYPE: (All laminated)	Annealed, heat/chemical strengthened, tempered	
THICKNESS:	Interior	5/16" (8 mm) or 7/16" (11 mm)
	Door	9/16" (14 mm)
	Exterior	1" (25mm) insulating glass unit (3/16" tempered outer glass + 3/8" airspace + 7/16" clear laminated Polyvision™ glass)
SIZE:	Up to 60" x 120" (1,524 mm x 3,048 mm)	
SHAPE:	Any shape, including holes anywhere	
ENVIRONMENTAL:	Storage	-20 °C to 70 °C (-4 °F to 158 °F)
	Operation	-10 °C to 60 °C (14 °F to 140 °F)
ELECTRICAL:	Driving voltage	65 ± 5 volts A.C.
	Current	less than 20 mA/ft ² (215 mA/m ²)
	Power	less than 0.5 W/ft ² (5 W/m ²)
SWITCHING TIME:	Approx. 100 milliseconds at room temperature	
OPTICAL:	Transmission (visible)	approx. 75%
	View angle	approx. 150°
	Scattering effectiveness	approx. 1 inch
LIFE:	Greater than 10 years (indoors)	
	Claim is supported by manufacturer's testing data	



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GLAZING (SECTION 08800.2)

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work included: Provide specialty glazing and glazing accessories where shown on the drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
 - 1. Documents affecting work of this section include, but not necessarily limited to General Conditions, Supplementary Conditions, and Sections in Division 1 of these specifications. Please select appropriate sections.
 - 2. Section 08410: Aluminum Entrances and Storefronts
 - 3. Section 08300: Glass Doors
 - 4. Section 08425: Automatic Entrance Doors
 - 5. Section 08960: Sloped Glazing
 - 6. Section 09875: Structural Sealant Glazing System
 - 7. Section 07920: Sealants
 - 8. Section 16050: Electrical
 - 9. Section 08600: Wood Framing Applications
 - 10. Section 08210: Wood Doors
 - 11. Section 08100: Metal Doors & Frames
 - 12. Section 08510: Steel Windows (Hollow Metal)



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GLAZING (SECTION 08800-2), Part 1, Continued:

1.2 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Sections.
- B. Polyvision™ panels comply with the following:
 - 1. Standards
 - a. FGMA (Flat Glass Marketing Association)
 - b. IGMA (Insulated Glass Manufacturers Association)
 - 2. Certification/Ratings
 - a. Safety Glazing
 - 1. CPSC (Consumer Products Safety Commission)
16 CFR 1201 Cat II
 - 2. ANSI (American National Standards Institute) Z97.1-2004
ANSI SAE Z26.1-1996 (safety glazing for motor vehicles)
 - b. Sound Control
 - 1. ASTM International (American Society for Testing and Materials) E90-83 (sound transmission class), E90-87 (analysis)
 - 2. E413-87 (certification)



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**GLAZING (SECTION 08800-2), Part 1,
1.2, B. 2. b. Sound Control, Continued:**

Polyvision™ Panel Sound Control Data

Overall Thickness	Construction	STC Value
5/16" (8mm)	1/8" x 0.060 x 1/8"	35
7/16" (11mm)	3/16" x 0.060 x 3/16"	37
9/16" (14mm)	1/4" x 0.060 x 1/4"	39
1" (25mm)	3/16" x 1/2" airspace x 5/16" laminate	39

Sound Transmission Control (STC): 15–25 = poor; 26–35 = marginal; 36–45 = good; 45–55 = very good; 56 or higher = excellent

3. Others

IGCC (Insulated Glass Certification Council) #681 per ASTM guidelines set forth in E-773 and E-774 and certified to level CBA

ASTM C-920 (elastomeric joint sealants)

ASTM C-162 (standard terminology of glass and glass products)

ASTM C-1036 (flat glass)

ASTM C-1048 (heat-treated flat glass)

ASTM C-1172 (laminated architectural flat glass)

ASTM C-1422 (chemically-strengthened flat glass)

ASTM C-1464 (bent glass)

ASTM D1003 (haze and luminous transmittance of transparent plastics)

ASTM E2190 (specification for insulating glass units)

ASTM E2188 (accelerated weathering)

ASTM E2189 (fog resistance)

ASTM F-1637 (standard practice for safe walking surfaces)

ASTM F-1646 (terminology relating to safety and traction for footwear)



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GLAZING (SECTION 08800-2), Part 1, Continued:

1.3 SUBMITTALS

- A. Comply with pertinent provisions of Section 01340.
- B. Product data: Within 60 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:
 - 1. Materials list of items proposed to be provided under this Section.
 - 2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.
 - 3. Manufacturer's recommended installation procedures which, when approved by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the work.
- C. Samples. Accompanying the above product data, submit:
 - 1. Samples of each type of gasket proposed to be used.
 - 2. Samples of each type of sealant proposed to be used, tested for each substrate involved (ADD-certified by sealant supplier if organic coating involved) proving compliance with manufacturer's recommended sealants for use with specialty glass.



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GLAZING (SECTION 08800-2), Part 1, Continued:

1.4 PRODUCT HANDLING

- A. Comply with pertinent provisions of section 01640.
- B. Follow strict glass handling and storage recommendations of referenced standards, including any special instructions from the specialty glass manufacturer.

1.5 WARRANTIES

- A. Contractor shall warrant for one year the satisfactory performance of the window installation which includes window, glass glazing, anchorage, and electrical work as detailed by the Specifications and approved Shop Drawing.
- B. The manufacturer of laminated glass assembly, single or double glazed, shall provide a one-year warranty against electrical failure and/or delamination in material and workmanship of the Polyvision™ panel. The manufacturer may select either to replace the panels at its cost or to refund the customer. The purchaser agrees to assume all financial responsibility for removal of old panels and installation of new ones.



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GLAZING (SECTION 08800-2), Continued:

PART 2 - PRODUCTS

2.1 GLASS

- A. General
 - 1. All glass comply with ASTM C-1036-06.
 - 2. Provide the type and thickness shown on the Drawings or specified herein.
 - 3. Where type or thickness, or both are not shown on the Drawings or as specified herein, provide type and thickness directed by the Architect.
 - 4. Polyvision™ panel WILL NOT be given a permanently etched safety certification label unless specifically directed by the Architect.
- B. Float glass-clear: Type 1, Class 1, Quality q3.
- C. Heat absorbing glass: Type 1, Class 2, Quality q5.
- D. Tempered glass: Comply with ASTM C-1048-85 and Z976.1-84.
- E. Laminated Glass:
 - 1. Provide specialty clear and/or tinted consisting of an outer face and an inner face of q5 float glass laminated under heat and pressure to a liquid crystal film, a proprietary product Polyvision™ manufactured by Polytronix, Inc., Richardson, TX (972)-238-7045, fax (972) 231-4052.



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**GLAZING (SECTION 08800-2), Part 2,
2.1 Glass, E. Laminated Glass, Continued:**

2. Polyvision™ panels with widths exceeding maximum width of 60” (contact a Polytronix representative for larger dimensions) will be manufactured with two butt-jointed liquid crystal films laminated into a single Panel.
3. Alternative Butt Joint Applications

See Section 2.2 B.1.a
4. Polyvision™ Glass Optical performance

See page 8 Technical Data.
5. Glass used in Polyvision™ can be annealed, heat strengthened, or tempered.



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GLAZING (SECTION 08800-2), Part 2, Continued:

2.2 OTHER MATERIALS

A. Special Electrical Conditions

1. For all fixed panel installation, a separate Polytronix Power Supply shall be provided for each 60 square feet or fraction thereof. Power source of 110 VAC, 60 Hz electricity must be supplied from a GFI circuit. The power supply should be connected to an accessible standard double junction box connected to ground continuity.
2. For all swing Panel installations, the power supplier should be located near the hinge side of door/window jamb and all installation is to conform to manufacturers instructions.

B. Special Glazing Requirements

1. Interior Butt Glazing
 - a. Polyvision™ panels can be butt glazed using a recommended minimum 7/16" thickness panel.
 - b. A standard neutral cure structural silicone sealant may be used to close the joint. A minimum of a 1/4" separation between panels is recommended.
 - c. Refer to applicable local building codes for design load requirements regarding interior glazing.



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GLAZING (SECTION 08800-2), Part 2, Continued:
2.2, B. Special Glazing Requirements, Continued:

2. Swing Doors/Windows
 - a. Swing door/window units may be glazed with Polyvision™ panels.
 - b. Door package will be complete with door header, door leaf, power transfer device, and all other hardware. Finish, cladding, hardware and keying may be selected as options.
 - c. Window Package will be complete with sash, frame, power transfer device and all hardware. Finish cladding and hardware may be selected as options.
- C. Provide other material, not specifically described but required for a complete and proper installation, as specified or selected by the Contractor subject to the approval of the Architect.



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GLAZING (SECTION 08800-2), Continued:

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

- A. The purchaser must examine the areas and conditions under which work of this Section will be performed. Correct conditions are detrimental to the timely and proper completion of this work. Do not proceed until unsatisfactory conditions are corrected.
- B. After preparation of the glazing system, clean glazing channels, stops and rabbets to receive the glazing materials, making free from obstructions and deleterious substances which might impair the work.
 - 1. Remove protective coating which might fall in adhesion or interfere with bond of sealants.
 - 2. Comply with manufacturers' instructions for final wiping of surfaces immediately prior to application of primer and glazing compounds or tapes. USE ONLY NEUTRAL CURE SILICONES. **DO NOT USE ACETIC SILICONES.**



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GLAZING (SECTION 08800), Part 3, Continued:

3.2 INSTALLATION

- A. Inspect each piece of glass immediately prior to start of installation.
 - 1. Do not install items which are improperly sized, have damaged edges, or are scratched, abraded, or deficient in any other manner.
 - 2. Do not remove labels that were provided by the glass supplier from the glass until so directed by the Architect.
 - 3. Adhere to all Polyvision TM installation instructions and installation drawings (for a sample wall installation, see Appendix VII on p. 30). For multi-panel wiring instructions, see Shop Drawing on p. 32.
- B. Locate sill setting blocks of standard width and thickness at quarter points of all glass lights unless otherwise recommended by manufacturer or supplier.
 - 1. Use blocks of proper durometer, size and thickness to support the glass in accordance with the manufacturers' recommendations.
 - 2. Glass lap and edge clearances must be provided according to pertinent codes and standards of manufacturers.



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GLAZING (SECTION 08800-2), Part 3, Continued:
3.2 INSTALLATION, Continued:

- C. Set glass in a manner which produces the greatest possible degree of uniformity in appearance.
 - 1. Installations of the glass in dynamic frames such as operable windows or sliding doors must meet architectural specifications.
 - 2. Glazing to the exterior and wet interior conditions must be wet-sealed and impervious to moisture with provisions to allow for weeping of condensation that may infiltrate the system.
 - 3. Pressure glazing systems without positive positioning stops are not to be used with this glass.
 - 4. Glazier has to place electrical connections properly to allow access by an electrician.
 - 5. Electrical connections must exit at the head condition of any framing system using Polyvision™ panels in wet environment applications.
- D. Cut and seal the joints of glazing gaskets in accordance with the manufacturers' recommendations, provide watertight and airtight seal at corners and other locations where joints are required.



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GLAZING (SECTION 08800-2), Part 3, Continued:

3.3 PROTECTION

Protect glass from breakage after installation by promptly installing streamers of ribbons, suitably attached to the framing and held free from the glass. Do not apply warning markings, streamers, ribbons, or other items directly to the glass except as specifically directed by the Architect.

Note: Windblown objects, welding sparks, or other material applied to the glass surface during construction may cause irreversible damage.

3.4 CLEANING

Cleaning of the glass during the subsequent weathering period is necessary. Abrasive cleaners should never be used, particularly when the surface to be cleaned has a reflective coating. Clean the Panels with a mild soap or very weak acid (vinegar) applied with a soft, clean, grit-free cloth. The glass and framing should be rinsed immediately with water and the excess should be squeezed away from the glass, taking care not to contact the glass with any metal parts. The framing should be wiped dry.

APPENDIX I: GLAZING GUIDELINES

1. SETTING/GLAZING

Polyvision™ panels may be oriented in any direction. The Flat Glass Marketing Association (FGMA) Glazing Guidelines are to be followed except as noted.

Glazing Methods:

A. Interior Applications - Laminated Polyvision™ panels

Dry Glazing: This is preferred interior glazing method.

Wet Glazing: If an elastomeric (non-acetic) sealant is used, it must be compatible with the panel polyvinyl butyral (PVB) interlayer. Never use putty or glazing compound to glazing a Polyvision™. Refer to the FGMA Glazing Manual for further information.

B. Exterior Applications - Insulated Glass Units made with Polyvision™

Wet Glazing: Pre-shimmed glazing tape and non-acetic sealants are required to create a seal impervious to moisture for all applications.

C. Butt-Joint Glazing: Polyvision™ panels can only be butt-joint glazed in interior applications.

D. Non-Acetic Sealants: The following sealants are listed as non-acetic by their manufactures. Confirm with these manufactures the compatibility of their respective sealants with regard to butt-joint glazing Polyvision™ panels (a PVB laminated flat glass product).

• GE SSG4000

• Rhodorsil 3B (Rhone-Poulenc)

• Dow Corning 399, 795, 991

• Dow Corning 1199

E. Structural Silicone Glazing: Insulated glass units manufactured with Polyvision™ panels should NOT be structurally silicone glazed.

APPENDIX I: GLAZING GUIDELINES, Continued:

2. FRAME DESIGN

Standard FGMA frame edge clearance and face clearances may be used, EXCEPT edge bite must be 7/16" minimum and framing must have a hole of 1/4" diameter. To maintain a proper seal against the infiltration of water and air, adequate bite is required.

Inadequate clearance for the edges can cause damage due to glass-to-metal contact. The FGMA Information Chart shows minimum edge clearances with a tolerance of $\pm 1/16$ ". This should only be increased if the surrounding materials' tolerances are difficult to control. See SCD 23300 or SCD 23200. Refer to FGMA Glazing Manual details.

The industry standard for framing deflection must be adhered to. The deflection must not exceed either the length of the span divided by 175, or 3/4", whichever is less. All expansion joints and anchors must be designed so that the glass framing does not incur a load due to structural movement. Refer to the FGMA Glazing Manual for the details of adequate framing systems.

3. SETTING BLOCKS

Glass larger than six (6) square feet should be placed on two EPDM or neoprene setting blocks. These blocks should have a durometer hardness of 85 ± 5 . They should be centered at the bottom quarter points (i.e. equal distance). The blocks should be 1/16" narrower than the channel width. Lock-strip gasket systems also require setting blocks. Recommendations can be obtained from the gasket manufacturers.

4. GLASS PROTECTION

Once the glass is installed, the architect, general contractor, or owner should provide for glass protection and cleaning. Weathering steel such as Cor-Ten or alkaline materials may cause surface damage due to staining. Abrasive cleaners should never be used, particularly when the surface to be cleaned has a reflective coating. Windblown objects, welding sparks, or other material applied to the glass surface during construction may cause irreversible damage.

APPENDIX II: SHIPPING AND RECEIVING

1. SHIPPING

If no preferred carrier is specified, the Panels for domestic customers will be shipped through our laminator's common ground carrier.

For overseas customers, specifying whether the freight should be shipped via Air or Sea is necessary. Where available, it is recommended to have your own agent to take care of the shipping and customs clearance issues.

Due to the difficulty in estimating the accurate weight and dimensions of the crate at the time of giving a quotation, the Panels will be shipped Freight Collect with the full value insured.

2. RECEIVING

Customers should inspect the shipment in the presence of the freight delivery driver to ensure no damage to the Panels has occurred. It is critical that this inspection take place in the presence of the freight delivery driver. If you fail to inspect the shipment, the carrier and Polytronix, Inc. are not responsible for damages.

Before signing for and accepting the shipment from the carrier, inspect the crate(s) for the following items:

- a. Inspect crate(s) for damage.
- b. Check Tip 'N Tell indicator.

If there are any indications of possible damage, you should immediately, in the presence of the carrier, open the crate(s) and inspect each Polyvision Panel for damage. If damage to any of the Panels is found, the shipping documents should be so noted and the driver's signature obtained as a witness. You should inform Polytronix immediately of any damaged Panels. Photographs should be furnished. A freight claim should be filed to the carrier as early as possible.

APPENDIX II: SHIPPING AND RECEIVING, Continued:

3. UNCRATING

Keep the crate upright at all times while removing the cover. The crate may be tilted, leaning at 5° – 7° from vertical. To avoid possible damage to the Panels, open the lid side first. All perimeter edge blocking should be carefully loosened and removed so that the Panels don't have to be pried out of the crate. Remove the Panels carefully.

Warning: The loose wires from the Panels are not to be used for lifting, moving or positioning the Panels.

4. STORAGE

Glass edges frequently sustain damage due to careless handling at some point between manufacture and installation. Handle with care! If the glass is to be stored on the job site or in warehouse conditions, proper blocking and protection should be maintained at all times. As with other flat glass products, the Polyvision Panels must be stored where the relative humidity is less than 80% to prevent the glass from staining. The glass temperature should be held nearly constant to prevent moisture condensation on the Panels. Storage temperature range is –4 – 158 °F (–20 – 70 °C). The crate of Panels should be kept in an upright position or tilted at 5° – 7° from vertical at all times using broad, sturdy uprights to support the weight of the crate.

5. "UNEXPECTED" BREAKAGE

"Unexplained" glass breakage may occur even after all precautions have been taken. Such breakage is beyond the control of the manufacturer and therefore not warrantable. This includes but is not limited to the following types of breakage or other damage:

- thermal stress
- damage during sand blasting
- glazing system pressures
- damage during glazing
- handling and storage problems
- excessive wind loads
- objects and debris striking the glass
- damage by persons/objects at the construction site

APPENDIX III: ELECTRICAL INSTALLATION

1. SUPPLIES NEEDED

Installation of Polyvision™ panels require the following items:

1. A 15 AMP (minimum) ground fault interrupter circuit breaker with 110 VAC 60Hz (installer/owner supplied) electricity.
2. A wall mounted switch, 110 VAC 60 Hz (installer/owner supplied). This switch is required to allow the Panels to be turned ON vision mode).
3. Polytronix power supply. Polyvision™ panels may be connected in parallel up to 60 square feet total area per single Polytronix power supply.

2. WIRING

1. Polyvision™ requires all electrical installations be completed by a licensed electrician, and in compliance with all coding requirements under applicable state or local laws as identified by the licensed electrician.
2. Before installation, inspect bus bars, electrode leads and wires to assure insulation. No exposed bus bars, electrode leads, or wires should contact any metal frames that will damage transformer and Polyvision™. Insulating tapes can be used to wrap exposed bus bars, electrode leads, or wires which may be caused during glass lamination or shipping.
3. Multiple Polyvision™ panels should be connected parallel with the transformer. Make sure that transformer "IN" connects to 110VAC, and "OUT" connects to Polyvision™. The out put voltage is ~ 65 VAC. Each transformer controls up to 60 square feet of Polyvision™.
4. Before turning on the power, test resistance reading between the metal frame and electrode and make sure that the resistance reading is infinite. Otherwise, check short location and insulate electrodes from metal frames.
5. Polyvision™ uses less than one watt per square foot in the "ON" (clear) state. No electricity is consumed in the "OFF" (translucent) state. Polyvision™ can be controlled with either a single or multiple switches or a remote controller.

APPENDIX IV: TROUBLESHOOTING

CAUTION: Polyvision operates at 65 VAC and 60 Hz. Higher voltage and frequency may cause permanent damages.

Troubleshooting and electrical service must be performed by a qualified electrician who has read and understood this document.

Switch the power ON. Verify that the panels turn clear. If one or more Polyvision™ panels are not operating:

1. Check the circuit breaker to verify power. If there is no power from the circuit breaker, reset or replace the circuit breaker.
2. Check the wall switch to verify power. If there is no power from the wall switch check the connection or replace the wall switch.
3. Check input to the power supply of affected panels to verify power. If there is not input power to the power supply, check the wiring between the wall switch and the power supply.
4. Check output from the power supply of affected panels to verify power. If there is no output power from the power supply, the fuse may have blown. Replace fuse with the same size and specifications which is available at electronic supply stores.

NOTES

1. Use care when opening the power supply and allow a few minutes to cool down. Internal electronic parts may be very hot. This is normal.
2. Warning: Do not substitute a higher fuse rating! Fuse rating is critical to properly protect Polyvision™ panels and the power supply.

APPENDIX V: FEATURES AND BENEFITS

UNIQUE FEATURES:

Privacy and security with architectural integrity

Visual attention to interior and exterior design

No distracting shutters and drapes

Beauty and Functions Combined!

HOW IS POLYVISION™ GREEN?

Saves energy by using natural lighting while maintaining privacy

Environmentally-friendly by reducing fabric wastes used to make curtains/drapes

Liquid crystal components are organic and biodegradable

Very low power consumption (equivalent to a clock radio)

Blocks over 80% infrared and over 99% ultraviolet light

BENEFITS TO OUR CUSTOMERS:

Highest Quality Product:

Leading manufacturer in Liquid Crystal Displays (LCD)

Cooperation with experts in glass and architectural industries

Qualified Laminators in both east and west coasts

Lower shipping costs to customers

Customer Services and Technical Support:

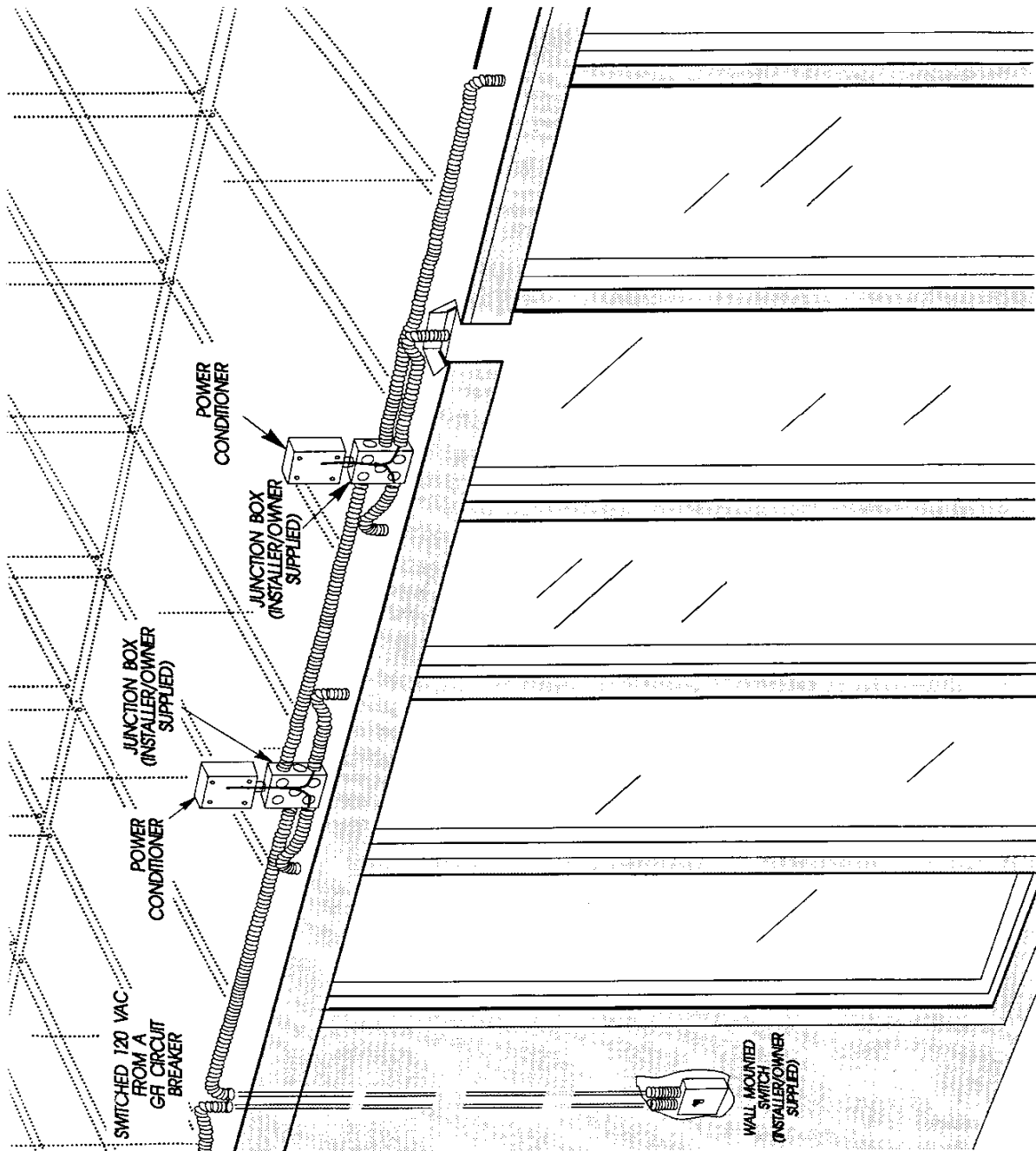
Quick response to customers' needs

Field supervision when necessary

APPENDIX VI: PARTIAL USERS' LIST

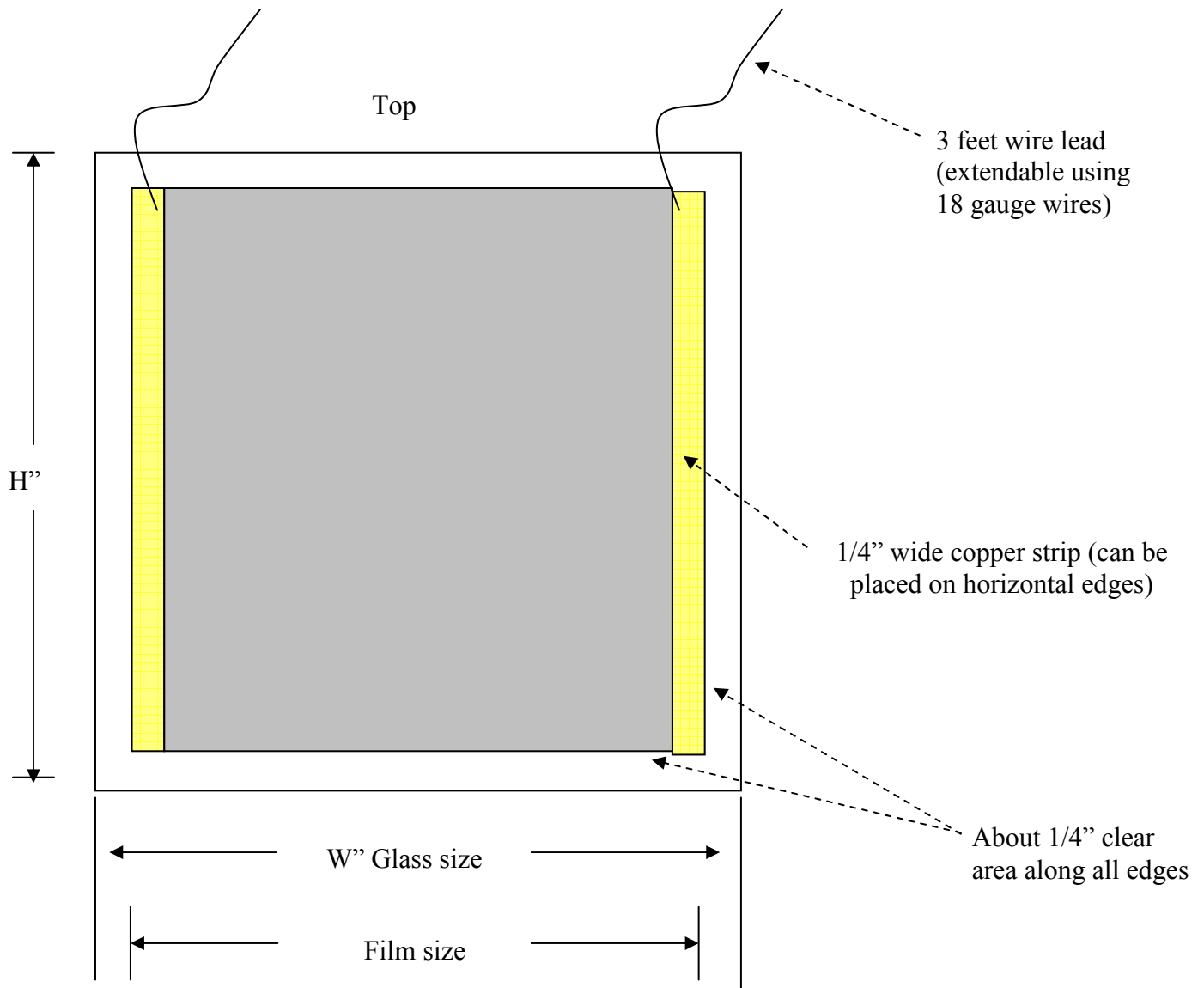
End User	Application	Glass Contractor/Architect
Three Strikes Production	XXX2 (Hollywood movie)	Three Strikes Production
CBS	Big Brother 5	Dave's Glass
IBM, Boulder, CO.	Command Center	Hillcrest Glass
AT & T, Murry Hill, NJ	Audio/Video Presentation Area	Galaxy Glass
Albert Einstein Hospital, Sao Paulo, Brazil	Intensive Care Rooms	Udiness Industria E Comercio Ltda
Edwards & Terry Law Firm, Corpus Christi, TX	Conference Room	Barcom Commercial/Scott H. Johnson AIA & Design Assoc.
American Nevada, Las Vegas, NV	Board Room	Fitzgerald Glass/Gensler & Asso.- Houston
Atlantic Studio, Atlantic City, NY	Presentation Studio	Mettel Toys/Evan Mower
Baptist, Nashville, TN	Conference Room	Infrastructure
Exchange Resources, Rutherford, NJ	Conference Room	Engineering Specialty Products
Hughes Galaxy Latin America, Long Beach, CA	Command Center	Heinaman Contract Glazing/Crosby Group, M.E. Engineers
Lehman Brothers, NY, NY	Conference Room	County Glass & Metal/Salsano Fahim Architects
Lockheed Martin	Conference Room	Lockheed Martin
North York General Hospital ON, Canada	Emergency Room	Stanley Access Technologies
Nations Bank, Nashville, TN	Conference Room	Infrastructure
Pulp Studio, LA, CA	Various applications	Pulp Studio, LA, CA
S P Telecom, Denver, CO	Audio/Video Presentation Area	Centere Constructions/KDC Arch
Saunders & Schmieller Law Offices, Silver Spring, MD	Office Entrance	Paul Gaiser Architects
Standard Micro Systems, Hauppange, NY	Conference Room	Lynbrook Glass
Triodyne/Goldberg, Chicago, IL	Office Windows	Mangrum Glass
Washington Hospital, San Jose, CA	Operating Room	Cline & Assoc./Collier Bldg. Spec.

APPENDIX VII: GLASS WALL SAMPLE



NOTE: Please also refer to page 32 for a sample connection diagram.

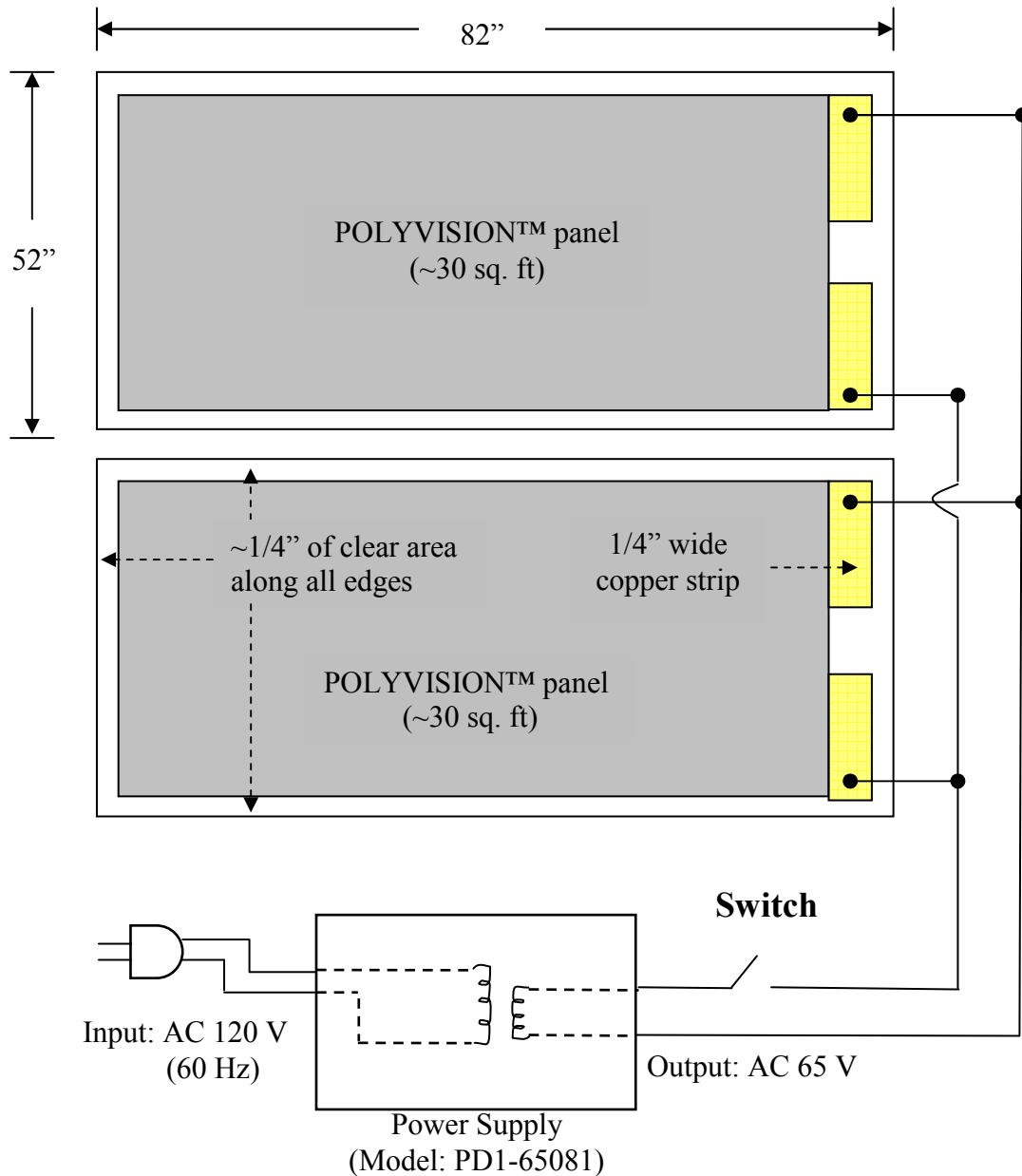
APPENDIX VIII: SHOP DRAWING – Single Lite



NOTE:

1. There will be about 1/4" clear visible area along all 4 edges. The clear visible area is transparent all the time.
2. The width of the Busbar (copper strip) is 1/4". The busbar can be placed along long or short edges.
3. Edges where the electrodes are placed (vertical edges in the above drawing) have to be covered by min. 1/2" (3/4" recommended). Cover min. 1/4" for other edges.

SHOP DRAWING – Multiple (or Butt-Joined) Lites



NOTE:

1. There will be ~1/2" of clear, visible areas when panels are butt joined. The clear areas can be covered by artificial grid, tape, or other decorative material as desired to provide complete privacy.
2. Exterior switches can be wired between the power supply and panels as desired. Wire extensions must be 18 gauge minimum.
3. Each power supply is only capable of supporting up to 60 sq. ft. of glass. The example connection diagram above shows the maximum width and length per unit.
4. Butt joined using neutral silicone only.

APPENDIX IX: 1'x1' SAMPLE PHOTO

Power OFF (Translucent)



Power ON (Transparent)



APPENDIX X: ARCHITECTURAL SPECIFICATION SAMPLE

Switchable Privacy Glass

- A. Laminated glass assembly for clear glass panes with polyvinyl butyral (PVB) films which are 0.76 mm (0.030 inch) thick on each side. Polymer-dispersed liquid crystal film (PDLC) core having electrical connections.
 - 1. With voltage PDLC core becomes transparent.
 - 2. Without voltage PDLC core becomes translucent.
- B. Electric Connections:
 - 1. Locate steel channel cap on one panel edges, integrally connected to glass panel.
 - 2. Integrally connect flexible steel conduit, not less than 1800 mm (six feet long), to steel channel cap. Provide threaded end fitting at free end.
 - 3. Integrally connect type TFFN or THHN number 18 AWG minimum size to panel with not less than 150 mm (six inches) extending beyond flexible conduct end.
- C. Power Conditioner:
 - 1. Designed to provide square wave electrical power to discharge the LC film, suppress voltage surges and transients, reduces in rush current, and reliably discharge the LC film.
 - 2. Operate from 120 volt AC, 60 Hz input.
- D. Switchable privacy glass assembly listed by UL in Building Materials Directory or other approved testing laboratory bearing permanent mark of approval.
- E. Switchable privacy glass:
 - 1. Both panes ASTM C1048, Kind HS, Condition A, Type I, Class 1, Quality q3, 4.8 mm (3/16 inch) thick.
 - 2. Size as indicated.
 - 3. Thickness 7/16".
- F. Switchable Privacy Glass system meeting the above specifications as manufactured by Polytronix Corporation, Telephone No. 972-238-7045, is acceptable.

APPENDIX XI: REPRESENTATIVE PROJECTS

Project Name: Bar 89 (Restaurant) (restroom door)

<http://www.worldsbestbars.com/city/new-york/bar-89-new-york.htm>

89 Mercer Street, New York, NY 10012-4402

Telephone: 212-274-0989

Project Name: Unical Aviation Inc. (28 panels, including door lites with holes for handle)

4775 Irwindale Ave, Irwindale, CA 91708

Contact: Paul Hui @ 626-813-1901

Project Name: Project: Fidelity (8 panels)

601-IV 2nd floor, Jacksonville, Florida

Glass Installer: Cragg's Glass; Contact: Jim Stapleton; Phone: 904-783-8483

Project Name: Ice Miller (4 panels)

One America Square 27th floor, Indianapolis, In 46282

Contact: Sara Edwards

Glass Installer: Ermco; Contact: Mr. Jim Bewsey; Phone: 317-780-2923

Project Name: Brouse-McDowell (26 panels)

388 South Main Street - Suite 500, Akron, OH 44311

Contact Name at Firm: Jerry Whitmer; Phone 330-535-5711

Glass Installer: Contract Glass

Contact: Echelberry Dale; Phone: 330-785-9501

Project Name: Schultz & Associates, P.C. (6 panels, including hinged door)

One Lincoln Centre, 5400 LBJ Freeway, Suite 1200, Dallas, Texas 75240

214-210-5940 (Office)

General Contractor: Scott Reid; Contact: Ronie @ 214-926-7031

Glass Company: Brian Kelly Glass

Contact: David Ramsey @ 214-287-5655

APPENDIX XII: OTHER PRODUCTS

POLYMAGIC™ Glass – LED Glass / Film



This special, patented technology incorporates LEDs, light sources, or electronic materials into glass panels to create distinctive patterns, images, and logos. It serves as an excellent promotional tool in creating attention-grabbing displays. High-performing LEDs conserve energy while being very bright. POLYMAGIC™ is available in special flat or curved glass with LEDs to match your applications without any distracting wires. POLYMAGIC™ helps to provide creative designs for architects and other imaginative users.

Applications include: lights, bath rooms/shower enclosures, clinics, conference rooms, tables/benches, hurricane resistant exterior window displays, inner doors/shop windows, façades, residential effects, shelf displays, skylights, boutiques/specialty counter displays, and as enhancements to specialty items like clocks, novelty displays, and more.

Polyholo™ Glass – Holographic Glass / Film



This patented technology creates unique glass panels embedded with holographic patterns. It provides a variety of colorful, attractive, eye-catching patterns (stock patterns or custom patterns available).

Applications include: outer windows, conference rooms, kitchens, shop windows, reception areas, newborn nurseries, room dividers, display areas, museums, and commercial shops.

Polyflush™ Glass / Film – One-way Viewing Colored Displays



Polyflush™ Glass appears in different colors when viewing at various angles. This is an attractive, eye-catching material with a unique presentation that will enhance your most imaginative product displays while providing 99% UV protection. As one-sided glass, viewers can see through one side but not the other. From the dark side, the glass is a blue/purple color that is see-through. From the bright side, you can see the different colors with a hint of gold.

Polynano™ Glass – Nano Moving Display



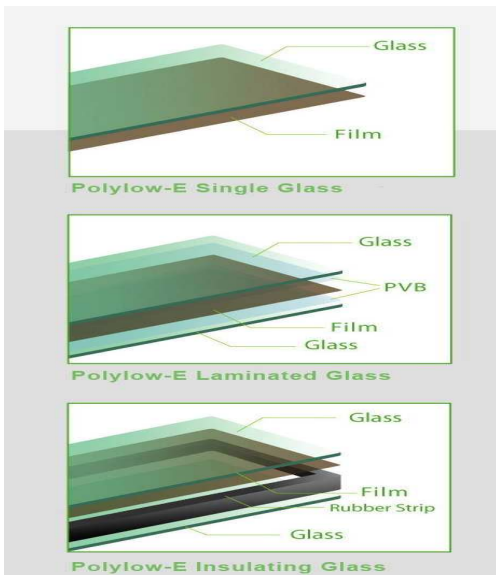
Polynano™ Carbon Nanotube Field Emission Device (CNT-FED) features two very thin, flat screens with a carbon nanotube emission cathode and circular dot-screen anode that produces a high beam output. This transparent, monochrome display can be used both indoor and outdoor and provides a wide viewing angle with low power consumption. It's easy to create letters and patterns from your computer with special Polynano™ software.

Polylens™ Glass / Film – Innovative Sparkle Designs



This product features new optical film materials to incorporate into unique, innovative designs. Through the PolyLens™ Glass, you will see lights become stars or sparkles. This product will make your light decoration seem like a dream from a fairy tale.

Polylow-E™ Glass / Film – Energy Saving – UV Blocking



This new trend for curtain walls combines Low-E film with glass. Its advanced technology provides you with energy-saving benefits as well as protection from flying debris caused by explosions. It also blocks damaging UV light and uncomfortable solar heat. It can be laminated or insulated with multiple layers of glass for added protection.

Advantages:

- Energy saving
- Blocks up to 99% of UV light
- Maximize comfort by blocking unwanted solar heat
- Blocks electromagnetic waves from electronic products
- High durability and stability
- Brings an aesthetic look to buildings with its natural color



LiteGlow™ Glass / Film – Luminous Technology



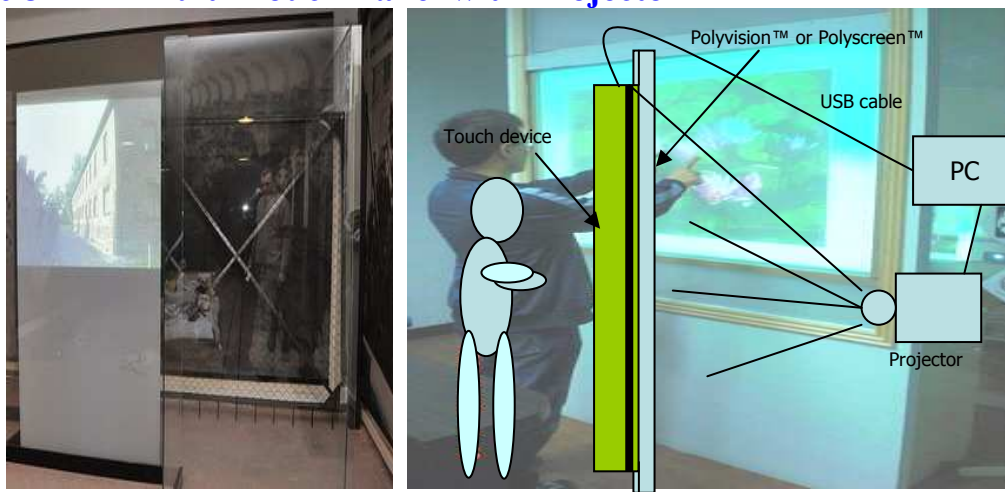
LiteGlow™ has unique glow-in-the-dark features, allowing it to set the perfect romantic atmosphere or serve as a light source in the event of a power outage. It's a novel application of using luminous technology in glass, and this innovative product will lead manufacturing techniques into the new era.

Polyscreen™ Film (Screen Film) – Display Image in Transparent Glass



Everyone knows that glass is generally transparent. You can see it through in different angles but are not able to cast an image or video on it via projector due to the light transmission feature of glass. **Polyscreen™** is a thin film that comes in black, white, or grey and adheres to glass to provide a translucent surface.

Polytouch™ – Multi-Touch Panel with Projector



Polytouch™ is technology which uses an optical unit to detect touch points. This highly reliable and sensitive product consists of a multi-touch function over a large area. The interactive window with rear projection can be used with either Polyvision™ or Polyscreen™.



Polytronix, Inc.
805 Alpha Drive
Richardson, TX 75081
Tel: 972-238-7045
Fax: 972-231-4052

**We Appreciate
Your Business and Support!
Thank You for Choosing
Polyvision™!**