

anti-reflective

anti-static

abrasion resistant

UV protection

## Optium® Combines the Best of Both Worlds: Glass and Acrylic

Optium® Acrylic Glazing, by Tru Vue® combines the best qualities of anti-reflective safety glass and UV filtering acrylic in one product, for all of your design and conservation needs.

Museums around the world depend on Optium® Acrylic Glazing to protect, conserve, and display their most valuable and historic collections.

### Optium® Acrylic Glazing

#### Features and Benefits:

- Newly enhanced **anti-reflective** coating optimizes appearance while significantly reducing distracting reflections to less than 1% at a 90 degree angle.
- Anti-static** protection that actually exceeds glass and dissipates 2000 times more static than regular acrylic, making it safe for friable materials and minimizing cleaning.
- Abrasion-resistant** glazing offers 20x more protection than regular acrylic and resists minor scratches associated with frequent cleaning like anti-reflective glass. Can be reused for traveling and temporary exhibits.
- Maximum **UV protection** filters up to 99% of damaging 300-380 nm UV rays so you can display sensitive objects.
- Lightweight** – 50% lighter than glass. Perfect for large items and display cases.
- Cleans like glass with ammonia-free cleaner.
- Shatter-resistant, thermal insulating, and anti-static properties provide a secure and protected environment.
- Perfect for display cases, vitrines and frames, inside or outside (weather resistant).
- Can be fabricated and cemented for museum quality joints.

### Size Availability

#### NEW! Optium® Museum Display Acrylic™ For Museum Display Cases

Thickness	Size	Sq. Ft./	Max Lites	Total Sq. Ft.
4.5mm(3/16 in.)	72x96in./183x243.84cm	48	1 to 26 (crate)	48 to 1248
Approx. lite wt.: 54lbs./24.50kg   1.13lbs. per ft²/.51kg per m²   Approx. empty crate wt.: 478lbs./216.82kg				
6.0mm(1/4 in.)	72x96in./183x243.84cm	48	1 to 20 (crate)	48 to 960
Approx. lite wt.: 72lbs./32.66kg   1.5lbs. per ft²/.68kg per m²   Approx. empty crate wt.: 478lbs./216.82kg				
9.0mm(3/8 in.)	72x96in./183x243.84cm	48	1 to 13 (crate)	48 to 624
Approx. lite wt.: 108lbs./48.98kg   2.25lbs. per ft²/1.02kg per m²   Approx. empty crate wt.: 478lbs./216.82kg				

#### Optium Museum Acrylic®

Thickness	Size	Sq. Ft./	Max Lites	Total Sq. Ft.
3.0mm(1/8 in.)	48x96in./121.91x243.84cm	32	1 (box)	32
3.0mm(1/8 in.)	48x96in./121.91x243.84cm	32	1 to 40 (crate)	32 to 1280
3.0mm(1/8 in.)	48x96in./121.91x243.84cm	32	25 (box/pallet)	800
Approx. lite wt.: 22lbs./9.98kg   .7lbs. per ft²/.32kg per m²   Approx. empty crate wt.: 329lbs./149.23kg				
4.5mm(3/16 in.)	72x96in./183x243.84cm	48	1 to 26 (crate)	48 to 1248
Approx. lite wt.: 54lbs./24.50kg   1.13lbs. per ft²/.51kg per m²   Approx. empty crate wt.: 478lbs./216.82kg				
6.0mm(1/4 in.)	72x120in./183x305cm	60	1 to 20 (crate)	60 to 1200
Approx. lite wt.: 89lbs./40.37kg   1.5lbs. per ft²/.68kg per m²   Approx. empty crate wt.: 500lbs./226.79kg				

#### Optium Acrylic®

Thickness	Size	Sq. Ft./	Max Lites	Total Sq. Ft.
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Ask Your Representative for Cut-to-Size Service, Product, and Display Case Availability.

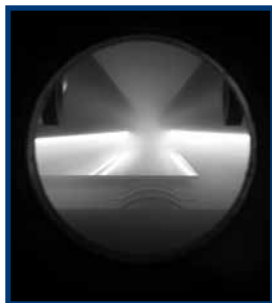
## Product Comparison Chart

### Physical Characteristics

### Performance Data

### Specifications

	<b>Optium® Museum Display Acrylic™</b> <i>4.5mm (3/16 in), 6mm (1/4 in) &amp; 9mm (3/8 in)</i>	<b>Optium Museum Acrylic®</b> <i>3.0mm (1/8 in), 4.5mm (3/16 in) &amp; 6.0mm (1/4 in)</i>	<b>Optium Acrylic®</b> <i>3.0mm (1/8 in)</i>
Substrate	Clear, hard-coated abrasion-resistant, UV filtering cell cast acrylic	Clear, hard coat abrasion-resistant, UV filtering extruded acrylic	Clear, hard coat abrasion-resistant extruded acrylic
Thickness Consistency	+/- 1.5mm. (For a 6.0mm the thickness can range from 4.98mm – 6.50 mm, for a total of 1.5mm range.) Thickness not as uniform as other acrylic substrates; There is variation sheet-to-sheet and within the same sheet.	+/- 0.3mm Most uniform consistency of acrylic substrates.	
Protective Film Colors Outside Appearance	Translucent Green – both sides	Previously: White – both sides  Newly enhanced anti-reflective product: White & Green or Black – both sides	Previously: White/Appears black (Second side is clear)  Newly enhanced anti-reflective product: White & Blue or Black & Blue
(please call 800-282-8788 with questions regarding product identification)			
UV Protection 300–380mm	Up to 99%		Up to 96%
Light transmission, total <a href="#">ASTM D-1003</a>	>98% *		
Light Reflection/ Double-sided Anti-Reflection <a href="#">Haze</a>	<1.0% **		
Outgassing <a href="#">Oddy Test</a>	None (<200 degrees F/93 degrees C)		
Tensile Strength Modulus of Elasticity <a href="#">ASTM D-638</a>	10,000 psi 400,000 psi		
Flexural Strength Modulus of Elasticity <a href="#">ASTM D-790</a>	16,500 psi 475,000 psi	17,000 psi 480,000 psi	
Impact Strength – Izod Milled Notch <a href="#">ASTM D-256</a>	0.4 ft. lbs./in. of notch		
Impact Strength – Gardner – falling weight <a href="#">ASTM 5420-04</a>	18.1 ft-lbs (6.0mm) Optium Acrylic Glazing products are significantly more impact-resistant than annealed glass and similar to that of tempered glass. If subject to impact beyond the limit of resistance, it does not shatter into small slivers, but breaks into larger pieces.		
Humidity Resistance <a href="#">MIL-C-48497A, para 4.5.3.2</a>	No deterioration after 40 days @ 50°C, 95% RH		



Magnetron Sputtered Process

#### Coating and Visual Color Impression (Transmitted and Reflected Color)

- Magnetron sputtered anti-reflective coating helps ensure maximum durability and strength
- Utilizes hard-coated, abrasion resistant acrylic sheet
- Patented Tru Vue Optium Technology
- Thin film coatings bonded to substrate at an atomic level
- Long-lasting anti-static protection
- Won't oxidize and degrade overtime

Transmitted color appears color neutral to pale yellowish. Reflection varies with viewing angle. The non-reflective properties of Optium technology are optimized for direct viewing at a 90° angle. However, if the angle of view changes, so does the amount of reflection. Up to a viewing angle of about 35 degrees the non-reflective, color neutral properties remain. Beyond that, reflections become visible in a subtle greenish/blue (previously reddish/purple) color and certain lighting conditions may make this more noticeable. The amount of reflection however is significantly lower than the reflection of regular uncoated glass or acrylic and is considered normal and inherent characteristic of an anti-reflective product. (ASTM D-1929)

\* Data is for newly enhanced anti-reflective coating: previously 97% \*\*Data is for newly enhanced anti-reflective coating: previously <1.6%

	Optium® Museum Display Acrylic™ 4.5mm (3/16 in), 6mm (1/4 in) & 9mm (3/8 in)	Optium Museum Acrylic® 3.0mm (1/8 in), 4.5mm (3/16 in) & 6.0mm (1/4 in)	Optium Acrylic® 3.0mm (1/8 in)
Corrosion Resistance (Salt Fog) ASTM B117 & B-368-03 & B368-97	48 hr. No Deterioration 50°C, 95% RH After exposure for 7 – 24 hr cycles (168 hours), the coating shows no damage – <b>Passed</b>		
RoHS compliance testing	(dangerous substance testing: presence of Lead (Pb), Cadmium (Cd), Mercury (Hg), Hexavalent chromium (Hex-Cr)) – <b>Passed</b>		
Photographic Activity Test ISO 18916 & ISO 18902	ISO 18916 Silver Image Interaction • Gelatin Staining • Mottling of Image • Interaction Detector Overall performance – <b>Passed</b> ISO 18902 Overall performance – <b>Meet; “Photo-safe” per ISO 18902 section 3.9</b>		
Coating Adhesion (Snap Tape) MIL-C-48497A, para 4.5.3.1	The coating shows no damage after snap removal of tape.		
Solubility MIL-C-48497A	After a 24-hour immersion or exposure at room temperature (60°-90°F), the anti-reflection coating shows no deterioration in the following solutions: • <i>Distilled Water</i> • <i>Saline Solution (170gm of NaCl per 3.8 liters of water)</i> • <i>Acetone</i> • <i>Ethyl Alcohol</i> • <i>Isopropyl Alcohol</i> • <i>Coffee</i> • <i>Coke</i>		
Flammability Self-Extinguish UV945VA & 5VB	No acrylic will self-extinguish, and therefore Optium Acrylic products do not meet this requirement. Optium Acrylic products are combustible and usually burn to completion if not extinguished. Precautions should be taken to protect this material from flames and high heat sources.		
Flammability Self-Ignition Temp. ASTM-D-1929	910°F / 488°C	830°F / 443°C	
Horizontal Burning Test Avg. Burn Rate ASTM D-635	1.2 in./min or 3.0 cm/min (3mm)	1.0 in./min or 2.5 cm/min (3mm)	
Smoke Density ASTM D-2843	11.4% (3mm)	6.4% (3mm)	
UL 94 Rating	94HB		
Deflection Temp. (264 psi load) ASTM D-648	210°F / 99°C		
Vicat Softening Point ASTM D-1525	239°F / 115°C	220°F / 105°C	
Max. Continuous Service Temp.	180°F / 82°C		
Coefficient of Thermal Expansion ASTM D-696	0.000040 in/in °F / 0.000072 m/m °C		
Water Vapor Transmission Rate (@ 50% R.H.)	0.01 gm/100 in² × day	0.014 gm/100 in² × day	
	Optium Acrylic Glazing performs like regular uncoated acrylic in response to changes in relative humidity. The vapor transmission rate is low enough that reasonable levels of humidity can be maintained inside an acrylic enclosure by using appropriate desiccants. Optium Acrylic Glazing should not be used for applications that must be hermetically sealed.		



#### Abrasion Resistance MIL-C-14806A, para 4.4.7& MIL-M13508C, para 4.4.5

The coating shows no signs of deterioration, other than discoloration, after being subjected to 20-alcohol soaked cheesecloth test at 2-2.5 lbs. The coating shows no damage after 600 dry cloth rubs at 2.5 lbs.

- Optium Acrylic Glazing performs like anti-reflective glass and offers 20 times the protection against minor scratches compared to uncoated acrylic.
- Optium Acrylic Glazing stands up to frequent cleaning and re-use from traveling/temporary exhibits.

#### Electrical Surface Resistivity (Anti-Static) ASTM D257

The surface resistivity is less than 10<sup>12</sup> ohm/sq at 20% Relative Humidity.

- Our anti-static protection actually exceeds that of glass and is engineered to immediately dissipate static charges.

- Independent tests show that Optium Acrylic Glazing is 2000 times more anti-static than regular acrylic.
- Safe for friable materials.
- Does not attract dust – minimizes cleaning.

#### Long-lasting anti-static protection

23 C and 50% r.h.	Surface Resistivity (Ohms/square)	Static Decay (seconds)
Optium Acrylic Glazing	5.0E+10	0.01
Uncoated Acrylic	1.0E+14	Infinite



## Framing and Fabrication Guidelines

### Application Recommendations

Space Expansion & Contraction	Allow at least 1/16th" of clearance for each 12" of frame length. In conditions of extreme humidity or temperature, greater allowances may be necessary. In outdoor use, where summer – winter temperatures vary as much as 100° F at 48" sheet will expand/contract approximately 3/16".
Rabbet size	When estimating the rabbet size, allow for the applicable glazing thickness and add to it the thickness of each of the other components used. Insuring the proper rabbet size is essential in supporting the framing components and helps guard against bowing.
Max. # of Mats	Any
Application	Pastels • Charcoal • Static Sensitive Pieces • Custom display cases • Shadowboxes • B&W and Bright Colored Pictures • Posters • Vitrines • Large Pieces • Shipping • Earthquake Zones • Safety Areas • Pieces requiring Maximum UV protection • Can be fabricated and cemented for museum quality, bubble-free joints
Framing Practices for 40 x 60 and larger acrylic sheets	To prevent bowing, twisting, and/or warping during framing, provide reinforcing support of the acrylic sheet. When working with a spacer to separate the object from the glazing, allow sufficient depth of the spacer (2" to 2.5" (5cm-6cm) for a full 6mm, 72x120 sheet) to protect object from flexing of the acrylic sheet.
Silkscreen Printing	Yes; however, the acrylic requires a low temperature process, so the completed silkscreen is fairly soft.

### Handling and Storage

Cutting	6mm and above, fabricate using a power saw with a blade specifically designed to cut acrylic. Contact Tru Vue for saw blade recommendations. 4.5mm and below, place Optium® Acrylic on a clean, dust-free work area. Cover the work table with a soft, clean, lint-free felt. Use a cutter "scribe and break" method. Optium Acrylic Glazing should NOT be cut with a laser. The extreme heat can cause crazing, which may lead to delamination of the coating.
Cleaning	For safety of the object, use ammonia-free cleaner. Spray solution on a lint-free or micro-fiber cloth and then apply to the acrylic. Do NOT use regular acrylic cleaners.
Handling	Due to anti-reflective coating, fingerprints or dirt are more visible but are easily removed. Cotton or nitrile rubber gloves should be worn to minimize fingerprints and other particles. Optium® Acrylic Glazing products are covered with a protective film masking on each surface that prevents scratching during handling and cutting and should be left in place as long as possible. To remove the masking, start at one corner and pull towards the opposite side of the sheet slowly and evenly without stopping. The masking should never be exposed to excessive sunlight or outdoor conditions for extended periods of time. Use of glass-skin during transportation is not recommended.
Storing	To avoid leaving water spots on the anti-reflective coating, don't store in areas where condensation might occur. Use 2-ply rag board or pH neutral paper for interleaf during short-term storage. Stack horizontally with larger sheets at the bottom, or lean at an angle of approximately 10° to prevent bowing. Although climate control for long-term storage is not required, we recommend you remove any protective film masking, use pH neutral paper to separate the parts and never expose the masking to excessive sunlight or outdoor conditions for extended periods of time. Allow 24 hours for climatizing before exhibiting. Optium Acrylic Glazing can withstand extreme temperatures of minus 30° F (-34° C) to 160° F (71° C). If storing framed pieces, please note that Optium Acrylic Glazing expands and contracts, so allow for size variation and avoid shipping horizontally as expansion/contraction of the sheet may cause vibration or rubbing against the surface of the artwork.

### Case Fabrication (for additional info, refer to manual)

Coating Removal	Cementing on or to Optium cannot be attained without first removing the coating due to the chemical resistance. All Optium products have a hard-coat and an anti-reflective film on both surfaces which are approximately 0.005 in. thick and must be removed from the joint area before attempting to cement the pieces together. When removing, ensure that the bonding surface is flat, clean, and free of stress. The hard-coat can be removed by scraping, wet sanding the joint area with 500 grit or finer sandpaper mounted on a sanding block or by machining with a router or milling machine. To set the width, painters masking tape with electrical tape on top or a table saw fence can be used. A vacuum hose connection to remove & collect small particles produced by scraping is also recommended.
Joint Type	Miter joints have an advantage because the coating removal step is accomplished when the miter is cut and the anti-reflective properties of the Optium are maintained to the edge of the completed joint. The disadvantages are: material thickness variations can prevent the joints from mating together cleanly and each piece must be cut very precisely. Butt joints can also be used with Optium so long as the hard-coat is removed from the joint area. The adhesive is introduced into the open side of this joint by using a suitable syringe. Avoid bubbles.
Joining	Polymerizing adhesives fill better and, therefore, impose fewer demands on the accuracy of fit between the parts. They must be used where high strength and good resistance to environmental conditions are required. If properly done, solvent cements also yield strong, transparent joints, but do not have filling properties, so you may see bubbles when it dries. Other two-component adhesives like epoxy resins, isocyanates (polyurethane), phenolics and aminoplastics are not suitable for bonding Optium Acrylic Glazing sheets to itself or other materials because their adhesion is very low.

## Optium Inspection Process

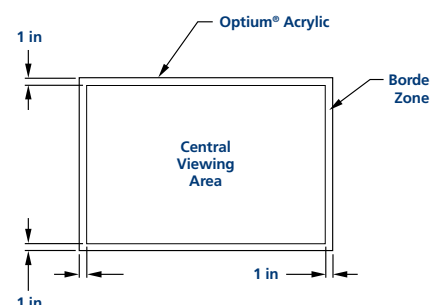
### Reflected Light Inspection

All Optium® Acrylic Glazing products are inspected using an on-line optical inspection system and must comply with Tru Vue's cosmetic specifications.

### Border Zone Specification

Each sheet of Optium® Acrylic Glazing contains a 1 inch perimeter border zone that is subject to inherent processing conditions. This area may have non-conforming optical and cosmetic performance.

Optium utilizes an inherently UV stable, non-yellowing, abrasion-resistant sheet that maintains its original appearance and color despite heat, cold, sunlight and humidity. It withstands the adverse effects of outdoor weathering and has been found to experience no significant loss of light transmittance or any appreciable increase in yellowing after an accelerated weathering. This should help ensure many years of trouble free performance.



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Acrylic Glazing  
TRU VUE  
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