

PRODUCT PERFORMANCE-COMPLIANCE WITH STANDARDS

VividGlass architectural glass meets the following industry standards, as applicable:

	GLASS QUALITY	SAFETY GLAZING
UNITED STATES	<ul style="list-style-type: none"> ASTM C1036 – Specification for Flat Glass ASTM C1048 – Specification for Heat-Treated Flat Glass—Kind HS, Kind FT Coated and Uncoated Glass where heat-treated glass is specified ASTM C1172 – Specification for Laminated Architectural Flat Glass augmented by VividGlass inspection guidelines for laminated glass, and level CBA rated in accordance with ASTM E-773 – Test Method for Seal Durability of Sealed Insulating Glass Units ASTM C1172-03 – Specification for Maximum Allowable Overall Bow and Warp for Laminated other than Annealed Transparent Glasses ASTM E-774 – Specification for Sealed Insulating Glass Units where insulating glass is specified 	<ul style="list-style-type: none"> ANSI Z-97.1 – Safety Performance Specifications and Methods of Test for Safety Glazing Material Used in Buildings CPSC 16 CFR 1201 – Safety Standard for Architectural Glazing Materials, Category I and II
CANADA	<ul style="list-style-type: none"> CAN/CGSB-12.1-M – Specification for M90 Tempered or Laminated Glass 	<ul style="list-style-type: none"> CAN/CGSB-12.1-M – Safety Performance Specifications and Methods of Test for Safety Glazing Material Used in Buildings

GLASS THICKNESS & WEIGHTS

GLASS TYPE	GLASS BUILD	TOTAL THICKNESS*	WEIGHT (PER SQUARE FOOT)*
LAMINATED	3mm lite / interlayer / 3mm lite	7.7 mm (5/16")	3.6 lbs
	6mm lite / interlayer / 6mm lite	13.7 mm (9/16")	6.4 lbs
	10mm lite / interlayer / 10mm lite	22.23 mm (7/8")	10.4 lbs

*Total thickness and weights are approximate; actual measurements may vary based on specific product type.

SOUND ATTENUATION

Shear damping by the VividGlass interlayer improves acoustical performance over a wide audible-frequency range and practically eliminates the coincidence dip typical of architectural glass in the 1,000 to 2,000 Hertz band—where significant levels of general environmental noise occur.

For Sound Transmission Class (STC) and Sound Transmission Loss (TL) information, please refer to the table below.

GLASS MAKEUP		FREQUENCY (HZ)																		
GLASS TYPE	TOTAL THICKNESS	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000	STC
LAMINATED	7.7 mm (5/16")	25	26	27	28	28	29	30	33	34	35	36	37	37	37	36	38	42	46	35
	13.7 mm (9/16")	26	29	28	30	33	33	35	36	37	38	38	37	38	41	44	47	51	54	39

ULTRAVIOLET (UV) SCREENING

VividGlass laminated glass transmits less than one-tenth of one percent of UV. It blocks over 99.5% of solar radiation at wavelengths 380 NM and below, where by comparison, 1/4" clear float glass transmits over 70%.

GRAPHICS DIMENSIONS & TOLERANCES

GRAPHIC FEATURE	DIMENSION	
Size	±1/8"	±3.2 mm
Registration	±1/8"	±3.2 mm
Color Trap	+1/8"	+3.2 mm
Panel-to-Panel Match	±1/4"	±6.4 mm

Registration is placement of the interlayer within the glass area. The **Color Trap** is the overlap of adjoining imprinted densities or colors. **Panel-to-Panel Match** can be controlled more tightly in the field, during glazing, when the glazing system is designed to accommodate shimming.

INSPECTION GUIDELINES

Vision Area Glazing - To incorporate unique product characteristics, the following table supersedes ASTM C1172, Table 3.

CHARACTERISTIC	SIZE THRU 25 sf (2.33 m ²)		SIZE OVER 25 sf (2.33 m ²)	
	CENTRAL AREA	OUTER AREA	CENTRAL AREA	OUTER AREA
Boil (Bubble)	1/16" (1.6 mm)	3/32" (2.4 mm)	1/8" (3.2 mm)	3/16" (4.8 mm)
Blow-In, Edge Boil	N/A	C 1/4" (6.4 mm)	N/A	C 1/4" (6.4 mm)
		E 1/32" (0.8 mm)		E 1/16" (1.6 mm)
Discoloration	None	None	None	None
Fuse	1/32" (0.8 mm)	1/16" (1.6 mm)	1/16" (1.6 mm)	3/32" (2.4 mm)
Hair, Lint (Single Strand)	Light	Medium	Light	Medium
Inside Dirt (Spot)	1/16" (1.6 mm)	3/32" (2.4 mm)	3/32" (2.4 mm)	5/32" (4.0 mm)
Concentrated Lint (Area)	Light	Light	Light	Light
Slippage, Mismatch	N/A	1/16" (1.6 mm)	N/A	3/32" (2.4 mm)
Separation, Delamination	None	1/4" (6.4 mm)	None	1/4" (6.4 mm)
Short Interlayer	N/A	C 1/4" (6.4 mm)	N/A	C 1/4" (6.4 mm)
		E 1/16" (1.6 mm)		E 3/32" (2.4 mm)
Interlayer Scuff, Dirt Streak	Light	Light	Light	Light
Interlayer Edge Ripple 6" (15.2 cm) max length	N/A	C 1/2" (12.7 mm)	N/A	C 1/2"
		E 3/8" (9.5 mm)		E 3/8" (9.5 mm)
Interlayer Pinholes, Voids 1/16" (1.6mm) max diameter	No Clusters	Clusters	No Clusters	Clusters
Interlayer Streaking, Mottling	Medium	Medium	Medium	Medium
Interlayer Roll-Wave Distortion	Heavy	Medium	Heavy	Medium

The **Central Area** is an area formed by an oval or circle whose axes or diameters, when centered, do not exceed 80% of the overall dimension; the **Outer Area** is the remaining perimeter.

C = Conventionally glazed, unexposed edge; **E** = Butt-glazed or other exposed edge

Light = Barely noticeable when viewed from a distance of 3 feet (1 meter) under normal lighting conditions

Medium = Noticeable from 3 feet (1 meter), but not 11' (3.5 meter)

Heavy = Plainly noticeable from any viewing distance

SEALANTS

Various non-hardening, solid sealants can be used successfully with VividGlass. In product selection, consider such factors as weather resistance and other fundamental mechanical properties, durability, cost, and compatibility with other glazing components, including the laminated glass itself, if direct sealant-to-edge contact is anticipated.

The VividGlass interlayer system is an advanced derivative of DuPont Butacite®. In direct sealant-to-edge contact, low molecular-weight sealant by-products—like water, plasticizers, solvents, acetic acid, ammonia, alcohol, and amines—may lead to potentially objectionable interlayer discoloration or minor edge separation. Because formulations vary over time and by manufacturer, compatibility testing of components should be initiated by the glazing contractor and conducted by the sealant manufacturer for critical applications. Where silicone is considered in such details, it should be non-acidic, neutral curing (alkoxy type). Acetoxy type silicone is not compatible with architectural laminated glass.

Sealants should be applied according to the manufacturer's recommendations. Work should be done only with clean, dry surfaces. Temperature during installation should be above 50°F (10°C) and for 24 hours after application. To limit thermal edge stress in conventional setting systems, the exterior watershed should be limited to 1/16".

MASTIC ADHESIVES

VividGlass products in the Reflect configuration are compatible with any high-quality mirror mastic such as CRL Gunther Mirror Mastic®. When applying mirror mastic avoid direct contact with the edges of the glass.

GLAZING GUIDELINES

<p>GENERAL PRINCIPLES</p> <ul style="list-style-type: none"> The glazing system must structurally support the glass, firmly and gently. It must cushion to prevent load points and excessive clamping pressures, isolate rotational forces, and minimize load transfer from the surround to the glass. For exterior applications, the glass must float in the frame and allow no metal-to-glass contact. For laminated or insulating glass, the glazing channel also must be drained to prevent prolonged moisture contact with the edge. Design for a properly functioning glazing system requires consideration of a number of factors including design modules, glass types and compatibility between components. Following the outlined glazing principles will assure a durable exterior installation and minimize glass breakage due to mechanical and thermal stresses. Reference to current guidelines published by the Glass Association of North America (GANA), American Architectural Manufacturers Association (AAMA), and Sealed Insulating Glass Manufacturers Association (SIGMA), as applicable, is recommended. Modification to these recommendations may be appropriate for special glazing systems, including pre-formed lock-strip gaskets, skylight systems, structural setting systems, bolt and plate assemblies, and interior glazing.
<p>FRAMING SYSTEM</p> <ul style="list-style-type: none"> Curtain wall or window anchors and expansion joints should be designed to accommodate building and wall movement without transfer of undue forces to the framing. Horizontal expansion joints should be provided at each vertical member, or at 20' maximum spacing. Vertical expansion should be allowed at each floor. The system should be designed to permit erection with expansion joints almost fully open in cold weather and almost fully closed in hot weather. At design loads, inward and outward deflection of glass framing members must be limited to the length of the unsupported span divided by 175, or 3/4", whichever is less. Horizontal deflection of the sill member should be limited to prevent breakage. A limit of 1/8", or 25% of design edge clearance, whichever is less, is recommended. Rotation or twisting of the sill member should be limited to one degree from horizontal plane. The framing system should provide openings which are square within 1/8" difference in the diagonals, have maximum corner offset of 1/32", and have maximum bow of 1/16" per 4' length.
<p>SURROUNDING CONDITIONS</p> <ul style="list-style-type: none"> When annealed glass is exposed to direct sunlight and set directly into a high heat-capacity material, such as concrete, it may be unable to withstand the resultant thermal stresses. Depending on thermal absorbance of the glass selected, the time of year, and temperature extremes, thermal stress due to exterior shading may be problematic. Maximum stress from this source occurs when a narrow shadow band, 1-2" wide, lingers at the glass edge for an hour or longer. Combinations of narrow horizontal, vertical and diagonal shadows create greater edge stress. Double-diagonal shading with the sunlit V-shape centered at an edge creates high stress. Please keep in mind, the position of interior shading devices and heating outlets can affect the degree of thermal stress in glass. Heat strengthening adds sufficient strength to withstand most adverse conditions and is recommended for the glass when the designer believes the application warrants additional thermal-stress resistance.

THE GLAZING CHANNEL

The glazing channel must be dimensioned to adequately cushion and retain the glass, while minimizing thermal stress and preventing metal-to-glass contact. It must accommodate glass fabrication tolerances and facilitate initial and replacement glazing, free from probable edge damage.

The nominal bite and minimal edge and face clearances detailed below should be provided. Units are expressed in inches (millimeters).

GLASS TYPE	NOMINAL THICKNESS	MINIMAL FACE CLEARANCE	MINIMAL EDGE CLEARANCE	NOMINAL BITE
SINGLE	Overall Thickness 9/32" (6.9 mm)	1/8" (3.2 mm)	1/4" (6.4 mm)	3/8" (9.5 mm)
	Glass Lites, Interlayer 2 lites 1/8", 0.037" (3 mm, 0.9 mm)			
	Overall Thickness 5/16" (7.7 mm)	1/8" (3.2 mm)	1/4" (6.4 mm)	3/8" (9.5 mm)
	Glass Lites, Interlayer 2 lites 1/8", 0.067" (3 mm, 1.7 mm)			
	Overall Thickness 17/32" (12.9 mm)	1/8" (3.2 mm)	1/4" (6.4 mm)	1/2" (12.7 mm)
	Glass Lites, Interlayer 2 lites 1/4", 0.037" (6 mm, 0.9 mm)			
	Overall Thickness 9/16" (13.7 mm)	1/8" (3.2 mm)	1/4" (6.4 mm)	1/2" (12.7 mm)
Glass Lites, Interlayer 2 lites 1/4", 0.067" (6 mm, 1.7 mm)				
Overall Thickness 25/32" (20.9 mm)	3/16" (4.8 mm)	1/4" (6.4 mm)	1/2" (12.7 mm)	
Glass Lites, Interlayer 2 lites 3/8", 0.037" (10 mm, 0.9 mm)				
Overall Thickness 13/16" (21.7 mm)	3/16" (4.8 mm)	5/16" (7.9 mm)	1/2" (12.7 mm)	
Glass Lites, Interlayer 2 lites 3/8", 0.067" (10 mm, 1.7 mm)				
INSULATING	Overall Thickness 1-1/32" (26.2 mm)	3/16" (4.8 mm)	1/4" (6.4 mm)	1/2" (12.7 mm)
	Glass Lites, Interlayer 1 lite 9/32" (7 mm) lam 1/2" cavity 1 lite 1/4" (6 mm)			
Overall Thickness 1-1/16" (27 mm)	3/16" (4.8 mm)			
Glass Lites, Interlayer 1 lite 5/16" (8 mm) lam 1/2" cavity 1 lite 1/4" (6 mm)				

The system must drain adequately to assure that the edge of the glass will not be submersed in water for prolonged periods of time. If weep holes are used, they should be minimally 5/16" diameter, or elongated slots of similar area, so they will not become easily plugged or bridge over due to surface tension. Three holes should be used at each sill in the bottom of the glazing channel—one in the center and two flanking, between jamb and setting block.

SETTING BLOCKS
<ul style="list-style-type: none"> Setting blocks made of permanently resilient neoprene, silicone, or other material compatible with the sealants used, 80-90 Shore A Durometer hardness, should be located in the sill glazing channel to support the glass. Two should be used per lite, centered at quarter points to support half the weight of the lite. The length of each block should be 0.100" for each square foot of glass area, but not less than 6"; width should be 1/16" less than the full channel width; and height should be appropriate to provide proper bite and edge clearance.
SPACERS & OTHER GLAZING ACCESSORIES
<ul style="list-style-type: none"> Continuous rubber-like sealant beads, gaskets or spacers should be used to maintain face clearances within the glazing channel. For wet-glazing systems, intermittent shims, 40-60 durometer, inserted on both sides of the glass, opposite each other on 18-24" centers around the perimeter, sized minimally 4" long, to provide at least 1/8" purchase on the edge, and to fit snugly, may be used for centering until the sealant cures. Gaskets or spacers should be made of permanently resilient sealant-compatible material. Their hardness will depend on specific design function. For large lites in dry-glazing systems, edge blocks should be used to in the vertical glazing channels to limit any potential lateral shifting of the glass due to vibration, wind loading, or thermal forces. These should be pre-cured, resilient neoprene, silicone, or other material compatible with the sealants used; 40-60 Shore A Durometer hardness; and sized 6" in length by full-channel width by edge clearance less 1/8" height to allow a little initial space between the block and the edge of the glass. The joints of dry-glazing gaskets should be cut and sealed in accordance with the manufacturers' recommendations to create a watertight and airtight seal.