ALPENGLASS

Insulated Glass Units

Product Catalog

ALPEN

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About AlpenGlass

About AlpenGlass

What is AlpenGlass?

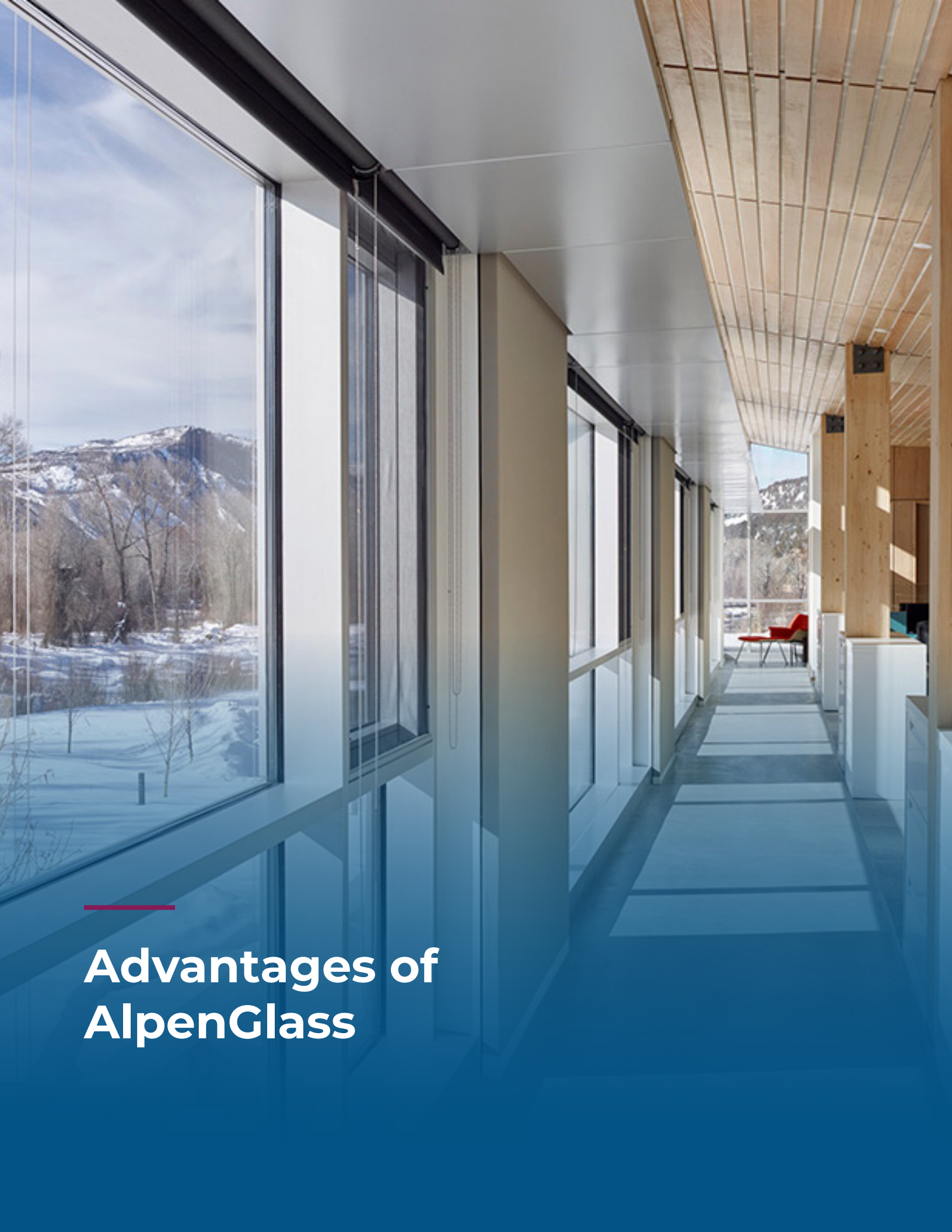
Alpen High Performance Products (Alpen HPP) is North America's pioneering leader in thin triple- and quad-pane insulated glass units (IGUs) with over 40 years of architectural glazing expertise. AlpenGlass is a high-performance IGU manufactured with thin glass to deliver triple- and quad- pane performance in a dual-pane footprint. Manufactured in the USA on automated production lines, AlpenGlass combines advanced robotics with engineered glass configurations that help meet and exceed today's tightening energy codes. AlpenGlass offers high-performance solutions for windows, doors, curtainwalls, and storefronts.

What is thin glass?

Thin glass is ultra-thin architectural glass, typically 0.5mm to 1.3mm thick, used in the center lite(s) of IGU configurations. Alpen's preferred thin glass is Corning ® Enlighten™ Glass, a boro-aluminosilicate glass, in 0.5mm and 0.7mm thicknesses, the slimmest and most durable thin glass available for architectural IGUs. For configurations that require a thicker center lite, Alpen uses 1.1mm and 1.3mm soda-lime glass. Unlike standard soda-lime glass manufactured through the float process, Enlighten Glass is fusion-drawn, a process originally developed for consumer electronics that yields thinner, stronger, and clearer glass ideal for IGU manufacturing. When positioned as center lite(s) in multi-pane assemblies, thin glass improves energy efficiency by allowing more room for insulating gas fills and enables weight reductions of 30-50% compared to traditional triple and quad IGUs while reducing material use and embodied carbon.

What are thin glass IGUs?

Thin glass IGUs are next-generation insulating glass units that provide the thermal performance of traditional triple-pane windows in the same footprint as standard double-pane units. By incorporating ultra-thin center panes (0.5mm-1.1mm) between standard outer glass lites, AlpenGlass units achieve R-values up to R15—roughly tripling the insulating value of conventional double-pane windows—while maintaining an overall thickness compatible with existing frame systems on the market. Each IGU features multiple low-emissivity (low-e) coatings and inert gas fills, engineered and modeled to meet project specifications for thermal and optical performance.



Advantages of AlpenGlass

Advantages of AlpenGlass in Windows and Doors

1. Drop-In Replacement

AlpenGlass thin triple and quad IGUs are engineered a**s seamless drop-in replacements for standard double-pane units, fitting into traditional glazing pockets without requiring manufacturer retooling, frame redesign, new hardware, or modifications to sash profiles. This enables architects and builders to maintain existing building practice**s while upgrading the energy performance of their buildings without compromising window area.

2. Enhanced thermal performance

AlpenGlass thin triple IGUs are 2x-3x times more energy efficient compared to conventional double-pane windows today. Thin quad IGUs have capability to reach center-of-glass R-values up to R-15 (U-factor ~0.067). AlpenGlass enables window systems and buildings to meet the most aggressive certifications and green-building standards like Energy Star, Passive House, LEED, and DOE Efficient New Homes requirements. See Table 1 and Figure 1 below for summary of thermal performance capabilities.

Table 1. AlpenGlass Performance Capabilities

Thermal Performance Capability[1,2,3]		
OA	**U-Value**	**R-Value**
¾”	0.126	7.937
7/8”	0.108	9.259
1”	0.101	9.901
1-1/8”	0.086	11.628
1-1/4”	0.077	12.987
1-3/8”	0.071	14.085
1-1/2”	0.068	14.706
1-5/8”	0.067	14.925
1-3/4”	0.067	14.925
1-7/8”	0.067	14.925

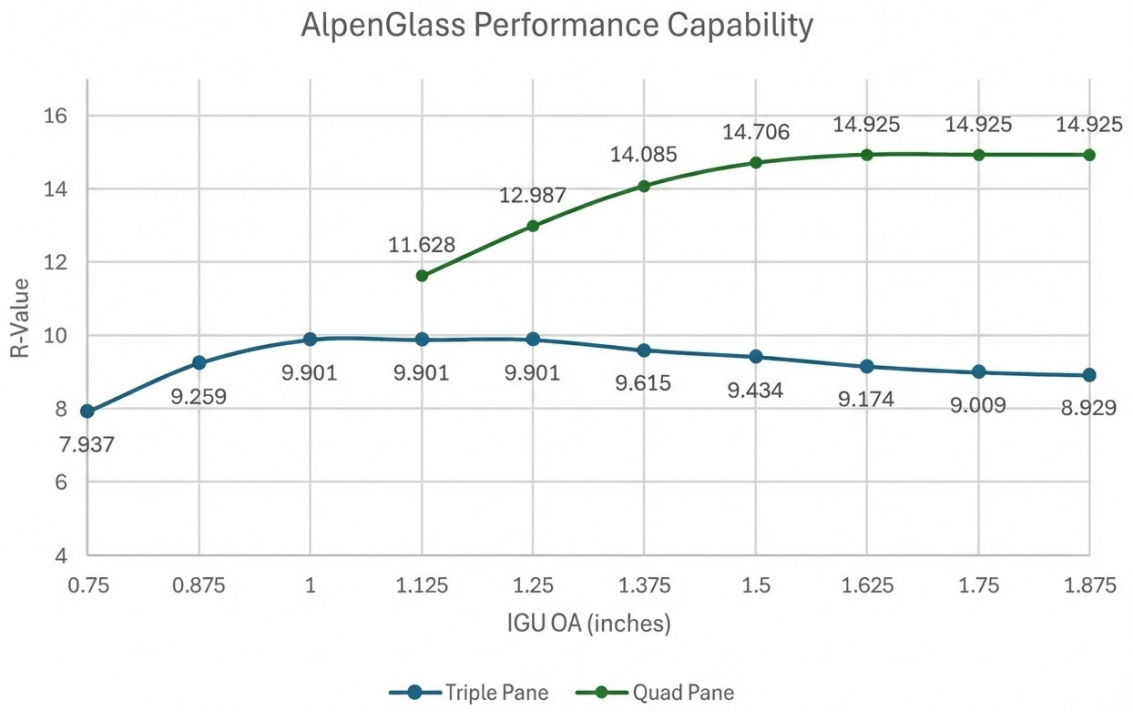


Figure 1. Thermal Performance Capability of AlpenGlass

1. *The above data represents the technical performance limit achievable with in-stock glass types with either triple or quad panes (outer lites vary). Higher performance may be achievable with Semi-Custom or Full-Custom orders. See sections below for Standard, Semi-Custom, and Full-Custom product lines.*
2. *Actual performance may vary depending on glass thicknesses, # of lites, coating types, and gas fill.*
3. *Center of glass values modeled using LBNL v7.8 Window Software*

3. Weight Reduction

AlpenGlass thin triple IGUs are approximately 30% lighter than traditional triple-pane units, while quad-pane IGUs are roughly 50% lighter than traditional quads. Thin triples add only 10-15% more weight than dual-pane IGUs, enabling the following benefits:

i. **Faster, easier installation** with reduced shipping costs, handling challenges and labor time.

ii. **Reduced hardware stress,** allowing existing window sashes, hinges, and framing systems to remain. This weight advantage, combined with improved thermal performance, enables architects and builders to design larger windows while still meeting today's energy codes.

*Table 2. Weight of Thin Glass Triple IGUs (lbs/sqft)**

	Outer Lites		
Inner Lite	**3 mm**	**5 mm**	**6 mm**
0.5 mm	3.282	4.972	5.986
1.1 mm	3.572	5.262	6.276

**clear annealed weights; does not include weight of spacer system*

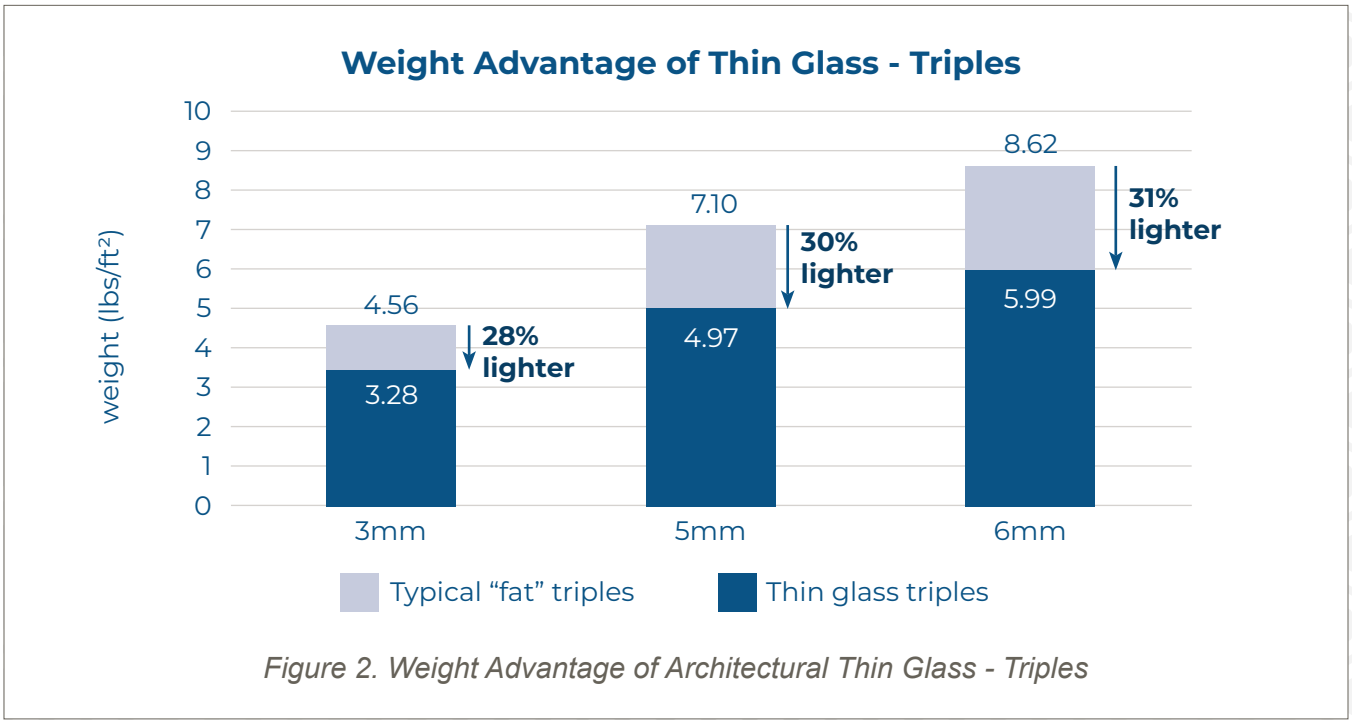


Figure 2. Weight Advantage of Architectural Thin Glass - Triples

*Table 3. Weight of Thin Glass Quad IGUs (lbs/sqft) **

	Outer Lites		
Inner Lite Combination	**3 mm**	**5 mm**	**6 mm**
0.5/0.5 mm	3.552	5.212	6.226
1.1/1.1 mm	4.102	5.792	6.806

**clear annealed weights; does not include weight of TPS spacer system*

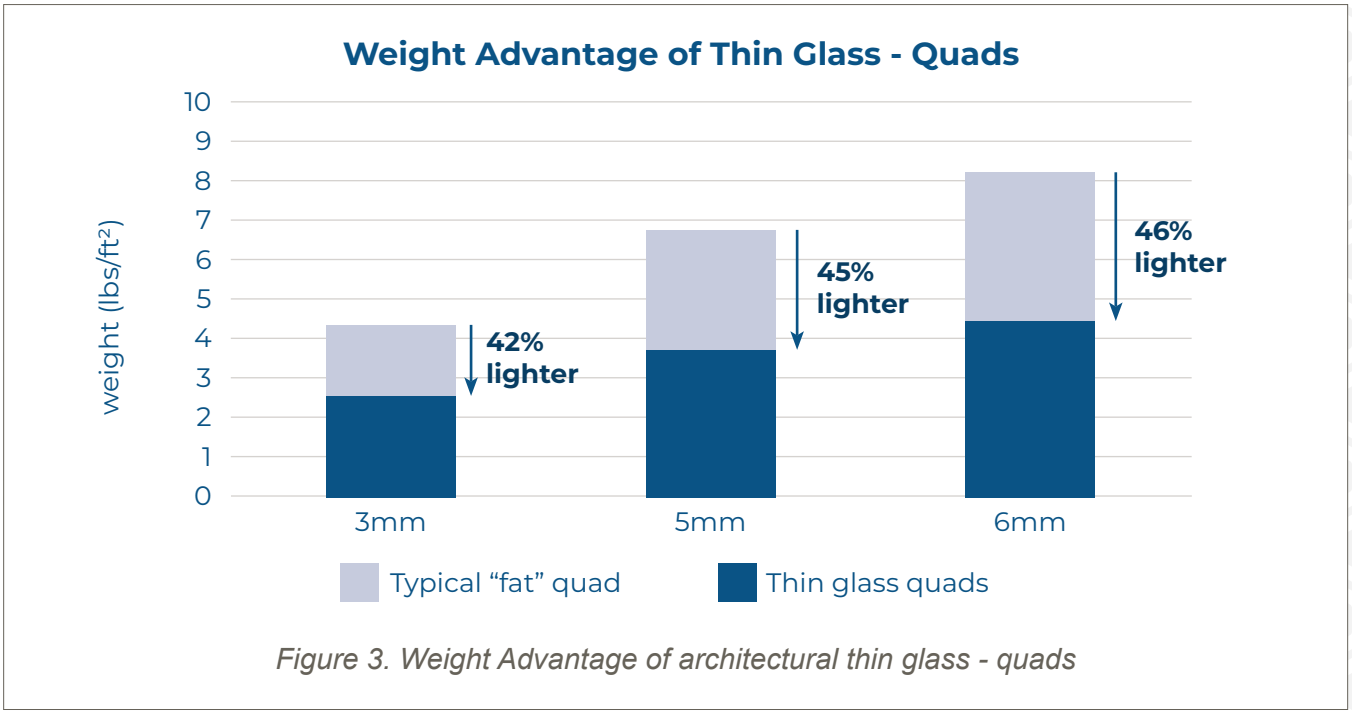


Figure 3. Weight Advantage of architectural thin glass - quads

4. Occupant Comfort

AlpenGlass thin triple and quad IGUs improve interior comfort by maintaining warmer interior glass surface temperatures in winter and cooler surfaces in summer. This reduces radiant heat loss and “cold draft” feeling near windows. Warmer interior glass surfaces also reduce condensation risk on windows in cold climates, preventing moisture-related issues and maintaining clear, unobstructed views.

5. Better Visibility

Corning® Enlighten™ Glass, a thin boro-aluminosilicate glass, delivers excellent optical clarity compared to traditional soda-lime glass. Its ultra-thin profile and fusion-draw manufacturing process allow higher light transmission and minimize the greenish hue caused by iron content in thicker glass substrates. As shown in Table 4, Enlighten Glass at 0.5mm achieves 0.92 visible light transmittance, higher than any thicker comparator on the market. Refer to “Thermal and Visual Performance Data – Standard Line” for visible light transmittance and reflectance data of standard AlpenGlass configurations.

Table 4. Visible light transmittance of typical clear glass lites

	Glass type (single lite; clear)	Tvis
Manufacturer 1	6mm; standard option	0.830
	6mm; mid-iron option	0.899
	6mm; low-iron option	0.904
Manufacturer 2	6mm; standard option	0.886
	6mm; mid-iron option	0.904
	6mm; low-iron option	0.911
Manufacturer 3	6mm; standard option	0.881
	6mm; low-iron option	0.911
Corning® Enlighten™ Glass	0.5mm clear	0.92
Data from LBNL WINDOW software		

AlpenGlass Durability

AlpenGlass thin triple and quad IGUs are engineered for long-term performance, backed by an industry-leading 20-year warranty. Since 2019, approximately 3 million square feet of AlpenGlass thin glass have been installed with zero known cases of thin glass pane breakage from structural, wind, or thermal stress loads.

Testing and Certification

Alpen is independently certified by NAMI and IGCC for IGU manufacturing and passed ASTM E2190 accelerated weatherization testing to verify gas retention, seal integrity, and resistance to fogging.

Ködispace 4SG TPS Technology

At the core of every AlpenGlass IGU is a thermoplastic spacer (TPS) system that integrates spacer, desiccant, and primary seal into one solution. Traditionally, the edge of an insulated glass unit is the thermal weak point. Ködispace 4SG is a permanently flexible TPS that chemically bonds to glass and secondary sealant, creating a reactive cross-link that delivers best-in-class gas retention, moisture barrier protection, and UV resistance. Importantly, center lites of thin glass are indexed back from the edge of glass and embedded directly into the seal material, forming a monolithic seal with fewer leak points and reduced edge stress compared to a conventional multi-component spacer system (see Figure 4). This fundamentally superior construction maintains gas-tight integrity through expansion and compression cycles, ensuring consistent performance throughout the IGU's lifetime. With a 40+ year life expectancy validated by NFRC and Passive House Institute, and proven performance from -40°F to 194°F, Ködispace 4SG represents the most advanced, durable spacer technology available.

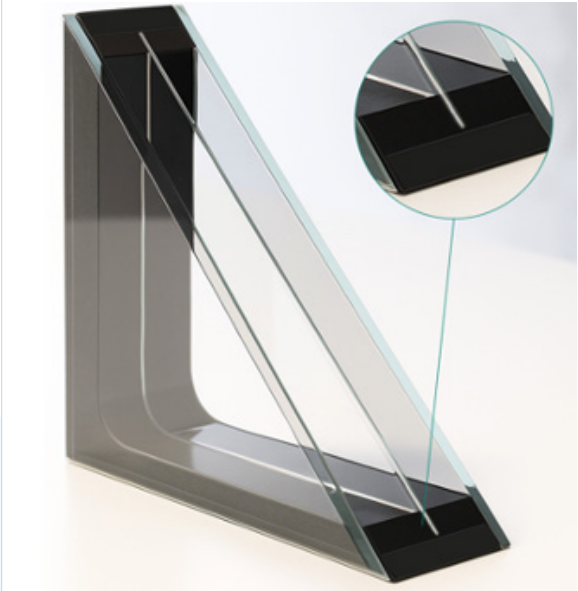


Figure 4. Diagram of thin glass indexed and embedded into TPS.

Figure 5. The TPS splice, where the spacer loop closes, is a core feature, maintaining a seamless, airtight connection that preserves the continuous bond.

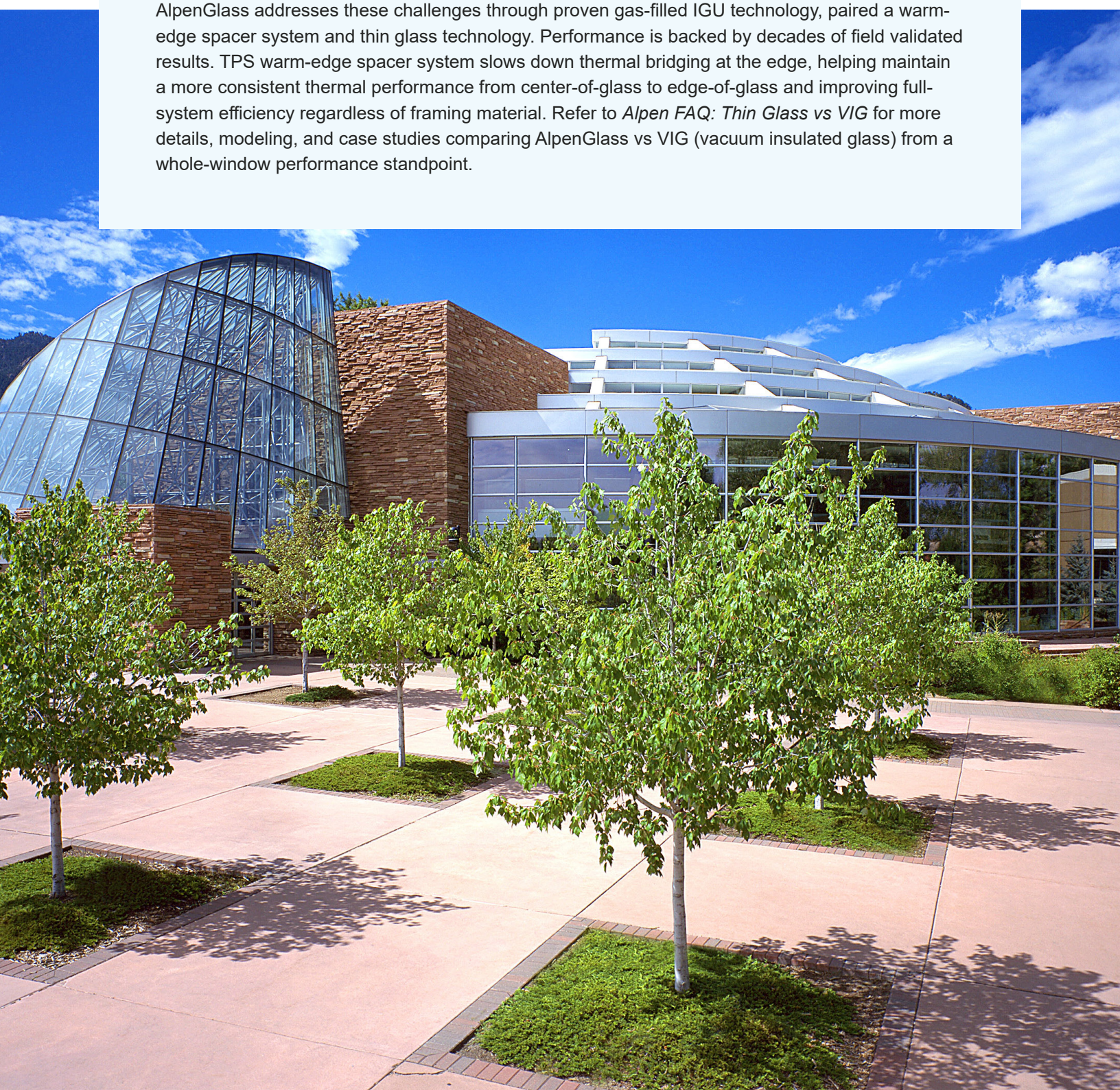
Resistance to Thermal Stress

Thermal stress in IGUs occurs when different areas of a glass unit heat and cool at different rates. As the glass expands or contracts unevenly, internal tension builds. If that stress becomes too great, it can lead to cracks or breakage, particularly in the center pane of traditional triple-pane units. Corning® Enlighten™ Glass, a thin boro-aluminosilicate glass, delivers has a 3x lower coefficient of thermal expansion than soda-lime glass, meaning it naturally resists thermal stress without the toughening methods required for soda-lime. Paired with the Ködispace 4SG TPS warm-edge spacer, AlpenGlass units built with Corning® Enlighten™ Glass is lighter, more durable, and more stable under performance-critical conditions.

Whole-window performance

A common challenge with advanced glazing technologies is achieving consistent thermal performance across the entire window system. Edge-of-glass performance and thermal interaction with the framing system is particularly critical. Inferior edge properties can create thermal bridging that not only compromises whole-window performance, but when combined with conductive metal framing systems, can lead to acute thermal stress and breakage at the glass edge.

AlpenGlass addresses these challenges through proven gas-filled IGU technology, paired a warm-edge spacer system and thin glass technology. Performance is backed by decades of field validated results. TPS warm-edge spacer system slows down thermal bridging at the edge, helping maintain a more consistent thermal performance from center-of-glass to edge-of-glass and improving full-system efficiency regardless of framing material. Refer to *Alpen FAQ: Thin Glass vs VIG* for more details, modeling, and case studies comparing AlpenGlass vs VIG (vacuum insulated glass) from a whole-window performance standpoint.



Manufacturing Capabilities

Manufacturing Capabilities

Quality with Advanced Automation

AlpenGlass IGUs are manufactured using automated production equipment designed to ensure precise tolerances and quality control across a wide range of glass configurations. Our production line incorporates robotic glass cutting and spacer application, along with automated alignment systems to maintain dimensional accuracy and seal quality. View videos or our automated **glass cutting** and **TPS application** lines.

Quality control is managed through integrated sensors and inspection systems, which detect defects during production. This approach reduces manufacturing variability and identifies imperfections before shipment. Calibrated altimeter equipment pre-pressurizes gas fill to match final installation elevation, optimizing thermal performance for each project location.

This combination of automated equipment and quality control processes enables consistent manufacturing across different glass types, sizes, and configurations. AlpenGlass IGUs are backed by a 20-year warranty, with approximately 3 million square feet installed since 2019.

For more details on AlpenGlass manufacturing specifications and tolerances, refer to *Alpen HPP Quality Manual* and the *Alpen Critical-to-Quality (CTQ) Supplier Glass Specifications.*

Gas Fill Options

AlpenGlass units are gas-filled with either Argon or Krypton, with standard gas fill ratios noted in Table 5. The use of TPS allows pre-pressurization of AlpenGlass units to match atmosphere pressure at installed location, without the need for breather tubes or equalization balloons.

Table 5. Standard Gas Fill Options

Standard Gas Fill Options	
Argon	95% Argon / 5% Air
Krypton	90% Krypton / 10% Air

AlpenGlass units are pre-pressurized to match atmospheric pressure at installation elevation.

Spacer & Sealant Systems

Table 6 details the standard spacer and sealant system in AlpenGlass products.

Table 6. Standard Spacer/Sealant System

Standard Spacer/Sealant System in all AlpenGlass	
Spacer	HB Fuller Ködispace 4SG (Thermo-Plastic Spacer)
Secondary Sealant	Kömmerling GD920D (Two-part silicone)

Note: Inter-pane distance capabilities from 6mm-18mm, *in 1mm increments*

Figure 6 details the sightline specification of the TPS system for simulation purposes. Refer to the *Alpen HPP Quality Manual* and the *Alpen Critical-to-Quality (CTQ) Supplier Glass Specifications* for tolerance ranges.

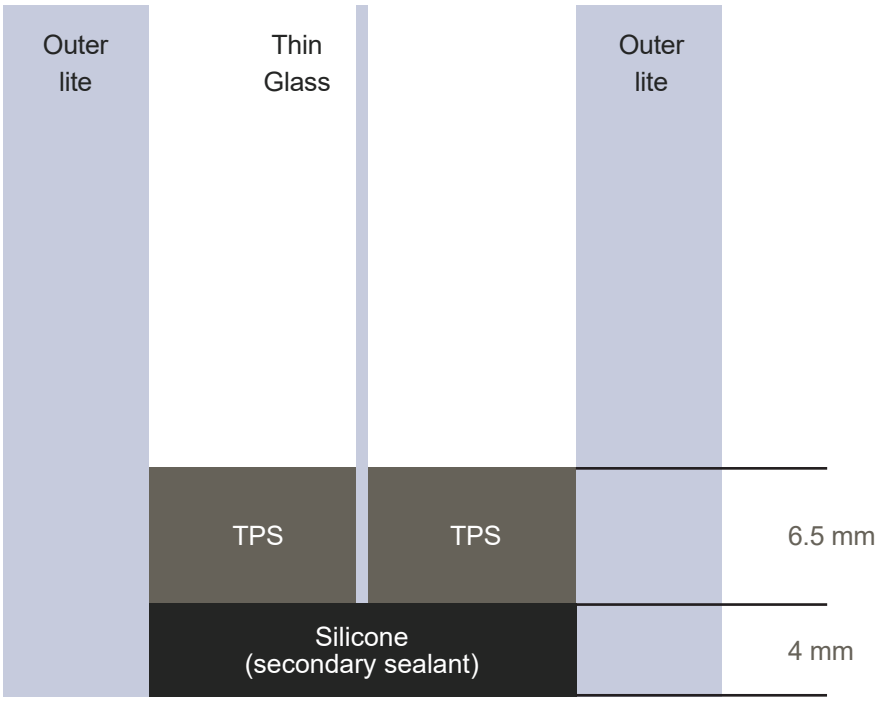


Figure 6. Sightline spec of TPS system to be used for thermal simulation purposes

Table 7 details the alternative spacer and sealant system used in some semi-custom and full-custom AlpenGlass products.

Table 7. Alternative Spacer/Sealant System (Used on some Semi-Custom or Full-Custom options)

Alternative Spacer/Sealant System	
Spacer	Super Spacer Premium Enhanced (silicone foam)
Secondary Sealant	Butyl 761-71X (Hot Melt Butyl)

OA Ranges

AlpenGlass units can be manufactured to meet your overall (OA) specifications.

Table 8. AlpenGlass OA Range Capability

OA Range Capability	
Minimum	¾”
Maximum	*2”*

Size Guidelines

The following size guidelines are intended to minimize breakage during handling and production, safety risks associated with large lites of thin glass, oil-canning risks from tempering process, and aesthetic issues related to large lites bowing under normal loading conditions.

Notes:

1. All IGU sizing are expressed in terms of **Standard Range** or **Custom Range.**
   - **Standard Range** = cost-optimized based on manufacturing efficiencies. Sizes outside of Standard Range may require engineering review before order submittal.
   - **Custom Range** = the maximum sizing that can be achieved but may require special glass orders and longer leads, special manufacturing considerations, and/or engineering review.
2. Refer to detailed Envelope Charts in **Appendix A** and **Appendix B** for more detailed dimensional limits.
3. The following tables apply to IGUs up to DP60 for tempered and DP30 for annealed.
4. Engineering review required for sizes >49ft^2 or wind loads>DP60.
5. Exceptions to these size parameters exist. See special consideration for quad max sizing below.
6. Size guidelines may be different for non-standard outer lites used (textured, patterned, bird glass, spandrel, laminated, etc.). Talk to your sales representative if using semi-custom or full-custom glass types.

Confirm Sizing: Refer to the interactive **AlpenGlass Sizing Calculator** to check your size requirements within our Standard and Custom Ranges. Reach out to your sales representative regarding unique sizing considerations.

Table 9. Summary Table – Max Sizing Guidelines – (May require custom range)

Outer Lite Thickness	Annealed		Tempered		
	Max Size (ft^2)	Max Length (in)	Max Size (ft^2)	Max Length (in)	Max Short Side (in)
3mm	20	80	20	80	36
4mm	28	90	30	90	48
5mm	40	100	50	120	60
6mm	50	120	60	120	72

Note 1: Minimum size requirements: at least 1 edge of IGU must be ≥16”
Note 2: See detailed envelope plots below for Standard and Custom size ranges for specific glass combinations with thin glass.
Note 3: The maximum short dimension limits for tempered IGUs is to reduce the potential of bi-stable glass (oil canning).
Note 4: If using NxLite L80 Low-E coating on 1.1mm center lite: max dimension = 99”x73” = 50.2 ft^2

Table 10. Max Sizing Guidelines – Standard Range

Outer Lite Thickness	Annealed		Tempered		
	Max Size (ft^2)	Max Length (in)	Max Size (ft^2)	Max Length (in)	Max Short Side (in)
3mm	20	80	20	80	36
4mm	28	90	30	90	48
5mm	40	95	48.3	120	58
6mm	46.8	95	50.3	125	58
			49.5	99	72

Note 1: Minimum size requirements: at least 1 edge of IGU must be ≥16”
Note 2: See detailed envelope plots below for Standard and Custom size ranges for specific glass combinations with thin glass.
Note 3: The maximum short dimension limits for tempered IGUs is to reduce the potential of bi-stable glass (oil canning).

Table 11. Special Sizing Considerations for Thin Quads

Max sizing for Quad Configurations with inter-pane gap < 3/8”	
Outer Lites	Max size
3mm	18ft^2
5mm	35ft^2
6mm	40ft^2

Note 1: Quad configurations with inter-pane gap < 3/8” have additional size constraints due to glass deflection risk. Talk to your sales representative if larger quad sizing is needed for your project. Engineering review required.

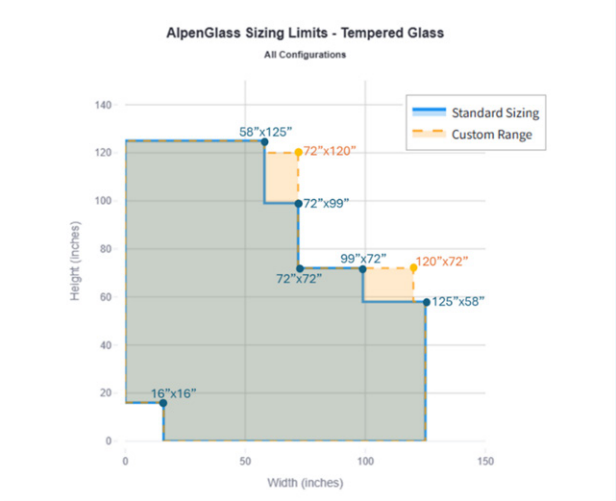


Figure 7. AlpenGlass Size Limits – Tempered IGUs

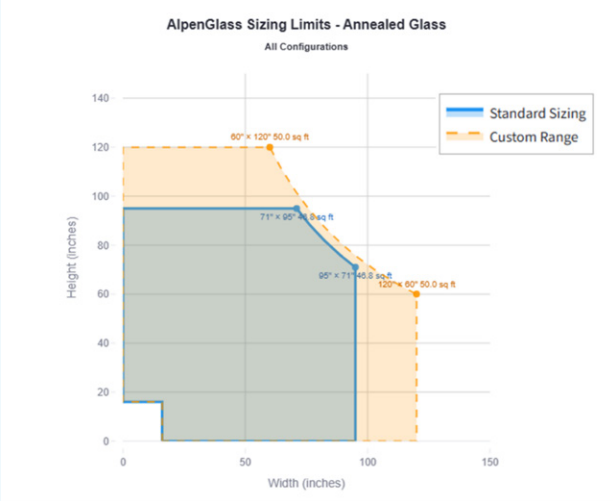


Figure 8. AlpenGlass Size Limits – Annealed IGUs

Shapes

Alpen has a suite of Standard and Custom Shape Options. Pricing and lead time varies, depending on shape complexity, manufacturing efficiencies, and procurement. Spacer and sealant system is dependent on the shape. See subsequent sections in catalog for more detail.

Table 12. Shape Capability

		Spacer & Sealant System	
Shape Category[1]	**Order Type[1]**	TPS	SuperSpacer
Rectangles	**Standard**	X	
Semi-Custom polygons or radius shapes	**Semi-Custom**	X (select shapes)	X
Full-Custom Polygons or radius shapes	**Full-Custom**		X

[1]See Standard, Semi-Custom, and Full-Custom sections of this catalog for more details on shape capabilities and compatibility with spacer/sealant systems.

GBB (grids between glass)

Grids are not currently available in AlpenGlass but expected to be offered as part of the product catalog in 2026.

AlpenGlass Product Lines

AlpenGlass Product Lines

Alpen offers three distinct product categories designed to meet the diverse needs of architects, builders, and window manufacturers.

Not sure which line fits your project? Your Alpen Sales Representative can help identify the most efficient solution for your specific needs.

Table 13. AlpenGlass Product Lines

Standard	Semi-Custom	Full-Custom
Standard products deliver the fastest path to high-performance glazing. They are made of stocked glass SKUs and are compatible with the standard limits of our manufacturing equipment. Lead times start at two weeks*	Semi-Custom products expand options with specialized glass options (ex. laminated glass, tints, spandrel, etc.) that are not stocked by Alpen but are readily available through our suppliers with additional lead time. Semi-custom also includes a set of non-rectangle shapes. Lead times start at 3-6 weeks*	If your project requires glass configurations, shapes, or sizes that fall outside those listed in this catalog, please contact your Alpen sales representative. We are happy to evaluate and quote projects outside of this guide, but added lead time and pricing is likely. Acceptance to full-custom projects are subject to Alpen's discretion with engineering review and manufacturing capacity.

**Lead time defined as time from when order is released to production to when it is shipped. Lead times and pricing are subject to our suppliers and subject to change. Contact your sales rep for regular scheduled lead times.*

AlpenGlass: Standard Products

AlpenGlass: Standard Products

Standard products deliver the fastest path to high-performance glazing. They are made of stocked glass SKUs and are compatible with the standard limits of our manufacturing equipment. Lead times start at two weeks[1] and subject to change.

General Details

Table 14. General Details for Standard Order

Lead Time[1]	**Standard** (current=2 weeks; subject to change)[2] *Quote turnaround: 2 business days*
Glass Types	Standard AlpenGlass IGUs are manufactured with stocked glass thicknesses and coatings. See details below.
Spacer[3] **& Sealant System**	HB Fuller Ködispace 4SG TPS (Thermo-Plastic Spacer) Kömmerling GD920D (Two-part silicone)
Gas Fill Options	95% Argon / 5% Air 90% Krypton / 10% Air
Shapes	Standard Orders are limited to rectangles only
Sizes	Standard Orders must fall within the blue “Standard” size ranges in Appendix A and B

[1]Lead time defined as total time from when order is placed to time that is it shipped.

[2] +1 week for orders >100 units

[3] Inter-pane distance capabilities from 6mm-18mm, in 1mm increments

Standard Glass and Coating Options (stocked)

The following tables summarize the glass thicknesses and coatings available in the AlpenGlass Standard Product Line.

*Table 15. Outer Lite Options – Standard Order**

Thickness	Coating Options
3 mm	Clear, LoE180, LoE270, LoE272, LoE366
4 mm	Clear, LoE180, LoE270, LoE272, LoE366
5 mm	Clear, LoE180, LoE270, LoE272, LoE366
6 mm	Clear, LoE180, LoE270, LoE272, LoE366

**Available in annealed or fully tempered*

Table 16. Center Lite Options – Standard Order

Thickness options	Coating Options
0.5 mm	Clear
1.1 mm	Clear, NxLite-L80
1.3 mm	Clear

Size Guidelines – Standard Products

See Appendix A for tempered glass and Appendix B for annealed glass. For Standard Order units and pricing, sizing must fall within the blue envelope labeled “Standard Sizing”. Sizes within this envelope are cost-optimized for high volume and high-quality production, based on manufacturing and supply efficiencies.

Click here to jump to Appendix A – Standard Order Size Guidelines for Tempered Glass
Click here to jump to Appendix B – Standard Order Size Guidelines for Annealed Glass

Minimum sizes apply for Standard Orders: one edge of IGU must be ≥16”, for all configurations and glass types.

Special Size Considerations for Quads

Quad configurations with inter-pane gap ≤ 3/8” have additional size constraints due to glass deflection risk. See Table 17 and Table 18 summarizes quad configurations that have < 3/8” average airgap. To read the chart, find your combination of OA, outer lites, and center lites. Orange cells have <3/8” average airgap and follow the special size considerations in Table 17. Green cells have >3/8” average air gap and follow the size guidelines in Appendices A and B.

Table 18. Talk to your sales representative if larger quad sizing is needed for your project. Engineering review required for quad sizes over 40 ft^2.

Table 17. Max Size Guidelines for Thin Glass Quad Configurations

Max sizing for Quad Configurations with gaps <3/8"*	
Outer Lites	**Max size**
3mm	18ft^2
5mm	35ft^2
6mm	40ft^2

Table 18 summarizes quad configurations that have < 3/8" average airgap. To read the chart, find your combination of OA, outer lites, and center lites. Orange cells have <3/8" average airgap and follow the special size considerations in Table 17. Green cells have >3/8" average air gap and follow the size guidelines in Appendices A and B.

Table 18. Average air gap of AlpenGlass quad configurations

	Average air gap thickness - AlpenGlass Quads*										
	OA (in)	**0.750**	0.875	1	1.125	1.25	1.375	1.5	1.625	1.75	
	OA (mm)	**19.05**	**22.23**	**25.40**	**28.58**	31.75	34.93	38.10	41.28	44.45	
Outer Lites (mm)	**3**			0.239	0.281	0.322	0.364	0.406	0.447	0.489	**0.5/0.5**
					0.265	0.306	0.348	0.390	0.431	0.473	**1.1/1.1**
	4				0.260	0.301	0.343	0.385	0.426	0.468	**0.5/0.5**
					0.244	0.285	0.327	0.369	0.410	0.452	**1.1/1.1**
	5				0.239	0.280	0.322	0.364	0.405	0.447	**0.5/0.5**
						0.264	0.306	0.348	0.389	0.431	**1.1/1.1**
	6					0.254	0.296	0.337	0.379	0.421	**0.5/0.5**
						0.238	0.280	0.322	0.363	0.405	1.1/1.1
											Center Lites (mm)

**Assumes symmetric spacer depths.*

Performance Tiers – Standard Line

Table 19 describes the standard, recommended coating configurations for triple- and quad-pane IGUs. See subsequent Thermal and Visual Performance Tables for detailed performance data across various combinations of overall IGU (OA) and outer lite thicknesses. Recommended configurations are highly dependent on climate and building application. Therefore, alternative configurations of coating options are available at customer request. Refer to Table 15 and Table 16 for all glass and coating types available in the Standard Line. For example, additional combinations of LoE366, LoE272, LoE180 are possible, but some configurations may by inadvisable in certain situations and should be discussed with Alpen Representative to assess impacts on comfort, visible light transmittance, aesthetics, performance, and cost.

Table 19. Recommended Coating Configurations – Standard IGUs

Triple-Pane

Recommended coating configurations[1,2]		
Outer Pane	Inner Pane	Outer Pane
LoE180(#2)	0.5mmClear	LoE180(#5) (cc)
LoE272(#2)	0.5mmClear	LoE180(#5)
LoE366(#2)	0.5mmClear	LoE180(#5)
LoE366(#2)	0.5mmClear	LoE272(#5)

Quad-Pane

Recommended coating configurations[1,2]			
Outer Pane	Inner Pane		Outer Pane
LoE366(#2)	0.5mmClear	0.5mmClear	LoE180(#7)
LoE366(#2)	1.1mmNxLite(#4)	1.1mmClear	LoE180(#7))
LoE366(#2)	1.1mmNxLite(#4)	1.1mmClear	LoE272(#7)

[cc] Advised in cold climates only.

[1] Alternate coating configurations available at customer request. Talk to your Alpen Sales Rep.

[2] 0.5mm center lites can be substituted for 1.1mm or 1.3mm, depending on size needs

Recommendation Methodology

Alpen HPP's recommended glass configurations balance cost, performance, occupant comfort, and visual quality. For each overall thickness (OA) and outer lite combination, we evaluated thermal performance, condensation resistance, interior surface temperatures, and optical quality to identify the optimal balance of efficiency, comfort, durability, and value. Gas-fill recommendations are determined through this same economic analysis – optimizing gas fill based on air-gap widths. Note that a wider range of thermal performance may be achieved with alternate coating configurations. An even higher level of thermal performance can be achieved with glass combinations available through our semi- or full-custom process. Speak to your Alpen representative about your specific performance needs.

Thermal and Visual Performance Data – Standard Line

The performance data shown in the tables below can be used to compare different insulating glass configurations. To use these tables, first find the OA and outer lite thickness needed for your window system. Then, identify the right configuration based on your center-of-glass performance needs.

U-Value and R-Value: Thermal performance of IGU. The lower the U-Value, the more thermally insulating the IGU is. R-Value is the inverse of U-Value. Therefore, the higher the R-Value, the more thermally insulating the IGU is.

SHGC (Solar Heat Gain Coefficient): The higher the value, the more solar energy is passed through the IG unit.
Visible Light Transmittance and Reflectance: Light that is transmitted through the glass and reflected off the glass surfaces. Higher light transmission values indicate more natural light coming through the glass.

- VT=visible light transmittance.
- Rf_out=Exterior surface visible light reflectance (surface #1).
- Rf_in=Interior surface visible light reflectance (surface #6 for triple IGUs, surface #8 for quad IGUs)

All performance data calculated using LBNL Window 7.8 software and represents center of glass performance data.

Naming convention

[Trip or Quad] - [OA"] - [outer lite thickness] - [center lite thickness] - [coating configuration] - [Gas]

Example: Trip-0.75"-3mm-0.5mm-366/clear/272-K

Segment	What It Represents	This Example
Trip	Glazing Construction	Triple-Pane
0.75″	Overall Thickness (OA)	0.75″
3mm	Exterior Lite Thickness	3mm
0.5mm	Center Lite Thickness	0.5mm
366/clear/180	Coating Configuration (Ext / Center / Int)	LowE366 / Clear / LoE180
K	Gas Fill	90/10 Krypton

3/4” OA, 3mm Outer Lites

OA (in)	Outer Lites (mm)	Full name	Center Lite 1 (mm)	Center Lite 2 (mm)	Surface 2	Surface 4	Surface 5	Surface 7	Gas Fill	U-Value	R-Value	SHGC	VT	Rf_in	Rf_out
0.75	3	Trip-0.75"-3mm-0.5mm-180/clear/180-K	0.5	0	E180	-	E180	N/A	90/10 Krypton	0.141	7.113	0.576	0.711	0.203	0.203
0.75	3	Trip-0.75"-3mm-0.5mm-272/clear/180-K	0.5	0	E272	-	E180	N/A	90/10 Krypton	0.137	7.302	0.382	0.644	0.180	0.148
0.75	3	Trip-0.75"-3mm-0.5mm-366/clear/180-K	0.5	0	E366	-	E180	N/A	90/10 Krypton	0.134	7.483	0.248	0.580	0.183	0.145
0.75	3	Trip-0.75"-3mm-0.5mm-366/clear/272-K	0.5	0	E366	-	E272	N/A	90/10 Krypton	0.130	7.700	0.251	0.526	0.132	0.129

AlpenGlass: Standard Products

7/8” OA, 3mm Outer Lites

OA (in)	Outer Lites (mm)	Full name	Center Lite 1 (mm)	Center Lite 2 (mm)	Surface 2	Surface 4	Surface 5	Surface 7	Gas Fill	U-Value	R-Value	SHGC	VT	Rf_in	Rf_out
0.875	3	Trip-0.875"-3mm-0.5mm-180/clear/180-K	0.5	0	E180	-	E180	N/A	90/10 Krypton	0.123	8.137	0.577	0.711	0.203	0.203
0.875	3	Trip-0.875"-3mm-0.5mm-272/clear/180-K	0.5	0	E272	-	E180	N/A	90/10 Krypton	0.119	8.387	0.381	0.644	0.180	0.148
0.875	3	Trip-0.875"-3mm-0.5mm-366/clear/180-K	0.5	0	E366	-	E180	N/A	90/10 Krypton	0.116	8.628	0.247	0.580	0.183	0.145
0.875	3	Trip-0.875"-3mm-0.5mm-366/clear/272-K	0.5	0	E366	-	E272	N/A	90/10 Krypton	0.112	8.939	0.250	0.526	0.132	0.129

1” OA, 3mm Outer Lites

OA (in)	Outer Lites (mm)	Full name	Center Lite 1 (mm)	Center Lite 2 (mm)	Surface 2	Surface 4	Surface 5	Surface 7	Gas Fill	U-Value	R-Value	SHGC	VT	Rf_in	Rf_out
1	3	Trip-1"-3mm-0.5mm-180/clear/180-A	0.5	0	E180	-	E180	N/A	95/5 Ar	0.154	6.477	0.576	0.711	0.203	0.203
1	3	Trip-1"-3mm-0.5mm-272/clear/180-A	0.5	0	E272	-	E180	N/A	95/5 Ar	0.151	6.627	0.382	0.644	0.180	0.148
1	3	Trip-1"-3mm-0.5mm-366/clear/180-A	0.5	0	E366	-	E180	N/A	95/5 Ar	0.148	6.768	0.249	0.580	0.183	0.145
1	3	Trip-1"-3mm-0.5mm-366/clear/272-A	0.5	0	E366	-	E272	N/A	95/5 Ar	0.144	6.941	0.251	0.526	0.132	0.129
1	3	Trip-1"-3mm-0.5mm-180/clear/180-K	0.5	0	E180	-	E180	N/A	90/10 Kr	0.116	8.600	0.577	0.711	0.203	0.203
1	3	Trip-1"-3mm-0.5mm-272/clear/180-K	0.5	0	E272	-	E180	N/A	90/10 Kr	0.113	8.859	0.380	0.644	0.180	0.148
1	3	Trip-1"-3mm-0.5mm-366/clear/180-K	0.5	0	E366	-	E180	N/A	90/10 Kr	0.110	9.105	0.246	0.580	0.183	0.145
1	3	Trip-1"-3mm-0.5mm-366/clear/272-K	0.5	0	E366	-	E272	N/A	90/10 Kr	0.105	9.483	0.249	0.526	0.132	0.129

1” OA, 5mm Outer Lites

OA (in)	Outer Lites (mm)	Full name	Center Lite 1 (mm)	Center Lite 2 (mm)	Surface 2	Surface 4	Surface 5	Surface 7	Gas Fill	U-Value	R-Value	SHGC	VT	Rf_in	Rf_out
1	5	Trip-1"-5mm-0.5mm-180/clear/180-K	0.5	0	E180	-	E180	N/A	90/10 Kr	0.123	8.099	0.559	0.699	0.200	0.200
1	5	Trip-1"-5mm-0.5mm-272/clear/180-K	0.5	0	E272	-	E180	N/A	90/10 Kr	0.120	8.346	0.374	0.634	0.177	0.146
1	5	Trip-1"-5mm-0.5mm-366/clear/180-K	0.5	0	E366	-	E180	N/A	90/10 Kr	0.116	8.585	0.246	0.570	0.181	0.142
1	5	Trip-1"-5mm-0.5mm-366/clear/272-K	0.5	0	E366	-	E272	N/A	90/10 Kr	0.112	8.889	0.248	0.517	0.130	0.127

1” OA, 6mm Outer Lites

OA (in)	Outer Lites (mm)	Full name	Center Lite 1 (mm)	Center Lite 2 (mm)	Surface 2	Surface 4	Surface 5	Surface 7	Gas Fill	U-Value	R-Value	SHGC	VT	Rf_in	Rf_out
1	6	Trip-1"-6mm-0.5mm-180/clear/180-K	0.5	0	E180	-	E180	N/A	90/10 Kr	0.134	7.489	0.544	0.686	0.196	0.196
1	6	Trip-1"-6mm-0.5mm-272/clear/180-K	0.5	0	E272	-	E180	N/A	90/10 Kr	0.130	7.700	0.368	0.622	0.174	0.144
1	6	Trip-1"-6mm-0.5mm-366/clear/180-K	0.5	0	E366	-	E180	N/A	90/10 Kr	0.127	7.902	0.246	0.561	0.178	0.141
1	6	Trip-1"-6mm-0.5mm-366/clear/272-K	0.5	0	E366	-	E272	N/A	90/10 Kr	0.123	8.147	0.248	0.509	0.128	0.126

1-1/8” OA, 3mm Outer Lites

OA (in)	Outer Lites (mm)	Full name	Center Lite 1 (mm)	Center Lite 2 (mm)	Surface 2	Surface 4	Surface 5	Surface 7	Gas Fill	U-Value	R-Value	SHGC	VT	Rf_in	Rf_out
1.125	3	Trip-1.125"-3mm-0.5mm-180/clear/180-A	0.5	0	E180	-	E180	N/A	95/5 Ar	0.140	7.124	0.576	0.711	0.203	0.203
1.125	3	Trip-1.125"-3mm-0.5mm-272/clear/180-A	0.5	0	E272	-	E180	N/A	95/5 Ar	0.137	7.308	0.381	0.644	0.180	0.148
1.125	3	Trip-1.125"-3mm-0.5mm-366/clear/180-A	0.5	0	E366	-	E180	N/A	95/5 Ar	0.134	7.483	0.248	0.580	0.183	0.145
1.125	3	Trip-1.125"-3mm-0.5mm-366/clear/272-A	0.5	0	E366	-	E272	N/A	95/5 Ar	0.130	7.706	0.251	0.526	0.132	0.129
1.125	3	Trip-1.125"-3mm-0.5mm-180/clear/180-K	0.5	0	E180	-	E180	N/A	90/10 Kr	0.118	8.485	0.577	0.711	0.203	0.203
1.125	3	Trip-1.125"-3mm-0.5mm-272/clear/180-K	0.5	0	E272	-	E180	N/A	90/10 Kr	0.114	8.749	0.379	0.644	0.180	0.148
1.125	3	Trip-1.125"-3mm-0.5mm-366/clear/180-K	0.5	0	E366	-	E180	N/A	90/10 Kr	0.111	9.000	0.245	0.580	0.183	0.145
1.125	3	Trip-1.125"-3mm-0.5mm-366/clear/272-K	0.5	0	E366	-	E272	N/A	90/10 Kr	0.107	9.345	0.248	0.526	0.132	0.129
1.125	3	Quad-1.125"-3mm-0.5mm-366/clear/clear/180-K	0.5	0.5	E366	-	-	E180	90/10 Kr	0.106	9.436	0.232	0.541	0.231	0.175
1.125	3	Quad-1.125"-3mm-1.1thin-366/NxLite/clear/180-K	1.1	1.1	E366	NxLite	-	E180	90/10 Kr	0.090	11.149	0.221	0.510	0.208	0.163
1.125	3	Quad-1.125"-3mm-1.1thin-366/NxLite/clear/272-K	1.1	1.1	E366	NxLite	-	E272	90/10 Kr	0.088	11.403	0.223	0.462	0.153	0.151

1-1/8” OA, 5mm Outer Lites

OA (in)	Outer Lites (mm)	Full name	Center Lite 1 (mm)	Center Lite 2 (mm)	Surface 2	Surface 4	Surface 5	Surface 7	Gas Fill	U-Value	R-Value	SHGC	VT	Rf_in	Rf_out
1.125	5	Trip-1.125"-5mm-0.5mm-180/clear/180-A	0.5	0	E180	-	E180	N/A	95/5 Ar	0.155	6.445	0.559	0.699	0.200	0.200
1.125	5	Trip-1.125"-5mm-0.5mm-272/clear/180-A	0.5	0	E272	-	E180	N/A	95/5 Ar	0.152	6.593	0.376	0.634	0.177	0.146
1.125	5	Trip-1.125"-5mm-0.5mm-366/clear/180-A	0.5	0	E366	-	E180	N/A	95/5 Ar	0.149	6.732	0.249	0.570	0.181	0.142
1.125	5	Trip-1.125"-5mm-0.5mm-366/clear/272-A	0.5	0	E366	-	E272	N/A	95/5 Ar	0.145	6.901	0.251	0.517	0.130	0.127
1.125	5	Trip-1.125"-5mm-0.5mm-180/clear/180-K	0.5	0	E180	-	E180	N/A	90/10 Kr	0.116	8.617	0.559	0.699	0.200	0.200
1.125	5	Trip-1.125"-5mm-0.5mm-272/clear/180-K	0.5	0	E272	-	E180	N/A	90/10 Kr	0.113	8.878	0.373	0.634	0.177	0.146
1.125	5	Trip-1.125"-5mm-0.5mm-366/clear/180-K	0.5	0	E366	-	E180	N/A	90/10 Kr	0.110	9.126	0.244	0.570	0.181	0.142
1.125	5	Trip-1.125"-5mm-0.5mm-366/clear/272-K	0.5	0	E366	-	E272	N/A	90/10 Kr	0.105	9.502	0.247	0.517	0.130	0.127

1-1/8” OA, 6mm Outer Lites

OA (in)	Outer Lites (mm)	Full name	Center Lite 1 (mm)	Center Lite 2 (mm)	Surface 2	Surface 4	Surface 5	Surface 7	Gas Fill	U-Value	R-Value	SHGC	VT	Rf_in	Rf_out
1.125	6	Trip-1.125"-6mm-0.5mm-180/clear/180-K	0.5	0	E180	-	E180	N/A	90/10 Kr	0.119	8.384	0.544	0.686	0.196	0.196
1.125	6	Trip-1.125"-6mm-0.5mm-272/clear/180-K	0.5	0	E272	-	E180	N/A	90/10 Kr	0.116	8.644	0.367	0.622	0.174	0.144
1.125	6	Trip-1.125"-6mm-0.5mm-366/clear/272-K	0.5	0	E366	-	E272	N/A	90/10 Kr	0.108	9.231	0.247	0.509	0.128	0.126

1-1/4” OA, 3mm Outer Lites

OA (in)	Outer Lites (mm)	Full name	Center Lite 1 (mm)	Center Lite 2 (mm)	Surface 2	Surface 4	Surface 5	Surface 7	Gas Fill	U-Value	R-Value	SHGC	VT	Rf_in	Rf_out
1.25	3	Trip-1.25"-3mm-0.5mm-180/clear/180-A	0.5	0	E180	-	E180	N/A	95/5 Ar	0.132	7.572	0.576	0.711	0.203	0.203
1.25	3	Trip-1.25"-3mm-0.5mm-272/clear/180-A	0.5	0	E272	-	E180	N/A	95/5 Ar	0.129	7.774	0.381	0.644	0.180	0.148
1.25	3	Trip-1.25"-3mm-0.5mm-366/clear/180-A	0.5	0	E366	-	E180	N/A	95/5 Ar	0.126	7.965	0.247	0.580	0.183	0.145
1.25	3	Trip-1.25"-3mm-0.5mm-366/clear/272-A	0.5	0	E366	-	E272	N/A	95/5 Ar	0.121	8.233	0.250	0.526	0.132	0.129
1.25	3	Quad-1.25"-3mm-0.5mm-366/clear/clear/180-K	0.5	0.5	E366	-	-	E180	90/10 Kr	0.098	10.163	0.231	0.541	0.231	0.175
1.25	3	Quad-1.25"-3mm-1.1thin-366/NxLite/clear/180-K	1.1	1.1	E366	NxLite	-	E180	90/10 Kr	0.081	12.335	0.221	0.510	0.208	0.163
1.25	3	Quad-1.25"-3mm-1.1thin-366/NxLite/clear/272-K	1.1	1.1	E366	NxLite	-	E272	90/10 Kr	0.079	12.659	0.223	0.462	0.153	0.151

1-1/4” OA, 5mm Outer Lites

OA (in)	Outer Lites (mm)	Full name	Center Lite 1 (mm)	Center Lite 2 (mm)	Surface 2	Surface 4	Surface 5	Surface 7	Gas Fill	U-Value	R-Value	SHGC	VT	Rf_in	Rf_out
1.25	5	Trip-1.25"-5mm-0.5mm-180/clear/180-A	0.5	0	E180	-	E180	N/A	95/5 Ar	0.141	7.104	0.559	0.699	0.200	0.200
1.25	5	Trip-1.25"-5mm-0.5mm-272/clear/180-A	0.5	0	E272	-	E180	N/A	95/5 Ar	0.137	7.286	0.375	0.634	0.177	0.146
1.25	5	Trip-1.25"-5mm-0.5mm-366/clear/180-A	0.5	0	E366	-	E180	N/A	95/5 Ar	0.134	7.459	0.247	0.570	0.181	0.142
1.25	5	Trip-1.25"-5mm-0.5mm-366/clear/272-A	0.5	0	E366	-	E272	N/A	95/5 Ar	0.130	7.678	0.249	0.517	0.130	0.127
1.25	5	Trip-1.25"-5mm-0.5mm-180/clear/180-K	0.5	0	E180	-	E180	N/A	90/10 Kr	0.117	8.524	0.559	0.699	0.200	0.200
1.25	5	Trip-1.25"-5mm-0.5mm-272/clear/180-K	0.5	0	E272	-	E180	N/A	90/10 Kr	0.114	8.789	0.372	0.634	0.177	0.146
1.25	5	Trip-1.25"-5mm-0.5mm-366/clear/180-K	0.5	0	E366	-	E180	N/A	90/10 Kr	0.111	9.031	0.243	0.570	0.181	0.142
1.25	5	Trip-1.25"-5mm-0.5mm-366/clear/272-K	0.5	0	E366	-	E272	N/A	90/10 Kr	0.107	9.388	0.247	0.517	0.130	0.127
1.25	5	Quad-1.25"-5mm-0.5mm-366/clear/clear/180-K	0.5	0.5	E366	-	-	E180	90/10 Kr	0.106	9.396	0.231	0.532	0.228	0.172
1.25	5	Quad-1.25"-5mm-1.1thin-366/NxLite/clear/180-K	1.1	1.1	E366	NxLite	-	E180	90/10 Kr	0.090	11.082	0.220	0.501	0.205	0.160
1.25	5	Quad-1.25"-5mm-1.1thin-366/NxLite/clear/272-K	1.1	1.1	E366	NxLite	-	E272	90/10 Kr	0.088	11.332	0.222	0.454	0.150	0.148

1-1/4” OA, 6mm Outer Lites

OA (in)	Outer Lites (mm)	Full name	Center Lite 1 (mm)	Center Lite 2 (mm)	Surface 2	Surface 4	Surface 5	Surface 7	Gas Fill	U-Value	R-Value	SHGC	VT	Rf_in	Rf_out
1.25	6	Trip-1.25"-6mm-0.5mm-180/clear/180-A	0.5	0	E180	-	E180	N/A	95/5 Ar	0.149	6.717	0.544	0.686	0.196	0.196
1.25	6	Trip-1.25"-6mm-0.5mm-272/clear/180-A	0.5	0	E272	-	E180	N/A	95/5 Ar	0.145	6.878	0.369	0.622	0.174	0.144
1.25	6	Trip-1.25"-6mm-0.5mm-366/clear/180-A	0.5	0	E366	-	E180	N/A	95/5 Ar	0.142	7.031	0.247	0.561	0.178	0.141
1.25	6	Trip-1.25"-6mm-0.5mm-366/clear/272-A	0.5	0	E366	-	E272	N/A	95/5 Ar	0.139	7.219	0.249	0.509	0.128	0.126
1.25	6	Trip-1.25"-6mm-0.5mm-180/clear/180-K	0.5	0	E180	-	E180	N/A	90/10 Kr	0.116	8.641	0.544	0.686	0.196	0.196
1.25	6	Trip-1.25"-6mm-0.5mm-272/clear/180-K	0.5	0	E272	-	E180	N/A	90/10 Kr	0.112	8.905	0.366	0.622	0.174	0.144
1.25	6	Trip-1.25"-6mm-0.5mm-366/clear/180-K	0.5	0	E366	-	E180	N/A	90/10 Kr	0.109	9.157	0.243	0.561	0.178	0.141
1.25	6	Trip-1.25"-6mm-0.5mm-366/clear/272-K	0.5	0	E366	-	E272	N/A	90/10 Kr	0.105	9.528	0.246	0.509	0.128	0.126
1.25	6	Quad-1.25"-6mm-1.1thin-366/NxLite/clear/180-K	1.1	1.1	E366	NxLite	-	E180	90/10 Kr	0.097	10.261	0.219	0.494	0.202	0.158
1.25	6	Quad-1.25"-6mm-1.1thin-366/clear/clear/272-K	1.1	1.1	E366	-	-	E272	90/10 Kr	0.096	10.470	0.221	0.447	0.148	0.147

1-3/8” OA, 3mm Outer Lites

OA (in)	Outer Lites (mm)	Full name	Center Lite 1 (mm)	Center Lite 2 (mm)	Surface 2	Surface 4	Surface 5	Surface 7	Gas Fill	U-Value	R-Value	SHGC	VT	Rf_in	Rf_out
1.375	3	Trip-1.375"-3mm-0.5mm-180/clear/180-A	0.5	0	E180	-	E180	N/A	95/5 Ar	0.130	7.712	0.577	0.711	0.203	0.203
1.375	3	Trip-1.375"-3mm-0.5mm-272/clear/180-A	0.5	0	E272	-	E180	N/A	95/5 Ar	0.126	7.909	0.380	0.644	0.180	0.148
1.375	3	Trip-1.375"-3mm-0.5mm-366/clear/180-A	0.5	0	E366	-	E180	N/A	95/5 Ar	0.123	8.110	0.247	0.580	0.183	0.145
1.375	3	Trip-1.375"-3mm-0.5mm-366/clear/272-A	0.5	0	E366	-	E272	N/A	95/5 Ar	0.119	8.382	0.249	0.526	0.132	0.129
1.375	3	Quad-1.375"-3mm-1.1thin-366/NxLite/clear/180-A	1.1	1.1	E366	NxLite	-	E180	95/5 Ar	0.110	9.083	0.223	0.510	0.208	0.163
1.375	3	Quad-1.375"-3mm-1.1thin-366/NxLite/clear/272-A	1.1	1.1	E366	NxLite	-	E272	95/5 Ar	0.108	9.244	0.224	0.462	0.153	0.151
1.375	3	Quad-1.375"-3mm-0.5mm-366/clear/clear/180-K	0.5	0.5	E366	-	-	E180	90/10 Kr	0.094	10.591	0.231	0.541	0.231	0.175
1.375	3	Quad-1.375"-3mm-1.1thin-366/NxLite/clear/180-K	1.1	1.1	E366	NxLite	-	E180	90/10 Kr	0.075	13.275	0.220	0.510	0.208	0.163
1.375	3	Quad-1.375"-3mm-1.1thin-366/NxLite/clear/272-K	1.1	1.1	E366	NxLite	-	E272	90/10 Kr	0.073	13.668	0.223	0.462	0.153	0.151

1-3/8” OA, 5mm Outer Lites

OA (in)	Outer Lites (mm)	Full name	Center Lite 1 (mm)	Center Lite 2 (mm)	Surface 2	Surface 4	Surface 5	Surface 7	Gas Fill	U-Value	R-Value	SHGC	VT	Rf_in	Rf_out
1.375	5	Trip-1.375"-5mm-0.5mm-180/clear/180-A	0.5	0	E180	-	E180	N/A	95/5 Ar	0.132	7.571	0.559	0.699	0.200	0.200
1.375	5	Trip-1.375"-5mm-0.5mm-272/clear/180-A	0.5	0	E272	-	E180	N/A	95/5 Ar	0.129	7.772	0.374	0.634	0.177	0.146
1.375	5	Trip-1.375"-5mm-0.5mm-366/clear/180-A	0.5	0	E366	-	E180	N/A	95/5 Ar	0.126	7.963	0.246	0.570	0.181	0.142
1.375	5	Trip-1.375"-5mm-0.5mm-366/clear/272-A	0.5	0	E366	-	E272	N/A	95/5 Ar	0.122	8.228	0.249	0.517	0.130	0.127
1.375	5	Quad-1.375"-5mm-0.5mm-366/clear/clear/180-K	0.5	0.5	E366	-	-	E180	90/10 Kr	0.099	10.141	0.230	0.532	0.228	0.172
1.375	5	Quad-1.375"-5mm-1.1thin-366/NxLite/clear/180-K	1.1	1.1	E366	NxLite	-	E180	90/10 Kr	0.081	12.278	0.219	0.501	0.205	0.160
1.375	5	Quad-1.375"-5mm-1.1thin-366/NxLite/clear/272-K	1.1	1.1	E366	NxLite	-	E272	90/10 Kr	0.079	12.597	0.221	0.454	0.150	0.148

1-3/8” OA, 6mm Outer Lites

OA (in)	Outer Lites (mm)	Full name	Center Lite 1 (mm)	Center Lite 2 (mm)	Surface 2	Surface 4	Surface 5	Surface 7	Gas Fill	U-Value	R-Value	SHGC	VT	Rf_in	Rf_out
1.375	6	Trip-1.375"-6mm-0.5mm-180/clear/180-A	0.5	0	E180	-	E180	N/A	95/5 Ar	0.137	7.317	0.544	0.686	0.196	0.196
1.375	6	Trip-1.375"-6mm-0.5mm-272/clear/180-A	0.5	0	E272	-	E180	N/A	95/5 Ar	0.133	7.509	0.368	0.622	0.174	0.144
1.375	6	Trip-1.375"-6mm-0.5mm-366/clear/180-A	0.5	0	E366	-	E180	N/A	95/5 Ar	0.130	7.691	0.246	0.561	0.178	0.141
1.375	6	Trip-1.375"-6mm-0.5mm-366/clear/272-A	0.5	0	E366	-	E272	N/A	95/5 Ar	0.126	7.928	0.248	0.509	0.128	0.126
1.375	6	Quad-1.375"-6mm-0.5mm-366/clear/clear/180-K	0.5	0.5	E366	-	-	E180	90/10 Kr	0.103	9.710	0.229	0.524	0.224	0.170
1.375	6	Quad-1.375"-6mm-1.1thin-366/NxLite/clear/180-K	1.1	1.1	E366	NxLite	-	E180	90/10 Kr	0.087	11.557	0.218	0.494	0.202	0.158
1.375	6	Quad-1.375"-6mm-1.1thin-366/NxLite/clear/272-K	1.1	1.1	E366	NxLite	-	E272	90/10 Kr	0.085	11.831	0.220	0.447	0.148	0.147

1-1/2” OA, 5mm Outer Lites

OA (in)	Outer Lites (mm)	Full name	Center Lite 1 (mm)	Center Lite 2 (mm)	Surface 2	Surface 4	Surface 5	Surface 7	Gas Fill	U-Value	R-Value	SHGC	VT	Rf_in	Rf_out
1.5	5	Trip-1.5"-5mm-0.5mm-180/clear/180-A	0.5	0	E180	-	E180	N/A	95/5 Ar	0.129	7.739	0.559	0.699	0.200	0.200
1.5	5	Trip-1.5"-5mm-0.5mm-272/clear/180-A	0.5	0	E272	-	E180	N/A	95/5 Ar	0.126	7.937	0.373	0.634	0.177	0.146
1.5	5	Trip-1.5"-5mm-0.5mm-366/clear/180-A	0.5	0	E366	-	E180	N/A	95/5 Ar	0.123	8.121	0.245	0.570	0.181	0.142
1.5	5	Trip-1.5"-5mm-0.5mm-366/clear/272-A	0.5	0	E366	-	E272	N/A	95/5 Ar	0.119	8.412	0.248	0.517	0.130	0.127
1.5	5	Quad-1.5"-5mm-0.5mm-366/clear/clear/180-K	0.5	0.5	E366	-	-	E180	90/10 Kr	0.094	10.595	0.229	0.532	0.228	0.172
1.5	5	Quad-1.5"-5mm-1.1thin-366/NxLite/clear/180-K	1.1	1.1	E366	NxLite	-	E180	90/10 Kr	0.076	13.240	0.219	0.501	0.205	0.160
1.5	5	Quad-1.5"-5mm-1.1thin-366/NxLite/clear/272-K	1.1	1.1	E366	NxLite	-	E272	90/10 Kr	0.073	13.628	0.221	0.454	0.150	0.148

1-1/2” OA, 6mm Outer Lites

OA (in)	Outer Lites (mm)	Full name	Center Lite 1 (mm)	Center Lite 2 (mm)	Surface 2	Surface 4	Surface 5	Surface 7	Gas Fill	U-Value	R-Value	SHGC	VT	Rf_in	Rf_out
1.5	6	Trip-1.5"-6mm-0.5mm-180/clear/180-A	0.5	0	E180	-	E180	N/A	95/5 Ar	0.130	7.686	0.544	0.686	0.196	0.196
1.5	6	Trip-1.5"-6mm-0.5mm-272/clear/180-A	0.5	0	E272	-	E180	N/A	95/5 Ar	0.127	7.890	0.367	0.622	0.174	0.144
1.5	6	Trip-1.5"-6mm-0.5mm-366/clear/180-A	0.5	0	E366	-	E180	N/A	95/5 Ar	0.124	8.081	0.245	0.561	0.178	0.141
1.5	6	Trip-1.5"-6mm-0.5mm-366/clear/272-A	0.5	0	E366	-	E272	N/A	95/5 Ar	0.120	8.360	0.247	0.509	0.128	0.126
1.5	6	Quad-1.5"-6mm-0.5mm-366/clear/clear/180-K	0.5	0.5	E366	-	-	E180	90/10 Kr	0.097	10.361	0.228	0.524	0.224	0.170
1.5	6	Quad-1.5"-6mm-1.1thin-366/NxLite/clear/180-K	1.1	1.1	E366	NxLite	-	E180	90/10 Kr	0.079	12.680	0.218	0.494	0.202	0.158
1.5	6	Quad-1.5"-6mm-1.1thin-366/NxLite/clear/272-K	1.1	1.1	E366	NxLite	-	E272	90/10 Kr	0.077	13.024	0.220	0.447	0.148	0.147

1-5/8” OA, 5mm Outer Lites

OA (in)	Outer Lites (mm)	Full name	Center Lite 1 (mm)	Center Lite 2 (mm)	Surface 2	Surface 4	Surface 5	Surface 7	Gas Fill	U-Value	R-Value	SHGC	VT	Rf_in	Rf_out
1.625	5	Trip-1.625"-5mm-0.5mm-180/clear/180-A	0.5	0	E180	-	E180	N/A	95/5 Ar	0.131	7.660	0.559	0.699	0.200	0.200
1.625	5	Trip-1.625"-5mm-0.5mm-272/clear/180-A	0.5	0	E272	-	E180	N/A	95/5 Ar	0.127	7.868	0.373	0.634	0.177	0.146
1.625	5	Trip-1.625"-5mm-0.5mm-366/clear/180-A	0.5	0	E366	-	E180	N/A	95/5 Ar	0.124	8.063	0.245	0.570	0.181	0.142
1.625	5	Trip-1.625"-5mm-0.5mm-366/clear/272-A	0.5	0	E366	-	E272	N/A	95/5 Ar	0.120	8.324	0.247	0.517	0.130	0.127
1.625	5	Quad-1.625"-5mm-0.5mm-366/clear/clear/180-A	0.5	0.5	E366	-	-	E180	95/5 Ar	0.120	8.355	0.232	0.532	0.228	0.172
1.625	5	Quad-1.625"-5mm-1.1thin-366/NxLite/clear/180-A	1.1	1.1	E366	NxLite	-	E180	95/5 Ar	0.102	9.847	0.221	0.501	0.205	0.160
1.625	5	Quad-1.625"-5mm-1.1thin-366/NxLite/clear/272-A	1.1	1.1	E366	NxLite	-	E272	95/5 Ar	0.100	10.040	0.223	0.454	0.150	0.148
1.625	5	Quad-1.625"-5mm-0.5mm-366/clear/clear/180-K	0.5	0.5	E366	-	-	E180	90/10 Kr	0.093	10.727	0.229	0.532	0.228	0.172
1.625	5	Quad-1.625"-5mm-1.1thin-366/NxLite/clear/180-K	1.1	1.1	E366	NxLite	-	E180	90/10 Kr	0.072	13.849	0.218	0.501	0.205	0.160
1.625	5	Quad-1.625"-5mm-1.1thin-366/NxLite/clear/272-K	1.1	1.1	E366	NxLite	-	E272	90/10 Kr	0.070	14.298	0.221	0.454	0.150	0.148

1-5/8” OA, 6mm Outer Lites

OA (in)	Outer Lites (mm)	Full name	Center Lite 1 (mm)	Center Lite 2 (mm)	Surface 2	Surface 4	Surface 5	Surface 7	Gas Fill	U-Value	R-Value	SHGC	VT	Rf_in	Rf_out
1.625	6	Trip-1.625"-6mm-0.5mm-180/clear/180-A	0.5	0	E180	-	E180	N/A	95/5 Ar	0.129	7.748	0.544	0.686	0.196	0.196
1.625	6	Trip-1.625"-6mm-0.5mm-272/clear/180-A	0.5	0	E272	-	E180	N/A	95/5 Ar	0.126	7.952	0.367	0.622	0.174	0.144
1.625	6	Trip-1.625"-6mm-0.5mm-366/clear/180-A	0.5	0	E366	-	E180	N/A	95/5 Ar	0.123	8.143	0.244	0.561	0.178	0.141
1.625	6	Trip-1.625"-6mm-0.5mm-366/clear/272-A	0.5	0	E366	-	E272	N/A	95/5 Ar	0.119	8.424	0.246	0.509	0.128	0.126
1.625	6	Quad-1.625"-6mm-1.1thin-366/NxLite/clear/180-A	1.1	1.1	E366	NxLite	-	E180	95/5 Ar	0.107	9.359	0.220	0.494	0.202	0.158
1.625	6	Quad-1.625"-6mm-1.1thin-366/NxLite/clear/272-A	1.1	1.1	E366	NxLite	-	E272	95/5 Ar	0.105	9.529	0.222	0.447	0.148	0.147
1.625	6	Quad-1.625"-6mm-0.5mm-366/clear/clear/180-K	0.5	0.5	E366	-	-	E180	90/10 Kr	0.094	10.684	0.228	0.524	0.224	0.170
1.625	6	Quad-1.625"-6mm-1.1thin-366/NxLite/clear/180-K	1.1	1.1	E366	NxLite	-	E180	90/10 Kr	0.074	13.527	0.217	0.494	0.202	0.158
1.625	6	Quad-1.625"-6mm-1.1thin-366/NxLite/clear/272-K	1.1	1.1	E366	NxLite	-	E272	90/10 Kr	0.072	13.939	0.219	0.447	0.148	0.147

1-3/4” OA, 5mm Outer Lites

OA (in)	Outer Lites (mm)	Full name	Center Lite 1 (mm)	Center Lite 2 (mm)	Surface 2	Surface 4	Surface 5	Surface 7	Gas Fill	U-Value	R-Value	SHGC	VT	Rf_in	Rf_out
1.75	5	Trip-1.75"-5mm-0.5mm-180/clear/180-A	0.5	0	E180	-	E180	N/A	95/5 Ar	0.132	7.550	0.559	0.699	0.200	0.200
1.75	5	Trip-1.75"-5mm-0.5mm-272/clear/180-A	0.5	0	E272	-	E180	N/A	95/5 Ar	0.129	7.747	0.373	0.634	0.177	0.146
1.75	5	Trip-1.75"-5mm-0.5mm-366/clear/180-A	0.5	0	E366	-	E180	N/A	95/5 Ar	0.126	7.932	0.244	0.570	0.181	0.142
1.75	5	Trip-1.75"-5mm-0.5mm-366/clear/272-A	0.5	0	E366	-	E272	N/A	95/5 Ar	0.122	8.188	0.247	0.517	0.130	0.127
1.75	5	Quad-1.75"-5mm-0.5mm-366/clear/clear/180-A	0.5	0.5	E366	-	-	E180	95/5 Ar	0.113	8.851	0.231	0.532	0.228	0.172
1.75	5	Quad-1.75"-5mm-1.1thin-366/NxLite/clear/180-A	1.1	1.1	E366	NxLite	-	E180	95/5 Ar	0.094	10.592	0.220	0.501	0.205	0.160
1.75	5	Quad-1.75"-5mm-0.5mm-366/clear/clear/180-K	0.5	0.5	E366	-	-	E180	90/10 Kr	0.094	10.671	0.228	0.532	0.228	0.172
1.75	5	Quad-1.75"-5mm-1.1thin-366/NxLite/clear/272-A	1.1	1.1	E366	NxLite	-	E272	95/5 Ar	0.092	10.821	0.222	0.454	0.150	0.148
1.75	5	Quad-1.75"-5mm-1.1thin-366/NxLite/clear/180-K	1.1	1.1	E366	NxLite	-	E180	90/10 Kr	0.071	14.052	0.218	0.501	0.205	0.160
1.75	5	Quad-1.75"-5mm-1.1thin-366/NxLite/clear/272-K	1.1	1.1	E366	NxLite	-	E272	90/10 Kr	0.069	14.523	0.220	0.454	0.150	0.148

1-3/4” OA, 6mm Outer Lites

OA (in)	Outer Lites (mm)	Full name	Center Lite 1 (mm)	Center Lite 2 (mm)	Surface 2	Surface 4	Surface 5	Surface 7	Gas Fill	U-Value	R-Value	SHGC	VT	Rf_in	Rf_out
1.75	6	Trip-1.75"-6mm-0.5mm-180/clear/180-A	0.5	0	E180	-	E180	N/A	95/5 Ar	0.131	7.639	0.544	0.686	0.196	0.196
1.75	6	Trip-1.75"-6mm-0.5mm-272/clear/180-A	0.5	0	E272	-	E180	N/A	95/5 Ar	0.128	7.841	0.366	0.622	0.174	0.144
1.75	6	Trip-1.75"-6mm-0.5mm-366/clear/180-A	0.5	0	E366	-	E180	N/A	95/5 Ar	0.125	8.031	0.243	0.561	0.178	0.141
1.75	6	Trip-1.75"-6mm-0.5mm-366/clear/272-A	0.5	0	E366	-	E272	N/A	95/5 Ar	0.121	8.293	0.246	0.509	0.128	0.126
1.75	6	Quad-1.75"-6mm-0.5mm-366/clear/clear/180-A	0.5	0.5	E366	-	-	E180	95/5 Ar	0.117	8.559	0.231	0.524	0.224	0.170
1.75	6	Quad-1.75"-6mm-1.1thin-366/NxLite/clear/180-A	1.1	1.1	E366	NxLite	-	E180	95/5 Ar	0.099	10.142	0.220	0.494	0.202	0.158
1.75	6	Quad-1.75"-6mm-1.1thin-366/NxLite/clear/272-A	1.1	1.1	E366	NxLite	-	E272	95/5 Ar	0.097	10.347	0.221	0.447	0.148	0.147
1.75	6	Quad-1.75"-6mm-0.5mm-366/clear/clear/180-K	0.5	0.5	E366	-	-	E180	90/10 Kr	0.093	10.741	0.227	0.524	0.224	0.170
1.75	6	Quad-1.75"-6mm-1.1thin-366/NxLite/clear/180-K	1.1	1.1	E366	NxLite	-	E180	90/10 Kr	0.072	13.973	0.217	0.494	0.202	0.158
1.75	6	Quad-1.75"-6mm-1.1thin-366/NxLite/clear/272-K	1.1	1.1	E366	NxLite	-	E272	90/10 Kr	0.069	14.439	0.219	0.447	0.148	0.147

1-7/8” OA, 5mm Outer Lites

OA (in)	Outer Lites (mm)	Full name	Center Lite 1 (mm)	Center Lite 2 (mm)	Surface 2	Surface 4	Surface 5	Surface 7	Gas Fill	U-Value	R-Value	SHGC	VT	Rf_in	Rf_out
1.875	5	Trip-1.875"-5mm-0.5mm-180/clear/180-A	0.5	0	E180	-	E180	N/A	95/5 Ar	0.134	7.443	0.559	0.699	0.200	0.200
1.875	5	Trip-1.875"-5mm-0.5mm-272/clear/180-A	0.5	0	E272	-	E180	N/A	95/5 Ar	0.131	7.633	0.372	0.634	0.177	0.146
1.875	5	Trip-1.875"-5mm-0.5mm-366/clear/180-A	0.5	0	E366	-	E180	N/A	95/5 Ar	0.128	7.811	0.244	0.570	0.181	0.142
1.875	5	Trip-1.875"-5mm-0.5mm-366/clear/272-A	0.5	0	E366	-	E272	N/A	95/5 Ar	0.124	8.058	0.247	0.517	0.130	0.127
1.875	5	Quad-1.875"-5mm-0.5mm-366/clear/clear/180-A	0.5	0.5	E366	-	-	E180	95/5 Ar	0.108	9.250	0.231	0.532	0.228	0.172
1.875	5	Quad-1.875"-5mm-1.1thin-366/NxLite/clear/180-A	1.1	1.1	E366	NxLite	-	E180	95/5 Ar	0.089	11.256	0.220	0.501	0.205	0.160
1.875	5	Quad-1.875"-5mm-1.1thin-366/NxLite/clear/272-A	1.1	1.1	E366	NxLite	-	E272	95/5 Ar	0.087	11.522	0.222	0.454	0.150	0.148

1-7/8” OA, 6mm Outer Lites

OA (in)	Outer Lites (mm)	Full name	Center Lite 1 (mm)	Center Lite 2 (mm)	Surface 2	Surface 4	Surface 5	Surface 7	Gas Fill	U-Value	R-Value	SHGC	VT	Rf_in	Rf_out
1.875	6	Trip-1.875"-6mm-0.5mm-180/clear/180-A	0.5	0	E180	-	E180	N/A	95/5 Ar	0.133	7.524	0.544	0.686	0.196	0.196
1.875	6	Trip-1.875"-6mm-0.5mm-272/clear/180-A	0.5	0	E272	-	E180	N/A	95/5 Ar	0.130	7.719	0.366	0.622	0.174	0.144
1.875	6	Trip-1.875"-6mm-0.5mm-366/clear/180-A	0.5	0	E366	-	E180	N/A	95/5 Ar	0.127	7.901	0.243	0.561	0.178	0.141
1.875	6	Trip-1.875"-6mm-0.5mm-366/clear/272-A	0.5	0	E366	-	E272	N/A	95/5 Ar	0.123	8.154	0.246	0.509	0.128	0.126
1.875	6	Quad-1.875"-6mm-0.5mm-366/clear/clear/180-A	0.5	0.5	E366	-	-	E180	95/5 Ar	0.111	9.024	0.230	0.524	0.224	0.170
1.875	6	Quad-1.875"-6mm-1.1thin-366/NxLite/clear/180-A	1.1	1.1	E366	NxLite	-	E180	95/5 Ar	0.092	10.861	0.219	0.494	0.202	0.158
1.875	6	Quad-1.875"-6mm-1.1thin-366/NxLite/clear/272-A	1.1	1.1	E366	NxLite	-	E272	95/5 Ar	0.090	11.103	0.221	0.447	0.148	0.147
1.875	6	Quad-1.875"-6mm-1.1thin-366/NxLite/clear/180-K	1.1	1.1	E366	NxLite	-	E180	90/10 Kr	0.071	14.060	0.217	0.494	0.202	0.158
1.875	6	Quad-1.875"-6mm-1.1thin-366/NxLite/clear/272-K	1.1	1.1	E366	NxLite	-	E272	90/10 Kr	0.069	14.527	0.219	0.447	0.148	0.147

AlpenGlass: Semi-Custom Products

AlpenGlass: Semi-Custom Products

Semi-Custom Line: Semi-Custom products expand options with specialized glass options (i.e. laminated glass, tints, bird glass , spandrel, shapes, additional thicknesses and coatings, etc.) that are not stocked by Alpen but are readily available through our suppliers with additional lead time. Lead times start at 3-6 weeks (subject to change). Note that engineering review by Alpen's Product Development Team is typically recommended for any size >49 ft². Special manufacturing, handling, shipping, and pricing considerations may apply in the Semi-Custom process. Minimum order quantity may apply for some semi-custom options.

General Details

Table 20. General Details for Semi-Custom Orders

Lead Time[1]	Standard + 1-6 weeks[2], dependent on sizing and glass needs. See descriptions of semi-custom glass options below and their associated additional leads times. *Quote turnaround: 5 business days*
Glass Types	The Semi-Custom line includes AlpenGlass IGUs that can be configured with an expanded line of glass type options, coatings, and thicknesses beyond the Standard glass types (e.g. spandrel, bird glass, laminated, etc.). See detailed categories and descriptions below.
Spacer[3] & Sealant System[4]	The Semi-Custom line includes AlpenGlass IGUs that can be configured with an expanded line of glass type options, coatings, and thicknesses beyond the Standard glass types (e.g. spandrel, bird glass, laminated, etc.). See detailed categories and descriptions below.
Gas Fill Options	95% Argon / 5% Air 90% Krypton / 10% Air

Shapes[4,5]

The Semi-Custom line includes select non-rectangle shapes (both polygons and radius shapes). Spacer and secondary sealant system is dependent on the shape. Shapes noted below can be made with TPS and two-part silicone sealant. All others will be made with SuperSpacer and hot melt butyl. Upcharges apply, depending on shape complexity and manufacturing efficiencies

Can be made with TPS:

- Extended half round
- Quarter Round
- Extended Quarter Round
- Extended eyebrow
- Clipped corner
- Trapezoid
- Right Triangle
- Double clipped corner
- Pentagon
- Extended quarter eyebrow
- Quarter eyebrow
- Right Triangle

SuperSpacer:

- Isosceles Triangle
- Octagon
- Parallelogram
- Circle
- Hexagon
- Half round

Sizes

Semi-custom sizes fall within the blue area of the envelopes in Appendix A and B

[1]Lead time defined as total time from when order is placed to time that is it shipped
[2] +1 week for orders >100 units
[3] Inter-pane distance capabilities from 6mm-18mm, in 1mm increments
[4]Only shapes notated with TPS are made with TPS. All others made w/ SuperSpacer & hot melt butyl
[5]Upcharges apply depending on shape and glass type used

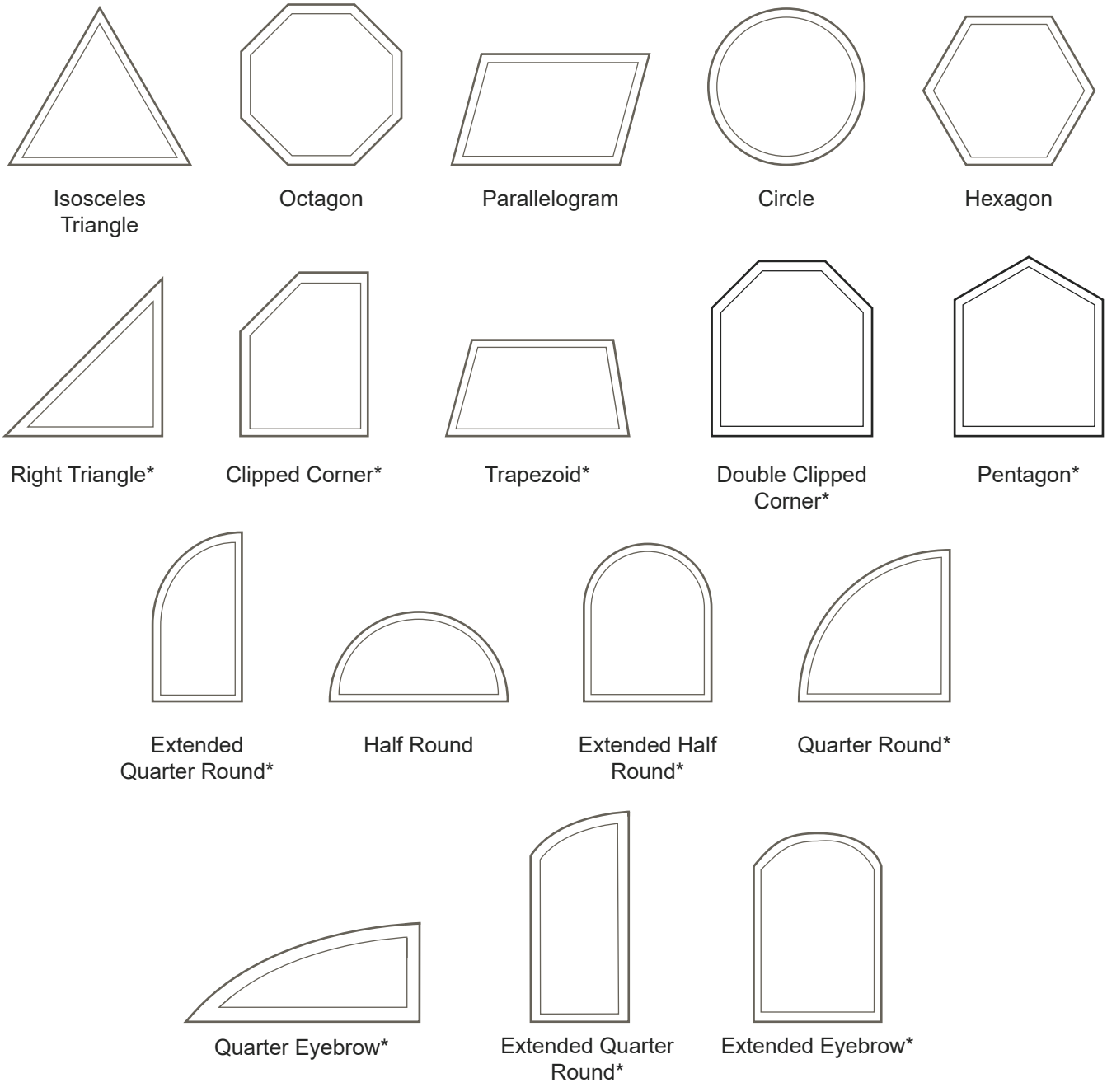
Semi-Custom Size Ranges

See Appendix A and Appendix B for AlpenGlass Sizing Guidelines for tempered and annealed glass, respectively. Semi-custom units include those units that fall inside the blue envelope of Appendix A and B. Sizes outside the blue envelope and inside the orange envelope are achievable but fall within the Full-Custom category. Sizes in the Custom range of these plots may require special considerations to manufacturing, handling, shipping, lead time, and price. Minimum order quantities apply for custom sizes (those that fall outside the blue range but inside the orange range).

Click here to jump to Appendix A – Standard Order Size Guidelines for Tempered Glass
Click here to jump to Appendix B – Standard Order Size Guidelines for Annealed Glass

Semi-Custom Shapes

The Semi-Custom line includes select non-rectangle shapes (both polygons and radius shapes). Spacer and secondary sealant system is dependent on the shape. Shapes noted with “TPS” can be made with TPS and two-part silicone sealant. All others will be made with SuperSpacer and hot melt butyl. Upcharges apply, depending on shape complexity and manufacturing efficiencies.



*Can be made with TPS and two-part silicone sealant

Figure 9. Semi-custom shapes capabilities, assembled with SuperSpacer system.

Semi-Custom Order: Expanded Glass Offerings

The following glass types are not part of Alpen HPP's regular stocked inventory but can be procured with additional lead time. Minimum order quantities may apply.

Table 21. Expanded Glass Offerings – Semi-Custom Order

Glass type	Additional lead time over standard order	*Minimum order qty*
2mm Single Strength (annealed)	+2 weeks	*Contact sales rep*
Expanded low-e coating options: E340, i89* LoE *Available on 3mm, 5mm, 6mm* **available on room-side only*	+1-2 weeks	*Contact sales rep*
Laminated Glass *See subsequent section on laminated glass options*	*+5 weeks*	*1,000 sqft*
Spandrel Glass *See subsequent section on spandrel glass offerings*	*+3 weeks*	*1,000 sqft*
Bird Glass *See subsequent section on bird glass offerings. Available for purchase Q1 2026*	*Contact sales rep. Available for purchase Q1 2026*	*Contact sales rep. Available for purchase Q1 2026*
Textured/Patterned/Obscure Glass * *See subsequent section on textured & patterned glass offerings*	*+1-4 weeks*	*Contact sales rep*

*Some textured/patterned glass will be made with SuperSpacer and Hot Melt Butyl instead of TPS system. See details in subsequent section.

Expanded soda-lime glass (SLG) options for outer lites:

In addition to the glass types in the Standard Line, the following thickness and coating options are available in our Semi-Custom Line.

Table 22. Expanded outer lite thickness and coating options (semi-custom line)

Category	Thickness	Strength options	Low-e coatings
SLG	2.2 mm (SS)	annealed	Clear, E180, E270, E272, E366, E240, E340, Ei89
SLG	3 mm	annealed or tempered	E240, E340, Ei89
SLG	4 mm	annealed	E240, E340, Ei89
SLG	4 mm	tempered	E340, Ei89
SLG	5 mm	annealed or tempered	E240, E340, Ei89
SLG	6 mm	annealed or tempered	E240, E340, Ei89

Laminated Glass Offerings

AlpenGlass can be configured with the following laminated glass options.

Table 23. Laminated glass offerings (Semi-custom line)

Category	Lami configuration	Strength	Low-e coating
Laminated	3mm/.030/3mm	annealed	-
Laminated	3mm/.030/3mm	annealed	E270
Laminated	3mm/.030/3mm	annealed	E366
Laminated	3mm/.030Acoustic/3mm	annealed	-
Laminated	3mm/.030Acoustic/3mm	annealed	E270
Laminated	3mm/.030Acoustic/3mm	annealed	E366
Laminated	3mm/.060/3mm	heat strengthened	-
Laminated	3mm/.060/3mm	tempered	-
Laminated	3mm/.060/3mm	heat strengthened	E270
Laminated	3mm/.060/3mm	tempered	E270
Laminated	3mm/.060/3mm	heat strengthened	E366
Laminated	3mm/.060/3mm	tempered	E366
Laminated	3mm/.060Acoustic/3mm	annealed	-
Laminated	3mm/.060Acoustic/3mm	heat strengthened	-
Laminated	3mm/.060Acoustic/3mm	tempered	-
Laminated	3mm/.060Acoustic/3mm	annealed	E270
Laminated	3mm/.060Acoustic/3mm	heat strengthened	E270
Laminated	3mm/.060Acoustic/3mm	tempered	E270
Laminated	3mm/.060Acoustic/3mm	annealed	E366
Laminated	3mm/.060Acoustic/3mm	heat strengthened	E366
Laminated	3mm/.060Acoustic/3mm	tempered	E366
Laminated	5mm/.030Acoustic/5mm	annealed	-
Laminated	5mm/.030Acoustic/5mm	annealed	E270
Laminated	5mm/.030Acoustic/5mm	annealed	E366
Laminated	5mm/.060Acoustic/5mm	annealed	E270
Laminated	5mm/.060Acoustic/5mm	annealed	-
Laminated	5mm/.060Acoustic/5mm	heat strengthened	-
Laminated	5mm/.060Acoustic/5mm	tempered	-
Laminated	5mm/.060Acoustic/5mm	heat strengthened	E270
Laminated	5mm/.060Acoustic/5mm	tempered	E270

Laminated	5mm/.060Acoustic/5mm	annealed	E366
Laminated	5mm/.060Acoustic/5mm	heat strengthened	E366
Laminated	5mm/.060Acoustic/5mm	tempered	E366
Laminated	6mm/.030/6mm	annealed	-
Laminated	6mm/.030/6mm	annealed	E270
Laminated	6mm/.030/6mm	annealed	E366
Laminated	6mm/.030Acoustic/6mm	annealed	-
Laminated	6mm/.030Acoustic/6mm	annealed	E270
Laminated	6mm/.030Acoustic/6mm	annealed	E366
Laminated	6mm/.060/6mm	annealed	-
Laminated	6mm/.060/6mm	heat strengthened	-
Laminated	6mm/.060/6mm	tempered	-
Laminated	6mm/.060/6mm	annealed	E270
Laminated	6mm/.060/6mm	heat strengthened	E270
Laminated	6mm/.060/6mm	tempered	E270
Laminated	6mm/.060/6mm	annealed	E366
Laminated	6mm/.060/6mm	heat strengthened	E366
Laminated	6mm/.060/6mm	tempered	E366
Laminated	6mm/.060Acoustic/6mm	annealed	-
Laminated	6mm/.060Acoustic/6mm	annealed	E270
Laminated	6mm/.060Acoustic/6mm	annealed	E366
Laminated	6mm/.060Acoustic/6mm	heat strengthened	-
Laminated	6mm/.060Acoustic/6mm	tempered	-
Laminated	6mm/.060Acoustic/6mm	heat strengthened	E270
Laminated	6mm/.060Acoustic/6mm	tempered	E270
Laminated	6mm/.060Acoustic/6mm	heat strengthened	E366
Laminated	6mm/.060Acoustic/6mm	tempered	E366
Laminated	6mm/.090Impact/6mm	heat strengthened	-
Laminated	6mm/.090Impact/6mm	heat strengthened	E270
Laminated	6mm/.090Impact/6mm	heat strengthened	E366

Spandrel Glass Offerings

AlpenGlass can be configured with the following spandrel glass options.

Table 24. Spandrel glass offerings (semi-custom line)

Category	Description	Strength	low-e
Spandrel	6mm-black-ceramic frit	HS	Clear
Spandrel	6mm-black-ceramic frit	Tempered	Clear
Spandrel	6mm-warm gray-ceramic frit	HS	Clear
Spandrel	6mm-warm gray-ceramic frit	Tempered	Clear
Spandrel	6mm-white-ceramic frit	HS	Clear
Spandrel	6mm-white-ceramic frit	Tempered	Clear

AlpenGlass: Semi-Custom Products

White Warm Gray Black

Figure 10. Ceramic frit spandrel color options (semi-custom line).

Textured/Patterned/Obscure Glass Offerings

AlpenGlass can be configured with the following textured/patterned glass options. Note that some patterns, notated with (*), can only be made with SuperSpacer.

Table 25. Patterned/textured glass offerings (semi-custom line)

Category	Pattern & thickness	Strength	low-e
Patterned	Pattern62-3mm*	Tempered	clear
Patterned	Pattern62-5mm*	Tempered	clear
Patterned	Rain-5mm*	Tempered	clear
Patterned	SatinEtch-4mm	Tempered	clear
Patterned	SatinEtch-6mm	Tempered	clear
Patterned	Reed-4mm	Tempered	clear

*made with SuperSpacer and Hot Melt Butyl


Satin Etch


Pattern 62 (Pinhead)


Reeded


Rain

Figure 11. Examples of patterned and textured glass options.

Tinted Glass

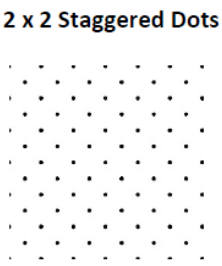
AlpenGlass can be configured with the following tinted glass options.

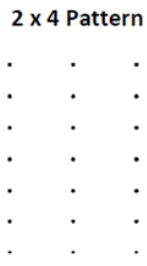
Table 26. Tinted glass offerings (semi-custom line)

Category	Description	Strength	low-e
Tint	VitroSolarBronze-3mm	Tempered	Clear
Tint	VitroSolarBronze-6mm	Tempered	Clear
Tint	VitroSolarGray-3mm	Tempered	Clear
Tint	VitroSolarGray-5mm	Tempered	Clear
Tint	VitroSolarGray-6mm	Tempered	Clear

Bird Glass Offerings

AlpenGlass can be configured with bird-friendly patterns to meet threat factors of 25 or 20, per the American Bird Conservancy (ABC) prescriptive path. AlpenGlass leverages a laminated glass solution to meet ABC requirements while maintaining thermal performance requirements of advancing energy codes. Alpen has standardized on 2 bird-safe patterns. The 2x4 dot pattern meets Threat Factor of 25 while the 2x2 dot pattern meets Threat Factor of 20.





See AlpenGlass Tech Doc on Bird Safe Solutions for more information.

AlpenGlass:
Full-Custom Order

AlpenGlass: Full-Custom Order

Full-Custom Line: If your project requires glass configurations, shapes, or sizes that fall outside those listed in this catalog, please contact your Alpen sales representative. We are happy to evaluate and quote projects outside of this guide. Note that additional lead time and pricing for engineering review and special glass procurement will apply. Customers should use the Full-Custom process if a specific glass type, specification, or irregular shape is needed that is not explicitly identified in this catalog. Acceptance to full-custom projects are subject to Alpen's discretion with engineering review and manufacturing capacity.

General Details

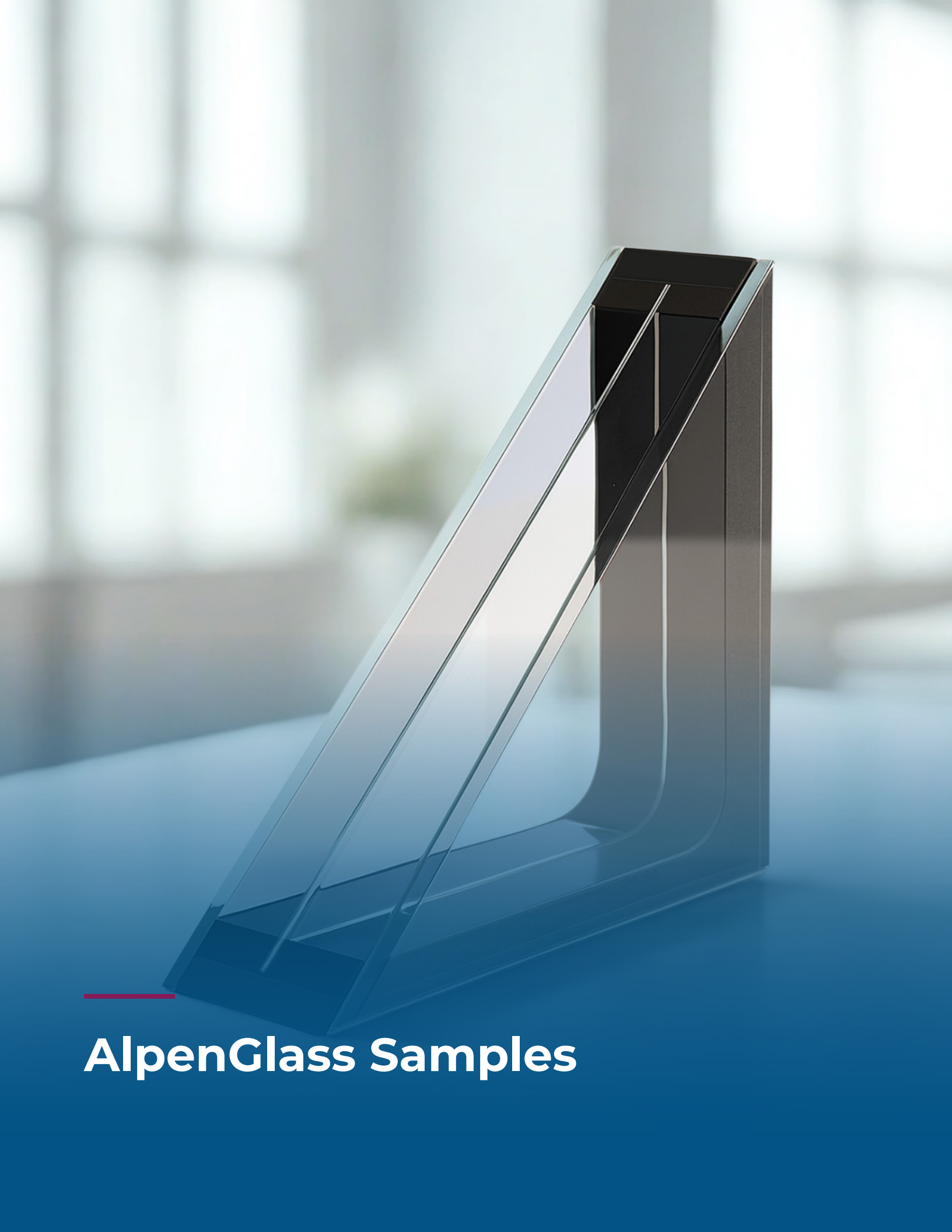
Table 27. General Details for Full-Custom Order

Lead Time	Quote turnaround and production lead time are subject to project needs. Inquire with your Alpen Sales Representative.
Spacer System	Depending on size, shape, and glass type, the spacer system will be either: • HB Fuller Ködispace 4SG TPS (Thermo-Plastic Spacer) with Kömmerling GD920D (two-part silicone) secondary sealant • Super Spacer Premium Enhanced (silicone foam) with Butyl 761-71X (Hot Melt Butyl) secondary sealant
Glass Types	Any glass type needs not specifically mentioned in Standard or Full Custom Product Lines will automatically trigger a Full Custom order and review with our Product Development team.
Gas Fills	Requests for custom gas fill ratio outside of 90% Krypton or 95% Argon will trigger a Full Custom order.
Shapes	Irregular, custom shapes can be delivered but may require longer lead times and special considerations for manufacturing, handling, and shipping. Radius shapes and polygons not explicitly identified in either the Standard or Semi-Custom Catalogs will be built with SuperSpacer and Hot Melt Butyl. Shapes that require template also fall into the Full-Custom Category.

Full-Custom Size Ranges

See Appendix A and Appendix B for AlpenGlass Sizing Guidelines for tempered and annealed glass, respectively. Sizing that falls outside the blue envelope and into the yellow envelope titled “Custom Range” are achievable but may require special considerations to manufacturing, handling, shipping, lead time, and price.

Click here to jump to Appendix A – Standard Order Size Guidelines for Tempered Glass
Click here to jump to Appendix B – Standard Order Size Guidelines for Annealed Glass



AlpenGlass Samples

AlpenGlass Samples

The following table describes available and/or buildable AlpenGlass samples.

Table 28. AlpenGlass Samples Summary Table

Sample Option	Category	Details/Options	Lead Time
6”x6” residential thin glass corner pair. (1 triple and 1 quad).	Non-configurable with stocked glass	TGT: 1” OA *3mm/0.5mm/3mm (clear lites)* TGQ: 1-1/4” OA *3mm/0.5mm/0.5mm/3mm (clear lites)* *Spacer=TPS*	2 days
6”x6” commercial thin glass corner pair. (1 triple and 1 quad).	Non-configurable with stocked glass	TGT: 1” OA *6mm/0.5mm/6mm (clear lites)* TGQ: 1-1/4” OA *6mm/0.5mm/0.5mm/6mm (clear lites)* *Spacer=TPS*	2 days
16”x16” TGT architectural sample	Configurable with stocked glass	OA options: 1” to 1-5/8” Outer lite options : 3mm, 5mm, 6mm Center lite: 0.5mm Low-e options: 366, 272, 180 Spacer: TPS	2 weeks
16”x16” TGQ architectural sample	Configurable with stocked glass	OA options: 1-1/8”to 1-5/8” Outer lite options: 3mm, 5mm, 6mm Center lites: 0.5mm/0.5mm Low-e options: 366, 272, 180 Spacer=TPS	2 weeks
12”x12” architectural sample with specialty glass	Configurable with non-stocked glass	Any sample made with specialty glass (spandrel, laminated, bird-glass, etc.) Spacer=SuperSpacer	Project dependent
All other samples and mockups	Configurable with non-stocked glass	Any samples not defined above Spacer=Project dependent	Project dependent

Shipping

AlpenGlass serves customers throughout the United States with expanding capabilities into Canada. We offer flexible freight solutions tailored to your project requirements, with IGUs shipped in either secure, custom-built crates or reusable glass racks. Our crating process ensures maximum protection during transit, utilizing industry-standard packaging materials and techniques to safeguard your investment. Glass rack shipping - which reduces packaging waste and streamlines receiving - is prioritized for established customers with repeat orders and is subject to distance limitations based on routing efficiency and equipment availability. Shipping costs are determined by distance, freight method, and packaging requirements. Your Alpen Sales Representative will provide detailed freight quotes specific to your delivery location and order specifications during the quoting process.

Appendix A: Standard & Custom Sizing - Envelope Charts - Tempered

Each of these plots can be viewed interactively on our AlpenGlass Sizing Calculator.

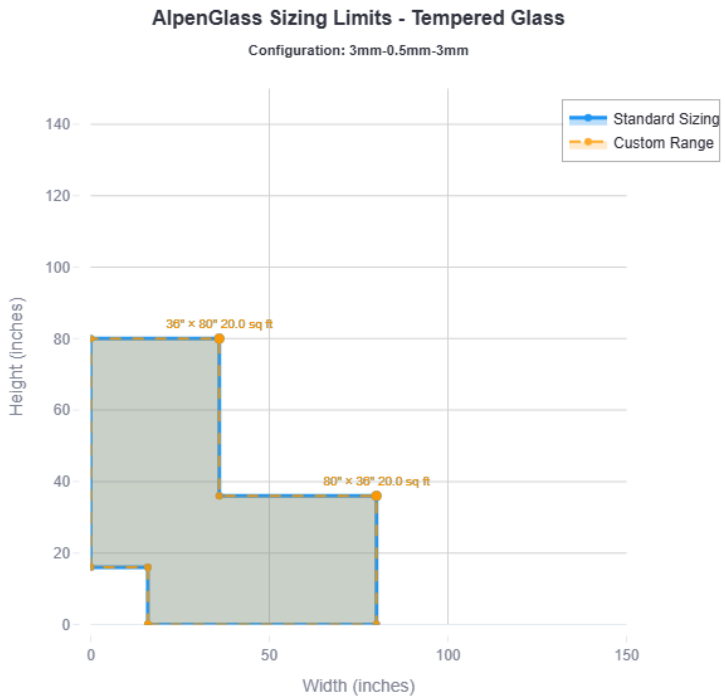


Figure 12. Tempered 3mm-0.5mm-3mm

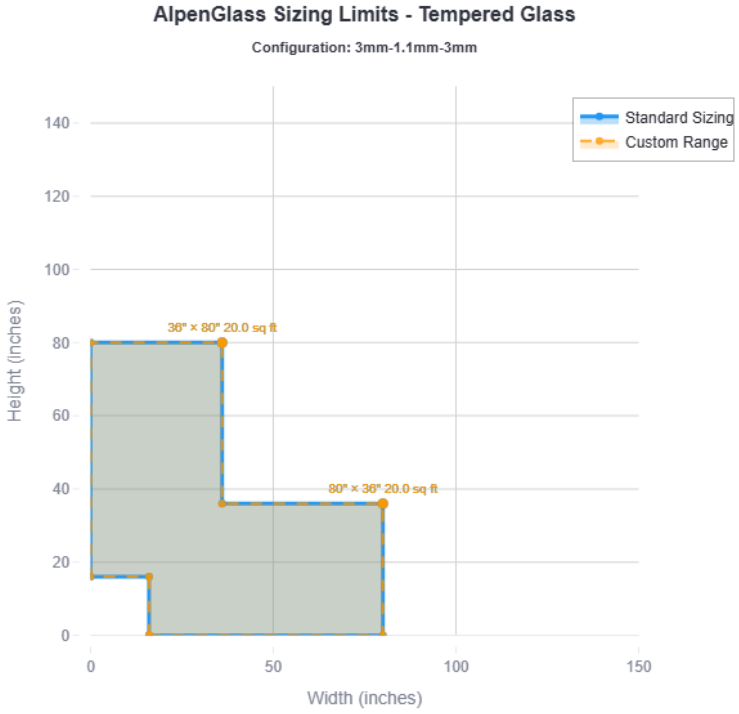


Figure 13. Tempered 3mm-1.1mm-3mm

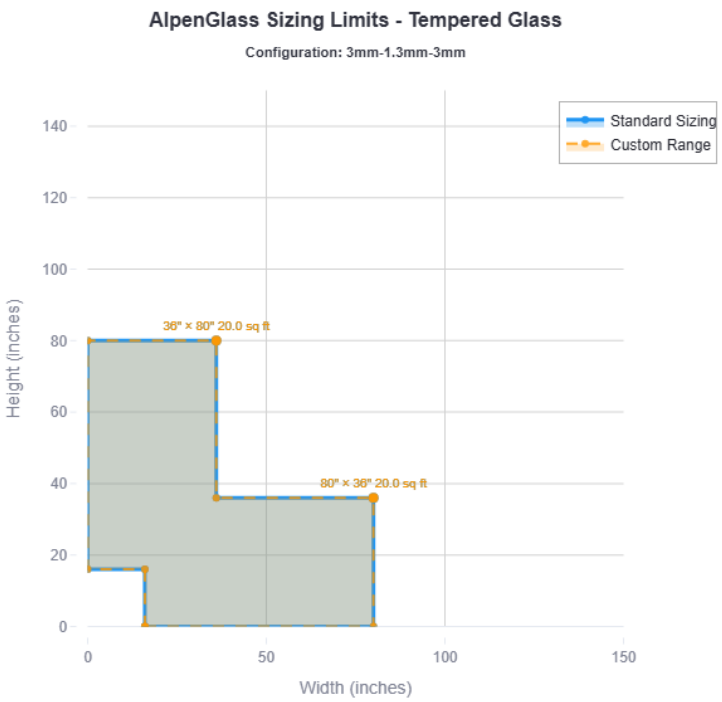


Figure 14. Tempered 3mm-1.3mm-3mm

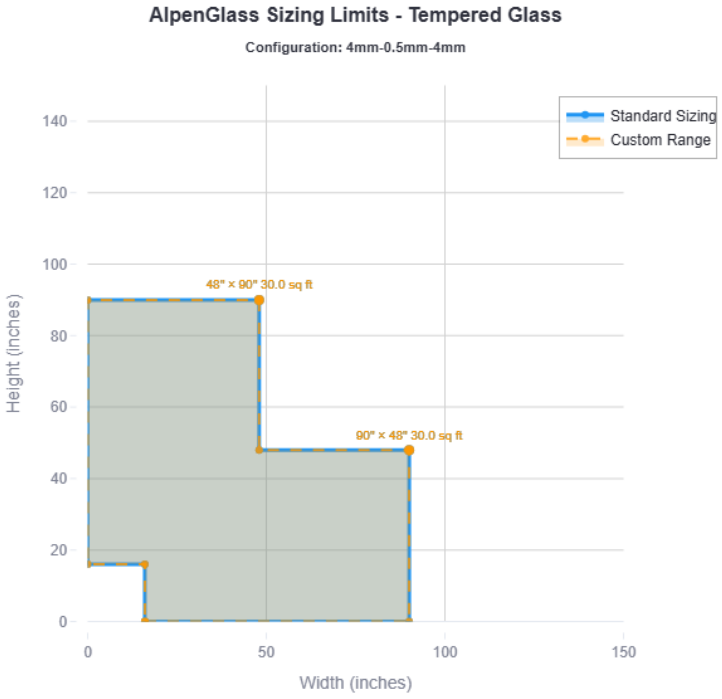


Figure 15. Tempered 4mm-0.5mm-4mm

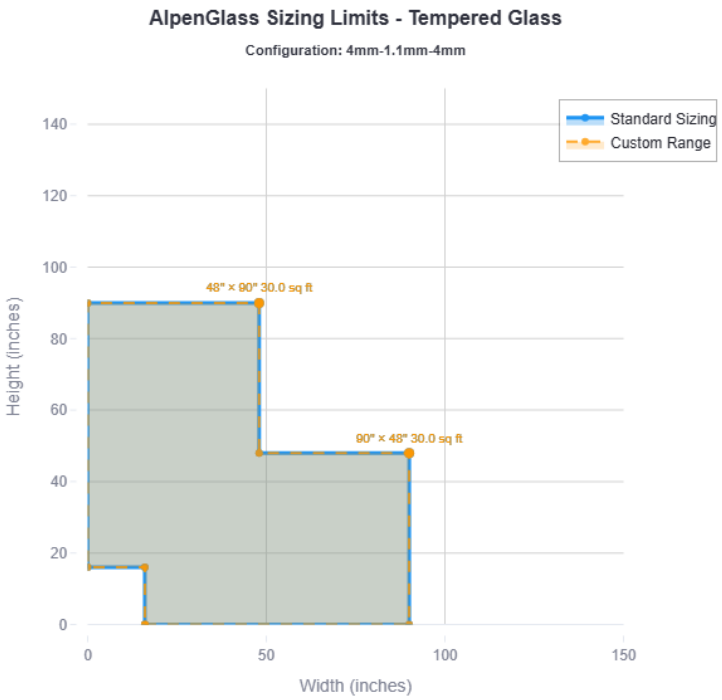


Figure 16. Tempered 4mm-1.1mm-4mm

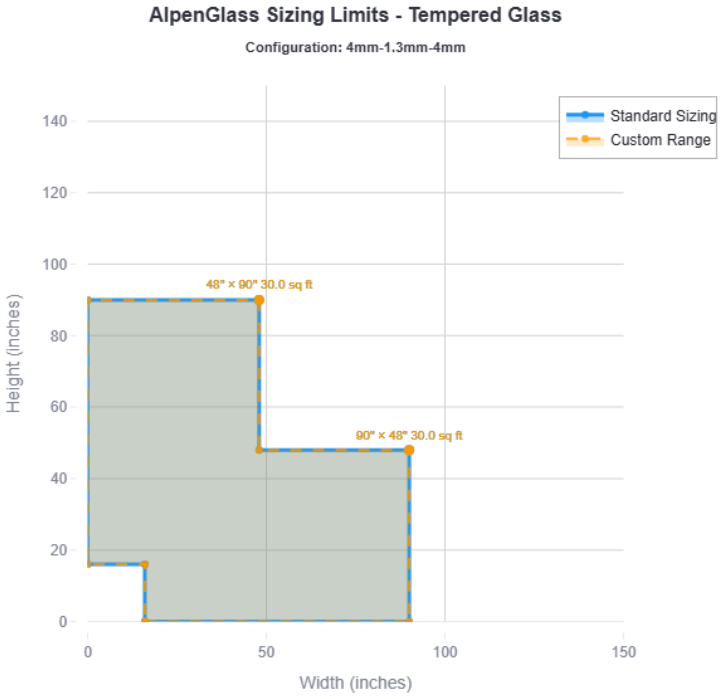


Figure 17. Tempered 4mm-1.3mm-4mm

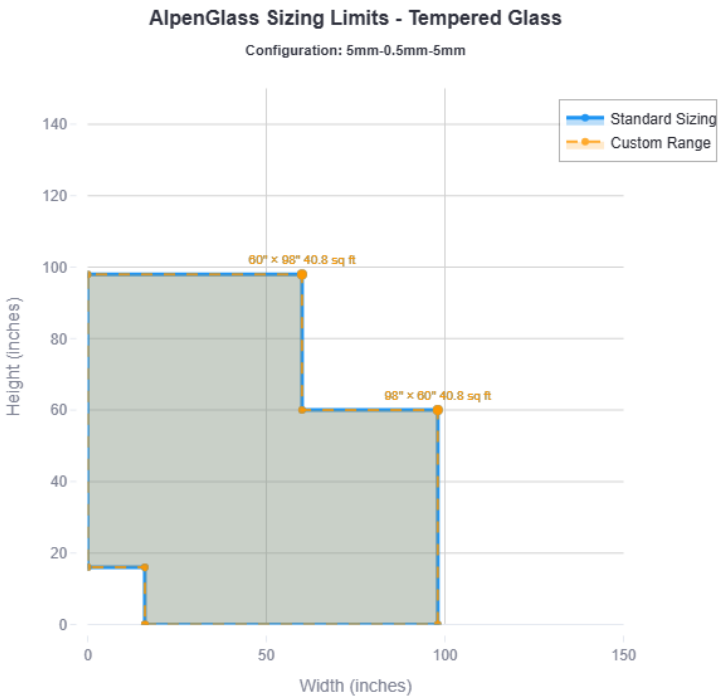


Figure 18. Tempered 5mm-0.5mm-5mm

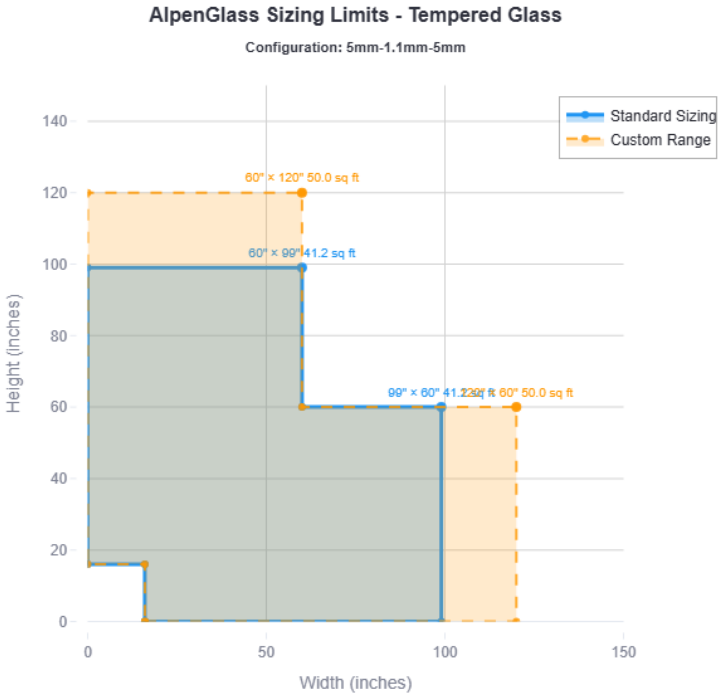


Figure 19. Tempered 5mm-1.1mm-5mm
(semi-custom sizing not available if using low-E coated 1.1mm)

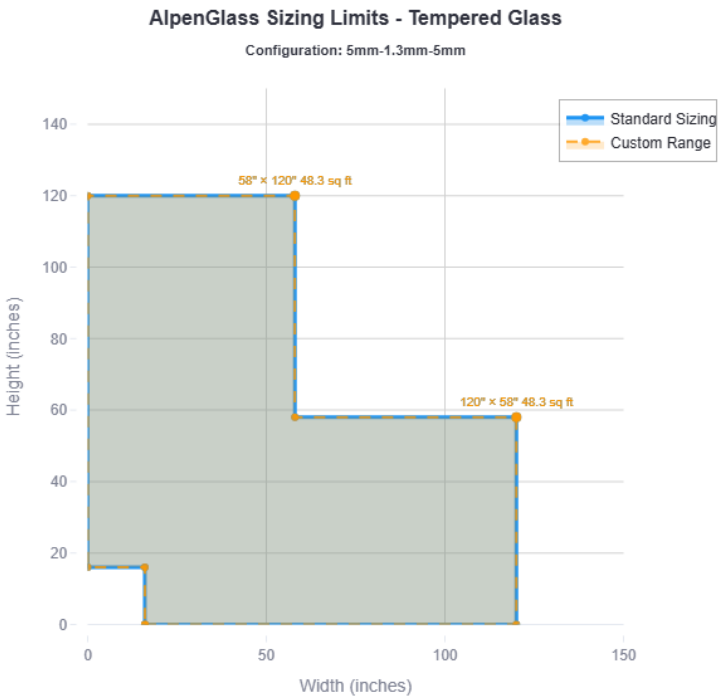


Figure 20. Tempered 5mm-1.3mm-5mm

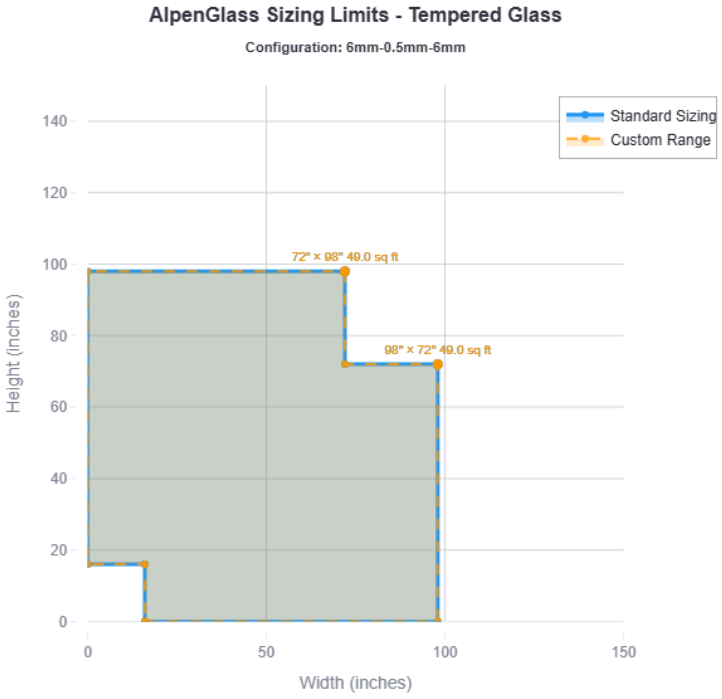


Figure 21. Tempered 6mm-0.5mm-6mm

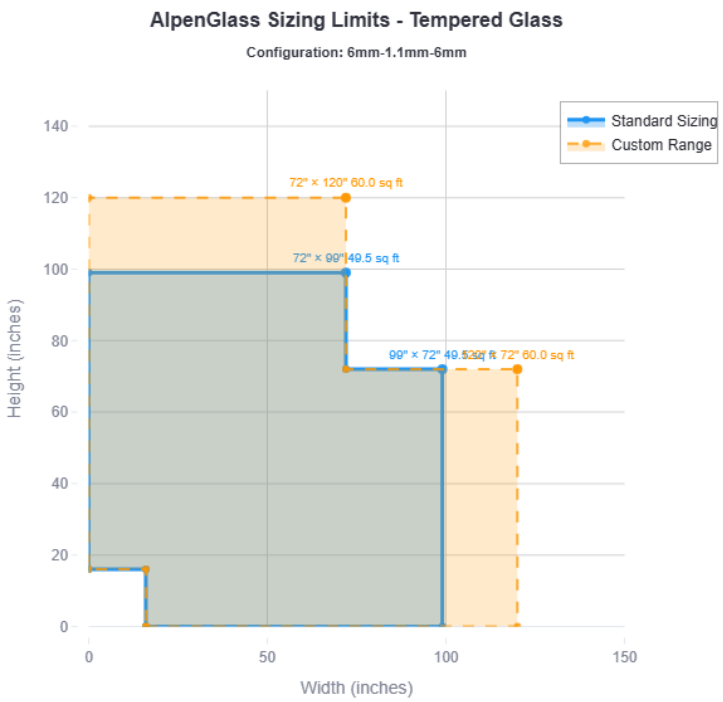


Figure 22. Tempered 6mm-1.1mm-6mm (custom sizing not available if using low-E coated 1.1mm)

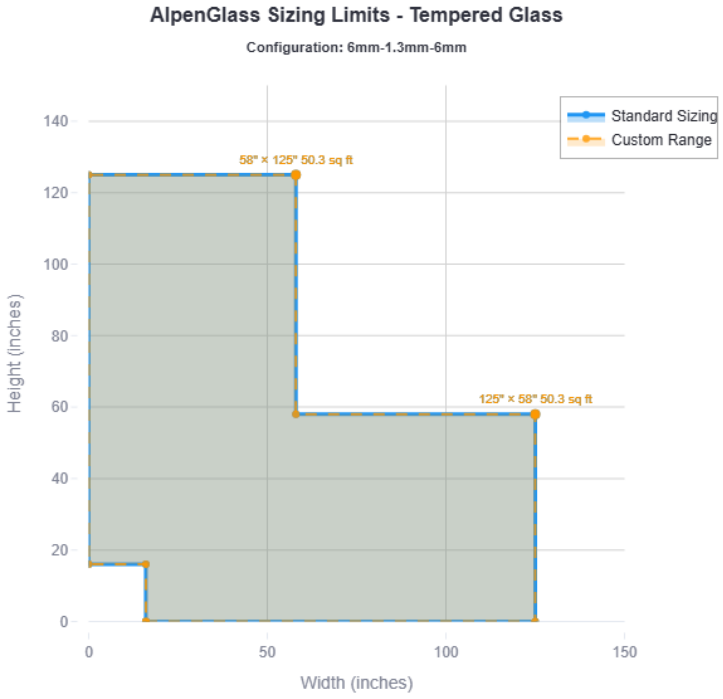


Figure 23. Tempered 6mm-1.3mm-6mm

Appendix B: Standard & Custom Sizing - Envelope Charts - Annealed

Each of these plots can be viewed interactively on our AlpenGlass Sizing Calculator.

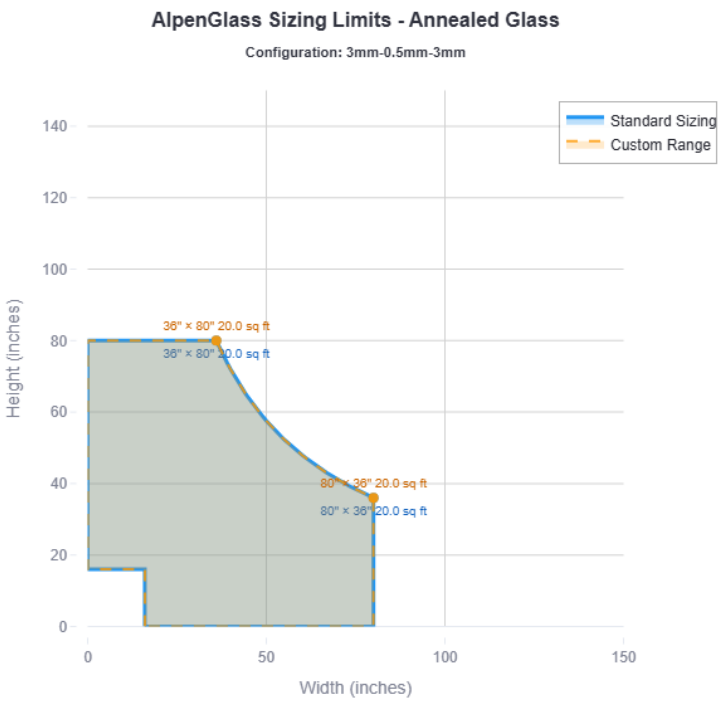


Figure 24. Annealed 3mm-0.5mm-3mm

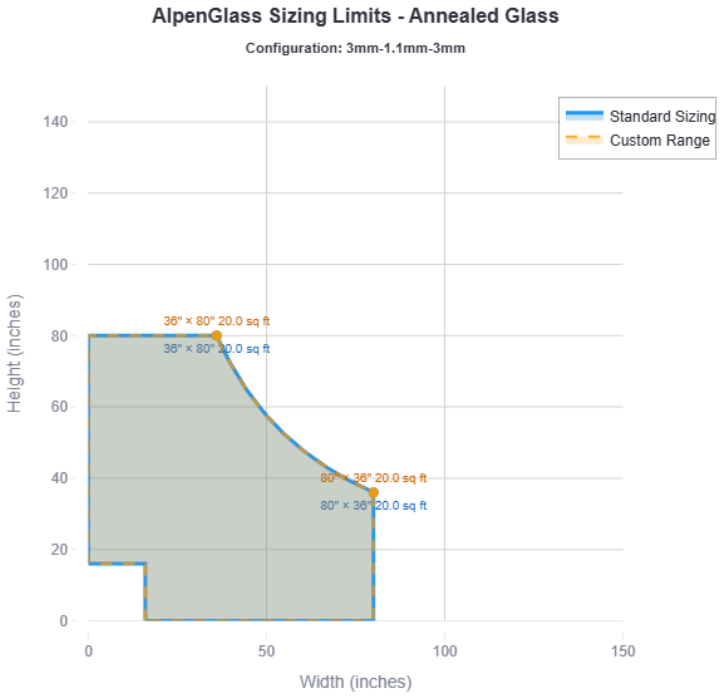


Figure 25. Annealed 3mm-1.1mm-3mm

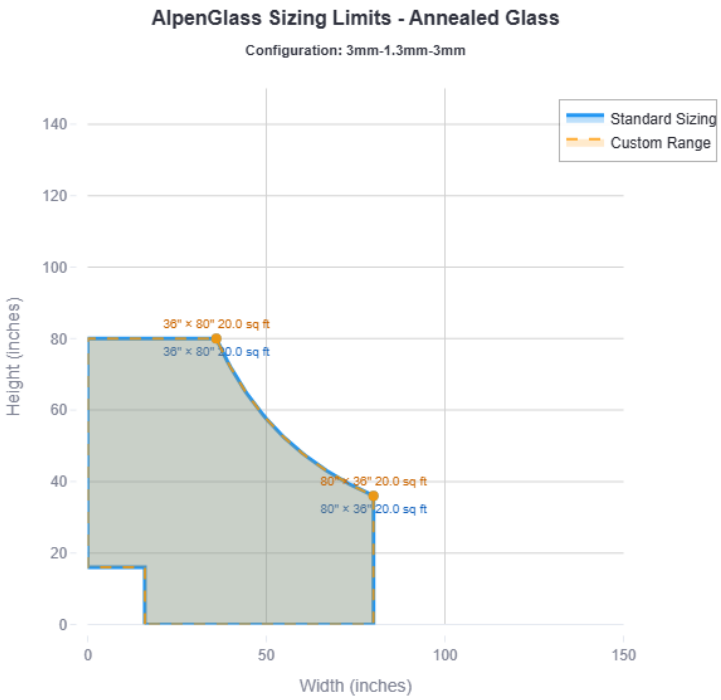


Figure 26. Annealed 3mm-1.3mm-3mm

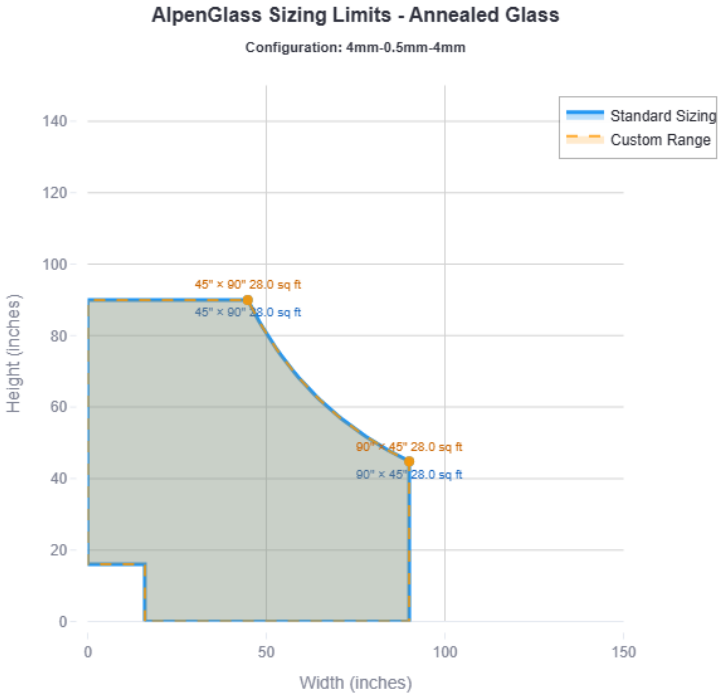


Figure 27. Annealed 4mm-0.5mm-4mm

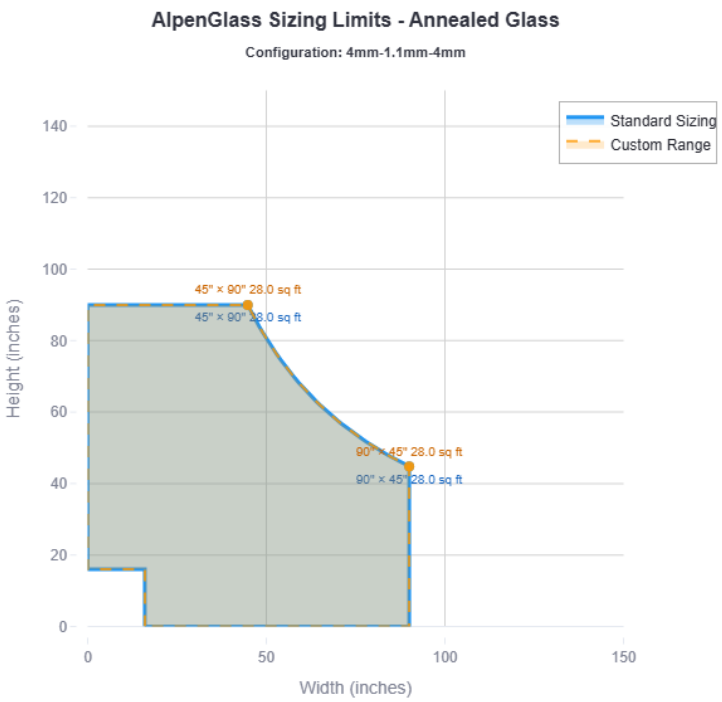


Figure 28. Annealed 4mm-1.1mm-4mm

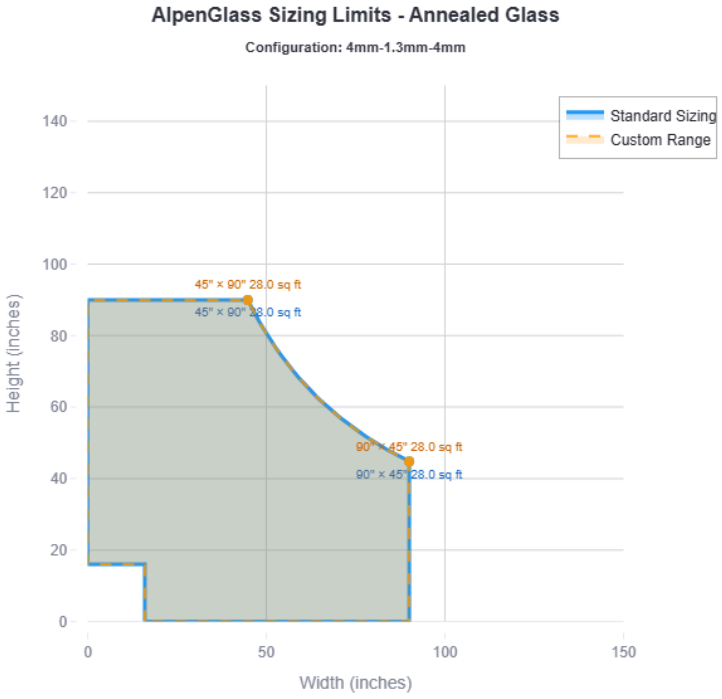


Figure 29. Annealed 4mm-1.3mm-4mm

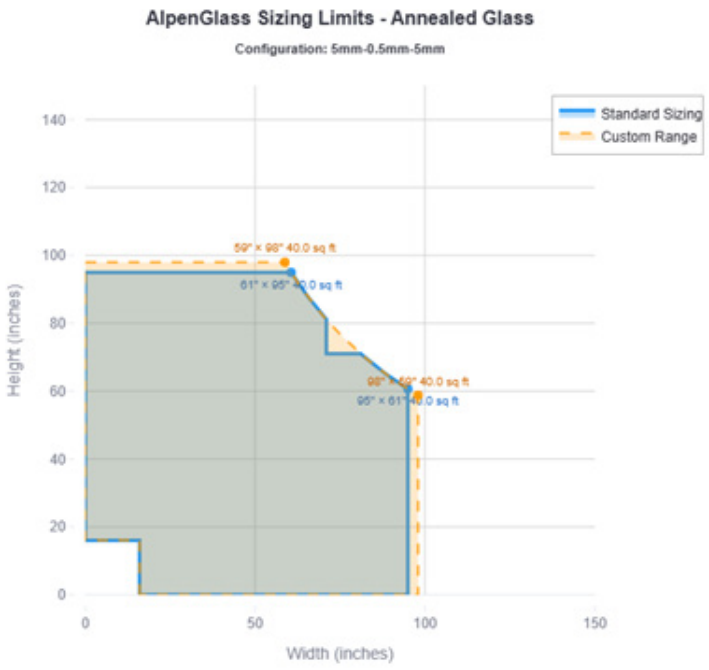


Figure 30. Annealed 5mm-0.5mm-5mm

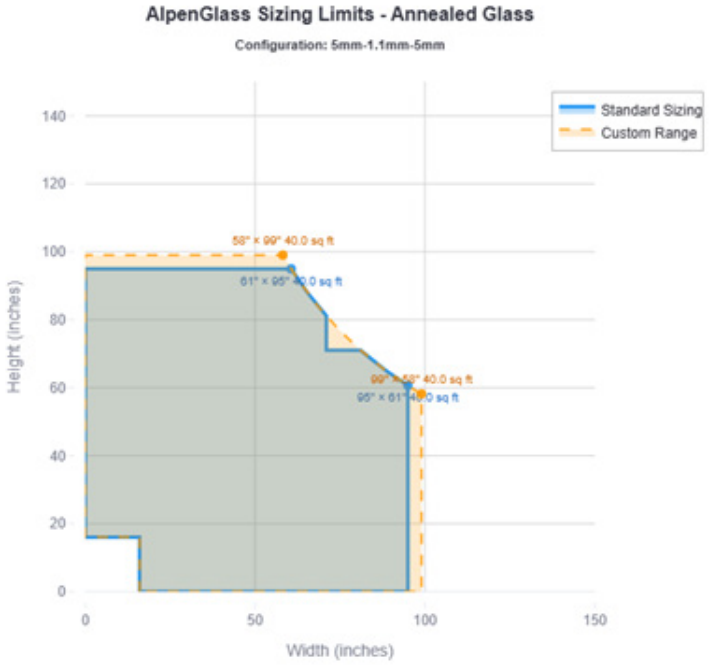


Figure 31. Annealed 5mm-1.1mm-5mm

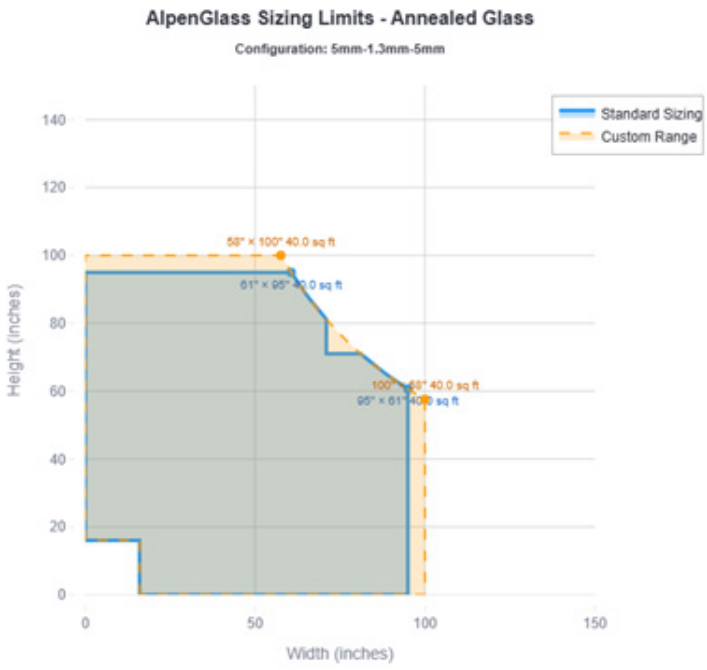


Figure 32. Annealed 5mm-1.3mm-5mm

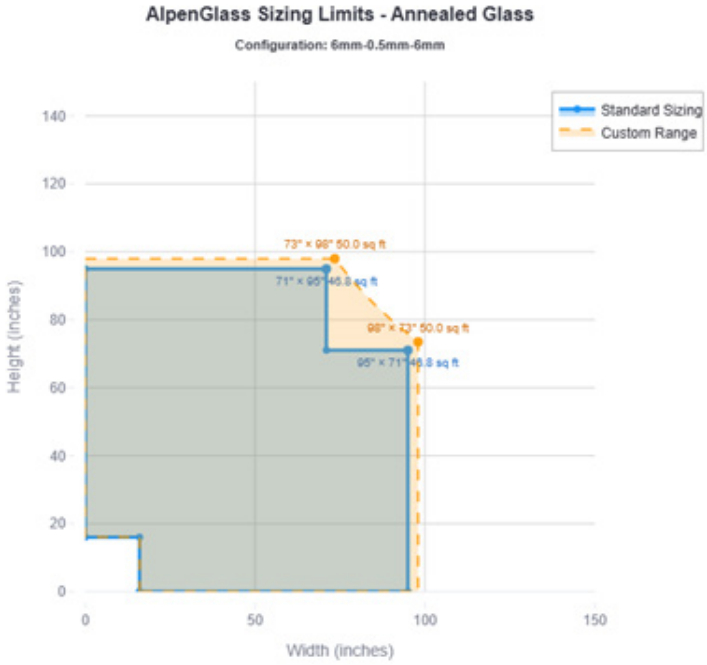


Figure 33. Annealed 6mm-0.5mm-6mm

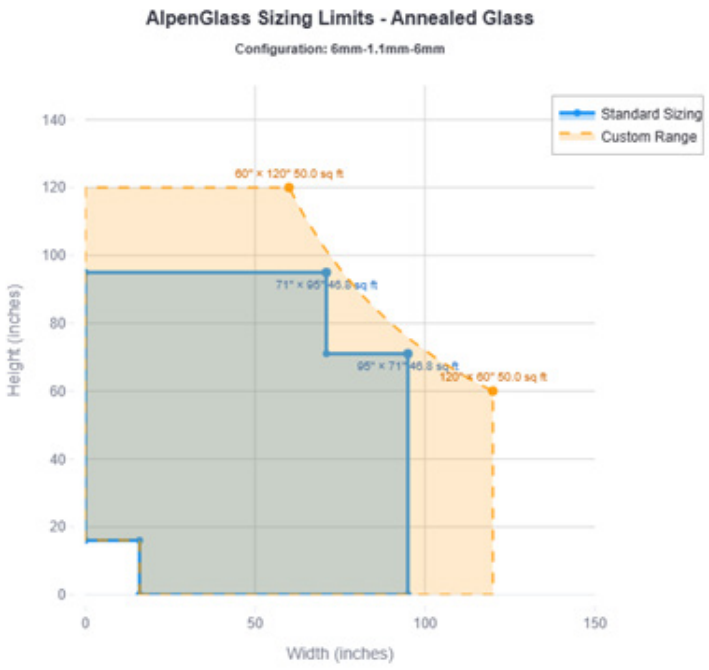


Figure 34. Annealed 6mm-1.1mm-6mm (custom sizing not available if using low-E coated 1.1mm)

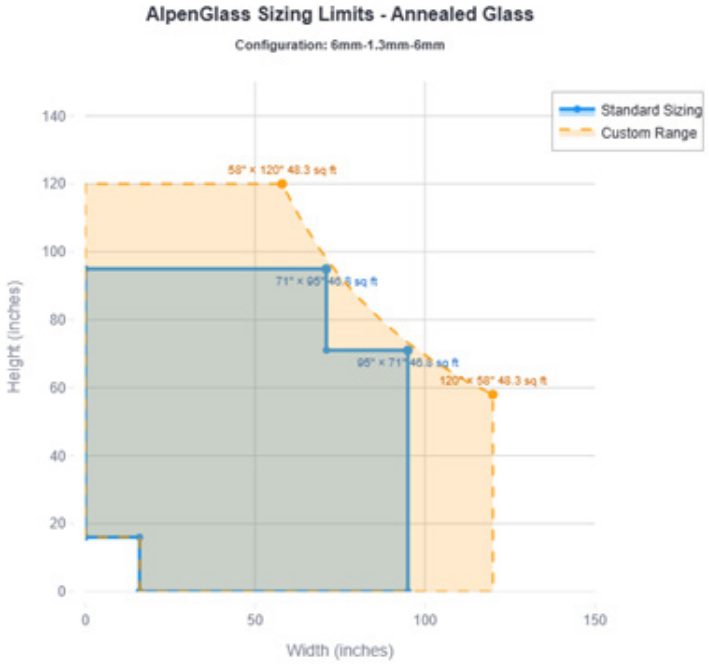


Figure 35. Annealed 6mm-1.3mm-6mm

Image References

Corning Incorporated. (2026). **www.corning.com/enlighten**

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