

Series 6000

Vinyl Fixed, Horizontal & Vertical Sliding Window

**STARLINE
WINDOWS**



Quality, Comfort & Peace of Mind



Foreword

This Design Guide provides specifications on the Series 6000 Vinyl Fixed Horizontal & Vertical Sliding Window.

This document is intended to provide information on our standard products. Non-standard designs and applications can be reviewed to determine the feasibility on a project-specific basis.

Please email any project specific enquiries to architectural@starlinewindows.com or technical@starlinewindows.com.

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Recommended Size Guidelines

Starline Windows provides maximum guidelines for window module area and weight for construction projects.

Fixed Lite and Combination Window Maximum Weight and Area

FRAME FINISH ¹	MAXIMUM WEIGHT ²	MAXIMUM FIXED LITE AREA ³	MAXIMUM COMBO WINDOW AREA ⁴
White (unpainted). Beige, Silver -UV Cure Coat – Exterior Only	250 pounds	50 sq. ft.	72 sq. ft.
Black, Charcoal, and Brown -UV Cure Coat – Exterior Only	250 pounds	50 sq. ft.	60 sq. ft.

Maximum Combination Window Width and Height

FRAME FINISH ¹	MAXIMUM WIDTH	MAXIMUM HEIGHT
White (unpainted). Beige, Silver -UV Cure Coat – Exterior Only	144"	120"
Black, Charcoal, and Brown -UV Cure Coat – Exterior Only	120"	96"

Maximum Fixed Window Width and Height

FRAME FINISH ¹	MAXIMUM WIDTH	MAXIMUM HEIGHT
White (unpainted). Beige, Silver -UV Cure Coat – Exterior Only	108"	108"
Black, Charcoal, and Brown -UV Cure Coat – Exterior Only	108"	108"

Note: Limitations are guidelines and depend on site conditions.

Note: Limitations are guidelines and depend on site conditions.

For instructions and examples on how to calculate area and weight, refer to [Calculate Fixed, Combination, and Vent Window Size and Weight](#).

¹ UV Cure coat is available for the exterior of the window frame only. Starline does not paint the interior of the window. The interior frame finish is only available in white unpainted vinyl.

² Maximum weight is a guideline that considers, production capabilities, tailgate deliveries and window installer capabilities. Please consult with the window installers on a project specific basis to determine their ideal overall window weight with respects to handling and installing. Industry standard for installation typically ranges from 200 lbs. and up, depending on site conditions, man power and equipment that will be used to assist with installation. If an overall window is greater than 300 lbs site glazing is required due to manufacturing limitations. Windows that are heavier than installers are willing to install (approximate range 200lbs – 300 lbs) site glazing may be an option, however it is Starline Window's recommendation that factory glazing, in a controlled environment, is utilized whenever possible.

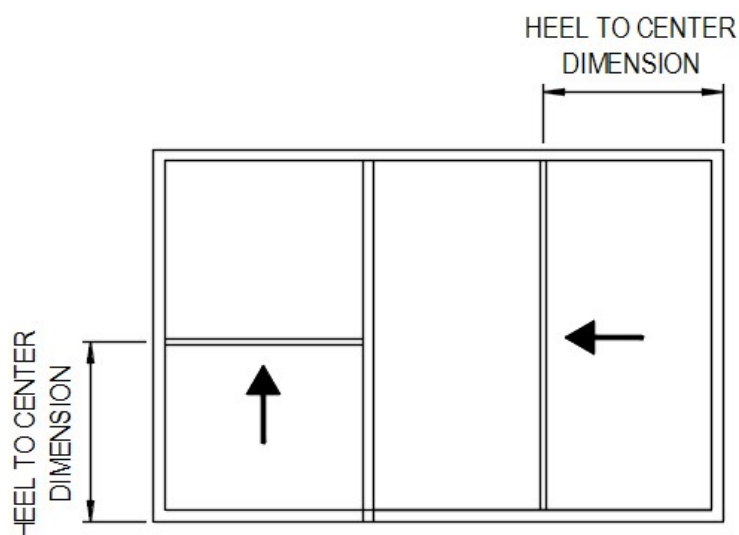
³ Maximum fixed lite area for an individual insulated glass unit (IGU) is dependent on the glass thickness selected. Once the desired IGU area has been determined, refer to **Maximum IGU Area Based on Glass Lite Thickness** (pg.3) for minimum allowable glass thickness. **Please note:** There may be certain design, structural, building code, by-law etc. requirements that could dictate the glass thickness. Glass thickness will be confirmed during the shop drawing phase, if applicable, and /or ordering of the windows.

⁴ A combo window is a window that has multiple lites, either fixed and / or operable vents. These lites are divided either by mullions and / or couplers and / or T-Bars.

Minimum Vent Size

Sizes are based on heel to center dimensions

HARDWARE	OPERABLE VENT	WIDTH (In)	HEIGHT (In)
Multi-point	Horizontal Slider	9"	9"
	Vertical Slider	9"	9"



Maximum Vent Size

To design an operable vent that is within Starline's recommended maximum vent size, refer to the chart below:

OPERABLE VENT	MAX. WIDTH (In)	MAX. HEIGHT (In)	MAX. AREA (SQ FT) DOUBLE GLAZED	MAX. WEIGHT
Horizontal Slider	48"	72"	18 sq. ft.	55 lbs.
Vertical Slider	48"	48"	8 sq. ft.	TBD

Calculating Fixed, Combination, and Vent Window Sizes

Using Starline Calculator

Starline has a **Maximum Fixed, Combination and Vent Window Size Calculator** available for use. Enter the required parameters and the calculator will advise if the window is within Starline's recommended design guidelines (PASS) or if it exceeds a certain parameter (FAIL). To retain a copy of this calculator contact technical@starlinewindows.com

Note: This calculator is a tool to assist with the design of basic window configurations. Combination windows can be complicated, and some configurations may need to be reviewed and approved by Starline's Designers and /or Structural Engineer for feasibility and structural compliance.

For any type of window; fixed, combination and /or vents, there may be certain design and / or structural requirements, building code requirements, by-law requirements, etc. which require consideration and could dictate the size of the window, glass thickness, etc. Final window sizes and configurations will be confirmed during the shop drawing phase, if applicable, and /or ordering of the windows.

Using Manual Calculations

Once the fixed and /or combination window and /or vent style has been selected, along with the frame dimensions (width and height) and the glass thickness, a calculation can be performed to determine the area and weight of the window.

The following examples are intended to provide sample calculations for the following window configurations:

Example #1: is intended to provide a sample calculation for a fixed window ¹.

Example #2: is intended to provide sample calculations for a sliding vent. Please note: Whether a horizontal or vertical slider is used the calculation methodology is the same.

Example #3: is intended to provide a sample calculation for a combination window.

Glass thickness can play a significant factor in determining how large the window can be. The thicker the glass, the heavier the IGU. When thicker glass is selected commonly the maximum weight allowed is reached prior to the maximum area allowed.

Refer to the **Typical Float Glass Weight per Thickness** chart below for weight of glass.

Typical Float Glass Weight per Thickness

GLASS LITE THICKNESS	3mm	4mm	5mm	6mm	8mm	10mm
Monolithic Glass – Weight (lb/ ft ²)	1.54	2.05	2.56	3.07	4.10	5.12
Double Glazed IGU – Weight (lb/ ft ²)	3.08	4.10	5.12	6.15	8.19	10.24
Triple Glazed IGU – Weight (lb/ ft ²)	4.61	6.15	7.68	9.22	12.29	15.36

Maximum IGU Area and Lineal Thickness Based on Glass Lite Thickness²

GLASS LITE THICKNESS	MAXIMUM IGU AREA	MAX. UNITED INCHES (One Width + Height)
3mm	19.5 sq. ft.	< 105"
4mm	30 sq. ft.	105"-150"
5mm	41 sq. ft.	>150"-175"
6mm	50 sq. ft.	>175" +

Note: There are minimum and maximum dimensions as well as overall IGU areas to consider for different types of glass, such as annealed, tempered, laminated, spandrel, etc. Maximum dimensions are as laid out in the above chart, regardless of the glass type.

For all other sizing information please visit the Products tab on the Vitrum Glass Groups website at: <http://www.vitrum.ca/> for the most up to date information.

Note: The following calculations are intended to provide examples on how to calculate window sizes for basic window configurations.

Combination windows can be complicated, and some configurations may need to be reviewed and approved by Starline's Designers and Structural Engineer for feasibility and structural compliance. A combination window is a window that has multiple lites; fixed and/or operable vents. These lites and vents are divided by T-Bar(s).

For any type of window; fixed, combination and vents, there may be certain design and /or structural requirements, building code requirements, by-law requirements, etc. that requires consideration and could dictate the size of the window, glass thickness, etc. Final window sizes and configurations will be confirmed during the shop drawing phase, if applicable, and/or ordering of the windows.

Figure 1 provides an example of a combination window.

The following examples are intended to provide sample calculations for the following window configurations:

Ex.#1- Fixed Window

1. Determine fixed window size ¹ - 60" wide x 96" tall. $(60" \times 96") / 144" = 40 \text{ ft}^2$ ✓
2. Determine max. united inches.
 - Based on area, min 5mm glass required therefore max. united inches can be <150"-175" $60" + 96" = 156"$ ✓
3. Determine glass weight - based on 5mm: $= 5.1 \text{ lbs/ft}^2$ ✓
4. Calculate overall weight $40 \text{ ft}^2 \times 5.12 \text{ lbs/ft}^2 = 204 \text{ lbs}$ ✓

Ex.#2- Horizontal Slider

1. Determine horizontal slider size - 36" wide x 60" tall. $(36" \times 60") / 144" = 15 \text{ ft}^2$ ✓
2. Determine max. united inches.
 - Based on area, min 3mm glass required therefore max. united inches can be <105" $36" + 60" = 96"$ ✓
3. Determine Glass - Double glazed unit 3mm / Air / 3mm $= 3.08 \text{ lbs/ft}^2$ ✓
4. Calculate overall weight $15 \text{ ft}^2 \times 3.08 \text{ lbs/ft}^2 = 46.2 \text{ lbs}$ ✓

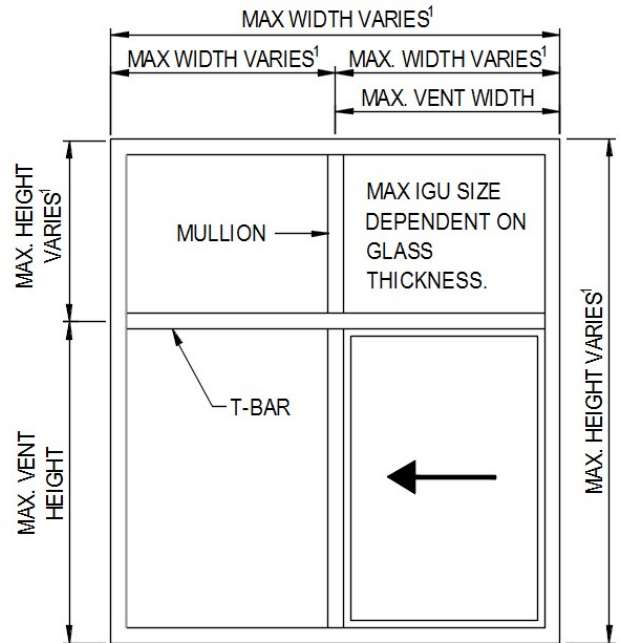


Figure 1

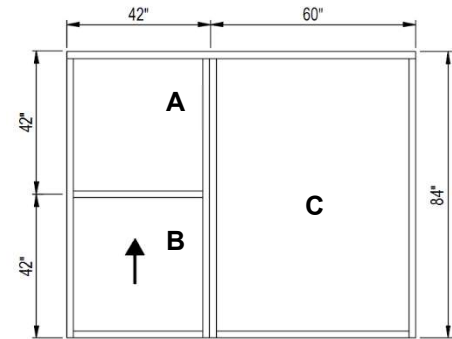
¹ Dimensions vary according to many factors, such as frame finish, glass lite thickness, etc. Review entire design guidelines document for further information and clarity.

Ex.#3- Combination Window

When determining the combination window overall area and weight, first ensure individual fixed lites and vent sizes are within Starline's recommended design guidelines (as demonstrated in Step 1-4).

If the fixed lite width exceeds 72", the addition of a vertical coupler is required, thus creating two separate window modules.

If the fixed lite height exceeds 84", the addition of another horizontal T-Bar is required.



1. Determine combination window size - 90" wide by 96" tall $((42" + 60") \times 84") / 144" = 59.5 \text{ ft}^2$ ✓
2. Confirm combination window width and height are within recommended design guidelines. (UV cure coat for this example) Width = $102" \leq 120"$ ✓
Height = $84" \leq 96"$ ✓
3. Summarize individual fixed lite and operable vent overall weight based on previous calculations completed (as demonstrated in Example #1-#2)
 - *This step is required in order to determine overall weight of combination window.
 - Remember to confirm united inches for each individual lite.
 - A. Vertical Slider 42" x 42" (12.25 ft²) 3mm glass = 37.7 lbs ✓
 - B. Fixed Lite 42" x 42" (12.25 ft²) 3mm glass = 37.7lbs ✓
 - C. Fixed Lite 60" x 84" (35 ft²) 5mm glass = 179.2 lbs ✓
4. Calculate overall weight $= (37.7 \times 2) + 179.2 = 255 \text{ lbs}^3$ ✓

¹ Maximum fixed window area for an insulated glass unit (IGU) is dependent on the glass thickness selected. Once the desired IGU area has been determined, refer to **Maximum IGU Area & Lineal Inches Based on Glass Lite Thickness** chart (page 3) to select required glass thickness.

² Glass thickness may be required to be thicker than stated in the **Maximum IGU Area & Lineal Inches Based on Glass Lite Thickness** chart (page 3) due to structural requirements, building code requirements, by-law requirements, etc. As an example: A glass thickness of 5mm may be selected based on the charts and it states 5mm glass can be used up to an IGU area that is 41 sq. ft. maximum, however structural requirements due to the buildings wind loading may require 6mm glass thickness to be used. 6mm glass is thicker than 5mm glass and weighs more, therefore the window size may need to be reduced to keep overall weight within Starline windows recommended maximum weight.

³ Maximum weight is a guideline that considers, production capabilities, tailgate deliveries and window installer capabilities. Please consult with the window installers on a project specific basis to determine their ideal overall window weight with respects to handling and installing. Industry standard for installation typically ranges from 200 lbs. and up, depending on site conditions, man power and equipment that will be used to assist with installation. If an overall window is greater than 300 lbs site glazing is required due to manufacturing limitations. Windows that are heavier than installers are willing to install (approx. 200 – 300 lbs) site glazing may be an option, however it is Starline Window's recommendation that factory glazing, in a controlled environment, is utilized whenever possible.

Frame and Accessory Options

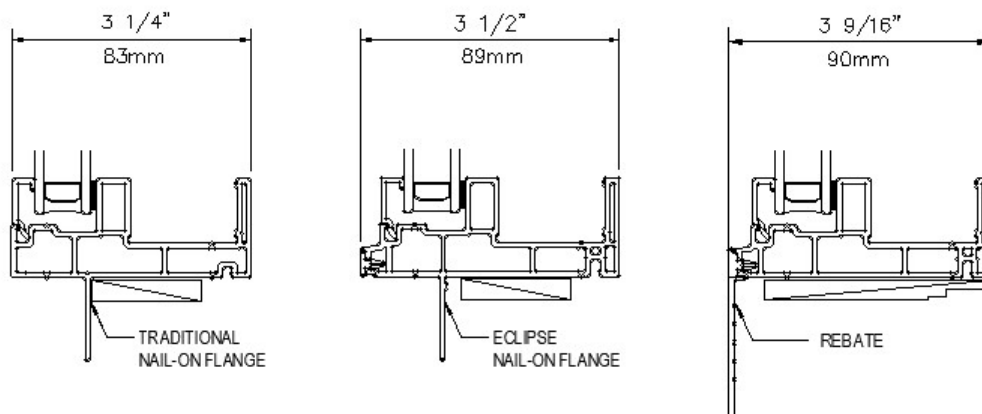
Starline Windows offers the following types of perimeter frames and accessories to best suite your project specific needs.

Perimeter Frame Options

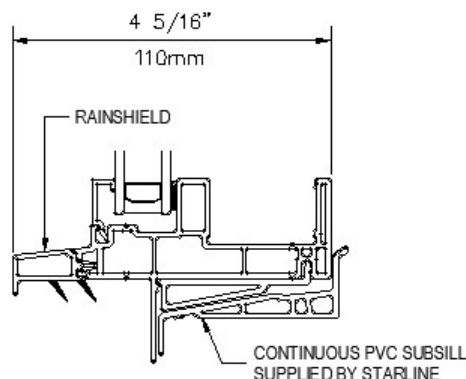
Starline Windows offers the following types of perimeter frames to best suite your project specific needs.

- NAIL-ON FLANGE
 - STANDARD
 - ECLIPSE
- REBATE¹
- RAINSHIELD

To support drainage when an interior air seal is required², it is Starline's recommendation to order the window sill nailing flange with factory drilled 3/8" x 5/8" slots at 30" o/c and 8" from the end of the frame, as this allows for sub sill drainage. The flanged weep holes are an industry accepted practice. Shimming between the nailing flange and the sheathing at the sill only is not ok as the shimmed flange provides unnecessary stress on the window sill and will result in Starline's warranty being void. If the building design requires shimming between the nailing flange and sheathing at the sill, head and jambs must also be shimmed out the same thickness as at the sill. Minimum 3/8" gap required between sheathing and nailing flange to allow for proper sub sill drainage.



SHIMS ARE TO BE 2" WIDE HIGH IMPACT PLASTIC SHIM @ 4" O.C., TO PROVIDE 50% LEVEL SUPPORT OF WINDOW SILL.
(OPTION TO BE SUPPLIED BY STARLINE)



Note: Refer to the **Eclipse 6000 Series – Standard Details** pdf for further information. These details will provide some standard installation methods for the above frame options. These installation details are a suggested method of installation and does not necessarily represent a detail that is suitable for a specific project. To confirm project specific details, please check with your Waterproofing / Building Envelope Consultant.

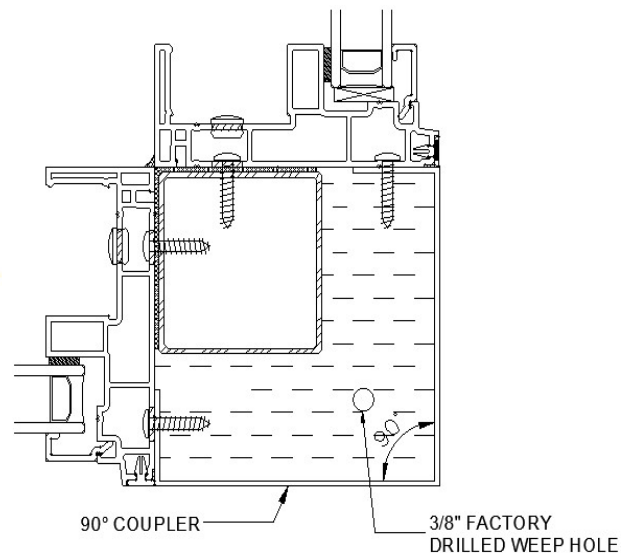
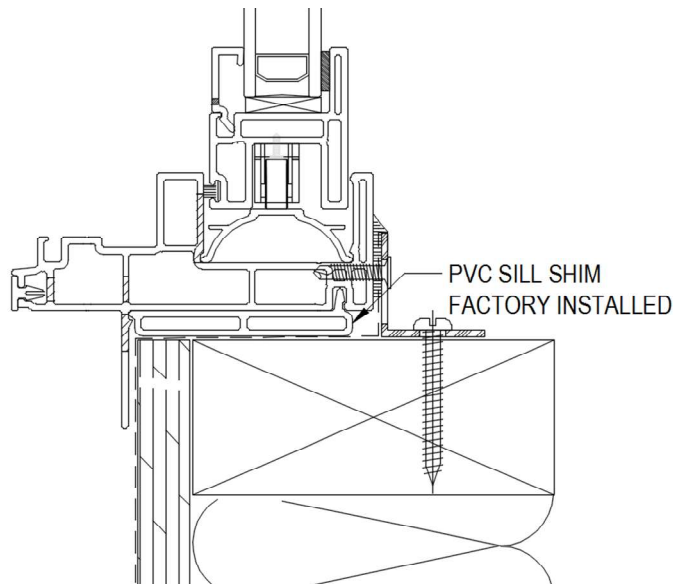
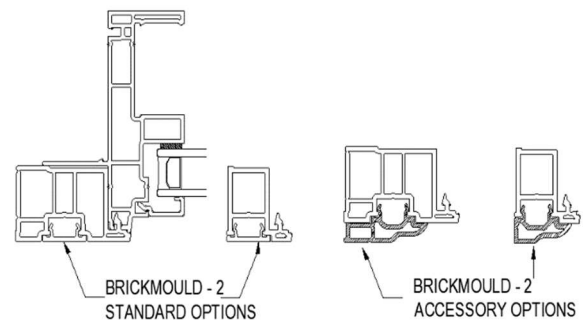
¹Rebate frame is available for project specific conditions only. Please email any project specific enquiries to sales@starlinewindows.com

²Starline and industry best practice guidelines recommends having an interior air seal.

Accessory Options

There are various accessory and add-on options available for the Eclipse 6000 Series, such as:

- Brickmould (2 profiles to choose from) with 2 accessory options
- Sill shims (factory installed)
- Variable degree couplers, 180°, 135° & 90°
- Surface mounted (plant on) muntins
- Insulated glass internal grilles
- Insect Screens



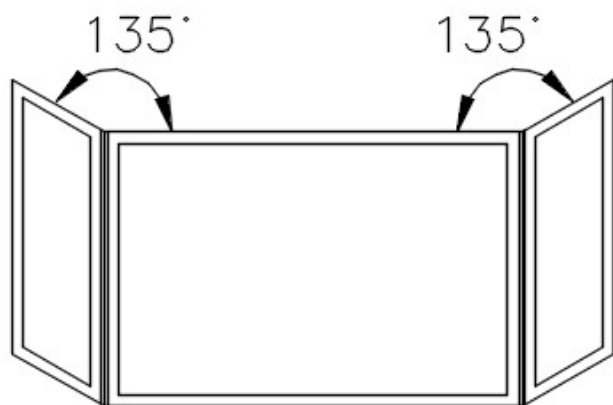
Factory installed sill shims will save time and simplify the installation process. These shims are available for an additional cost. It is Starline's recommendation that an interior sill angle is used when using the factory installed sill shims, this detail is a suggested method of installation and does not necessarily represent a detail that is suitable for a specific project. To confirm project specific details, please check with your Waterproofing / Building Envelope Consultant.

Note: Refer to the **Eclipse 6000 Series – Standard Details** pdf for further information. The pdf contains details for some of the accessory options available. For additional and complete information regarding the available accessory options, contact your local Starline Sales rep at sales@starlinewindows.com.

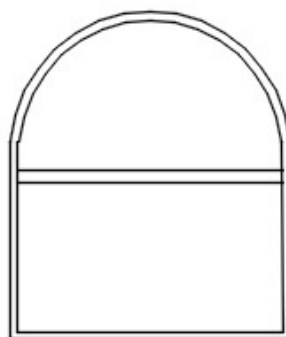
Refer to the **Vinyl Windows & Doors – Internal Grilles & Surface Mounted Muntins** document in the Miscellaneous section of the catalogue for more detailed information regarding options available.

Radius, Angled, Bay, and Bow Windows

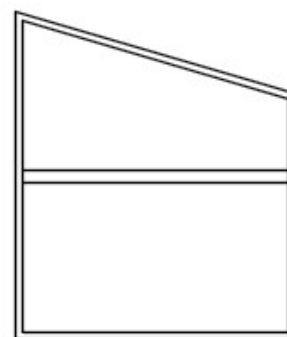
There are various special shapes sizes and configurations that Starline Windows can manufacturer. Below is a few examples of different styles of windows Starline has to offer. There are other options available. Contact your local Starline Sales rep at sales@starlinewindows.com for further information on these types of windows.



Bay Window



Half Round Window

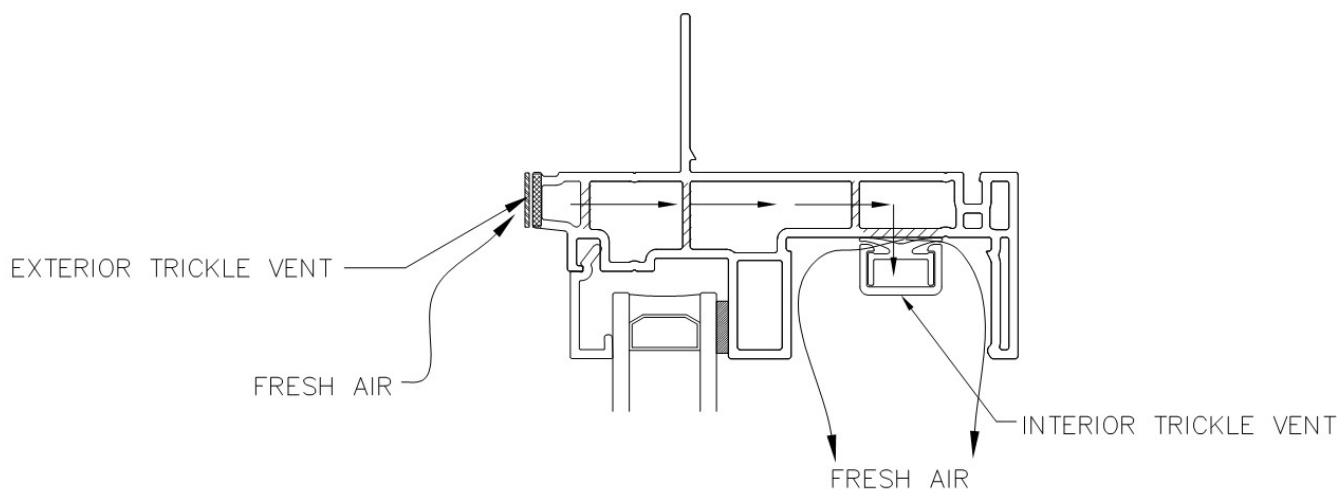


ANGLED Window (Trapezoid)

Note: Starline does not offer radius or angled horizontal or vertical sliding windows.

Trickle Vent

The head trickle vent has not been tested for acoustic ratings; expect some localized exterior sound transmission to the interior. The trickle vent assembly is also not tested for thermal performance, expect localized exterior cooling/heating to the interior. If you require additional information please contact your local sales rep or email sales@starlinewindows.com.



Window Head Trickle Vent with Exterior and Interior Vent

Window Hardware

The Eclipse series 6000 uses a cam lock. This cam lock features a spring design, which holds the handle in both the locked and unlocked positions. Cam locks are available in white.

Rollers are PVC with stainless steel axle.

Options

- Secondary latch which restricts window to opening 4". Retractable and non-retractable options. Available in white.
- Auto lock. Available in white.

Frame Finishes

Starline standard finish for the exterior and interior of the vinyl frame is Standard White. The extrusion is left as a bare substrate (not painted) as the colour is impregnated into the vinyl material.

Options

There is an option to paint the exterior of the frame using an exterior grade UV cure coating which is specifically designed for use on vinyl fenestration products. This coating contains 100% solids, thus emits no volatile organic compounds (VOC's) or hazardous air pollutants (HAPS).

The following **standard colours**¹ are available:

- Black
- Charcoal

The following **semi-standard colours**¹ are available:

- Brown
- Silver
- Beige

Custom colours may also be available for the exterior of the frame. The scope of work and overall custom colour quantity will be reviewed by Starline on a project specific basis to determine the feasibility of the custom colour request.

Note: Standard and Semi-standard colours are available for an additional cost.

Custom colours are available for an additional cost premium. An approximate 12-week lead time is required to procure custom colour requests.

¹Starline does not paint the interior of the windows. If the exterior of the window is painted, the interior frame finish is white unpainted vinyl.

Refer to the **Vinyl Finishes** document in the **Miscellaneous section** of the catalogue for images of the stock and semi-standard colours available

Glazing

Starline Windows standard insulated glass unit (IGU) will be comprised of the following glass make-up:

- Double glazed, double sealed IGU with an overall thickness of 3/4" (19 mm).
- Standard high-performance soft coat (sputtered) Low E which is applied to surface #2.
- Aluminum spacer with argon fill.
- Minimum glass thickness is 3mm.

Maximum IGU Area Based on Glass Lite Thickness

GLASS THICKNESS	MAX IGU AREA	MAX. UNITED INCHES (One Width + Height)
3mm	19.5 sq. ft.	< 105"
4mm	30 sq. ft.	105"-150"
5mm	41 sq. ft.	>150"-175"
6mm	50 sq. ft.	>175" +

Note: There are minimum and maximum dimensions as well as overall IGU areas to consider for different types of glass, such as annealed, tempered, laminated, spandrel, etc. Maximum dimensions are as laid out in above chart, regardless of the glass type. For all other sizing information please visit the Products tab on the Vitrum Glass Groups website at: <http://www.vitrum.ca/> for the most up to date information.

IGU Chart

SERIES 6000 DOUBLE GLAZED IGU: 19mm, Overall thickness of primary seal (Butyl): 0.8mm

EXTERIOR		SPACER		INTERIOR	
mm	inch	mm	inch	mm	inch
3	1/8	12.6	1/2	3	1/8
4	5/32	11.6	7/16	4	5/32
4	5/32	9.6	3/8	6	1/4
5	3/16	9.6	3/8	5	3/16
6	1/4	6.6 ¹	1/4 ¹	6	1/4
4	5/32	9.6	3/8	6LAM .030	1/4

¹Warm edge spacer is not available

Note:

The IGU, glass thickness, and spacer bar size is based on nominal dimension. Actual dimensions will vary slightly.

There are other glass make-up combinations available other than noted in the above chart. This chart's purpose is to provide a few examples. There are various other combinations available that can be reviewed on a project-specific basis.

Acoustical Ratings

Based on 19mm Double Glazed IGU

GLASS EXT.	GAP	GLASS INT.	TEST NUMBER	STC	OITC
3mm Ann.	13mm AIR	3mm Ann.	TL2106	29	23
5mm Ann.	9mm AIR	5mm Ann.	TL2114	30	25
5mm Ann.	11mm AIR	3mm Ann.	TL2111	32	26
6mm Ann.	9mm AIR	4mm Ann.	TL2119	32	28
6mm Lam. (PVB 0.8mm)	10mm AIR	4mm Ann.	TL98-440	35	29

Performance Test Results¹

Series 6000 mulled assembly window has been tested to AAMA/WDMA/CSA 101 I.S.2/A440-08, AAMA/WDMA/CSA 101 I.S.2/A440-11 and CSA A440SI-09.

Canada

PRODUCT DESIGNATOR	AIR TIGHTNESS	WATER PENETRATION RESISTANCE		UNIFORM LOAD DEFLECTION	RESISTANCE TO FORCED ENTRY
		LAB TESTED	FIELD TEST ^{2, 3}		
LC-PG50	A3	575 Pa	330 Pa	2394 Pa	Pass

USA

PRODUCT DESIGNATOR	AIR TIGHTNESS	WATER PENETRATION RESISTANCE		UNIFORM LOAD STRUCTURAL	RESISTANCE TO FORCED ENTRY
		LAB TESTED	FIELD TEST ^{2, 3}		
LC-PG50	0.05 CFM/ft ² @ 1.57 psf	12.11 psf	6.89 psf ³	75.19 psf	Pass

¹The performance test results are based on lab testing and will vary depending on the specific window configuration. Contact your local Starline Sales Representative to determine the specific performance test results for the window configurations on a project specific basis.

²Water penetration resistance field tests shall follow the criteria and testing procedures as outlined in the AAMA 502-08 specification standard.

³330Pa / 6.89 psf is the maximum field test result that can be achieved. Should the Project Specifications state a water penetration field test requirement of a lesser value, the project specified values shall govern.

Egress Requirements

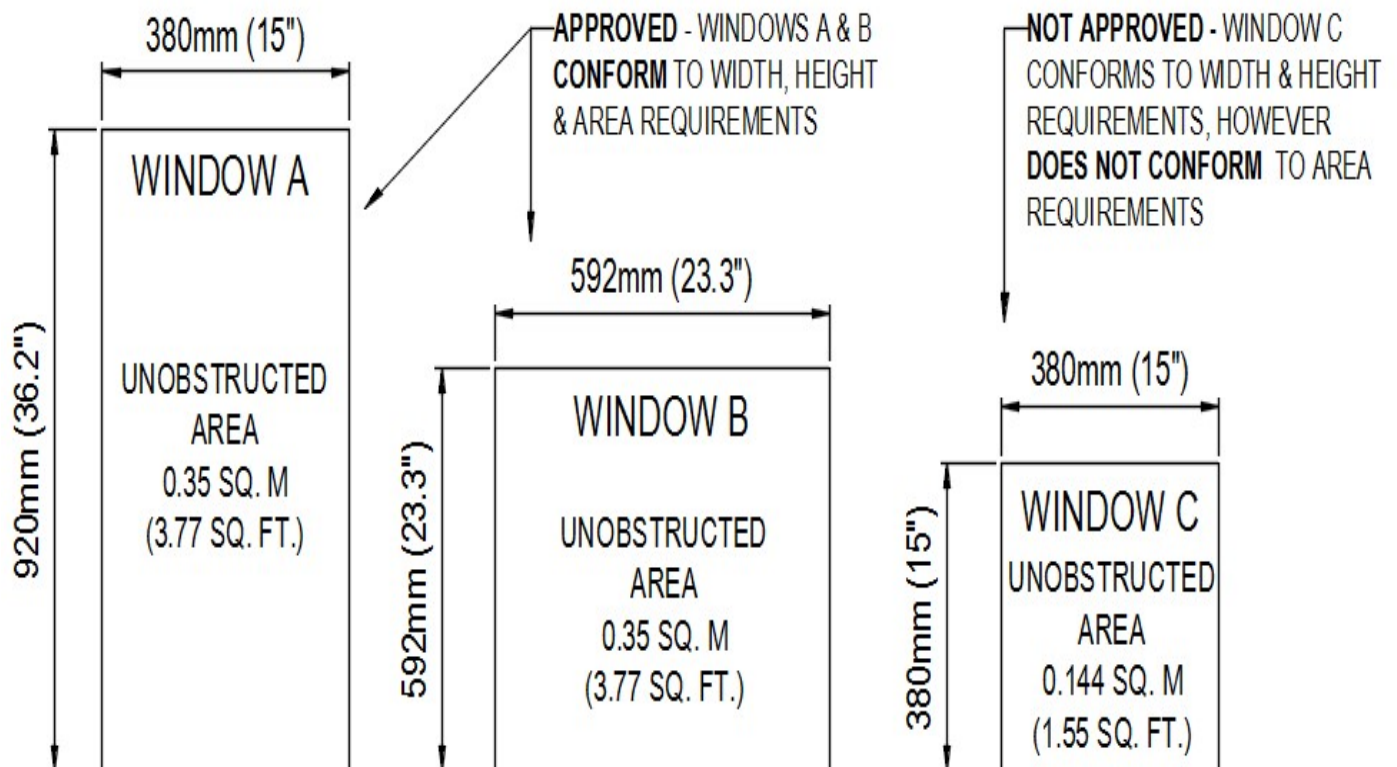
NBC 2015, BCBC 2012 & IBC 2015 Egress Size Requirements

Windows have to be a certain size in order to meet egress requirements. The size of the window is dependent on the project location.

Generally, for buildings that are 3 stories or less and except where the suite is sprinklered, or a bedroom door provides direct access to the exterior, each bedroom shall have one window which can be opened and leads to the exterior.

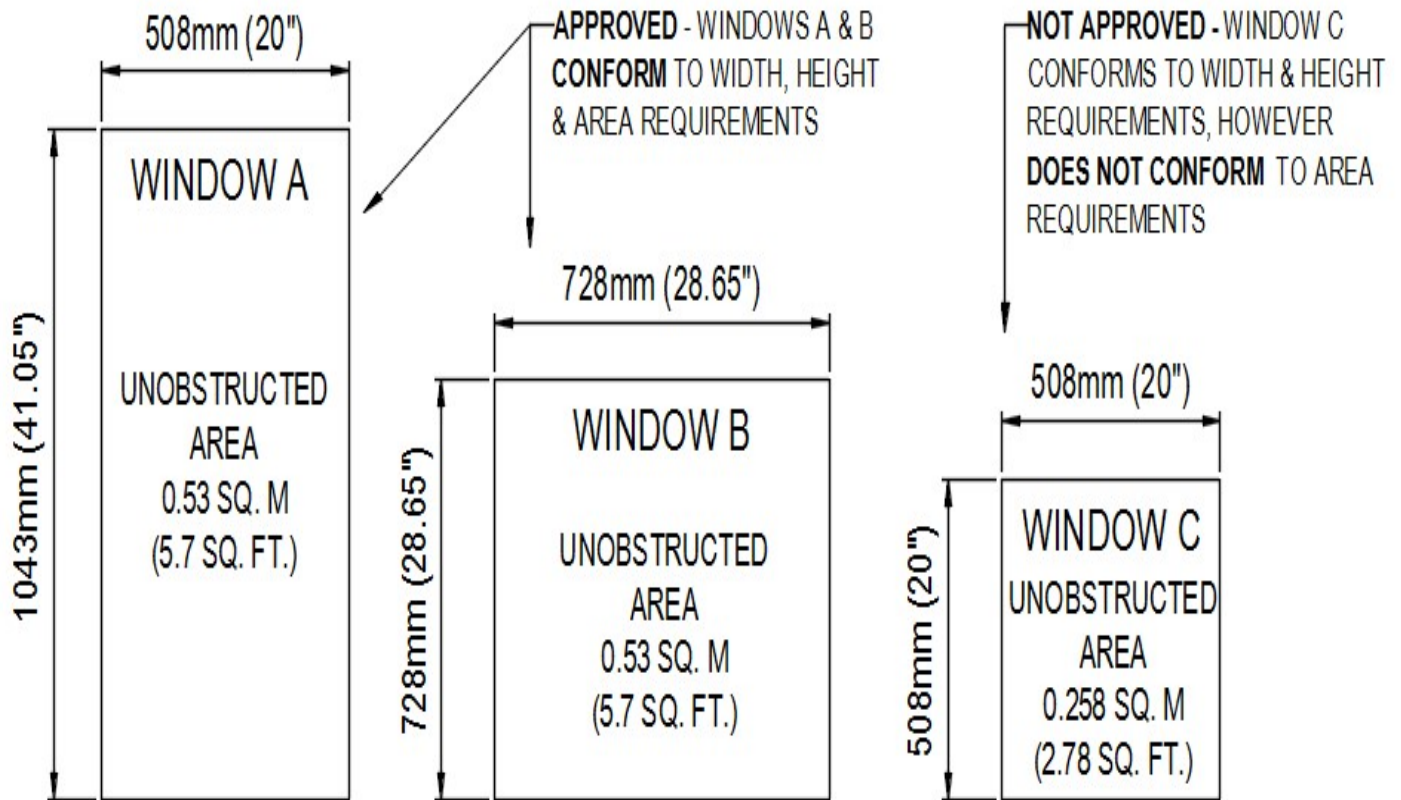
The NBC 2015 & BCBC 2012 – Part 9 – 9.9.10.1.2 codes requirement for egress is as follows:

- Minimum Clear Opening Width = 15" (380 mm)
- Minimum Clear Opening Height = 15" (380 mm)
- Minimum Clear Opening Area = 3.77 sq. ft (0.35 m²)



The IBC – Section 1030.2 & 1030.2.1 codes requirement for egress is as follows:

- Minimum Clear Opening Width = 20" (508 mm)
- Minimum Clear Opening Height = 24" (610 mm)
- Minimum Clear Opening Area = 5.7 sq. ft (0.53 m²)
 - **Exception:** Minimum Clear Opening Area Ground Floor = 5.0 sq. in (0.47 m²).



Standard Size Charts

Standard Sizes Egress Chart Canada – Horizontal Slider – XO, OX Configuration ¹

ROUGH OPENING W x H	HEEL DIMENSION W x H	CLEAR OPENING W x H	AREA SQ. IN.	DOES WINDOW MEET CANADA EGRESS REQUIREMENTS AS PER NBC 2015 & BCBC 2012 PART 9 - 9.9.10.1.2
3'-0" x 3'-0"	35 1/4" x 35 1/4"	14 3/4" x 32 1/2"	479	No – Does not meet min. requirement for area or clear opening width
3'-6" x 3'-0"	41 1/4" x 35 1/4"	17 3/4" x 32 1/2"	577	Yes
4'-0" x 2'-6"	47 1/4" x 29 1/4"	20 3/4" x 26 1/2"	549	Yes
4'-6" x 2'-0"	53 1/4" x 23 1/4"	23 3/4" x 20 1/2"	486	No - Does not meet min. requirement for area
4'-6" x 2'-6"	53 1/4" x 29 1/4"	23 3/4" x 26 1/2"	629	Yes
5'-0" x 2'-0"	59 1/4" x 23 1/4"	26 3/4" x 20 1/2"	548	Yes
5'-6" x 1'-6"	65 1/4" x 17 1/4"	29 3/4" x 14 1/2"	431	No - Does not meet min. requirement for area
6'-0" x 1'-6"	71 1/4" x 17 1/4"	32 3/4" x 14 1/2"	474	No - Does not meet min. requirement for area
6'-0" x 2'-0"	71 1/4" x 23 1/4"	32 3/4" x 20 1/2"	671	Yes

Standard Sizes Egress Chart USA – Horizontal Slider – XO, OX Configuration ¹

ROUGH OPENING W x H	HEEL DIMENSION W x H	CLEAR OPENING W x H	AREA SQ. IN.	DOES WINDOW MEET USA EGRESS REQUIREMENTS AS PER IBC 2015 SECTION 1030.2 & 1030.2.1?
3'-6" x 3'-6"	41 1/4" x 41 1/4"	17 3/4" x 38 1/2"	683	No – Does not meet min. requirement for area or clear opening width
4'-0" x 3'-6"	47 1/4" x 41 1/4"	20 3/4" x 38 1/2"	799	Yes - When window located on ground floor. No - Does not meet min. requirement for area if window not located on ground floor.
4'-0" x 4'-0"	47 1/4" x 47 1/4"	20 3/4" x 44 1/2"	923	Yes
4'-6" x 3'-6"	53 1/4" x 41 1/4"	23 3/4" x 38 1/2"	914	Yes
5'-0" x 3'-0"	59 1/4" x 35 1/4"	26 3/4" x 32 1/2"	869	Yes
5'-6" x 2'-6"	65 1/4" x 29 1/4"	29 3/4" x 26 1/2"	788	Yes - When window located on ground floor. No - Does not meet min. requirement for area if window not located on ground floor.
5'-6" x 3'-0"	65 1/4" x 35 1/4"	29 3/4" x 32 1/2"	966	Yes
6'-0" x 2'-6"	71 1/4" x 29 1/4"	32 3/4" x 26 1/2"	867	Yes

CANADA : NBC 2010 & BCBC 0212 - Part 9 - 9.9.10.1.2

USA: IBC 2015 - Section 1030.2, 1030.2.1

¹It is Starline Windows understanding that this document reflects the current egress requirements in Canada and the USA as of September 1, 2017, however, codes are subject to change. Contact your local municipal authority to confirm egress requirements in your area. Starline is not responsible for determining the clear opening in any jurisdiction. Clearly state egress requirements when ordering windows from Starline as Starline's profiles are subject to change without notice.

Series 6000 Vinyl Sliding Window Design Guidelines



Standard Sizes Egress Chart Canada – Vertical Slider – OX, XO Configuration ¹

ROUGH OPENING W x H	HEEL DIMENSION W x H	CLEAR OPENING W x H	AREA SQ. IN.	DOES WINDOW MEET CANADA EGRESS REQUIREMENTS AS PER NBC 2015 & BCBC 2012 PART 9 - 9.9.10.1.2
2'-0" x 4' - 0"	23 1/4" x 47 1/4"	20 1/2" x 20 1/8"	413	No – Does not meet min. requirement for area
2'-6" x 4' - 0"	29 1/4" x 47 1/4"	26 1/2" x 20 1/8"	533	No – Does not meet min. requirement for area
3'-0" x 4' - 0"	35 1/4" x 47 1/4"	32 1/2" x 20 1/8"	654	Yes
3'-0" x 3' - 6"	35 1/4" x 41 1/4"	32 1/2" x 17 1/8"	557	Yes
3'-6" x 3' - 0"	41 1/4" x 35 1/4"	38 1/2" x 14 1/8"	544	No – Does not meet min. requirement for clear opening height
3'-6" x 3' - 6"	41 1/4" x 41 1/4"	38 1/2" x 17 1/8"	659	Yes
4'-0" x 3' - 6"	47 1/4" x 41 1/4"	44 1/2" x 17 1/8"	762	Yes
2'-0" x 4' - 6"	23 1/4" x 53 1/4"	20 1/2" x 23 1/8"	474	No – Does not meet min. requirement for area
2'-6" x 4' - 6"	29 1/4" x 53 1/4"	26 1/2" x 23 1/8"	613	Yes
2'-0" x 5' - 0"	23 1/4" x 59 1/4"	20 1/2" x 26 1/8"	536	No – Does not meet min. requirement for area
2'-0" x 5' - 6"	23 1/4" x 65 1/4"	20 1/2" x 29 1/8"	597	Yes

Standard Sizes Egress Chart USA – Vertical Slider – OX, XO Configuration ¹

ROUGH OPENING W x H	HEEL DIMENSION W x H	CLEAR OPENING W x H	AREA SQ. IN.	DOES WINDOW MEET USA EGRESS REQUIREMENTS AS PER IBC 2015 SECTION 1030.2 & 1030.2.1?
3'-0" x 4' - 6"	35 1/4" x 53 1/4"	32 1/2" x 23 1/8"	752	No – Does not meet min. requirement for area or the min. clear opening height
3'-0" x 5' - 0"	35 1/4" x 59 1/4"	32 1/2" x 26 1/8"	849	Yes
2'-6" x 5' - 0"	29 1/4" x 59 1/4"	26 1/2" x 26 1/8"	692	No – Does not meet min. requirement for area
2'-6" x 5' - 6"	29 1/4" x 65 1/4"	26 1/2" x 29 1/8"	772	Yes - When window located on ground floor. No - Does not meet min. requirement for area if window not located on ground floor.
2'-6" x 6' - 0"	29 1/4" x 71 1/4"	26 1/2" x 32 1/8"	851	Yes
2'-0" x 6' - 6"	23 1/4" x 77 1/4"	20 1/2" x 35 1/8"	720	Yes - When window located on ground floor. No - Does not meet min. requirement for area if window not located on ground floor.

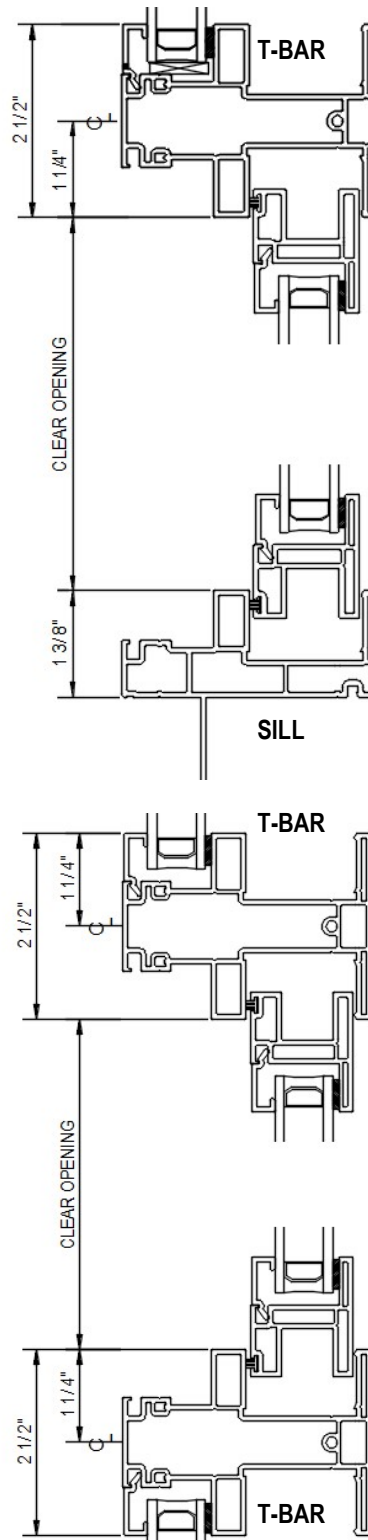
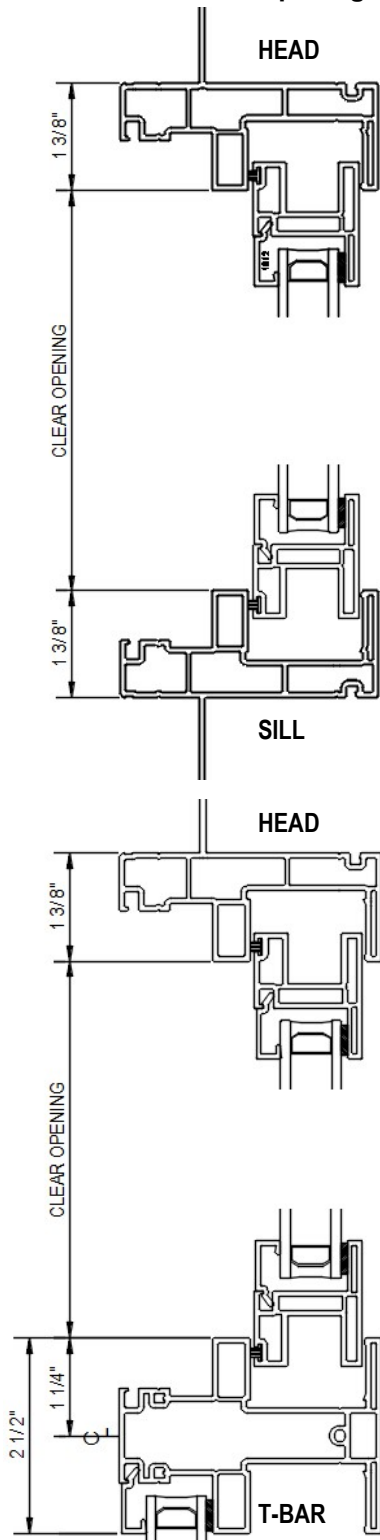
CANADA: NBC 2010 & BCBC 0212 - Part 9 - 9.9.10.1.2

USA: IBC 2015 - Section 1030.2, 1030.2.1

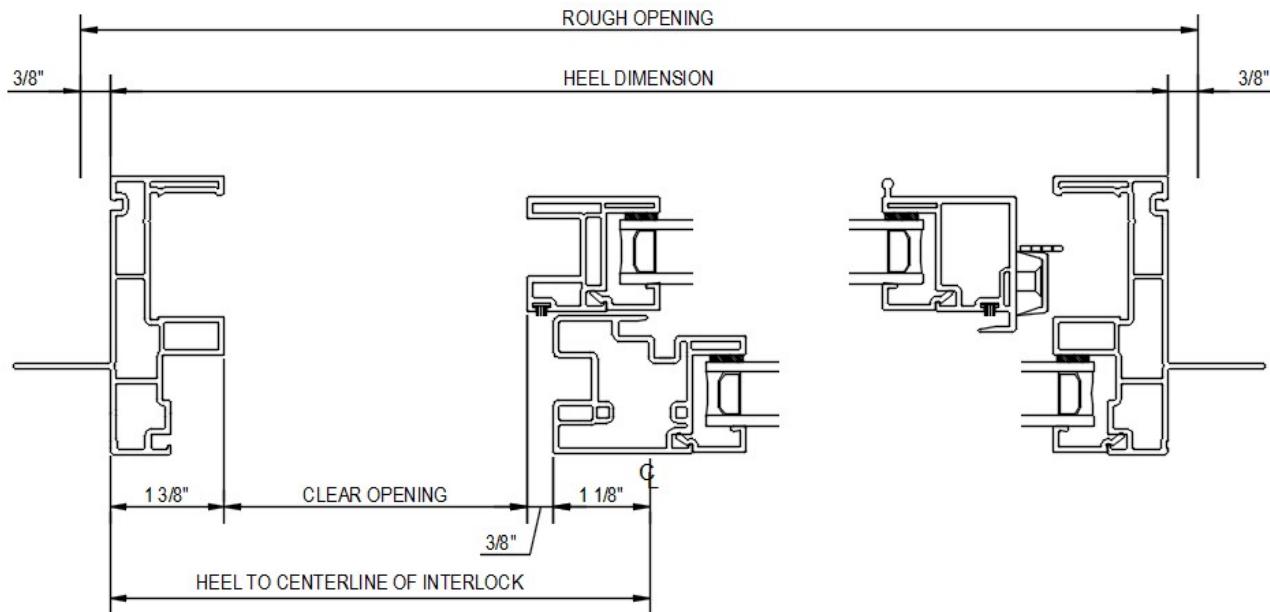
¹It is Starline Windows understanding that this document reflects the current egress requirements in Canada and the USA as of September 1, 2017, however, codes are subject to change. Contact your local municipal authority to confirm egress requirements in your area. Starline is not responsible for determining the clear opening in any jurisdiction. Clearly state egress requirements when ordering windows from Starline as Starline's profiles are subject to change without notice.

Determining Heel Dimension - Minimum Clear Opening Required

Horizontal Slider Clear Opening Height Measurement Point



XO, OX Horizontal Slider Clear Opening Between Jamb and Interlock



CANADA: CLEAR OPENING (CO) REQUIREMENTS: 15" WIDTH; 15" HEIGHT; 543 SQ. IN. TOTAL AREA

IF MINIMUM CO WIDTH IS REQUIRED

$$\text{Heel Width} = (15 \frac{1}{2}''^1 + 1 \frac{3}{8}'' + \frac{3}{8}'' + 1 \frac{1}{8}'') \times 2$$

$$\text{Heel Height} = (543 \text{ sq. in.} / 15'') + \frac{1}{2}''^1 + (2 \times 1 \frac{3}{8}'')$$

$$\text{Minimum Heel Dimension} = 36 \frac{3}{4}'' \times 39 \frac{1}{2}''$$

IF MINIMUM CO HEIGHT IS REQUIRED

$$\text{Heel Height} = 15 \frac{1}{2}''^1 + (2 \times 1 \frac{3}{8}'')$$

$$\text{Heel Width} = [(543 \text{ sq. in.} / 15'') + \frac{1}{2}''^1 + 1 \frac{3}{8}'' + \frac{3}{8}'' + 1 \frac{1}{8}''] \times 2$$

$$\text{Minimum Heel Dimension} = 79 \frac{1}{4}'' \times 18 \frac{1}{4}''$$

USA: CLEAR OPENING (CO) REQUIREMENTS: 20" WIDTH; 24" HEIGHT; 820 SQ. IN. TOTAL AREA

IF MINIMUM CO WIDTH IS REQUIRED

$$\text{Heel Width} = (20 \frac{1}{2}''^1 + 1 \frac{3}{8}'' + \frac{3}{8}'' + 1 \frac{1}{8}'') \times 2$$

$$\text{Heel Height} = (820 \text{ sq. in.} / 20'') + \frac{1}{2}''^1 + (2 \times 1 \frac{3}{8}'')$$

$$\text{Minimum Heel Dimension} = 46 \frac{3}{4}'' \times 44 \frac{1}{4}''$$

IF MINIMUM CO HEIGHT IS REQUIRED

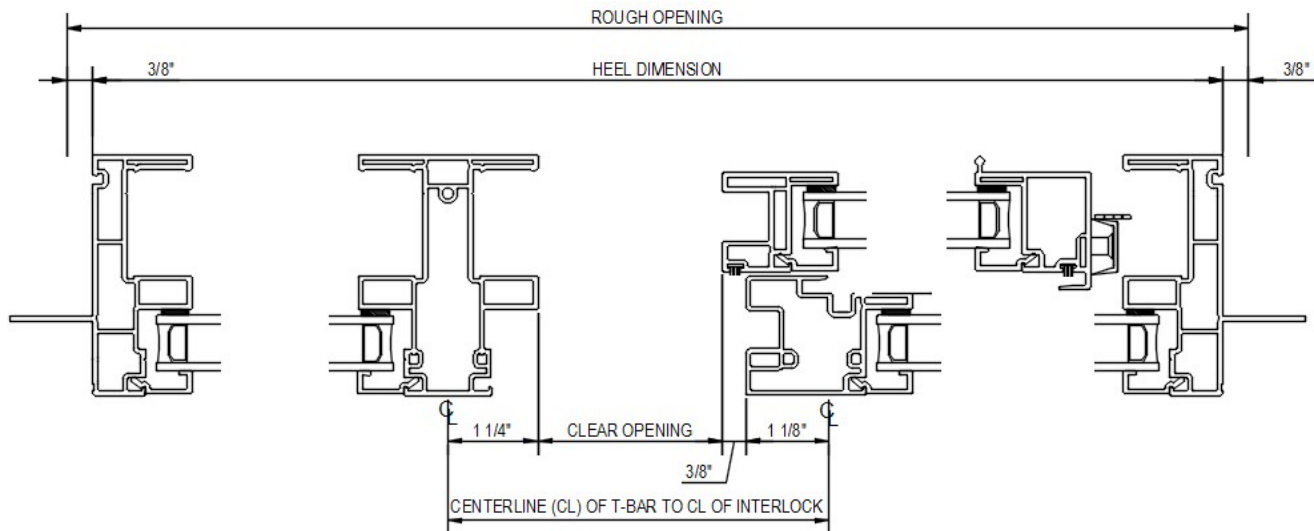
$$\text{Heel Height} = 24 \frac{1}{2}''^1 + (2 \times 1 \frac{3}{8}'')$$

$$\text{Heel Width} = [(820 \text{ sq. in.} / 24'') + \frac{1}{2}''^1 + 1 \frac{3}{8}'' + \frac{3}{8}'' + 1 \frac{1}{8}''] \times 2$$

$$\text{Minimum Heel Dimension} = 75 \frac{1}{4}'' \times 27 \frac{1}{4}''$$

¹ It is Starline's policy to add 1/2" to both width and height of the clear opening to ensure it meets code compliance.

OXO Horizontal Slider Clear Opening Between C/L of T-Bar and C/L of Interlock



Note: The heel dimension cannot be calculated as it is dependent on the fixed lite dimensions. While the fixed lites can be larger than the centerline (CL) of T-Bar to CL of interlock dimensions, the fixed lite in which the slider opens towards cannot be less than the CL of T-Bar to CL of interlock dimension. The below calculation provides the minimum dimension for CL of T-Bar to CL of interlock.

CANADA: CLEAR OPENING (CO) REQUIREMENTS: 15" WIDTH; 15" HEIGHT; 543 SQ. IN. TOTAL AREA

IF MINIMUM CO WIDTH IS REQUIRED

$$\text{Heel Width} = 15 \frac{1}{2}"^1 + 1 \frac{1}{4}" + 3/8" + 1 \frac{1}{8}"$$

$$\text{Heel Height} = (543 \text{ sq. in.} / 15") + 1/2" + (2 \times 1 \frac{3}{8}")$$

$$\text{Minimum Centerline of T-Bar to Centerline of Interlock Heel Dimension} = 18 \frac{1}{4}" \times 39 \frac{1}{2}"$$

IF MINIMUM CO HEIGHT IS REQUIRED

$$\text{Heel Height} = 15 \frac{1}{2}" + (2 \times 1 \frac{3}{8}")$$

$$\text{Heel Width} = (543 \text{ sq. in.} / 15") + 1/2" + 1 \frac{1}{4}" + 3/8" + 1 \frac{1}{8}"$$

$$\text{Minimum Centerline of T-Bar to Centerline of Interlock Heel Dimension} = 39 \frac{1}{2}" \times 18 \frac{1}{4}"$$

USA: CLEAR OPENING (CO) REQUIREMENTS: 20" WIDTH; 24" HEIGHT; 820 SQ. IN. TOTAL AREA

IF MINIMUM CO WIDTH IS REQUIRED

$$\text{Heel Width} = 20 \frac{1}{2}"^1 + 1 \frac{1}{4}" + 3/8" + 1 \frac{1}{8}"$$

$$\text{Heel Height} = (820 \text{ sq. in.} / 20") + 1/2" + (2 \times 1 \frac{3}{8}")$$

$$\text{Minimum Centerline of T-Bar to Centerline of Interlock Heel Dimension} = 23 \frac{1}{4}" \times 44 \frac{1}{4}"$$

IF MINIMUM CO HEIGHT IS REQUIRED

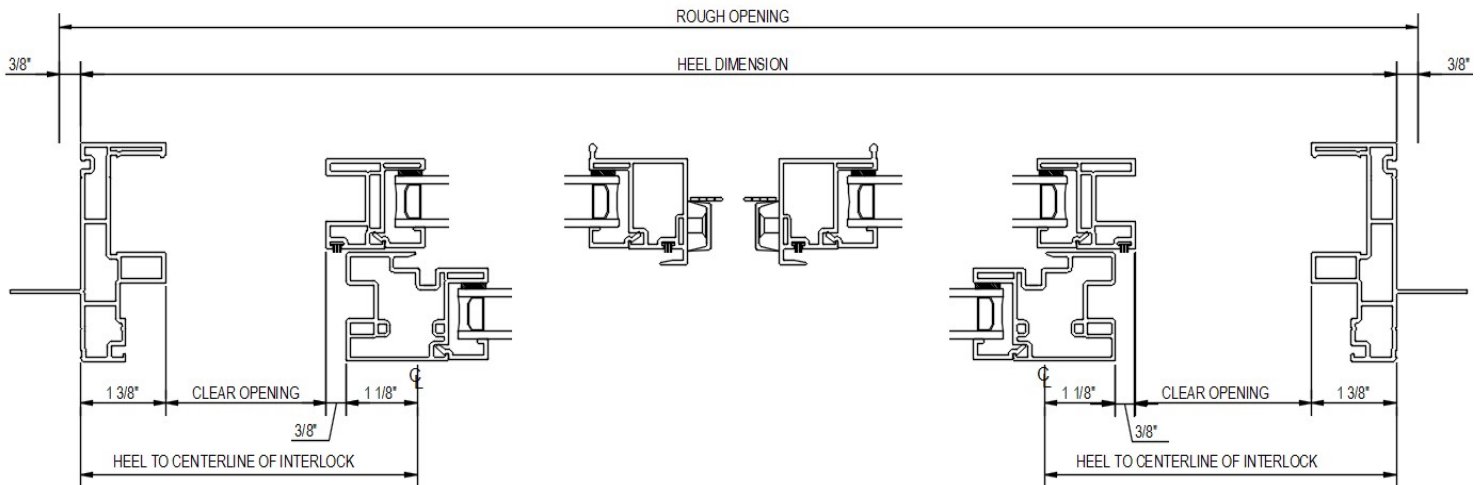
$$\text{Heel Height} = (24 \frac{1}{2}" + (2 \times 1 \frac{3}{8}"))$$

$$\text{Heel Width} = [(820 \text{ sq. in.} / 24") + 1/2" + 1 \frac{1}{4}" + 3/8" + 1 \frac{1}{8}"]$$

$$\text{Minimum Centerline of T-Bar to Centerline of Interlock Heel Dimension} = 37 \frac{1}{2}" \times 27 \frac{1}{4}"$$

¹ It is Starline's policy to add 1/2" to both width and height of the clear opening to ensure it meets code compliance.

XOX Horizontal Slider Clear Opening Heel to C/L Interlock



Note: The heel dimension cannot be calculated as it is dependent on the fixed lite dimension. While the fixed lite can be larger than 2 x heel to centerline (CL) of interlock dimensions, the fixed lite cannot be less than 2 x heel to centerline (CL) of interlock dimensions. The below calculation provides the minimum dimension from heel to CL of interlock.

CANADA: CLEAR OPENING (CO) REQUIREMENTS: 15" WIDTH; 15" HEIGHT; 543 SQ. IN. TOTAL AREA

IF MINIMUM CO WIDTH IS REQUIRED

$$\text{Heel Width} = 15 \frac{1}{2}''^1 + 1 \frac{3}{8}'' + \frac{3}{8}'' + 1 \frac{1}{8}''$$

$$\text{Heel Height} = (543 \text{ sq. in.} / 15'') + \frac{1}{2}''^1 + (2 \times 1 \frac{3}{8}'')$$

$$\text{Minimum Heel to Centerline of Interlock Heel Dimension} = 18 \frac{3}{8}'' \times 39 \frac{1}{2}''$$

IF MINIMUM CO HEIGHT IS REQUIRED

$$\text{Heel Height} = 15 \frac{1}{2}''^1 + (2 \times 1 \frac{3}{8}'')$$

$$\text{Heel Width} = (543 \text{ sq. in.} / 15'') + \frac{1}{2}''^1 + 1 \frac{3}{8}'' + \frac{3}{8}'' + 1 \frac{1}{8}''$$

$$\text{Minimum Heel to Centerline of Interlock Heel Dimension} = 39 \frac{5}{8}'' \times 18 \frac{3}{8}''$$

USA: CLEAR OPENING (CO) REQUIREMENTS: 20" WIDTH; 24" HEIGHT; 820 SQ. IN. TOTAL AREA

IF MINIMUM CO WIDTH IS REQUIRED

$$\text{Heel Width} = 20 \frac{1}{2}''^1 + 1 \frac{3}{8}'' + \frac{3}{8}'' + 1 \frac{1}{8}''$$

$$\text{Heel Height} = (820 \text{ sq. in.} / 20'') + \frac{1}{2}''^1 + (2 \times 1 \frac{3}{8}'')$$

$$\text{Minimum Heel to Centerline of Interlock Heel Dimension} = 23 \frac{3}{8}'' \times 44 \frac{1}{4}''$$

IF MINIMUM CO HEIGHT IS REQUIRED

$$\text{Heel Height} = 24 \frac{1}{2}''^1 + (2 \times 1 \frac{3}{8}'')$$

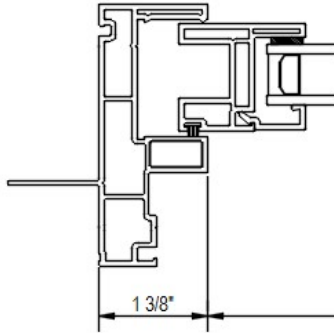
$$\text{Heel Width} = [(820 \text{ sq. in.} / 24'') + \frac{1}{2}''^1 + 1 \frac{3}{8}'' + \frac{3}{8}'' + 1 \frac{1}{8}''$$

$$\text{Minimum Heel to Centerline of Interlock Heel Dimension} = 37 \frac{5}{8}'' \times 27 \frac{1}{4}''$$

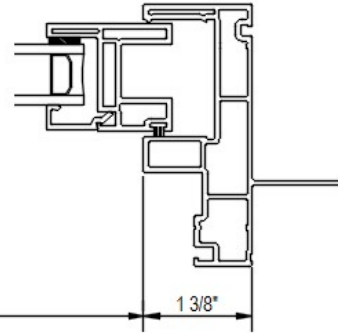
¹ It is Starline's policy to add 1/2" to both width and height of the clear opening to ensure it meets code compliance.

Vertical Slider Clear Opening Height Measurement Point

JAMB

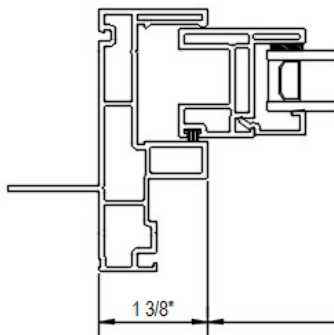


JAMB

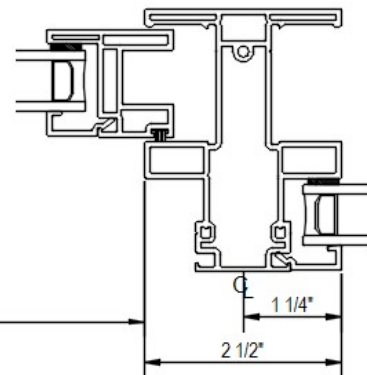


CLEAR OPENING

JAMB

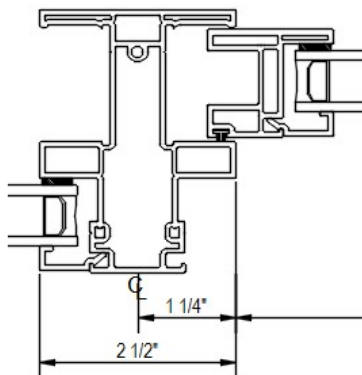


MULLION

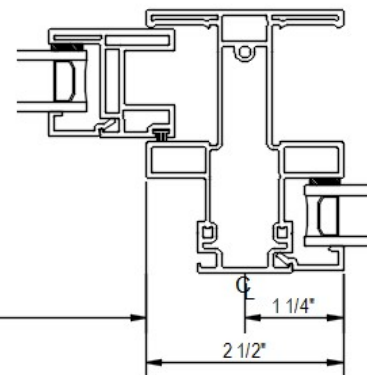


CLEAR OPENING

MULLION

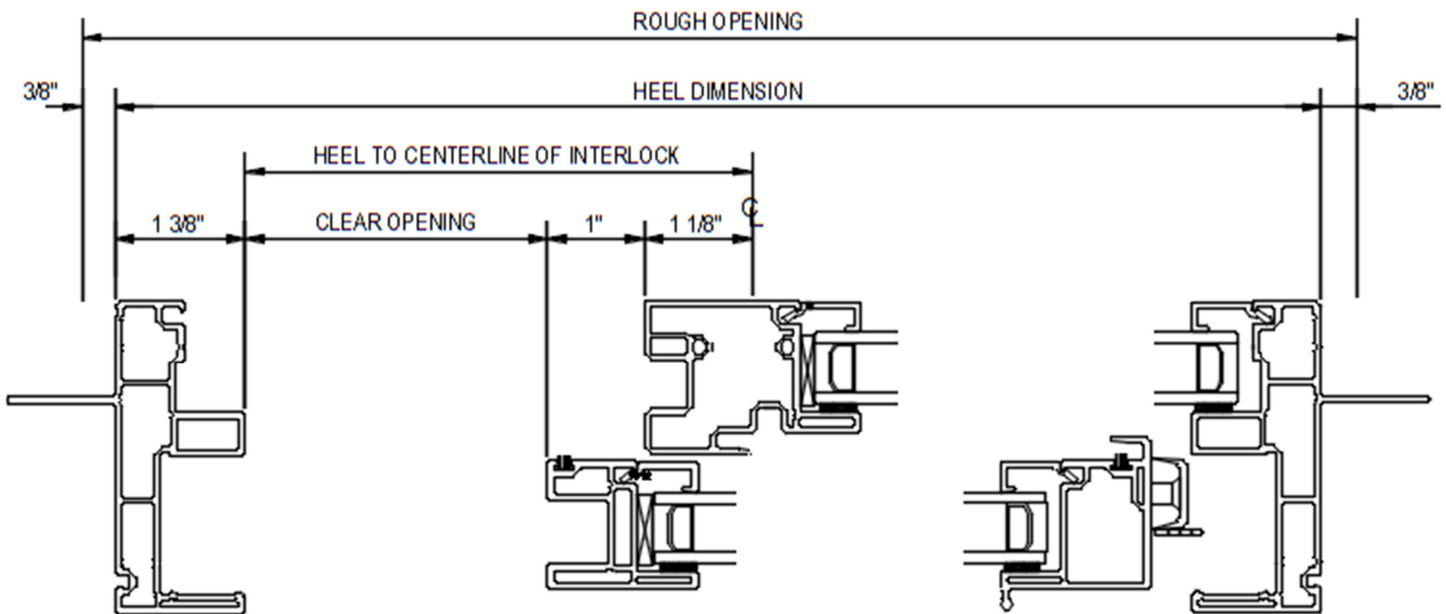


MULLION



CLEAR OPENING

X/O, O/X Vertical Slider Clear Opening Between Jamb and Interlock



CANADA: CLEAR OPENING (CO) REQUIREMENTS: 15" WIDTH; 15" HEIGHT; 543 SQ. IN. TOTAL AREA

IF MINIMUM CO HEIGHT IS REQUIRED

$$\text{Heel Height} = (15 \frac{1}{2}"^1 + 1 \frac{3}{8}" + 1" + 1 \frac{1}{8}") \times 2$$

$$\text{Heel Width} = [(543 \text{ sq. in.} / 15") + \frac{1}{2}"^1 + (2 \times 1 \frac{3}{8}")]$$

$$\text{Minimum Heel Dimension} = 39 \frac{1}{2}" \times 38"$$

IF MINIMUM CO WIDTH IS RQUIRED

$$\text{Heel Width} = 15 \frac{1}{2}"^1 + (2 \times 1 \frac{3}{8}")$$

$$\text{Heel Height} = [(543 \text{ sq. in.} / 15") + \frac{1}{2}"^1 + 1 \frac{3}{8}" + 1" + 1 \frac{1}{8}"] \times 2$$

$$\text{Minimum Heel Dimension} = 18 \frac{1}{4}" \times 80 \frac{1}{2}"$$

USA: CLEAR OPENING (CO) REQUIREMENTS: 20" WIDTH; 24" HEIGHT; 820 SQ. IN. TOTAL AREA

IF MINIMUM CO HEIGHT IS REQUIRED

$$\text{Heel Height} = (24 \frac{1}{2}"^1 + 1 \frac{3}{8}" + 1" + 1 \frac{1}{8}") \times 2$$

$$\text{Heel Width} = [(820 \text{ sq. in.} / 24") + \frac{1}{2}"^1 + (2 \times 1 \frac{3}{8}")]$$

$$\text{Minimum Heel Dimension} = 37 \frac{1}{2}" \times 56"$$

IF MINIMUM CO WIDTH IS RQUIRED

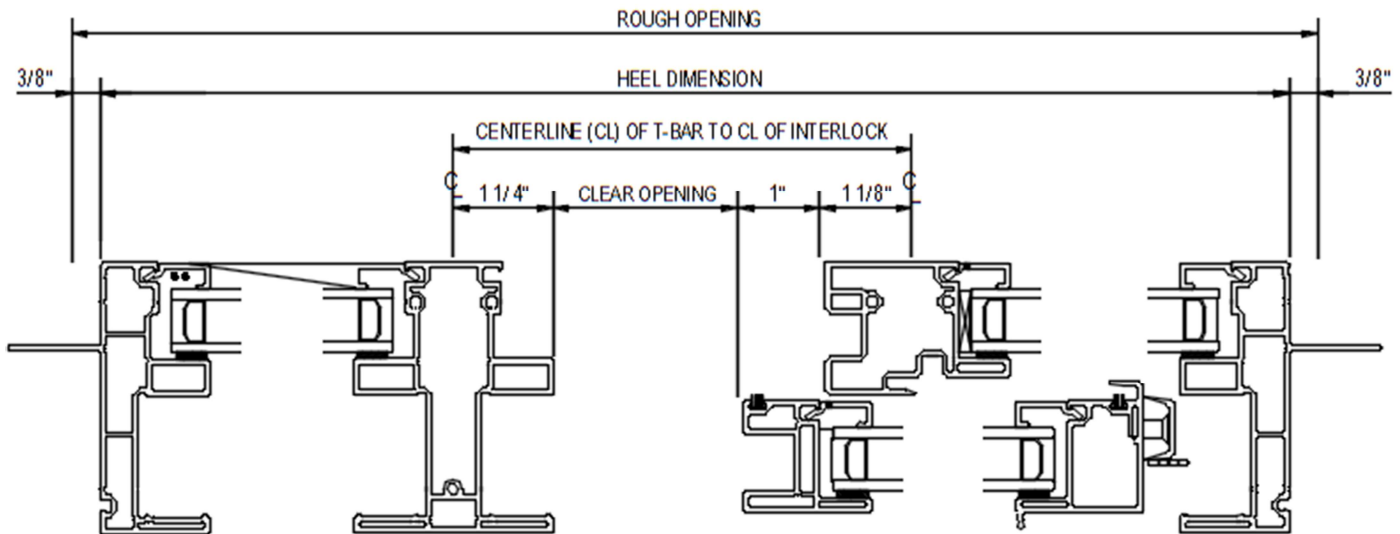
$$\text{Heel Width} = 20 \frac{1}{2}"^1 + (2 \times 1 \frac{3}{8}")$$

$$\text{Heel Height} = [(820 \text{ sq. in.} / 20") + \frac{1}{2}"^1 + 1 \frac{3}{8}" + 1" + 1 \frac{1}{8}"] \times 2$$

$$\text{Minimum Heel Dimension} = 23 \frac{1}{4}" \times 90"$$

¹ It is Starline's policy to add 1/2" to both width and height of the clear opening to ensure it meets code compliance.

O/X/O Vertical Slider Clear Opening Between C/L to C/L of Interlock



Note: The heel dimension cannot be calculated as it is dependent on the fixed lite dimensions. While the fixed lites can be larger than the centerline (CL) of T-Bar to CL of interlock dimensions, the fixed lite in which the slider opens towards cannot be less than the CL of T-Bar to CL of interlock dimension. The following calculations provide the minimum dimension for CL of T-Bar to CL of interlock.

CANADA: CLEAR OPENING (CO) REQUIREMENTS: 15" WIDTH; 15" HEIGHT; 543 SQ. IN. TOTAL AREA

IF MINIMUM CO HEIGHT IS REQUIRED

$$\text{Heel Height} = 15 \frac{1}{2}"^1 + 1 \frac{1}{4}" + 1" + 1 \frac{1}{8}"$$

$$\text{Heel Width} = [(543 \text{ sq. in.} / 15") + 1/2" + (2 \times 1 \frac{3}{8}")]$$

$$\text{Minimum CL of T-Bar to CL of Interlock Heel Dimension} = 39 \frac{1}{2}" \times 18 \frac{7}{8}"$$

IF MINIMUM CO WIDTH IS REQUIRED

$$\text{Heel Width} = (15 \frac{1}{2}"^1 + (2 \times 1 \frac{3}{8}"))$$

$$\text{Heel Height} = (543 \text{ sq. in.} / 15") + 1/2" + 1 \frac{1}{4}" + 1" + 1 \frac{1}{8}"$$

$$\text{Minimum CL of T-Bar to CL of Interlock Heel Dimension} = 18 \frac{1}{4}" \times 40 \frac{1}{8}"$$

USA: CLEAR OPENING (CO) REQUIREMENTS: 20" WIDTH; 24" HEIGHT; 820 SQ. IN. TOTAL AREA

IF MINIMUM CO HEIGHT IS REQUIRED

$$\text{Heel Height} = 24 \frac{1}{2}"^1 + 1 \frac{1}{4}" + 1" + 1 \frac{1}{8}"$$

$$\text{Heel Width} = [(820 \text{ sq. in.} / 24") + 1/2" + (2 \times 1 \frac{3}{8}")]$$

$$\text{Minimum Heel Dimension} = 37 \frac{1}{2}" \times 27 \frac{7}{8}"$$

IF MINIMUM CO WIDTH IS REQUIRED

$$\text{Heel Width} = (20 \frac{1}{2}"^1 + (2 \times 1 \frac{3}{8}"))$$

$$\text{Heel Height} = (820 \text{ sq. in.} / 20") + 1/2" + 1 \frac{1}{4}" + 1" + 1 \frac{1}{8}"$$

$$\text{Minimum Heel Dimension} = 23 \frac{1}{4}" \times 44 \frac{7}{8}"$$

¹ It is Starline's policy to add 1/2" to both width and height of the clear opening to ensure it meets code compliance.

Determining Clear Opening Based on Heel Dimension Provided

CANADA: CLEAR OPENING (CO) REQUIREMENTS: 15" WIDTH; 15" HEIGHT; 543 SQ. IN. TOTAL AREA

XO, OX HORIZONTAL SLIDER

Clear Opening Width = (Heel Dimension / 2) – 2.875"

Clear Opening Height = Heel Dimension – 2.75"

OXO HORIZONTAL SLIDER

Clear Opening Width = C/L of T-Bar to C/L of Interlock Heel Dimension – 2.75"

Clear Opening Height = Heel Dimension – 2.75"

XOX HORIZONTAL SLIDER

Clear Opening Width = Heel to C/L of T-Bar – 2.875"

Clear Opening Height = Heel Dimension – 2.75"

XO, OX VERTICAL SLIDER

Clear Opening Height = (Heel Dimension / 2) – 3.5"

Clear Opening Width = Heel Dimension – 2.75"

OXO VERTICAL SLIDER

Clear Opening Height = C/L of T-Bar to C/L of Interlock Heel Dimension – 3.375"

Clear Opening Width = Heel Dimension – 2.75"

NOTE: No clear opening dimension can be smaller than 15 1/2" in either the width or the height as it is Starline's policy to manufacturer to a 1/2" larger dimension than minimum code requirement while also ensuring a minimum area for the clear opening is 543 sq. in. or greater.

Product Specification 08 53 13 – Vinyl Windows



Note: Bolded text in this specification are options that are highlighted for the specifier to select or to list requirements.

Part 1 - General

A fully welded 3 1/2" PVC window frame designed for single family homes, townhouses, residential low and midrise construction and institutional projects. ¹

¹ Note to specifier: Frame depth depends on frame type selected. Nail-on Flange, Rebate, and Rainshield frame depths vary. Above frame depth is based on Starline's standard Nail-on Flange frame. If a frame type other than Nail-on Flange is selected, contact technical@starlinewindows.com for further information.

1.1 Summary

A. Section Includes: Vinyl Windows:

1. Vinyl **fixed and/or horizontal sliding and/or vertical sliding** windows complete with **Nail-on Flange (Eclipse or traditional) and /or Rebate and / or Rainshield frame** to be Starline's Eclipse 6000 Series window manufactured by Starline Windows Ltd.
2. Work included: Furnish labor, material and other services to complete the fabrication and installation of the windows, including all materials and fitments required for the operation of the units in the manner, direction and performance shown on the shop drawings and specified herein.

Work not included: Structural support of window framing, interior trims. (**Specifier list others**).

Related work specified elsewhere: (**Specifier to list**).

B. Related Sections: (**Specifier to select the following related sections**)

1. 07 27 00 – Air Barriers
2. 07 60 00 – Flashing and Trim
3. 07 92 00 – Joint Sealants
4. 08 15 23 – Vinyl-Framed Glass Swing Doors
5. 08 32 13 – Sliding Vinyl-Framed Glass Doors
6. 08 80 00 – Glazing

1.2 Quality Assurance

- A. Drawings and specifications for Work of this Section are based upon the Eclipse 6000 Punched Windows manufactured by Starline Windows. Whenever alternative products are offered, submit supporting technical literature, samples, drawings and performance data for comparison 10 days prior to closing date. Test reports must be made available on request.
- B. Windows shall be tested and conform to the AAMA/WDMA/CSA 101 I.S.2/A440-08, AAMA/WDMA/CSA 101 I.S.2/A440-11, and CSA A440SI-09 requirements.
- C. Manufacturer Qualifications:
 1. Manufacturer to have a minimum 10 years of documented experience.

2. Manufacturer capable of providing an aluminum window system that meet or exceed the performance requirements indicated.
3. Manufacturer capable of providing field representation during window installation.
- D. Installer Qualifications: Installer performing the Work in this Section to have a minimum of 3 years documented experience and approved by the manufacturer.
- E. Mock-Up: If requested by Consultant, a mock up is to be provided and installed at project site. Mock-up to include acceptable products and manufacturer approved installation methods. Obtain Owner's and Consultant's acceptance of finish color, and workmanship standard.

1.3 Structural requirements¹

Specifier to select or remove section depending if project is engineered.

- A. Limit mullion deflection to L/175.
- B. Allow for deflection of building structure. Vinyl windows shall be designed, fabricated and installed to withstand slab edge vertical differential deflections of maximum $3/4''^2$ and seismic inter-story lateral drift movements of elastic $\pm 3/8''^1$ without significant damage to the fenestration system or in-elastic $\pm 1 3/4''^1$ with significant damage expected but framing to be designed to remain anchored to the structure.

¹ Note to specifier: This section is only applicable if there is a Professional Engineer involved with the project.

² Values may change based on the configuration of the windows. Values to be specified by a Professional Engineer.

1.4 Test and Performance Requirements

Specifier to select from the following performance requirements.

- A. Fixed window wall shall meet performance class **LC-PG50** when tested to AAMA/WDMA/CSA 101 I.S.2/A440-08, AAMA/WDMA/CSA 101 I.S.2/A440-11, and CSA A440SI-09:
 1. Air Infiltration: Fixed window air infiltration shall not exceed 0.05 cfm/ft² (A3) when tested in accordance with ASTM E 283 with a pressure difference of 1.57 psf / 75 Pa.
 2. Water Penetration Resistance:
 - I. There shall be no water infiltration for fixed windows when tested in accordance with ASTM E547 with a pressure difference of 12.11 psf / 575 Pa (Laboratory Test).
 - II. There shall be no water infiltration for fixed windows when tested in accordance with AAMA 502-08 with a pressure difference up to a maximum of 6.89 psf / 330 Pa (Field Test)²
 3. Uniform Load Deflection Test: The deflection of fixed window shall not exceed L/175 and there shall be no permanent set when tested in accordance with ASTM E330 with a design pressure of 50 psf / 2394 Pa, positive and negative.
 4. Uniform Load Structural Test: There shall be no damage to hardware, accessories, fasteners, or any other damage that would render the window in operable when tested in accordance with ASTM E330 with a structural test pressure of 75.19 psf / 3600 Pa, positive and negative.
 5. Thermal Performance³
 - I. U-value: The maximum fixed window thermal transmittance U-value shall be **0.28 BTU/ hr*ft²*°F (1.59 W/m²*K) when tested in accordance with AAMA 1503.1 and CAN/CSA-A440.2. Windows shall be tested and labeled to N.F.R.C. standard 100 & 200.**
 - II. Solar Heat Gain Coefficient: A (**maximum or minimum**) of **0.36**.
 - III. Visible Light Transmittance: A (**maximum or minimum**) of **0.65**.

- B. Operable windows (ventilator) shall meet performance class **CW- PG55¹** when tested to AMA/WDMA/CSA 101 I.S.2/A440-08, AAMA/WDMA/CSA 101 I.S.2/A440-11 and CSA A440SI-09:
1. Air Infiltration: Operable window air infiltration shall not exceed 0.05 cfm/ft² (A3) when tested in accordance with ASTM E 283 with a pressure difference of 1.57 psf / 75 Pa.
 2. Water Penetration Resistance:
 - I. There shall be no water infiltration for operable windows when tested in accordance with ASTM E547 with a pressure difference of 12.11 psf / 575 Pa (Laboratory Test).
 - II. There shall be no water infiltration for operable windows when tested in accordance with AAMA 502-08 with a pressure difference up to a maximum of 6.89 psf / 330 Pa (Field Test)²
 3. Uniform Load Deflection Test: The deflection of operable window shall not exceed L/175 and there shall be no permanent set when tested in accordance with ASTM E330 with a design pressure of 50 psf / 2394 Pa, positive and negative.
 4. Uniform Load Structural Test: There shall be no damage to hardware, accessories, fasteners, or any other damage that would render the window in operable when tested in accordance with ASTM E330 with a structural test pressure of 75.19 psf / 3600 Pa, positive and negative.
 5. Thermal Performance³
 - I. U-value:
 - a. **Horizontal Slider:** The maximum awning window thermal transmittance U-value shall be 0.30 BTU/hr*ft²*°F (1.70 W/m²*k) when tested in accordance with AAMA 1503.1 and CAN/CSA-A440.2. Windows shall be tested and labeled to N.F.R.C. standard 100 & 200.
 - b. **Vertical Slider:** The maximum casement window thermal transmittance U-value shall be 0.30 BTU/hr*ft²*°F (1.70 W/m²*k) when tested in accordance with AAMA 1503.1 and CAN/CSA-A440.2. Windows shall be tested and labeled to N.F.R.C. standard 100 & 200.
 - II. Solar Heat Gain Coefficient:
 - a. **Horizontal Slider:** A (maximum or minimum) of 0.33.
 - b. **Vertical Slider:** A (maximum or minimum) of 0.33.
 - III. Visible Light Transmittance:
 - a. **Horizontal Slider:** A (maximum or minimum) of 0.59.
 - b. **Vertical Slider:** A (maximum or minimum) of 0.59.

¹Note to specifier: Performance class result is based on lab testing and will vary by configuration and glass type. Contact Starline Windows for information on how the product can be engineered to achieve higher performance class than specified above.

²Note to specifier: 330Pa / 6.89 psf is the maximum field test result that can be achieved. Should the Project Specifications state a water penetration resistance field test pressure of a lesser value, the project specified values shall govern. The water penetration resistance field tests shall follow the criteria and testing procedures as outlined in the AAMA 502-08 specification standard.

³Note to specifier: Thermal performance depends on glass specified. For double glazed values the above test was performed using 19mm double glazed insulated glass unit (3mm/Argon/3mm) with Standard high performance soft coat (sputtered) Low E which is applied to surface #2, argon filled with aluminum spacer bar.

Note: A second low E coating can be applied to surface #4 to further increase the thermal performance. The NFRC test sizes were 47" x 59" (1200mm x 1500mm) for a fixed window, 59" x 47 1/4" (1500mm x 1200mm) for a horizontal sliding window and 47 1/4" x 59" (1200mm x 1500mm) for a vertical sliding window.

1.5 Submittals

- A. Product Data: Submit complete product data on system being used.
- B. Samples: Submit glass and frame colour(s) samples.
- C. Close-out Submittals:
 - 1. Warranty: Submit executed Manufacturer's warranty.
 - 2. Project Record Documents: Submit operation and maintenance data for installed product in accordance with General Conditions.

Part 2 – Products

2.1 Manufacturers

- A. Acceptable Manufacturers: Starline Windows
 - 1. Vinyl Windows (Punched Opening): Eclipse 6000 Series
- B. Substitutions: Approved alternates

2.2 Material

- A. Vinyl Extrusion:
 - 1. 89 mm (3 1/2") deep perimeter frame member¹.
 - 2. Multi-chamber for strength and thermal performance with a nominal wall thickness of 1.93mm (0.078").
 - 3. Frame member and intermediate bars 100% uPVC and is UV stabilized for optimum outdoor performance.
- B. Fasteners: Stainless steel and / or steel coated with Leland DT200 coating and of sufficient size and quantity to perform their intended function.
- C. Weather-stripping: Finseal material.
- D. Glass Setting Blocks: FPVC, Neoprene, EPDM, Santoprene or silicone with an 80 to 90 ± Shore A durometer hardness. Block material shall be compatible with sealed unit edge sealant.
- E. Glazing bead: uPVC and glazed from the outside.
- F. Glazing tape: Foam tape.

2.3 Fabrication

- A. Fabricate framing from extrusions of size and shape shown on approved shop drawings or approved signed order if shop drawings are not applicable.
- B. Main framing and operable sash (ventilator) extrusions shall be welded mitre corner construction.
- C. Intermediate mullions and T-Bars shall be butt jointed and gasketed, mechanically screwed and sealed to the main perimeter frame.
- D. All framing profiles shall be straight and free of deformations and defects.
- E. Joints shall be accurately machined, fitted and sealed.
- F. Coupling mullions shall be designed to provide a functional split to permit modular construction and allow for thermal expansion.

- G. Perimeter frame shall be 89mm (3 1/2") deep with a minimum wall thickness of 2mm (0.078") and be thermally broken.¹
- H. Operable window (ventilator) shall be 33mm (1 5/16") deep with a minimum wall thickness of 2mm (0.078") and be thermally broken.
- I. All interior joints and interior screw heads shall be sealed with a non-hardening sealant.
- J. Sliding ventilator shall have a single Mohair weather strip with fin seal. Weather stripping will be white when a white, beige or silver exterior frame colour is used and weather stripping will be black when a brown, charcoal or black frame is used.
- K. All glazing pockets shall be vented, pressure equalized, and drained to the outside.
- L. Glass bead shall be uPVC and a snap-in screw less type.

¹Note to specifier: Frame depth depends on frame type selected. Nail-flange, Rebate and Rainshield frame depths vary. Above frame depth is based on Starline's standard Nail-on flange frame.

2.4 Glazing¹

- A. Double glazed, double seal insulated glass unit (IGU) with an overall thickness of 3/4" (19 mm).
- B. Standard high-performance soft coat (sputtered) Low E applied to surface #2.
- C. Aluminum spacer with argon fill.
- D. Glass thickness shall be 3mm. Glass thickness and quality shall conform to the requirements of the U.S.A. and Canadian Code for commercial construction, current edition.
- E. Where practical, glazing shall be installed at the factory before shipping to site.

¹ Note to specifier: Glazing noted above is based on Starline Windows standard product offering. There are various other options available. See [2.7.A](#) of this specification.

2.5 Hardware¹

- A. Hardware for the vinyl operable sash (ventilator) and window frames shall be furnished by the window manufacturer.
- B. Where practical, all hardware fittings shall be installed at the factory before shipping to site.
- C. Hardware shall be as follows:
 - 1. Sliding operable sash (ventilator) slides on PVC rollers that have a stainless-steel axle.
 - 2. Cam lock with spring design. The spring design holds the handle in locked and unlocked positions. Cam locks are PVC and are available in white.

¹ Note to specifier: Hardware noted above is based on Starline Windows standard product offering. There are various other options available. Refer to [2.7.F](#) of this specification.

2.6 Frame Finish

- A. All exposed surfaces of vinyl window and framing members shall be free of scratches and other serious surface blemishes.
- B. Finish: Standard white on the exterior and interior¹.

¹ Note to Specifier: Option to have dual frame colour; Painted colour on the exterior of the window only. The interior of the window is always white. Should an exterior colour be required, refer to [2.7.D](#) of this specification.

2.7 Optional Items

Specifier to select from the following options and remove options not being selected

- A. Glazing
1. **4mm, 5mm, 6mm and greater thickness** available.
 2. Tinted, obscured & reflective glass
 3. Laminated glass
 4. Insulated glass internal grilles
 5. Surface mounted (plant-on) muntins.
 6. Spacer bars
 - i. Aluminum spacer bar
 - ii. Black aluminum spacer bar
- B. Coupling mullions – Range of couplers are available, i.e.: 180°, 135° (Bay), variable degree, ect.
- C. Extruded aluminum head flashing
- D. Dual frame color upgrade options – 1 color on exterior and white on the interior:
1. UV cure coating¹: UV cure coating on the exterior with white interior.

Black	Brown	Silver
Charcoal	Beige	
 2. **Custom colours² may be available.** Virtually any colour can be matched or very closely matched. The scope of work and overall custom colour quantity will be reviewed by Starline on a project specific basis to determine the feasibility of the custom colour request.
- E. Shop Drawings: Submit complete shop drawings which include floor plans, elevations, window schedule, and product components including anchorage, fasteners, accessories and finish colour
1. Non-engineered shop drawings.
 2. Engineered shop drawings, stamped and sealed by professional engineer.
- F. Hardware:
1. Secondary latch which restricts window to opening 4". Retractable and non-retractable options. Available in white.
 2. Auto lock. Available in white.
- G. Sill Shim (Factory Installed).
- H. Protection: Insulated Glass Unit shall be protected with smart guard on the **exterior and / or interior**.
- I. Insect Screens: Frames are made from extruded aluminum and are rigidly joined at the corners. Aluminum frame shall be finished to match interior window frame colour. Screen shall be black fiber mesh. Screens are held in place with clips.

¹ Note to Specifier: UV colours are available for an additional cost premium.

² Custom colours are available for an additional cost premium. An approximate 12-week lead time is required to procure custom colour requests.

Part 3 - Execution

3.1 Examination

- A. Installer to examine openings, structural support, substrates and any other conditions that would affect the installation, for compliance with manufacturer's instructions.
- B. Verify rough opening dimensions.
- C. Verify sill is within tolerance of levelness to ensure adequate shimming to obtain proper drainage.

3.2 Installation

- A. Install manufacturer's system in accordance with manufacturer's approved shop drawings.
- B. Windows shall be installed and adjusted by experienced personnel in accordance with the manufacturer instructions and approved shop drawings.
- C. All items in this section shall be set in their correct location and shall be set level, square, plumb and at proper elevations and in alignment with other work.

3.3 Field Quality and Control

- A. Manufacturer's Field Services: Upon Owner and/or Consultants written request, provide manufacturer's field service representative for site visit to inspect installation and to ensure accordance with manufacturer's instruction and approved shop drawings.
- B. Field Tests: Owner and/or Consultant may choose to conduct tests for water penetration and air infiltration.
 - 1. Testing Standard per AAMA 502.
 - 2. Field testing shall be performed by a qualified independent testing agency.
 - 3. Field testing should not occur until the window has been installed and the caulking is cured. Ensure the products used to complete building envelope tie in (membrane, caulking, flashing, cladding, etc.) are installed complete and have cured.

3.4 Protection and Cleaning

- A. Protection: Windows shall be isolated from concrete, mortar, plaster and dissimilar metals with bituminous paint or other isolation coatings.
- B. Cleaning: It shall be the responsibility of the General Contractor to maintain protection and provide final cleaning.

Note: This specification is intended to be used by a qualified Specifier and will require modifications for the project specific requirements. This specification is not intended to be use verbatim as the project specific specification.

Laws, building and safety codes governing the design and use of this product vary widely. Starline Windows does not control the selection and use of this product and assumes no responsibility therefor.

Series 6000 Double Glazed NFRC Product Energy Chart

NFRC PRODUCT ENERGY CHART

DOUBLE GLAZED (19mm IGU)	GLAZING (Ext/Gap/Int)	U VALUE (W/M²k)	U VALUE (Btu/hft²F)	Shading Coefficient	Solar Heat Gain Coefficient	Visible Light Transmittance	CPD (Certified Product Directory)
Center of Glass (COG)	3mm LOE270 (#2) / Arg / 3mm Clear	1.42	0.25	0.42	0.37	0.70	
	3mm LOE366 (#2) / Arg / 3mm Clear	1.36	0.24	0.31	0.27	0.65	
	3mm LOE270 / Arg / 3mm i89 (#4)	1.14	0.20	0.41	0.36	0.68	
	3mm LOE366 / Arg / 3mm i89 (#4)	1.14	0.20	0.31	0.27	0.63	
Picture (Fixed)	3mm LOE270 (#2) / Arg / 3mm Clear	1.48	0.26	0.38	0.33	0.63	STL-A-42-02953-00001
	3mm LOE366 (#2) / Arg / 3mm Clear	1.48	0.26	0.29	0.25	0.58	STL-A-42-02954-00001
	3mm LOE270 / Arg / 3mm i89 (#4)	1.25	0.22	0.37	0.32	0.61	STL-A-42-02955-00001
	3mm LOE366 / Arg / 3mm i89 (#4)	1.19	0.21	0.28	0.24	0.57	STL-A-42-02956-00001
Horizontal Slider	3mm LOE270 (#2) / Arg / 3mm Clear	1.59	0.28	0.34	0.30	0.57	STL-A-43-02953-00001
	3mm LOE366 (#2) / Arg / 3mm Clear	1.59	0.28	0.25	0.22	0.53	STL-A-43-02954-00001
	3mm LOE270 / Arg / 3mm i89 (#4)	1.36	0.24	0.34	0.30	0.55	STL-A-43-02955-00001
	3mm LOE366 / Arg / 3mm i89 (#4)	1.36	0.24	0.25	0.22	0.51	STL-A-43-02956-00001
Vertical Slider	3mm LOE270 (#2) / Arg / 3mm Clear	1.59	0.28	0.34	0.30	0.57	STL-A-44-02953-00001
	3mm LOE366 (#2) / Arg / 3mm Clear	1.59	0.28	0.25	0.22	0.53	STL-A-44-02954-00001
	3mm LOE270 / Arg / 3mm i89 (#4)	1.36	0.24	0.34	0.30	0.55	STL-A-44-02955-00001
	3mm LOE366 / Arg / 3mm i89 (#4)	1.36	0.24	0.25	0.22	0.51	STL-A-44-02956-00001
I.G.U. (Insulated Glass Unit)	GLASS			WARM EDGE SPACER		GAS FILL	
	Cardinal LOE270 (#2 surface) Cardinal LOE366 (#2 surface) Cardinal i89 (#4 surface)			13.0mm (1/2")		90% Argon & 10% Air	

Based on NFRC CPD - Recertification Date: November 2019 Expiration Date: June 2024