

3500-3501 SERIES

EUROSTAR SWING DOOR

PRODUCT CATALOGUE
VINYL DOOR



STARLINE
WINDOWS



Foreword

This Design Guide provides specifications on the Series 3500 outswing and inswing vinyl balcony door.

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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Series 3500 and 3501 Outswing and Inswing Balcony Door Design Guidelines

Recommended Size Guidelines

Starline Windows provides maximum guidelines for door module area and weight for new construction and restoration projects. The Eurostar 3500 Series is an outswing patio door. The Eurostar 3501 Series is an inswing patio door. Unless specifically stated, the information contained in this document applies to both outswing and inswing patio doors.

Door Configuration Options

DD = French Door

D = Swing Door

S = Side Lite

T/DD = Transom over
French Door

T/D = Transom over
Swing Door

In the following tables: ✓ Means available door configuration. ✗ Means unavailable door configuration.

SWING DOOR STANDARD SIZES AND AVAILABLE CONFIGURATIONS¹

Heel Dimension	Width	37 1/4"		41 1/4"	
	Height	82 1/4"	94 1/4"	82 1/4"	94 1/4"
Configuration	D	✓	✓	✓	✓
	S	✓	✓	✓	✓
	T/D	✗	✓	✗	✓

FRENCH AND MULTI-LITE DOOR SIZES AND AVAILABLE CONFIGURATIONS¹

Heel Dimension	Width	62 1/4"		66 1/4"		70 1/4"		74 1/4"		86 1/4"		92 1/4"	
	Height	82 1/4"	94 1/4"	82 1/4"	94 1/4"	82 1/4"	94 1/4"	82 1/4"	94 1/4"	82 1/4"	94 1/4"	82 1/4"	94 1/4"
Configuration	DD	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	✗
	SD	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	✗
	SDDS	✗	✗	✗	✗	✗	✗	✗	✗	✓	✓	✓	✓
	SDS	✗	✗	✗	✗	✗	✗	✗	✓	✓	✓	✓	✓
	T/DD	✗	✓	✗	✓	✗	✓	✗	✓	✗	✓	✗	✗
	T/SD	✗	✓	✗	✓	✗	✓	✗	✓	✗	✓	✗	✗
	T/SDDS	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓	✗	✓
	T/SDS	✗	✗	✗	✗	✗	✗	✗	✓	✗	✓	✗	✓
	TT/DD	✗	✓	✗	✓	✗	✓	✗	✓	✗	✓	✗	✗
	TT/SD	✗	✓	✗	✓	✗	✓	✗	✓	✗	✓	✗	✗
	TTT/SDS	✗	✗	✗	✗	✗	✗	✗	✓	✗	✓	✗	✓

¹ Non-standard door sizes may be available upon request and for an additional cost. Non-standard sizing will be reviewed on a project specific basis and may require longer lead times.

SWING, FRENCH & MULTI-LITE DOOR MAXIMUM MODULE WEIGHT, HEIGHT AND AREA

3500 Vent		
Max Heel Width	Max Heel Height	Max Sq.ft
42"	95"	28 Double Glazed
		20 Triple Glazed

3500 Combo		
Max Heel Width	Max Heel Height	Max Sq.ft
102"	95"	68 Double Glazed
		60 Triple Glazed

3500 Sidelite		
Max Heel Width	Max Heel Height	Max Sq.ft
60"	95"	50 Double Glazed
		40 Triple Glazed

MAXIMUM IGU AREA BASED ON GLASS LITE THICKNESS ⁴

GLASS THICKNESS	MAX. IGU	MAX. UNITED INCHES (One Width + Height)
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 (ex. annealed, tempered, laminated, 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 Vitrum Glass Groups website at: <http://www.vitrum.ca/> for the most up to date information.

¹ UV Cure coat is available for the exterior and interior of the window frame.

² Maximum module 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 door module 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 door module is greater than 300 lbs, site glazing is required due to manufacturing limitations. Door modules 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 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** chart above for minimum allowable glass thickness. A minimum glass thickness of 4mm is required for all swing doors regardless of IGU size. Fixed lites can use 3mm or thicker depending on the overall IGU size. **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.

Series 3500 and 3501 Outswing and Inswing Balcony Door Design Guidelines

⁴ Glass thickness may be required to be thicker than stated in the **Maximum IGU Area Based on Glass Lite Thickness** chart due to structural requirements, building code requirements, by-law requirements, etc. Example: 4mm thick glass is selected from the chart for an IGU that is 25 sq. ft. (4mm can be up to 30 sq. ft). Due to structural requirements, 5mm glass is required (due to wind load). 5mm glass is heavier than 4mm glass, therefore the door size may need to be reduced to keep overall weight within Starline windows recommended maximum weight.

Door Hardware

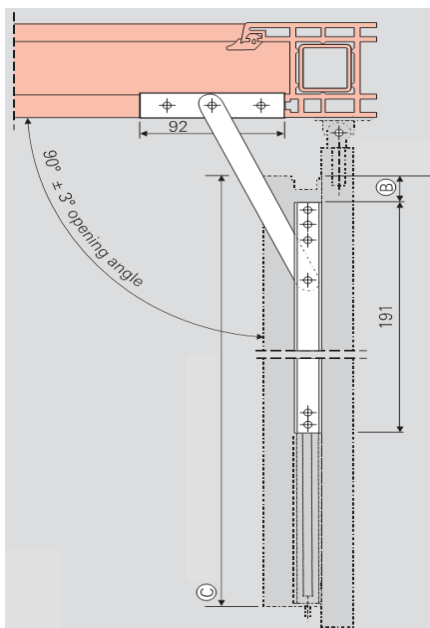
The Eurostar 3500 & 3501 swing door has an interior and exterior 5" long lever handle, complete with escutcheon plate made from zinc die cast. Handles are available in white and black.

Deadbolt/Cylinder with interior thumb-turn which engages multi-point locking system.

Minimum three hinges per door leaf. Hinges are on the exterior for an exterior swing door and on the interior for an interior swing door. Hinges are available in white, black and silver.

Options include keyed locks, overhead holders (stay arm) in stainless steel, and security automatic door lock/lever handle.

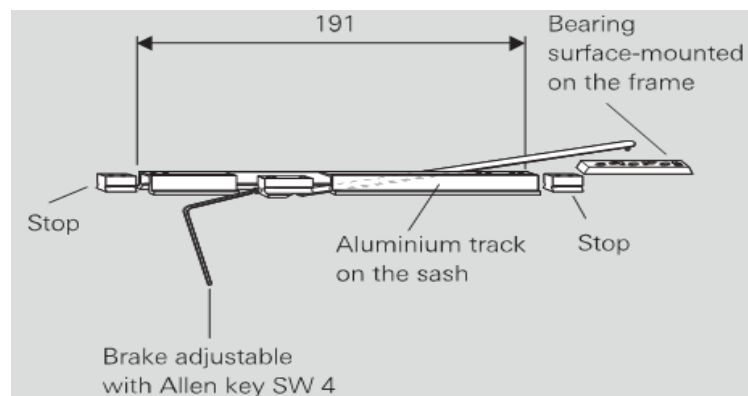
Overhead holder (stay arm)



The Eurostar stay arm is designed to prevent damage to the door and hardware from the abuse of heavy winds and misuse of the door.

As per the image below you can increase the strength and position the stay arm by using an allen key and twisting clockwise.

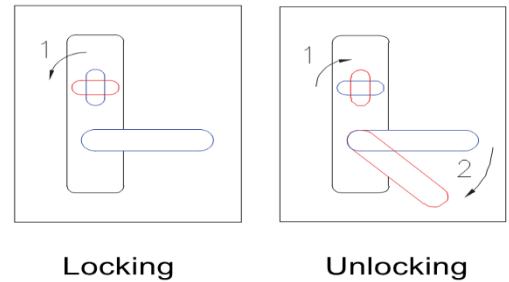
If you require more information regarding Starline's stay arm, please email technical@starlinewindows.com.



Security Automatic Door Lock and Lever Handle

The new “Security” automatic locking system features a 3-point automatic latching system with a 1” deadbolt and two additional 3/4” latches which become deadbolts for maximum security and protection¹.

In contrary to the standard multi-point locking system this hardware option engages automatically when the door is closed and does not require the turning of the handle when in the closed position to lock the door. The door can be locked simply by turning the thumb lock 90 degrees when in the closed position.



¹Security automatic locking system is only available for single family households not for multi-family projects

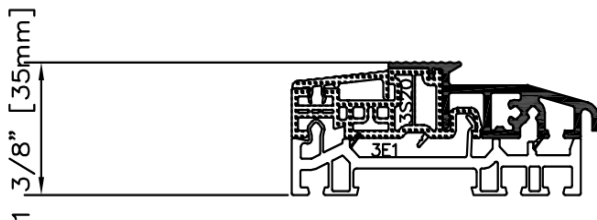
Door Thresholds

The standard door threshold for the Eurostar 3500 Series Outswing Patio Door provides a step of 1 3/8” (35 mm). No nailing flange is available.

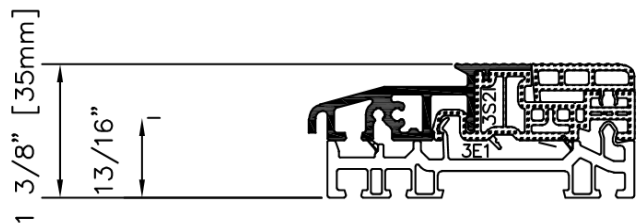
The standard door threshold for the Eurostar 3501 Series Inswing Patio Door provides a step of 1 3/8” (35 mm). No nailing flange is available.

Option – For the Series Eurostar 3500 and 3501 Series Patio Door there is an option for a 2 3/4” (70mm) threshold which is available upon request for higher water ratings.

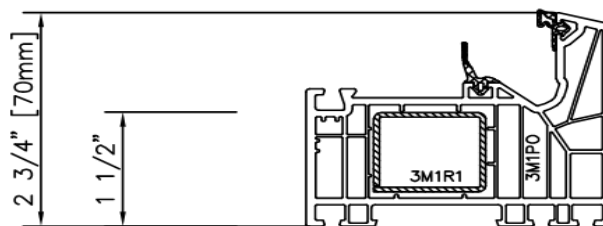
Option – For the series Eurostar 3500 and 3501 Series Patio door there is an accessible threshold option, please reach out to technical@starlinewindows.com for more information.



Series 3500 Standard Threshold
1 3/8” (35mm)



Series 3501 Standard Threshold
1 3/8” (35mm)



Series 3500 & 3501 Optional Threshold
2 3/4” (70mm)

Series 3500 and 3501 Outswing and Inswing Balcony Door Design Guidelines

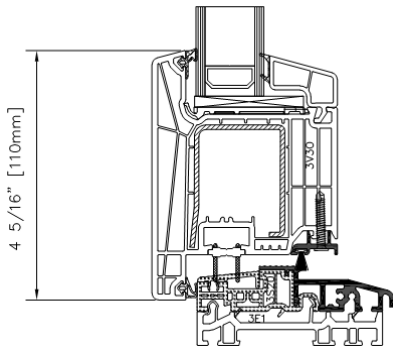
Note: Refer to the *Eurostar 3500 & 3501 Standard Details* pdf for further information. These details will provide some standard installation methods. These installation details are a suggested method of installation and does not necessarily represent a detail that is suitable for a specific project. To confirm project specific details, please check with your Waterproofing / Building Envelope Consultant.

¹ Starline Windows and industry best practice guidelines recommend having an interior air seal.

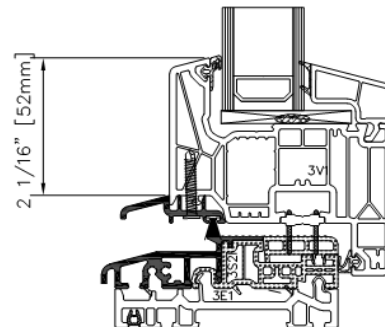
Door Sashes

The standard sash for the Eurostar 3500 and 3501 series Outswing/Inswing Patio Door is 4 5/16" (110mm) when looking from the exterior.

Option – For the series Eurostar 3501 Inswing patio Door there is an option for a 2 1/16" (52mm) door sash which is available upon request.



Series 3500 & 3501 Standard Door Sash
4 5/16" (110mm)



Series 3501 Optional Door Sash
2 1/16" (52mm)

Seamless Welder

The 3500 series product line includes a seamless weld at all four corners of the frame and tbar joints. This innovation in machinery eliminates the welding seam, corner touch ups on painted product and ensures the weld is perfectly flush with the exterior frame.



Frame Finishes

Starline Windows offers various options for vinyl frame finish. 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** are available:

- *Black
- *Black Charcoal

The following **semi-standard¹** colours are available:

- *Brown
- *Silver
- *Beige

***Available to be painted on the exterior and interior**

Custom colours may also be available for the exterior and interior 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.

¹Semi Standard colors that are painted on the exterior and interior must have a minimum of 10 windows to apply.

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

Glazing

Series 3500 and 3501 Outswing and Inswing Balcony Door Design Guidelines

Starline's 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" (20 mm).
- Standard high-performance soft coat (sputtered) Low E which is applied to surface #2.
- Warm edge spacer with argon fill.
- Minimum glass thickness is 4mm.

Options

There is an option to upgrade to a triple glazed IGU, which will be provided enhanced energy performance. The triple glazed IGU will be comprised of the following glass make-up:

- Triple glazing, double seal insulated glass unit with an overall thickness of 1 3/8" (36 mm).
- Standard high-performance soft coat (sputtered) Low E which is applied to surface #2.
- Warm edge spacer with argon fill.
- Minimum glass thickness is 4mm.

Additional options are available for an additional cost.

Maximum IGU Area

Includes united inches based on glass lite thickness.

GLASS THICKNESS	MAX IGU AREA	MAX. UNITED INCHES (One Width + Height)
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.

Refer to the *Vinyl Windows & Doors - Glass & IGU Product Information* document in the **Miscellaneous** section of the catalogue for more detailed information regarding size limitations, available configurations, defects and definitions.

Acoustical Ratings

DOUBLE GLAZED IGU

GLASS EXT.	GAP	GLASS INT.	TEST NUMBER	STC	OITC
4mm Temp	12mm	4mm Temp	TL9200	33	27
4mm Temp	11mm	6mm Temp	TL9201	36	30
6mm Temp	20mm	6mm Lam. W/0.8mm PVB	TL9199	39	32
6mm Temp	21mm	8mm Lam. W/0.8mm PVB	TL9221	39	33

TRIPLE GLAZED IGU

Email any project-specific enquiries to technical@starlinewindows.com
Starline Windows reserves the right to change or discontinue this product without notice.

GLASS EXT.	GAP	GLASS CENTRE	GAP	GLASS INT.	TEST NUMBER	STC	OITC
3mm Temp	12mm	4mm Temp	12mm	4mm Temp	TL9080	36	29
4mm Temp	10mm	4mm Temp	10mm	6mm Temp	TL9084	37	31
4mm Temp	10mm	4mm Temp	10mm	6mm Lam. W/0.8mm PVB	TL9085A	39	31
6mm Temp	11mm	4mm Temp	10mm	8mm Lam. W/0.8mm PVB	TL9222	40	33

Performance Test Results - Canada

EUROSTAR 3500 SERIES OUTSWING PATIO DOOR

PRODUCT DESIGNATOR	AIR TIGHTNESS	WATER PENETRATION RESISTANCE		UNIFORM LOAD DEFLECTION	OPERATIONAL FORCE
		LAB TESTED	FIELD TEST ^{2,3}		
LC-PG55	A3	510PA	330Pa	3960Pa	PASS

Series 3500 Outswing patio door 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

¹ The 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.

² Water penetration resistance field tests shall follow the criteria and testing procedures as outlined in the AAMA 502-08 specification standard. Please see more specific field ratings under section "Field Test Water Ratings".

³ 330Pa / 6.89 psf is the maximum field test result that can be achieved for the Series 3500 & 3501 Patio Door. Should the Project Specifications state a water penetration field test requirement of a lesser value, the project specified values shall govern.

Field Test Water Ratings Per Configuration 3500/3501

3500 DOOR CONFIGURATION	FIELD RATING ¹
Single Outswing – Standard Threshold	300 Pa
Single Outswing – High Threshold (70mm)	500 Pa
Single Outswing – Accessible Threshold	150 Pa
Double Outswing – Standard Threshold	260 Pa
Double Outswing – High Threshold (70mm)	330 Pa

Series 3500 and 3501 Outswing and Inswing Balcony Door Design Guidelines

3501 DOOR CONFIGURATION	FIELD RATING ¹
Single Inswing – Standard Threshold	200 Pa
Single Inswing – High Threshold (70mm)	400 Pa
Single Inswing – Accessible Threshold	150 Pa
Double Inswing – Standard Threshold	TBD
Double Inswing – High Threshold (70mm)	TBD

¹If a project deems a higher field test rating please consult your sales rep or contact technical@starlinewindows.com

Determining Clear Opening Based on Heel Dimension Provided¹

Single Swing

- CO Width = Heel – 7"
- CO Height =
 - Standard Threshold (1 3/8") = Heel – 4 1/8"
 - Optional Threshold (2 3/4") = Heel – 5 1/2"

Single Swing w/Sidelite

- CO Width = Heel – 6 7/16"
- CO Height =
 - Standard Threshold (1 3/8") = Heel – 4 1/8"
 - Optional Threshold (2 3/4") = Heel – 5 1/2"

Single Swing w/Sidelite (Coupled)

- CO Width = Heel – 7"
- CO Height =
 - Standard Threshold (1 3/8") = Heel – 4 1/8"
 - Optional Threshold (2 3/4") = Heel – 5 1/2"

Single Swing w/Transom

- CO Width = Heel – 7"
- CO Height =
 - Standard Threshold (1 3/8") = Heel – 3 9/16"

- Optional Threshold (2 3/4") = Heel – 4 15/16"

Double Door

- CO Width = Heel / 2 – 5 11/16"
- CO Height =
 - Standard Threshold (1 3/8") = Heel – 4 1/8"
 - Optional Threshold (2 3/4") = Heel – 5 1/2"

Double Door w/Transom

- CO Width = Heel / 2 – 5 11/16"
- CO Height =
 - Standard Threshold (1 3/8") = Heel – 3 9/16"
 - Optional Threshold (2 3/4") = Heel – 4 15/16"

¹ Please refer to the shop drawings for all clear opening calculations for projects, these are intended for single family use only.

Product Specification 08 15 23 – Vinyl Framed Glass Outswing Door



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

Part 1 - General

A high quality fully welded PVC outswing patio door designed for single family homes, townhouses, residential low and midrise construction and institutional projects.

1.1 Summary

A. Section Includes: Vinyl Doors:

1. Vinyl framed outswing patio doors complete with a flangeless system at the jambs and the head¹ shall be Starline's **Eurostar 3500 Series double glazed outswing door and /or Eurostar 3500 Series triple glazed outswing door** manufactured by Starline Windows Ltd.
2. Work included: Furnish labor, material and other services to complete the fabrication of the doors, 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: Window installation and installation accessories, structural support of door framing, interior trims. **(Specifier list others)**.

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

Series 3500 and 3501 Outswing and Inswing Balcony Door Design Guidelines

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 53 13 – Vinyl Windows
5. 08 80 00 – Glazing

1.2 Quality Assurance

- A. Drawings and specifications for Work of this Section are based upon Eurostar 3500 Outswing Patio Door manufactured by Starline Windows Ltd. Whenever alternative products are offered, submit supporting technical literature, samples, drawings and performance data for comparison 10 days prior to closing date.
- B. Doors 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 a vinyl swing door system that meet or exceed the performance requirements indicated.
- D. Installers to follow manufacture's installation procedures and recommendations.
- 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 or components, depending if project is engineered.

- A. **Limit mullion deflection to L/175.**
- B. **Allow for deflection of building structure. Vinyl doors 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 +/- 3/8" ² without significant damage to the fenestration system or in-elastic +/- 1 3/4" ² 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 Note to specifier: Values may change based on the configuration of the doors. Values to be specified by a Professional Engineer.

1.4 Test and Performance Requirements

(Specifier to select from the following performance requirements)

- A. Doors shall meet performance class **LC-PG55¹** when tested to AAMA/WDMA/CSA 101 I.S.2/A440-08 and CSA A440SI-09:
 - 1. Air Infiltration: Door air infiltration shall not exceed 0.02 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 doors when tested in accordance with ASTM E547 with a pressure difference of 6.75 psf / 510 Pa (Laboratory Test).
 - ii. There shall be no water infiltration for doors when tested in accordance with AAMA 502-08 with a pressure difference up to a maximum of 6.75 psf / 510 Pa (Field Test). ²
 - 3. Uniform Load Deflection Test: The deflection of door shall not exceed L/175 and there shall be no permanent set when tested in accordance with ASTM E330 with a design pressure of 45 psf / 2640 Pa, positive and negative.

Series 3500 and 3501 Outswing and Inswing Balcony Door Design Guidelines

4. Uniform Load Structural Test: There shall be no damage to hardware, accessories, fasteners, or any other damage that would render the door in operable when tested in accordance with ASTM E330 with a structural test pressure of 67.5 psf / 3960 Pa, positive and negative.

5. Thermal Performance³
 - i. U-value: The maximum door thermal transmittance U-value shall be 0.21 BTU/ hr*ft²*°F (1.19 W/m²*K) for double glazed and / or 0.15 BTU/ hr*ft²*°F (0.85 W/m²*k) for triple glazed when tested in accordance with AAMA 1503.1 and CAN/CSA-A440.2. Door shall be tested and labeled to N.F.R.C. standard 100 & 200. (Specifier to select)
 - ii. Solar Heat Gain Coefficient: A (maximum or minimum) of 0.16 for double glazed and / or 0.13 for triple glazed. (Specifier to select)
 - iii. Visible Light Transmittance: A (maximum or minimum) of 0.37 for double glazed and / or 0.27 for triple glazed. (Specifier to select)

¹ Note 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.

² Note to specifier: 330Pa / 6.75 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 follow the criteria and testing procedures as outlined in the AAMA 502-08 specification standard.

³ Note to specifier: Thermal performance depends on glass specified. For double glazed values the above test was performed using 24mm double glazed insulated glass unit (4mm/Argon/4mm) with standard high-performance soft coat (sputtered) Low E which is applied to surface #2, argon filled with aluminum spacer bar. For triple glazed values the above test was performed using 36mm triple glazed insulated glass unit (4mm/Argon/4mm/Argon/4mm) with standard high-performance soft coat (sputtered) Low E which is applied to surface #2, argon filled with aluminum spacer bar. *Please note: A second low E coating can be applied to surface #4 for the double-glazed unit and surface #6 for the triple glazed unit to further increase the thermal performance.* For both double and triple glazed the NFRC door test size was 37 3/4" x 82 3/8" (960mm x 2090mm).

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-Framed Glass Outswing and Inswing Patio Doors: Eurostar 3500 Series.
- B. Substitutions: Approved alternates

2.2 Material

- A. Vinyl Extrusion:
 - 1. 82 mm (3 1/4") deep perimeter frame member.
 - 2. Multi-chamber for strength and thermal performance with a nominal wall thickness of 3.18mm (0.125").
 - 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. Gaskets: Extruded Santoprene, flexible PVC, Santoprene or EPDM.
- D. Glass Setting Blocks: HDPE flat shim. Block material shall be compatible with sealed unit edge sealant.
- E. Glazing bead: uPVC and glazed from the inside.
- 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. Perimeter frame shall be 82 mm (3 1/4") deep with a minimum wall thickness of 3.18mm (0.125") and be thermally broken.
- G. Door stiles and rails shall be 82 mm (3 1/4") deep with a minimum wall thickness of 3.18mm (0.125") and be thermally broken.
- H. All interior joints and interior screw heads shall be sealed with a non-hardening sealant.
- I. All glazing pockets shall be vented, pressure equalized, and drained to the vertical extrusions.
- J. Glass bead shall be uPVC and a snap-in screw less type.

2.4 Glazing^{1,2}

- A. Double glazed, double seal insulated glass unit (IGU) with an overall thickness of 3/4" (20 mm). **Triple glazed IGU 1 7/16" (36mm) thick is available (Refer to [2.7.A.1](#) of this specification).**
- B. Standard high-performance soft coat (sputtered) Low E applied to surface #2.

Series 3500 and 3501 Outswing and Inswing Balcony Door Design Guidelines

- C. Aluminum spacer with argon fill.
- D. Glass thickness shall be 4mm. 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's standard product offering. There are various other options available. Refer to [2.7.A](#) of this specification.

² Note to specifier: Ensure [1.4.A.5](#) Thermal Performance values selected reflect if double and / or triple glazing is selected.

2.5 Hardware¹

- A. Hardware shall be furnished by the door manufacturer.
- B. Where practical, all hardware fittings shall be installed at the factory before shipping to site.
- C. Hardware shall be as follows:
 - 1. Deadbolt/Cylinder with interior thumb-turn, single point lock (Note: keyed locks are not available).
 - 2. Two 5" long lever handles (one for exterior, one for interior). Handles are available in black and white.
 - 3. Hinges – Minimum of 3 surface mounted exterior pivot hinges. Hinges are available in white, beige, brown, black and silver.

¹ Note to specifier: Hardware noted above is based on Starline's 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 door and framing members shall be free of scratches and other serious surface blemishes.
- B. Finish: Standard white on the exterior and interior

¹ Note to Specifier: Option to have dual frame colour; painted colour on the exterior and interior of the window. Should an exterior colour be required, refer to [2.7.C](#) of this specification for colour options.

2.7 Optional Items

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

- A. Glazing
 - 1. Triple glazed 1 7/16" (36mm) IGU with black warm edge spacer bar with air fill. 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.
 - 2. **4mm, 5mm, 6mm and greater thickness available.**
 - 3. Tinted, obscured & reflective glass
 - 4. Laminated glass
 - 5. Insulated glass internal grilles
 - 6. Surface mounted (plant-on) muntins
 - 7. Spacer bars

- I. Warm edge spacer bar
- II. Black aluminum spacer bar
- B. Extruded aluminum head flashing
- C. Dual frame color upgrade options:
 - 1. UV cure coating¹: UV cure coating on the exterior with white interior². (**Specifier to select from the colour(s) listed below**).

Black

Brown

Silver

Charcoal

Beige

- 2. Custom colours³ may be available. (**Specifier to state custom colour**) Virtually any colour can be matched or 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.
- D. Shop Drawings: Submit complete shop drawings which include floor plans, elevations, door 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.
- E. Threshold
 - 1. 35mm tall threshold
- F. Hardware
 - 1. Keyed lock
 - 2. Overhead holders (Stay arm) in stainless steel.
- G. Protection: Insulated Glass Unit shall be protected with smart guard on the **exterior and / or interior**.

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

²Note to specifier: All colors are available to be painted on the exterior and interior for an additional cost premium(minimum 10 windows to apply).

³Note to specifier: 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 installation procedures and recommendations **and approved shop drawings. (Specifier to select if shop drawings are a requirement for the project).**
- B. Doors shall be installed and adjusted by experienced personnel in accordance with the manufacturer's installation procedures and instructions **and approved shop drawings. (Specifier to select if shop drawings are a requirement for the project).**
- 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 instructions (and approved shop drawings, if applicable).
- 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 door has been installed and the caulking is cured. Ensure the products used to complete the building envelope tie in (membrane, caulking, flashing, cladding, etc.) are installed complete and have cured.

3.4 Protection and Cleaning

- A. Protection: Doors 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 therefore.

Product Specification 08 15 23 – Vinyl Framed Glass Inswing Door



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

Part 1 - General

A high quality fully welded PVC inswing patio door designed for single family homes, townhouses, residential low and midrise construction and institutional projects.

1.1 Summary

A. Section Includes: Vinyl Doors:

1. Vinyl framed inswing patio doors complete with a flangeless system at the jambs and the head shall be Starline's Eurostar 3501 Series double glazed inswing door and /or Eurostar 3501 Series triple glazed inswing door manufactured by Starline Windows Ltd. (Specifier to select).
2. Work included: Furnish labor, material and other services to complete the fabrication of the doors, 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: Window installation and installation accessories, structural support of door 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 53 13 – Vinyl Windows
5. 08 80 00 – Glazing

Series 3500 and 3501 Outswing and Inswing Balcony Door Design Guidelines

1.2 Quality Assurance

- A. Drawings and specifications for Work of this Section are based upon Eurostar 3501 Inswing Patio Door manufactured by Starline Windows Ltd. Whenever alternative products are offered, submit supporting technical literature, samples, drawings and performance data for comparison 10 days prior to closing date.
- B. Doors shall be tested and conform to the AAMA/WDMA/CSA 101 I.S.2/A440-08 and CSA A440SI-09 requirements.
- C. Manufacturer Qualifications:
 - 1. Manufacturer to have a minimum 10 years of documented experience.
 - 2. Manufacturer capable of providing a vinyl swing door system that meet or exceed the performance requirements indicated.
- D. Installers to follow manufacture's installation procedures and recommendations.
- 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 Requirements 1

(Specifier to select from the following performance requirements)

- A. Limit mullion deflection to L/175.
- B. Allow for deflection of building structure. Vinyl doors 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 $\pm 3/8''^2$ without significant damage to the fenestration system or in-elastic $\pm 1 3/4''^2$ 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 Note to specifier: Values may change based on the configuration of the doors. Values to be specified by a Professional Engineer.

1.4 Test and Performance Requirements

(Specifier to select from the following performance requirements)

- B. Doors shall meet performance class **LC-PG55**¹ when tested to AAMA/WDMA/CSA 101 I.S.2/A440-08 and CSA A440SI-09:
- 6. Air Infiltration: Door air infiltration shall not exceed 0.02 cfm/ft² (A3) when tested in accordance with ASTM E 283 with a pressure difference of 1.57 psf / 75 Pa.
- 7. Water Penetration Resistance:
 - i. There shall be no water infiltration for doors when tested in accordance with ASTM E547 with a pressure difference of 6.75 psf / 510 Pa (Laboratory Test).
 - ii. There shall be no water infiltration for doors when tested in accordance with AAMA 502-08 with a pressure difference up to a maximum of 6.75 psf / 510 Pa (Field Test). ²

8. Uniform Load Deflection Test: The deflection of door shall not exceed L/175 and there shall be no permanent set when tested in accordance with ASTM E330 with a design pressure of 45 psf / 2640 Pa, positive and negative.
9. Uniform Load Structural Test: There shall be no damage to hardware, accessories, fasteners, or any other damage that would render the door in operable when tested in accordance with ASTM E330 with a structural test pressure of 67.5 psf / 3960 Pa, positive and negative.
10. Thermal Performance ³
 - i. U-value: The maximum door thermal transmittance U-value shall be 0.21 BTU/ hr*ft²*°F (1.19 W/m²*K) for double glazed and / or 0.15 BTU/ hr*ft²*°F (0.85 W/m²*k) for triple glazed when tested in accordance with AAMA 1503.1 and CAN/CSA-A440.2. Door shall be tested and labeled to N.F.R.C. standard 100 & 200. (Specifier to select)
 - ii. Solar Heat Gain Coefficient: A (maximum or minimum) of 0.16 for double glazed and / or 0.13 for triple glazed. (Specifier to select)
 - iii. Visible Light Transmittance: A (maximum or minimum) of 0.37 for double glazed and / or 0.27 for triple glazed. (Specifier to select)

¹ Note 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.

² Note to specifier: 330Pa / 6.75 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 follow the criteria and testing procedures as outlined in the AAMA 502-08 specification standard.

³ Note to specifier: Thermal performance depends on glass specified. For double glazed values the above test was performed using 20mm double glazed insulated glass unit (4mm/Argon/4mm) with standard high performance soft coat (sputtered) Low E which is applied to surface #2, argon filled with aluminum spacer bar. For triple glazed values the above test was performed using 36mm triple glazed insulated glass unit (4mm/Argon/4mm/Argon/4mm) with standard high performance soft coat (sputtered) Low E which is applied to surface #2, argon filled with warm edge spacer bar. *Please note: A second low E coating can be applied to surface #4 for the double glazed unit and surface #6 for the triple glazed unit to further increase the thermal performance.* For both double and triple glazed the NFRC door test size was 37 3/4" x 82 3/8" (960mm x 2090mm).

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

Series 3500 and 3501 Outswing and Inswing Balcony Door Design Guidelines

PART 2 – Products

2.1 Manufacturers

- A. Acceptable Manufacturers: Starline Windows Ltd.
 - 1. Vinyl-Framed Glass Inswing Patio Doors: Eurostar 3501 Series.
- B. Substitutions: Approved alternates

2.2 Material

- A. Vinyl Extrusion:
 - 1. 82 mm (3 1/4") deep perimeter frame member.
 - 2. Multi-chamber for strength and thermal performance with a nominal wall thickness of 3.18mm (0.125").
 - 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. Gaskets: Extruded Santoprene, flexible PVC, Santoprene or EPDM.
- D. Glass Setting Blocks: HDPE flat shim. Block material shall be compatible with sealed unit edge sealant.
- E. Glazing bead: uPVC and glazed from the inside.
- 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. Perimeter frame shall be 82 mm (3 1/4") deep with a minimum wall thickness of 3.18mm (0.125") and be thermally broken.
- G. Door stiles and rails shall be 82 mm (3 1/4") deep with a minimum wall thickness of 3.18mm (0.125") and be thermally broken.
- H. All interior joints and interior screw heads shall be sealed with a non-hardening sealant.
- I. All glazing pockets shall be vented, pressure equalized, and drained to the vertical extrusions.
- J. Glass bead shall be uPVC and a snap-in screw less type.

2.4 Glazing^{1,2}

- A. Double glazed, double seal insulated glass unit (IGU) with an overall thickness of 3/4" (20 mm). Triple glazed IGU 1 7/16" (36mm) thick is available (Refer to 2.7.A.1 of this specification).
- B. Standard high-performance soft coat (sputtered) Low E applied to surface #2.
- C. Aluminum spacer with argon fill.
- D. Glass thickness shall be 4mm. 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's standard product offering. There are various other options available. Refer to 2.7.A of this specification.

² Note to specifier: Ensure 1.4.A.5 Thermal Performance values selected reflect if double and / or triple glazing is selected.

2.5 Hardware

- A. Hardware shall be furnished by the door manufacturer.
- B. Where practical, all hardware fittings shall be installed at the factory before shipping to site.
- C. Hardware shall be as follows:
 - 1. Deadbolt/Cylinder with interior thumb-turn which engages multi-point locking system.(Note: Keyed locks are available)
 - 2. Two 5" long lever handles (one for exterior, one for interior). Handles are available in white and black.
 - 3. Hinges - Minimum 3 surface mounted interior pivot hinges - Hinges are available in white. ,

¹ Note to specifier: Hardware noted above is based on Starline's 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 door and framing members shall be free of scratches and other serious surface blemishes.
- B. Finish: Standard white on the exterior and interior

Note to Specifier: Option to have dual frame colour; painted colour on the exterior and interior of the window. Should an exterior colour be required, refer to 2.7.C of this specification for color options.

2.7 Optional Items

- A. Glazing
 - 1. Triple glazed 1 7/16" (36mm) IGU with black warm edge spacer bar with air fill. 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.
 - 2. 4mm, 5mm, 6mm and greater thickness available (Specifier to select glass thickness required).

Series 3500 and 3501 Outswing and Inswing Balcony Door Design Guidelines

3. Tinted, obscured & reflective glass
 4. Laminated glass
 5. Insulated glass internal grilles
 6. Surface mounted (plant-on) muntins
 7. Spacer bars
 - i. Warm edge spacer bar
 - ii. Black aluminum spacer bar
- B. Extruded aluminum head flashing
- C. Dual frame color upgrade options:
1. UV cure coating ¹: UV cure coating on the exterior with white interior ². (Specifier to select from the colour(s) listed below).
 - **Black**
 - **Beige**
 - **Brown**
 - **Charcoal**
 - **Silver**
 2. Custom colours ³ may be available. (Specifier to state custom colour) Virtually any colour can be matched or 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.
- D. Shop Drawings: Submit complete shop drawings which include floor plans, elevations, door 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.
- E. Threshold: 35mm with no nailing flange
- F. Hardware
1. Keyed lock
 2. Overhead holders (Stay arm) in stainless steel.
- G. Protection: Insulated Glass Unit shall be protected with smart guard on the exterior and / or interior.

¹ Note to specifier: UV colors are available for an additional cost premium.

²Note to specifier: All colors are available to be painted on the exterior and interior for an additional cost premium (minimum 10 windows to apply).

³ Note to specifier: Custom colors are available for an additional cost premium. An approximate 12-week lead time is required to procure custom color 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 installation procedures and recommendations and approved shop drawings. (Specifier to select if shop drawings are a requirement for the project).
- B. Doors shall be installed and adjusted by experienced personnel in accordance with manufacturer's installation procedures and recommendations and approved shop drawings. (Specifier to select if shop drawings are a requirement for the project).
- 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 and Quality 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 instructions (and approved shop drawings, if applicable).
- 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 door has been installed and the caulking is cured. Ensure the products use to complete building envelope tie in (membrane, caulking, flashing, cladding, etc.) are installed complete and have cured.

3.4 Protection and cleaning

- A. Protection: Doors 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 dstherefore.

Series 3500 NFRC Product Energy Chart

DOUBLE (19mm IGU) TRIPLE (35mm IGU)	GLAZING (Ext/Gap/Int)	U VALUE (W/M ² K)	U VALUE (Btu/hft ² F)	Shading Coefficient	Solar Heat Gain Coefficient	Visible Light Transmittance	CPD (Certified Product Directory)
Center of Glass (COG)	4mm 270 (#2) / 4mm Clear	1.36	0.24	0.42	0.36	0.69	
	4mm 270 / 4mm i89	1.14	0.20	0.41	0.36	0.68	
	4mm 366 (#2) / 4mm Clear	1.36	0.24	0.31	0.27	0.64	
	4mm 366 / 4mm i89	1.08	0.19	0.31	0.27	0.63	
	4mm 180 (#2) / 4mm Clear	1.48	0.26	0.72	0.63	0.79	
	4mm 180 / 4mm i89	1.19	0.21	0.70	0.61	0.77	
	4mm 270 (#2) / 4mm Clear / 4mm Clear	1.08	0.19	0.39	0.34	0.63	
	4mm 270 (#2) / 4mm Clear / 4mm 270 (#5)	0.74	0.13	0.35	0.31	0.53	
	4mm 270 (#2) / 4mm 270 (#4) / 4mm i89 (#6)	0.62	0.11	0.31	0.27	0.52	
	4mm 366 (#2) / 4mm Clear / 4mm Clear	1.02	0.18	0.29	0.25	0.59	
	4mm 366 (#2) / 4mm Clear / 4mm 366 (#5)	0.68	0.12	0.27	0.24	0.46	
	4mm 366 (#2) / 4mm 366 (#4) / 4mm i89 (#6)	0.62	0.11	0.23	0.20	0.45	
	4mm 180 (#2) / 4mm Clear / 4mm Clear	1.08	0.19	0.66	0.58	0.72	
	4mm 180 (#2) / 4mm Clear / 4mm 180 (#5)	0.79	0.14	0.63	0.54	0.69	
	4mm 180 (#2) / 4mm 180 (#4) / 4mm i89 (#6)	0.68	0.12	0.59	0.52	0.68	
Swing Door	4mm 270 (#2) / 4mm Clear	1.36	0.24	0.25	0.22	0.41	STL-A-57-00157-00001
	4mm 270 / 4mm i89	1.19	0.21	0.25	0.22	0.40	STL-A-57-00158-00001
	4mm 366 (#2) / 4mm Clear	1.36	0.24	0.19	0.17	0.38	STL-A-57-00159-00001
	4mm 366 / 4mm i89	1.19	0.21	0.19	0.16	0.37	STL-A-57-00160-00001
	4mm 180 (#2) / 4mm Clear	1.42	0.25	0.44	0.38	0.47	STL-A-57-00235-00001
	4mm 180 / 4mm i89	1.25	0.22	0.42	0.36	0.46	STL-A-57-00236-00001
	4mm 270 (#2) / 4mm Clear / 4mm Clear	1.14	0.20	0.23	0.20	0.37	STL-A-57-00193-00001
	4mm 270 (#2) / 4mm Clear / 4mm 270 (#5)	0.91	0.16	0.21	0.19	0.32	STL-A-57-00194-00001
	4mm 270 (#2) / 4mm 270 (#4) / 4mm i89 (#6)	0.85	0.15	0.19	0.17	0.31	STL-A-57-00195-00001

4mm 366 (#2) / 4mm Clear / 4mm Clear	1.14	0.20	0.18	0.15	0.35	STL-A-57-00196-00001
4mm 366 (#2) / 4mm Clear / 4mm 366 (#5)	0.91	0.16	0.17	0.15	0.27	STL-A-57-00197-00001
4mm 366 (#2) / 4mm 366 (#4) / 4mm i89 (#6)	0.85	0.15	0.14	0.13	0.27	STL-A-57-00198-00001
4mm 180 (#2) / 4mm Clear / 4mm Clear	1.14	0.20	0.40	0.35	0.43	STL-A-57-00253-00001
4mm 180 (#2) / 4mm Clear / 4mm 180 (#5)	0.97	0.17	0.38	0.33	0.41	STL-A-57-00254-00001
4mm 180 (#2) / 4mm 180 (#4) / 4mm i89 (#6)	0.91	0.16	0.36	0.31	0.40	STL-A-57-00255-00001

Based on NFRC CPD - Expiration Date: July 2028