



CASEMENT

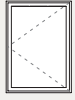
SECTION DIRECTORY

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Pella® 350 Series Casement

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CASEMENT

BRAND SUMMARY



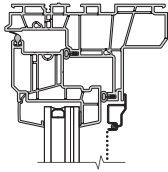
Pella® 350 Series Casement

windows feature extruded, rigid PVC (polyvinyl chloride) frames and sash with heat-fused mitered corners for a fully welded corner assembly. The SmoothSeam™ welded corners on the interior of the sash are virtually invisible. Casement windows meet industry standards for water infiltration and wind resistance and meet ENERGY STAR® guidelines with dual-pane or triple-pane insulated glass. Standard performance window sash are available with optional foam insulation for increased thermal performance.

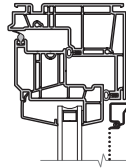
BLOCK FRAME DESIGN

4-1/2" Block or 3-1/4" Block Pocket Install

- 3-1/4" Block Pocket Install Frame allows a perfect fit into a 3-1/4" pocket when installed into an existing Double-Hung or Single-Hung wood frame from the interior.
- 4-1/2" block frame can be used in new construction block or concrete walls. They may also be used in replacement of old aluminum or steel frame windows or pocket replacement into wood frames from the exterior.
- The block frames include interior and exterior accessory grooves.
- Custom sizes are available in 1/8" increments - for a perfect fit.



4-1/2" Block Frame

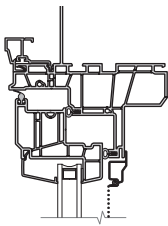


3-1/4" Block Pocket Install

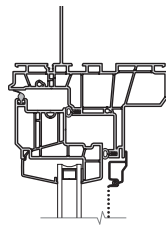
NAIL FIN FRAME DESIGN

With or Without Integrated J-Channel

- Continuous fin with welded corners adds a protective weather barrier and allows for hassle-free installation.
- The standard 4-1/2" frame depth includes interior and exterior accessory grooves.
- Nailing fin has a 1-7/16" setback from exterior face of window frame.
- Custom sizes are available in 1/8" increments - for a perfect fit.
- 4-9/16" and 6-9/16" factory applied primed or clear jamb extensions are available.



With J-Channel



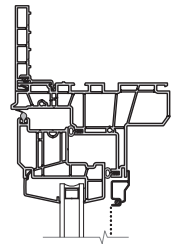
Without J-Channel



DOUBLE-WALL FLUSH FLANGE

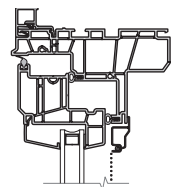
Replacement Frame Design

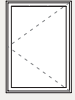
- The flush flange frame allows for easy replacement of old aluminum or steel frame windows without removing the existing frame head or jambs - typically used with stucco exteriors in southwest arid climates.
- The frame depth is 4-1/2" (overall wall depth of 4-1/16") includes interior accessory groove.
- Custom sizes are available in 1/8" increments - for a perfect fit.



INTEGRAL 5/8" FLANGE FRAME

- The integral 5/8" flange frame can be used in new construction block or concrete walls. Commonly used in Florida and often referred to as "Florida Flange" frame.
- The frame depth is 4-1/2" (overall wall depth of 3-7/8") includes interior accessory groove.
- Custom sizes are available in 1/8" increments - for a perfect fit.





CASEMENT

PRODUCT SELECTION GUIDE

Size and Performance Data
Sound Transmission Class



SIZES

Standard Sizes	S
Special Sizes Available Built on 1/8" Increments	O

FRAMES

Nail Fin Only	O
Nail Fin with J-Channel	O
4-1/2" Block	S
3-1/4" Block Pocket Install/Replacement	S
Double-Wall Flush Flange	O
Integral 5/8" Flange	O

PERFORMANCE₁

Standard Performance

Meets or Exceeds AAMA/WDMA Ratings	LC-PG40 Hallmark Certified
Air Infiltration (cfm/ft ² of frame @ 1.57 psf wind pressure.)	0.05
Design Pressure	40 psf
Water Penetration Resistance	6.06 psf

Performance Upgrade

Meets or Exceeds AAMA/WDMA Ratings	LC-PG60 Hallmark Certified
Air Infiltration (cfm/ft ² of frame @ 1.57 psf wind pressure.)	0.05
Design Pressure	60 psf
Water Penetration Resistance	9.20 psf

Other Performance Criteria

Forced Entry Resistance (Minimum Security Grade) ₂	40
Maximum Operating Force (lbs) (Initiate Motion / Maintain Motion)	15/6

Sound Transmission Class and Outdoor-Indoor Transmission Class

Frame Size Tested ₃	Glazing System				STC Rating	OITC Rating
	Overall Glazing Thickness	Exterior Glass Thickness	Interior Glass Thickness	Third Pane Thickness		
CASEMENT - DUAL PANE INSULATING GLASS						
24" x 60"	11/16"	3mm	3mm	—	30	24
24" x 60"	11/16"	3mm	5mm	—	33	28
CASEMENT - NON-IMPACT LAMINATED INSULATING GLASS						
24" x 60"	1"	3mm	7mm PVB	—	36	29
24" x 60"	1"	5mm	7mm PVB	—	37	29
CASEMENT - HURRICANESHIELD IMPACT-RESISTANT LAMINATED INSULATING GLASS						
24" x 60"	1"	3mm	8.6mm PVB	—	36	28
24" x 60"	1"	5mm	8.6mm PVB	—	38	30
CASEMENT - TRIPLE-PANE INSULATING GLASS						
24" x 60"	1-1/4"	3mm	3mm	3mm	29	24

S = Standard; O = Optional

(1) Published performance data is for single unit only. See Design Data pages in this section for specific product performance class and grade values.

(2) The higher the level, the greater the product's ability to resist forced entry.

(3) ASTM E 1425 defines standard sizes for acoustical testing. Ratings achieved at that size are representative of all sizes of the same configuration.

The presence of low-e or argon have negligible effect on sound attenuation characteristics.



CASEMENT

PRODUCT SELECTION GUIDE

Features and Options



GLAZING (INSULATING GLASS)

Glazing Type

Dual-pane insulating glass	S
Triple-pane insulating glass	O

Insulated Glass Options / Low-E Types

Advanced Low-E	S
NaturalSun Low-E	O
SunDefense™ Low-E ₁	O
Gray Low-E ₁	O
Bronze-tinted Advanced Low-E ₁	O

Additional Glazing Options

Annealed glass	S
Tempered glass	O
Obscure glass ₂	O
Noise reduction glass (STC 3mm/5mm combination) ₁	O
Noise Reduction laminated glass (non-impact) ₁	O

Gas Fill / High Altitude

Argon	S
High altitude	O
High altitude with argon ₁	O

SASH

Foam Insulation	O
Performance Upgrade	O

INTERIOR / EXTERIOR COLOR

White	S
Almond	O
Brown exterior/White interior	O

HARDWARE

Color matched hardware	S
Bright Brass, Satin Nickel or Oil-Rubbed Bronze	O

SCREENS

Conventional black fiberglass screens - flat	S
InView™ screens	O

GRILLES

Grilles-Between-the-Glass

Traditional, Prairie, Top Row, Custom - Equally Divided	O
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Simulated-Divided-Light Grilles₁ (without spacer)

Traditional, Prairie, Top Row, Custom - Equally Divided	O
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S = Standard; O = Optional

(1) Not available with triple-pane glazing.

(2) Contact your local Pella sales representative for current offering.



CASEMENT

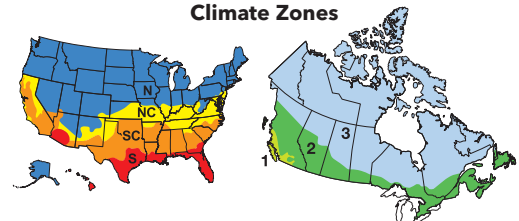
GLAZING PERFORMANCE - TOTAL UNIT

11/16" Insulating Glass with 3mm Glass



Glass Thickness	Type of Glazing	NFRC Certified Product #	Glass (mm)		Gap Fill	Performance Values ₁				Shaded Areas Meet ENERGY STAR® Performance Criteria in Zones Shown							
			Ext.	Int.		U-Factor	SHGC	VLT %	CR	U. S.				Canada ₂			
										Zone				ER	Zone		
VENT										N	NC	SC	S		1	2	3
11/16"	Advanced Low-E IG	PEL-N-184-00006-00001	3	3	air	0.28	0.24	44	59					19			
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00130-00001				0.29	0.21	39	59								
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00250-00001				0.28	0.21	39	59					17			
11/16"	Advanced Low-E IG	PEL-N-184-00044-00001	3	3	argon	0.25	0.23	44	62					22			
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00164-00001				0.26	0.21	39	62					19			
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00282-00001				0.25	0.21	39	62					21			
11/16"	NaturalSun Low-E IG	PEL-N-184-00007-00001	3	3	air	0.28	0.43	49	58					30			
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00131-00001				0.29	0.39	44	58					26			
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00251-00001				0.28	0.39	44	58					27			
11/16"	NaturalSun Low-E IG	PEL-N-184-00045-00001	3	3	argon	0.26	0.43	49	62					32			
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00165-00001				0.27	0.39	44	62					28			
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00283-00001				0.26	0.39	44	62					30			
11/16"	SunDefense™ Low-E IG	PEL-N-184-00008-00001	3	3	air	0.27	0.18	40	59					16			
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00132-00001				0.29	0.16	36	59								
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00252-00001				0.27	0.16	36	59								
11/16"	SunDefense Low-E IG	PEL-N-184-00046-00001	3	3	argon	0.24	0.17	40	63					19			
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00166-00001				0.26	0.16	36	63					16			
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00284-00001				0.24	0.16	36	63					19			
VENT – WITH FOAM INSERTS																	
11/16"	Advanced Low-E IG	PEL-N-184-00078-00001	3	3	air	0.28	0.24	44	59					19			
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00198-00001				0.29	0.21	39	59					16			
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00310-00001				0.28	0.21	39	59					17			
11/16"	Advanced Low-E IG	PEL-N-184-00104-00001	3	3	argon	0.25	0.23	44	62					22			
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00224-00001				0.26	0.21	39	62					19			
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00330-00001				0.26	0.21	39	62					19			
11/16"	NaturalSun Low-E IG	PEL-N-184-00079-00001	3	3	air	0.28	0.43	49	58					30			
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00199-00001				0.29	0.39	44	58					26			
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00311-00001				0.28	0.39	44	58					27			
11/16"	NaturalSun Low-E IG	PEL-N-184-00105-00001	3	3	argon	0.25	0.43	49	62					33			
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00225-00001				0.27	0.39	44	62					28			
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00331-00001				0.27	0.39	44	62					28			
11/16"	SunDefense™ Low-E IG	PEL-N-184-00080-00001	3	3	air	0.27	0.18	40	59					16			
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00200-00001				0.29	0.16	36	59								
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00312-00001				0.27	0.16	36	59								
11/16"	SunDefense Low-E IG	PEL-N-184-00106-00001	3	3	argon	0.24	0.17	40	63					19			
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00226-00001				0.25	0.16	36	63					18			
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00332-00001				0.25	0.16	36	63					18			

Climate Zones



R-Value = 1/U-Factor

SHGC = Solar Heat Gain Coefficient

VLT % = Visible Light Transmission

CR = Condensation Resistance

ER = Canadian Energy Rating

(1) Glazing performance values are calculated based on NFRC 100, NFRC 200 and NFRC 500. ENERGY STAR® values are updated to 2015 (Version 6) criteria.

(2) The values shown are based on Canada's updated ENERGY STAR® 2015 initiative.

Based on unit size, some products will use 2.5mm glass that may have improved glazing performance from what is shown.

See the Product Performance section for more detailed information or visit www.energystar.gov for Energy Star guidelines.



GLAZING PERFORMANCE - TOTAL UNIT

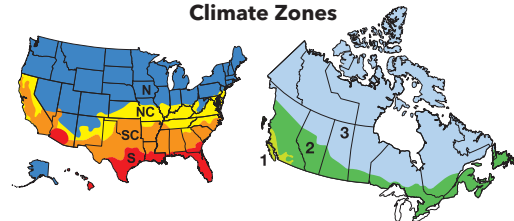
1" Insulating Glass with 5mm Glass



CASEMENT

Glass Thickness	Type of Glazing	NFRC Certified Product #	Glass (mm)		Gap Fill	Performance Values ₁				Shaded Areas Meet ENERGY STAR® Performance Criteria in Zones Shown								
			Ext.	Int.		U-Factor	SHGC	VLT %	CR	U. S.				Canada ₂				
										Zone				ER	Zone			
VENT										N	NC	SC	S	1			2	3
1"	Advanced Low-E IG	PEL-N-184-00016-00001	5	5	air	0.28	0.23	43	58					18				
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00140-00001				0.28	0.21	38	58					17				
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00260-00001				0.28	0.21	38	58					17				
1"	Advanced Low-E IG	PEL-N-184-00054-00001	5	5	argon	0.25	0.23	43	61					22				
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00174-00001				0.25	0.18	31	61					19				
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00292-00001				0.25	0.21	38	61					21				
1"	NaturalSun Low-E IG	PEL-N-184-00017-00001	5	5	air	0.28	0.41	48	57					28				
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00141-00001				0.28	0.34	41	57					24				
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00261-00001				0.28	0.37	43	57					26				
1"	NaturalSun Low-E IG	PEL-N-184-00055-00001	5	5	argon	0.26	0.41	48	60					31				
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00175-00001				0.26	0.35	41	60					27				
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00293-00001				0.26	0.37	43	60					29				
1"	SunDefense™ Low-E IG	PEL-N-184-00018-00001	5	5	air	0.27	0.18	39	58					16				
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00142-00001				0.27	0.18	30	58					16				
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00262-00001				0.27	0.16	36	58									
1"	SunDefense Low-E IG	PEL-N-184-00056-00001	5	5	argon	0.25	0.17	39	62					18				
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00176-00001				0.25	0.18	30	62					19				
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00294-00001				0.25	0.16	36	62					18				
VENT – WITH FOAM INSERTS																		
1"	Advanced Low-E IG	PEL-N-184-00088-00001	5	5	air	0.28	0.23	43	58					18				
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00208-00001				0.28	0.21	38	58					17				
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00320-00001				0.28	0.21	38	58					17				
1"	Advanced Low-E IG	PEL-N-184-00114-00001	5	5	argon	0.25	0.23	43	61					22				
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00234-00001				0.25	0.21	38	61					21				
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00340-00001				0.25	0.21	38	61					21				
1"	NaturalSun Low-E IG	PEL-N-184-00089-00001	5	5	air	0.28	0.41	48	57					28				
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00209-00001				0.28	0.37	43	57					26				
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00321-00001				0.28	0.37	43	57					26				
1"	NaturalSun Low-E IG	PEL-N-184-00115-00001	5	5	argon	0.26	0.41	48	60					31				
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00235-00001				0.26	0.37	43	60					29				
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00341-00001				0.26	0.37	43	60					29				
1"	SunDefense™ Low-E IG	PEL-N-184-00090-00001	5	5	air	0.27	0.18	39	58					16				
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00210-00001				0.27	0.16	36	58									
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00322-00001				0.27	0.16	36	58									
1"	SunDefense Low-E IG	PEL-N-184-00116-00001	5	5	argon	0.24	0.17	39	62					19				
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00236-00001				0.25	0.16	36	62					18				
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00342-00001				0.25	0.16	36	62					18				

Climate Zones


$$R\text{-Value} = 1/U\text{-Factor}$$

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CR = Condensation Resistance

ER = Canadian Energy Rating

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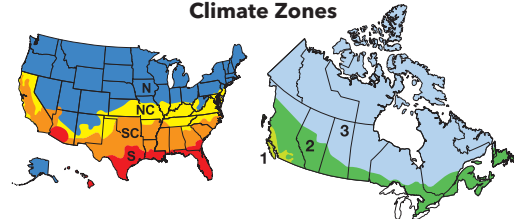
GLAZING PERFORMANCE - TOTAL UNIT

Tinted Insulating Glass



Glass Thickness	Type of Glazing	NFRC Certified Product #	Glass (mm)		Gap Fill	Performance Values ₁				Shaded Areas Meet ENERGY STAR® Performance Criteria in Zones Shown								
			Ext.	Int.		U-Factor	SHGC	VLT %	CR	U. S.				Canada ₂				
										Zone				ER	Zone			
TINTED GLAZING										N	NC	SC	S		1	2	3	
11/16"	Bronze Advanced Low-E IG	PEL-N-188-00010-00001	3	3	air	0.28	0.23	32	59	<div></div>	<div></div>	<div></div>	<div></div>	18	<div></div>	<div></div>	<div></div>	
	with 3/4" or 1" grilles-between-the-glass	PEL-N-188-00114-00001				0.29	0.21	29	59	<div></div>	<div></div>	<div></div>	<div></div>		<div></div>	<div></div>	<div></div>	
	with 7/8" Simulated Divided Light grilles	PEL-N-188-00218-00001				0.28	0.21	29	59	<div></div>	<div></div>	<div></div>	<div></div>	17	<div></div>	<div></div>	<div></div>	
11/16"	Bronze Advanced Low-E IG	PEL-N-188-00036-00001	3	3	argon	0.25	0.23	32	63	<div></div>	<div></div>	<div></div>	<div></div>	22	<div></div>	<div></div>	<div></div>	
	with 3/4" or 1" grilles-between-the-glass	PEL-N-188-00140-00001				0.26	0.21	29	63	<div></div>	<div></div>	<div></div>	<div></div>	19	<div></div>	<div></div>	<div></div>	
	with 7/8" Simulated Divided Light grilles	PEL-N-188-00238-00001				0.25	0.21	29	63	<div></div>	<div></div>	<div></div>	<div></div>	21	<div></div>	<div></div>	<div></div>	
1"	Bronze Advanced Low-E IG	PEL-N-188-00020-00001	5	5	air	0.28	0.21	28	58	<div></div>	<div></div>	<div></div>	<div></div>	17	<div></div>	<div></div>	<div></div>	
	with 3/4" or 1" grilles-between-the-glass	PEL-N-188-00124-00001				0.28	0.19	25	58	<div></div>	<div></div>	<div></div>	<div></div>	16	<div></div>	<div></div>	<div></div>	
	with 7/8" Simulated Divided Light grilles	PEL-N-188-00228-00001				0.28	0.19	25	58	<div></div>	<div></div>	<div></div>	<div></div>	16	<div></div>	<div></div>	<div></div>	
1"	Bronze Advanced Low-E IG	PEL-N-188-00046-00001	5	5	argon	0.25	0.20	28	61	<div></div>	<div></div>	<div></div>	<div></div>	20	<div></div>	<div></div>	<div></div>	
	with 3/4" or 1" grilles-between-the-glass	PEL-N-188-00150-00001				0.25	0.19	25	61	<div></div>	<div></div>	<div></div>	<div></div>	19	<div></div>	<div></div>	<div></div>	
	with 7/8" Simulated Divided Light grilles	PEL-N-188-00248-00001				0.25	0.19	25	61	<div></div>	<div></div>	<div></div>	<div></div>	19	<div></div>	<div></div>	<div></div>	
TINTED GLAZING – WITH FOAM INSERTS																		
11/16"	Bronze Advanced Low-E IG	PEL-N-188-00062-00001	3	3	air	0.28	0.23	32	59	<div></div>	<div></div>	<div></div>	<div></div>	18	<div></div>	<div></div>	<div></div>	
	with 3/4" or 1" grilles-between-the-glass	PEL-N-188-00166-00001				0.29	0.21	29	59	<div></div>	<div></div>	<div></div>	<div></div>		<div></div>	<div></div>	<div></div>	
	with 7/8" Simulated Divided Light grilles	PEL-N-188-00258-00001				0.28	0.21	29	59	<div></div>	<div></div>	<div></div>	<div></div>	17	<div></div>	<div></div>	<div></div>	
11/16"	Bronze Advanced Low-E IG	PEL-N-188-00088-00001	3	3	argon	0.25	0.23	32	63	<div></div>	<div></div>	<div></div>	<div></div>	22	<div></div>	<div></div>	<div></div>	
	with 3/4" or 1" grilles-between-the-glass	PEL-N-188-00192-00001				0.26	0.21	29	63	<div></div>	<div></div>	<div></div>	<div></div>	19	<div></div>	<div></div>	<div></div>	
	with 7/8" Simulated Divided Light grilles	PEL-N-188-00278-00001				0.26	0.21	29	63	<div></div>	<div></div>	<div></div>	<div></div>	19	<div></div>	<div></div>	<div></div>	
1"	Bronze Advanced Low-E IG	PEL-N-188-00072-00001	5	5	air	0.28	0.21	28	58	<div></div>	<div></div>	<div></div>	<div></div>	17	<div></div>	<div></div>	<div></div>	
	with 3/4" or 1" grilles-between-the-glass	PEL-N-188-00176-00001				0.28	0.18	30	58	<div></div>	<div></div>	<div></div>	<div></div>		<div></div>	<div></div>	<div></div>	
	with 7/8" Simulated Divided Light grilles	PEL-N-188-00268-00001				0.28	0.19	25	58	<div></div>	<div></div>	<div></div>	<div></div>	16	<div></div>	<div></div>	<div></div>	
1"	Bronze Advanced Low-E IG	PEL-N-188-00098-00001	5	5	argon	0.25	0.20	28	62	<div></div>	<div></div>	<div></div>	<div></div>	20	<div></div>	<div></div>	<div></div>	
	with 3/4" or 1" grilles-between-the-glass	PEL-N-188-00202-00001				0.25	0.19	25	61	<div></div>	<div></div>	<div></div>	<div></div>	19	<div></div>	<div></div>	<div></div>	
	with 7/8" Simulated Divided Light grilles	PEL-N-188-00288-00001				0.25	0.19	25	61	<div></div>	<div></div>	<div></div>	<div></div>	19	<div></div>	<div></div>	<div></div>	

Climate Zones



R-Value = 1/U-Factor
 SHGC = Solar Heat Gain Coefficient
 VLT % = Visible Light Transmission
 CR = Condensation Resistance
 ER = Canadian Energy Rating

(1) Glazing performance values are calculated based on NFRC 100, NFRC 200 and NFRC 500. ENERGY STAR® values are updated to 2015 (Version 6) criteria.

(2) The values shown are based on Canada's updated ENERGY STAR® 2015 initiative.

Based on unit size, some products will use 2.5mm glass that may have improved glazing performance from what is shown.

See the Product Performance section for more detailed information or visit www.energystar.gov for Energy Star guidelines.



CASEMENT

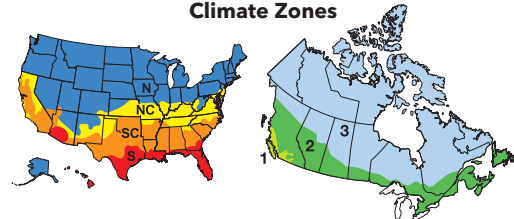
GLAZING PERFORMANCE - TOTAL UNIT

Non-Impact Laminated



Glass Thickness	Type of Glazing	NFRC Certified Product #	Glass (mm)		Gap Fill	Performance Values ₁				Shaded Areas Meet ENERGY STAR® Performance Criteria in Zones Shown								
			Ext.	Int.		U-Factor	SHGC	VLT %	CR	U. S.				Canada ₂				
										Zone				ER	Zone			
VENT										N	NC	SC	S		1	2	3	
1"	Advanced Low-E PVB IG	PEL-N-184-00481-00001	3	7	air	0.27	0.23	43	60					19				
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00495-00001				0.27	0.21	39	60					18				
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00523-00001				0.27	0.21	39	60					18				
1"	Advanced Low-E PVB IG	PEL-N-184-00474-00001	5	7	air	0.27	0.23	43	59					19				
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00488-00001				0.27	0.21	38	59					18				
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00516-00001				0.27	0.21	38	59					18				
1"	Advanced Low-E PVB IG	PEL-N-184-00537-00001	3	7	argon	0.25	0.23	43	63					22				
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00551-00001				0.25	0.21	39	63					21				
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00579-00001				0.25	0.21	39	63					21				
1"	Advanced Low-E PVB IG	PEL-N-184-00530-00001	5	7	argon	0.25	0.23	43	62					22				
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00544-00001				0.25	0.21	38	62					21				
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00572-00001				0.25	0.21	38	62					21				
1"	NaturalSun Low-E PVB IG	PEL-N-184-00484-00001	3	7	air	0.28	0.40	49	59					28				
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00498-00001				0.28	0.36	44	59					25				
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00526-00001				0.28	0.36	44	59					25				
1"	NaturalSun Low-E PVB IG	PEL-N-184-00477-00001	3	7	argon	0.25	0.40	49	62					32				
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00491-00001				0.25	0.36	44	62					29				
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00519-00001				0.25	0.36	44	62					29				
1"	NaturalSun Low-E PVB IG	PEL-N-184-00540-00001	5	7	air	0.28	0.39	48	58					27				
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00554-00001				0.28	0.35	44	58					25				
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00582-00001				0.28	0.35	44	58					25				
1"	NaturalSun Low-E PVB IG	PEL-N-184-00533-00001	5	7	argon	0.25	0.39	48	62					31				
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00547-00001				0.25	0.35	44	62					29				
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00575-00001				0.25	0.35	44	62					29				
1"	SunDefense™ Low-E PVB IG	PEL-N-184-00483-00001	3	7	air	0.27	0.17	40	60					16				
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00497-00001				0.27	0.16	36	60									
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00525-00001				0.27	0.16	36	60									
1"	SunDefense Low-E PVB IG	PEL-N-184-00476-00001	3	7	argon	0.24	0.17	40	63					19				
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00490-00001				0.24	0.16	36	63					19				
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00518-00001				0.24	0.16	36	63					19				
1"	SunDefense™ Low-E PVB IG	PEL-N-184-00539-00001	5	7	air	0.27	0.18	40	59					16				
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00553-00001				0.27	0.16	36	59									
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00581-00001				0.27	0.16	36	59									
1"	SunDefense Low-E PVB IG	PEL-N-184-00532-00001	5	7	argon	0.24	0.17	40	63					19				
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00546-00001				0.24	0.16	36	63					19				
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00574-00001				0.24	0.16	36	63					19				

Climate Zones



R-Value = 1/U-Factor

SHGC = Solar Heat Gain Coefficient

VLT % = Visible Light Transmission

CR = Condensation Resistance

ER = Canadian Energy Rating

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See the Product Performance section for more detailed information or visit www.energystar.gov for Energy Star guidelines.



CASEMENT

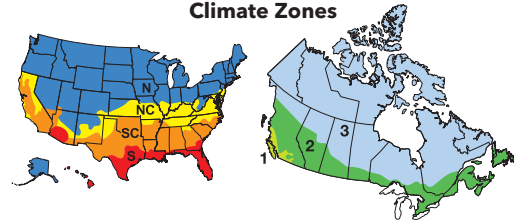
GLAZING PERFORMANCE - TOTAL UNIT

Non-Impact Laminated with Tinted Glass



Glass Thickness	Type of Glazing	NFRC Certified Product #	Glass (mm)		Gap Fill	Performance Values ₁				Shaded Areas Meet ENERGY STAR® Performance Criteria in Zones Shown							
			Ext.	Int.		U-Factor	SHGC	VLT %	CR	U. S.				Canada ₂			
										Zone				ER	Zone		
VENT – WITH TINTED GLAZING										N	NC	SC	S		1	2	3
1"	Gray Advanced Low-E PVB IG	PEL-N-184-00480-00001	3	7	air	0.28	0.16	25	59								
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00494-00001				0.28	0.15	22	59								
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00522-00001				0.28	0.15	22	59								
1"	Gray Advanced Low-E PVB IG	PEL-N-184-00473-00001	3	7	argon	0.25	0.16	25	62					18			
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00487-00001				0.25	0.14	22	62					17			
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00515-00001				0.25	0.14	22	62					17			
1"	Gray Advanced Low-E PVB IG	PEL-N-184-00536-00001	5	7	air	0.28	0.16	24	59								
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00550-00001				0.28	0.15	22	59								
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00578-00001				0.28	0.15	22	59								
1"	Gray Advanced Low-E PVB IG	PEL-N-184-00529-00001	5	7	argon	0.25	0.15	24	62					17			
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00543-00001				0.25	0.14	22	62					17			
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00571-00001				0.25	0.14	22	62					17			
1"	Bronze Advanced Low-E PVB IG	PEL-N-184-00482-00001	3	7	air	0.27	0.22	24	60					19			
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00496-00001				0.27	0.20	21	60					17			
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00524-00001				0.27	0.20	21	60					17			
1"	Bronze Advanced Low-E PVB IG	PEL-N-184-00475-00001	3	7	argon	0.25	0.22	24	63					21			
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00489-00001				0.25	0.20	21	63					20			
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00517-00001				0.25	0.20	21	63					20			
1"	Bronze Advanced Low-E PVB IG	PEL-N-184-00538-00001	5	7	air	0.27	0.22	23	59					19			
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00552-00001				0.27	0.20	21	59					17			
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00580-00001				0.27	0.20	21	59					17			
1"	Bronze Advanced Low-E PVB IG	PEL-N-184-00531-00001	5	7	argon	0.25	0.22	23	62					21			
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00545-00001				0.25	0.20	21	62					20			
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00573-00001				0.25	0.20	21	62					20			

Climate Zones



R-Value = 1/U-Factor
 SHGC = Solar Heat Gain Coefficient
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 ER = Canadian Energy Rating

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Based on unit size, some products will use 2.5mm glass that may have improved glazing performance from what is shown.

See the Product Performance section for more detailed information or visit www.energystar.gov for Energy Star guidelines.



CASEMENT

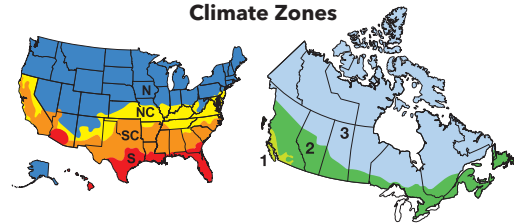
GLAZING PERFORMANCE - TOTAL UNIT

Triple-Pane Insulating Glass



Glass Thickness	Type of Glazing	NFRC Certified Product #	Glass (mm)			Gap Fill	Performance Values ₁				Shaded Areas Meet ENERGY STAR® Performance Criteria in Zones Shown															
			Ext.	Mid.	Int.		U-Factor	SHGC	VLT %	CR	U. S.				Canada ₂											
											Zone				ER	Zone										
VENT																			N	NC	SC	S		1	2	3
1-1/4"	Advanced Low-E Triple-pane IG	PEL-N-184-00023-00001	3	3	3	air	0.19	0.20	34	69					27											
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00147-00001					0.20	0.18	30	69					25											
1-1/4"	Advanced Low-E Triple-pane IG	PEL-N-184-00061-00001	3	3	3	argon	0.17	0.20	34	74					30											
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00181-00001					0.17	0.18	30	74					29											
1-1/4"	NaturalSun Low-E Triple-pane IG	PEL-N-184-00024-00001	3	3	3	air	0.23	0.37	45	65					32											
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00148-00001					0.24	0.34	41	65					29											
1-1/4"	NaturalSun Low-E Triple-pane IG	PEL-N-184-00062-00001	3	3	3	argon	0.21	0.37	45	67					35											
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00182-00001					0.22	0.34	41	67					32											
1-7/16"	Advanced Low-E Triple-pane IG	PEL-N-184-00025-00001	5	5	5	air	0.19	0.19	33	69					27											
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00149-00001					0.20	0.18	30	69					25											
1-7/16"	Advanced Low-E Triple-pane IG	PEL-N-184-00063-00001	5	5	5	argon	0.17	0.19	33	73					29											
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00183-00001					0.17	0.18	30	73					29											
1-7/16"	NaturalSun Low-E Triple-pane IG	PEL-N-184-00026-00001	5	5	5	air	0.23	0.36	44	64					32											
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00150-00001					0.24	0.32	39	64					28											
1-7/16"	NaturalSun Low-E Triple-pane IG	PEL-N-184-00064-00001	5	5	5	argon	0.21	0.36	44	66					34											
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00184-00001					0.22	0.32	39	66					31											
VENT – WITH FOAM INSERTS																										
1-1/4"	Advanced Low-E Triple-pane IG	PEL-N-184-00095-00001	3	3	3	air	0.19	0.20	34	69					27											
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00215-00001					0.20	0.18	30	69					25											
1-1/4"	Advanced Low-E Triple-pane IG	PEL-N-184-00121-00001	3	3	3	argon	0.17	0.20	34	75					30											
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00241-00001					0.17	0.18	30	75					29											
1-1/4"	NaturalSun Low-E Triple-pane IG	PEL-N-184-00096-00001	3	3	3	air	0.23	0.37	45	65					32											
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00216-00001					0.24	0.34	41	65					29											
1-1/4"	NaturalSun Low-E Triple-pane IG	PEL-N-184-00122-00001	3	3	3	argon	0.21	0.37	45	68					35											
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00242-00001					0.22	0.34	41	68					32											
1-7/16"	Advanced Low-E Triple-pane IG	PEL-N-184-00097-00001	5	5	5	air	0.19	0.19	33	69					27											
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00217-00001					0.20	0.18	30	69					25											
1-7/16"	Advanced Low-E Triple-pane IG	PEL-N-184-00123-00001	5	5	5	argon	0.17	0.19	33	73					29											
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00243-00001					0.17	0.18	30	73					29											
1-7/16"	NaturalSun Low-E Triple-pane IG	PEL-N-184-00098-00001	5	5	5	air	0.23	0.36	44	64					32											
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00218-00001					0.24	0.32	39	64					28											
1-7/16"	NaturalSun Low-E Triple-pane IG	PEL-N-184-00124-00001	5	5	5	argon	0.21	0.36	44	67					34											
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00244-00001					0.21	0.32	39	67					32											

Climate Zones



R-Value = 1/U-Factor

SHGC = Solar Heat Gain Coefficient

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ER = Canadian Energy Rating

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Based on unit size, some products will use 2.5mm glass that may have improved glazing performance from what is shown.

See the Product Performance section for more detailed information or visit www.energystar.gov for Energy Star guidelines.



CASEMENT

GLAZING PERFORMANCE - TOTAL UNIT

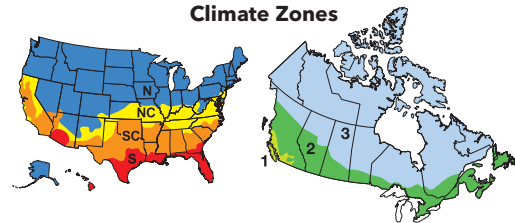
3-1/4" Pocket-Replacement

11/16" Insulating Glass with 3mm Glass



Glass Thickness	Type of Glazing	NFRC Certified Product #	Glass (mm)		Gap Fill	Performance Values ₁				Shaded Areas Meet ENERGY STAR® Performance Criteria in Zones Shown															
			Ext.	Int.		U-Factor	SHGC	VLT %	CR	U. S.				Canada ₂											
										Zone				ER	Zone										
VENT																		N	NC	SC	S		1	2	3
11/16"	Advanced Low-E IG	PEL-N-188-00006-00001	3	3	air	0.28	0.24	44	59					19											
	with 3/4" or 1" grilles-between-the-glass	PEL-N-188-00110-00001				0.29	0.21	39	59																
	with 7/8" Simulated Divided Light grilles	PEL-N-188-00214-00001				0.28	0.22	39	59					17											
11/16"	Advanced Low-E IG	PEL-N-188-00032-00001	3	3	argon	0.25	0.23	44	63					22											
	with 3/4" or 1" grilles-between-the-glass	PEL-N-188-00136-00001				0.26	0.21	39	63					19											
	with 7/8" Simulated Divided Light grilles	PEL-N-188-00234-00001				0.25	0.21	39	63					21											
11/16"	NaturalSun Low-E IG	PEL-N-188-00007-00001	3	3	air	0.29	0.43	49	58					28											
	with 3/4" or 1" grilles-between-the-glass	PEL-N-188-00111-00001				0.30	0.37	44	58																
	with 7/8" Simulated Divided Light grilles	PEL-N-188-00215-00001				0.29	0.39	44	58					26											
11/16"	NaturalSun Low-E IG	PEL-N-188-00033-00001	3	3	argon	0.26	0.43	49	62					32											
	with 3/4" or 1" grilles-between-the-glass	PEL-N-188-00137-00001				0.27	0.39	44	62					28											
	with 7/8" Simulated Divided Light grilles	PEL-N-188-00235-00001				0.26	0.39	44	62					30											
11/16"	SunDefense™ Low-E IG	PEL-N-188-00008-00001	3	3	air	0.28	0.18	40	59																
	with 3/4" or 1" grilles-between-the-glass	PEL-N-188-00112-00001				0.29	0.16	36	59																
	with 7/8" Simulated Divided Light grilles	PEL-N-188-00216-00001				0.28	0.16	36	59																
11/16"	SunDefense Low-E IG	PEL-N-188-00034-00001	3	3	argon	0.25	0.18	40	63					19											
	with 3/4" or 1" grilles-between-the-glass	PEL-N-188-00138-00001				0.26	0.16	36	63					16											
	with 7/8" Simulated Divided Light grilles	PEL-N-188-00236-00001				0.25	0.16	36	63					18											
VENT – WITH FOAM INSERTS																									
11/16"	Advanced Low-E IG	PEL-N-188-00058-00001	3	3	air	0.28	0.24	44	59					19											
	with 3/4" or 1" grilles-between-the-glass	PEL-N-188-00162-00001				0.29	0.22	39	59																
	with 7/8" Simulated Divided Light grilles	PEL-N-188-00254-00001				0.28	0.22	39	59					17											
11/16"	Advanced Low-E IG	PEL-N-188-00084-00001	3	3	argon	0.25	0.23	44	63					22											
	with 3/4" or 1" grilles-between-the-glass	PEL-N-188-00188-00001				0.26	0.21	39	63					19											
	with 7/8" Simulated Divided Light grilles	PEL-N-188-00274-00001				0.26	0.21	39	63					19											
11/16"	NaturalSun Low-E IG	PEL-N-188-00059-00001	3	3	air	0.29	0.17	25	58					25											
	with 3/4" or 1" grilles-between-the-glass	PEL-N-188-00163-00001				0.30	0.39	44	58					26											
	with 7/8" Simulated Divided Light grilles	PEL-N-188-00255-00001				0.29	0.39	44	58																
11/16"	NaturalSun Low-E IG	PEL-N-188-00085-00001	3	3	argon	0.26	0.43	49	62					32											
	with 3/4" or 1" grilles-between-the-glass	PEL-N-188-00189-00001				0.27	0.39	44	62					28											
	with 7/8" Simulated Divided Light grilles	PEL-N-188-00275-00001				0.27	0.39	44	62					28											
11/16"	SunDefense™ Low-E IG	PEL-N-188-00060-00001	3	3	air	0.28	0.23	32	59					18											
	with 3/4" or 1" grilles-between-the-glass	PEL-N-188-00164-00001				0.29	0.16	36	59																
	with 7/8" Simulated Divided Light grilles	PEL-N-188-00256-00001				0.28	0.16	36	59																
11/16"	SunDefense Low-E IG	PEL-N-188-00086-00001	3	3	argon	0.25	0.18	40	63					19											
	with 3/4" or 1" grilles-between-the-glass	PEL-N-188-00190-00001				0.26	0.16	36	63					16											
	with 7/8" Simulated Divided Light grilles	PEL-N-188-00276-00001				0.26	0.16	36	63					16											

Climate Zones



R-Value = 1/U-Factor
 SHGC = Solar Heat Gain Coefficient
 VLT % = Visible Light Transmission
 CR = Condensation Resistance
 ER = Canadian Energy Rating

(1) Glazing performance values are calculated based on NFRC 100, NFRC 200 and NFRC 500. ENERGY STAR® values are updated to 2015 (Version 6) criteria.

(2) The values shown are based on Canada's updated ENERGY STAR® 2015 initiative.

Based on unit size, some products will use 2.5mm glass that may have improved glazing performance from what is shown.

See the Product Performance section for more detailed information or visit www.energystar.gov for Energy Star guidelines.



GLAZING PERFORMANCE - TOTAL UNIT

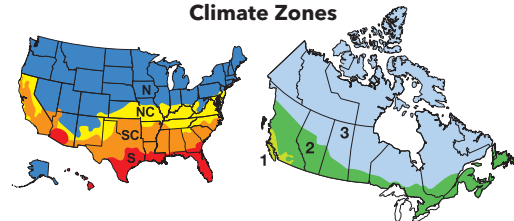
3-1/4" Pocket-Replacement

1" Insulating Glass with 5mm Glass



Glass Thickness	Type of Glazing	NFRC Certified Product #	Glass (mm)		Gap Fill	Performance Values ₁				Shaded Areas Meet ENERGY STAR® Performance Criteria in Zones Shown								
			Ext.	Int.		U-Factor	SHGC	VLT %	CR	U. S.				Canada ₂				
										Zone				ER	Zone			
VENT										N	NC	SC	S	123				
1"	Advanced Low-E IG	PEL-N-188-00016-00001	5	5	air	0.28	0.23	43	58					18				
	with 3/4" or 1" grilles-between-the-glass	PEL-N-188-00120-00001				0.28	0.21	38	58					17				
	with 7/8" Simulated Divided Light grilles	PEL-N-188-00224-00001				0.28	0.21	38	58					17				
1"	Advanced Low-E IG	PEL-N-188-00042-00001	5	5	argon	0.25	0.20	34	61					20				
	with 3/4" or 1" grilles-between-the-glass	PEL-N-188-00146-00001				0.25	0.21	38	61					21				
	with 7/8" Simulated Divided Light grilles	PEL-N-188-00244-00001				0.25	0.21	38	61					21				
1"	NaturalSun Low-E IG	PEL-N-188-00017-00001	5	5	air	0.29	0.41	48	57					27				
	with 3/4" or 1" grilles-between-the-glass	PEL-N-188-00121-00001				0.29	0.37	43	57					25				
	with 7/8" Simulated Divided Light grilles	PEL-N-188-00225-00001				0.29	0.37	43	57					25				
1"	NaturalSun Low-E IG	PEL-N-188-00043-00001	5	5	argon	0.26	0.38	46	61					29				
	with 3/4" or 1" grilles-between-the-glass	PEL-N-188-00147-00001				0.26	0.38	43	61					29				
	with 7/8" Simulated Divided Light grilles	PEL-N-188-00245-00001				0.26	0.38	43	61					29				
1"	SunDefense™ Low-E IG	PEL-N-188-00018-00001	5	5	air	0.28	0.18	39	58									
	with 3/4" or 1" grilles-between-the-glass	PEL-N-188-00122-00001				0.28	0.16	36	58									
	with 7/8" Simulated Divided Light grilles	PEL-N-188-00226-00001				0.28	0.16	36	58									
1"	SunDefense Low-E IG	PEL-N-188-00044-00001	5	5	argon	0.25	0.17	39	62					18				
	with 3/4" or 1" grilles-between-the-glass	PEL-N-188-00148-00001				0.25	0.16	36	62					18				
	with 7/8" Simulated Divided Light grilles	PEL-N-188-00246-00001				0.25	0.16	36	62					18				
VENT – WITH FOAM INSERTS																		
1"	Advanced Low-E IG	PEL-N-188-00068-00001	5	5	air	0.28	0.23	43	58					18				
	with 3/4" or 1" grilles-between-the-glass	PEL-N-188-00172-00001				0.28	0.21	38	58					17				
	with 7/8" Simulated Divided Light grilles	PEL-N-188-00264-00001				0.28	0.21	38	58					17				
1"	Advanced Low-E IG	PEL-N-188-00094-00001	5	5	argon	0.25	0.17	39	62					18				
	with 3/4" or 1" grilles-between-the-glass	PEL-N-188-00198-00001				0.25	0.21	38	61					21				
	with 7/8" Simulated Divided Light grilles	PEL-N-188-00284-00001				0.25	0.21	38	61					21				
1"	NaturalSun Low-E IG	PEL-N-188-00069-00001	5	5	air	0.29	0.41	48	57					27				
	with 3/4" or 1" grilles-between-the-glass	PEL-N-188-00173-00001				0.29	0.34	41	57									
	with 7/8" Simulated Divided Light grilles	PEL-N-188-00265-00001				0.29	0.37	43	57					25				
1"	NaturalSun Low-E IG	PEL-N-188-00095-00001	5	5	argon	0.26	0.41	48	61					31				
	with 3/4" or 1" grilles-between-the-glass	PEL-N-188-00199-00001				0.26	0.38	43	61					29				
	with 7/8" Simulated Divided Light grilles	PEL-N-188-00285-00001				0.26	0.38	43	61					29				
1"	SunDefense™ Low-E IG	PEL-N-188-00070-00001	5	5	air	0.28	0.18	39	58									
	with 3/4" or 1" grilles-between-the-glass	PEL-N-188-00174-00001				0.28	0.18	30	58									
	with 7/8" Simulated Divided Light grilles	PEL-N-188-00266-00001				0.28	0.16	36	58									
1"	SunDefense Low-E IG	PEL-N-188-00096-00001	5	5	argon	0.25	0.17	39	62					18				
	with 3/4" or 1" grilles-between-the-glass	PEL-N-188-00200-00001				0.25	0.16	36	62					18				
	with 7/8" Simulated Divided Light grilles	PEL-N-188-00286-00001				0.25	0.16	36	62					18				

Climate Zones



R-Value = 1/U-Factor

SHGC = Solar Heat Gain Coefficient

VLT % = Visible Light Transmission

CR = Condensation Resistance

ER = Canadian Energy Rating

(1) Glazing performance values are calculated based on NFRC 100, NFRC 200 and NFRC 500. ENERGY STAR® values are updated to 2015 (Version 6) criteria.

(2) The values shown are based on Canada's updated ENERGY STAR® 2015 initiative.

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CASEMENT

GLAZING PERFORMANCE - TOTAL UNIT

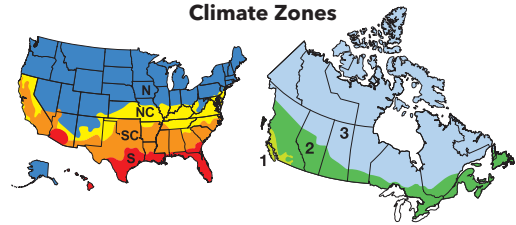
3-1/4" Pocket Replacement

Tinted Glass



Glass Thickness	Type of Glazing	NFRC Certified Product #	Glass (mm)		Gap Fill	Performance Values ₁				Shaded Areas Meet ENERGY STAR® Performance Criteria in Zones Shown							
			Ext.	Int.		U-Factor	SHGC	VLT %	CR	U. S.				Canada ₂			
										Zone				ER	Zone		
TINTED GLAZING										N	NC	SC	S	1 2 3			
11/16"	Bronze Advanced Low-E IG	PEL-N-188-00010-00001	3	3	air	0.28	0.23	32	59					18			
	with 3/4" or 1" grilles-between-the-glass	PEL-N-188-00114-00001				0.29	0.21	29	59								
	with 7/8" Simulated Divided Light grilles	PEL-N-188-00218-00001				0.28	0.21	29	59					17			
11/16"	Bronze Advanced Low-E IG	PEL-N-188-00036-00001	3	3	argon	0.25	0.23	32	63					22			
	with 3/4" or 1" grilles-between-the-glass	PEL-N-188-00140-00001				0.26	0.21	29	63					19			
	with 7/8" Simulated Divided Light grilles	PEL-N-188-00238-00001				0.25	0.21	29	63					21			
1"	Bronze Advanced Low-E IG	PEL-N-188-00020-00001	5	5	air	0.28	0.21	28	58					17			
	with 3/4" or 1" grilles-between-the-glass	PEL-N-188-00124-00001				0.28	0.19	25	58					16			
	with 7/8" Simulated Divided Light grilles	PEL-N-188-00228-00001				0.28	0.19	25	58					16			
1"	Bronze Advanced Low-E IG	PEL-N-188-00046-00001	5	5	argon	0.25	0.20	28	61					20			
	with 3/4" or 1" grilles-between-the-glass	PEL-N-188-00150-00001				0.25	0.19	25	61					19			
	with 7/8" Simulated Divided Light grilles	PEL-N-188-00248-00001				0.25	0.19	25	61					19			
TINTED GLAZING – WITH FOAM INSERTS																	
11/16"	Bronze Advanced Low-E IG	PEL-N-188-00062-00001	3	3	air	0.28	0.23	32	59					18			
	with 3/4" or 1" grilles-between-the-glass	PEL-N-188-00166-00001				0.29	0.21	29	59								
	with 7/8" Simulated Divided Light grilles	PEL-N-188-00258-00001				0.28	0.21	29	59					17			
11/16"	Bronze Advanced Low-E IG	PEL-N-188-00088-00001	3	3	argon	0.25	0.23	32	63					22			
	with 3/4" or 1" grilles-between-the-glass	PEL-N-188-00192-00001				0.26	0.21	29	63					19			
	with 7/8" Simulated Divided Light grilles	PEL-N-188-00278-00001				0.26	0.21	29	63					19			
1"	Bronze Advanced Low-E IG	PEL-N-188-00072-00001	5	5	air	0.28	0.21	28	58					17			
	with 3/4" or 1" grilles-between-the-glass	PEL-N-188-00176-00001				0.28	0.18	3	58								
	with 7/8" Simulated Divided Light grilles	PEL-N-188-00268-00001				0.28	0.19	25	58					16			
1"	Bronze Advanced Low-E IG	PEL-N-188-00098-00001	5	5	argon	0.25	0.20	28	62					20			
	with 3/4" or 1" grilles-between-the-glass	PEL-N-188-00202-00001				0.25	0.19	25	61					19			
	with 7/8" Simulated Divided Light grilles	PEL-N-188-00288-00001				0.25	0.19	25	61					19			

Climate Zones



R-Value = 1/U-Factor
 SHGC = Solar Heat Gain Coefficient
 VLT % = Visible Light Transmission
 CR = Condensation Resistance
 ER = Canadian Energy Rating

(1) Glazing performance values are calculated based on NFRC 100, NFRC



CASEMENT

GLAZING PERFORMANCE - TOTAL UNIT

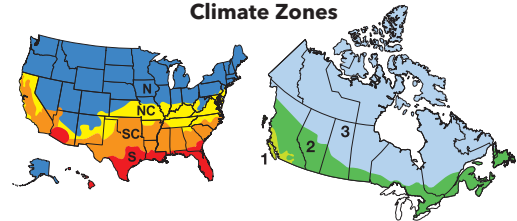
3-1/4" Pocket-Replacement

Triple-Pane Insulating Glass



Glass Thickness	Type of Glazing	NFRC Certified Product #	Glass (mm)			Gap Fill	Performance Values ₁				Shaded Areas Meet ENERGY STAR® Performance Criteria in Zones Shown							
			Ext.	Mid.	Int.		U-Factor	SHGC	VLT%	CR	U. S.				Canada ₂			
											Zone				ER	Zone		
VENT											N	NC	SC	S	1 2 3			
1-1/4"	Advanced Low-E Triple-pane IG	PEL-N-188-00023-00001	3	3	3	air	0.20	0.20	34	71	<div></div>	<div></div>	<div></div>	<div></div>	26	<div></div>	<div></div>	<div></div>
	with 3/4" or 1" grilles-between-the-glass	PEL-N-188-00127-00001					0.20	0.18	30	71	<div></div>	<div></div>	<div></div>	<div></div>	25	<div></div>	<div></div>	<div></div>
1-1/4"	Advanced Low-E Triple-pane IG	PEL-N-188-00049-00001	3	3	3	argon	0.17	0.20	34	75	<div></div>	<div></div>	<div></div>	<div></div>	30	<div></div>	<div></div>	<div></div>
	with 3/4" or 1" grilles-between-the-glass	PEL-N-188-00153-00001					0.18	0.18	30	75	<div></div>	<div></div>	<div></div>	<div></div>	28	<div></div>	<div></div>	<div></div>
1-1/4"	NaturalSun Low-E Triple-pane IG	PEL-N-188-00024-00001	3	3	3	air	0.23	0.37	45	65	<div></div>	<div></div>	<div></div>	<div></div>	32	<div></div>	<div></div>	<div></div>
	with 3/4" or 1" grilles-between-the-glass	PEL-N-188-00128-00001					0.24	0.32	39	65	<div></div>	<div></div>	<div></div>	<div></div>	28	<div></div>	<div></div>	<div></div>
1-1/4"	NaturalSun Low-E Triple-pane IG	PEL-N-188-00050-00001	3	3	3	argon	0.21	0.37	45	68	<div></div>	<div></div>	<div></div>	<div></div>	35	<div></div>	<div></div>	<div></div>
	with 3/4" or 1" grilles-between-the-glass	PEL-N-188-00154-00001					0.22	0.34	41	68	<div></div>	<div></div>	<div></div>	<div></div>	32	<div></div>	<div></div>	<div></div>
1-7/16"	Advanced Low-E Triple-pane IG	PEL-N-188-00025-00001	5	5	5	air	0.20	0.19	33	69	<div></div>	<div></div>	<div></div>	<div></div>	26	<div></div>	<div></div>	<div></div>
	with 3/4" or 1" grilles-between-the-glass	PEL-N-188-00129-00001					0.20	0.18	30	69	<div></div>	<div></div>	<div></div>	<div></div>	25	<div></div>	<div></div>	<div></div>
1-7/16"	Advanced Low-E Triple-pane IG	PEL-N-188-00051-00001	5	5	5	argon	0.17	0.19	33	73	<div></div>	<div></div>	<div></div>	<div></div>	29	<div></div>	<div></div>	<div></div>
	with 3/4" or 1" grilles-between-the-glass	PEL-N-188-00155-00001					0.18	0.18	30	73	<div></div>	<div></div>	<div></div>	<div></div>	28	<div></div>	<div></div>	<div></div>
1-7/16"	NaturalSun Low-E Triple-pane IG	PEL-N-188-00026-00001	5	5	5	air	0.23	0.36	44	64	<div></div>	<div></div>	<div></div>	<div></div>	32	<div></div>	<div></div>	<div></div>
	with 3/4" or 1" grilles-between-the-glass	PEL-N-188-00130-00001					0.24	0.32	39	64	<div></div>	<div></div>	<div></div>	<div></div>	28	<div></div>	<div></div>	<div></div>
1-7/16"	NaturalSun Low-E Triple-pane IG	PEL-N-188-00052-00001	5	5	5	argon	0.21	0.36	44	67	<div></div>	<div></div>	<div></div>	<div></div>	34	<div></div>	<div></div>	<div></div>
	with 3/4" or 1" grilles-between-the-glass	PEL-N-188-00156-00001					0.22	0.32	39	67	<div></div>	<div></div>	<div></div>	<div></div>	31	<div></div>	<div></div>	<div></div>
VENT – WITH FOAM INSERTS																		
1-1/4"	Advanced Low-E Triple-pane IG	PEL-N-188-00075-00001	3	3	3	air	0.20	0.20	34	71	<div></div>	<div></div>	<div></div>	<div></div>	26	<div></div>	<div></div>	<div></div>
	with 3/4" or 1" grilles-between-the-glass	PEL-N-188-00179-00001					0.20	0.18	30	71	<div></div>	<div></div>	<div></div>	<div></div>	25	<div></div>	<div></div>	<div></div>
1-1/4"	Advanced Low-E Triple-pane IG	PEL-N-188-00101-00001	3	3	3	argon	0.17	0.20	34	75	<div></div>	<div></div>	<div></div>	<div></div>	30	<div></div>	<div></div>	<div></div>
	with 3/4" or 1" grilles-between-the-glass	PEL-N-188-00205-00001					0.18	0.18	30	75	<div></div>	<div></div>	<div></div>	<div></div>	28	<div></div>	<div></div>	<div></div>
1-1/4"	NaturalSun Low-E Triple-pane IG	PEL-N-188-00076-00001	3	3	3	air	0.23	0.17	41	65	<div></div>	<div></div>	<div></div>	<div></div>	21	<div></div>	<div></div>	<div></div>
	with 3/4" or 1" grilles-between-the-glass	PEL-N-188-00180-00001					0.24	0.34	41	65	<div></div>	<div></div>	<div></div>	<div></div>	29	<div></div>	<div></div>	<div></div>
1-1/4"	NaturalSun Low-E Triple-pane IG	PEL-N-188-00102-00001	3	3	3	argon	0.21	0.37	45	68	<div></div>	<div></div>	<div></div>	<div></div>	35	<div></div>	<div></div>	<div></div>
	with 3/4" or 1" grilles-between-the-glass	PEL-N-188-00206-00001					0.22	0.34	41	68	<div></div>	<div></div>	<div></div>	<div></div>	32	<div></div>	<div></div>	<div></div>
1-7/16"	Advanced Low-E Triple-pane IG	PEL-N-188-00077-00001	5	5	5	air	0.20	0.16	25	69	<div></div>	<div></div>	<div></div>	<div></div>	24	<div></div>	<div></div>	<div></div>
	with 3/4" or 1" grilles-between-the-glass	PEL-N-188-00181-00001					0.20	0.18	30	69	<div></div>	<div></div>	<div></div>	<div></div>	25	<div></div>	<div></div>	<div></div>
1-7/16"	Advanced Low-E Triple-pane IG	PEL-N-188-00103-00001	5	5	5	argon	0.17	0.19	33	73	<div></div>	<div></div>	<div></div>	<div></div>	29	<div></div>	<div></div>	<div></div>
	with 3/4" or 1" grilles-between-the-glass	PEL-N-188-00207-00001					0.18	0.18	30	73	<div></div>	<div></div>	<div></div>	<div></div>	28	<div></div>	<div></div>	<div></div>
1-7/16"	NaturalSun Low-E Triple-pane IG	PEL-N-188-00078-00001	5	5	5	air	0.23	0.36	44	64	<div></div>	<div></div>	<div></div>	<div></div>	32	<div></div>	<div></div>	<div></div>
	with 3/4" or 1" grilles-between-the-glass	PEL-N-188-00182-00001					0.24	0.32	39	64	<div></div>	<div></div>	<div></div>	<div></div>	28	<div></div>	<div></div>	<div></div>
1-7/16"	NaturalSun Low-E Triple-pane IG	PEL-N-188-00104-00001	5	5	5	argon	0.21	0.36	44	67	<div></div>	<div></div>	<div></div>	<div></div>	34	<div></div>	<div></div>	<div></div>
	with 3/4" or 1" grilles-between-the-glass	PEL-N-188-00208-00001					0.22	0.32	39	67	<div></div>	<div></div>	<div></div>	<div></div>	31	<div></div>	<div></div>	<div></div>

Climate Zones



R-Value = 1/U-Factor

SHGC = Solar Heat Gain Coefficient

VLT % = Visible Light Transmission

CR = Condensation Resistance

ER = Canadian Energy Rating

(1) Glazing performance values are calculated based on NFRC 100, NFRC 200 and NFRC 500. ENERGY STAR® values are updated to 2015 (Version 6) criteria.

(2) The values shown are based on Canada's updated ENERGY STAR® 2015 initiative.

Based on unit size, some products will use 2.5mm glass that may have improved glazing performance from what is shown.

See the Product Performance section for more detailed information or visit www.energystar.gov for Energy Star guidelines.



CASEMENT

HURRICANESHIELD® IMPACT-RESISTANT GLAZING

GLAZING PERFORMANCE - TOTAL UNIT

1" Impact-Resistant Insulating Glass



Glass Thickness	Type of Glazing	NFRC Certified Product #	Glass (mm)		Gap Fill	Performance Values ₁				Shaded Areas Meet ENERGY STAR® Performance Criteria in Zones Shown									
			Ext.	Int.		U-Factor	SHGC	VLT %	CR	U. S.				Canada ₂					
										Zone				ER	Zone				
VENT											N	NC	SC	S	1			2	3
1"	Advanced Low-E IG PVB	PEL-N-184-00384-00001	3	9	air	0.27	0.23	43	59					19					
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00408-00001				0.27	0.21	38	59					18					
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00420-00001				0.27	0.21	38	59					18					
1"	Advanced Low-E IG PVB	PEL-N-184-00378-00001	3	9	air	0.24	0.23	43	62					23					
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00402-00001				0.24	0.21	38	62					22					
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00414-00001				0.24	0.21	38	62					22					
1"	SunDefense™ Low-E IG PVB	PEL-N-184-00386-00001	3	9	argon	0.27	0.17	39	59					16					
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00410-00001				0.27	0.16	36	59					15					
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00422-00001				0.27	0.16	36	59					15					
1"	SunDefense Low-E IG PVB	PEL-N-184-00380-00001	3	9	argon	0.24	0.17	39	62					19					
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00404-00001				0.24	0.16	36	62					19					
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00416-00001				0.24	0.16	36	62					19					
1"	Advanced Low-E IG PVB	PEL-N-184-00432-00001	5	9	air	0.27	0.23	42	59					19					
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00456-00001				0.28	0.21	38	59					17					
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00468-00001				0.27	0.21	38	59					18					
1"	Advanced Low-E IG PVB	PEL-N-184-00426-00001	5	9	argon	0.24	0.23	42	62					23					
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00450-00001				0.25	0.21	38	62					21					
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00462-00001				0.24	0.21	38	62					22					
1"	SunDefense™ Low-E IG PVB	PEL-N-184-00434-00001	5	9	air	0.27	0.18	39	59					16					
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00458-00001				0.28	0.16	35	59					14					
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00470-00001				0.27	0.16	35	59					15					
1"	SunDefense Low-E IG PVB	PEL-N-184-00428-00001	5	9	argon	0.24	0.17	39	62					19					
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00452-00001				0.25	0.16	35	62					18					
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00464-00001				0.24	0.16	35	62					19					
VENT – WITH OBSCURE GLAZING																			
1"	Advanced Low-E IG PVB	PEL-N-184-00347-00001	3	9	air	0.27	0.22	30	59					19					
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00355-00001				0.27	0.20	27	59					17					
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00359-00001				0.27	0.20	27	59					17					
1"	Advanced Low-E IG PVB	PEL-N-184-00345-00001	3	9	argon	0.24	0.22	30	62					22					
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00353-00001				0.24	0.20	27	62					21					
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00357-00001				0.24	0.20	27	62					21					
1"	SunDefense™ Low-E IG PVB	PEL-N-184-00348-00001	3	9	air	0.27	0.17	28	59					16					
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00356-00001				0.27	0.15	25	59					15					
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00360-00001				0.27	0.15	25	59					15					
1"	SunDefense Low-E IG PVB	PEL-N-184-00346-00001	3	9	argon	0.24	0.17	28	62					19					
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00354-00001				0.24	0.15	25	62					18					
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00358-00001				0.24	0.15	25	62					18					
1"	Advanced Low-E IG PVB	PEL-N-184-00363-00001	5	9	air	0.27	0.22	30	59					19					
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00371-00001				0.28	0.20	27	59					16					
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00375-00001				0.27	0.20	27	59					17					
1"	Advanced Low-E IG PVB	PEL-N-184-00361-00001	5	9	argon	0.24	0.22	30	62					22					
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00369-00001				0.25	0.20	27	62					20					
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00373-00001				0.24	0.20	27	62					21					
1"	SunDefense™ Low-E IG PVB	PEL-N-184-00364-00001	5	9	air	0.27	0.17	28	59					16					
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00372-00001				0.28	0.15	25	59					13					
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00376-00001				0.27	0.15	25	59					15					
1"	SunDefense Low-E IG PVB	PEL-N-184-00362-00001	5	9	argon	0.24	0.17	28	62					19					
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00370-00001				0.25	0.15	25	62					17					
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00374-00001				0.24	0.15	25	62					18					

R-Value = 1/U-Factor

SHGC = Solar Heat Gain Coefficient

VLT % = Visible Light Transmission

CR = Condensation Resistance

ER = Canadian Energy Rating

(1) Glazing performance values are calculated based on NFRC 100, NFRC 200 and NFRC 500.

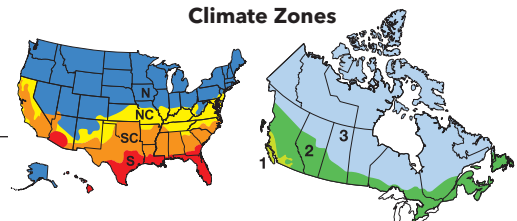
ENERGY STAR® values are updated to 2015 (Version 6) criteria.

(2) The values shown are based on Canada's updated ENERGY STAR® 2015 initiative.

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See the Product Performance section for more detailed information or visit www.energystar.gov for Energy Star guidelines.

Climate Zones





CASEMENT

HURRICANESHIELD® IMPACT-RESISTANT GLAZING

GLAZING PERFORMANCE - TOTAL UNIT

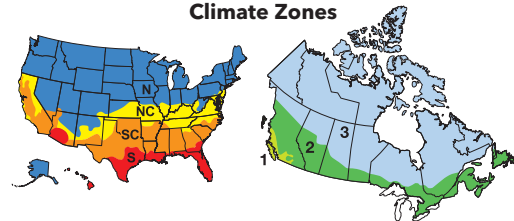
1" Impact-Resistant Insulating Glass



Glass Thickness	Type of Glazing	NFRC Certified Product #	Glass (mm)		Gap Fill	Performance Values ₁				Shaded Areas Meet ENERGY STAR® Performance Criteria in Zones Shown								
			Ext.	Int.		U-Factor	SHGC	VLT %	CR	U. S.				Canada ₂				
										Zone				ER	Zone			
VENT										N	NC	SC	S		1	2	3	
1"	Bronze Advanced Low-E IG PVB	PEL-N-184-00385-00001	3	9	air	0.27	0.22	24	59					19				
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00409-00001				0.27	0.20	21	59					17				
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00421-00001				0.27	0.20	21	59					17				
1"	Bronze Advanced Low-E IG PVB	PEL-N-184-00379-00001	3	9	argon	0.24	0.22	24	62					22				
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00403-00001				0.24	0.20	21	62					21				
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00415-00001				0.24	0.20	21	62					21				
1"	Gray Advanced Low-E IG PVB	PEL-N-184-00383-00001	3	9	air	0.27	0.16	0	58					15				
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00407-00001				0.27	0.15	0	58					15				
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00419-00001				0.27	0.15	0	58					15				
1"	Gray Advanced Low-E IG PVB	PEL-N-184-00377-00001	3	9	argon	0.25	0.16	0	62					18				
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00401-00001				0.25	0.14	0	62					17				
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00413-00001				0.25	0.14	0	62					17				
1"	Bronze Advanced Low-E IG PVB	PEL-N-184-00433-00001	5	9	air	0.27	0.22	23	59					19				
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00457-00001				0.28	0.20	21	59					16				
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00469-00001				0.27	0.20	21	59					17				
1"	Bronze Advanced Low-E IG PVB	PEL-N-184-00427-00001	5	9	argon	0.24	0.22	23	62					22				
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00451-00001				0.25	0.20	21	62					20				
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00463-00001				0.24	0.20	21	62					21				
1"	Gray Advanced Low-E IG PVB	PEL-N-184-00431-00001	5	9	air	0.27	0.16	24	58					15				
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00455-00001				0.29	0.15	22	58					12				
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00467-00001				0.27	0.15	22	58					15				
1"	Gray Advanced Low-E IG PVB	PEL-N-184-00425-00001	5	9	argon	0.25	0.16	24	61					18				
	with 3/4" or 1" grilles-between-the-glass	PEL-N-184-00449-00001				0.26	0.14	22	61					15				
	with 7/8" Simulated Divided Light grilles	PEL-N-184-00461-00001				0.25	0.14	22	61					17				

R-Value = 1/U-Factor
 SHGC = Solar Heat Gain Coefficient
 VLT % = Visible Light Transmission
 CR = Condensation Resistance
 ER = Canadian Energy Rating

Climate Zones



(1) Glazing performance values are calculated based on NFRC 100, NFRC 200 and NFRC 500. ENERGY STAR® values are updated to 2015 (Version 6) criteria.

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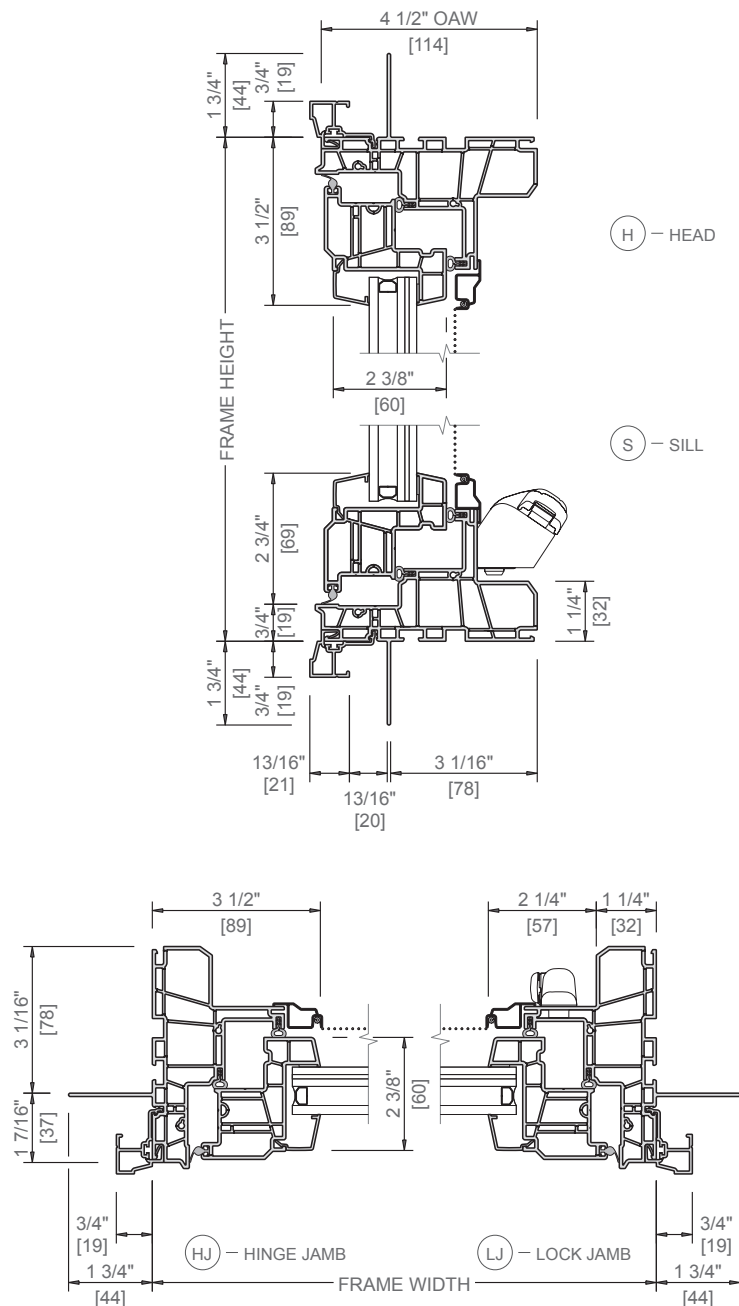
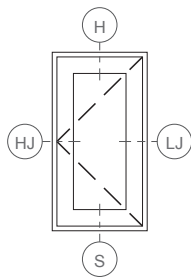


HURRICANESHIELD® IMPACT-RESISTANT GLAZING

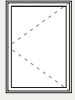


Certification Results₁

Product	Design Pressure Large Missile Rating D		Hallmark Certified	Miami-Dade County Approved (NOA)	Florida Product Approval System (FPAS)	Texas Department of Insurance (TDI)
	Minimum	Maximum				
VENT UNITS						
1" Insulated Glass PVB	+ 70 / - 75	+ 70 / - 75	411-H-1416	13-0114.07	FL16053	WIN-1773



(1) Published performance data is for single unit only. See Design Data pages in this section for specific product performance class and grade values.



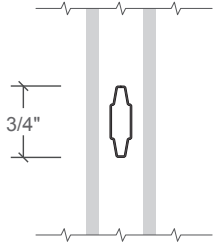
CASEMENT

GRILLE TYPES

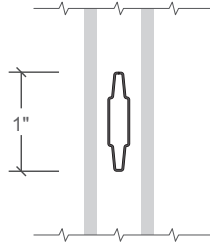


Grille Profiles

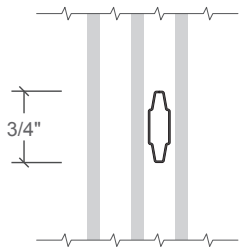
GRILLES-BETWEEN-THE-GLASS



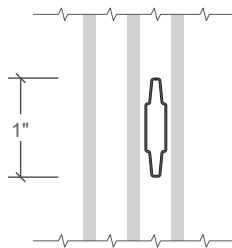
3/4" Contour



1" Contour

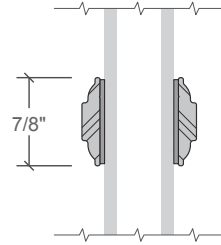


3/4" Contour



1" Contour

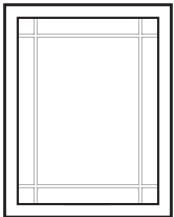
SIMULATED-DIVIDED-LIGHT GRILLES WITHOUT SPACER



7/8" Contour

Grille Patterns

PRAIRIE LITE PATTERNS

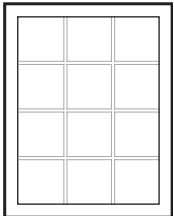


9-Lite Prairie

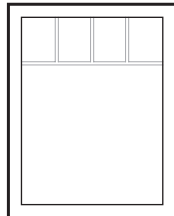
Prairie

- Approximately 4" from edge of sash to center of bar
- Minimum actual glass is 13"

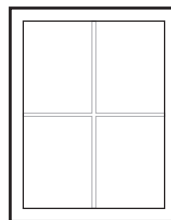
OTHER AVAILABLE PATTERNS



Traditional



Top Row



Custom - Equally Divided

Traditional

- Specify number of lites.
- Grilles must be equally divided on visible glass.
- Minimum 6" x 6".

Top Row

- Standard visible glass to separator bar = 14" or half of total visible glass height, whichever is smaller.

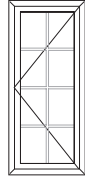
For traditional patterns, see size tables.



CASEMENT

SPECIAL SIZE FRAME DIMENSIONS

Miscellaneous Formulas

1-WIDE
VENT UNIT

MINIMUM

13-1/2" W x 17-1/2" H
(343 x 445)

MAXIMUM

35-1/2" W x 71-1/2" H
(889 x 1 803)

General Notes:

- To convert areas to square meters (m²), multiply square feet by 0.0929.
- Rough Opening = Frame Dimension + 1/2".
- Unit Height must be > Unit Width
- Keep frame dimensions to the nearest 1/8" increment.
- Tempered glass must measure ≥ 18-1/2" diagonally.
- If glass width to height ratio is > 5 to 1, then unit must be tempered.

Miscellaneous Formulas

	1-WIDE-VENT
VISIBLE GLASS	VGW = FW - 7"
	VGH = FH - 7"
ACTUAL GLASS	AGW = FW - 5-7/8"
	AGH = FH - 5-7/8"

Clear Opening Formulas

	1-WIDE-VENT
VENT AREA	VA = (COH X COW) / 144
COH	COH = FH - 5.5
COW	Standard Performance COW = FW - 11.8125
	Impact / High Performance COW = FW - 12.125
	Side Pivot COW = FW - 7.543

KEY:

AGW = Actual Glass Width
 AGH = Actual Glass Height
 FW = Frame Width
 FH = Frame Height
 VGW = Visible Glass Width
 VGH = Visible Glass Height
 COW = Clear opening width
 COH = Clear opening height

Side pivot hardware only available on frame widths of 28" to 32"
 The clear opening formulas do not apply to units with FW < 16.25"



CASEMENT

SIZE TABLES



1-Wide Vent

		(457) (445)	(610) (597)	(711) (699)	(762) (749)	(813) (800)	(914) (902)
	Opening	1' 6"	2' 0"	2' 4"	2' 6"	2' 8"	3' 0"
	Frame	17 1/2"	23 1/2"	27 1/2"	29 1/2"	31 1/2"	35 1/2"
(762) (749)	2' 6"						
(914) (902)	3' 0"						
(1 067) (1 054)	3' 6"						
(1 219) (1 207)	4' 0"						
(1 372) (1 359)	4' 6"						
(1 524) (1 511)	5' 0"						
(1 676) (1 664)	5' 6"						
(1 829) (1 816)	6' 0"						

Egress Notes:

Check all applicable local codes for emergency egress requirements.

E = Window meets minimum clear opening of 24" height, 20" width, and 5.7 ft².

E1 = Window meets minimum clear opening of 24" height, 20" width, and 5.0 ft².

E2 = With optional side pivot hardware, window meets minimum clear opening of 24" height, 20" width, and 5.7 ft².

E3 = With optional side pivot hardware, window meets minimum clear opening of 24" height, 20" width, and 5.0 ft².



CASEMENT

DESIGN DATA



VENT UNITS

Unit	Egress	Frame (Inches)		Clear Opening (Inches) (Vent Units Only)			Vent Area Ft²	Visible Glass Ft²	Standard Glass Thickness (mm)		Performance Class & Grade ₁	
		Width	Height	Width	Height	Ft²			Annealed	Tempered	Standard	Upgraded
1-6/2-6		17-1/2	29-1/2	5-11/16	24	0.9	0.9	1.6	2.5	3	LC40	LC60
1-6/3-0		17-1/2	35-1/2	5-11/16	30	1.1	1.1	2.1	2.5	3	LC40	LC60
1-6/3-6		17-1/2	41-1/2	5-11/16	36	1.4	1.4	2.5	2.5	3	LC40	LC60
1-6/4-0		17-1/2	47-1/2	5-11/16	42	1.6	1.6	3.0	2.5	3	LC40	LC60
1-6/4-6		17-1/2	53-1/2	5-11/16	48	1.8	1.8	3.4	2.5	3	LC40	LC60
1-6/5-0		17-1/2	59-1/2	5-11/16	54	2.1	2.1	3.8	2.5	3	LC40	LC60
1-6/5-6		17-1/2	65-1/2	5-11/16	60	2.3	2.3	4.3	2.5	3	LC40	LC60
1-6/6-0		17-1/2	71-1/2	5-11/16	66	2.6	2.6	4.7	2.5	3	LC40	LC60
2-0/2-6		23-1/2	29-1/2	11-11/16	24	1.9	1.9	2.6	2.5	3	LC40	LC60
2-0/3-0		23-1/2	35-1/2	11-11/16	30	2.4	2.4	3.3	2.5	3	LC40	LC60
2-0/3-6		23-1/2	41-1/2	11-11/16	36	2.9	2.9	4.0	2.5	3	LC40	LC60
2-0/4-0		23-1/2	47-1/2	11-11/16	42	3.4	3.4	4.6	2.5	3	LC40	LC60
2-0/4-6		23-1/2	53-1/2	11-11/16	48	3.8	3.8	5.3	2.5	3	LC40	LC60
2-0/5-0		23-1/2	59-1/2	11-11/16	54	4.3	4.3	6.0	2.5	3	LC40	LC60
2-0/5-6		23-1/2	65-1/2	11-11/16	60	4.8	4.8	6.7	2.5	3	LC40	LC60
2-0/6-0		23-1/2	71-1/2	11-11/16	66	5.3	5.3	7.4	3	3	LC40	LC60
2-4/2-6		27-1/2	29-1/2	15-11/16	24	2.6	2.6	3.2	2.5	3	LC40	LC60
2-4/3-0		27-1/2	35-1/2	15-11/16	30	3.2	3.2	4.1	2.5	3	LC40	LC60
2-4/3-6		27-1/2	41-1/2	15-11/16	36	3.9	3.9	4.9	2.5	3	LC40	LC60
2-4/4-0		27-1/2	47-1/2	15-11/16	42	4.5	4.5	5.8	2.5	3	LC40	LC60
2-4/4-6		27-1/2	53-1/2	15-11/16	48	5.2	5.2	6.6	2.5	3	LC40	LC60
2-4/5-0		27-1/2	59-1/2	15-11/16	54	5.8	5.8	7.5	3	3	LC40	LC60
2-4/5-6		27-1/2	65-1/2	15-11/16	60	6.5	6.5	8.3	3	3	LC40	LC60
2-4/6-0		27-1/2	71-1/2	15-11/16	66	7.1	7.1	9.2	3	3	LC40	LC60
2-6/2-6		29-1/2	29-1/2	17-11/16	24	2.9	2.9	3.5	2.5	3	LC40	LC60
2-6/3-0		29-1/2	35-1/2	17-11/16	30	3.6	3.6	4.5	2.5	3	LC40	LC60
2-6/3-6	E3	29-1/2	41-1/2	17-11/16	36	4.4	4.4	5.4	2.5	3	LC40	LC60
2-6/4-0	E2	29-1/2	47-1/2	17-11/16	42	5.1	5.1	6.3	2.5	3	LC40	LC60
2-6/4-6	E2	29-1/2	53-1/2	17-11/16	48	5.8	5.8	7.3	2.5	3	LC40	LC60
2-6/5-0	E2	29-1/2	59-1/2	17-11/16	54	6.6	6.6	8.2	3	3	LC40	LC60
2-6/5-6	E2	29-1/2	65-1/2	17-11/16	60	7.3	7.3	9.1	3	3	LC40	LC60
2-6/6-0	E2	29-1/2	71-1/2	17-11/16	66	8.1	8.1	10.1	3	3	LC40	LC60
2-8/3-0		31-1/2	35-1/2	19-11/16	30	4.0	4.0	4.8	2.5	3	LC40	LC60
2-8/3-6	E2	31-1/2	41-1/2	19-11/16	36	4.9	4.9	5.9	2.5	3	LC40	LC60
2-8/4-0	E2	31-1/2	47-1/2	19-11/16	42	5.7	5.7	6.9	2.5	3	LC40	LC60
2-8/4-6	E2	31-1/2	53-1/2	19-11/16	48	6.5	6.5	7.9	2.5	3	LC40	LC60
2-8/5-0	E2	31-1/2	59-1/2	19-11/16	54	7.3	7.3	8.9	3	3	LC40	LC60
2-8/5-6	E2	31-1/2	65-1/2	19-11/16	60	8.1	8.1	10.0	3	3	LC40	LC60
2-8/6-0	E2	31-1/2	71-1/2	19-11/16	66	9.0	9.0	11.0	3	3	LC40	LC60
3-0/3-0		35-1/2	35-1/2	23-11/16	30	4.9	4.9	5.6	2.5	3	LC40	LC60
3-0/3-6	E	35-1/2	41-1/2	23-11/16	36	5.9	5.9	6.8	2.5	3	LC40	LC60
3-0/4-0	E	35-1/2	47-1/2	23-11/16	42	6.9	6.9	8.0	2.5	3	LC40	LC60
3-0/4-6	E	35-1/2	53-1/2	23-11/16	48	7.8	7.8	9.2	2.5	3	LC40	LC60
3-0/5-0	E	35-1/2	59-1/2	23-11/16	54	8.8	8.8	10.4	3	3	LC40	LC60
3-0/5-6	E	35-1/2	65-1/2	23-11/16	60	9.8	9.8	11.6	3	3	LC40	LC60
3-0/6-0	E	35-1/2	71-1/2	23-11/16	66	10.8	10.8	12.8	3	3	LC40	LC60

Egress Notes:

Check all applicable local codes for emergency egress requirements.

E = Window meets minimum clear opening of 24" height, 20" width, and 5.7 ft².

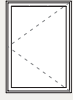
E1 = Window meets minimum clear opening of 24" height, 20" width, and 5.0 ft².

E2 = With optional side pivot hardware, window meets minimum clear opening of 24" height, 20" width, and 5.7 ft².

E3 = With optional side pivot hardware, window meets minimum clear opening of 24" height, 20" width, and 5.0 ft².

To convert areas to square meters (m²), multiply square feet by 0.0929.

(1) Maximum performance when glazed with the appropriate glass thickness.



CASEMENT

DETAILED PRODUCT DESCRIPTIONS



FRAME

- Overall frame depth: 4-1/2" on all frame types except the 3-1/4" pocket replacement frame.
- Frame members are mitered and heat fused to provide a fully welded corner assembly.
- Frame: [1-7/16" setback nail fin for 3-1/16" wall depth] [Block frame for 4-1/2" wall depth] [Block frame for 3-1/4" pocket replacement install] [Flush flange for 4" wall depth] [Integral flange for 3-7/8" wall depth].
- Interior and exterior frame surfaces are extruded rigid PVC.

SASH

- Sash members are extruded rigid PVC [with optional foam Insulation¹].
- Panel members are mitered and heat-fused to provide a fully welded corner assembly with SmoothSeam™ virtually invisible interior welds.
- Contains sealed insulating glass.

WEATHERSTRIPPING

- Vent is weatherstripped around the sash with rainstrip and the frame perimeter is weatherstripped with an extruded bulb weatherstrip in two locations.

GLAZING SYSTEM

- Quality float glass complying with ASTM C 1036.
- Exterior face-glazed sealed insulating glass.
- [11/16"] [1"] Dual-Pane annealed [Advanced Low-E coated [with Argon]] [NaturalSun Low-E coated [with Argon]] [SunDefense™ Low-E coated [with Argon]] [Bronze, Advanced Low-E coated [with Argon]] [Gray Low-E coated [with Argon]] [Obscure³] [High Altitude²] [Tempered].
-or-
- 1-1/4" and 1-7/16" Triple-Pane annealed [Advanced Low-E coated with Argon] [NaturalSun Low-E coated with Argon] [Obscure] [High Altitude²] [Tempered].
-or-
- Silicone-glazed 1" dual-pane impact-resistant insulating glass PVB. Laminated [clear] [Bronze⁴] [Opaque⁵] interior light. [Tempered] [Annealed] exterior light is [Advanced Low-E coated [with argon]] [SunDefense™ Low-E coated [with argon]] [Gray Low-E coated with argon] [High Altitude²]].

INTERIOR / EXTERIOR

- Window frame members [[White] [Almond] have an integral color extruded throughout the profiles] [Brown exterior has a solar reflective coating per AAMA 614, and integral color on the interior].
- All exposed PVC surfaces are smooth, glossy and uniform in appearance.
- Frame color options [White] [Almond] [Brown exterior / White interior].

HARDWARE

- Multipoint unison lock with single handle is factory-installed zinc die cast.
- High quality dual-arm roto operator with fold down crank handle on sill.
- Corrosion-resistant fasteners of PVC-compatible material.
- Hardware finish [White] [Almond] [Bright Brass] [Satin Nickel] [Oil-Rubbed Bronze].

SCREENS

- Standard Screen
 - Black vinyl coated 18/14 mesh fiberglass screen cloth complying with ASTM D 3656 and SMA 1201.
 - Set in aluminum extruded frame and fitted to interior of window.
 - Screen frame finish is baked enamel, color to match interior.
- or-
- InView™ Screens
 - Vinyl-coated 18/18 mesh fiberglass screen cloth complying with SMA 1201, set in aluminum extruded frame fitted to inside of window, supplied complete with all necessary hardware.
 - Screen frame finish is baked enamel, color to match interior.

OPTIONAL PRODUCTS

Grilles

- Grilles-Between-the-Glass
 - Insulating glass contains [3/4"] [1"] contoured aluminum grilles permanently installed between two panes of glass.
 - Patterns are [Traditional] [9-Lite Prairie] [Top Row] [Custom - Equally Divided].
 - Grilles match color of interior and exterior frame.
 - Available on units glazed with dual-pane and triple-pane insulated glass.
- Simulated-Divided-Light grilles without spacer
 - 7/8" Grilles permanently bonded to the interior and exterior of glass.
 - Patterns are [Traditional] [9-Lite Prairie] [Top Row] [Custom - Equally Divided].
 - Grilles match color of interior and exterior frame.
 - Available only on units glazed with dual-pane insulated glass.

Hardware

- Optional limited opening hardware available for vent units in stainless steel; nominal 3" opening.
- Optional window opening control device available for field installation. Device allows window to open less than 4" with normal operation, with a release mechanism that allows the sash to open completely. Complies with ASTM F2090-10.

(1) Foam Insulation is not available with Performance Upgrade.

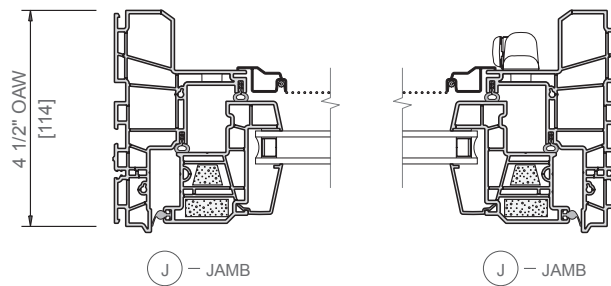
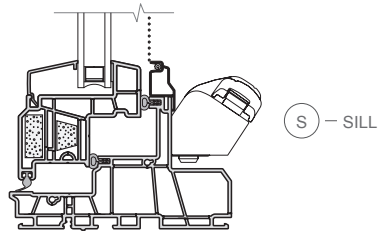
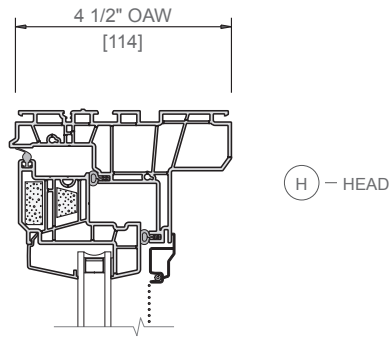
(2) Dual-Pane IG High Altitude glazings are available with or without Argon. Triple-Pane IG High Altitude glazings are only available without Argon.

(3) Obscure glass not available with Bronze Advanced Low-E IG.



CASEMENT

OPTIONAL FOAM INSULATION





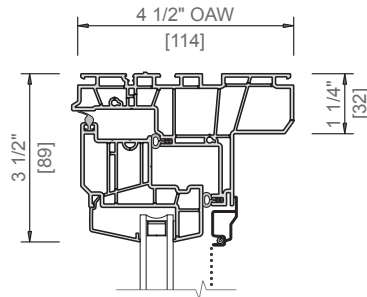
CASEMENT

UNIT SECTIONS

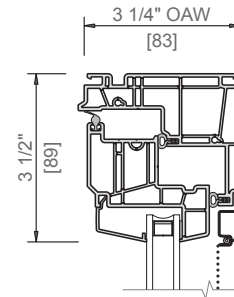
Installation Types



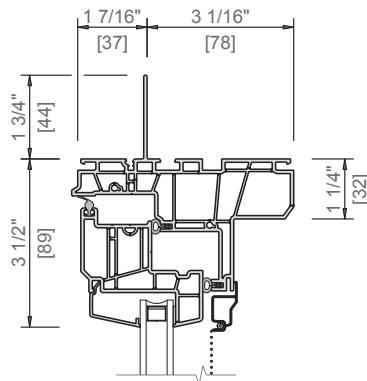
STANDARD
BLOCK FRAME



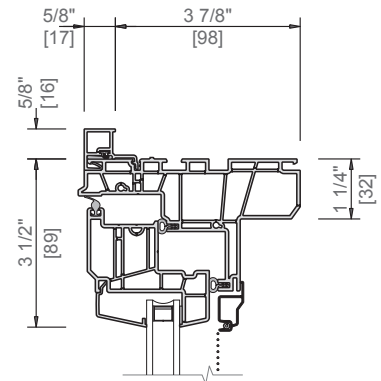
POCKET REPLACEMENT



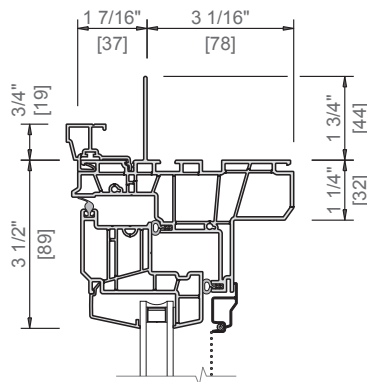
STANDARD
NAIL FIN



BLOCK FRAME with
5/8" INTEGRAL FLANGE

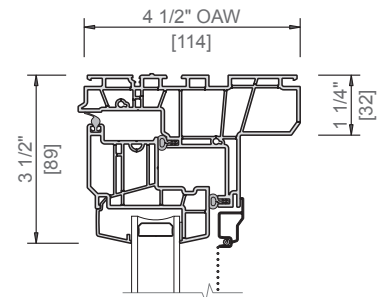


NAIL FIN
with J-CHANNEL

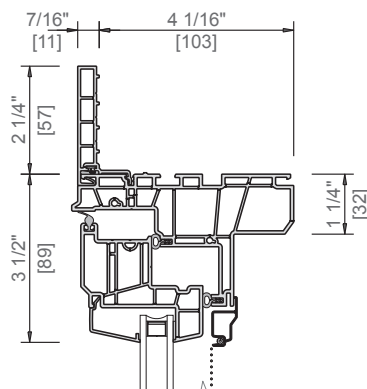


Additional Glazing Options

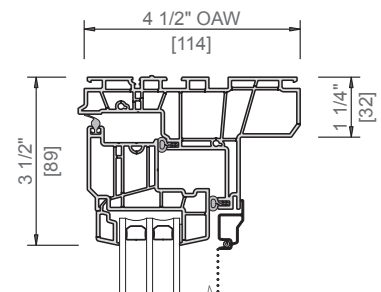
1" IG



DOUBLE WALL
FLUSH FLANGE



1 1/4" TRIPLE
PANE IG

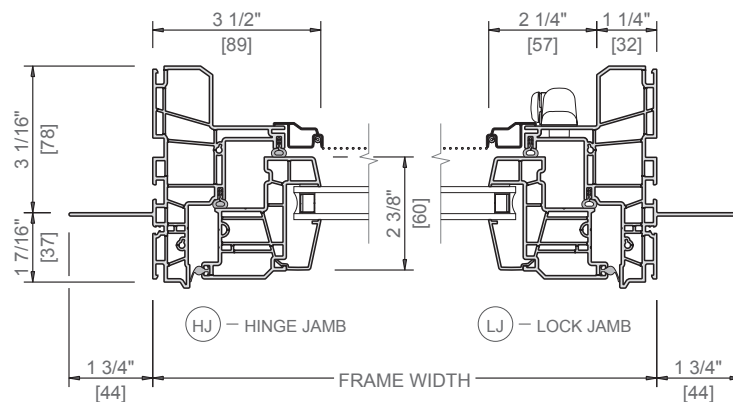
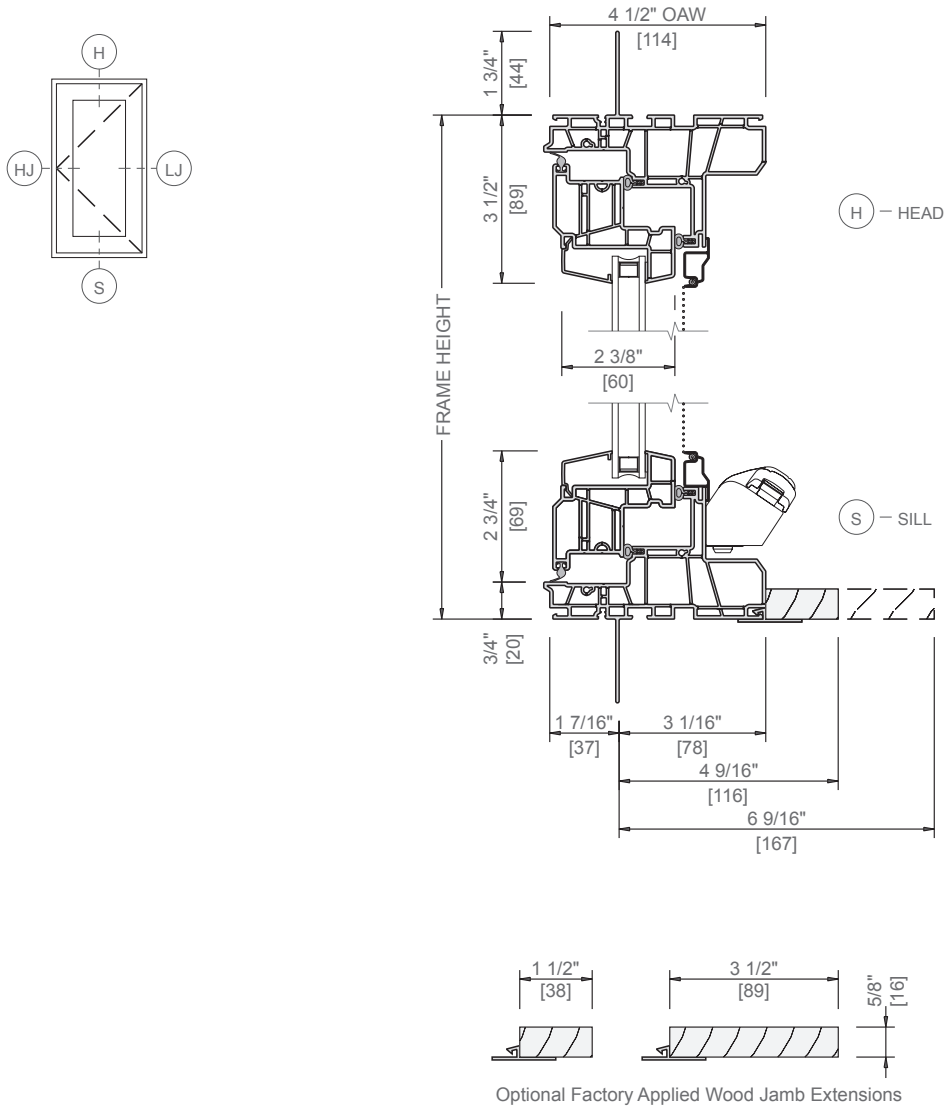




CASEMENT

UNIT SECTIONS

Standard Nail Fin



Scale 3" = 1' 0"

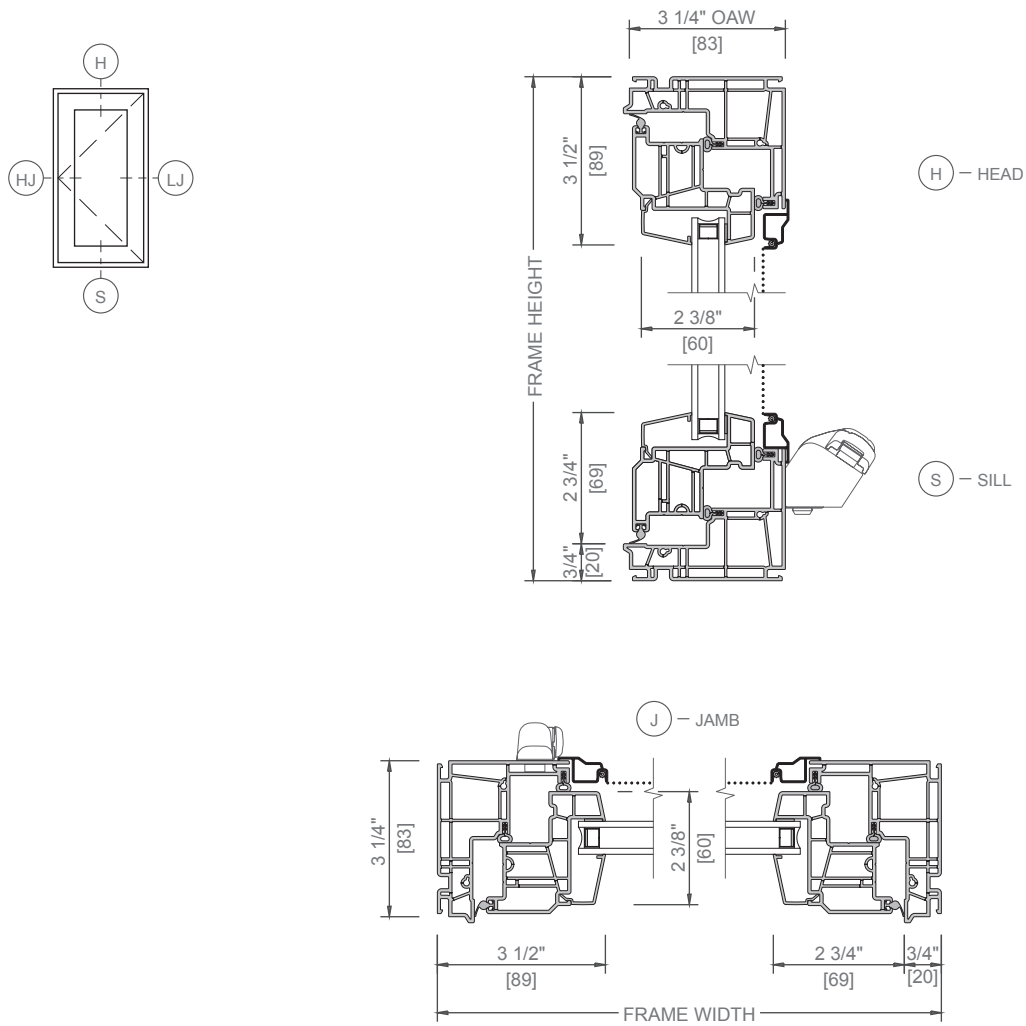
All dimensions are approximate.



CASEMENT

UNIT SECTIONS

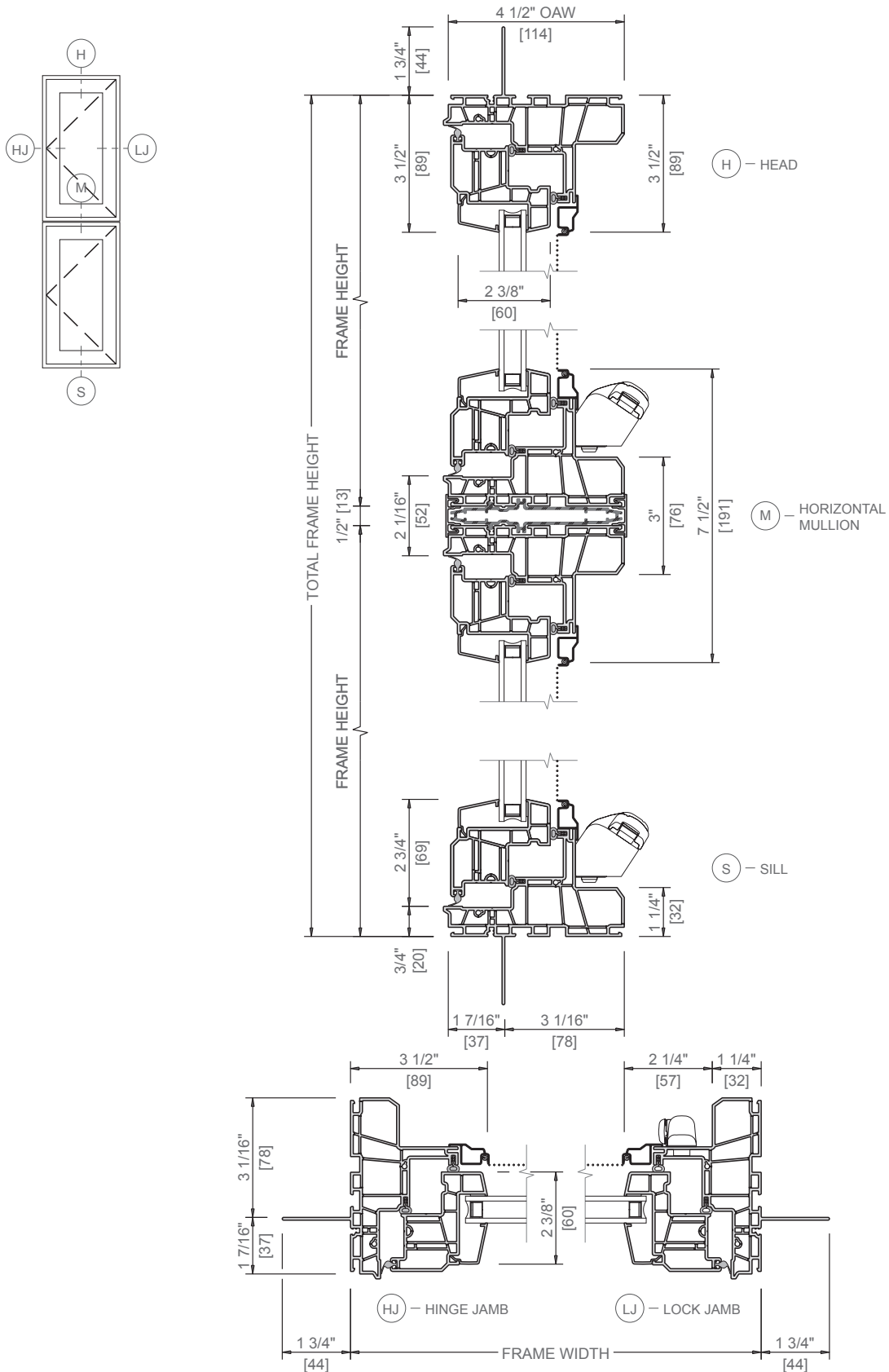
Pocket Replacement Frame





UNIT SECTIONS

Typical Factory-Assembled Joining Mullions
with Standard Nail Fin



Scale 3" = 1' 0"

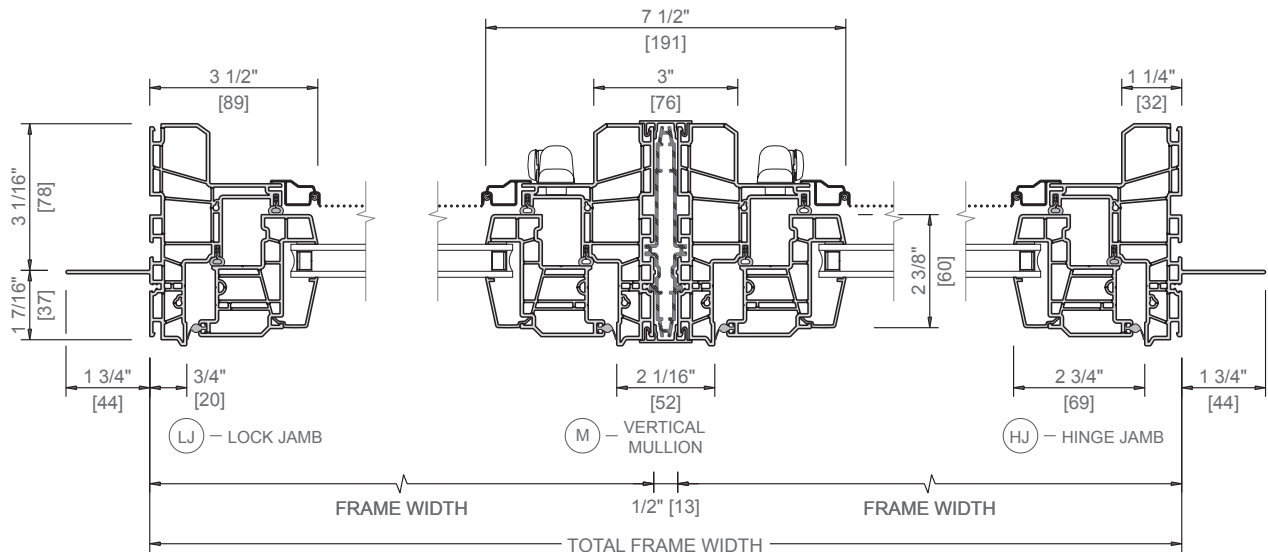
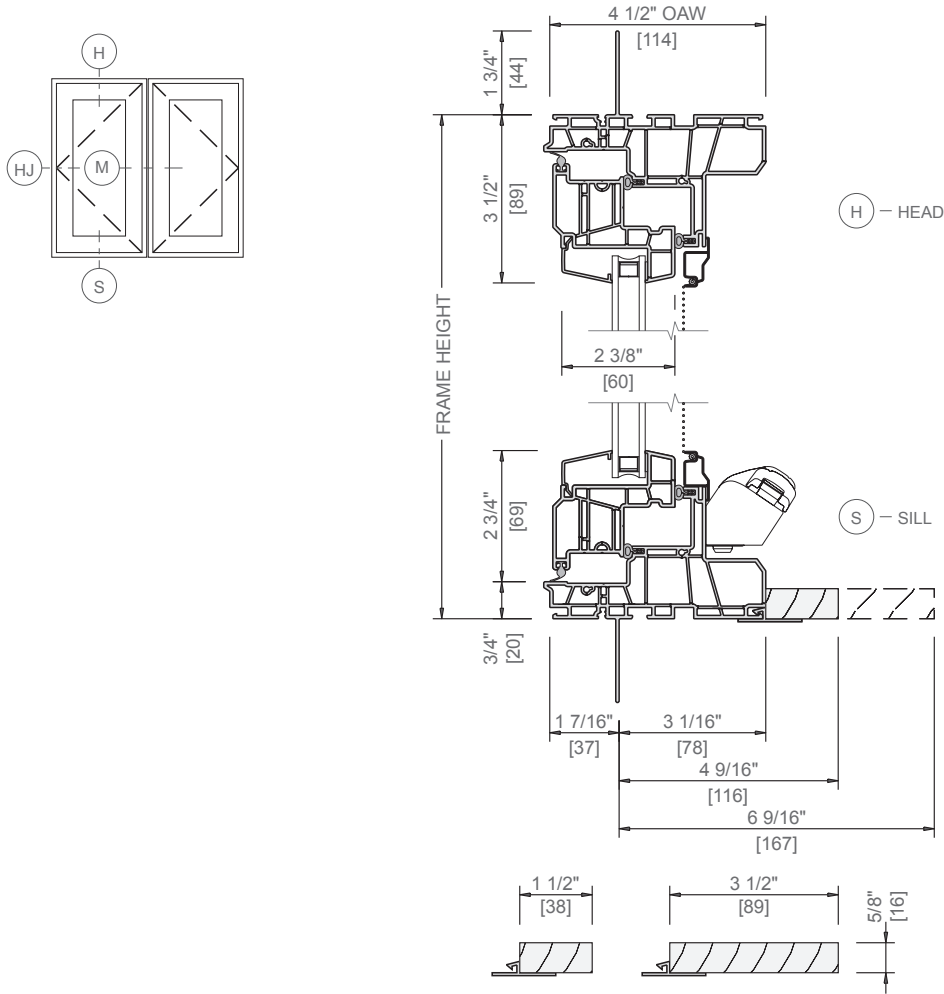
All dimensions are approximate.

See Installation and Performance section for mulling limitations.



UNIT SECTIONS

Typical Factory-Assembled Joining Mullions
with Standard Nail Fin



Scale 3" = 1' 0"

All dimensions are approximate.

See Installation and Performance section for mulling limitations.