



Product Selection Guide

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Supporting documents for this product:

Test Reports:

https://media.pella.com/professional/adm/CertificationReports/Test_Reports_IMP.pdf?utm_source=pdfdoc

CSI Specs (readable using Microsoft Word or other text editing application):

https://media.pella.com/professional/adm/Fiberglass-CSI_Specs/08572_CMAW.rtf?utm_source=pdfdoc

AIA Masterspec (readable using Microsoft Word or other text editing application):

https://media.pella.com/professional/adm/Fiberglass-CSI_Specs/085413_fl.doc?utm_source=pdfdoc

Detailed Product Description (readable using Microsoft Word or other text editing application):

https://media.pella.com/professional/adm/Fiberglass/F2-CM.rtf?utm_source=pdfdoc

Size Tables (requires appropriate CAD software to read and use):

https://media.pella.com/professional/adm/Fiberglass/IMP-CM-Elev_D.dwg?utm_source=pdfdoc

CAD cross sections (requires appropriate CAD software to read and use):

https://media.pella.com/professional/adm/Fiberglass/IMP-CM-Detail_D.dwg?utm_source=pdfdoc

3D & BIM (requires appropriate software to read and use):

https://media.pella.com/professional/adm/RevitFiles/Imp-Revit/Window-Casement-Pella-Impervia.zip?utm_source=pdfdoc

Sketchup (requires appropriate software to read and use):

https://media.pella.com/professional/adm/Fiberglass/PellaSKP_Impervia_Casement.zip?utm_source=pdfdoc

Combination Recommendations:

https://media.pella.com/professional/adm/Fiberglass/F2_Combinations.pdf?utm_source=pdfdoc

Installation Details:

https://media.pella.com/professional/adm/Fiberglass/Pella-Impervia_InstallationDetails.pdf?utm_source=pdfdoc

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Size and Performance Data

Size and Performance Data

		Casement
Sizes		
Standard Vent/Fixed		●
Standard Fixed Companion Sizes		●
Transom Sizes		●
Egress Sizes		●
Special Sizes		●
Performance₁		
Meets or Exceeds AAMA / WDMA Ratings		C-LC45 – LC +50/-60 Hallmark Certified
Air Infiltration (cfm/ft ² of frame @ 1.57 psf wind pressure)		0.05
Water Resistance		6.75 – 7.5 psf
Design Pressure		45 – 50 psf
Products with Impact-Resistant Laminated Glass Meets or Exceeds AAMA / WDMA Ratings		C-LC +50/-50 Missile C, Windzone 2 Hallmark Certified
Other Performance Criteria		
Forced Entry Resistance Level (Minimum Security Grade) ₂		40
Roto-Operator Maximum Operating Force (lb) Initiate Motion/Maintain Motion		15/6
Easy-Slide Operator Maximum Operating Force (lb) Initiate Motion/Maintain Motion		10/7
Easy-Slide Operator with Accessibility Lock Lever - Operating Force (lb) Initiate Motion/Maintain Motion (Available for select sizes only) Size requirements: Frame Width is ≤ 35" and Frame Height is ≤ 72.5" or Frame Width is > 35" but ≤ 36" and Frame Height is ≤ 60" Review Local and Federal requirements for guidance on install height and other considerations to meet ADA compliance.		5/5

Sound Transmission Class / Outdoor-Indoor Transmission Class

Product	Frame Size Tested ₃	Glazing System				STC Rating	OITC Rating
		Overall Glazing Thickness	Exterior Glass Thickness	Middle Glass Thickness	Interior Glass Thickness		
VENT	23-1/2" x 59"	11/16"	3mm	—	3mm	28	25
	23-1/2" x 59"	11/16"	4mm	—	4mm	31	26
	23-1/2" x 59"	11/16"	5mm	—	3mm	32	27
	23-1/2" x 59"	1"	3mm	3mm	3mm	29	24
	23-1/2" x 59"	1"	4mm	—	6mm	34	28
	23-1/2" x 59"	1"	5mm	—	3mm	34	28
	23-1/2" x 59"	1"	5mm	—	5mm	30	24
	23-1/2" x 59"	1"	6mm	—	6mm	32	26
	23-1/2" x 59"	1"	4mm	—	7mm PVB Laminated	33	27
FIXED	23-1/2" x 59"	1"	5mm	—	10mm PVB Laminated	37	32
	47" x 59"	11/16"	3mm	—	3mm	28	24
	47" x 59"	11/16"	4mm	—	4mm	29	25
	47" x 59"	11/16"	5mm	—	3mm	31	26
	47" x 59"	1"	3mm	3mm	3mm	29	24
	47" x 59"	1"	4mm	4mm	4mm	30	26
	47" x 59"	1"	4mm	—	6mm	33	28
	47" x 59"	1"	5mm	—	3mm	32	27
	47" x 59"	1"	5mm	—	5mm	30	25
	47" x 59"	1"	6mm	—	6mm	30	24
	47" x 59"	1"	4mm	—	7mm PVB Laminated	34	29
	47" x 59"	1"	5mm	—	10mm PVB Laminated	36	31

(1) 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.



	Block Frame	Integral Nailing Fin
Glazing		
Glazing Type		
Dual-pane Insulating Glass	S	S
Triple-pane Insulating Glass	O	O
Insulated Glass Options / Low-E Types		
Clear Insulating Glass (no Low-E coating)	S	S
Advanced Low-E Insulating Glass	O	O
SunDefense™ Low-E Insulating Glass	O	O
SunDefense+ Low-E Insulating Glass	O	O
AdvancedComfort Low-E Insulating Glass	O	O
NaturalSun Low-E Insulating Glass	O	O
NaturalSun+ Low-E Insulating Glass	O	O
Additional Glass Options		
Annealed Glass	S	S
Tempered Glass	O	O
Impact-Resistant Laminated Glass	O	—
Noise reduction glass (5/3mm, 4/6mm combinations)	O	O
Noise Reduction laminated glass (non-impact)	O	O
Tinted glass (Bronze, Gray, Green) Advanced Low-E	O	O
Obscure Glass ₁	O	O
Gas Fill / High Altitude		
Argon	S	S
High Altitude	O	O
High Altitude with argon	O	O
Exterior / Interior Factory Pre-finish Colors		
Powder-Coat White	S	S
Powder-Coat Brown, Black, Tan or Morning Sky Gray	O	O
Powder-Coat Dual-color (Brown, Black, Tan or Morning Sky Gray Exterior with White interior)	O	—
Hardware		
Match interior finish	S	S
Tan, Morning Sky Gray, Satin Nickel ₂	O	O
Operator		
Easy-Slide Operator	S	S
Fold Away Crank	O	O
Sash Locks		
Accessibility Lock Handle	O	O
Unison Lock System ₃	S	S
Screens		
InView™ screen	O	O
Grilles		
Grilles-Between-the-Glass		
Traditional, Prairie, Top Row and Custom - Equally Divided	O	O

S = Standard; O = Optional; (—) = Not available

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

(2) Satin Nickel is not available for Easy-Slide operator.

(3) Unit size determines availability.



Glazing Performance – Total Unit

Glazing 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	CA			
11/16"	Clear IG	PEL-N-277-00225-00001	3	3	air	0.44	0.55	0.58	44								
	with grilles-between-the-glass	PEL-N-277-00226-00001				0.45	0.50	0.52	44								
11/16"	Clear IG	PEL-N-277-00229-00001	4	4	air	0.45	0.53	0.57	43								
	with grilles-between-the-glass	PEL-N-277-00230-00001				0.46	0.49	0.52	43								
1"	Clear IG	PEL-N-277-00001-00001	5	5	air	0.43	0.53	0.57	44								
	with grilles-between-the-glass	PEL-N-277-00002-00001				0.43	0.48	0.51	44								
1"	Clear IG	PEL-N-277-00005-00001	6	6	air	0.43	0.51	0.56	44								
	with grilles-between-the-glass	PEL-N-277-00006-00001				0.43	0.46	0.50	44								
11/16"	Advanced Low-E IG	PEL-N-277-00235-00001	3	3	argon	0.28	0.26	0.49	60								
	with grilles-between-the-glass	PEL-N-277-00236-00001				0.29	0.24	0.44	60								
11/16"	Advanced Low-E IG	PEL-N-277-00239-00001	4	4	argon	0.30	0.26	0.48	58								
	with grilles-between-the-glass	PEL-N-277-00240-00001				0.31	0.24	0.44	58								
1"	Advanced Low-E IG	PEL-N-277-00019-00001	5	5	argon	0.28	0.26	0.48	59								
	with grilles-between-the-glass	PEL-N-277-00020-00001				0.28	0.24	0.43	59								
1"	Advanced Low-E IG	PEL-N-277-00023-00001	6	6	argon	0.28	0.25	0.47	58								
	with grilles-between-the-glass	PEL-N-277-00024-00001				0.28	0.23	0.43	58			SC	S				
11/16"	SunDefense™ IG	PEL-N-277-00243-00001	3	3	argon	0.28	0.20	0.45	60			SC	S				
	with grilles-between-the-glass	PEL-N-277-00244-00001				0.29	0.18	0.41	60				S				
11/16"	SunDefense™ IG	PEL-N-277-00247-00001	4	4	argon	0.29	0.20	0.45	58				S				
	with grilles-between-the-glass	PEL-N-277-00248-00001				0.30	0.18	0.41	58				S				
11/16"	SunDefense+ IG	PEL-N-277-00835-00001	3	3	argon	0.25	0.19	0.44	48		NC	SC	S				
	with grilles-between-the-glass	PEL-N-277-00300-00001				0.25	0.18	0.40	48		NC	SC	S				
11/16"	SunDefense+ IG	PEL-N-277-00303-00001	4	4	argon	0.26	0.19	0.44	46			SC	S				
	with grilles-between-the-glass	PEL-N-277-00304-00001				0.27	0.18	0.40	46			SC	S				
1"	SunDefense™ IG	PEL-N-277-00059-00001	5	5	argon	0.28	0.20	0.44	59			SC	S				
	with grilles-between-the-glass	PEL-N-277-00060-00001				0.28	0.18	0.40	59			SC	S				
1"	SunDefense™ IG	PEL-N-277-00063-00001	6	6	argon	0.28	0.20	0.44	59			SC	S				
	with grilles-between-the-glass	PEL-N-277-00064-00001				0.28	0.18	0.40	59			SC	S				
1"	SunDefense+ IG	PEL-N-277-00867-00001	5	5	argon	0.25	0.19	0.43	47		NC	SC	S				
	with grilles-between-the-glass	PEL-N-277-00868-00001				0.25	0.18	0.39	47		NC	SC	S				
1"	SunDefense+ IG	PEL-N-277-00871-00001	6	6	argon	0.25	0.19	0.43	46		NC	SC	S				
	with grilles-between-the-glass	PEL-N-277-00872-00001				0.25	0.18	0.39	46		NC	SC	S				
11/16"	AdvancedComfort Low-E IG	PEL-N-277-00827-00001	3	3	argon	0.25	0.26	0.48	48		NC						
	with grilles-between-the-glass	PEL-N-277-00260-00001				0.26	0.24	0.43	47								
11/16"	AdvancedComfort Low-E IG	PEL-N-277-00263-00001	4	4	argon	0.26	0.26	0.47	45				SC	S			
	with grilles-between-the-glass	PEL-N-277-00264-00001				0.27	0.23	0.43	45								
1"	AdvancedComfort Low-E IG	PEL-N-277-00859-00001	5	5	argon	0.25	0.25	0.47	46		NC						
	with grilles-between-the-glass	PEL-N-277-00860-00001				0.25	0.23	0.42	46			NC	SC	S			
1"	AdvancedComfort Low-E IG	PEL-N-277-00863-00001	6	6	argon	0.25	0.25	0.46	46		NC						
	with grilles-between-the-glass	PEL-N-277-00864-00001				0.25	0.23	0.42	46		NC	SC	S				
11/16"	NaturalSun Low-E IG	PEL-N-277-00251-00001	3	3	argon	0.29	0.48	0.55	59								
	with grilles-between-the-glass	PEL-N-277-00252-00001				0.30	0.44	0.50	59								
11/16"	NaturalSun Low-E IG	PEL-N-277-00255-00001	4	4	argon	0.30	0.47	0.55	57								
	with grilles-between-the-glass	PEL-N-277-00256-00001				0.32	0.43	0.50	57								
11/16"	NaturalSun+ Low-E IG	PEL-N-277-00819-00001	3	3	argon	0.26	0.44	0.54	47	N							
	with grilles-between-the-glass	PEL-N-277-00820-00001				0.26	0.40	0.49	47	N							
11/16"	NaturalSun+ Low-E IG	PEL-N-277-00823-00001	4	4	argon	0.26	0.43	0.54	45	N							
	with grilles-between-the-glass	PEL-N-277-00824-00001				0.27	0.39	0.49	45								
1"	NaturalSun Low-E IG	PEL-N-277-00075-00001	5	5	argon	0.29	0.47	0.54	58								
	with grilles-between-the-glass	PEL-N-277-00076-00001				0.29	0.43	0.49	58								
1"	NaturalSun Low-E IG	PEL-N-277-00079-00001	6	6	argon	0.29	0.45	0.54	58								
	with grilles-between-the-glass	PEL-N-277-00080-00001				0.29	0.41	0.49	58								
1"	NaturalSun+ Low-E IG	PEL-N-277-00851-00001	5	5	argon	0.26	0.42	0.53	46	N							
	with grilles-between-the-glass	PEL-N-277-00852-00001				0.26	0.39	0.48	46								
1"	NaturalSun+ Low-E IG	PEL-N-277-00855-00001	6	6	argon	0.26	0.41	0.52	45	N							
	with grilles-between-the-glass	PEL-N-277-00856-00001				0.26	0.38	0.47	45								

(1) Glazing performance values are calculated based on NFRC 100, NFRC 200 and NFRC 500. ENERGY STAR® values are updated to 2023 (version 7) criteria.

(2) The values shown are based on Canada's updated ENERGY STAR® 2020 initiative.

For center-glass values, see the Product Performance section.

Visit www.energystar.gov for Energy Star guidelines.

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



Impervia® Casement Windows

Glazing Performance – Total Unit

Glazing 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 Foam Insulation					
11/16"	Advanced Low-E IG	PEL-N-277-00567-00001	3	3	argon	0.27	0.26	0.49	60						
	with grilles-between-the-glass	PEL-N-277-00568-00001				0.28	0.24	0.44	60						
11/16"	Advanced Low-E IG	PEL-N-277-00571-00001	4	4	argon	0.29	0.26	0.48	58						
	with grilles-between-the-glass	PEL-N-277-00572-00001				0.30	0.24	0.44	58						
1"	Advanced Low-E IG	PEL-N-277-00351-00001	5	5	argon	0.27	0.26	0.48	59						
	with grilles-between-the-glass	PEL-N-277-00352-00001				0.27	0.24	0.43	59						
1"	Advanced Low-E IG	PEL-N-277-00355-00001	6	6	argon	0.27	0.25	0.47	58						
	with grilles-between-the-glass	PEL-N-277-00356-00001				0.27	0.23	0.43	58			SC	S		
11/16"	SunDefense IG	PEL-N-277-00575-00001	3	3	argon	0.27	0.20	0.45	61			SC	S		
	with grilles-between-the-glass	PEL-N-277-00576-00001				0.28	0.18	0.41	61			SC	S		
11/16"	SunDefense IG	PEL-N-277-00579-00001	4	4	argon	0.28	0.20	0.45	58			SC	S		
	with grilles-between-the-glass	PEL-N-277-00580-00001				0.29	0.18	0.41	58				S		
11/16"	SunDefense+ IG	PEL-N-277-01667-00001	3	3	argon	0.24	0.19	0.44	48		NC	SC	S		
	with grilles-between-the-glass	PEL-N-277-01668-00001				0.24	0.18	0.40	48		NC	SC	S		
11/16"	SunDefense+ IG	PEL-N-277-01671-00001	4	4	argon	0.25	0.19	0.44	46		NC	SC	S		
	with grilles-between-the-glass	PEL-N-277-01672-00001				0.26	0.18	0.40	46			SC	S		
1"	SunDefense IG	PEL-N-277-00391-00001	5	5	argon	0.27	0.20	0.44	59			SC	S		
	with grilles-between-the-glass	PEL-N-277-00392-00001				0.27	0.18	0.40	59			SC	S		
1"	SunDefense IG	PEL-N-277-00395-00001	6	6	argon	0.27	0.20	0.44	59			SC	S		
	with grilles-between-the-glass	PEL-N-277-00396-00001				0.27	0.18	0.40	59			SC	S		
1"	SunDefense+ IG	PEL-N-277-01699-00001	5	5	argon	0.25	0.19	0.43	47		NC	SC	S		
	with grilles-between-the-glass	PEL-N-277-01700-00001				0.25	0.18	0.39	47		NC	SC	S		
1"	SunDefense+ IG	PEL-N-277-01703-00001	6	6	argon	0.25	0.19	0.43	46		NC	SC	S		
	with grilles-between-the-glass	PEL-N-277-01704-00001				0.25	0.18	0.39	46		NC	SC	S		
11/16"	AdvancedComfort Low-E IG	PEL-N-277-01659-00001	3	3	argon	0.25	0.26	0.48	48		NC				
	with grilles-between-the-glass	PEL-N-277-01660-00001				0.25	0.24	0.43	48		NC				
11/16"	AdvancedComfort Low-E IG	PEL-N-277-01663-00001	4	4	argon	0.26	0.26	0.47	46						
	with grilles-between-the-glass	PEL-N-277-01664-00001				0.26	0.23	0.43	46			SC	S		
1"	AdvancedComfort Low-E IG	PEL-N-277-01691-00001	5	5	argon	0.25	0.25	0.47	46		NC				
	with grilles-between-the-glass	PEL-N-277-01692-00001				0.25	0.23	0.42	46		NC	SC	S		
1"	AdvancedComfort Low-E IG	PEL-N-277-01695-00001	6	6	argon	0.25	0.25	0.46	46		NC				
	with grilles-between-the-glass	PEL-N-277-01696-00001				0.25	0.23	0.42	46		NC	SC	S		
11/16"	NaturalSun Low-E IG	PEL-N-277-00583-00001	3	3	argon	0.28	0.48	0.55	59						
	with grilles-between-the-glass	PEL-N-277-00584-00001				0.29	0.44	0.50	59						
11/16"	NaturalSun Low-E IG	PEL-N-277-00587-00001	4	4	argon	0.29	0.47	0.55	57						
	with grilles-between-the-glass	PEL-N-277-00588-00001				0.30	0.43	0.50	57						
11/16"	NaturalSun+ Low-E IG	PEL-N-277-01651-00001	3	3	argon	0.25	0.44	0.54	47	N					
	with grilles-between-the-glass	PEL-N-277-01652-00001				0.25	0.40	0.49	47	N	NC				
11/16"	NaturalSun+ Low-E IG	PEL-N-277-01655-00001	4	4	argon	0.26	0.43	0.54	45	N					
	with grilles-between-the-glass	PEL-N-277-01656-00001				0.27	0.39	0.49	45						
1"	NaturalSun Low-E IG	PEL-N-277-00407-00001	5	5	argon	0.28	0.47	0.54	58						
	with grilles-between-the-glass	PEL-N-277-00408-00001				0.28	0.43	0.49	58						
1"	NaturalSun Low-E IG	PEL-N-277-00411-00001	6	6	argon	0.28	0.45	0.54	58						
	with grilles-between-the-glass	PEL-N-277-00412-00001				0.28	0.41	0.49	58						
1"	NaturalSun+ Low-E IG	PEL-N-277-01683-00001	5	5	argon	0.25	0.42	0.53	46	N					
	with grilles-between-the-glass	PEL-N-277-01684-00001				0.25	0.39	0.48	46			NC			
1"	NaturalSun+ Low-E IG	PEL-N-277-01687-00001	6	6	argon	0.25	0.41	0.52	45	N					
	with grilles-between-the-glass	PEL-N-277-01688-00001				0.25	0.38	0.47	45			NC			

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

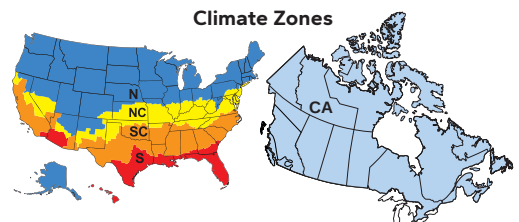
(1) Glazing performance values are calculated based on NFRC 100, NFRC 200 and NFRC 500.

ENERGY STAR® values are updated to 2023 (version 7) criteria.

(2) The values shown are based on Canada's updated ENERGY STAR® 2020 initiative.

For center-glass values, see the Product Performance section.

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Glazing Performance – Total Unit

Glazing 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 — High Altitude Glazing					
11/16"	(HA) Advanced Low-E IG	PEL-N-277-00233-00001	3	3	air	0.32	0.27	0.49	56						
	with grilles-between-the-glass	PEL-N-277-00234-00001				0.33	0.24	0.44	56						
11/16"	(HA) Advanced Low-E IG	PEL-N-277-00237-00001	4	4	air	0.34	0.27	0.48	53						
	with grilles-between-the-glass	PEL-N-277-00238-00001				0.35	0.24	0.44	53						
1"	(HA) Advanced Low-E IG	PEL-N-277-00017-00001	5	5	air	0.32	0.26	0.48	56						
	with grilles-between-the-glass	PEL-N-277-00018-00001				0.32	0.24	0.43	56						
1"	(HA) Advanced Low-E IG	PEL-N-277-00021-00001	6	6	air	0.31	0.26	0.47	55						
	with grilles-between-the-glass	PEL-N-277-00022-00001				0.31	0.24	0.43	55						
11/16"	(HA) SunDefense IG	PEL-N-277-00241-00001	3	3	air	0.32	0.20	0.45	56				S		
	with grilles-between-the-glass	PEL-N-277-00242-00001				0.33	0.18	0.41	56						
11/16"	(HA) SunDefense IG	PEL-N-277-00245-00001	4	4	air	0.33	0.20	0.45	54						
	with grilles-between-the-glass	PEL-N-277-00246-00001				0.35	0.19	0.41	54						
11/16"	(HA) SunDefense+ IG	PEL-N-277-00297-00001	3	3	air	0.27	0.20	0.44	44			SC	S		
	with grilles-between-the-glass	PEL-N-277-00298-00001				0.28	0.18	0.40	44			SC	S		
11/16"	(HA) SunDefense+ IG	PEL-N-277-00301-00001	4	4	air	0.29	0.20	0.44	42					S	
	with grilles-between-the-glass	PEL-N-277-00302-00001				0.30	0.18	0.40	42					S	
1"	(HA) SunDefense IG	PEL-N-277-00057-00001	5	5	air	0.31	0.20	0.44	56					S	
	with grilles-between-the-glass	PEL-N-277-00058-00001				0.31	0.18	0.40	56					S	
1"	(HA) SunDefense IG	PEL-N-277-00061-00001	6	6	air	0.31	0.20	0.44	55					S	
	with grilles-between-the-glass	PEL-N-277-00062-00001				0.31	0.18	0.40	55					S	
1"	(HA) SunDefense+ IG	PEL-N-277-00865-00001	5	5	air	0.27	0.19	0.43	44			SC	S		
	with grilles-between-the-glass	PEL-N-277-00866-00001				0.27	0.18	0.39	44			SC	S		
1"	(HA) SunDefense+ IG	PEL-N-277-00869-00001	6	6	air	0.27	0.19	0.43	43			SC	S		
	with grilles-between-the-glass	PEL-N-277-00870-00001				0.27	0.18	0.39	43			SC	S		
11/16"	(HA) AdvancedComfort Low-E IG	PEL-N-277-00257-00001	3	3	air	0.28	0.26	0.48	43						
	with grilles-between-the-glass	PEL-N-277-00258-00001				0.28	0.24	0.43	44						
11/16"	(HA) AdvancedComfort Low-E IG	PEL-N-277-00261-00001	4	4	air	0.29	0.26	0.47	41						
	with grilles-between-the-glass	PEL-N-277-00262-00001				0.30	0.24	0.43	41						
1"	(HA) AdvancedComfort Low-E IG	PEL-N-277-00857-00001	5	5	air	0.27	0.25	0.47	43						
	with grilles-between-the-glass	PEL-N-277-00858-00001				0.27	0.23	0.42	43			SC	S		
1"	(HA) AdvancedComfort Low-E IG	PEL-N-277-00861-00001	6	6	air	0.27	0.25	0.46	43						
	with grilles-between-the-glass	PEL-N-277-00862-00001				0.27	0.23	0.42	43			SC	S		
11/16"	(HA) NaturalSun Low-E IG	PEL-N-277-00249-00001	3	3	air	0.33	0.48	0.55	55						
	with grilles-between-the-glass	PEL-N-277-00250-00001				0.33	0.44	0.50	55						
11/16"	(HA) NaturalSun Low-E IG	PEL-N-277-00253-00001	4	4	air	0.34	0.47	0.55	53						
	with grilles-between-the-glass	PEL-N-277-00254-00001				0.36	0.43	0.50	53						
11/16"	(HA) NaturalSun+ Low-E IG	PEL-N-277-00817-00001	3	3	air	0.28	0.44	0.54	43						
	with grilles-between-the-glass	PEL-N-277-00818-00001				0.28	0.40	0.49	43						
11/16"	(HA) NaturalSun+ Low-E IG	PEL-N-277-00821-00001	4	4	air	0.29	0.43	0.54	41						
	with grilles-between-the-glass	PEL-N-277-00822-00001				0.30	0.39	0.49	41						
1"	(HA) NaturalSun Low-E IG	PEL-N-277-00073-00001	5	5	air	0.32	0.47	0.54	55						
	with grilles-between-the-glass	PEL-N-277-00074-00001				0.32	0.42	0.49	55						
1"	(HA) NaturalSun Low-E IG	PEL-N-277-00077-00001	6	6	air	0.32	0.45	0.54	54						
	with grilles-between-the-glass	PEL-N-277-00078-00001				0.32	0.41	0.49	54						
1"	(HA) NaturalSun+ Low-E IG	PEL-N-277-00849-00001	5	5	air	0.28	0.42	0.53	43						
	with grilles-between-the-glass	PEL-N-277-00850-00001				0.28	0.39	0.48	43						
1"	(HA) NaturalSun+ Low-E IG	PEL-N-277-00853-00001	6	6	air	0.28	0.41	0.52	42						
	with grilles-between-the-glass	PEL-N-277-00854-00001				0.28	0.37	0.47	42						

R-Value = 1/U-Factor
 SHGC = Solar Heat Gain Coefficient
 VLT % = Visible Light Transmission
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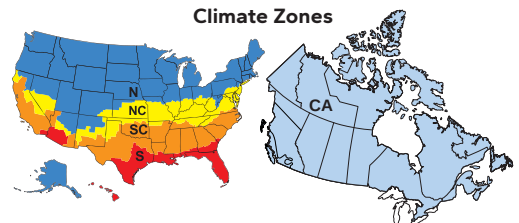
(1) Glazing performance values are calculated based on NFRC 100, NFRC 200 and NFRC 500.

ENERGY STAR® values are updated to 2023 (version 7) criteria.

(2) The values shown are based on Canada's updated ENERGY STAR® 2020 initiative.

For center-glass values, see the Product Performance section.

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Glazing Performance – Total Unit

Glazing 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 — High Altitude Glazing with Foam Insulation										N	NC	SC	S		CA
11/16"	(HA) Advanced Low-E IG	PEL-N-277-00565-00001	3	3	air	0.31	0.27	0.49	56						
	with grilles-between-the-glass	PEL-N-277-00566-00001				0.32	0.24	0.44	56						
11/16"	(HA) Advanced Low-E IG	PEL-N-277-00569-00001	4	4	air	0.33	0.27	0.48	54						
	with grilles-between-the-glass	PEL-N-277-00570-00001				0.34	0.24	0.44	54						
1"	(HA) Advanced Low-E IG	PEL-N-277-00349-00001	5	5	air	0.31	0.26	0.48	56						
	with grilles-between-the-glass	PEL-N-277-00350-00001				0.31	0.24	0.43	56						
1"	(HA) Advanced Low-E IG	PEL-N-277-00353-00001	6	6	air	0.30	0.26	0.47	55						
	with grilles-between-the-glass	PEL-N-277-00354-00001				0.30	0.24	0.43	55						
11/16"	(HA) SunDefense IG	PEL-N-277-00573-00001	3	3	air	0.31	0.20	0.45	57				S		
	with grilles-between-the-glass	PEL-N-277-00574-00001				0.32	0.18	0.41	57				S		
11/16"	(HA) SunDefense IG	PEL-N-277-00577-00001	4	4	air	0.32	0.20	0.45	54				S		
	with grilles-between-the-glass	PEL-N-277-00578-00001				0.34	0.19	0.41	54						
11/16"	(HA) SunDefense+ IG	PEL-N-277-01665-00001	3	3	air	0.27	0.20	0.44	44			SC	S		
	with grilles-between-the-glass	PEL-N-277-00630-00001				0.27	0.18	0.40	44			SC	S		
11/16"	(HA) SunDefense+ IG	PEL-N-277-01669-00001	4	4	air	0.28	0.20	0.44	42			SC	S		
	with grilles-between-the-glass	PEL-N-277-01670-00001				0.29	0.18	0.40	42				S		
1"	(HA) SunDefense IG	PEL-N-277-00389-00001	5	5	air	0.30	0.20	0.44	56				S		
	with grilles-between-the-glass	PEL-N-277-00390-00001				0.30	0.18	0.40	56				S		
1"	(HA) SunDefense IG	PEL-N-277-00393-00001	6	6	air	0.30	0.20	0.44	56				S		
	with grilles-between-the-glass	PEL-N-277-00394-00001				0.30	0.18	0.40	56				S		
1"	(HA) SunDefense+ IG	PEL-N-277-01697-00001	5	5	air	0.27	0.19	0.43	44			SC	S		
	with grilles-between-the-glass	PEL-N-277-01698-00001				0.27	0.18	0.39	44			SC	S		
1"	(HA) SunDefense+ IG	PEL-N-277-01701-00001	6	6	air	0.27	0.19	0.43	43			SC	S		
	with grilles-between-the-glass	PEL-N-277-01702-00001				0.27	0.18	0.39	43			SC	S		
11/16"	(HA) AdvancedComfort Low-E IG	PEL-N-277-01657-00001	3	3	air	0.27	0.26	0.48	44						
	with grilles-between-the-glass	PEL-N-277-00590-00001				0.27	0.24	0.43	44						
11/16"	(HA) AdvancedComfort Low-E IG	PEL-N-277-01661-00001	4	4	air	0.28	0.26	0.47	42						
	with grilles-between-the-glass	PEL-N-277-01662-00001				0.29	0.24	0.43	42						
1"	(HA) AdvancedComfort Low-E IG	PEL-N-277-01689-00001	5	5	air	0.27	0.25	0.47	43						
	with grilles-between-the-glass	PEL-N-277-01690-00001				0.27	0.23	0.42	43			SC	S		
1"	(HA) AdvancedComfort Low-E IG	PEL-N-277-01693-00001	6	6	air	0.27	0.25	0.46	43						
	with grilles-between-the-glass	PEL-N-277-01694-00001				0.27	0.23	0.42	43			SC	S		
11/16"	(HA) NaturalSun Low-E IG	PEL-N-277-00581-00001	3	3	air	0.32	0.48	0.55	55						
	with grilles-between-the-glass	PEL-N-277-00582-00001				0.32	0.44	0.50	55						
11/16"	(HA) NaturalSun Low-E IG	PEL-N-277-00585-00001	4	4	air	0.33	0.47	0.55	53						
	with grilles-between-the-glass	PEL-N-277-00586-00001				0.35	0.43	0.50	53						
11/16"	(HA) NaturalSun+ Low-E IG	PEL-N-277-01649-00001	3	3	air	0.28	0.44	0.54	43						
	with grilles-between-the-glass	PEL-N-277-01650-00001				0.28	0.40	0.49	43						
11/16"	(HA) NaturalSun+ Low-E IG	PEL-N-277-01653-00001	4	4	air	0.29	0.43	0.54	41						
	with grilles-between-the-glass	PEL-N-277-01654-00001				0.30	0.39	0.49	41						
1"	(HA) NaturalSun Low-E IG	PEL-N-277-00405-00001	5	5	air	0.31	0.47	0.54	55						
	with grilles-between-the-glass	PEL-N-277-00406-00001				0.31	0.42	0.49	55						
1"	(HA) NaturalSun Low-E IG	PEL-N-277-00409-00001	6	6	air	0.31	0.45	0.54	55						
	with grilles-between-the-glass	PEL-N-277-00410-00001				0.31	0.41	0.49	55						
1"	(HA) NaturalSun+ Low-E IG	PEL-N-277-01681-00001	5	5	air	0.27	0.42	0.53	43						
	with grilles-between-the-glass	PEL-N-277-01682-00001				0.27	0.39	0.48	43						
1"	(HA) NaturalSun+ Low-E IG	PEL-N-277-01685-00001	6	6	air	0.27	0.41	0.52	42						
	with grilles-between-the-glass	PEL-N-277-01686-00001				0.27	0.37	0.47	42						

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 ER = Canadian Energy Rating

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

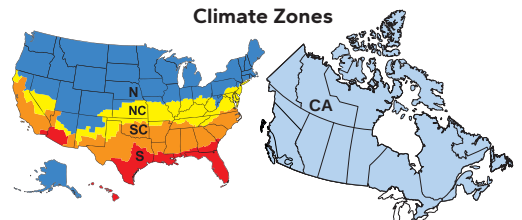
ENERGY STAR® values are updated to 2023 (version 7) criteria.

(2) The values shown are based on Canada's updated ENERGY STAR® 2020 initiative.

For center-glass values, see the Product Performance section.

Visit www.energystar.gov for Energy Star guidelines.

Climate Zones





Glazing Performance – Total Unit

Glazing 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 - 5 mm/3 mm Glass										N	NC	SC	S	CA	
1"	Clear IG	PEL-N-277-00009-00001	5	3	air	0.43	0.53	0.57	45						
	with grilles-between-the-glass	PEL-N-277-00010-00001				0.43	0.48	0.52	45						
1"	Advanced Low-E IG	PEL-N-277-00051-00001	5	3	argon	0.29	0.26	0.48	60						
	with grilles-between-the-glass	PEL-N-277-00052-00001				0.29	0.24	0.44	60						
1"	SunDefense™ IG	PEL-N-277-00067-00001	5	3	argon	0.28	0.20	0.45	60			SC	S		
	with grilles-between-the-glass	PEL-N-277-00068-00001				0.28	0.18	0.41	60			SC	S		
1"	SunDefense+ IG	PEL-N-277-00891-00001	5	3	argon	0.25	0.19	0.44	48		NC	SC	S		
	with grilles-between-the-glass	PEL-N-277-00892-00001				0.25	0.18	0.40	48		NC	SC	S		
1"	AdvancedComfort Low-E IG	PEL-N-277-00887-00001	5	3	argon	0.25	0.25	0.47	48		NC				
	with grilles-between-the-glass	PEL-N-277-00888-00001				0.25	0.23	0.43	48		NC	SC	S		
1"	NaturalSun Low-E IG	PEL-N-277-00083-00001	5	3	argon	0.29	0.47	0.55	59						
	with grilles-between-the-glass	PEL-N-277-00084-00001				0.29	0.43	0.50	59						
1"	NaturalSun+ Low-E IG	PEL-N-277-00883-00001	5	3	argon	0.26	0.43	0.54	47	N					
	with grilles-between-the-glass	PEL-N-277-00884-00001				0.26	0.39	0.48	47						
Vent — 5mm/3mm Glass with Foam Insulation															
1"	Advanced Low-E IG	PEL-N-277-00383-00001	5	3	argon	0.28	0.26	0.48	60						
	with grilles-between-the-glass	PEL-N-277-00384-00001				0.28	0.24	0.44	60						
1"	SunDefense IG	PEL-N-277-00399-00001	5	3	argon	0.27	0.20	0.45	61			SC	S		
	with grilles-between-the-glass	PEL-N-277-00400-00001				0.27	0.18	0.41	61			SC	S		
1"	SunDefense+ IG	PEL-N-277-01723-00001	5	3	argon	0.25	0.19	0.44	48		NC	SC	S		
	with grilles-between-the-glass	PEL-N-277-01724-00001				0.25	0.18	0.40	48		NC	SC	S		
1"	AdvancedComfort Low-E IG	PEL-N-277-01719-00001	5	3	argon	0.25	0.25	0.47	48		NC				
	with grilles-between-the-glass	PEL-N-277-01720-00001				0.25	0.23	0.43	48		NC	SC	S		
1"	NaturalSun Low-E IG	PEL-N-277-00415-00001	5	3	argon	0.28	0.47	0.55	60						
	with grilles-between-the-glass	PEL-N-277-00416-00001				0.28	0.43	0.50	60						
1"	NaturalSun+ Low-E IG	PEL-N-277-01715-00001	5	3	argon	0.26	0.43	0.54	47	N					
	with grilles-between-the-glass	PEL-N-277-01716-00001				0.26	0.39	0.48	47						
Vent - 5mm/3mm Glass High Altitude Glazing															
1"	(HA) Advanced Low-E IG	PEL-N-277-00049-00001	5	3	air	0.32	0.26	0.48	57						
	with grilles-between-the-glass	PEL-N-277-00050-00001				0.32	0.24	0.44	57						
1"	(HA) SunDefense IG	PEL-N-277-00065-00001	5	3	air	0.31	0.20	0.45	57				S		
	with grilles-between-the-glass	PEL-N-277-00066-00001				0.31	0.18	0.41	57				S		
1"	(HA) SunDefense+ IG	PEL-N-277-00889-00001	5	3	air	0.27	0.19	0.44	45			SC	S		
	with grilles-between-the-glass	PEL-N-277-00890-00001				0.27	0.18	0.40	45			SC	S		
1"	(HA) AdvancedComfort Low-E IG	PEL-N-277-00885-00001	5	3	air	0.27	0.25	0.47	44						
	with grilles-between-the-glass	PEL-N-277-00886-00001				0.27	0.23	0.43	44			SC	S		
1"	(HA) NaturalSun Low-E IG	PEL-N-277-00081-00001	5	3	air	0.32	0.47	0.55	56						
	with grilles-between-the-glass	PEL-N-277-00082-00001				0.32	0.43	0.50	56						
1"	(HA) NaturalSun+ Low-E IG	PEL-N-277-00881-00001	5	3	air	0.28	0.43	0.54	44						
	with grilles-between-the-glass	PEL-N-277-00882-00001				0.28	0.39	0.48	44						
Vent - 5 mm/3 mm Glass High Altitude Glazing — with Foam Insulation															
1"	(HA) Advanced Low-E IG	PEL-N-277-00381-00001	5	3	air	0.31	0.26	0.48	57						
	with grilles-between-the-glass	PEL-N-277-00382-00001				0.31	0.24	0.44	57						
1"	(HA) SunDefense IG	PEL-N-277-00397-00001	5	3	air	0.30	0.20	0.45	57				S		
	with grilles-between-the-glass	PEL-N-277-00398-00001				0.30	0.18	0.41	57				S		
1"	(HA) SunDefense+ IG	PEL-N-277-01721-00001	5	3	air	0.27	0.19	0.44	45			SC	S		
	with grilles-between-the-glass	PEL-N-277-01722-00001				0.27	0.18	0.40	45			SC	S		
1"	(HA) AdvancedComfort Low-E IG	PEL-N-277-01717-00001	5	3	air	0.27	0.25	0.47	44						
	with grilles-between-the-glass	PEL-N-277-01718-00001				0.27	0.23	0.43	44			SC	S		
1"	(HA) NaturalSun Low-E IG	PEL-N-277-00413-00001	5	3	air	0.31	0.47	0.55	56						
	with grilles-between-the-glass	PEL-N-277-00414-00001				0.31	0.43	0.50	56						
1"	(HA) NaturalSun+ Low-E IG	PEL-N-277-01713-00001	5	3	air	0.28	0.43	0.54	44						
	with grilles-between-the-glass	PEL-N-277-01714-00001				0.28	0.39	0.48	44						

(1) Glazing performance values are calculated based on NFRC 100, NFRC 200 and NFRC 500. ENERGY STAR® values are updated to 2023 (version 7) criteria.

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SHGC = Solar Heat Gain Coefficient
VLT % = Visible Light Transmission
CR = Condensation Resistance
ER = Canadian Energy Rating



Glazing Performance – Total Unit

Glazing 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 - 4 mm/6mm Glass										N	NC	SC	S	CA	
1"	Clear IG	PEL-N-277-00013-00001	4	6	air	0.43	0.53	0.56	44						
	with grilles-between-the-glass	PEL-N-277-00014-00001				0.43	0.48	0.51	44						
1"	Advanced Low-E IG	PEL-N-277-00055-00001	4	6	argon	0.28	0.26	0.48	58						
	with grilles-between-the-glass	PEL-N-277-00056-00001				0.28	0.24	0.43	58						
1"	SunDefense™ IG	PEL-N-277-00071-00001	4	6	argon	0.28	0.20	0.44	59			SC	S		
	with grilles-between-the-glass	PEL-N-277-00072-00001				0.28	0.18	0.40	59			SC	S		
1"	SunDefense+ IG	PENDING	4	6	argon										
	with grilles-between-the-glass	PENDING													
1"	AdvancedComfort Low-E IG	PEL-N-277-00103-00001	4	6	argon	0.25	0.25	0.47	47		NC				
	with grilles-between-the-glass	PEL-N-277-00104-00001				0.25	0.23	0.42	47		NC	SC	S		
1"	NaturalSun Low-E IG	PEL-N-277-00087-00001	4	6	argon	0.29	0.47	0.54	58						
	with grilles-between-the-glass	PEL-N-277-00088-00001				0.29	0.43	0.49	58						
1"	NaturalSun+ Low-E IG	PENDING	4	6	argon										
	with grilles-between-the-glass	PENDING													
Vent — 4mm/6mm Glass with Foam Insulation															
1"	Advanced Low-E IG	PEL-N-277-00387-00001	4	6	argon	0.27	0.26	0.48	59						
	with grilles-between-the-glass	PEL-N-277-00388-00001				0.27	0.24	0.43	59						
1"	SunDefense IG	PEL-N-277-00403-00001	4	6	argon	0.27	0.20	0.44	59			SC	S		
	with grilles-between-the-glass	PEL-N-277-00404-00001				0.27	0.18	0.40	59			SC	S		
1"	SunDefense+ IG	PENDING	4	6	argon										
	with grilles-between-the-glass	PENDING													
1"	AdvancedComfort Low-E IG	PEL-N-277-00435-00001	4	6	argon	0.24	0.25	0.47	47		NC				
	with grilles-between-the-glass	PEL-N-277-00436-00001				0.24	0.23	0.42	47		NC	SC	S		
1"	NaturalSun Low-E IG	PEL-N-277-00419-00001	4	6	argon	0.28	0.47	0.54	58						
	with grilles-between-the-glass	PEL-N-277-00420-00001				0.28	0.43	0.49	58						
1"	NaturalSun+ Low-E IG	PENDING	4	6	argon										
	with grilles-between-the-glass	PENDING													
Vent - 4mm/6mm Glass High Altitude Glazing															
1"	(HA) Advanced Low-E IG	PEL-N-277-00053-00001	4	6	air	0.32	0.26	0.48	55						
	with grilles-between-the-glass	PEL-N-277-00054-00001				0.32	0.24	0.43	55						
1"	(HA) SunDefense IG	PEL-N-277-00069-00001	4	6	air	0.31	0.20	0.44	55				S		
	with grilles-between-the-glass	PEL-N-277-00070-00001				0.31	0.18	0.40	55				S		
1"	(HA) SunDefense+ IG	PENDING	4	6	air										
	with grilles-between-the-glass	PENDING													
1"	(HA) AdvancedComfort Low-E IG	PEL-N-277-00101-00001	4	6	air	0.27	0.25	0.47	44						
	with grilles-between-the-glass	PEL-N-277-00102-00001				0.27	0.23	0.42	44			SC	S		
1"	(HA) NaturalSun Low-E IG	PEL-N-277-00085-00001	4	6	air	0.32	0.47	0.54	54						
	with grilles-between-the-glass	PEL-N-277-00086-00001				0.32	0.43	0.49	54						
1"	(HA) NaturalSun+ Low-E IG	PENDING	4	6	air										
	with grilles-between-the-glass	PENDING													
Vent - 4mm/6mm Glass High Altitude Glazing — with Foam Insulation															
1"	(HA) Advanced Low-E IG	PEL-N-277-00385-00001	4	6	air	0.31	0.26	0.48	55						
	with grilles-between-the-glass	PEL-N-277-00386-00001				0.31	0.24	0.43	55						
1"	(HA) SunDefense IG	PEL-N-277-00401-00001	4	6	air	0.30	0.20	0.44	56				S		
	with grilles-between-the-glass	PEL-N-277-00402-00001				0.30	0.18	0.40	56				S		
1"	(HA) SunDefense+ IG	PENDING	4	6	air										
	with grilles-between-the-glass	PENDING													
1"	(HA) AdvancedComfort Low-E IG	PEL-N-277-00433-00001	4	6	air	0.26	0.25	0.47	44						
	with grilles-between-the-glass	PEL-N-277-00434-00001				0.26	0.23	0.42	44			SC	S		
1"	(HA) NaturalSun Low-E IG	PEL-N-277-00417-00001	4	6	air	0.31	0.47	0.54	55						
	with grilles-between-the-glass	PEL-N-277-00418-00001				0.31	0.43	0.49	55						
1"	(HA) NaturalSun+ Low-E IG	PENDING	4	6	air										
	with grilles-between-the-glass	PENDING													

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ER = Canadian Energy Rating



Impervia® Casement Windows

Glazing Performance – Total Unit

Glazing 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		CA	
11/16"	Bronze Advanced Low-E IG	PEL-N-277-00275-00001	5	3	argon	0.30	0.24	0.32	59							
	with grilles-between-the-glass	PEL-N-277-00276-00001				0.31	0.22	0.29	59				S			
1"	Bronze Advanced Low-E IG	PEL-N-277-00027-00001	5	5	argon	0.28	0.23	0.31	59			SC	S			
	with grilles-between-the-glass	PEL-N-277-00028-00001				0.28	0.21	0.28	59			SC	S			
1"	Bronze Advanced Low-E IG	PEL-N-277-00039-00001	6	6	argon	0.28	0.22	0.28	58			SC	S			
	with grilles-between-the-glass	PEL-N-277-00040-00001				0.28	0.20	0.25	58			SC	S			
11/16"	Gray Advanced Low-E IG	PEL-N-277-00279-00001	5	3	argon	0.30	0.22	0.27	59				S			
	with grilles-between-the-glass	PEL-N-277-00280-00001				0.31	0.20	0.25	59				S			
1"	Gray Advanced Low-E IG	PEL-N-277-00031-00001	5	5	argon	0.28	0.21	0.27	59			SC	S			
	with grilles-between-the-glass	PEL-N-277-00032-00001				0.28	0.19	0.24	59			SC	S			
1"	Gray Advanced Low-E IG	PEL-N-277-00043-00001	6	6	argon	0.28	0.19	0.24	58			SC	S			
	with grilles-between-the-glass	PEL-N-277-00044-00001				0.28	0.18	0.21	58			SC	S			
11/16"	Green Advanced Low-E IG	PEL-N-277-00283-00001	5	3	argon	0.30	0.27	0.43	59							
	with grilles-between-the-glass	PEL-N-277-00284-00001				0.31	0.24	0.39	59							
1"	Green Advanced Low-E IG	PEL-N-277-00035-00001	5	5	argon	0.28	0.26	0.42	59							
	with grilles-between-the-glass	PEL-N-277-00036-00001				0.28	0.24	0.38	59							
1"	Green Advanced Low-E IG	PEL-N-277-00047-00001	6	6	argon	0.28	0.25	0.41	58							
	with grilles-between-the-glass	PEL-N-277-00048-00001				0.28	0.23	0.37	58			SC	S			
Vent — with Foam Insulation and Tinted Glazing																
11/16"	Bronze Advanced Low-E IG	PEL-N-277-00607-00001	5	3	argon	0.29	0.24	0.32	59							
	with grilles-between-the-glass	PEL-N-277-00608-00001				0.30	0.22	0.29	59				S			
1"	Bronze Advanced Low-E IG	PEL-N-277-00359-00001	5	5	argon	0.27	0.23	0.31	59			SC	S			
	with grilles-between-the-glass	PEL-N-277-00360-00001				0.27	0.21	0.28	59			SC	S			
1"	Bronze Advanced Low-E IG	PEL-N-277-00371-00001	6	6	argon	0.27	0.22	0.28	59			SC	S			
	with grilles-between-the-glass	PEL-N-277-00372-00001				0.27	0.20	0.25	59			SC	S			
11/16"	Gray Advanced Low-E IG	PEL-N-277-00611-00001	5	3	argon	0.29	0.22	0.27	59				S			
	with grilles-between-the-glass	PEL-N-277-00612-00001				0.30	0.20	0.25	59				S			
1"	Gray Advanced Low-E IG	PEL-N-277-00363-00001	5	5	argon	0.27	0.21	0.27	59			SC	S			
	with grilles-between-the-glass	PEL-N-277-00364-00001				0.27	0.19	0.24	59			SC	S			
1"	Gray Advanced Low-E IG	PEL-N-277-00375-00001	6	6	argon	0.27	0.19	0.24	59			SC	S			
	with grilles-between-the-glass	PEL-N-277-00376-00001				0.27	0.18	0.21	59			SC	S			
11/16"	Green Advanced Low-E IG	PEL-N-277-00615-00001	5	3	argon	0.29	0.27	0.43	59							
	with grilles-between-the-glass	PEL-N-277-00616-00001				0.30	0.24	0.39	59							
1"	Green Advanced Low-E IG	PEL-N-277-00367-00001	5	5	argon	0.27	0.26	0.42	59							
	with grilles-between-the-glass	PEL-N-277-00368-00001				0.27	0.24	0.38	59							
1"	Green Advanced Low-E IG	PEL-N-277-00379-00001	6	6	argon	0.27	0.25	0.41	59							
	with grilles-between-the-glass	PEL-N-277-00380-00001				0.27	0.23	0.37	59			SC	S			

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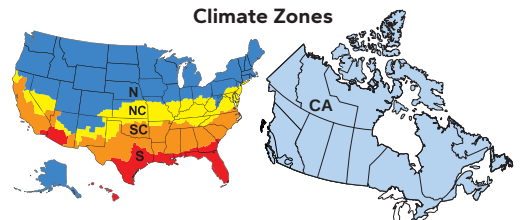
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Glazing Performance – Total Unit

Glazing 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 - High Altitude Glazing – with Tinted Glazing										N	NC	SC	S	CA	
11/16"	Bronze Advanced Low-E IG	PEL-N-277-00273-00001	5	3	air	0.34	0.24	0.32	54						
	with grilles-between-the-glass	PEL-N-277-00274-00001				0.35	0.22	0.29	54						
1"	Bronze Advanced Low-E IG	PEL-N-277-00025-00001	5	5	air	0.32	0.24	0.31	56						
	with grilles-between-the-glass	PEL-N-277-00026-00001				0.32	0.22	0.28	56				S		
1"	Bronze Advanced Low-E IG	PEL-N-277-00037-00001	6	6	air	0.31	0.22	0.28	55				S		
	with grilles-between-the-glass	PEL-N-277-00038-00001				0.31	0.20	0.25	55				S		
11/16"	Gray Advanced Low-E IG	PEL-N-277-00277-00001	5	3	air	0.34	0.22	0.27	54						
	with grilles-between-the-glass	PEL-N-277-00278-00001				0.35	0.21	0.25	54						
1"	Gray Advanced Low-E IG	PEL-N-277-00029-00001	5	5	air	0.32	0.22	0.27	56				S		
	with grilles-between-the-glass	PEL-N-277-00030-00001				0.32	0.20	0.24	56				S		
1"	Gray Advanced Low-E IG	PEL-N-277-00041-00001	6	6	air	0.31	0.20	0.24	55				S		
	with grilles-between-the-glass	PEL-N-277-00042-00001				0.31	0.18	0.21	55				S		
11/16"	Green Advanced Low-E IG	PEL-N-277-00281-00001	5	3	air	0.34	0.27	0.43	54						
	with grilles-between-the-glass	PEL-N-277-00282-00001				0.35	0.25	0.39	54						
1"	Green Advanced Low-E IG	PEL-N-277-00033-00001	5	5	air	0.32	0.26	0.42	56						
	with grilles-between-the-glass	PEL-N-277-00034-00001				0.32	0.24	0.38	56						
1"	Green Advanced Low-E IG	PEL-N-277-00045-00001	6	6	air	0.31	0.25	0.41	55						
	with grilles-between-the-glass	PEL-N-277-00046-00001				0.31	0.23	0.37	55				S		
Vent - High Altitude Glazing – with Foam Insulation and Tinted Glazing															
11/16"	Bronze Advanced Low-E IG	PEL-N-277-00605-00001	5	3	air	0.33	0.24	0.32	54						
	with grilles-between-the-glass	PEL-N-277-00606-00001				0.34	0.22	0.29	54						
1"	Bronze Advanced Low-E IG	PEL-N-277-00357-00001	5	5	air	0.31	0.24	0.31	56						
	with grilles-between-the-glass	PEL-N-277-00358-00001				0.31	0.22	0.28	56				S		
1"	Bronze Advanced Low-E IG	PEL-N-277-00369-00001	6	6	air	0.30	0.22	0.28	55				S		
	with grilles-between-the-glass	PEL-N-277-00370-00001				0.30	0.20	0.25	55				S		
11/16"	Gray Advanced Low-E IG	PEL-N-277-00609-00001	5	3	air	0.33	0.22	0.27	54						
	with grilles-between-the-glass	PEL-N-277-00610-00001				0.34	0.21	0.25	54						
1"	Gray Advanced Low-E IG	PEL-N-277-00361-00001	5	5	air	0.31	0.22	0.27	56				S		
	with grilles-between-the-glass	PEL-N-277-00362-00001				0.31	0.20	0.24	56				S		
1"	Gray Advanced Low-E IG	PEL-N-277-00373-00001	6	6	air	0.30	0.20	0.24	55				S		
	with grilles-between-the-glass	PEL-N-277-00374-00001				0.30	0.18	0.21	55				S		
11/16"	Green Advanced Low-E IG	PEL-N-277-00613-00001	5	3	air	0.33	0.27	0.43	54						
	with grilles-between-the-glass	PEL-N-277-00614-00001				0.34	0.25	0.39	54						
1"	Green Advanced Low-E IG	PEL-N-277-00365-00001	5	5	air	0.31	0.26	0.42	56						
	with grilles-between-the-glass	PEL-N-277-00366-00001				0.31	0.24	0.38	56						
1"	Green Advanced Low-E IG	PEL-N-277-00377-00001	6	6	air	0.30	0.25	0.41	55						
	with grilles-between-the-glass	PEL-N-277-00378-00001				0.30	0.23	0.37	55				S		

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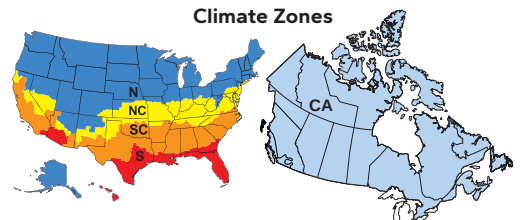
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Glazing Performance – Total Unit

Glazing 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 Laminated for Sound Glazing										N	NC	SC	S	CA		
1"	Advanced Low-E IG	PEL-N-277-00139-00001	4	7	argon	0.28	0.26	0.48	59							
	with grilles-between-the-glass	PEL-N-277-00140-00001				0.28	0.24	0.43	59							
1"	Advanced Low-E IG	PEL-N-277-00151-00001	5	10	argon	0.28	0.26	0.47	58							
	with grilles-between-the-glass	PEL-N-277-00152-00001				0.28	0.23	0.42	58			SC	S			
1"	SunDefense™ IG	PEL-N-277-00135-00001	4	7	argon	0.28	0.20	0.44	59			SC	S			
	with grilles-between-the-glass	PEL-N-277-00136-00001				0.28	0.18	0.40	59			SC	S			
1"	SunDefense™ IG	PEL-N-277-00147-00001	5	10	argon	0.27	0.20	0.44	58			SC	S			
	with grilles-between-the-glass	PEL-N-277-00148-00001				0.27	0.18	0.39	58			SC	S			
Vent — with Foam insulation and Laminated for Sound Glazing																
1"	Advanced Low-E IG	PEL-N-277-00471-00001	4	7	argon	0.27	0.26	0.48	59							
	with grilles-between-the-glass	PEL-N-277-00472-00001				0.27	0.24	0.43	59							
1"	Advanced Low-E IG	PEL-N-277-00483-00001	5	10	argon	0.27	0.26	0.47	58							
	with grilles-between-the-glass	PEL-N-277-00484-00001				0.27	0.23	0.42	58			SC	S			
1"	SunDefense™ IG	PEL-N-277-00467-00001	4	7	argon	0.27	0.20	0.44	60			SC	S			
	with grilles-between-the-glass	PEL-N-277-00468-00001				0.27	0.18	0.40	60			SC	S			
1"	SunDefense™ IG	PEL-N-277-00479-00001	5	10	argon	0.26	0.20	0.44	58			SC	S			
	with grilles-between-the-glass	PEL-N-277-00480-00001				0.26	0.18	0.39	58			SC	S			
Vent — High Altitude Glazing — with Laminated for Sound Glazing																
1"	Advanced Low-E IG	PEL-N-277-00137-00001	4	7	air	0.31	0.26	0.48	56							
	with grilles-between-the-glass	PEL-N-277-00138-00001				0.31	0.24	0.43	56							
1"	Advanced Low-E IG	PEL-N-277-00149-00001	5	10	air	0.31	0.26	0.47	54							
	with grilles-between-the-glass	PEL-N-277-00150-00001				0.31	0.24	0.42	54							
1"	SunDefense™ IG	PEL-N-277-00133-00001	4	7	air	0.31	0.20	0.44	56				S			
	with grilles-between-the-glass	PEL-N-277-00134-00001				0.31	0.18	0.40	56				S			
1"	SunDefense™ IG	PEL-N-277-00145-00001	5	10	air	0.31	0.20	0.44	55				S			
	with grilles-between-the-glass	PEL-N-277-00146-00001				0.31	0.18	0.39	55				S			
Vent — High Altitude Glazing — with Foam Insulation and Laminated for Sound Glazing																
1"	Advanced Low-E IG	PEL-N-277-00469-00001	4	7	air	0.30	0.26	0.48	56							
	with grilles-between-the-glass	PEL-N-277-00470-00001				0.30	0.24	0.43	56							
1"	Advanced Low-E IG	PEL-N-277-00481-00001	5	10	air	0.30	0.26	0.47	55							
	with grilles-between-the-glass	PEL-N-277-00482-00001				0.30	0.24	0.42	55							
1"	SunDefense™ IG	PEL-N-277-00465-00001	4	7	air	0.30	0.20	0.44	56				S			
	with grilles-between-the-glass	PEL-N-277-00466-00001				0.30	0.18	0.40	56				S			
1"	SunDefense™ IG	PEL-N-277-00477-00001	5	10	air	0.30	0.20	0.44	55				S			
	with grilles-between-the-glass	PEL-N-277-00478-00001				0.30	0.18	0.39	55				S			

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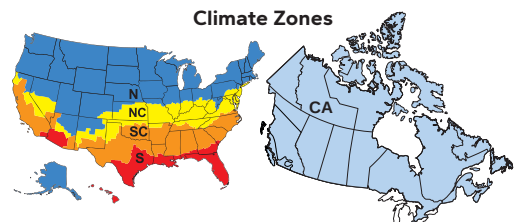
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Impervia® Casement Windows

Glazing Performance – Total Unit

Glazing 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 Impact-Resistant Laminated Glazing					
11/16"	Clear IG (PVB)	PEL-N-277-00665-00001	3	7.6	air	0.47	0.52	0.56	41						
	with grilles-between-the-glass	PEL-N-277-00666-00001				0.48	0.47	0.51	41						
1"	Clear IG (PVB)	PEL-N-277-00913-00001	3	8.6	air	0.43	0.52	0.56	45						
	with grilles-between-the-glass	PEL-N-277-00914-00001				0.43	0.47	0.51	45						
11/16"	Advanced Low-E IG (PVB)	PEL-N-277-00699-00001	3	7.6	argon	0.33	0.26	0.47	54						
	with grilles-between-the-glass	PEL-N-277-00700-00001				0.35	0.24	0.43	54						
1"	Advanced Low-E IG (PVB)	PEL-N-277-00963-00001	3	8.6	argon	0.28	0.26	0.47	59						
	with grilles-between-the-glass	PEL-N-277-00964-00001				0.28	0.24	0.43	59						
11/16"	SunDefense™ IG (PVB)	PEL-N-277-00683-00001	3	7.6	argon	0.33	0.20	0.44	54						
	with grilles-between-the-glass	PEL-N-277-00684-00001				0.35	0.18	0.40	54						
1"	SunDefense™ IG (PVB)	PEL-N-277-00939-00001	3	8.6	argon	0.28	0.19	0.44	59			SC	S		
	with grilles-between-the-glass	PEL-N-277-00940-00001				0.28	0.18	0.40	59			SC	S		
11/16"	Bronze Advanced Low-E IG (PVB)	PEL-N-277-00703-00001	3	7.6	argon	0.33	0.25	0.35	54						
	with grilles-between-the-glass	PEL-N-277-00704-00001				0.35	0.23	0.31	54						
1"	Bronze Advanced Low-E IG (PVB)	PEL-N-277-00975-00001	3	8.6	argon	0.28	0.25	0.35	60						
	with grilles-between-the-glass	PEL-N-277-00976-00001				0.28	0.23	0.31	60			SC	S		
Vent — with Foam Insulation and Impact-Resistant Laminated Glazing															
11/16"	Advanced Low-E IG (PVB)	PEL-N-277-01531-00001	3	7.6	argon	0.33	0.26	0.47	54						
	with grilles-between-the-glass	PEL-N-277-01532-00001				0.35	0.24	0.43	54						
1"	Advanced Low-E IG (PVB)	PEL-N-277-01795-00001	3	8.6	argon	0.28	0.26	0.47	59						
	with grilles-between-the-glass	PEL-N-277-01796-00001				0.28	0.24	0.43	59						
11/16"	SunDefense™ IG (PVB)	PEL-N-277-01515-00001	3	7.6	argon	0.33	0.20	0.44	54						
	with grilles-between-the-glass	PEL-N-277-01516-00001				0.35	0.18	0.40	54						
1"	SunDefense™ IG (PVB)	PEL-N-277-01771-00001	3	8.6	argon	0.27	0.19	0.44	60			SC	S		
	with grilles-between-the-glass	PEL-N-277-01772-00001				0.27	0.18	0.40	60			SC	S		
11/16"	Bronze Advanced Low-E IG (PVB)	PEL-N-277-01535-00001	3	7.6	argon	0.33	0.25	0.35	54						
	with grilles-between-the-glass	PEL-N-277-01536-00001				0.35	0.23	0.31	54						
1"	Bronze Advanced Low-E IG (PVB)	PEL-N-277-01807-00001	3	8.6	argon	0.28	0.25	0.35	60						
	with grilles-between-the-glass	PEL-N-277-01808-00001				0.28	0.23	0.31	60			SC	S		

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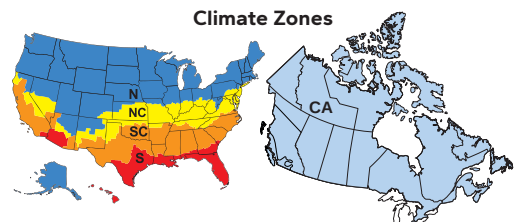
(1) Glazing performance values are calculated based on NFRC 100, NFRC 200 and NFRC 500.

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Impervia® Casement Windows

Glazing Performance – Total Unit

Glazing 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.	Middle	Int.		U-Factor	SHGC	VLT	CR	U. S.		Canada ₂			
											Zone		ER	Zone		
Vent — Triple Pane											N	NC	SC	S		CA
1"	Advanced Low-E IG	PEL-N-277-00167-00001	3	3	3	argon	0.23	0.24	0.43	67		NC				
	with grilles-between-the-glass	PEL-N-277-00168-00001					0.24	0.22	0.39	67		NC	SC	S		
1"	SunDefense™ IG	PEL-N-277-00179-00001	3	3	3	argon	0.23	0.18	0.40	67		NC	SC	S		
	with grilles-between-the-glass	PEL-N-277-00180-00001					0.23	0.17	0.36	67		NC	SC	S		
1"	NaturalSun Low-E IG	PEL-N-277-00155-00001	3	3	3	argon	0.23	0.40	0.49	66	N	NC				
	with grilles-between-the-glass	PEL-N-277-00156-00001					0.24	0.36	0.44	66	N	NC				
Vent — Triple Pane with Foam Insulation																
1"	Advanced Low-E IG	PEL-N-277-00499-00001	3	3	3	argon	0.22	0.24	0.43	67	N	NC				
	with grilles-between-the-glass	PEL-N-277-00500-00001					0.23	0.22	0.39	67		NC	SC	S		
1"	SunDefense IG	PEL-N-277-00511-00001	3	3	3	argon	0.22	0.18	0.40	67	N	NC	SC	S		
	with grilles-between-the-glass	PEL-N-277-00512-00001					0.22	0.17	0.36	67	N	NC	SC	S		
1"	NaturalSun Low-E IG	PEL-N-277-00487-00001	3	3	3	argon	0.22	0.40	0.49	67	N	NC			35	CA
	with grilles-between-the-glass	PEL-N-277-00488-00001					0.23	0.36	0.44	67	N	NC				
Vent — Triple Pane with High Altitude Glazing																
1"	(HA) Advanced Low-E IG	PEL-N-277-00165-00001	3	3	3	air	0.26	0.24	0.43	63						
	with grilles-between-the-glass	PEL-N-277-00166-00001					0.27	0.22	0.39	63			SC	S		
1"	(HA) SunDefense IG	PEL-N-277-00177-00001	3	3	3	air	0.26	0.18	0.40	63			SC	S		
	with grilles-between-the-glass	PEL-N-277-00178-00001					0.27	0.17	0.36	63			SC	S		
1"	(HA) NaturalSun Low-E IG	PEL-N-277-00153-00001	3	3	3	air	0.27	0.40	0.49	63						
	with grilles-between-the-glass	PEL-N-277-00154-00001					0.27	0.36	0.44	63						
Vent — Triple Pane with High Altitude Glazing and Foam Insulation																
1"	(HA) Advanced Low-E IG	PEL-N-277-00497-00001	3	3	3	air	0.25	0.24	0.43	63		NC				
	with grilles-between-the-glass	PEL-N-277-00498-00001					0.26	0.22	0.39	63			SC	S		
1"	(HA) SunDefense IG	PEL-N-277-00509-00001	3	3	3	air	0.25	0.18	0.40	63		NC	SC	S		
	with grilles-between-the-glass	PEL-N-277-00510-00001					0.26	0.17	0.36	63			SC	S		
1"	(HA) NaturalSun Low-E IG	PEL-N-277-00485-00001	3	3	3	air	0.26	0.40	0.49	63	N					
	with grilles-between-the-glass	PEL-N-277-00486-00001					0.26	0.36	0.44	63						

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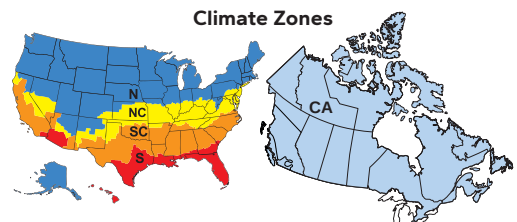
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Impervia® Casement Windows

Glazing Performance – Total Unit

Glazing 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	C _g	U. S.				Canada ₂		
										Zone				ER	Zone	
Fixed										N	NC	SC	S		CA	
11/16"	Clear IG	PEL-N-276-00225-00001	3	3	air	0.46	0.63	0.66	44							
	with grilles-between-the-glass	PEL-N-276-00226-00001				0.46	0.56	0.59	44							
11/16"	Clear IG	PEL-N-276-00229-00001	4	4	air	0.47	0.61	0.66	43							
	with grilles-between-the-glass	PEL-N-276-00230-00001				0.48	0.55	0.59	43							
1"	Clear IG	PEL-N-276-00001-00001	5	5	air	0.45	0.60	0.65	44							
	with grilles-between-the-glass	PEL-N-276-00002-00001				0.45	0.54	0.58	44							
1"	Clear IG	PEL-N-276-00005-00001	6	6	air	0.44	0.58	0.64	44							
	with grilles-between-the-glass	PEL-N-276-00006-00001				0.44	0.52	0.57	44							
11/16"	Advanced Low-E IG	PEL-N-276-00235-00001	3	3	argon	0.27	0.30	0.56	59							
	with grilles-between-the-glass	PEL-N-276-00236-00001				0.28	0.27	0.50	59							
11/16"	Advanced Low-E IG	PEL-N-276-00239-00001	4	4	argon	0.28	0.30	0.56	57							
	with grilles-between-the-glass	PEL-N-276-00240-00001				0.30	0.27	0.50	57							
1"	Advanced Low-E IG	PEL-N-276-00019-00001	5	5	argon	0.27	0.29	0.55	59							
	with grilles-between-the-glass	PEL-N-276-00020-00001				0.27	0.26	0.49	59							
1"	Advanced Low-E IG	PEL-N-276-00023-00001	6	6	argon	0.27	0.29	0.54	58							
	with grilles-between-the-glass	PEL-N-276-00024-00001				0.27	0.26	0.48	58							
11/16"	SunDefense™ IG	PEL-N-276-00243-00001	3	3	argon	0.27	0.22	0.52	60			SC	S			
	with grilles-between-the-glass	PEL-N-276-00244-00001				0.28	0.20	0.46	60			SC	S			
11/16"	SunDefense™ IG	PEL-N-276-00247-00001	4	4	argon	0.28	0.23	0.52	58			SC	S			
	with grilles-between-the-glass	PEL-N-276-00248-00001				0.29	0.21	0.46	58				S			
11/16"	SunDefense+ IG	PEL-N-276-00299-00001	3	3	argon	0.23	0.22	0.51	47		NC	SC	S			
	with grilles-between-the-glass	PEL-N-276-00300-00001				0.24	0.20	0.45	47		NC	SC	S			
11/16"	SunDefense+ IG	PEL-N-276-00303-00001	4	4	argon	0.24	0.22	0.50	45		NC	SC	S			
	with grilles-between-the-glass	PEL-N-276-00304-00001				0.25	0.20	0.45	45		NC	SC	S			
1"	SunDefense™ IG	PEL-N-276-00059-00001	5	5	argon	0.27	0.22	0.51	59			SC	S			
	with grilles-between-the-glass	PEL-N-276-00060-00001				0.27	0.20	0.46	59			SC	S			
1"	SunDefense™ IG	PEL-N-276-00063-00001	6	6	argon	0.27	0.22	0.50	58			SC	S			
	with grilles-between-the-glass	PEL-N-276-00064-00001				0.27	0.20	0.45	58			SC	S			
1"	SunDefense+ IG	PEL-N-276-00867-00001	5	5	argon	0.23	0.22	0.50	47		NC	SC	S			
	with grilles-between-the-glass	PEL-N-276-00868-00001				0.23	0.20	0.45	47		NC	SC	S			
1"	SunDefense+ IG	PEL-N-276-00871-00001	6	6	argon	0.23	0.22	0.49	46		NC	SC	S			
	with grilles-between-the-glass	PEL-N-276-00872-00001				0.23	0.20	0.44	46		NC	SC	S			
11/16"	AdvancedComfort Low-E IG	PEL-N-276-00259-00001	3	3	argon	0.23	0.29	0.55	47		NC					
	with grilles-between-the-glass	PEL-N-276-00260-00001				0.24	0.27	0.49	47		NC					
11/16"	AdvancedComfort Low-E IG	PEL-N-276-00263-00001	4	4	argon	0.24	0.29	0.54	45		NC					
	with grilles-between-the-glass	PEL-N-276-00264-00001				0.26	0.26	0.48	45							
1"	AdvancedComfort Low-E IG	PEL-N-276-00859-00001	5	5	argon	0.23	0.29	0.54	46		NC					
	with grilles-between-the-glass	PEL-N-276-00860-00001				0.23	0.26	0.48	46		NC					
1"	AdvancedComfort Low-E IG	PEL-N-276-00863-00001	6	6	argon	0.23	0.28	0.53	46		NC					
	with grilles-between-the-glass	PEL-N-276-00864-00001				0.23	0.26	0.47	46		NC					
11/16"	NaturalSun Low-E IG	PEL-N-276-00251-00001	3	3	argon	0.28	0.55	0.64	59					37	CA	
	with grilles-between-the-glass	PEL-N-276-00252-00001				0.29	0.50	0.57	59							
11/16"	NaturalSun Low-E IG	PEL-N-276-00255-00001	4	4	argon	0.29	0.54	0.63	57					35	CA	
	with grilles-between-the-glass	PEL-N-276-00256-00001				0.31	0.48	0.56	57							
11/16"	NaturalSun+ Low-E IG	PEL-N-276-00819-00001	3	3	argon	0.24	0.50	0.62	46	N				39	CA	
	with grilles-between-the-glass	PEL-N-276-00820-00001				0.24	0.45	0.56	46	N				36	CA	
11/16"	NaturalSun+ Low-E IG	PEL-N-276-00823-00001	4	4	argon	0.25	0.49	0.62	44	N				37	CA	
	with grilles-between-the-glass	PEL-N-276-00824-00001				0.26	0.44	0.55	44	N						
1"	NaturalSun Low-E IG	PEL-N-276-00075-00001	5	5	argon	0.28	0.53	0.63	58					36	CA	
	with grilles-between-the-glass	PEL-N-276-00076-00001				0.28	0.48	0.56	58							
1"	NaturalSun Low-E IG	PEL-N-276-00079-00001	6	6	argon	0.28	0.52	0.62	57					35	CA	
	with grilles-between-the-glass	PEL-N-276-00080-00001				0.28	0.47	0.55	57							
1"	NaturalSun+ Low-E IG	PEL-N-276-00851-00001	5	5	argon	0.24	0.49	0.61	46	N				38	CA	
	with grilles-between-the-glass	PEL-N-276-00852-00001				0.24	0.44	0.55	46	N				35	CA	
1"	NaturalSun+ Low-E IG	PEL-N-276-00855-00001	6	6	argon	0.24	0.47	0.60	45	N				37	CA	
	with grilles-between-the-glass	PEL-N-276-00856-00001				0.24	0.42	0.54	45	N				34	CA	

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Glazing Performance – Total Unit

Glazing 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	
										Fixed — with Foam Insulation						
11/16"	Advanced Low-E IG	PEL-N-276-00567-00001	3	3	argon	0.26	0.30	0.56	59							
	with grilles-between-the-glass	PEL-N-276-00568-00001				0.27	0.27	0.50	59							
11/16"	Advanced Low-E IG	PEL-N-276-00571-00001	4	4	argon	0.28	0.30	0.56	57							
	with grilles-between-the-glass	PEL-N-276-00572-00001				0.29	0.27	0.50	57							
1"	Advanced Low-E IG	PEL-N-276-00351-00001	5	5	argon	0.27	0.29	0.55	59							
	with grilles-between-the-glass	PEL-N-276-00352-00001				0.27	0.26	0.49	59							
1"	Advanced Low-E IG	PEL-N-276-00355-00001	6	6	argon	0.27	0.29	0.54	58							
	with grilles-between-the-glass	PEL-N-276-00356-00001				0.27	0.26	0.48	58							
11/16"	SunDefense IG	PEL-N-276-00575-00001	3	3	argon	0.26	0.22	0.52	60			SC	S			
	with grilles-between-the-glass	PEL-N-276-00576-00001				0.27	0.20	0.46	60			SC	S			
11/16"	SunDefense IG	PEL-N-276-00579-00001	4	4	argon	0.27	0.23	0.52	58			SC	S			
	with grilles-between-the-glass	PEL-N-276-00580-00001				0.29	0.21	0.46	58				S			
11/16"	SunDefense+ IG	PEL-N-276-01667-00001	3	3	argon	0.23	0.22	0.51	47		NC	SC	S			
	with grilles-between-the-glass	PEL-N-276-00632-00001				0.23	0.20	0.45	47		NC	SC	S			
11/16"	SunDefense+ IG	PEL-N-276-01671-00001	4	4	argon	0.23	0.22	0.50	46		NC	SC	S			
	with grilles-between-the-glass	PEL-N-276-00636-00001				0.25	0.20	0.45	45		NC	SC	S			
1"	SunDefense IG	PEL-N-276-00391-00001	5	5	argon	0.26	0.22	0.51	59			SC	S			
	with grilles-between-the-glass	PEL-N-276-00392-00001				0.26	0.20	0.46	59			SC	S			
1"	SunDefense IG	PEL-N-276-00395-00001	6	6	argon	0.26	0.22	0.50	58			SC	S			
	with grilles-between-the-glass	PEL-N-276-00396-00001				0.26	0.20	0.45	58			SC	S			
1"	SunDefense+ IG	PEL-N-276-01699-00001	5	5	argon	0.23	0.22	0.50	47		NC	SC	S			
	with grilles-between-the-glass	PEL-N-276-01700-00001				0.23	0.20	0.45	47		NC	SC	S			
1"	SunDefense+ IG	PEL-N-276-01703-00001	6	6	argon	0.22	0.22	0.49	46	N	NC	SC	S			
	with grilles-between-the-glass	PEL-N-276-01704-00001				0.22	0.20	0.44	46	N	NC	SC	S			
11/16"	AdvancedComfort Low-E IG	PEL-N-276-00591-00001	3	3	argon	0.23	0.29	0.55	47		NC					
	with grilles-between-the-glass	PEL-N-276-00592-00001				0.23	0.27	0.49	47		NC					
11/16"	AdvancedComfort Low-E IG	PEL-N-276-01663-00001	4	4	argon	0.24	0.29	0.54	45		NC					
	with grilles-between-the-glass	PEL-N-276-00596-00001				0.23	0.26	0.48	46		NC					
1"	AdvancedComfort Low-E IG	PEL-N-276-01691-00001	5	5	argon	0.23	0.29	0.54	46		NC					
	with grilles-between-the-glass	PEL-N-276-01692-00001				0.23	0.26	0.48	46		NC					
1"	AdvancedComfort Low-E IG	PEL-N-276-01695-00001	6	6	argon	0.23	0.28	0.53	46		NC					
	with grilles-between-the-glass	PEL-N-276-01696-00001				0.23	0.26	0.47	46		NC					
11/16"	NaturalSun Low-E IG	PEL-N-276-00583-00001	3	3	argon	0.27	0.55	0.64	59					38	CA	
	with grilles-between-the-glass	PEL-N-276-00584-00001				0.28	0.50	0.57	59					34	CA	
11/16"	NaturalSun Low-E IG	PEL-N-276-00587-00001	4	4	argon	0.29	0.54	0.63	57					35	CA	
	with grilles-between-the-glass	PEL-N-276-00588-00001				0.30	0.48	0.56	57							
11/16"	NaturalSun+ Low-E IG	PEL-N-276-01651-00001	3	3	argon	0.24	0.50	0.62	46	N				39	CA	
	with grilles-between-the-glass	PEL-N-276-01652-00001				0.24	0.45	0.56	46	N				36	CA	
11/16"	NaturalSun+ Low-E IG	PEL-N-276-01655-00001	4	4	argon	0.24	0.49	0.62	44	N				38	CA	
	with grilles-between-the-glass	PEL-N-276-01656-00001				0.25	0.44	0.55	44	N				34	CA	
1"	NaturalSun Low-E IG	PEL-N-276-00407-00001	5	5	argon	0.28	0.53	0.63	58					36	CA	
	with grilles-between-the-glass	PEL-N-276-00408-00001				0.28	0.48	0.56	58							
1"	NaturalSun Low-E IG	PEL-N-276-00411-00001	6	6	argon	0.28	0.52	0.62	58					35	CA	
	with grilles-between-the-glass	PEL-N-276-00412-00001				0.28	0.47	0.55	58							
1"	NaturalSun+ Low-E IG	PEL-N-276-01683-00001	5	5	argon	0.24	0.49	0.61	46	N				38	CA	
	with grilles-between-the-glass	PEL-N-276-01684-00001				0.24	0.44	0.55	46	N				35	CA	
1"	NaturalSun+ Low-E IG	PEL-N-276-01687-00001	6	6	argon	0.24	0.47	0.60	45	N				37	CA	
	with grilles-between-the-glass	PEL-N-276-01688-00001				0.24	0.42	0.54	45	N				34	CA	

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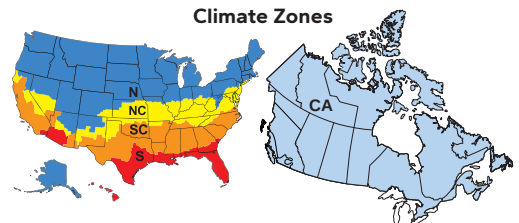
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Climate Zones





Impervia® Casement Windows

Glazing Performance – Total Unit

Glazing 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	
Fixed — High Altitude Glazing										N	NC	SC	S	CA	
11/16"	(HA) Advanced Low-E IG	PEL-N-276-00233-00001	3	3	air	0.31	0.30	0.56	55						
	with grilles-between-the-glass	PEL-N-276-00234-00001				0.33	0.27	0.50	55						
11/16"	(HA) Advanced Low-E IG	PEL-N-276-00237-00001	4	4	air	0.33	0.30	0.56	53						
	with grilles-between-the-glass	PEL-N-276-00238-00001				0.35	0.27	0.50	53						
1"	(HA) Advanced Low-E IG	PEL-N-276-00017-00001	5	5	air	0.31	0.30	0.55	55						
	with grilles-between-the-glass	PEL-N-276-00018-00001				0.31	0.27	0.49	55						
1"	(HA) Advanced Low-E IG	PEL-N-276-00021-00001	6	6	air	0.31	0.29	0.54	55						
	with grilles-between-the-glass	PEL-N-276-00022-00001				0.31	0.27	0.48	55						
11/16"	(HA) SunDefense IG	PEL-N-276-00241-00001	3	3	air	0.31	0.23	0.52	56					S	
	with grilles-between-the-glass	PEL-N-276-00242-00001				0.32	0.21	0.46	56					S	
11/16"	(HA) SunDefense IG	PEL-N-276-00245-00001	4	4	air	0.33	0.23	0.52	53						
	with grilles-between-the-glass	PEL-N-276-00246-00001				0.35	0.21	0.46	53						
11/16"	(HA) SunDefense+ IG	PEL-N-276-00297-00001	3	3	air	0.26	0.22	0.51	43			SC	S		
	with grilles-between-the-glass	PEL-N-276-00298-00001				0.27	0.20	0.45	43			SC	S		
11/16"	(HA) SunDefense+ IG	PEL-N-276-00301-00001	4	4	air	0.27	0.22	0.50	41			SC	S		
	with grilles-between-the-glass	PEL-N-276-00302-00001				0.29	0.20	0.45	41				S		
1"	(HA) SunDefense IG	PEL-N-276-00057-00001	5	5	air	0.31	0.22	0.51	56					S	
	with grilles-between-the-glass	PEL-N-276-00058-00001				0.31	0.20	0.46	56					S	
1"	(HA) SunDefense IG	PEL-N-276-00061-00001	6	6	air	0.30	0.23	0.50	55					S	
	with grilles-between-the-glass	PEL-N-276-00062-00001				0.30	0.20	0.45	55					S	
1"	(HA) SunDefense+ IG	PEL-N-276-00865-00001	5	5	air	0.25	0.22	0.50	44		NC	SC	S		
	with grilles-between-the-glass	PEL-N-276-00866-00001				0.25	0.20	0.45	44		NC	SC	S		
1"	(HA) SunDefense+ IG	PEL-N-276-00869-00001	6	6	air	0.25	0.22	0.49	43		NC	SC	S		
	with grilles-between-the-glass	PEL-N-276-00870-00001				0.25	0.20	0.44	43		NC	SC	S		
11/16"	(HA) AdvancedComfort Low-E IG	PEL-N-276-00257-00001	3	3	air	0.26	0.30	0.55	43						
	with grilles-between-the-glass	PEL-N-276-00258-00001				0.27	0.27	0.49	43						
11/16"	(HA) AdvancedComfort Low-E IG	PEL-N-276-00261-00001	4	4	air	0.28	0.29	0.54	41						
	with grilles-between-the-glass	PEL-N-276-00262-00001				0.29	0.26	0.48	41						
1"	(HA) AdvancedComfort Low-E IG	PEL-N-276-00857-00001	5	5	air	0.26	0.29	0.54	43						
	with grilles-between-the-glass	PEL-N-276-00858-00001				0.26	0.26	0.48	43						
1"	(HA) AdvancedComfort Low-E IG	PEL-N-276-00861-00001	6	6	air	0.25	0.29	0.53	43		NC				
	with grilles-between-the-glass	PEL-N-276-00862-00001				0.25	0.26	0.47	43		NC				
11/16"	(HA) NaturalSun Low-E IG	PEL-N-276-00249-00001	3	3	air	0.32	0.55	0.64	55						
	with grilles-between-the-glass	PEL-N-276-00250-00001				0.32	0.50	0.57	55						
11/16"	(HA) NaturalSun Low-E IG	PEL-N-276-00253-00001	4	4	air	0.34	0.54	0.63	52						
	with grilles-between-the-glass	PEL-N-276-00254-00001				0.36	0.48	0.56	52						
11/16"	(HA) NaturalSun+ Low-E IG	PEL-N-276-00817-00001	3	3	air	0.27	0.50	0.62	42						35 CA
	with grilles-between-the-glass	PEL-N-276-00818-00001				0.27	0.45	0.56	42						
11/16"	(HA) NaturalSun+ Low-E IG	PEL-N-276-00821-00001	4	4	air	0.28	0.49	0.62	41						
	with grilles-between-the-glass	PEL-N-276-00822-00001				0.29	0.44	0.55	41						
1"	(HA) NaturalSun Low-E IG	PEL-N-276-00073-00001	5	5	air	0.32	0.53	0.63	55						
	with grilles-between-the-glass	PEL-N-276-00074-00001				0.32	0.48	0.56	55						
1"	(HA) NaturalSun Low-E IG	PEL-N-276-00077-00001	6	6	air	0.32	0.52	0.62	54						
	with grilles-between-the-glass	PEL-N-276-00078-00001				0.32	0.47	0.55	54						
1"	(HA) NaturalSun+ Low-E IG	PEL-N-276-00849-00001	5	5	air	0.26	0.48	0.61	43	N				35	CA
	with grilles-between-the-glass	PEL-N-276-00850-00001				0.26	0.43	0.55	43	N					
1"	(HA) NaturalSun+ Low-E IG	PEL-N-276-00853-00001	6	6	air	0.26	0.47	0.60	42	N				35	CA
	with grilles-between-the-glass	PEL-N-276-00854-00001				0.26	0.42	0.54	42	N					

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.

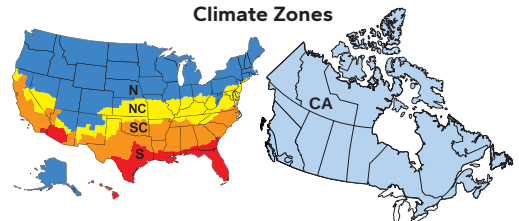
ENERGY STAR® values are updated to 2023 (version 7) criteria.

(2) The values shown are based on Canada's updated ENERGY STAR® 2020 initiative.

For center-glass values, see the Product Performance section.

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Climate Zones





Impervia® Casement Windows

Glazing Performance – Total Unit

Glazing 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			
Fixed — High Altitude Glazing with Foam Insulation										N	NC	SC	S	CA	
11/16"	(HA) Advanced Low-E IG	PEL-N-276-00565-00001	3	3	air	0.31	0.30	0.56	55						
	with grilles-between-the-glass	PEL-N-276-00566-00001				0.32	0.27	0.50	55						
11/16"	(HA) Advanced Low-E IG	PEL-N-276-00569-00001	4	4	air	0.33	0.30	0.56	53						
	with grilles-between-the-glass	PEL-N-276-00570-00001				0.34	0.27	0.50	53						
1"	(HA) Advanced Low-E IG	PEL-N-276-00349-00001	5	5	air	0.30	0.30	0.55	55						
	with grilles-between-the-glass	PEL-N-276-00350-00001				0.30	0.27	0.49	55						
1"	(HA) Advanced Low-E IG	PEL-N-276-00353-00001	6	6	air	0.30	0.29	0.54	55						
	with grilles-between-the-glass	PEL-N-276-00354-00001				0.30	0.27	0.48	55						
11/16"	(HA) SunDefense IG	PEL-N-276-00573-00001	3	3	air	0.30	0.23	0.52	56				S		
	with grilles-between-the-glass	PEL-N-276-00574-00001				0.32	0.21	0.46	56				S		
11/16"	(HA) SunDefense IG	PEL-N-276-00577-00001	4	4	air	0.32	0.23	0.52	53				S		
	with grilles-between-the-glass	PEL-N-276-00578-00001				0.34	0.21	0.46	53				S		
11/16"	(HA) SunDefense+ IG	PEL-N-276-01665-00001	3	3	air	0.25	0.22	0.51	44		NC	SC	S		
	with grilles-between-the-glass	PEL-N-276-00630-00001				0.26	0.20	0.45	43			SC	S		
11/16"	(HA) SunDefense+ IG	PEL-N-276-00633-00001	4	4	air	0.27	0.22	0.50	41			SC	S		
	with grilles-between-the-glass	PEL-N-276-00634-00001				0.28	0.20	0.45	41			SC	S		
1"	(HA) SunDefense IG	PEL-N-276-00389-00001	5	5	air	0.30	0.22	0.51	56				S		
	with grilles-between-the-glass	PEL-N-276-00390-00001				0.30	0.20	0.46	56				S		
1"	(HA) SunDefense IG	PEL-N-276-00393-00001	6	6	air	0.30	0.23	0.50	55				S		
	with grilles-between-the-glass	PEL-N-276-00394-00001				0.30	0.20	0.45	55				S		
1"	(HA) SunDefense+ IG	PEL-N-276-01697-00001	5	5	air	0.25	0.22	0.50	44		NC	SC	S		
	with grilles-between-the-glass	PEL-N-276-01698-00001				0.25	0.20	0.45	44		NC	SC	S		
1"	(HA) SunDefense+ IG	PEL-N-276-01701-00001	6	6	air	0.25	0.22	0.49	43		NC	SC	S		
	with grilles-between-the-glass	PEL-N-276-01702-00001				0.25	0.20	0.44	43		NC	SC	S		
11/16"	(HA) AdvancedComfort Low-E IG	PEL-N-276-01657-00001	3	3	air	0.26	0.30	0.55	43						
	with grilles-between-the-glass	PEL-N-276-00590-00001				0.27	0.27	0.49	43						
11/16"	(HA) AdvancedComfort Low-E IG	PEL-N-276-00593-00001	4	4	air	0.27	0.29	0.54	41						
	with grilles-between-the-glass	PEL-N-276-00594-00001				0.28	0.26	0.48	41						
1"	(HA) AdvancedComfort Low-E IG	PEL-N-276-01689-00001	5	5	air	0.26	0.29	0.54	43						
	with grilles-between-the-glass	PEL-N-276-01690-00001				0.26	0.26	0.48	43						
1"	(HA) AdvancedComfort Low-E IG	PEL-N-276-01693-00001	6	6	air	0.25	0.29	0.53	43		NC				
	with grilles-between-the-glass	PEL-N-276-01694-00001				0.25	0.26	0.47	43		NC				
11/16"	(HA) NaturalSun Low-E IG	PEL-N-276-00581-00001	3	3	air	0.32	0.55	0.64	55						
	with grilles-between-the-glass	PEL-N-276-00582-00001				0.32	0.50	0.57	55						
11/16"	(HA) NaturalSun Low-E IG	PEL-N-276-00585-00001	4	4	air	0.33	0.54	0.63	52						
	with grilles-between-the-glass	PEL-N-276-00586-00001				0.35	0.48	0.56	52						
11/16"	(HA) NaturalSun+ Low-E IG	PEL-N-276-01649-00001	3	3	air	0.26	0.50	0.62	43	N					36
	with grilles-between-the-glass	PEL-N-276-01650-00001				0.26	0.45	0.56	43	N					
11/16"	(HA) NaturalSun+ Low-E IG	PEL-N-276-01653-00001	4	4	air	0.27	0.49	0.62	41						35
	with grilles-between-the-glass	PEL-N-276-01654-00001				0.29	0.44	0.55	41						
1"	(HA) NaturalSun Low-E IG	PEL-N-276-00405-00001	5	5	air	0.31	0.53	0.63	55						
	with grilles-between-the-glass	PEL-N-276-00406-00001				0.31	0.48	0.56	55						
1"	(HA) NaturalSun Low-E IG	PEL-N-276-00409-00001	6	6	air	0.31	0.52	0.62	54						
	with grilles-between-the-glass	PEL-N-276-00410-00001				0.31	0.47	0.55	54						
1"	(HA) NaturalSun+ Low-E IG	PEL-N-276-01681-00001	5	5	air	0.26	0.48	0.61	43	N					35
	with grilles-between-the-glass	PEL-N-276-01682-00001				0.26	0.43	0.55	43	N					
1"	(HA) NaturalSun+ Low-E IG	PEL-N-276-01685-00001	6	6	air	0.26	0.47	0.60	42	N					35
	with grilles-between-the-glass	PEL-N-276-01686-00001				0.26	0.42	0.54	42	N					

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

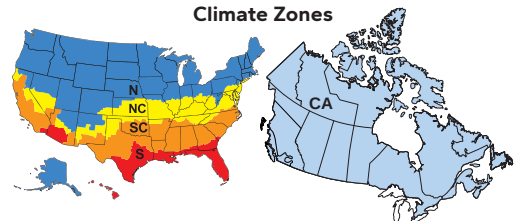
ENERGY STAR® values are updated to 2023 (version 7) criteria.

(2) The values shown are based on Canada's updated ENERGY STAR® 2020 initiative.

For center-glass values, see the Product Performance section.

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Climate Zones





Glazing Performance – Total Unit

Glazing 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		
Fixed — 5mm/3mm Glass										N	NC	SC	S	CA			
1"	Clear IG	PEL-N-276-00009-00001	5	3	air	0.45	0.61	0.66	45								
	with grilles-between-the-glass	PEL-N-276-00010-00001				0.45	0.55	0.59	45								
1"	Advanced Low-E IG	PEL-N-276-00051-00001	5	3	argon	0.28	0.29	0.55	60								
	with grilles-between-the-glass	PEL-N-276-00052-00001				0.28	0.27	0.50	60								
1"	SunDefense™ IG	PEL-N-276-00067-00001	5	3	argon	0.27	0.22	0.52	60			SC	S				
	with grilles-between-the-glass	PEL-N-276-00068-00001				0.27	0.20	0.46	60			SC	S				
1"	SunDefense+ IG	PEL-N-276-00891-00001	5	3	argon	0.23	0.22	0.50	48		NC	SC	S				
	with grilles-between-the-glass	PEL-N-276-00892-00001				0.23	0.20	0.45	48		NC	SC	S				
1"	AdvancedComfort Low-E IG	PEL-N-276-00887-00001	5	3	argon	0.24	0.29	0.54	48		NC						
	with grilles-between-the-glass	PEL-N-276-00888-00001				0.24	0.26	0.48	48		NC						
1"	NaturalSun Low-E IG	PEL-N-276-00083-00001	5	3	argon	0.29	0.54	0.63	60					35	CA		
	with grilles-between-the-glass	PEL-N-276-00084-00001				0.29	0.48	0.56	60								
1"	NaturalSun+ Low-E IG	PEL-N-276-00883-00001	5	3	argon	0.24	0.49	0.62	47	N				38	CA		
	with grilles-between-the-glass	PEL-N-276-00884-00001				0.24	0.44	0.55	47	N				35	CA		
Fixed — 5mm/3mm Glass with Foam Insulation																	
1"	Advanced Low-E IG	PEL-N-276-00383-00001	5	3	argon	0.27	0.29	0.55	60								
	with grilles-between-the-glass	PEL-N-276-00384-00001				0.27	0.27	0.50	60								
1"	SunDefense IG	PEL-N-276-00399-00001	5	3	argon	0.27	0.22	0.52	61			SC	S				
	with grilles-between-the-glass	PEL-N-276-00400-00001				0.27	0.20	0.46	61			SC	S				
1"	SunDefense+ IG	PEL-N-276-01723-00001	5	3	argon	0.23	0.22	0.50	48		NC	SC	S				
	with grilles-between-the-glass	PEL-N-276-01724-00001				0.23	0.20	0.45	48		NC	SC	S				
1"	AdvancedComfort Low-E IG	PEL-N-276-01719-00001	5	3	argon	0.23	0.29	0.54	48		NC						
	with grilles-between-the-glass	PEL-N-276-01720-00001				0.23	0.26	0.48	48		NC						
1"	NaturalSun Low-E IG	PEL-N-276-00415-00001	5	3	argon	0.28	0.54	0.63	60					36	CA		
	with grilles-between-the-glass	PEL-N-276-00416-00001				0.28	0.48	0.56	60								
1"	NaturalSun+ Low-E IG	PEL-N-276-01715-00001	5	3	argon	0.24	0.49	0.62	47	N				38	CA		
	with grilles-between-the-glass	PEL-N-276-01716-00001				0.24	0.44	0.55	47	N				35	CA		
Fixed — 5mm/3mm Glass High Altitude Glazing																	
1"	(HA) Advanced Low-E IG	PEL-N-276-00049-00001	5	3	air	0.31	0.30	0.55	56								
	with grilles-between-the-glass	PEL-N-276-00050-00001				0.31	0.27	0.50	56								
1"	(HA) SunDefense IG	PEL-N-276-00065-00001	5	3	air	0.31	0.22	0.52	57				S				
	with grilles-between-the-glass	PEL-N-276-00066-00001				0.31	0.20	0.46	57				S				
1"	(HA) SunDefense+ IG	PEL-N-276-00889-00001	5	3	air	0.26	0.22	0.50	45			SC	S				
	with grilles-between-the-glass	PEL-N-276-00890-00001				0.26	0.20	0.45	45			SC	S				
1"	(HA) AdvancedComfort Low-E IG	PEL-N-276-00885-00001	5	3	air	0.26	0.29	0.54	44								
	with grilles-between-the-glass	PEL-N-276-00886-00001				0.26	0.26	0.48	44								
1"	(HA) NaturalSun Low-E IG	PEL-N-276-00081-00001	5	3	air	0.32	0.54	0.63	56								
	with grilles-between-the-glass	PEL-N-276-00082-00001				0.32	0.48	0.56	56								
1"	(HA) NaturalSun+ Low-E IG	PEL-N-276-00881-00001	5	3	air	0.27	0.49	0.62	44					35	CA		
	with grilles-between-the-glass	PEL-N-276-00882-00001				0.27	0.44	0.55	44								
Fixed — 5mm/3mm Glass High Altitude Glazing — with Foam Insulation																	
1"	(HA) Advanced Low-E IG	PEL-N-276-00381-00001	5	3	air	0.31	0.30	0.55	57								
	with grilles-between-the-glass	PEL-N-276-00382-00001				0.31	0.27	0.50	57								
1"	(HA) SunDefense IG	PEL-N-276-00397-00001	5	3	air	0.30	0.22	0.52	57				S				
	with grilles-between-the-glass	PEL-N-276-00398-00001				0.30	0.20	0.46	57				S				
1"	(HA) SunDefense+ IG	PEL-N-276-01721-00001	5	3	air	0.26	0.22	0.50	45			SC	S				
	with grilles-between-the-glass	PEL-N-276-01722-00001				0.26	0.20	0.45	45			SC	S				
1"	(HA) AdvancedComfort Low-E IG	PEL-N-276-01717-00001	5	3	air	0.26	0.29	0.54	44								
	with grilles-between-the-glass	PEL-N-276-01718-00001				0.26	0.26	0.48	44								
1"	(HA) NaturalSun Low-E IG	PEL-N-276-00413-00001	5	3	air	0.32	0.54	0.63	56								
	with grilles-between-the-glass	PEL-N-276-00414-00001				0.32	0.48	0.56	56								
1"	(HA) NaturalSun+ Low-E IG	PEL-N-276-01713-00001	5	3	air	0.26	0.49	0.62	44	N				36	CA		
	with grilles-between-the-glass	PEL-N-276-01714-00001				0.26	0.44	0.55	44	N							

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Impervia® Casement Windows

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Glazing 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
Fixed — 4mm/6mm Glass										N	NC	SC	S	CA	
1"	Clear IG	PEL-N-276-00013-00001	4	6	air	0.45	0.60	0.65	44						
	with grilles-between-the-glass	PEL-N-276-00014-00001				0.45	0.54	0.58	44						
1"	Advanced Low-E IG	PEL-N-276-00055-00001	4	6	argon	0.27	0.29	0.55	58						
	with grilles-between-the-glass	PEL-N-276-00056-00001				0.27	0.27	0.49	58						
1"	SunDefense™ IG	PEL-N-276-00071-00001	4	6	argon	0.27	0.22	0.51	59			SC	S		
	with grilles-between-the-glass	PEL-N-276-00072-00001				0.27	0.20	0.46	59			SC	S		
1"	SunDefense+ IG	PENDING	4	6	argon										
	with grilles-between-the-glass	PENDING													
1"	AdvancedComfort Low-E IG	PEL-N-276-00103-00001	4	6	argon	0.23	0.29	0.54	46		NC				
	with grilles-between-the-glass	PEL-N-276-00104-00001				0.23	0.26	0.48	46		NC				
1"	NaturalSun Low-E IG	PEL-N-276-00087-00001	4	6	argon	0.28	0.54	0.62	58					36	CA
	with grilles-between-the-glass	PEL-N-276-00088-00001				0.28	0.49	0.56	58						
1"	NaturalSun+ Low-E IG	PENDING	4	6	argon										
	with grilles-between-the-glass	PENDING													
Fixed — 4mm/6mm Glass with Foam Insulation															
1"	Advanced Low-E IG	PEL-N-276-00387-00001	4	6	argon	0.27	0.29	0.55	58						
	with grilles-between-the-glass	PEL-N-276-00388-00001				0.27	0.27	0.49	58						
1"	SunDefense IG	PEL-N-276-00403-00001	4	6	argon	0.26	0.22	0.51	59			SC	S		
	with grilles-between-the-glass	PEL-N-276-00404-00001				0.26	0.20	0.46	59			SC	S		
1"	SunDefense+ IG	PENDING	4	6	argon										
	with grilles-between-the-glass	PENDING													
1"	AdvancedComfort Low-E IG	PEL-N-276-00435-00001	4	6	argon	0.22	0.29	0.54	47	X	NC				
	with grilles-between-the-glass	PEL-N-276-00436-00001				0.22	0.26	0.48	47	X	NC				
1"	NaturalSun Low-E IG	PEL-N-276-00419-00001	4	6	argon	0.28	0.54	0.62	58					36	CA
	with grilles-between-the-glass	PEL-N-276-00420-00001				0.28	0.49	0.56	58						
1"	NaturalSun+ Low-E IG	PENDING	4	6	argon										
	with grilles-between-the-glass	PENDING													
Fixed — 4mm/6mm Glass High Altitude Glazing															
1"	(HA) Advanced Low-E IG	PEL-N-276-00053-00001	4	6	air	0.31	0.30	0.55	55						
	with grilles-between-the-glass	PEL-N-276-00054-00001				0.31	0.27	0.49	55						
1"	(HA) SunDefense IG	PEL-N-276-00069-00001	4	6	air	0.31	0.22	0.51	55				S		
	with grilles-between-the-glass	PEL-N-276-00070-00001				0.31	0.20	0.46	55				S		
1"	(HA) SunDefense+ IG	PENDING	4	6	air										
	with grilles-between-the-glass	PENDING													
1"	(HA) AdvancedComfort Low-E IG	PEL-N-276-00101-00001	4	6	air	0.26	0.29	0.54	43						
	with grilles-between-the-glass	PEL-N-276-00102-00001				0.26	0.26	0.48	43						
1"	(HA) NaturalSun Low-E IG	PEL-N-276-00085-00001	4	6	air	0.32	0.54	0.62	54						
	with grilles-between-the-glass	PEL-N-276-00086-00001				0.32	0.48	0.56	54						
1"	(HA) NaturalSun+ Low-E IG	PENDING	4	6	air										
	with grilles-between-the-glass	PENDING													
Fixed — 4mm/6mm Glass High Altitude Glazing — with Foam Insulation															
1"	(HA) Advanced Low-E IG	PEL-N-276-00385-00001	4	6	air	0.30	0.30	0.55	55						
	with grilles-between-the-glass	PEL-N-276-00386-00001				0.30	0.27	0.49	55						
1"	(HA) SunDefense IG	PEL-N-276-00401-00001	4	6	air	0.30	0.22	0.51	55				S		
	with grilles-between-the-glass	PEL-N-276-00402-00001				0.30	0.20	0.46	55				S		
1"	(HA) SunDefense+ IG	PENDING	4	6	air										
	with grilles-between-the-glass	PENDING													
1"	(HA) AdvancedComfort Low-E IG	PEL-N-276-00433-00001	4	6	air	0.25	0.29	0.54	44		NC				
	with grilles-between-the-glass	PEL-N-276-00434-00001				0.25	0.26	0.48	44		NC				
1"	(HA) NaturalSun Low-E IG	PEL-N-276-00417-00001	4	6	air	0.31	0.54	0.62	55						
	with grilles-between-the-glass	PEL-N-276-00418-00001				0.31	0.48	0.56	55						
1"	(HA) NaturalSun+ Low-E IG	PENDING	4	6	air										
	with grilles-between-the-glass	PENDING													

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R-Value = 1/U-Factor

SHGC = Solar Heat Gain Coefficient

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CR = Condensation Resistance

ER = Canadian Energy Rating



Impervia® Casement Windows

Glazing Performance – Total Unit

Glazing 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	
										Fixed — with Tinted Glazing						
11/16"	Bronze Advanced Low-E IG	PEL-N-276-00275-00001	5	3	argon	0.28	0.27	0.36	58							
	with grilles-between-the-glass	PEL-N-276-00276-00001				0.30	0.24	0.32	58							
1"	Bronze Advanced Low-E IG	PEL-N-276-00027-00001	5	5	argon	0.27	0.26	0.36	59							
	with grilles-between-the-glass	PEL-N-276-00028-00001				0.27	0.24	0.32	59							
1"	Bronze Advanced Low-E IG	PEL-N-276-00039-00001	6	6	argon	0.27	0.25	0.32	58							
	with grilles-between-the-glass	PEL-N-276-00040-00001				0.27	0.22	0.29	58			SC	S			
11/16"	Gray Advanced Low-E IG	PEL-N-276-00279-00001	5	3	argon	0.28	0.25	0.31	58							
	with grilles-between-the-glass	PEL-N-276-00280-00001				0.30	0.22	0.28	58				S			
1"	Gray Advanced Low-E IG	PEL-N-276-00031-00001	5	5	argon	0.27	0.24	0.31	59							
	with grilles-between-the-glass	PEL-N-276-00032-00001				0.27	0.22	0.28	59			SC	S			
1"	Gray Advanced Low-E IG	PEL-N-276-00043-00001	6	6	argon	0.27	0.22	0.27	58			SC	S			
	with grilles-between-the-glass	PEL-N-276-00044-00001				0.27	0.20	0.24	58			SC	S			
11/16"	Green Advanced Low-E IG	PEL-N-276-00283-00001	5	3	argon	0.28	0.30	0.49	58							
	with grilles-between-the-glass	PEL-N-276-00284-00001				0.30	0.27	0.44	58							
1"	Green Advanced Low-E IG	PEL-N-276-00035-00001	5	5	argon	0.27	0.30	0.49	59							
	with grilles-between-the-glass	PEL-N-276-00036-00001				0.27	0.27	0.44	59							
1"	Green Advanced Low-E IG	PEL-N-276-00047-00001	6	6	argon	0.27	0.28	0.47	58							
	with grilles-between-the-glass	PEL-N-276-00048-00001				0.27	0.26	0.42	58							
Fixed — with Foam Insulation and Tinted Glazing																
11/16"	Bronze Advanced Low-E IG	PEL-N-276-00607-00001	5	3	argon	0.28	0.27	0.36	58							
	with grilles-between-the-glass	PEL-N-276-00608-00001				0.29	0.24	0.32	58							
1"	Bronze Advanced Low-E IG	PEL-N-276-00359-00001	5	5	argon	0.27	0.26	0.36	59							
	with grilles-between-the-glass	PEL-N-276-00360-00001				0.27	0.24	0.32	59							
1"	Bronze Advanced Low-E IG	PEL-N-276-00371-00001	6	6	argon	0.27	0.25	0.32	58							
	with grilles-between-the-glass	PEL-N-276-00372-00001				0.27	0.22	0.29	58			SC	S			
11/16"	Gray Advanced Low-E IG	PEL-N-276-00611-00001	5	3	argon	0.28	0.25	0.31	58							
	with grilles-between-the-glass	PEL-N-276-00612-00001				0.29	0.22	0.28	58				S			
1"	Gray Advanced Low-E IG	PEL-N-276-00363-00001	5	5	argon	0.27	0.24	0.31	59							
	with grilles-between-the-glass	PEL-N-276-00364-00001				0.27	0.22	0.28	59			SC	S			
1"	Gray Advanced Low-E IG	PEL-N-276-00375-00001	6	6	argon	0.27	0.22	0.27	58			SC	S			
	with grilles-between-the-glass	PEL-N-276-00376-00001				0.27	0.20	0.24	58			SC	S			
11/16"	Green Advanced Low-E IG	PEL-N-276-00615-00001	5	3	argon	0.28	0.30	0.49	58							
	with grilles-between-the-glass	PEL-N-276-00616-00001				0.29	0.27	0.44	58							
1"	Green Advanced Low-E IG	PEL-N-276-00367-00001	5	5	argon	0.27	0.30	0.49	59							
	with grilles-between-the-glass	PEL-N-276-00368-00001				0.27	0.27	0.44	59							
1"	Green Advanced Low-E IG	PEL-N-276-00379-00001	6	6	argon	0.27	0.28	0.47	58							
	with grilles-between-the-glass	PEL-N-276-00380-00001				0.27	0.26	0.42	58							

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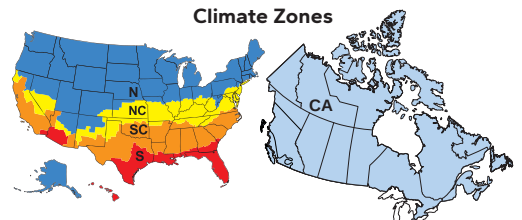
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Glazing Performance – Total Unit

Glazing 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	
										Fixed — High Altitude Glazing — with Tinted Glazing						
11/16"	Bronze Advanced Low-E IG	PEL-N-276-00273-00001	5	3	air	0.33	0.27	0.36	54							
	with grilles-between-the-glass	PEL-N-276-00274-00001				0.35	0.25	0.32	54							
1"	Bronze Advanced Low-E IG	PEL-N-276-00025-00001	5	5	air	0.31	0.27	0.36	56							
	with grilles-between-the-glass	PEL-N-276-00026-00001				0.31	0.24	0.32	56							
1"	Bronze Advanced Low-E IG	PEL-N-276-00037-00001	6	6	air	0.31	0.25	0.32	55							
	with grilles-between-the-glass	PEL-N-276-00038-00001				0.31	0.23	0.29	55				S			
11/16"	Gray Advanced Low-E IG	PEL-N-276-00277-00001	5	3	air	0.33	0.25	0.31	54							
	with grilles-between-the-glass	PEL-N-276-00278-00001				0.35	0.23	0.28	54							
1"	Gray Advanced Low-E IG	PEL-N-276-00029-00001	5	5	air	0.31	0.24	0.31	56							
	with grilles-between-the-glass	PEL-N-276-00030-00001				0.31	0.22	0.28	56				S			
1"	Gray Advanced Low-E IG	PEL-N-276-00041-00001	6	6	air	0.31	0.22	0.27	55				S			
	with grilles-between-the-glass	PEL-N-276-00042-00001				0.31	0.20	0.24	55				S			
11/16"	Green Advanced Low-E IG	PEL-N-276-00281-00001	5	3	air	0.33	0.31	0.49	54							
	with grilles-between-the-glass	PEL-N-276-00282-00001				0.35	0.28	0.44	54							
1"	Green Advanced Low-E IG	PEL-N-276-00033-00001	5	5	air	0.31	0.30	0.49	56							
	with grilles-between-the-glass	PEL-N-276-00034-00001				0.31	0.27	0.44	56							
1"	Green Advanced Low-E IG	PEL-N-276-00045-00001	6	6	air	0.31	0.29	0.47	55							
	with grilles-between-the-glass	PEL-N-276-00046-00001				0.31	0.26	0.42	55							
Fixed — High Altitude Glazing — with Foam Insulation and Tinted Glazing																
11/16"	Bronze Advanced Low-E IG	PEL-N-276-00605-00001	5	3	air	0.33	0.27	0.36	54							
	with grilles-between-the-glass	PEL-N-276-00606-00001				0.34	0.25	0.32	54							
1"	Bronze Advanced Low-E IG	PEL-N-276-00357-00001	5	5	air	0.30	0.27	0.36	56							
	with grilles-between-the-glass	PEL-N-276-00358-00001				0.30	0.24	0.32	56							
1"	Bronze Advanced Low-E IG	PEL-N-276-00369-00001	6	6	air	0.30	0.25	0.32	55							
	with grilles-between-the-glass	PEL-N-276-00370-00001				0.30	0.23	0.29	55				S			
11/16"	Gray Advanced Low-E IG	PEL-N-276-00609-00001	5	3	air	0.33	0.25	0.31	54							
	with grilles-between-the-glass	PEL-N-276-00610-00001				0.34	0.23	0.28	54							
1"	Gray Advanced Low-E IG	PEL-N-276-00361-00001	5	5	air	0.30	0.24	0.31	56							
	with grilles-between-the-glass	PEL-N-276-00362-00001				0.30	0.22	0.28	56				S			
1"	Gray Advanced Low-E IG	PEL-N-276-00373-00001	6	6	air	0.30	0.22	0.27	55				S			
	with grilles-between-the-glass	PEL-N-276-00374-00001				0.30	0.20	0.24	55				S			
11/16"	Green Advanced Low-E IG	PEL-N-276-00613-00001	5	3	air	0.33	0.31	0.49	54							
	with grilles-between-the-glass	PEL-N-276-00614-00001				0.34	0.28	0.44	54							
1"	Green Advanced Low-E IG	PEL-N-276-00365-00001	5	5	air	0.30	0.30	0.49	56							
	with grilles-between-the-glass	PEL-N-276-00366-00001				0.30	0.27	0.44	56							
1"	Green Advanced Low-E IG	PEL-N-276-00377-00001	6	6	air	0.30	0.29	0.47	55							
	with grilles-between-the-glass	PEL-N-276-00378-00001				0.30	0.26	0.42	55							

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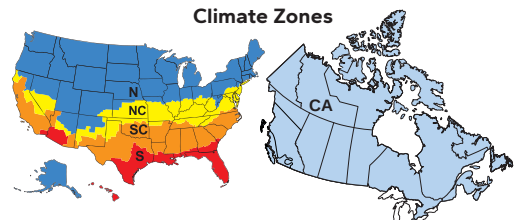
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Impervia® Casement Windows

Glazing Performance – Total Unit

Glazing 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
Fixed — with Laminated for Sound Glazing										N	NC	SC	S	CA	
1"	Advanced Low-E IG	PEL-N-276-00139-00001	4	7	argon	0.27	0.29	0.55	59						
	with grilles-between-the-glass	PEL-N-276-00140-00001				0.27	0.26	0.49	59						
1"	Advanced Low-E IG	PEL-N-276-00151-00001	5	10	argon	0.26	0.29	0.54	57						
	with grilles-between-the-glass	PEL-N-276-00152-00001				0.26	0.26	0.48	57						
1"	SunDefense™ IG	PEL-N-276-00135-00001	4	7	argon	0.27	0.22	0.51	59			SC	S		
	with grilles-between-the-glass	PEL-N-276-00136-00001				0.27	0.20	0.46	59			SC	S		
1"	SunDefense™ IG	PEL-N-276-00147-00001	5	10	argon	0.26	0.22	0.50	58			SC	S		
	with grilles-between-the-glass	PEL-N-276-00148-00001				0.26	0.20	0.45	58			SC	S		
Fixed — with Foam insulation and Laminated for Sound Glazing															
1"	Advanced Low-E IG	PEL-N-276-00471-00001	4	7	argon	0.26	0.29	0.55	59						
	with grilles-between-the-glass	PEL-N-276-00472-00001				0.26	0.26	0.49	59						
1"	Advanced Low-E IG	PEL-N-276-00483-00001	5	10	argon	0.26	0.29	0.54	57						
	with grilles-between-the-glass	PEL-N-276-00484-00001				0.26	0.26	0.48	57						
1"	SunDefense™ IG	PEL-N-276-00467-00001	4	7	argon	0.26	0.22	0.51	59			SC	S		
	with grilles-between-the-glass	PEL-N-276-00468-00001				0.26	0.20	0.46	59			SC	S		
1"	SunDefense™ IG	PEL-N-276-00479-00001	5	10	argon	0.25	0.22	0.50	58		NC	SC	S		
	with grilles-between-the-glass	PEL-N-276-00480-00001				0.25	0.20	0.45	58		NC	SC	S		
Fixed — High Altitude Glazing — with Laminated for Sound Glazing										N	NC	SC	S	CA	
1"	Advanced Low-E IG	PEL-N-276-00137-00001	4	7	air	0.31	0.30	0.55	55						
	with grilles-between-the-glass	PEL-N-276-00138-00001				0.31	0.27	0.49	55						
1"	Advanced Low-E IG	PEL-N-276-00149-00001	5	10	air	0.30	0.29	0.54	54						
	with grilles-between-the-glass	PEL-N-276-00150-00001				0.30	0.27	0.48	54						
1"	SunDefense IG	PEL-N-276-00133-00001	4	7	air	0.30	0.22	0.51	56				S		
	with grilles-between-the-glass	PEL-N-276-00134-00001				0.30	0.20	0.46	56				S		
1"	SunDefense IG	PEL-N-276-00145-00001	5	10	air	0.30	0.23	0.50	54				S		
	with grilles-between-the-glass	PEL-N-276-00146-00001				0.30	0.20	0.45	54				S		
Fixed — High Altitude Glazing — with Foam Insulation and Laminated for Sound Glazing															
1"	Advanced Low-E IG	PEL-N-276-00469-00001	4	7	air	0.30	0.30	0.55	56						
	with grilles-between-the-glass	PEL-N-276-00470-00001				0.30	0.27	0.49	56						
1"	Advanced Low-E IG	PEL-N-276-00481-00001	5	10	air	0.30	0.29	0.54	54						
	with grilles-between-the-glass	PEL-N-276-00482-00001				0.30	0.27	0.48	54						
1"	SunDefense IG	PEL-N-276-00465-00001	4	7	air	0.30	0.22	0.51	56				S		
	with grilles-between-the-glass	PEL-N-276-00466-00001				0.30	0.20	0.46	56				S		
1"	SunDefense IG	PEL-N-276-00477-00001	5	10	air	0.29	0.23	0.50	54				S		
	with grilles-between-the-glass	PEL-N-276-00478-00001				0.29	0.20	0.45	54				S		

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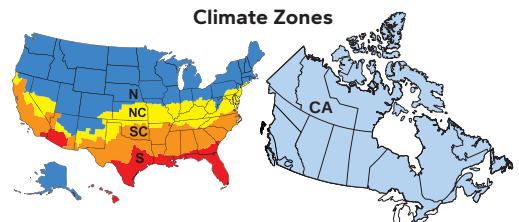
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Impervia® Casement Windows

Glazing Performance – Total Unit

Glazing 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.	Middle	Int.		U-Factor	SHGC	VLT	CR	U. S.				Canada ₂	
											Zone				ER	Zone
Fixed — Triple Pane											N	NC	SC	S		CA
1"	Advanced Low-E IG	PEL-N-276-00167-00001	3	3	3	argon	0.21	0.27	0.50	67	N	NC			29	CA
	with grilles-between-the-glass	PEL-N-276-00168-00001					0.22	0.25	0.44	67	N	NC				
1"	Advanced Low-E IG	PEL-N-276-00173-00001	4	4	4	argon	0.24	0.27	0.49	63		NC				
	with grilles-between-the-glass	PEL-N-276-00174-00001					0.25	0.24	0.43	63		NC				
1"	SunDefense™ IG	PEL-N-276-00179-00001	3	3	3	argon	0.21	0.20	0.46	67	N	NC	SC	S	25	CA
	with grilles-between-the-glass	PEL-N-276-00180-00001					0.22	0.19	0.41	67	N	NC	SC	S		
1"	SunDefense™ IG	PEL-N-276-00185-00001	4	4	4	argon	0.24	0.21	0.45	64		NC	SC	S		
	with grilles-between-the-glass	PEL-N-276-00186-00001					0.25	0.19	0.40	64		NC	SC	S		
1"	NaturalSun Low-E IG	PEL-N-276-00155-00001	3	3	3	argon	0.22	0.45	0.56	67	N				38	CA
	with grilles-between-the-glass	PEL-N-276-00156-00001					0.22	0.41	0.50	67	N				36	CA
1"	NaturalSun Low-E IG	PEL-N-276-00161-00001	4	4	4	argon	0.24	0.44	0.55	63	N				35	CA
	with grilles-between-the-glass	PEL-N-276-00162-00001					0.26	0.40	0.50	63	N					
Fixed — Triple Pane with Foam Insulation																
1"	Advanced Low-E IG	PEL-N-276-00499-00001	3	3	3	argon	0.21	0.27	0.50	67	N	NC			29	CA
	with grilles-between-the-glass	PEL-N-276-00500-00001					0.21	0.25	0.44	67	N	NC			28	CA
1"	Advanced Low-E IG	PEL-N-276-00505-00001	4	4	4	argon	0.23	0.27	0.49	64		NC				
	with grilles-between-the-glass	PEL-N-276-00506-00001					0.25	0.24	0.43	64		NC				
1"	SunDefense IG	PEL-N-276-00511-00001	3	3	3	argon	0.21	0.20	0.46	68	N	NC	SC	S	25	CA
	with grilles-between-the-glass	PEL-N-276-00512-00001					0.21	0.19	0.41	68	N	NC	SC	S	25	CA
1"	SunDefense IG	PEL-N-276-00517-00001	4	4	4	argon	0.23	0.21	0.45	64		NC	SC	S		
	with grilles-between-the-glass	PEL-N-276-00518-00001					0.24	0.19	0.40	64		NC	SC	S		
1"	NaturalSun Low-E IG	PEL-N-276-00487-00001	3	3	3	argon	0.21	0.45	0.56	67	N				40	CA
	with grilles-between-the-glass	PEL-N-276-00488-00001					0.22	0.41	0.50	67	N				36	CA
1"	NaturalSun Low-E IG	PEL-N-276-00493-00001	4	4	4	argon	0.24	0.44	0.55	63	N				35	CA
	with grilles-between-the-glass	PEL-N-276-00494-00001					0.25	0.40	0.50	63	N	NC				

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

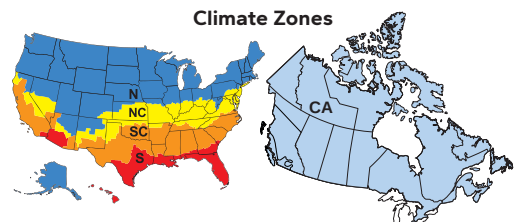
(1) Glazing performance values are calculated based on NFRC 100, NFRC 200 and NFRC 500.

ENERGY STAR® values are updated to 2023 (version 7) criteria.

(2) The values shown are based on Canada's updated ENERGY STAR® 2020 initiative.

For center-glass values, see the Product Performance section.

Visit www.energystar.gov for Energy Star guidelines.





Impervia® Casement Windows

Glazing Performance – Total Unit

Glazing 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.	Middle	Int.		U-Factor	SHGC	VLT	CR	U. S.		Canada ₂			
											Zone		ER	Zone		
Fixed — Triple Pane with High Altitude Glazing											N	NC	SC	S	CA	
1"	(HA) Advanced Low-E IG	PEL-N-276-00165-00001	3	3	3	air	0.25	0.27	0.50	63		NC				
	with grilles-between-the-glass	PEL-N-276-00166-00001					0.26	0.25	0.44	63						
1"	(HA) Advanced Low-E IG	PEL-N-276-00171-00001	4	4	4	air	0.28	0.27	0.49	60						
	with grilles-between-the-glass	PEL-N-276-00172-00001					0.30	0.25	0.43	60						
1"	(HA) SunDefense IG	PEL-N-276-00177-00001	3	3	3	air	0.25	0.21	0.46	63		NC	SC	S		
	with grilles-between-the-glass	PEL-N-276-00178-00001					0.26	0.19	0.41	63			SC	S		
1"	(HA) SunDefense IG	PEL-N-276-00183-00001	4	4	4	air	0.28	0.21	0.45	60			SC	S		
	with grilles-between-the-glass	PEL-N-276-00184-00001					0.30	0.19	0.40	60				S		
1"	(HA) NaturalSun Low-E IG	PEL-N-276-00153-00001	3	3	3	air	0.26	0.45	0.56	63	N					
	with grilles-between-the-glass	PEL-N-276-00154-00001					0.26	0.41	0.50	63	N					
1"	(HA) NaturalSun Low-E IG	PEL-N-276-00159-00001	4	4	4	air	0.29	0.44	0.55	59						
	with grilles-between-the-glass	PEL-N-276-00160-00001					0.30	0.39	0.50	59						
Fixed — Triple Pane with High Altitude Glazing and Foam Insulation																
1"	(HA) Advanced Low-E IG	PEL-N-276-00497-00001	3	3	3	air	0.25	0.27	0.50	63		NC				
	with grilles-between-the-glass	PEL-N-276-00498-00001					0.25	0.25	0.44	63		NC				
1"	(HA) Advanced Low-E IG	PEL-N-276-00503-00001	4	4	4	air	0.28	0.27	0.49	60						
	with grilles-between-the-glass	PEL-N-276-00504-00001					0.29	0.25	0.43	60						
1"	(HA) SunDefense IG	PEL-N-276-00509-00001	3	3	3	air	0.24	0.21	0.46	64		NC	SC	S		
	with grilles-between-the-glass	PEL-N-276-00510-00001					0.25	0.19	0.41	64			SC	S		
1"	(HA) SunDefense IG	PEL-N-276-00515-00001	4	4	4	air	0.28	0.21	0.45	60			SC	S		
	with grilles-between-the-glass	PEL-N-276-00516-00001					0.29	0.19	0.40	60				S		
1"	(HA) NaturalSun Low-E IG	PEL-N-276-00485-00001	3	3	3	air	0.25	0.45	0.56	63	N				35	CA
	with grilles-between-the-glass	PEL-N-276-00486-00001					0.26	0.41	0.50	63	N					
1"	(HA) NaturalSun Low-E IG	PEL-N-276-00491-00001	4	4	4	air	0.28	0.44	0.55	60						
	with grilles-between-the-glass	PEL-N-276-00492-00001					0.29	0.39	0.50	60						

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

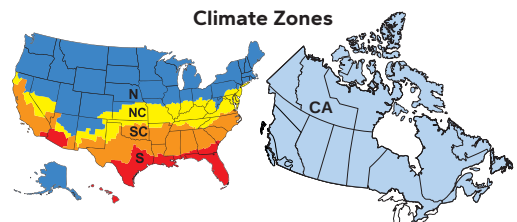
(1) Glazing performance values are calculated based on NFRC 100, NFRC 200 and NFRC 500.

ENERGY STAR® values are updated to 2023 (version 7) criteria.

(2) The values shown are based on Canada's updated ENERGY STAR® 2020 initiative.

For center-glass values, see the Product Performance section.

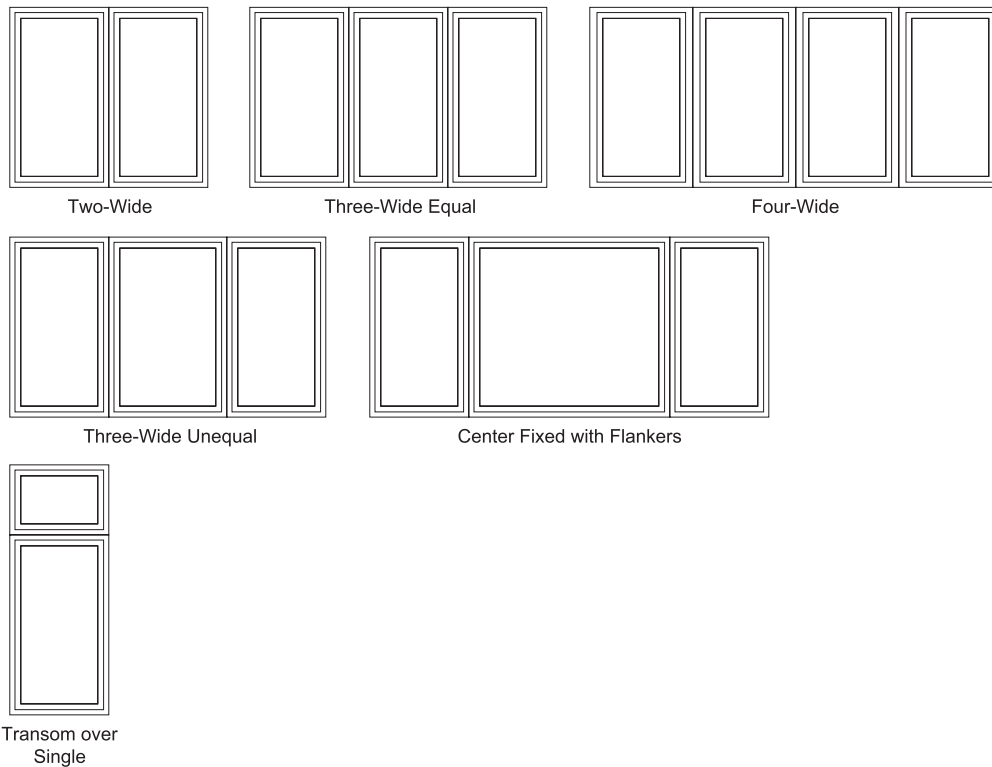
Visit www.energystar.gov for Energy Star guidelines.





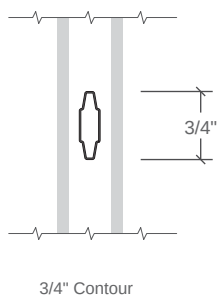
A combination is defined as an assembly formed by two or more separate windows or doors whose frames are mulled together utilizing a combination mullion or reinforcing mullion.

Below are available factory-assembled combinations. See the Combination section for requirements and limitations plus configuration size range information.

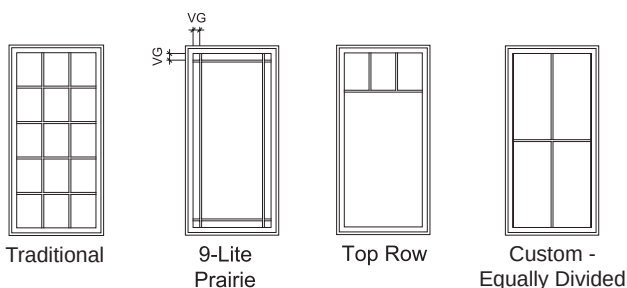


Grille Profiles

Grilles-Between-the-Glass



Grille Patterns



Standard corner lite dimension for Prairie patterns = 4" visible glass (VG).

(1) Standard visible glass to center line of separator bar = 14" or half the total visible glass height, whichever is smaller. Multiple rows are available up to 50% glass size.

Pattern availability may vary depending on size of unit.

VG = Visible Glass

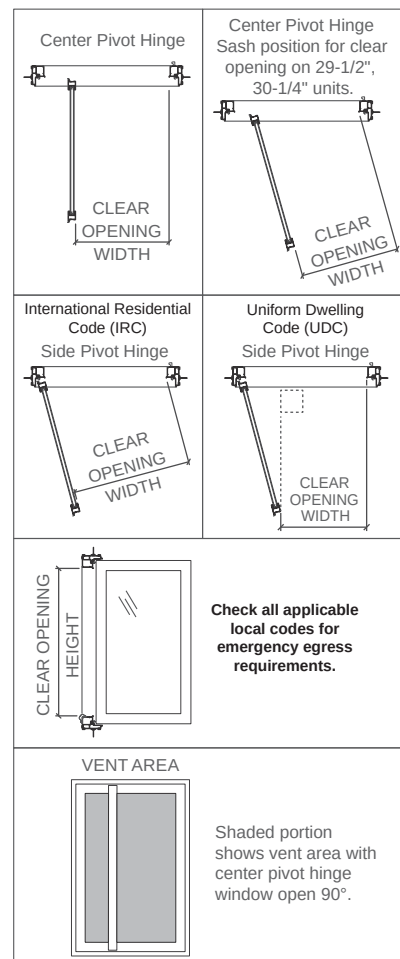
Lite dimensions noted can vary.



Impervia® Casement Windows

Size Tables

Transoms		(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		1' 5 1/2"	1' 11 1/2"	2' 3 1/2"	2' 5 1/2"	2' 7 1/2"	2' 11 1/2"
SPECIAL NARROWER AND WIDER SIZES AVAILABLE							
SPECIAL SIZES AVAILABLE	1' 1 1/2"	1-6/1-2	2-0/1-2	2-4/1-2	2-6/1-2	2-8/1-2	3-0/1-2
	1' 5 1/2"	1-6/1-6	2-0/1-6	2-4/1-6	2-6/1-6	2-8/1-6	3-0/1-6
	1' 11 1/2"	1-6/2-0	2-0/2-0	2-4/2-0	2-6/2-0	2-8/2-0	3-0/2-0
	2' 0"						
Vent and Fixed Units							
SPECIAL SHORTER AND TALLER SIZES AVAILABLE	2' 6"	1-6/2-6	2-0/2-6	2-4/2-6	2-6/2-6	2-8/2-6	3-0/2-6
	2' 11 1/2"	1-6/3-0	2-0/3-0	2-4/3-0	2-6/3-0 E1	2-8/3-0 E1	3-0/3-0 E
	3' 0"	1-6/3-6	2-0/3-6	2-4/3-6 E1	2-6/3-6 E	2-8/3-6 E	3-0/3-6 E
	3' 5 1/2"	1-6/4-0	2-0/4-0	2-4/4-0 E	2-6/4-0 E	2-8/4-0 E	3-0/4-0 E
	3' 11 1/2"	1-6/4-6	2-0/4-6	2-4/4-6 E	2-6/4-6 E	2-8/4-6 E	3-0/4-6 E
	4' 0"	1-6/5-0	2-0/5-0	2-4/5-0 E	2-6/5-0 E	2-8/5-0 E	3-0/5-0 E
	4' 5 1/2"	1-6/5-6	2-0/5-6	2-4/5-6 E	2-6/5-6 E	2-8/5-6 E	3-0/5-6 E
	4' 11 1/2"	1-6/6-0	2-0/6-0	2-4/6-0 E	2-6/6-0 E	3-0/6-0 E	
	5' 0"						
	5' 5 1/2"						
	5' 6"						
	5' 11 1/2"						
	6' 0"						
	6' 6"						
	7' 0"						
	7' 6"						



Center pivot hinge is available with crank operator only. Crank operator with side pivot hinge available in limited sizes. Side pivot hinge does not include wash feature.

Egress shown in size table is for Easy-Slide operator with side pivot hinge. For other product configurations see Design Data tables.

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.

See Design Data pages in this section for clear opening dimensions.

Egress information shown is for International Residential Code (IRC) standards only, see Design Data page for Uniform Dwelling Code (UDC) information.

T = Tempered glass.

Not to scale.

Any vent casement with frame height greater than 70" will have 3mm tempered glass to reduce sash weight.

All units are available as fixed in the Casement section.

Traditional grille patterns shown. See Grilles in the Overview section for additional patterns and profiles.



Transoms

Fixed Units

Not to scale.

Traditional grille patterns shown. See Grilles in the Overview section for additional patterns and profiles.

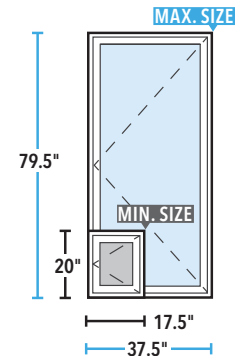


Special Size Frame Dimensions

	Minimum	Maximum
Vent	1' 5-1/2" W x 1' 8" H (17-1/2" x 20") (445 x 508)	3' 1-1/2" W x 6' 7-1/2" H (37-1/2" x 79-1/2") (953 x 2 019)
Fixed	1' 1-1/2" W x 11-1/2" H (13-1/2" x 11-1/2") (343 x 292)	5' 11-1/2" W x 6' 7-1/2" H (71-1/2" x 79-1/2") (1 816 x 2 019)

Available within size range shown.
Keep frame dimensions to the nearest 1/8" increment. Frame width cannot exceed frame height on special size vent units.

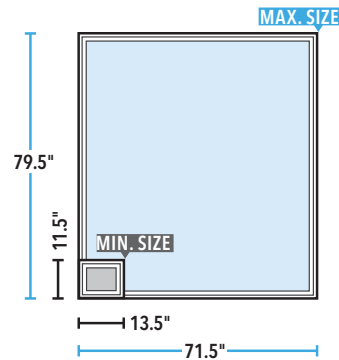
Vent Sizes



Glass Formulas

	Formula
Visible Glass	Width = Frame – 5-7/16" Height = Frame – 5-7/16"
Actual Glass	Width = Frame – 4-3/8" Height = Frame – 4-3/8"

Fixed Sizes



Lock Handle Operator Height

Frame Height	Standard Locked Location (A)	Standard Unlocked Location (B)	Accessibility Locked Location** (A)	Accessibility Unlocked Location** (B)
≥ 20" to ≤ 59.5"	4-5/8"	9-3/8"	2-1/2"	9-7/8"
> 59.5" to < 72.5"	9-5/8"	14-3/8"	7-1/2"	14-7/8"
≥ 72.5" to ≤ 79.5"	30-9/16"	35-5/16"	—	—

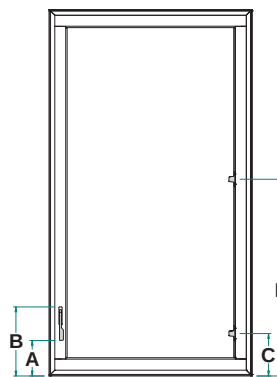
Easy-Slide Operator Height

Frame Height	Closed Location (C)	Open Location (D)*
≥ 20" to < 30.5"	5-1/2"	15-1/2"
≥ 30.5" to < 72.5"	5-1/2"	25-1/2"
≥ 72.5" to ≤ 79.5"	21-1/2"	41-1/2"

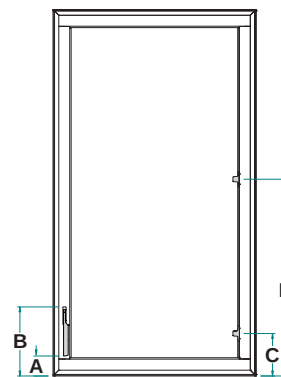
Height is measured from the bottom of the frame, proper installation height is required for ADA compliance. Review Local and Federal requirements for guidance on install height and other considerations to meet ADA compliance.

*Limited Opening Limited Travel and Window Opening Control Device Hardware will reduce the open location by 5"

** Accessibility Lock Lever available factory installed for Frame Width ≤ 35" and Frame Height ≤ 72.5" or Frame Width > 35" but ≤ 36" and Frame Height ≤ 60".



Standard Lock Lever



Accessibility Lock Lever

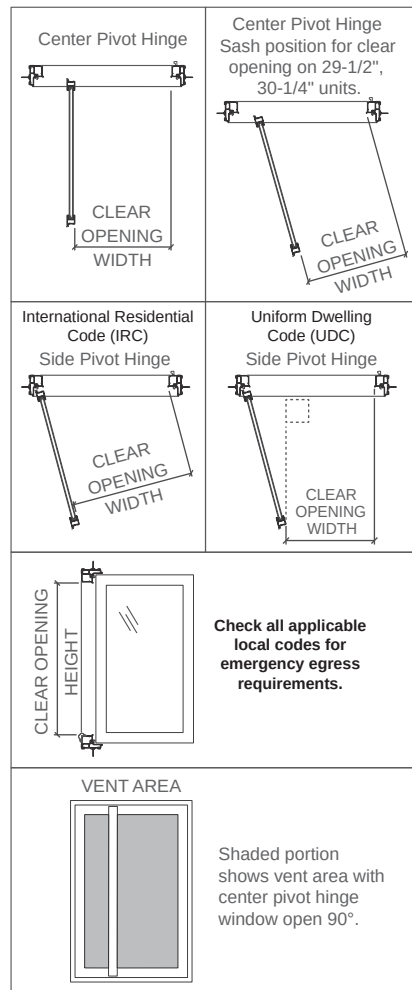
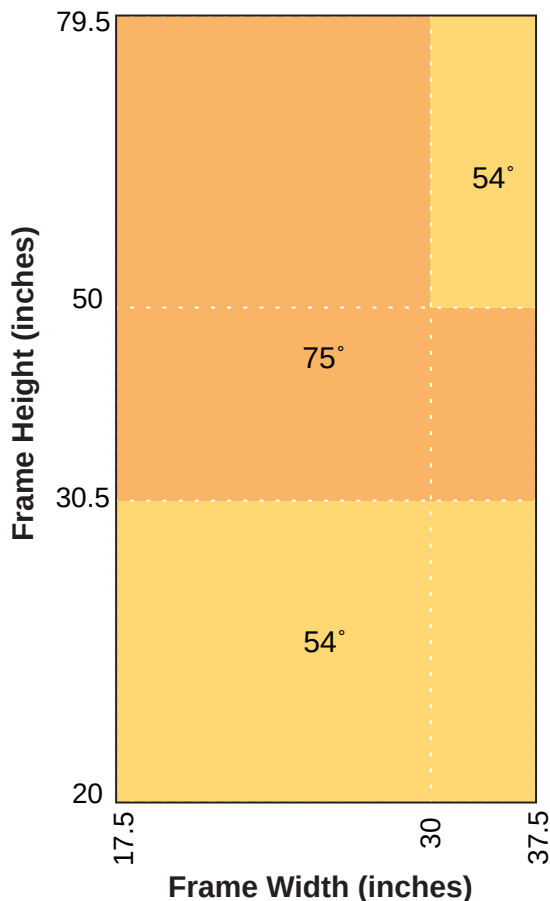


Clear Opening Dimensions

Clear Opening Height				
Frame Height – 4-3/4"				
Clear Opening Width				
Hinge	Code	Frame Width	Formula	Angle
Fold-away crank with wash hinge	IRC	29-1/2" to <30-1/4"	FW – 9-1/2"	75°
Fold-away crank with wash hinge	IRC UDC	30-1/4" to 37-1/2"	FW – 10-1/4"	90°
Fold-away crank with side pivot hinge	IRC	25-1/2" to 32"	FW – 5-1/2"	75°
Easy-Slide operator with side pivot hinge	IRC	25-1/2" to 37-1/2"	FW – 5-1/2"	75° See chart
Easy-Slide operator with side pivot hinge	IRC	30" to 37-1/2"	FW x 0.67	54° See chart
Fold-away crank and Easy-Slide operator with side pivot hinge	UDC	(FW - 4.742) - ((FW - 2.432) × (SIN (90-Angle)))		See chart

Vent Opening Area = ((Clear Opening Width) × (Clear Opening Height)) ÷ 144

Side Pivot Window Angle



Center pivot hinge is available with crank operator only. Crank operator with side pivot hinge available in limited sizes. Side pivot hinge does not include wash feature.

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.



Impact-resistant laminated glass will only be available on Block Frame with a Prep for Screw Through Frame or Installation Clips attachment methods. See FPAS documents or Pella Installation Instructions for required anchor layout and details. All hardware types including Easy-Slide operator are qualified for the sizes and performance shown.

Impact-Resistant Special Size Frame Dimensions

	Minimum	Maximum PVB	Maximum SGP
Vent	1' 5-1/2" W x 1' 8" H (17-1/2" x 20") (445 x 508)	2' 11-1/2" W x 6' 1-1/2" H (35-1/2" x 73-1/2") (902 x 1 867)	NA
Fixed	1' 1-1/2" W x 11-1/2" H (13-1/2" x 11-1/2") (343 x 292)	2' 11-1/2" W x 6' 1-1/2" H (35-1/2" x 73-1/2") (902 x 1 867)	4' 8-1/2" W x 6' 1-1/2" H (56-1/2" x 73-1/2") (1 435 x 1 867)

Available within size range shown.
Keep frame dimensions to the nearest 1/8" increment. Frame width cannot exceed frame height on special size vent units.

Vent - Casement								
Insulated Glass 11/16" PVB			Insulated Glass 1" SGP			Insulated Glass 1" PVB		
Design Pressure	FPAS / TDI	Hallmark Certified	Design Pressure	FPAS / TDI	Hallmark Certified	Design Pressure	FPAS / TDI	Hallmark Certified
+50/-50	FL 35278	411-H-1510	+50/-50	Pending	Pending	+50/-50	FL 35278	411-H-1510
Fixed - Casement								
+50/-50	FL 35284	411-H-1512	+50/-50	FL 35284	411-H-1512	+50/-50	FL 35284	411-H-1512

All vent sizes and glass types are tested for air/water/structural and impact-resistance, and are certified for wind zone 2, large missile rating C (Non-HVHZ).



Impervia® Casement Windows

Design Data

Vent																								
Unit		Easy-Slide operator with side pivot hinge					Fold-Away Crank with Wash Hinge							Fold-Away Crank with Side Pivot Hinge						Visible Glass Ft²	Standard Glass Thickness (mm)		Performance Class & Grade	
		Clear Opening (IRC)				Vent Area Ft²	Egress (IRC)	Egress (UDC)	Clear Opening (IRC)				Vent Area Ft²	Egress (IRC)	Egress (UDC)	Clear Opening (IRC)					Vent Area Ft²			
		Width (Inches)	Max Angle Opening	Height (Inches)	Ft²				Width (Inches)	Max Angle Opening	Height (Inches)	Ft²				Width (Inches)	Max Angle Opening	Height (Inches)	Ft²					
1-6/2-6		11-23/32	54°	24-3/4	2.0	2.0			7-1/4	90°	24-3/4	1.2	1.7			—	—	—	—	—	2.0	3	3	LC+50/-60
1-6/3-0		12	75°	30-3/4	2.6	2.6			7-1/4	90°	30-3/4	1.5	2.1			—	—	—	—	—	2.5	3	3	LC+50/-60
1-6/3-6		12	75°	36-3/4	3.1	3.1			7-1/4	90°	36-3/4	1.9	2.5			—	—	—	—	—	3.0	3	3	LC+50/-60
1-6/4-0		12	75°	42-3/4	3.6	3.6			7-1/4	90°	42-3/4	2.2	2.9			—	—	—	—	—	3.5	3	3	LC+50/-60
1-6/4-6		12	75°	48-3/4	4.1	4.1			7-1/4	90°	48-3/4	2.5	3.3			—	—	—	—	—	4.0	3	3	LC+50/-60
1-6/5-0		12	75°	54-3/4	4.6	4.6			7-1/4	90°	54-3/4	2.8	3.8			—	—	—	—	—	4.5	3	3	LC+50/-60
1-6/5-6		12	75°	60-3/4	5.1	5.1			7-1/4	90°	60-3/4	3.1	4.2			—	—	—	—	—	5.0	3	3	LC50
1-6/6-0 T		12	75°	66-3/4	5.6	5.6			7-1/4	90°	66-3/4	3.4	4.6			—	—	—	—	—	5.5	—	3	LC50
2-0/2-6		15-3/4	54°	24-3/4	2.7	2.7			13-1/4	90°	24-3/4	2.3	2.6			—	—	—	—	—	3.0	3	3	LC+50/-60
2-0/3-0		18	75°	30-3/4	3.8	3.8			13-1/4	90°	30-3/4	2.8	3.3			—	—	—	—	—	3.7	3	3	LC+50/-60
2-0/3-6		18	75°	36-3/4	4.6	4.6			13-1/4	90°	36-3/4	3.4	4.0			—	—	—	—	—	4.5	3	3	LC+50/-60
2-0/4-0		18	75°	42-3/4	5.3	5.3			13-1/4	90°	42-3/4	3.9	4.6			—	—	—	—	—	5.2	3	3	LC+50/-60
2-0/4-6		18	75°	48-3/4	6.1	6.1			13-1/4	90°	48-3/4	4.5	5.3			—	—	—	—	—	6.0	3	3	LC+50/-60
2-0/5-0		18	75°	54-3/4	6.8	6.8			13-1/4	90°	54-3/4	5.0	6.0			—	—	—	—	—	6.7	3	3	LC+50/-60
2-0/5-6		18	75°	60-3/4	7.6	7.6			13-1/4	90°	60-3/4	5.6	6.7			—	—	—	—	—	7.5	3	3	LC50
2-0/6-0		18	75°	66-3/4	8.3	8.3			13-1/4	90°	66-3/4	6.1	7.3			—	—	—	—	—	8.2	3	3	LC50
2-4/2-6		18-7/16	54°	24-3/4	3.2	3.2			17-1/4	90°	24-3/4	3.0	3.3			22	75°	—	3.8	3.8	3.6	3	3	LC+50/-60
2-4/3-0		22	75°	30-3/4	4.7	4.7			17-1/4	90°	30-3/4	3.7	4.1			22	75°	—	4.7	4.7	4.6	3	3	LC+50/-60
2-4/3-6	E1	22	75°	36-3/4	5.6	5.6			17-1/4	90°	36-3/4	4.4	5.0	E3	22	75°	—	5.6	5.6	5.5	3	3	LC+50/-60	
2-4/4-0	E	22	75°	42-3/4	6.5	6.5			17-1/4	90°	42-3/4	5.1	5.8	E2	22	75°	—	6.5	6.5	6.4	3	3	LC+50/-60	
2-4/4-6	E	22	75°	48-3/4	7.4	7.4			17-1/4	90°	48-3/4	5.8	6.6	E2	22	75°	—	7.4	7.4	7.3	3	3	LC+50/-60	
2-4/5-0	E	22	75°	54-3/4	8.4	8.4			17-1/4	90°	54-3/4	6.6	7.5	E2	22	75°	—	8.4	8.4	8.2	3	3	LC+50/-60	
2-4/5-6	E	22	75°	60-3/4	9.3	9.3			17-1/4	90°	60-3/4	7.3	8.3	E2	22	75°	—	9.3	9.3	9.1	3	3	LC50	
2-4/6-0	E	22	75°	66-3/4	10.2	10.2			17-1/4	90°	66-3/4	8.0	9.1	E2	22	75°	—	10.2	10.2	10.1	4	3	LC50	
2-6/2-6		19-3/4	54°	24-3/4	3.4	3.4			20	75°	24-3/4	3.4	3.6			24	75°	—	4.1	4.1	4.0	3	3	LC+50/-60
2-6/3-0	E1	24	75°	30-3/4	5.1	5.1			20	75°	30-3/4	4.3	4.5	E3	24	75°	—	5.1	5.1	5.0	3	3	LC+50/-60	
2-6/3-6	E	24	75°	36-3/4	6.1	6.1	E1	20	75°	36-3/4	5.1	5.5	E2	24	75°	—	6.1	6.1	6.0	3	3	LC+50/-60		
2-6/4-0	E	24	75°	42-3/4	7.1	7.1	E	20	75°	42-3/4	5.9	6.4	E2	24	75°	—	7.1	7.1	7.0	3	3	LC+50/-60		
2-6/4-6	E	24	75°	48-3/4	8.1	8.1	E	20	75°	48-3/4	6.8	7.3	E2	24	75°	—	8.1	8.1	8.0	3	3	LC+50/-60		
2-6/5-0	E	24	75°	54-3/4	9.1	9.1	E	20	75°	54-3/4	7.6	8.2	E2	24	75°	—	9.1	9.1	9.0	3	3	LC+50/-60		
2-6/5-6	E	24	75°	60-3/4	10.1	10.1	E	20	75°	60-3/4	8.4	9.1	E2	24	75°	—	10.1	10.1	10.0	3	3	LC50		
2-6/6-0	E	24	75°	66-3/4	11.1	11.1	E	20	75°	66-3/4	9.3	10.1	E2	24	75°	—	11.1	11.1	11.0	4	3	LC50		
2-8/2-6		21-3/32	54°	24-3/4	3.6	3.6			21-1/4	90°	24-3/4	3.7	3.9			26	75°	—	4.5	4.5	4.3	3	3	LC+50/-60
2-8/3-0	E1	26	75°	30-3/4	5.6	5.6			21-1/4	90°	30-3/4	4.5	4.9	E3	26	75°	—	5.6	5.6	5.4	3	3	LC+50/-60	
2-8/3-6	E	26	75°	36-3/4	6.6	6.6	E1	E1	21-1/4	90°	36-3/4	5.4	5.9	E2	26	75°	—	6.6	6.6	6.5	3	3	LC+50/-60	
2-8/4-0	E	26	75°	42-3/4	7.7	7.7	E	E	21-1/4	90°	42-3/4	6.3	7.0	E2	26	75°	—	7.7	7.7	7.6	3	3	LC+50/-60	
2-8/4-6	E	21-3/32	54°	48-3/4	7.1	7.1	E	E	21-1/4	90°	48-3/4	7.2	8.0	E2	26	75°	—	8.8	8.8	8.6	3	3	LC+50/-60	
2-8/5-0	E	21-3/32	54°	54-3/4	8.0	8.0	E	E	21-1/4	90°	54-3/4	8.1	9.0	E2	26	75°	—	9.9	9.9	9.7	3	3	LC+50/-60	
2-8/5-6	E	21-3/32	54°	60-3/4	8.9	8.9	E	E	21-1/4	90°	60-3/4	9.0	10.0	E2	26	75°	—	11.0	11.0	10.8	3	3	LC50	
2-8/6-0	E	21-3/32	54°	66-3/4	9.8	9.8	E	E	21-1/4	90°	66-3/4	9.9	11.0	E2	26	75°	—	12.1	12.1	11.9	4	3	LC50	
3-0/2-6		23-25/32	54°	24-3/4	4.1	4.1			25-1/4	90°	24-3/4	4.3	4.6			—	—	—	—	—	5.0	3	3	LC+50/-60
3-0/3-0	E	30	75°	30-3/4	6.4	6.4	E1	E1	25-1/4	90°	30-3/4	5.4	5.8			—	—	—	—	—	6.2	3	3	LC+50/-60
3-0/3-6	E	E1	30	75°	36-3/4	7.7	7.7	E	E	25-1/4	90°	36-3/4	6.4	6.9	E1	—	—	—	—	—	7.5	3	3	LC+50/-60
3-0/4-0	E	E	30	75°	42-3/4	8.9	8.9	E	E	25-1/4	90°	42-3/4	7.5	8.1	E	—	—	—	—	—	8.7	3	3	LC+50/-60
3-0/4-6	E	23-25/32	54°	48-3/4	8.1	8.1	E	E	25-1/4	90°	48-3/4	8.5	9.3			—	—	—	—	—	10.0	3	3	LC+50/-60
3-0/5-0	E	23-25/32	54°	54-3/4	9.0	9.0	E	E	25-1/4	90°	54-3/4	9.6	10.4			—	—	—	—	—	11.2	3	3	LC+50/-60
3-0/5-6	E	23-25/32	54°	60-3/4	10.0	10.0	E	E	25-1/4	90°	60-3/4	10.7	11.6			—	—	—	—	—	12.5	3	3	LC50
3-0/6-0	E	23-25/32	54°	66-3/4	11.0	11.0	E	E	25-1/4	90°	66-3/4	11.7	12.8			—	—	—	—	—	13.7	4	3	LC50

(1) Maximum performance when glazed with the appropriate glass thickness. Second value, where shown, requires tempered glass.

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



Impervia® Casement Windows

Design Data

Transom Units

Unit	Visible Glass Ft ²	Standard Glass Thickness (mm)		Performance Class & Grade ⁽¹⁾
		Annealed	Tempered	
1-6/1-2	0.6	3	3	LC+50/-60
1-6/1-6	1.0	3	3	LC+50/-60
1-6/2-0	1.5	3	3	LC+50/-60
2-0/1-2	1.0	3	3	LC+50/-60
2-0/1-6	1.5	3	3	LC+50/-60
2-0/2-0	2.2	3	3	LC+50/-60
2-4/1-2	1.2	3	3	LC+50/-60
2-4/1-6	1.8	3	3	LC+50/-60
2-4/2-0	2.7	3	3	LC+50/-60
2-6/1-2	1.3	3	3	LC+50/-60
2-6/1-6	2.0	3	3	LC+50/-60
2-6/2-0	3.0	3	3	LC+50/-60
2-8/1-2	1.4	3	3	LC+50/-60
2-8/1-6	2.1	3	3	LC+50/-60
2-8/2-0	3.2	3	3	LC+50/-60
3-0/1-2	1.6	3	3	LC+50/-60
3-0/1-6	2.5	3	3	LC+50/-60
3-0/2-0	3.7	3	3	LC+50/-60
4-0/1-2	2.3	3	3	LC+50/-60
4-0/1-6	3.5	3	3	LC+50/-60
4-0/2-0	5.2	3	3	LC+50/-60
5-0/1-2 T	3.0	—	3	LC+50/-60
5-0/1-6	4.5	3	3	LC+50/-60
5-0/2-0	6.7	3	3	LC+50/-60
6-0/1-2 T	3.6	—	3	LC45
6-0/1-6 T	5.5	—	3	LC45
6-0/2-0	8.2	3	3	LC45

Fixed Units

Unit	Visible Glass Ft ²	Standard Glass Thickness (mm)		Performance Class & Grade ⁽¹⁾
		Annealed	Tempered	
3-0/3-0	6.2	3	3	LC+50/-60
3-0/3-6	7.5	3	3	LC+50/-60
3-0/4-0	8.7	3	3	LC+50/-60
3-0/4-6	10.0	3	3	LC+50/-60
3-0/5-0	11.2	3	3	LC+50/-60
3-0/5-6	12.5	3	3	LC50
3-0/6-0	13.7	3	3	LC45/LC50
4-0/3-0	8.7	3	3	LC+50/-60
4-0/3-6	10.5	3	3	LC+50/-60
4-0/4-0	12.2	3	3	LC+50/-60
4-0/4-6	14.0	3	3	LC50/LC-60
4-0/5-0	15.7	3	3	LC45/LC50/LC-60
4-0/5-6	17.5	4	4	LC50
4-0/6-0	19.2	4	4	LC50
5-0/3-0	11.2	3	3	LC+50/-60
5-0/3-6	13.5	3	3	LC50/LC-60
5-0/4-0	15.7	3	3	LC45/LC50/LC-60
5-0/4-6	18.0	4	4	LC+50/-60
5-0/5-0	20.2	4	5	LC50/LC-60
5-0/5-6	22.5	4	5	LC50
5-0/6-0	24.7	5	5	LC50
6-0/3-0	13.7	3	3	LC45
6-0/3-6	16.5	3	3	LC45
6-0/4-0	19.2	4	4	LC45
6-0/4-6	22.0	4	4	LC45
6-0/5-0	24.7	4	5	LC45
6-0/5-6	27.5	5	5	LC45
6-0/6-0	30.2	5	6	LC45

(1) Maximum performance when glazed with the appropriate glass thickness. Second value, where shown, requires tempered glass.

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



Detailed Product Description

Frame

- Frame is Duracast—five-layer pultruded fiberglass material [with optional foam insulation⁽¹⁾] reinforced with a Pella patented interlocking mat.
- Overall frame depth is 3-1/4".
- Nominal wall thickness of Duracast® fiberglass composite members is .050" to .090" thick.
- Frame corners are mitered, joined and bonded with corner lock and injected with sealant.
- Jambs contain factory-drilled installation screw holes on block frame.
- Optional factory-applied jamb extensions available in 4-9/16" and 6-9/16".

Sash

- Sash is Duracast fiberglass composite — five-layer pultruded fiberglass material, reinforced with a Pella patented interlocking mat.
- All sash members have mitered corners bonded with corner lock and sealed with injected sealant.

Exterior / Interior

- Frame Interior cover made from a proprietary blend of mineral filled polyvinyl chloride (PVC) with an acrylic cap that matches the interior color of the product.
- Duracast fiberglass composite surfaces with powder-coat paint finish.
 - Color is [White] [Brown] [Black] [Tan] [Morning Sky Gray].
 - or –
 - Dual-color option [Brown] [Black] [Tan] [Morning Sky Gray] exterior with White interior⁽²⁾.

Glazing System

- Quality float glass complying with ASTM C 1036.
- 11/16" insulating glass [[annealed] [tempered]] [obscure⁽³⁾] [clear] [Advanced] [SunDefense™] [SunDefense+] [AdvancedComfort] [NaturalSun] [NaturalSun+] Low-E coated, with argon]] sealed and bonded to sash.
- or –
- 1" Triple-pane insulating glass [annealed] [tempered] [obscure⁽³⁾] [clear] [[Advanced] [SunDefense™] [AdvancedComfort] [NaturalSun] Low-E coated, [with argon]]] [[bronze] [gray] [green] Advanced Low-E [with Argon]] sealed and bonded to sash.
- High altitude glazing available.
- or –

Impact-Resistant

- Silicone-glazed 1" dual-seal impact-resistant insulating glass [SGP] [PVB]. [[tempered] [annealed]] exterior light is [[Advanced Low-E] [SunDefense] [clear] [bronze]]. Laminated clear interior light.
- or –
- Silicone-glazed 11/16" dual-seal impact-resistant insulating glass PVB. [[tempered] [annealed]] exterior light is [[Advanced Low-E] [SunDefense] [clear]]. Laminated [clear] interior light, or [[tempered] [annealed]] exterior light is [multi-layer Low-E]. Laminated [bronze] interior light.

Dual Weatherstripping

- Continuous, flexible ThermoPlastic Vulcanizate material in dual durometer design, compressed between frame and sash for positive seal on all four sides.
- Secondary ThermoPlastic Vulcanizate leaf-type weatherstrip between edge of sash and frame.

Foam Insulation Inserts⁽¹⁾

Hardware

- Easy-Slide operator assembly
 - Hardened, nickel-coated Steel worm and wheel gears.
 - Zinc-magnesium alloy hob and gearbox with corrosion-protecting ultra-clear finish.
 - 5 ball bearings.
 - Stainless steel swing arm and hinge pin for extra corrosion protection of exposed components.
 - Kevlar-reinforced drive belt.
 - Harsh environment approved – ASTM B 117 salt chamber and debris cycling, 20,000 life cycle test approved.
- Optional Easy-Slide operator with Accessibility Lock Lever assembly.
 - 6" elongated lock lever.
 - 5lb operational forces available on sizes when FW is ≤ 35" and FH is ≤ 72.5" or FW > 35" but ≤ 36" and FH ≤ 60".
 - or –
- Roto operator assembly
 - Steel worm gear sash operator with hardened gears.
 - Operator base is zinc die cast with painted finish.
 - Operator linkage, hinge slide, and hinge arms are 300 series stainless steel.
 - Exposed fasteners are stainless steel.
 - Hardware shall exceed 1,000 hours salt spray exposure per ASTM B 117.
- Finish of integrated folding crank is [baked enamel [White] [Brown] [Tan] [Matte Black] [Morning Sky Gray]] [Satin Nickel (Roto operator only)]. All vent units are available with left- or right-hand hinging.
- Unison Locking System—A single handle locking system operates positive-acting arms that reach out and pull the sash into a locked position: one installed on units 27-1/2" and smaller frame height, two unison operating locks installed on units over 27-1/2" frame height, three unison operating locks over 72-1/2".
- Lock handle finish is [baked enamel [White] [Brown] [Matte Black] [Tan] [Morning Sky Gray]] [Satin Nickel (Roto operator only)].

Optional Products

Screens

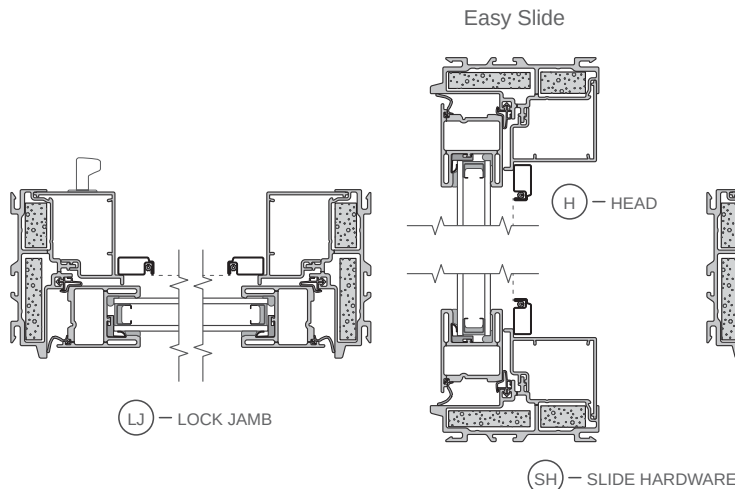
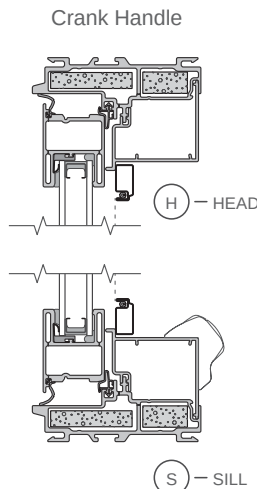
- InView™ screens
 - Vinyl-coated 18/18 mesh fiberglass screen cloth complying with SMA 1201, set in aluminum frame fitted to inside of window, supplied complete with all necessary hardware.
 - Screen frame finish is baked enamel, color to match interior.

Grilles

- Grilles-Between-the-Glass
 - Insulating glass contains 3/4" contoured aluminum grilles permanently installed between two panes of glass.
 - Grilles are factory prefinished [White] [Brown] [Black] [Tan] [Morning Sky Gray] to match interior and exterior finish

Hardware

- Optional factory applied 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 inserts are not available with clear glazing. (2) Dual-color finish is not available on products with integral nailing fin.

(3) Obscure glazing is not available when AdvancedComfort Low-E coated IG is specified.

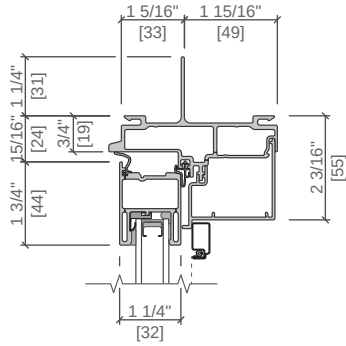


Impervia® Casement Windows

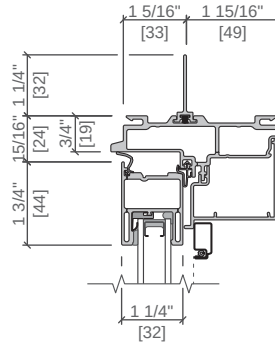
Unit Sections - Frame and Glazing Types Overview

NEW CONSTRUCTION FRAME

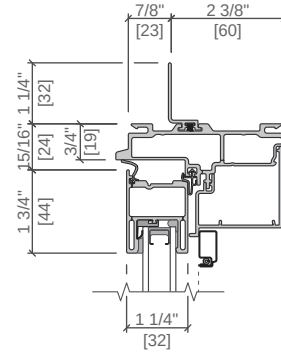
Integral Nailing Fin



Standard Block Frame with Standard Fin

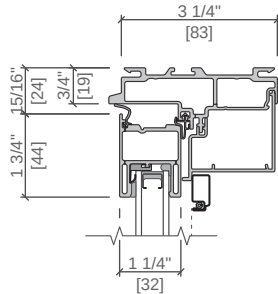


Standard Block Frame with Off Set Fin



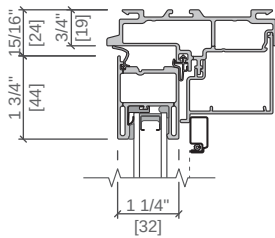
REPLACEMENT FRAME

Standard Block Frame

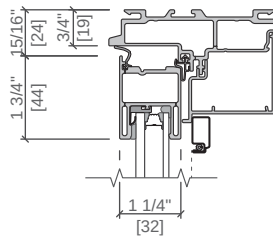


GLAZING OPTIONS

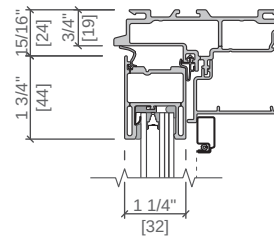
11/16" Dual IG



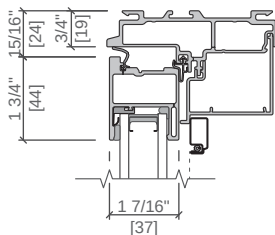
11/16" Sound IG



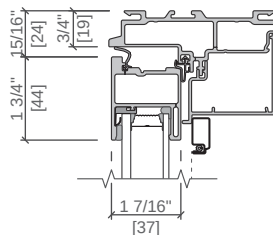
11/16" Laminated IG



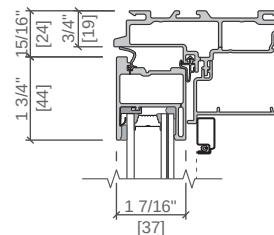
1" Dual IG



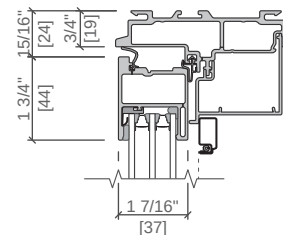
1" Sound IG



1" Laminated IG



1" Triple IG



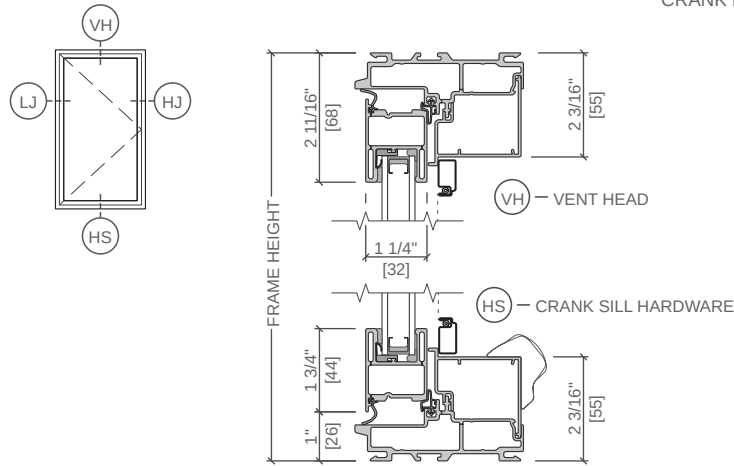
Scale 3" = 1' 0"

All dimensions are approximate.

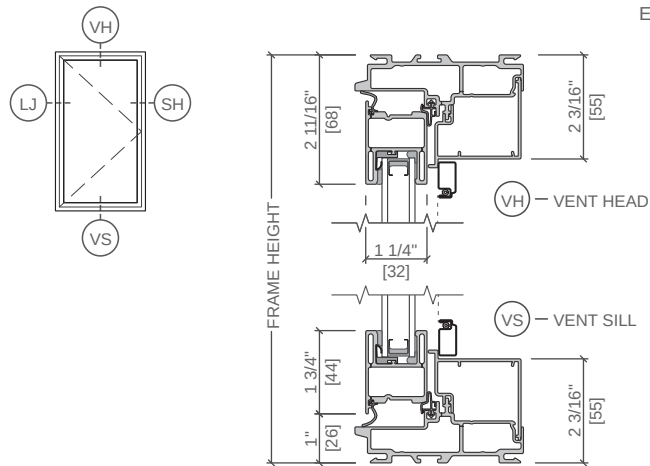
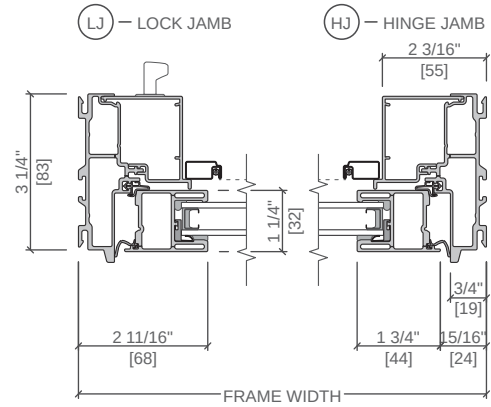


Impervia® Casement Windows

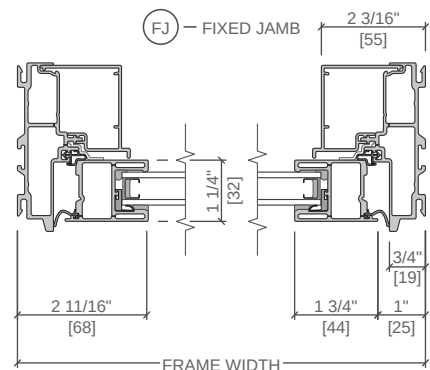
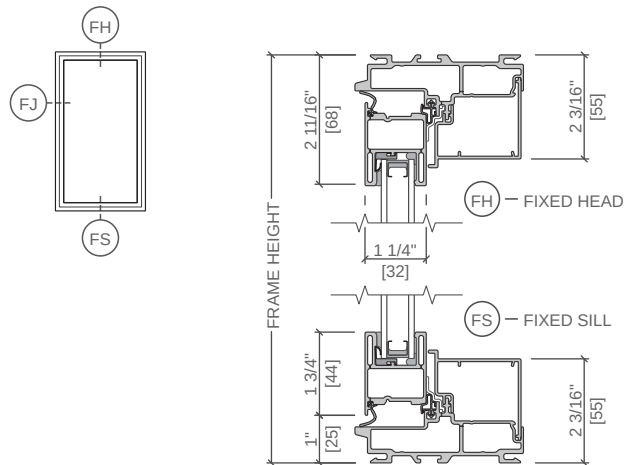
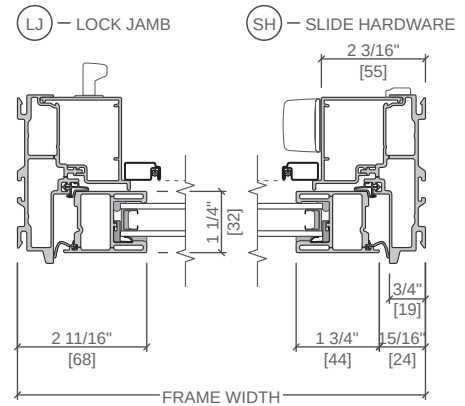
Unit Sections - Block Frame, Dual-Pane 11/16" Glazing



CRANK HARDWARE



EASY SLIDE HARDWARE



Scale 3" = 1' 0"

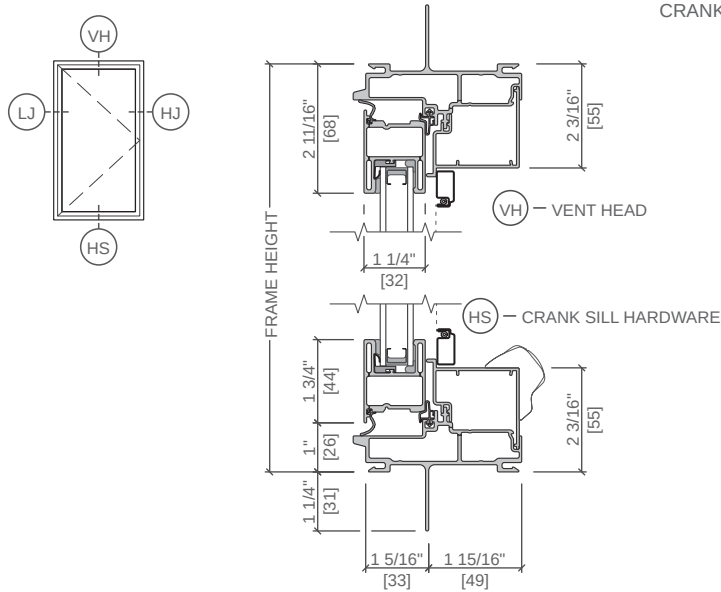
All dimensions are approximate.

See the Installation and Performance section on Pella.com for mullion applications and structural limitations.

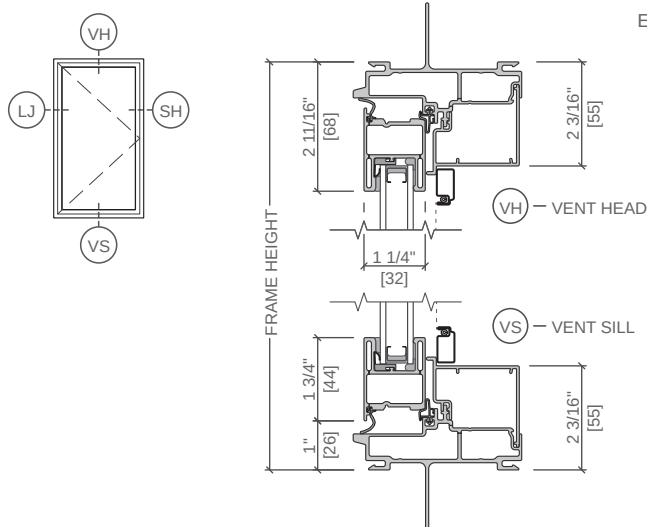
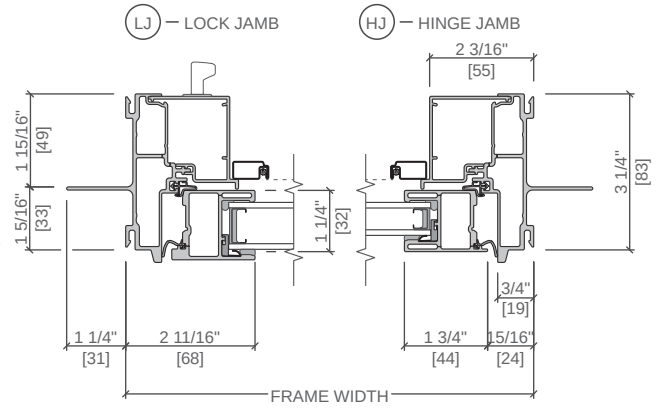


Impervia® Casement Windows

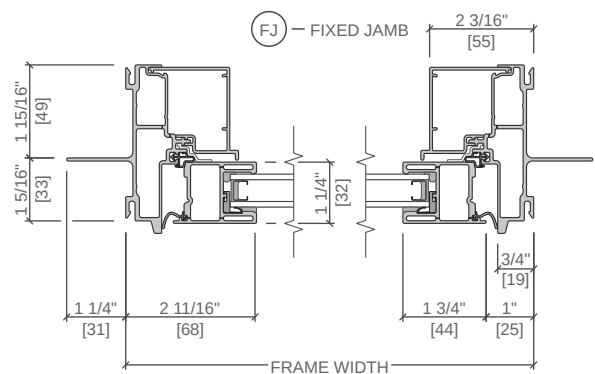
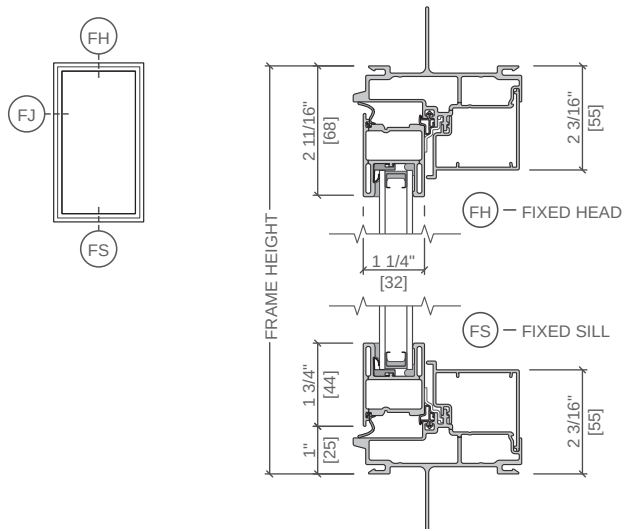
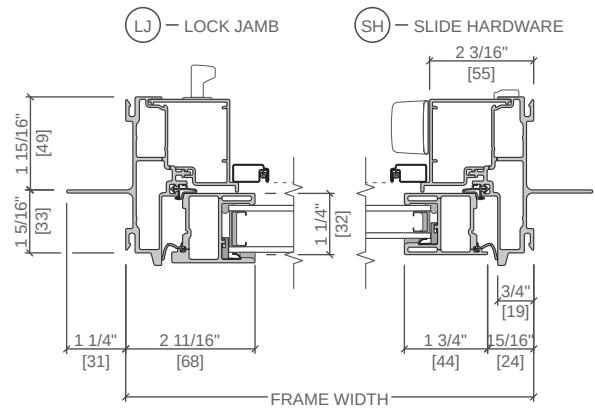
Unit Sections - Integral Fin, Dual-Pane 11/16" Glazing



CRANK HARDWARE



EASY SLIDE HARDWARE

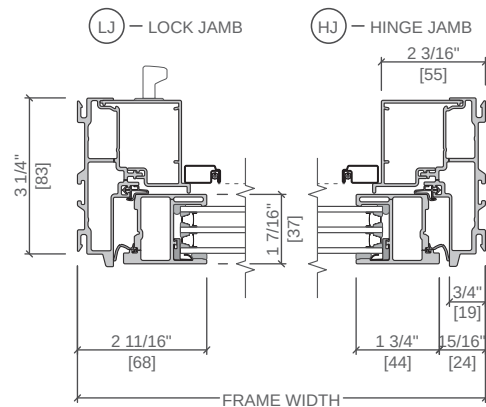
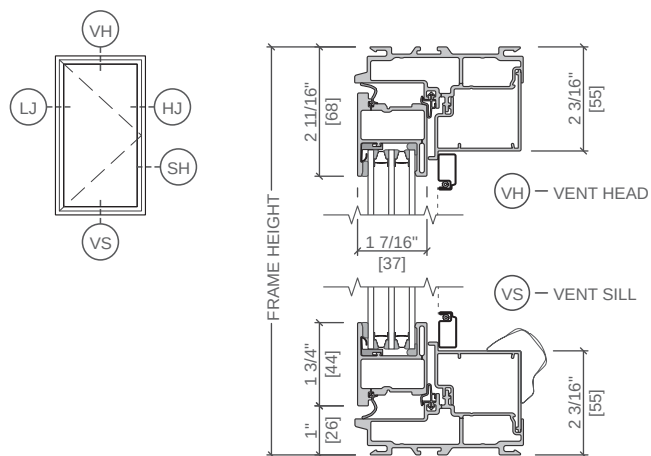


Scale 3" = 1' 0"

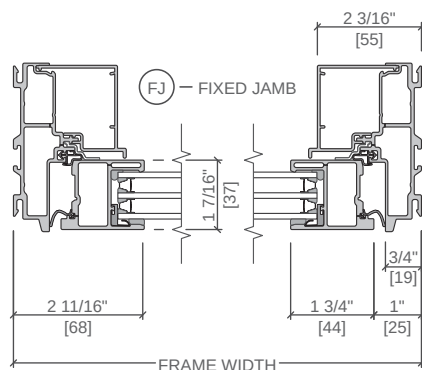
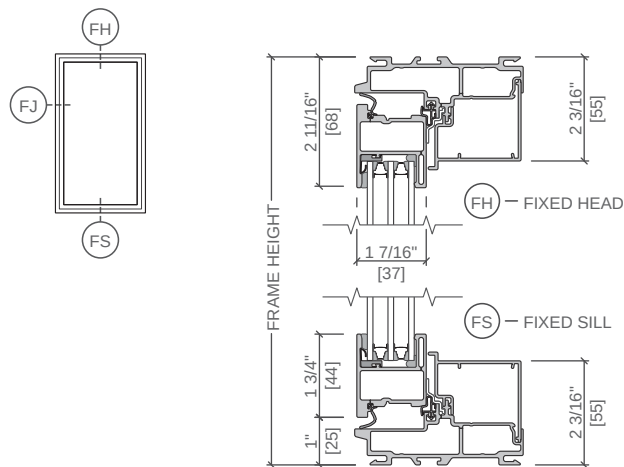
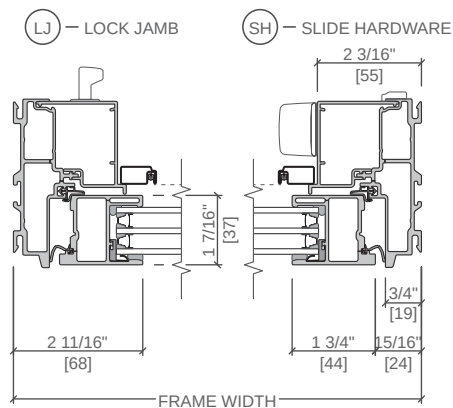
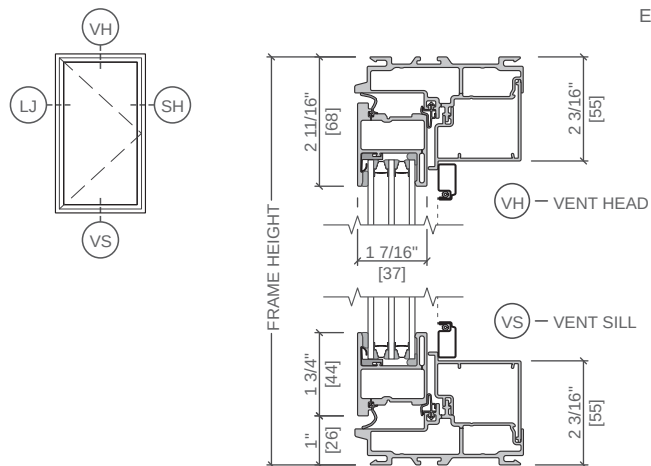
All dimensions are approximate.

Unit Sections - Block Frame, Triple-Pane 1" Glazing

CRANK HARDWARE



EASY SLIDE HARDWARE



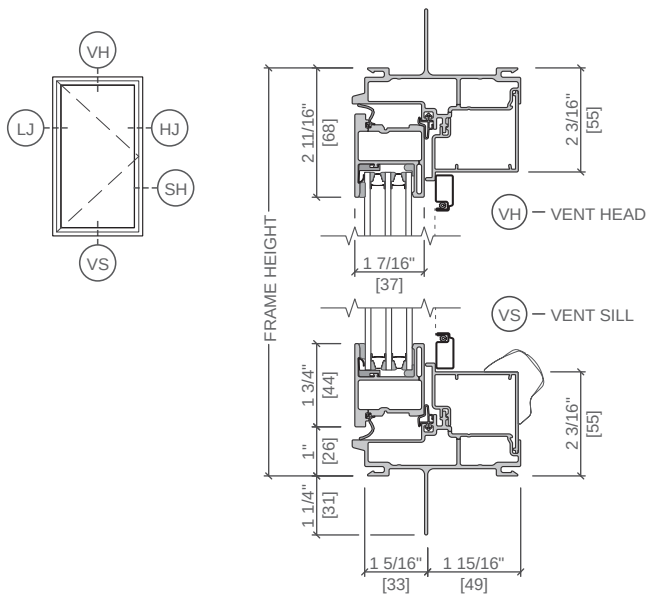
Scale 3" = 1' 0"

All dimensions are approximate.

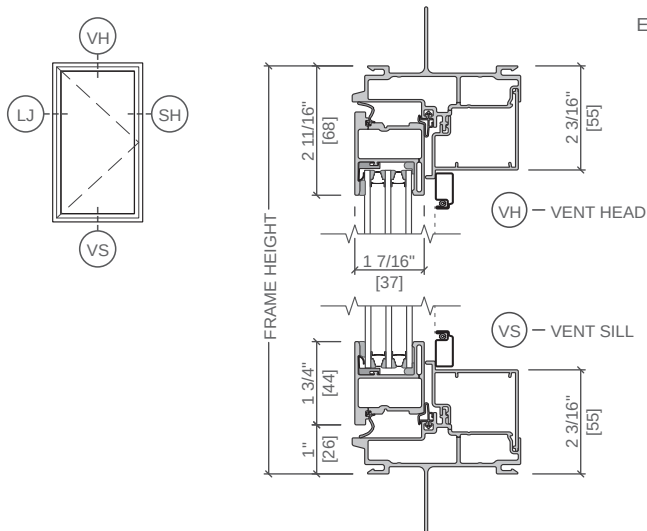
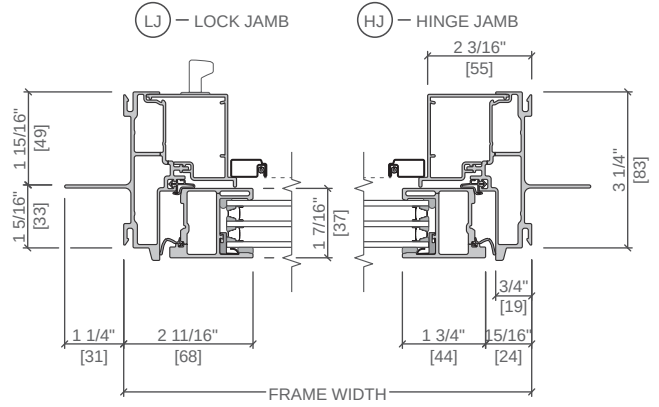


Impervia® Casement Windows

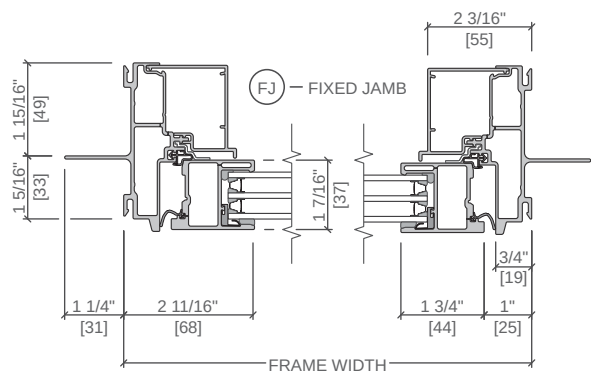
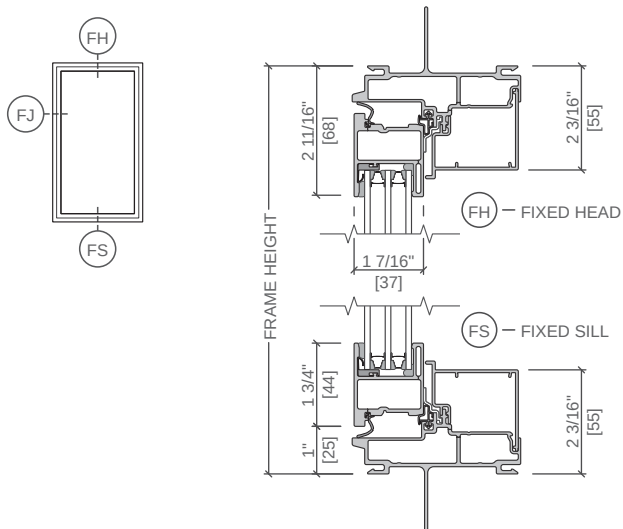
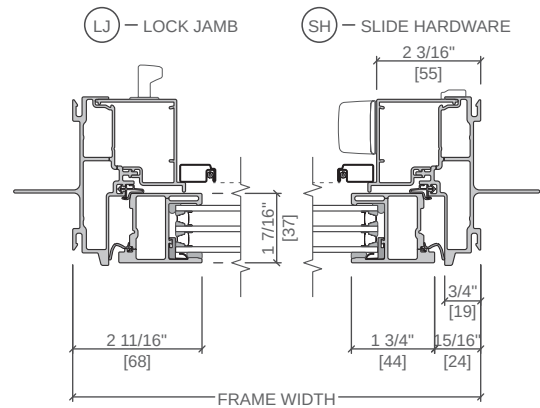
Unit Sections - Integral Fin, Triple-Pane 1" Glazing



CRANK HARDWARE



EASY SLIDE HARDWARE



Scale 3" = 1' 0"

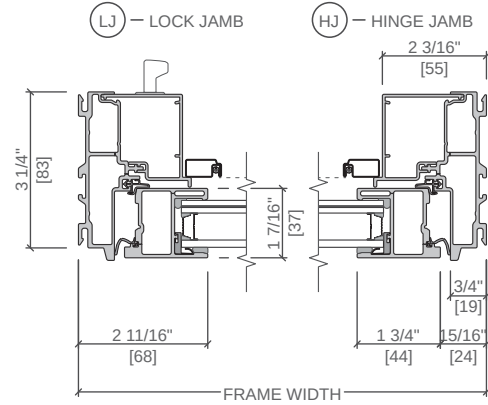
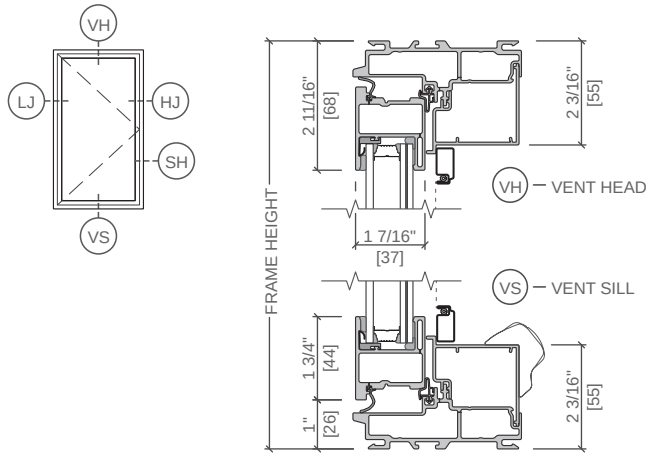
All dimensions are approximate.



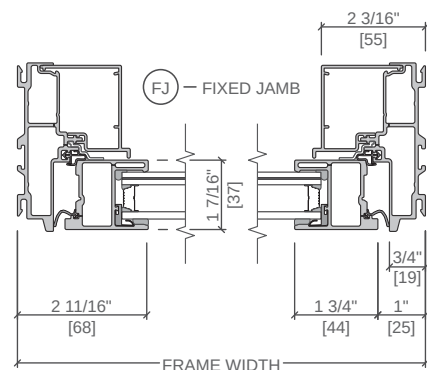
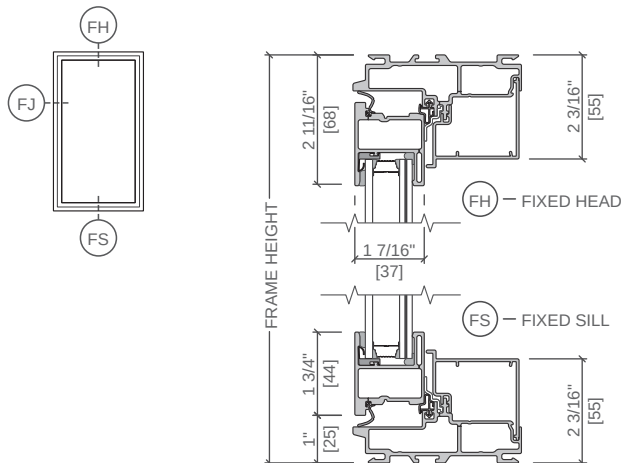
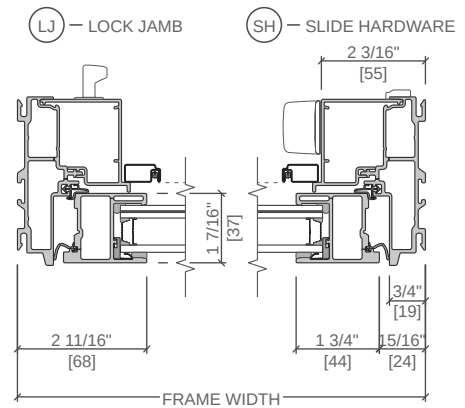
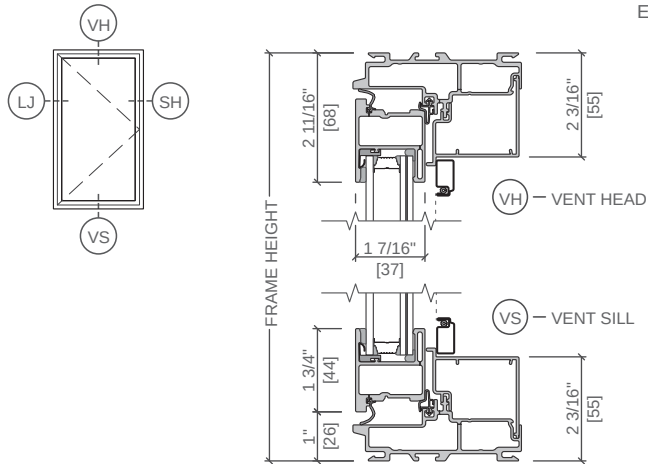
Impervia® Casement Windows

Unit Sections - Block Frame, Dual-Pane 1" Impact-Resistant Laminated Glass

CRANK HARDWARE



EASY SLIDE HARDWARE



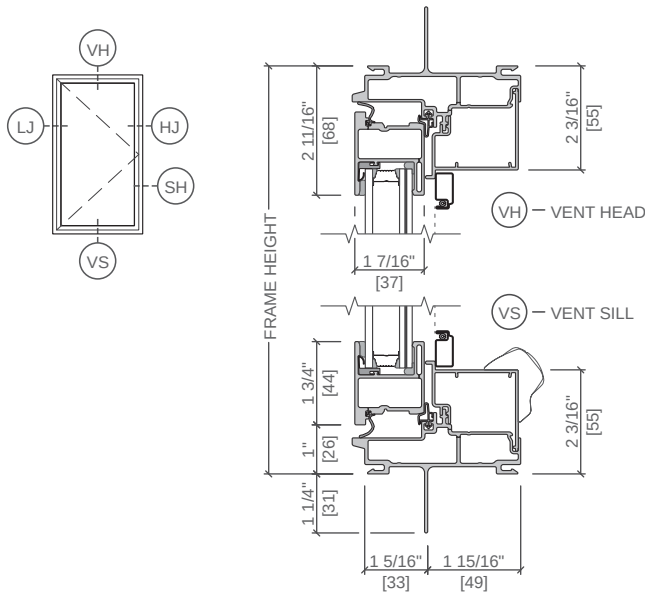
Scale 3" = 1' 0"

All dimensions are approximate.

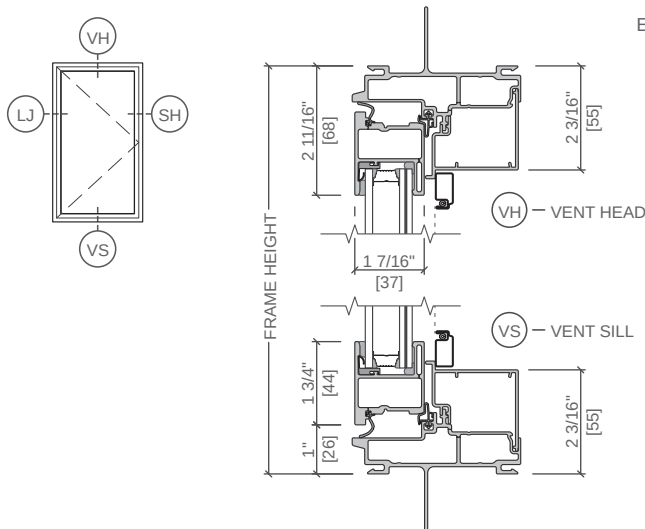
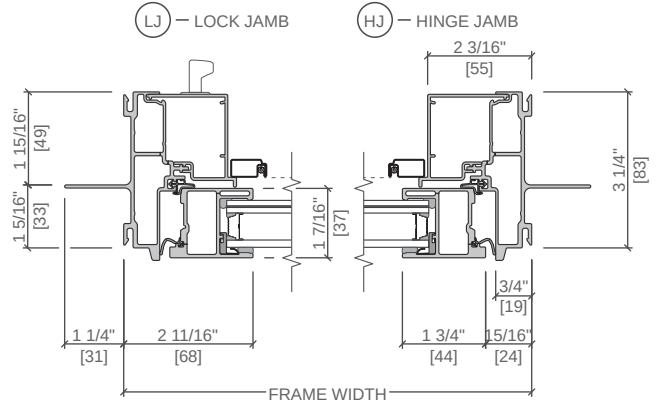


Impervia® Casement Windows

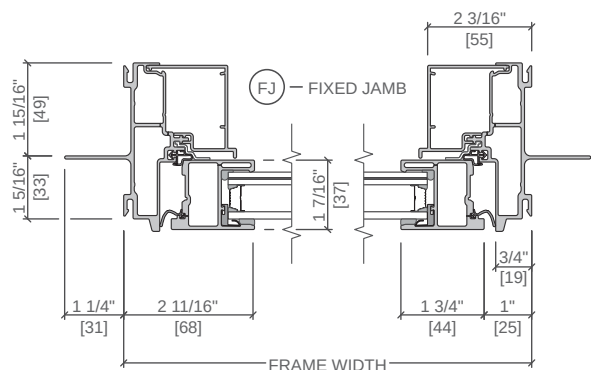
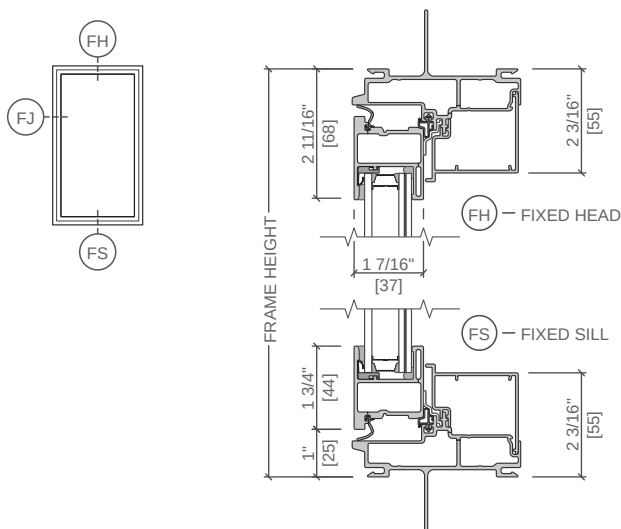
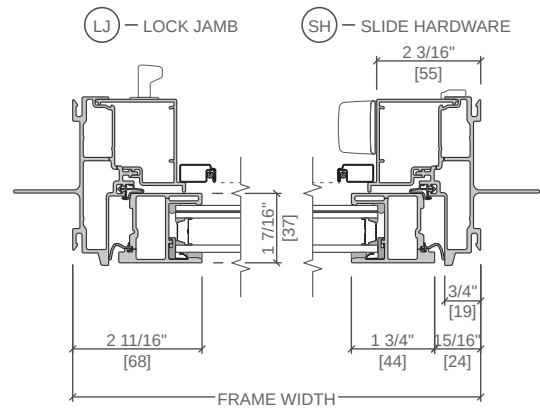
Unit Sections - Integral Fin, Dual-Pane Laminated 1" (Sound Performance) Glass



CRANK HARDWARE



EASY SLIDE HARDWARE



Scale 3" = 1' 0"

All dimensions are approximate.