



Calculation based on ISO 15099

Product name: <b>Universal Inswing Hopper Window</b>				Center-of-glass properties		
ASHRAE/IECC /DOE North American Climate Zone	North, East, South- facing West - facing			Cardinal E180/ Arg/ Clear/ Arg/ E180 (6mm) 44,0mm No Grids		
Climate specific recommendations:		Whole-window installed U-value		Ucog-Value		
		W/m2K	BTU/hr.ft2.F	SHGC	W/m2K	BTU/hr.ft2.F
8		0.95	0.17	0.514	0.743	0.131
7		0.94	0.16	0.514	0.730	0.129
6		0.93	0.16	0.514	0.723	0.127
5		0.93	0.16	0.514	0.723	0.127
4		0.93	0.16	0.514	0.724	0.127
Marine North	✓	0.93	0.16	0.514	0.725	0.128
Marine South		0.94	0.16	0.514	0.729	0.128
3		0.93	0.16	0.514	0.726	0.128
2 West		0.94	0.17	0.514	0.736	0.130
2 East		0.94	0.17	0.514	0.736	0.130
Universal Inswing Hopper Window Cardinal Endur		FRAME		Psi-spacer		Psi-opaque
		Frame height		U-frame		W/mK  BTU/hr.ft.F  0.078 Grade B
		mm	in	W/m2K	BTU/hr.ft2.F	
Head		105	4.12	1.03	0.18	0.017
Sill		105	4.12	1.03	0.18	0.017
left jamb		105	4.12	1.04	0.18	0.016
right jamb		105	4.12	1.04	0.18	0.016


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Product name: <b>Universal Inswing Hopper Window</b>				Center-of-glass properties		
ASHRAE/IECC /DOE North American Climate Zone	North, East, South- facing West - facing			Cardinal E180/ Arg/ Clear/ Arg/ E180 (6mm) 44,0mm SDL/no Internal grids < 25.4mm		
Climate specific recommendations:		Whole-window installed U-value		Ucog-Value		
		W/m2K	BTU/hr.ft2.F	SHGC	W/m2K	BTU/hr.ft2.F
8		0.95	0.17	0.447	0.743	0.131
7		0.94	0.16	0.447	0.730	0.129
6		0.93	0.16	0.447	0.723	0.127
5		0.93	0.16	0.447	0.723	0.127
4		0.93	0.16	0.447	0.724	0.127
Marine North		0.93	0.16	0.447	0.725	0.128
Marine South	✓	0.94	0.16	0.447	0.729	0.128
3	✓	0.93	0.16	0.447	0.726	0.128
2 West		0.94	0.17	0.447	0.736	0.130
2 East		0.94	0.17	0.447	0.736	0.130
Universal Inswing Hopper Window Cardinal Endur		FRAME		Psi-spacer		Psi-opaque
		Frame height		U-frame		W/mK  BTU/hr.ft.F  0.078 Grade B
		mm	in	W/m2K	BTU/hr.ft2.F	
Head		105	4.12	1.03	0.18	0.017
Sill		105	4.12	1.03	0.18	0.017
left jamb		105	4.12	1.04	0.18	0.016
right jamb		105	4.12	1.04	0.18	0.016


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Product name: <b>Universal Inswing Hopper Window</b>				Center-of-glass properties		
ASHRAE/IECC /DOE North American Climate Zone	North, East, West - facing	South- facing				Cardinal E180/ Arg/ Clear/ Arg/ E180 (6mm) 44,0mm Internal grids And SDL with Internal grids < 25.4mm maintain 3mm clearance
Climate specific recommendations:			Whole-window installed U-value		Ucog-Value	
			W/m2K	BTU/hr.ft2.F	SHGC	BTU/hr.ft2.F
8			0.95	0.17	0.447	0.131
7			0.94	0.16	0.447	0.129
6			0.93	0.16	0.447	0.127
5			0.93	0.16	0.447	0.127
4			0.93	0.16	0.447	0.127
Marine North			0.93	0.16	0.447	0.128
Marine South	✓		0.94	0.16	0.447	0.128
3	✓		0.93	0.16	0.447	0.128
2 West			0.94	0.17	0.447	0.130
2 East			0.94	0.17	0.447	0.130
Universal Inswing Hopper Wi Cardinal Endur		FRAME			Psi-spacer	
		Frame height		U-frame		Psi
		mm	in	W/m2K	BTU/hr.ft2.F	
Head		105	4.12	1.03	0.18	0.017
Sill		105	4.12	1.03	0.18	0.017
left jamb		105	4.12	1.04	0.18	0.016
right jamb		105	4.12	1.04	0.18	0.016
						W/mK
						0.135
						BTU/hr.ft.F
						0.078
						Grade B


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ASHRAE/IECC /DOE North American Climate Zone	North, East, West - facing	South- facing			
			Cardinal E180/ Arg/ Clear/ Arg/ E180 (6mm) 44,0mm Internal grids And SDL with Internal grids < 25.4mm		
			Whole-window installed U-value		Ucog-Value
Climate specific recommendations:			W/m2K	BTU/hr.ft2.F	SHGC
					W/m2K
					BTU/hr.ft2.F
8			1.00	0.18	0.447
7			0.99	0.17	0.447
6			0.99	0.17	0.447
5			0.99	0.17	0.447
4			0.99	0.17	0.447
Marine North			0.99	0.17	0.447
Marine South	✓		0.99	0.17	0.447
3	✓		0.99	0.17	0.447
2 West			1.00	0.18	0.447
2 East			1.00	0.18	0.447
Universal Inswing Hopper Window			FRAME		Psi-spacer
Cardinal Endur			Psi-opaque		
			Frame height		U-frame
			mm in		W/m2K BTU/hr.ft2.F
					Ψ
					W/mK
					BTU/hr.ft.F
					W/mK
Head			105	4.12	1.03
Sill			105	4.12	1.03
left jamb			105	4.12	1.04
right jamb			105	4.12	1.04
					0.017
					0.010
					0.016
					0.009
					0.016
					0.009
					Grade B


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Product name: Universal Inswing Hopper Window				Center-of-glass properties				
ASHRAE/IECC /DOE North American Climate Zone	South-facing	North, East, West - facing	<div> Passive House Institute US</div>			Cardinal E180/ Arg/ Clear/ Arg/ E180 (6mm) 44,0mm    SDL/no Internal grids >= 25.4mm		
Climate specific recommendations:			Whole-window installed U-value		Ucog-Value			
			W/m2K	BTU/hr.ft2.F	SHGC	W/m2K	BTU/hr.ft2.F	
8			0.95	0.17	0.385	0.743	0.131	
7			0.94	0.16	0.385	0.730	0.129	
6			0.93	0.16	0.385	0.723	0.127	
5			0.93	0.16	0.385	0.723	0.127	
4			0.93	0.16	0.385	0.724	0.127	
Marine North		✓	0.93	0.16	0.385	0.725	0.128	
Marine South	✓		0.94	0.16	0.385	0.729	0.128	
3	✓		0.93	0.16	0.385	0.726	0.128	
2 West			0.94	0.17	0.385	0.736	0.130	
2 East			0.94	0.17	0.385	0.736	0.130	
Universal Inswing Hopper Window		FRAME			Psi-spacer		Psi-opaque	
Cardinal Endur		Frame height		U-frame		Ψ		W/mK
		mm	in	W/m2K	BTU/hr.ft2.F	W/mK	BTU/hr.ft.F	
Head		105	4.12	1.03	0.18	0.017	0.010	0.135
Sill		105	4.12	1.03	0.18	0.017	0.010	BTU/hr.ft.F
left jamb		105	4.12	1.04	0.18	0.016	0.009	0.078
right jamb		105	4.12	1.04	0.18	0.016	0.009	Grade B


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			W/m2K	BTU/hr.ft2.F	SHGC	W/m2K	BTU/hr.ft2.F	
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Universal Inswing Hopper Window Cardinal Endur		FRAME				Psi-spacer		Psi-opaque
		Frame height		U-frame		Ψ		W/mK
		mm	in	W/m2K	BTU/hr.ft2.F	W/mK	BTU/hr.ft.F	
Head		105	4.12	1.03	0.18	0.017	0.010	0.135
Sill		105	4.12	1.03	0.18	0.017	0.010	BTU/hr.ft.F
left jamb		105	4.12	1.04	0.18	0.016	0.009	0.078
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2 West		1.00	0.18	0.385	0.736	0.130
2 East		1.00	0.18	0.385	0.736	0.130
Universal Inswing Hopper Wi		FRAME		Psi-spacer		Psi-opaque
Cardinal Endur		Frame height		Ψ		W/mK
		mm	in	W/m2K	BTU/hr.ft2.F	
Head		105	4.12	1.03	0.18	0.017
Sill		105	4.12	1.03	0.18	0.010
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