



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 E366/ 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		0.92	0.16	0.239	0.710	0.125
7		0.91	0.16	0.239	0.693	0.122
6		0.90	0.16	0.239	0.681	0.120
5		0.90	0.16	0.239	0.680	0.120
4		0.90	0.16	0.239	0.679	0.120
Marine North		0.90	0.16	0.239	0.679	0.120
Marine South	✓	0.90	0.16	0.239	0.681	0.120
3	✓	0.90	0.16	0.239	0.680	0.120
2 West	✓	0.90	0.16	0.239	0.686	0.121
2 East	✓	0.90	0.16	0.239	0.686	0.121
Universal Inswing Hopper Window Cardinal Endur		FRAME		Psi-spacer		Psi-opaque
		Frame height		U-frame		W/mK
		mm	in	W/m2K	BTU/hr.ft2.F	
Head		105	4.12	1.02	0.18	0.017
Sill		105	4.12	1.02	0.18	0.010
left jamb		105	4.12	1.03	0.18	0.010
right jamb		105	4.12	1.03	0.18	0.010


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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 E366/ 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	BTU/hr.ft2.F
8			0.92	0.16	0.208	0.125
7			0.91	0.16	0.208	0.122
6			0.90	0.16	0.208	0.120
5			0.90	0.16	0.208	0.120
4			0.90	0.16	0.208	0.120
Marine North		✓	0.90	0.16	0.208	0.120
Marine South	✓	✓	0.90	0.16	0.208	0.120
3	✓	✓	0.90	0.16	0.208	0.120
2 West	✓	✓	0.90	0.16	0.208	0.121
2 East	✓	✓	0.90	0.16	0.208	0.121
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	1.02	0.18	0.017
Sill		105	4.12	1.02	0.18	0.017
left jamb		105	4.12	1.03	0.18	0.017
right jamb		105	4.12	1.03	0.18	0.017
						W/mK
						0.134
						BTU/hr.ft.F
						0.078
						Grade B


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Product name: Universal Inswing Hopper Window				Center-of-glass properties				
ASHRAE/IECC /DOE North American Climate Zone	North, East, West - facing	South-facing	<div> Passive House Institute US</div>			Cardinal E366/ 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			0.92	0.16	0.208	0.125		
7			0.91	0.16	0.208	0.122		
6			0.90	0.16	0.208	0.120		
5			0.90	0.16	0.208	0.120		
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Marine South	✓	✓	0.90	0.16	0.208	0.120		
3	✓	✓	0.90	0.16	0.208	0.120		
2 West	✓	✓	0.90	0.16	0.208	0.121		
2 East	✓	✓	0.90	0.16	0.208	0.121		
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	1.02	0.18	0.017	0.010	0.134
Sill		105	4.12	1.02	0.18	0.017	0.010	BTU/hr.ft.F
left jamb		105	4.12	1.03	0.18	0.017	0.010	0.078
right jamb		105	4.12	1.03	0.18	0.017	0.010	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 E366/ Arg/ Clear/ Arg/ E180 (6mm) 44,0mm Internal grids And SDL with 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			0.98	0.17	0.208	0.710	0.125	
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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	1.02	0.18	0.017	0.010	0.134
Sill		105	4.12	1.02	0.18	0.017	0.010	BTU/hr.ft.F
left jamb		105	4.12	1.03	0.18	0.017	0.010	0.078
right jamb		105	4.12	1.03	0.18	0.017	0.010	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 E366/ 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			0.92	0.16	0.179	0.710	0.125	
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Universal Inswing Hopper Wi		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	1.02	0.18	0.017	0.010	0.134
Sill		105	4.12	1.02	0.18	0.017	0.010	BTU/hr.ft.F
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