

Hardware Comparison for NAFS Casement Window Hardware Load Test

North American Fenestration Standard (AAMA/WDMA/CSA 101/I.S. 2/A440-08)

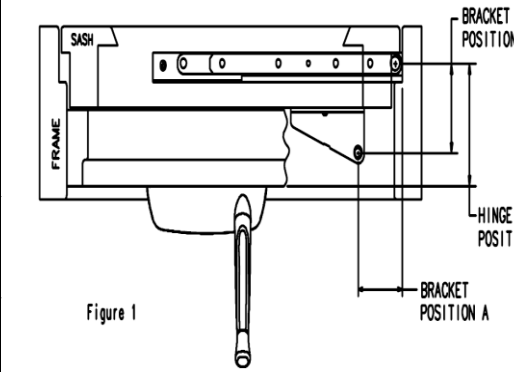
CAUTION: There are many factors in addition to the hardware which influence the maximum size casement window that should be produced. These include sash and frame stiffness and strength, screw holding strength, sash sag, weather tightness, and weatherstrip drag. For this reason, Truth recommends careful evaluation of the entire window before producing units as large as this matrix suggests.

Performance Class R: The Maximum Frame Size and Sash Weight are Listed in the Table.

Performance Classes LC, C, HC, AW: The Maximum Frame Area (Width x Height) Listed in the Table Must be Reduced by 20%.

Maximum Frame Size & Sash Weight for Operator & Hinge Combination Shown											
Operator	Maxim Washable 14.97 14.92	Maxim Egress 14.12 14.13	Heavy Duty 14.10	Hinge						Butt Hinge	Approx. Minimum Frame Width to Fit Operator
				10" Standard 14.75 14.80 14.05 14.19	10" Washable 14.76 14.91 14.06	10" Egress 14.77 14.93	10" HP Concealed 14.96	10" HP Concealed Egress 14.00			
Maxim Dual Arm 50.00	40"W x 84"H; 108*(96) lbs	32"W x 68"H; 69 lbs	38"W x 84"H; 103 lbs* (140) [^]	32"W x 84"H; 85 lbs	32"W x 72"H; 73 lbs	32"W x 68"H; 69 lbs	38"W x 78"H; 95 lbs	32"W x 68"H; 69 lbs	Not Recommended	24"	
Maxim Short Dual Arm 50.04	Not Recommended	28"W x 78"H; 69 lbs	Not Recommended	32"W x 84"H; 85 lbs	32"W x 84"H; 85 lbs	28"W x 78"H; 69 lbs	32"W x 84"H; 85 lbs	32"W x 68"H; 69 lbs	Not Recommended	21"	
Maxim Dyad 50.50	32"W x 72"H; 73*(55) lbs	Not Recommended	32"W x 76"H; 77 lbs* (132)	24"W x 64"H; 47 lbs	24"W x 60"H; 45 lbs	Not Recommended	28"W x 69"H; 49*(44) lbs	Not Recommended	Not Recommended	16"	
Maxim Reverse Dyad 50.70	24"W x 72"H; 53 lbs**	24"W x 72"H; 53 lbs**	24"W x 72"H; 83 lbs**	24"W x 72"H; 53 lbs**	24"W x 72"H; 53 lbs**	24"W x 72"H; 53 lbs**	24"W x 72"H; 53 lbs**	24"W x 72"H; 53 lbs**	24"W x 72"H; 53 lbs**	12"	
Maxim Single Arm 52.01	Not Recommended	32"W x 72"H; 73 lbs	Not Recommended	32"W x 70"H; 71*(36) lbs	32"W x 70"H; 71*(29) lbs	32"W x 72"H; 73 lbs	32"W x 70"H; 71*(36) lbs	32"W x 72"H; 73 lbs	30"W x 69"H; 65 lbs	20"	
Maxim Short Single Arm 52.06	Not Recommended	22"W x 63"H; 42 lbs	Not Recommended	Not Recommended	Not Recommended	22"W x 63"H; 42 lbs	Not Recommended	22"W x 63"H; 42 lbs	20"W x 60"H; 36 lbs	15"	
EntryGard Dual Arm 15.10	Not Recommended	Not Recommended	Not Recommended	32"W x 60"H; 60 lbs	32"W x 60"H; 60*(54) lbs	Not Recommended	32"W x 60"H; 60 lbs	Not Recommended	Not Recommended	20"	
EntryGard Egress D.A. 15.15	Not Recommended	28"W x 60"H; 52 lbs	Not Recommended	Not Recommended	Not Recommended	28"W x 60"H; 52 lbs	Not Recommended	28"W x 60"H; 52 lbs	Not Recommended	18"	
EntryGard Dyad 15.11	Not Recommended	Not Recommended	Not Recommended	26"W x 61"H; 49 lbs	24"W x 67"H; 49 lbs	Not Recommended	30"W x 61"H; 57 lbs	Not Recommended	Not Recommended	13"	
EntryGard Single Arm 15.94	Not Recommended	22"W x 62"H; 42 lbs	Not Recommended	22"W x 60"H; 40 lbs	Not Recommended	22"W x 62"H; 42 lbs	22"W x 60"H; 40 lbs	22"W x 62"H; 42 lbs	20"W x 61"H; 36 lbs	16" - 18" †	
13.5" Single Arm 15.32	Not Recommended	26"W x 65"H; 52 lbs	Not Recommended	26"W x 67"H; 54*(50) lbs	26"W x 69"H; 55*(41) lbs	26"W x 65"H; 52 lbs	26"W x 67"H; 54(50) lbs	26"W x 65"H; 52 lbs	24"W x 64"H; 47 lbs	22" - 24" †	
9.5" Single Arm 15.31	Not Recommended	24"W x 65"H; 48 lbs	Not Recommended	24"W x 61"H; 45*(27) lbs	24"W x 62"H; 45*(19) lbs	24"W x 65"H; 48 lbs	24"W x 61"H; 45*(27) lbs	24"W x 65"H; 48 lbs	22"W x 65"H; 43 lbs	18" - 20" †	
7.5" Single Arm 15.56	Not Recommended	22"W x 63"H; 42 lbs	Not Recommended	Not Recommended	Not Recommended	22"W x 63"H; 42 lbs	Not Recommended	22"W x 63"H; 42 lbs	20"W x 65"H; 39 lbs	16"	
6" Single Arm 15.39	Not Recommended	18"W x 66"H; 35 lbs	Not Recommended	Not Recommended	Not Recommended	18"W x 66"H; 35 lbs	Not Recommended	18"W x 66"H; 35 lbs	16"W x 70"H; 33 lbs	15"	
Split Arm 15.18	Not Recommended	Not Recommended	Not Recommended	24"W x 70"H; 52 lbs	24"W x 64"H; 47 lbs	Not Recommended	30"W x 64"H; 60*(56) lbs	Not Recommended	Not Recommended	16"	
23 Series Single Arm 13.5" 23.03	Not Recommended	26"W x 66"H; 53 lbs	Not Recommended	26"W x 69"H; 55 lbs	26"W x 71"H; 57*(43) lbs	26"W x 66"H; 53 lbs	26"W x 69"H; 55 lbs	26"W x 66"H; 53 lbs	26"W x 62"H; 50 lbs	22" - 24" †	
23 Series Single Arm 9.5" 23.01	Not Recommended	24"W x 69"H; 51 lbs	Not Recommended	24"W x 65"H; 48*(31) lbs	24"W x 66"H; 48*(22) lbs	24"W x 65"H; 51 lbs	24"W x 65"H; 48*(31) lbs	24"W x 69"H; 51 lbs	24"W x 69"H; 50 lbs	18" - 20" †	
23 Series Single Arm 7.5" 23.38	Not Recommended	22"W x 69"H; 46 lbs	Not Recommended	Not Recommended	Not Recommended	22"W x 69"H; 46 lbs	Not Recommended	22"W x 69"H; 46 lbs	24"W x 64"H; 47 lbs	16"	
23 Series Single Arm 6" 23.78	Not Recommended	20"W x 60"H; 36 lbs	Not Recommended	Not Recommended	Not Recommended	20"W x 60"H; 36 lbs	Not Recommended	20"W x 60"H; 36 lbs	22"W x 68"H; 45 lbs	15"	
23 Series Dyad Short Link 23.46	30"W x 63"H; 59 lbs	Not Recommended	26"W x 71"H; 58 lbs* (131)	26"W x 63"H; 51 lbs	24"W x 68"H; 50 lbs	Not Recommended	28"W x 61"H; 53 lbs	Not Recommended	Not Recommended	15"	
23 Series Dyad Long Link 23.49	32"W x 67"H; 68 lbs	Not Recommended	32"W x 60"H; 60 lbs* (140) [^]	26"W x 62"H; 50 lbs	24"W x 67"H; 49 lbs	Not Recommended	28"W x 66"H; 58 lbs	Not Recommended	Not Recommended	19"	

Typical Mounting Positions - Used for Hardware Comparison					
Hinge	Operator	Hinge Position	Bracket Position A	Bracket Position B	Operator Position
14.XX Concealed Hinges	Maxim Reverse Dyad	2.375	11.062	.813	Dual Arm & Dyad determined by Bracket Position A.
	Other Maxim		1.750	1.563	
	EntryGard Dual Arm w/10" Washable Hinge		1.625	.875	
	Other EntryGard Dual Arm Operators		1.375	1.563	Single Arm per catalog.
	Entrygard Dyad & Single Arm				
	Traditional & Ellipse				
23 Series	2.125				
14.10 Heavy Duty Hinges	Maxim Reverse Dyad	2.812	11.062	1.250	Determined by Bracket Position A
	Other Maxim		1.750	2.000	
	23 Series	2.562	1.375	2.000	
Butt Hinges	Maxim Reverse Dyad	4.000	11.062	2.437	Catalog Dim B=8.000
	EntryGard Single Arm		NA	NA	Catalog Dim A=4.000
	Maxim Single Arm				
	Traditional & Ellipse Single Arm				
	23 Series Single Arm		2.500		



The maximum window size, ease of operation, and service life are strongly influenced by hardware mounting positions (see Fig. 1 below).

Applications with dimensions larger than the typical mounting positions given above will not be able to support a window as large as that shown in this Table.

Applications with smaller dimensions may be able to support a larger window. Contact Truth for recommendations specific to your application.

* The first sash weight shown in the table is the maximum permitted for the AAMA Hardware Load Test. The sash weight shown in parenthesis is the maximum recommended by Truth to assure ease of operation.

If the sash weight in parenthesis exceeds the maximum permitted for the AAMA Hardware Load Test, a counteracting upward force must be applied to the sash during the test to reduce the load to the level specified by AAMA.

** The Maxim Reverse Dyad Operator has been limited to use in windows 24" wide and narrower in order to ensure good performance near the closed position. In its full open position, it can support windows larger than those shown in the table.

[^] This is the maximum rating of the hinge. Ease of operation is provided up to this weight.

† The smaller number applies when the operator is used with Egress hinges while the larger number applies when it is used with the 10" Standard or 10" High Performance hinge.