

Hardware Comparison for NAFS Casement Window Hardware Load Test

North American Fenestration Standard (ANSI/AAMA/WDMA 101/1.S.2/NAFS-02)

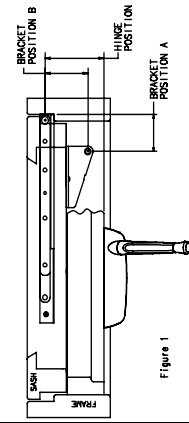
CAUTION: There are many factors in addition to the hardware which influence the maximum size casement window that should be produced. These include sash and frame stiffness and strength, screw holding strength, sash sag, weather-tightness, and weatherstrip drag. For this reason, Truth recommends careful 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%.

Operator	Hinge										Approx. Minimum Frame Width to Fit Operator
	Maxim Washable 14.97 14.92	Maxim Egress 14.12 14.13	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	Butt Hinge			
Maxim Dual Arm	50.00	40"W x 84"H, 108"(99) lbs	32"W x 68"H, 69 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	Not Recommended	24"	
Maxim Dyad	50.50	32"W x 72"H, 73"(55) lbs	Not Recommended	24"W x 64"H, 47 lbs	24"W x 60"H, 45 lbs	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, 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 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	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	32"W x 60"H, 60 lbs	32"W x 60"H, 60"(64) 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	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	22"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 62"H, 42 lbs	22"W x 62"H, 42 lbs	Not Recommended	Not Recommended	16" - 18" †		
13.5" Single Arm	15.32	Not Recommended	26"W x 67"H, 54"(50) lbs	26"W x 69"H, 55"(41) lbs	26"W x 69"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	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	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	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	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	26"W x 71"H, 57"(43) lbs	26"W x 66"H, 53 lbs	26"W x 66"H, 53 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 65"H, 51 lbs	24"W x 66"H, 48"(22) lbs	24"W x 69"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	20"W x 69"H, 36 lbs	Not Recommended	22"W x 69"H, 46 lbs	Not Recommended	22"W x 69"H, 46 lbs	22"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	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	Not Recommended	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	23.32	Not Recommended	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"		

Hinge	Typical Mounting Positions - Used for Hardware Comparison			Operator Position
	Operator	Bracket Position A	Bracket Position B	
14 XX Concealed Hinges	Maxim Reverse Dyad	11,062	.813	Dual Arm & Dyad determined by Bracket Position A.
	Other Maxim	1,750	1,563	
	EntryGard Dual Arm w/10" Washable Hinge	2,375	.875	
	Other EntryGard Dual Arm Operators	1,625		
	EntryGard Dyad & Single Arm	1,375	1,563	Single Arm per catalog
Butt Hinges	Traditional & Ellipse	2,125		
	22 Series			
	Maxim Reverse Dyad	11,062	2,437	Catalog Dim A=8,000
	EntryGard Single Arm	4,000	NA	Catalog Dim A=4,000
	Maxim Single Arm	2,500	NA	Operator is fully open (arm against stop) at 90° window position.



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.

** 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.

† 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.

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