

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.

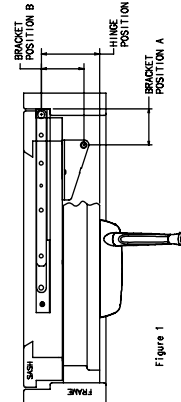
Performance Class R: The Maximum Frame Size and Sash Weight are Listed in the Table.

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

Operator	Hinge										Butt Hinge	Approx. Minimum Frame Width to Fit Operator
	Maxim Washable 14.97 14.92	Maxim Washable 14.76 14.91 14.06	10" Standard 14.75 14.80 14.19	10" Egress 14.12 14.13	10" Standard 14.75 14.80 14.19	10" Egress 14.77 14.93	10" HP Concealed 14.96	10" HP Concealed Egress 14.00	10" HP Concealed Egress 14.00	10" HP Concealed Egress 14.00		
Encore or Maxim Dual Arm	50.10	40"W x 84"H, 108"(66) lbs	32"W x 84"H, 65 lbs	32"W x 68"H, 69 lbs	32"W x 72"H, 73 lbs	32"W x 68"H, 69 lbs	32"W x 78"H, 95 lbs	32"W x 68"H, 69 lbs	32"W x 68"H, 69 lbs	32"W x 68"H, 69 lbs	Not Recommended	24"
Encore or Maxim Dyad	50.60	32"W x 72"H, 73"(35)	24"W x 64"H, 47 lbs	Not Recommended	24"W x 60"H, 45 lbs	Not Recommended	28"W x 69"H, 49"(44)	Not Recommended	Not Recommended	Not Recommended	Not Recommended	16"
Encore or Maxim Reverse Dyad	50.80	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	24"W x 72"H, 53	24"W x 72"H, 53	24"W x 72"H, 53	24"W x 72"H, 53	Not Recommended	12"
Encore or Maxim Single Arm	52.11	Not Recommended	32"W x 70"H	32"W x 70"H	32"W x 72"H, 73 lbs	32"W x 72"H, 73 lbs	32"W x 70"H, 71"(29)	32"W x 72"H, 73 lbs	32"W x 72"H, 73 lbs	32"W x 72"H, 73 lbs	30"W x 69"H, 65 lbs	20"
Encore or Maxim Short Single Arm	52.16	Not Recommended	Not Recommended	22"W x 63"H, 42 lbs	22"W x 63"H, 42 lbs	22"W x 63"H, 42 lbs	22"W x 63"H, 42 lbs	22"W x 63"H, 42 lbs	22"W x 63"H, 42 lbs	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	Not Recommended	32"W x 60"H, 60"(64)	Not Recommended	32"W x 60"H, 60 lbs	Not Recommended	Not Recommended	Not Recommended	Not Recommended	20"
EntryGard Egress D.A.	15.15	Not Recommended	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	Not Recommended	Not Recommended	18"
EntryGard Dyad	15.11	Not Recommended	26"W x 61"H, 49 lbs	Not Recommended	24"W x 67"H, 49 lbs	Not Recommended	30"W x 61"H, 57 lbs	Not Recommended	Not Recommended	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	Not Recommended	22"W x 60"H, 40 lbs	Not Recommended	Not Recommended	Not Recommended	20"W x 61"H, 36 lbs	16"
13.5" Single Arm	15.32	Not Recommended	26"W x 65"H, 52 lbs	26"W x 65"H, 52 lbs	26"W x 69"H, 55"(41) lbs	26"W x 65"H, 52 lbs	26"W x 69"H, 54"(60) lbs	26"W x 65"H, 52 lbs	26"W x 65"H, 52 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 65"H, 48 lbs	24"W x 67"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	24"W x 65"H, 48 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	Not Recommended	22"W x 63"H, 42 lbs	Not Recommended	22"W x 63"H, 42 lbs	Not Recommended	Not Recommended	Not Recommended	Not Recommended	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	18"W x 66"H, 35 lbs	18"W x 66"H, 35 lbs	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	Not Recommended	24"W x 64"H, 47 lbs	Not Recommended	30"W x 64"H, 60"(56) lbs	Not Recommended	Not Recommended	Not Recommended	Not Recommended	16"
23 Series Single Arm 13.5"	23.03	Not Recommended	26"W x 69"H, 55 lbs	26"W x 74"H, 57"(43) lbs	26"W x 66"H, 53 lbs	26"W x 69"H, 53 lbs	26"W x 69"H, 55 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 69"H, 51 lbs	24"W x 65"H, 48"(21) 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, 51 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	22"W x 69"H, 46 lbs	Not Recommended	Not Recommended	Not Recommended	Not Recommended	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	Not Recommended	20"W x 60"H, 36 lbs	Not Recommended	Not Recommended	Not Recommended	Not Recommended	22"W x 68"H, 45 lbs	15"
23 Series Dyad Short Link	23.46	Not Recommended	26"W x 63"H, 51 lbs	Not Recommended	26"W x 63"H, 51 lbs	Not Recommended	28"W x 61"H, 53 lbs	Not Recommended	Not Recommended	Not Recommended	Not Recommended	15"
23 Series Dyad Long Link	23.32	Not Recommended	26"W x 62"H, 50 lbs	Not Recommended	24"W x 67"H, 49 lbs	Not Recommended	28"W x 66"H, 58 lbs	Not Recommended	Not Recommended	Not Recommended	Not Recommended	19"

Typical Mounting Positions - Used for Hardware Comparison

Hinge	Operator			Hinge Position			Bracket Position A			Bracket Position B			Operator Position		
	Encore/Maxim Reverse Dyad	Other Encore/Maxim	EntryGard Dual Arm w/10" Washable Hinge	Encore/Maxim Reverse Dyad	Other Encore/Maxim	EntryGard Dual Arm w/10" Washable Hinge	11,062	1,750	1,625	813	1,563	875	Dual Arm & Dyad determined by Bracket Position A.	Single Arm per catalog.	
14.XX Concealed Hinges	Encore/Maxim Reverse Dyad	Other Encore/Maxim	EntryGard Dual Arm w/10" Washable Hinge	2,375	2,375	2,375	1,375	1,375	1,375	1,563	1,563	1,563	Single Arm per catalog.	Single Arm per catalog.	
	Encore/Maxim Reverse Dyad	Other Encore/Maxim	EntryGard Dual Arm w/10" Washable Hinge	2,125	2,125	2,125	2,125	2,125	2,125	2,125	2,125	2,125	Single Arm per catalog.	Single Arm per catalog.	
	Encore/Maxim Reverse Dyad	Other Encore/Maxim	EntryGard Dual Arm w/10" Washable Hinge	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	Single Arm per catalog.	Single Arm per catalog.	
Butt Hinges	Encore/Maxim Reverse Dyad	Other Encore/Maxim	EntryGard Dual Arm w/10" Washable Hinge	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	Single Arm per catalog.	Single Arm per catalog.	
	Encore/Maxim Reverse Dyad	Other Encore/Maxim	EntryGard Dual Arm w/10" Washable Hinge	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	Single Arm per catalog.	Single Arm per catalog.	



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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