

Architectural Binder Section Aluminum Folding Systems



Nana Wall Systems, Inc. 100 Meadowcreek Drive #250 Corte Madera, CA 94925 800 873 5673 415 383 3148 Fax 415 383 0312 info@nanawall.com nanawall.com

Aluminum Folding Systems

Systems and Common Features	2
Comparison of Different Aluminum Systems	. 4
Suggested Selection Procedure	5
Standard Configurations	. 6
Unhinged Paired Panels	.12
FoldFlat	.13
Open Corner with 90° and 135° Angle Turns	.15
Segmented Curve Units	.16
Some Panels Inward, Some Outward	.17
Folding Door / Window Combination in One Unit	.18



Aluminum Framed Folding NanaWall Systems That Make Large Exterior Openings Possible

Nine Different Aluminum Framed Folding Panel Systems and a Paired Panel System are Available

NanaWall Systems, Inc. offers nine different aluminum framed folding door systems:

NW Aluminum 640 - The Slimmest Aluminum Framed Folding System

NW Acoustical 645 - Interior Acoustically Rated Folding System

NW Reinforced 647 - Slim With Higher Windload Folding Wall

NW Aluminum 840 - The Slimmest Aluminum Framed with Superior Thermal Performance Folding Wall

NW Reinforced 847 - Slim Aluminum Framed Folding Wall for Mid to High-Rise Building

SL60 - The Standard Thermally Broken Folding System

SL45 - The Monumental Folding/Paired-Panel System

SL70 - The Monumental Thermally Broken Rated Folding System

SL73 - Miami Dade / AAMA Hurricane Resistant Thermally Broken Folding System

Large Exterior Openings Are Possible

With NanaWall folding systems, openings can range from one panel to as many as twelve panels and can be as wide as 43' (13 m). With paired panels or FourFold and SixFold panel sets, virtually unlimited widths are possible.

Generation 4 Folding Glass Wall

Generation 4 walls are engineered with a host of benefit. The next-level performance features effortless operation and field-tested security that stands up to the harshest weather and use. The panels are tested over 20,000 operational cycles for decade of performance, built in innovations, and have the option of moving in stacks of four and six—unattached to the side jamb, and possessing the ability to stack to the left, right or center of the opening.

Engineered, Tested Systems from a Single Source Supplier

NanaWalls have been engineered for superior performance. Units have been independently tested for air and water penetration resistance, structural deflection, thermal performance, forced entry, operation performance, and acoustical testing. All products are NFRC certified and labeled. NW Acoustical 645, SL45, SL60, SL70 are tested for acoustic performance. The SL73 is Miami-Dade County / AAMA hurricane approved.

Slim Profile with Minimal Aesthetics

With the slim aluminum frame, the frame profile is styled in a crisp, angular design. The systems offer an extremely steamline appearance with minimal exposed hardware, creating a new level of aesthetics.

Secure / Single Hand Operation

Multiple point locking that operates with a turn of a handle. The top and bottom shoots bolts between each folding pair of panels have a full 15/16" (24 mm) throw. Independent tests confirm that the locking system passes strict California forced entry testing requirements. No surface mounted flush bolts are used for standard units.

Versatile Functions

Versatile functions with swing entry/exit panel(s) option and with flexibility to fully or partially open. Ease of operation to quickly open or close wide openings.

Multitude of Stacking Configurations

Over fifty stacking configurations as well as inward opening and outward opening options. Unhinged paired and FourFold and SixFold panel options available for maximum stacking flexibility and larger opening walls. 90°, 135°, segmented or other angled units with Window Door Combination are available on some systems.

Outstanding Appearance

European styling and handsome, sleek lines allow glass areas to be maximized. All folding and locking hardware is integrated into the profiles for a clean look and for narrow stacking. No surface mounted hinges are used.

Continued, Long-Term Satisfactory Operation

Smooth sliding and folding operation, even when the bottom track has some dirt and sand in it. State-of-the-art hardware with ball bearing running carriages. On top hung systems, the main weight is carried by the head track. Variable interlocking of profiles minimizes expansion problems. Long-term ease of operation with adjustment features.

Easy to Install, Complete System

Easy to install with complete, precision built systems and prefitted hardware.



Design Flexibility

Design freedom with custom sizes, thermally broken and non-thermal options, glazing choices, and monumental series for larger panels or heavier glass panes. Top hung or floor supported. Different sill options.

A large selection of muntin layouts is offered. Horizontal mullions, SDL muntins with spacer bars, solid panels, or other custom layouts are available. Three glass stop options available for NW Aluminum 640 and NW Aluminum 840 to create a classic Steel look.

Choice of Finishes

In addition to the choices from the NanaWall Powder Coating Finish Chart, the full range of RAL high gloss and matte powder coating are available. Anodized finishes are also available. A RAL color chart is available on request.

For a Steel Effect look, SE colors are available with a fine matte texture.

Hardware Options

A choice of different locking options are available depending on need. Different handle finishes are also available see "Design - Locking Systems" on the website. Depending on the configuration selected, door closers can be incorporated and units can be prepared for panic devices provided by others. Custodial hardware is also available.

Complete, Coordinated Glass Walls

With the SL joining system and Generation 4 Folding Glass Walls, complete, coordinated glass walls can be provided with various folding doors and folding windows combinations, single track sliding panel system (HSW), matching French doors, transoms, side lites, and corner posts; see "Glass Walls - Matching Windows" on the website.

Insect Screen

Retractable Screen are available by others.





Comparison of Different Aluminum Folding Systems

All nine of the aluminum framed folding systems have been designed, engineered, and manufactured to the highest standards. Each system, however, has its own special, unique features and may be more suitable for certain applications than others. Below is a comparison of systems and features. See the individual sections for further system details.

	NW Aluminum 640	NW Acoustical 645	NW Reinforced 647	NW Aluminum 840	NW Reinforced 847	SL45	SL60	SL70	SL73	
Slim Profile	3 7/8" (99 mm)	3 7/8" (99 mm)	5 1/4" (133 mm)	3 7/8" (99 mm)	5 1/4" (133 mm)	4 7/16" (113 mm)	5 1/8" (130 mm)	6 3/16" (157 mm)	6 3/16" (157 mm)	
Maximum Panel Width	3' 3"	3' 3"	3' 3"	3' 7"	3' 7"	3' 3"	3' 3"	3' 3"	3' 2"	
Max. Unit Height with Swing Panel (*without swing panel)	10' 2"	10' 2" / 11' 6" *	10' 2"	10' 2" / 11' 6" *	10' 2" / 11' 6" *	9' 6"	8' 6"	10' 2" / 12' *	10'	
SEE MAXIMUM SIZE CHARTS										
Thermally Broken	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	
Air Infiltration $^{\textcircled{1}}$	0.03	-	0.03	0.04	0.03	0.25	0.02	0.02	0.02	
Water Penetration $^{\odot}$	9 psf	-	9 psf	9 psf	9 psf	3.76 psf	7.5 psf	9 psf	9 psf	
Structural Load Deflection $^{\textcircled{0}}$	+/- 55 psf +/- 50 psf	-	+/- 70 psf	+/- 55 psf +/- 50 psf	+/- 85 psf	+/- 35 psf	+/- 45 psf - 40 psf	+/- 70 psf - 100 psf	+/- 90 psf - 110 psf	
Acoustical Performance	Up to Unit OITC 37	Up to Unit STC 45	-	Up to Unit OITC 37	-	Up to Unit STC 36	Up to Unit STC 35	Up to Unit STC 42	-	
Swing Door Cycle Tested - 500,000	Yes	Yes	Yes	Yes	Yes	Yes	Yes (with surface hinges)	Yes	No	
Running Carriage Support	Floor Supported	Floor Supported	Floor Supported	Floor Supported	Floor Supported	Top Hung	60/o - Top Hung 60/u - Floor Supported	Floor Supported	Floor Supported	
Inward & Outward Opening	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Some Panels Inward & Some Outward Opening	No	No	No	No	No	Yes	No	No	No	
FoldFlat Option (stacking of panels outside the opening)	No	No	No	No	No	Yes	No	No	No	
Possibility of Unhinged Panels Paired	Yes - FourFold and SixFold Panel Sets	Yes - FourFold and SixFold Panel Sets	Yes - FourFold and SixFold Panel Set	Yes - FourFold and SixFold Panel Sets	Yes - FourFold and SixFold Panel Set	Yes	Yes (not recommend)	No	No	
Possibility of Different Finishes on Inside & Outside	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	
Slimline Steel Effect	Yes	Yes	No	Yes	No	No	No	No	No	
Possibility of 90° Turn / Open Corner and Window Door Combination	Yes	Yes (Only Open Corner Possible)	No	Yes	No	Yes	Yes	Yes	No	
Segmented Angles between each folding pair (see limits of each system)	No	No	No	No	No	Yes	No	Yes	No	

^① As per Performance Sill for NW Aluminum 640, NW Reinforced 647, NW Aluminum 840, NW Reinforced 847. Low Profile Saddle Sill for SL45. Higher Weather Performance Sill for SL60, SL70, SL73. For more details, check the performance chart in the Product Architectural Binder.

o = top hung system

u = floor mounted system

Suggested Selection Procedure

As there are several different aluminum folding door systems available from NanaWall Systems, Inc., each with its own special features, study the Comparison Page, the different features of each system, the specifications, the section drawings, the sizes and configurations available, etc. and choose a system most suitable for your particular project.

Steps in Selecting an Aluminum Folding System

- 1. Select a system and whether single, double, or triple glazed.
- 2. Determine the frame width and height.
 - a. From the rough opening height measured from subfloor, subtract 1/2"- 1" to obtain the frame height (note that the shim space is determined by any code requirements or personal preference). Adjust height as required if the bottom of the frame is not on the same level as the sub floor, especially with a flush sill.
 - b. From the rough opening width, subtract 3/4" (suggested shim space of 3/8" on each side) to obtain the frame width.
- 3. From the appropriate line on the Maximum Size Chart for your chosen system, for your specific frame height and frame width, determine the minimum number of panels needed. Please note that any custom size is possible up to the maximum size line shown.
- 4. From the different configurations shown that are available for that number of panels, select a configuration. Configuration determination is made with viewing from the inside. Note the lower size restrictions if a configuration with a swing panel not attached to a side jamb is selected. ("B" line). If this is the case you may need to adjust your sizes, number of panels or configurations if you are not within the "B" line.
- 5. Select an inward or outward opening unit. The first letter in the model number indicates inward or outward opening. "i" is inward and "o" is outward. After the "i" or "o" in the model number, the number preceded by "L" indicates the number of panels folding to the left and the number preceded by "R" indicates the number of panels folding to the right. For example, 1L3R indicates 1 panel folding to left and 3 panels folding to right, while its mirror opposite 3L1R indicates 3 panels folding to the left and 1 panel folding to the right.
- 6. From the elevations and cross-sections, actual and nominal heights and widths of the individual panels can be determined. As panels overlap and some configurations include running astragals, panel sizes are not necessarily all equal and vary with each configuration. Panel height

also vary with the head jamb size and sill used. For each system, see Installation and Owner's Manual.

- 7. Select a sill and mullion option.
- 8. Select the finish desired from the standard and optional colors available. Different finishes for the inside and outside are available.
- 9. Select the locking for the swing panel.
- 10. Select handle type and height, finish of handles and hinges/corner connectors from standard colors available.
- 11. Select any other options desired such as:
 - a. Special features available for system such as segmented curves, FoldFlat, fourfold and sixfold panel sets, units with 90° or 135° turns, window door combination etc. Note the restrictions on some of these options.
 - b. Higher bottom rail.
 - c. Simulated divided lites (SDL).
 - d. Matching doors and windows.
 - e. Transoms and sidelites.
 - f. Screens by others.

Example

The SL 60/o is to be used for an opening with rough dimensions of 8' in height and 10' 3/4" in width.

Frame height = FH = 8' - 1" = 7' 11" (using 1" shim space)

Frame width = FW = 10' 3/4" - 3/4" = 10' (using ¾" shim space)

Looking at the "A" line on the Maximum Size Chart for SL60, for a frame height of 7' 11", a unit with at least 4 panels is necessary.

(For a 3 panel system, the frame width will need to be reduced to about 9' 9".)

From the configurations available with 4 panels, 1L3R is chosen. The size is within the "B" line size.

From information on elevations and cross-sections for 1L3R, the following determination can be made:

Nominal panel width =

(FW - 5 9/16")/4 = (9' - 5 9/16")/4 = 25.6" or 2' 1 5/8"

Glass width is 2' 1 5/8" - 3 9/16" = 1' 10 1/16"

If the raised sill is used, Panel Height =

Frame Height - 5 1/2" = 7' 10" - 5 1/2" = 7' 4 1/2"

Glass height is 7' 4 1/2" - 3 9/16" = 7' 15/16"



Elevation Drawings of Configurations with Majority of Panels Folding to Right (Looking from Inside)

Shown to the right of each elevation are horizontal cross-section schematics of the folding operation of the panels. Shown are inward ("i") and outward opening ("o") units with the upper part being the outside and lower part being the inside as shown on Model 2R below. For inward opening section details, look at details with ".0" suffix; for outward opening section details, look at details with ".1" suffix.

i1R

o1R

i1L1R

o1L1R

i2R

o2R



Indicates swing panel

Indicates folding direction



i4R

o4R

i1L3R

o1L3R



Model 1L1R



Model 2R



Model 3R



Model 1L2R





i3R



1 or 12

2, 15, 16, 21, 22, 23, 26, 27 or 29

3R 8 7C

7C





Model 2L3R

Model 4R

Model 1L3R 1 or 12 —









Elevation Drawings of Configurations with Majority of Panels Folding to Right (Looking from Inside)

Model 1L4R



Model 3L3R





Model 1L6R



Model 2L5R



Model 3L4R







2, 15, 16, 21, 22, 23, 26, 27 or 29

Model 4L4R

i4L4R

o4L4R

i3L4R

o3L4R

Model 2L4R









2, 15, 16, 21, 22, 23, 26, 27 or 29











Standard Configurations for All Aluminum Folding Systems Elevation Drawings of Models with Majority of Panels Folding to Right (Looking from Inside)





Elevation Drawings of Models with Majority of Panels Folding to Left (Looking from Inside)

Shown to the right of each elevation are horizontal cross-section schematics of the folding operation of the panels. Shown are inward ("i") and outward opening ("o") units with the upper part being the outside and lower part being the inside as shown on Model 2L below. For inward opening section details, look at details with ".0" suffix; for outward opening section details, look at details with ".1" suffix.

i1L

o1L

Indicates folding direction

Indicates swing panel



Indicates double swing panels









Model 2L



Model 3L



Model 2L1R









Model 2L2R





Model 3L2R







Elevation Drawings of Models with Majority of Panels Folding to Left (Looking from Inside)



2, 15, 16, 21, 22, 23, 26, 27 or 29

Nand Boundaries Unbound

Elevation Drawings of Models with Majority of Panels Folding to Left (Looking from Inside)



Stack Panels On Either Side with Unhinged Paired Panels:

Additional Possibilities with Generation 4 Folding Glass Walls

In configurations with an even number of panels on one or both sides, pairs of panels need not be hinged to a side jamb or other panels. Flexibility in folding in any direction or position along the track can be achieved by having sets of running carriages at both outside corners of a pair of panels or multiple of pairs of panels. Unhinged paired panels can be combined with hinged configurations for even more options. Below are examples of some possibilities with inward opening units.

Please note that surface mounted bolts are needed in addition to the concealed locking.

NOTE: For NW Aluminum 640, NW Acoustical 645, NW Reinforced 647, NW Aluminum 840 and NW Reinforced 847; large opening sizes and flexible space management is possible with the Integration of FourFold or SixFold Panel Sets. The Panel Sets can move and stack either to the right, left, or center.

Examples: As there can be many other possibilities, please submit your ideas and sketches to NanaWall Systems, Inc. for evaluation.



Model I-1L2LR



(surface mounted bolt needed)





Model I-4LR

(this configuration with swing panels on

both ends is possible only for windows

less than 5' 6" high)

Model I-1L4LR1R





Model I-3L4LR

Model I-2LR 2LR

7

Model I-4LRO 70 7 7RC

5

Δ

9

5R

4R





FoldFlat Against the Adjacent Wall:

Additional Possibilities with SL45

Now possible with configurations up to 3 panels on one side or 6 panels in an opening, panels can be folded flat against the adjacent wall instead of staying perpendicular in the opening - creating a folding system that when opened, all panels are completely out of the opening with no separate structural support above needed.

For larger opening requirements, a FoldFlat on one side can be combined with a standard chain of bi-fold panels.

FoldFlat can be used as a door or window system and is only available with the recessed flush sill (Detail 26).

Example of a FoldFlat unit - Inward Opening with 3 panels stacking flat against the adjacent wall.



Some Installation Notes:

For panels to be able to FoldFlat against the adjacent wall, unit will need to be installed flush with the outermost projection of the adjacent wall. An alternate method of attaching the frame to the surrounding wall (instead of screwing through the center of the frame) will need to be used.

As shown in the drawings above, there will be an extension of the head track and sill outside the opening for the FoldFlat function. The head track extension will be self-supporting. The sill extension will need to be recessed. In this sill extension area that is a max. of about 9" from the opening, there can be no changes in the floor level.

There should be adequate space on the adjacent wall to allow the panels to fold flat against the wall (at least the width of the widest panel).



FoldFlat Against the Adjacent Wall:

Additonal Possibilities with SL45

Some Configurations Possible (Elevations are viewed from the inside.)

Configurations possible shown below are for outward opening units. The same can be achieved for inward opening units.

3R



26







10R

Model o2L1RFF

1

3R

7R



Model o3RFF



Model o3LFF



Model o1L3RFF







Model o2L2RFF



Model o2L3RFF



Model o3L2RFF



Model o3L3RFF





Other Configuration Possibilities

Instead of folding flat against the adjacent wall, the panels can fold flat agianst a fixed panel. For example, Model 1 Fixed + FFA - 3L



A Fold Flat Configuration on one side of the opening can also be combined with any of the other standard configurations on the other side of the opening. For example, FFA - 3L + A - 5R.



Open Corner with 90° Angle Turns:

Additional Possibilities with SL45, SL60, SL70, NW Aluminum 640, NW Acoustical 645, NW Aluminum 840

(also 135° angle turn for SL45 and SL70)

For certain configurations of the systems, a 90° angle (or 135°) turn of the head jamb and sill is possible. Create dramatic unique openings by opening two corners of a room without the need of a corner post. See below for some examples.

Please note that angled units are not as weather resistant as standard straight units.

Examples: As there can be many design possibilities, please submit your preliminary ideas and sketches to NanaWall Systems for evaluation.



Shown are outside corner configurations. Inside corners are also possible.

Many other configurations are possible and are derived from these above basic configurations. They are created by adding multiple pairs of panels to either side. Mirror images of these configurations are also possible.

Segmented Curve Units:

Additional Configurations Possible with SL45 and SL70

Possible with the SL45 system are changes in direction or angle of the head jamb and sill up to 22° between each panel, pair of folding panels or series of panels so that with multiple connections, the unit can have segmented curves. With the SL70, the maximum angle change is limited to 6.5°. Limitations as compared to straight units are as follows:

- 1. A segmented curve unit is not as weather resistant and may not withstand the same structural load.
- 2. Installation is more complicated and past experience in installing folding systems is recommended.
- 3. Besides frame dimensions, precise angles or radius need to be provided.
- 4. There are limitations as to which configurations are possible.
- 5. Costs are substantially more than standard straight units.
- 6. Stacking may not be as flat as straight units and stiles may not be straight.

Examples: As there can be many design possibilities, please submit your preliminary ideas and sketches to NanaWall Systems, Inc. for evaluation.



Other configurations are possible and are derived from these above basic configurations. They are created by adding multiple pairs of panels to either side and having similar segments.



Some Panels Inward and Some Panels Outward:

Examples of Other Possibilities with SL45

Below are elevation drawings and horizontal cross-section schematics of some possible configurations.

Other configurations possible are made with the addition of one or more pairs of panels to either or both sides or flipping the inward or outward opening on either side.

"O" denotes outswing panels and "I" denotes inswing panels.

Please note that the width of panels that are inward opening can be different from the width of panels that are outward opening.

Examples: As there can be many other possibilities, please submit your ideas and sketches to NanaWall Systems, Inc. for evaluation.



Indicates folding direction

Indicates swing panel



Indicates double swing panels

Shown with Model O-1L + I-2R are the other three possibilities



Model O-1L + I-2R







Model O-2L + A-1R





Model O-2L + I-1R



Other configurations for majority of panels folding to right with inward opening panels on the right











Folding Door / Window Combination in One Unit - With/Without a Fixed Post Separating the Doors from the Windows - NanaWall Kitchen Transition

The Folding Door / Window combination opens wide, seamlessly turning a kitchen into an indoor / outdoor space. It can also be used in other types of applications.

Please note some limitations as follows:

- 1. Is only possible with certain systems, configurations, and sills as shown below.
- 2. Lower corner where window meets door will not be as weather resistant as compared to a unit with all panels equal in height.
- 3. Please note that the location of the handle of the swing door panel has limitations due to the strike plate having to be either on the side jamb profile below the counter or on the adjacent window panel.
- 4. Handle heights of the door unit and window unit may be different.

Examples: As there can be many design possibilities, please submit your preliminary ideas and sketches to NanaWall Systems, Inc. for evaluation. (Please note that below are examples with just four of the folding configurations. Door / Window combinations are also possible with other configurations.)

Elevations Looking from Inside

Even number of door panels meeting even number of window panels.



Odd number of door panels (with swing door) meeting even number of window panels.



NW Aluminum 640 NW Aluminum 840 SL45 SL60 SL70





NW Aluminum 640 NW Aluminum 840 SL45 SL60 SL70



Even number of door panels meeting odd number of window panels.*



Based on the above basic configurations, other configurations are possible by adding (or subtracting) pairs of panels to either side.

*Please note that for outward opening units, operator will need to stand on the exterior to engage / disengage the window swing panel from the panel catch on the adjacent panel.

