# **LEALUMINUM**®

# SERIES 4500 SSG WINDOW WALL UNIT GLAZE SYSTEM

#### NOTE

THE INSTALLATION DETAILS FOUND IN THIS PACKAGE ARE GENERIC AND ARE FOR REPRESENTATION ONLY WITH THE INTENT OF GIVING THE INSTALLATION TEAM A VISUAL REPRESENTATION AS TO HOW THE ASSEMBLIES TYPICALLY INSTALL. THE SHOP SUBMISSION DRAWINGS AND DETAILS ARE THE GOVERNING DOCUMENTS AND AS SUCH THIS PACKAGE IS TO BE USED ONLY AS A RESOURCE

FOLLOW SEALANT MANUFACTURERS' RECOMMENDATIONS FOR USE AND APPLICATION OF ALL STRUCTURAL SILICONE SEALANT AND WEATHER SEAL SILICONE SEALANT.

CUSTOMER/PROJECT QUALITY ASSURANCE PROCEDURES ARE SEPARATE DOCUMENTS AND ARE TO BE FOLLOWED IN CONJUNCTION WITH THIS MANUAL.

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Thank you for your purchase of the US Aluminum Unit Glaze System. It is designed to install easily and efficiently. Please take time to review this manual before you begin.

# HANDLING, STORAGE, AND PROTECTION OF ALUMINUM

The following precautions are recommended to protect the material against damage. Following these precautions will help ensure early acceptance of your products and workmanship.

#### A. HANDLE CAREFULLY.

All aluminum materials at job site must be stored in a safe place, well removed from possible damage by other trades. Cardboard wrapped or paper interleaved materials must be kept dry.

#### B. CHECK ARRIVING MATERIALS.

Check for quantity counts and keep records of where various materials are stored.

#### C. KEEP MATERIALS AWAY FROM WATER, MUD, AND SPRAY.

Prevent cement, plaster, or other materials from damaging the finish.

#### D. PROTECT THE MATERIALS AFTER ERECTION.

Protect erected frame with polyethylene or canvas splatter screen. Cement, plaster, terrazzo, other alkaline solutions, and acid based materials used to clean masonry are harmful to the finish. If any of these materials come in contact with the aluminum, immediately remove with water and mild soap.

The rapidly changing technology within the architectural aluminum products industry demands that U.S. Aluminum reserve the right to revise, discontinue or change any product line, specification or electronic media without prior written notice.

NOTE: Dimensions in parentheses () are millimeters unless otherwise noted.

# **GENERAL INSTALLATION NOTES**

## **Recommended guidelines for all installations:**

- 1. **REVIEW CONTRACT DOCUMENTS.** Check shop drawings, installation instructions, architectural drawings and shipping lists to become thoroughly familiar with the project. The shop drawings take precedence and include specific details for the project. Note any *field verified* notes on the shop drawings prior to installing. The installation instructions are of a general nature and cover most conditions.
- 2. INSTALLATION. All materials are to be installed plumb, level, and true.
- 3. INSTALLER QUALIFICATION. The Series 4500SSG window wall system is intended for fabrication, assembly, sealing, installation and glazing by professionals with appropriate knowledge and experience of the system(s) and their incorporation into various building conditions.
- 4. BENCH MARKS. All work should start from bench marks and/or column lines as established by the architectural drawings and the general contractor with guaranteed accuracy. Working from these datum points and lines determine:
  - a) The plane of the wall in reference to offset lines provided on each floor.
  - b) The finish floor lines in reference to bench marks on the outer building columns.
  - c) Mullion spacing from both ends of masonry opening to prevent dimensional build-up of daylight opening.
- 5. FIELD WELDING. All field welding must be adequately shielded to avoid any splatter on glass or aluminum. Results will be unsightly and/or structurally unsound. Advise general contractor and other trades accordingly. All field welds of steel anchors must receive touch-up paint (zinc chromate) to avoid rust.
- SURROUNDING CONDITIONS. Make certain that construction which will receive your materials is in accordance with the contract documents. If not, notify the general contractor in writing and resolve differences before proceeding with work.
- 7. ISOLATION OF ALUMINUM. Aluminum to be placed in direct contact with uncured masonry or incompatible materials should be isolated with a heavy coat of bituminous paint. For steel reinforcement primer, use manufacturer's standard corrosion resistant primer, meeting or exceeding Sherwin Williams Kem Kromik<sup>®</sup> and ASTM D5894, 1008 Corrosion Resistance.
- 8. SEALANTS. The fabrication and installation of a structural silicone-glazed (SSG) or wet glazed system requires more technical knowledge and experience than is required for a conventional pressure-glazed or dry glazed system. The glazing contractor should take all steps as outlined and required by the structural silicone sealant manufacturer, glass fabricator, framing manufacturer, and the project professional engineer of record as well as follow local building code requirements and industry best practices to ensure the proper installation and safe performance of the SSG system.

The glazing contractor for each project needs to ensure compliance with each step, including, but not limited to, design reviews, formal adhesion testing, formal compatibility testing, project specification compliance, validating procedures, field testing, and quality control validation of installed product and surrounding conditions.

Testing of component materials for use in a SSG or wet glazed system is mandatory to fulfill project specifications and warranty requirements and must be submitted by the glazing contractor to the structural silicone manufacturer. All materials that comprise the structural silicone joint, such as the framing system (with the job-specific finish) and job-specific glass must be tested by the structural silicone manufacturer for compatibility and adhesion. All other accessory materials in contact with the structural silicone, such as setting blocks, spacers, gaskets, sweeps, air seals and expansion joints, must also be submitted to the silicone sealant manufacturer for compatibility testing.

To ensure that nothing has changed in formulation or chemistry since the initial tests, subsequent testing during periodic time frames of the project is to be conducted to confirm continued acceptance of the material for use on the project.

To ensure the structural performance and integrity of the insulating glass unit (IGU), the glazing contractor must submit the project shop drawings to the glass fabricator to obtain approval for use of their product(s) in any 2, 3 or 4-sided SSG applications.

Quality control procedures for field glazing are to be increased beyond those required for shop glazing. Job conditions will normally have dust, dirt, and other construction debris on the surfaces where structural silicone is to be applied. Great care should be exercised in cleaning and preparing these surfaces for silicone application. The recommendations of the silicone sealant manufacturer are to be strictly enforced and followed. The fabrication and installation of the SSG system and its components, whether shop or field glazed, should be governed by a quality control program, and all steps, procedures, and test reports should be documented throughout the project.

# **GENERAL INSTALLATION NOTES CONT.** Recommended guidelines for all installations:

Prior to installation of any SSG system, refer to industry documents (e.g., AAMA Curtain Wall Design Guide Manual, ASTM C1401-14, and AAMA SSGDG-17) for detailed instructions and recommendations.

THE GLAZING CONTRACTOR ASSUMES FULL RESPONSIBILITY FOR ENSURING COMPLIANCE WITH THE ABOVE, AND ASSUMES FULL LIABILITY FOR ANY ISSUES ARISING FROM NONCOMPLIANCE.

- **9. FASTENING.** Within the body of these instructions "fastening" means any method of securing one part to another or to adjacent materials. Only those fasteners used within the system are specified in these instructions. Due to the varying perimeter conditions and performance requirements, perimeter and anchor fasteners are not specified in these instructions. For perimeter and anchor fasteners refer to the shop drawings or consult the fastener supplier.
- **10. BUILDING CODES.** Due to the diversity in state/provincial, local, and federal laws and codes that govern the design and application of architectural products, it is the responsibility of the individual architect, owner, and installer to assure that products selected for use on projects comply with all the applicable building codes and laws. U. S. Aluminum exercises no control over the use or application of its products, glazing materials, and operating hardware, and assumes no responsibility thereof.
- 11. EXPANSION JOINTS. Expansion joints and perimeter seals shown in these instructions and in the shop drawings are shown at normal size. Actual dimensions may vary due to perimeter conditions and/or difference in metal temperature between the time of fabrication and the time of installation. Gaps between expansion members should be based on temperature at time of installation.
- 12. GLAZING PRACTICES. The air and water performance of the Series 4500SSG window wall system is directly related to the completeness and integrity of the installation process, including but not limited to the assembly seals of the framing joinery, the installed glazing gaskets, and the alignment of the framing joinery glazing plane. Before glazing, verify the glazing pocket width and glazing infill thickness, as both must be in tolerance to assure adequate edge pressure and to achieve the desired air and water performance levels. (In general, framing systems utilizing 1" insulating glass are designed to accommodate a thickness variance of +/- 1/32"). Note: Excessive pressure can cause glass breakage and/or IGU failure. Consult the glass manufacturer for their recommended edge pressure per lineal inch.

To achieve the designed and tested air and water performance, best practices include:

- Glazing gaskets should be cut 1/4" longer per foot, and lay flat, preferably for 24 hours
- Gaskets should be cut as single monolithic pieces and "crowded" during their installation to avoid corner gaps caused by post-installation relaxation
- · The interior glazing gasket should be installed so as to avoid stretching, buckles, or tears
- Corners must be cut square, and at a slight angle when required to conform to the bevel on the intersecting gasket; sealed and butted together.
- Gasket corner joinery must also be crowded, and sealant applied onto the gasket contact frame surface and into gasket reglet raceway where applicable.
- Gasket corner seals are to be done just prior to installing glass, while the sealant is still wet and uncured, and
  ensure exterior gaskets are installed so as to place the glass into it's final in service condition and allow the sealant
  to conform to optimum configuration. Note: If the sealant cures prior to glazing, the cured sealant could create
  excessive edge pressure onto the glass and has the potential to cause glass breakage.
- The glass must be checked for squareness, size dimension, and thickness along the edges paying attention to any variances from center edge to corner edge
- Check the placement of the installed glass and verify there is proper edge bite into the pocket, and proper edge clearance from framing elements

After sealant has set and a representative amount of the wall has been installed and glazed (250 square feet or more) run a water hose test in accordance with AAMA 501.2 specifications to check installation. On large projects the hose test should be repeated during the glazing operation. Consult and follow NGA's GANA Manual and FGMA Glazing Manual for proper glazing technique and procedure.

- **13. COORDINATION WITH OTHER TRADES.** Coordinate with the general contractor any sequence with other trades which offset curtain wall installation (i.e. fire proofing, back-up walls, partitions, ceilings, mechanical ducts, converters, etc.).
- 14. CARE AND MAINTENANCE. Final cleaning of exposed aluminum surfaces should be done in accordance with AAMA 609.1 for anodized aluminum and 610.1 for painted aluminum.

# ORDER OF ASSEMBLY AND INSTALLATION

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# **PRODUCT DESCRIPTION**

## ABOUT THE SSG UNIT GLAZE SYSTEM

This Installation Manual covers the general procedures required for the Unit Glaze System. Please review it thoroughly before starting your installation. Each fully glazed panel is fabricated to specifications in the shop rather than on the job site. This gives the contractor access to in-house equipment and fixtures not available in the field. It also provides a cleaner and safer environment for fabrication and inspection. Once the Unit Glaze panels are complete they are easily transported to the job where they are positioned and snapped into place. After installation they are sealed to the structure.

**TOP VIEW** 





Frames may be shop fabricated and shipped to job site partially or totally assembled. Systems feature screw race joinery and allow for interior or exterior assembly. Frames are fabricated in units and snapped together. Each unit must have at least one vertical deep pocket to allow for glazing. Plan units accordingly. **See DETAIL A.** Never allow two shallow pockets to face each other.

# **PARTS LIST**

TW718	PS145	TW700 (	TW770
<u>لے۔</u> Mullion	Jamb Filler	Stiffener Clip	Male Vertical Mullion
TW771	TW917	TW703	TW747
Female Vertical Mullion	Horizontal Face Cap	Sub Sill	Sill
TW728	TW912	TW744	PV100
			J. F
Horizontal Mullion	Vertical Face Cap	Head	PVC Flush Insert - Optional
DJ751	EC680	HC751	NP716
Drill Jig	End Dam	Head Anchor	Interior Sponge Gasket
NP726	VS302000012	SP250	WB701
Exterior Dense Gasket	Weather Gasket	Silicone Spacer Gasket	Edge Block
SB710	WD710	WD711	NC900
Setting Block	Water Deflector	Water Deflector	Face Cap Retainer Clip
8X12PHPSMS	ST251		
8 x 1/2" Pan Head Phillips Sheet Metal Screw	#10 x 1" Hex Head Washer Screw		

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# FABRICATION

#### **CUT SIZE CALCULATIONS**

Measure ROUGH OPENING to determine FRAME DIMENSION. Allow a minimum clearance of 1-1/2" (38.1) at header and 1-1/2" (38.1) at wall jambs and subsill. Extra clearances may be necessary to accommodate building tolerances.

Cut members to size

Subsill:	Overall FRAME WIDTH PLUS 1" (25.4). Subsill must extend 1" (25.4) outside of last wall jamb to allow last panel installation. Subsill runs through. If opening exceeds 24' (7.32 m) in width splice sleeves must be used at splice joints. If entrances occur subsill should butt against door jambs.
Verticals:	FRAME HEIGHT MINUS 5/16" (7.9). Verticals run through.
Horizontals:	DAYLIGHT OPENING. Horizontals run between verticals. Cut horizontal glazing beads 1/32" (0.8) undersize for easier installation.
Vertical Trims:	FRAME HEIGHT MINUS 5/16" (7.9). Verticals run through.
Horizontal Trims:	END HORIZONTALS: Daylight Opening plus 1-1/16" (27).
	CENTER HORIZONTALS: Daylight Opening plus 2-1/8" (54).



**DETAIL B** 

# FABRICATION

## **DRILLING ATTACHMENT HOLES**

Mark the location of horizontals in vertical members and drill holes for assembly screws. The use of drill jigs is recommended. Place jig over glazing edge.



DETAIL C

Drill .201" (5.1) holes (#7 drill) as shown

## **INSTALLING TW700 STIFFENER CLIPS**

Slide the TW700 Stiffener Clip into TW770 split mullion. Position clips and stake in place.



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## **FABRICATION**

## FABRICATE SILL WEEP HOLES

Fabricate one 2" (50.8) weep hole 6" (152.4) from each end of all sills.





#### **FABRICATE TW703 WEEP HOLES**



**DETAIL F** 

## FABRICATE HORIZONTAL FACE CAP WEEP HOLES

NOTE: One weep hole each end of all horizontal face caps. See DETAIL G.



**DETAIL G** 

### FRAME MEMBER CONNECTION

Apply silicone to ends of horizontal members and assemble panels using screws provided.

Tool excess silicone.



**DETAIL H** 

## FRAME SEALING

After panels are assembled apply bead of silicone to joint between verticals, horizontals, head and sill members from underside, including over all screw threads to ensure a watertight installation.



## FILLER PLATE ATTACHMENT

Apply sealant on jamb before snapping jamb fillers to back of wall jamb.



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## WATER DEFLECTORS (ONLY AT JAMBS)

Apply silicone to vertical glazing pocket and gasket reglet at vertical/horizontal intersection. Silicone must be applied to two sides of pocket only. Clearance at exterior side will allow infiltrated water to run down to subsill. **See DETAIL K.** 

Insert water deflector into glazing pocket and slide it down into position. **See DETAIL L.** Top of deflector must be flush with horizontal glazing pocket.

**NOTE:** Water deflectors applied to door jambs must be sealed all around to prevent water from running to floor (Water will drain at opposite end).



#### **SETTING BLOCKS**

Locate two setting blocks at quarter points or eighth points as shown on approved shop drawings.



#### **DETAIL M**

Peel off paper backing from edge blocks and locate one on each vertical at mid-points of the glass height.



#### **DETAIL N**

## **GASKET INSTALLATION (FACE CAPS)**

**NP726** EPDM Exterior Dense gasket is used on all Face Caps. Vertical face gaskets run continuous and should be cut 1" (25.4) long on each end to allow for shrinkage



Horizontal Trim Plates

Bottom gasket runs for 8" (203.2) then a 10" (254) gap from each end.



DETAIL O

## **GASKET INSTALLATION (FRAME)**

**NP716** sponge glazing gasket is used on the interior framing members. Insert push-in gaskets into all back members and face covers. Vertical gaskets on the mullions run through. Horizontal gaskets butt against vertical gaskets and are silicone together.



DETAIL P

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## **INSTALLING FACE CAP CLIPS**

Install **NC900** Face Cap Clips using spacing guidelines below. To install Face Cap Clips, twist clockwise. **See DETAIL V.** 



**DETAIL V** 

## VERTICAL FACE CAP INSTALLATION

Install Vertical Face Caps on end jambs and door jambs from top to bottom and in between Horizontal Face Caps. Care must be taken to prevent damage of Face Caps during installation. **See DETAIL W**. Use a 2" x 4" (50.8 x 101.6) piece of wood and a Dead Blow Hammer to engage Face Caps. Use the markers on the glass indicating **NC900** Face Cap Clip locations to engage Face Caps. **See DETAIL X**.

#### ONLY HIT COVERS AT FACE CAP CLIP LOCATIONS.

1. Fit vertical Face Cap onto jambs.



**DETAIL W** 

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2. Use wood block and dead blow hammer to install.

#### HIT ONLY AT FACE CAP CLIP LOCATION.



**DETAIL X** 

## VERTICAL FACE CAP INSTALLATION

Pinning of Vertical Face Caps is required to prevent covers from sliding. Use one screw per cut length nearest the center of the length. Locate the screw so that it rests on the tip edge of the bottom wall of the Horizontal Face Cap, concealed from view.

3. Pin Vertical Face Cap. **ELEVATION VIEW** Vertical Face Cap Beveled Horizontal Face Cap 1/4" (6.4)Part 8X12PHPSMS Located at each end of the Vertical Drill .136" (3.5) Face Cap. (Conceal behind cover) diameter hole in Holds Vertical Face Cap in place. Vertical Face Cap 5/16" **DETAIL Y** (7.9)

#### HORIZONTAL FACE CAP INSTALLATION

Install Horizontal Face Caps. Use same procedure as Vertical Face Caps, striking the covers only at Face Cap clip locations. Always install horizontal face covers with beveled edge on top.

- 1. Fit Horizontal Face Caps onto horizontal members.
- 2. Use wood block and dead blow hammer to install.

HIT ONLY AT FACE CAP CLIP LOCATION.



NOTE: 1/16" (1.6) MAX gap between Caps at jamb, 1/8" (3.2) MAX at split mullions.

#### DETAIL Z

Intermediate Section

End Section

Butter ends of Face Caps to be joined.

#### SUBSILL END DAMS

Apply end dams to ends of subsill. Do not apply end dams to ends that butt against door jambs.



#### SUBSILL INSTALLATION

Set subsill in place, shimmed as required for leveling and anchor it to structure. Locate fasteners 6" (152.4) each side of verticals and 24" (609.6) O.C. or as required. Holes for fasteners should be elongated laterally to allow for thermal movement. **Pin subsill to structure at one point only per cut length.** (This hole is not elongated). Subsill should be shimmed at fasteners location and underneath verticals. Seal around all joints and over head of fasteners.



DETAIL BB

## SUBSILL INSTALLATION (CONTINUED)

When end of subsill butts against door jamb it cannot be dammed to allow for sidelite installation. Special care should be taken to control water infiltration at this joint.

Infiltrated water from upper lites must be kept out of door jambs.





Splice subsill as required. Splice sleeves are required at splice joints. Locate splice sleeves near center Daylight Opening.



DETAIL DD

#### **HEAD ANCHORS**

Install snap in covers and head anchors. Tape head anchor in place. Mullion caps installed after panels are pushed together.



DETAIL EE

## **INSERTING THE PANELS**

If there are no entrances start installation at wall jamb unit. Apply silicone to end dam contact area. Tuck the panel in from the exterior and then slide up against the end dam.



Butter the end of horizontal face plates and top exterior gasket before setting the next panel.



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## **FASTEN HEAD ANCHORS**

Fasten head anchors to the structure using specified fasteners.

**NOTE:** 1/2" (12.7) Minimum clearance between head and structure required to allow for vertical expansion. Anchors may be shimmed if required.



#### SEAL END JAMB

The last glazed panel will require a 1" (25.4) gap between the Jamb and the Wall to allow room for inserting it into the subsill. Once the panel is in place, seal it to the Sub Sill and wall.



**DETAIL II** 

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### SEALING THE SUBSILL

Seal joints between panels and subsill at both inside and outside.



**DETAIL JJ** 

#### **FINAL SEALING**

All exterior perimeter seals must be done as a secondary operation from the exterior. **See Detail KK**. Seal interior perimeter at sill and 8" (203.2) up where panels meet. **See Detail LL**.



DETAIL KK

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# **GUIDE TO SEALANTS**

NOTE: All sealants must be tooled to ensure proper adhesion.



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