INSTALLATION INSTRUCTIONS
2 1/2” x 5” for 1 5/16” Insulating Laminated Glass

Deep pocket allows for direct anchor attachment to substrate without flat filler plate.

3/8” Ø perimeter anchor holes drilled with CoraPunch Die Set.

Sill may be used at head for ease of glazing large glass lites.

Intermediate horizontals may be inverted for ease of glazing large lites. (2 removable glass stops).

Deep pocket allows for hex head fasteners to be used for anchor attachment.

Screw-spline joinery for #14 x 1” HWHSTS

FL519 Full height subsill flashing.

Deep pocket sill eliminates blind seal at anchor attachment to substrate.
PRODUCT FEATURES:

- Screw-spline joinery
- **CoraPunch** or drill jig fabrication
- Panelized assembly
- Deep pocket perimeter sections:
  - Eliminates drilling access holes with blind seals
  - Eliminates flat filler plate at head and wall jambs
  - Allows for 3/8" diameter hex head anchor bolt attachment to substrate
  - Intermediate horizontals may be inverted for ease of glazing large lites
  - Sill may be used at head for ease of glazing large lites
- Heavy wall mullion option without steel
- Steel reinforcing attachment to mullions at head and sill only
- Tested with and without steel reinforcement at various design pressures
- Tested with 84” x 96” **Series 381 M.S.** impact-resistant entrance doors
- Tested with 72” x 84” **Series 281 N.S.** impact-resistant entrance doors
- Anodized finishing or factory applied thermosetting fluorocarbon powder coating option

To download 3-part specification, go to: [www.coralind.com](http://www.coralind.com)
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These instructions are for typical installations. Reference shop drawings for special notations on installations and glazing.
Coral Series FL550 (2-1/2” x 5”) hurricane impact-resistant system was especially designed to meet the stringent Dade County, FL Building Codes for impact-resistant glass and glazing systems. Series FL550 successfully passed a series of large missile impact and cyclic wind tests with multiple impact-resistant glass compositions.

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. Field verified notations shown within shop drawings must be resolved prior to installation. These installation instructions are of general nature and cover most conditions.

2. INSTALLATION. All materials shall be installed plumb, level and true.

3. BENCHMARKS. All work should start from established benchmarks and column center lines established by the architect and general contractor.

4. FIELD WELDING. All field welding must be adequately shielded to avoid any splatter on glass or aluminum. Advise general contractor and other trades accordingly. All field welds of steel anchors must receive touch-up paint (zinc chromate) to avoid rust.

5. 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.

6. ISOLATION OF ALUMINUM. Aluminum to be placed in direct contact with uncured masonry or incompatible materials should be isolated with a heavy coat of zinc chromate or bituminous paint.

7. STRUCTURAL SEALANTS.
   A. DOW 995 structural sealant was used on the Series FL550 test specimen approved by Dade County for glass to metal adhesion. To comply with Dade County, FL Building Code Protocols, DOW 995 sealant must be used for glass to metal adhesion with Series FL550.
   B. Perimeter Sealants: Due to varying job conditions, all perimeter sealants used should be approved by the sealant manufacturer to ensure the sealant will function for the conditions shown on these instructions and shop drawings. Sealants must be compatible with all surfaces in which adhesion is required, including other sealants. Use primers where directed by sealant manufacturer. Be sure to properly store sealants at recommended temperature and check container for remainder of shelf life before using. DOW 795 structural silicone was the perimeter sealant used on the Series FL550 test specimen approved by Dade County.

8. FASTENING. Only those fasteners used within the system are specified in these instructions. Due to the varying perimeter conditions and performance requirements, perimeter fasteners are not specified in these instructions. Reference the shop drawings or anchor charts for perimeter fasteners.
9. **BUILDING CODES.** Due to the diversity in state, local and national codes that govern the design and application of architectural products, it is the responsibility of the architect, owner and installer to assure that products selected for use on each project comply with all the applicable building codes and laws. CORAL ARCHITECTURAL PRODUCTS exercises no control over the use or application of its products, glazing materials and operating hardware and assumes no responsibility thereof.

10. **EXPANSION JOINTS.** Expansion joints and perimeter seals shown in these instructions and shop drawings are shown at normal size. Expansion mullion gaps should be based on temperature at time of installation.

11. **WATER HOSE TEST.** After a representative amount of the storefront system has been glazed (250 square feet) and the sealant has cured, a water hose test should be conducted in accordance with AAMA 501.2 specifications to check the installation. This test should be repeated every 500 square feet during the glazing operation. Note: This test procedure should not be used for entrance doors.

12. **COORDINATION WITH OTHER TRADES.** Coordinate with the general contractor and sequence with other trades items which offset the storefront installation such as back-up walls, partitions, ceilings and mechanical ducts.

13. **MATERIAL HANDLING:**
   A. **SHOP**
      1. Cardboard wrapped or paper interleaved material must be kept dry.
      2. Immediately remove aluminum from cardboard wrapped or paper interleaved materials should it get wet to prevent staining or etching aluminum finish.
      3. Check arriving materials for quantity and keep record of where various materials are stored.

   B. **JOB SITE**
      1. Material at job site must be stored in a safe place well removed from possible damage by other trades.
      2. Cardboard wrapped or paper interleaved material must be keep dry. (See 13.A.2)
      3. Keep record of where various materials are stored.
      4. Protect materials after erection. Cement, plaster, mortar and other alkaline solutions are very harmful to the finish.

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.

15. **CORAL ARCHITECTURAL PRODUCTS.** It is the responsibility of CORAL ARCHITECTURAL PRODUCTS to supply a system to meet the architect’s specifications.

16. **GLASS.** Glazing gaskets are designed for a compression fit against glass and can accommodate (+/- 1/32”). Be sure to check overall size of glass size and thickness.
PRODUCT APPLICATION
AND INSTALLATION

Series FL550 hurricane impact-resistant storefront system was designed with screw spline joinery for simple fabrication and panelized installation, but should only be installed by glazing contractors employing personnel with the necessary installation and project management experience to handle these type projects.

FL550 hurricane impact-resistant storefront system requires the installer to pay close attention to the details shown within these Instructions and General Notes. All critical seal areas must be done as shown.

OPTIONS and LIMITATIONS

The laminated glass and mullions function as an integral unit. The combinations shown in the Options and Limitation Charts for FL550 framing and Series 281 and 381 entrance doors are based on actual performance testing and cannot be altered without sacrificing the integrity of the system.
FRAME FABRICATION

Establish Frame Size and Cut Metal to Length

STEP 1.

Measure width of rough opening.
A. Measure opening at bottom.
B. Measure opening at center.
C. Measure opening at top.
The frame width will be the smallest dimension less 1/2” allowing for a minimum 1/4” caulk joint at each jamb.

Note: Maximum caulk joint for Dade County, FL installation is 1/4”.

Repeat process to determine frame height.
A. Beginning on left side of opening, measure dimension from top to bottom.
B. Repeat at center.
C. Repeat at right side of opening.
The frame height will be the smallest dimension less 5/8”. This allows 1/8” for subsill and a 1/4” caulk joint at the sill and head.

STEP 2.

Cut members to size.
A. Cut subsill to frame dimension plus 1/4”. The subsill at entrance locations butt tight against door jambs and is cut 1/8” longer than width of side lights on either side of door frame.*
B. Wall jambs and intermediate vertical mullions are cut to frame height.
C. Horizontal members are cut to D.L.O.
D. Snap-on glass stops are cut D.L.O. minus (-) 1/16”.

* Note: See Page 30 for subsill condition abutting door frame.

Abbreviations used within these instructions:
D.L.O. = Day Light Opening
D.O.W. = Door Opening Width
D.O.H. = Door Opening Height
C.O.C. = Concealed Overhead Closer
C.V.R. = Concealed Vertical Rod
Ø = Diameter
FRAME FABRICATION
Joinery Hole Locations

STEP 3.
Use DJ550 drill jig or FL550 Punch Die Set
with pocket adaptor for fabricating spline hole
locations in verticals.

Note: NG1 Gasket reglet
is always to exterior.

5/16" Ø Steel Attachment Hole

1/4"
2-1/2"
1/4"

Top of Horizontal

5/16" Ø Steel Attachment Hole

1/4"
2-1/2"
1/4"

1/4"
2
1/4"
2
1-1/4"
FRAME FABRICATION
Steel Reinforcement

STEP 4.
Fabricate steel reinforcement where required. Cut steel 1” less than length of vertical mullion. 
Note: AS38 hex head fastener location is below glass line and does not interfere with glazing.

STEEL REINFORCEMENT

Attach steel at top and bottom with AS38 fastener (1/4 - 20 x 3/8" HH Type “F” self tapping).

Steel attachment at Intermediate vertical and door jamb.

Caution: SR554 steel slide fits into FL554 vertical mullion.

Drill 7/32" Ø hole (#1 drill) as shown for AS38 (1/4-20 x 3/8” HH type “F” self tapping). Match drill holes in steel to FL554 vertical. Reference Step 3.

Alternate Steel Attachment Method
Snap fastener off flush with steel using vice grip pliers.

AS19 fastener
(#12 x 1 HWH #3 self drilling)
STEP 5.
Fabricate head and sill anchor holes as shown, using **FL550 Punch Die Set** or drill. Number of anchor holes required is based on substrate material conditions. Reference **CAP anchor charts**, (Pages 50-52) for number of anchor holes and locations for various substrates. First hole is always 2" from end. Each additional fastener hole is at required minimum spacing “A” between fasteners as shown in fastener charts.

**Note:** Removable glass stop at head facilitates glazing of large lites. (Reference Page 21)
**Note:** Anchor holes may be punched using **FL550 Punch Die Set**.

<table>
<thead>
<tr>
<th>DIMENSION “A”</th>
<th>Steel</th>
<th>4&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete</td>
<td>6&quot;</td>
<td></td>
</tr>
<tr>
<td>Wood</td>
<td>2&quot;</td>
<td></td>
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</table>

**HEAD FL501**

3/8" Ø hole

**ALTERNATE HEAD / SILL FL502**

3/8" Ø hole
STEP 6. Fabricate wall jamb for anchor holes, when required. Number of anchors required is dependent on mullion length and substrate material. Reference CAP Anchor Chart, (Pages 51-53).

Note: Anchor holes may be punched using FL550 Punch Die Set.

Compare charted anchor hole locations with intermediate horizontals dimensions on shop drawings. Should charted anchor holes be shown at same location as intermediate horizontal, then drill holes directly above or below horizontal to avoid fastener installation interference.

Note: Locate anchors as close to charted dimensions as possible.
FRAME FABRICATION
Subsill Flashing

STEP 7.
Fabricate FL519 subsill flashing for end dams and non-structural fastener holes. Hole location dimensions for non-structural fasteners in subsill are approximate.

1. Drill 3/16” dia. hole for non-structural fasteners used for temporarily attaching subsill to substrate as shown. Repeat this hole pattern for each additional 12’-0” of length or as required until structural fasteners are installed.

2. Drill two each 9/64” dia. holes (#25 drill) at each end (except end abutting at door jamb) for attaching ED519-1 end dams. Note: Subsill terminates at door jamb. Reference Page 29.
FRAME ASSEMBLY
Joinery Tape Application

STEP 1.

GLAZING TAPE INSTALLATION PROCEDURES:
Ref. Step 2 for location.

1. Cut SM5601 1/8" x 1/2" Tacky Tape approximately 2-3/4" long.
2. Clean surfaces where tape is to be applied with isopropyl alcohol or solvent to remove all dirt and cutting oils. Allow surface to dry before applying tape.
3. Position tape on vertical mullions at horizontal joint intersections, as shown on Page 14.
4. Just prior to frame assembly, remove protective cover and screw joints together.
5. Use a box knife to trim excess sealant tape where exposed. Do not pull tape to trim.

NG1 gasket reglet is always to exterior.

NG14 spacer gasket runs full length on verticals.

Schnee-Morehead SM5601 1/8" x 1/2" Tacky Tape.
CAPTURED FRAME ASSEMBLY
Vertical to Horizontal Joinery

STEP 2. Install **NG14** interior spacer gaskets into vertical and horizontal members prior to frame assembly. Cut spacer gaskets to D.L.O. dimensions.

**Note:** Shallow glazing pockets cannot face each other.

---

**FL555** (Deep Pocket)

**Anchor Hole(s)**
(Ref. page 10)

**FL551** Head

**FL553** Glass Stop

**FL556** Horizontal

**FL552** Inverted Horizontal
(Reference Page 21)

**FL554** (Shallow Pocket)

**NG14** Spacer Gasket

**FL552** Optional Head used with horizontal orientated as shown below.

**Exterior**
STEP 3.
ED519-1
End Dam

Apply SM-5601 Tacky Tape to end dams as shown and stick to the ends of subsill.

Note: Reference Page 29 for subsill abutting the door jamb where entrance doors occur.

ED519-1
End Dam

Match drill holes in subsill to end dam with #36 Ø drill. Attach with AS21 fasteners as shown.
FRAME INSTALLATION
Subsill Installation and Sealant Application

STEP 1.
Position fabricated subsill with end dams into opening. Center into opening allowing shim space at jambs. (See Page 29 for openings with entrance frames).

Shim tightly prior to panel installation.

Note: Apply Dow 995 sealant at “C” slot just prior to installing frame panels.

Dow 995 sealant

FL519 Subsill

Cap seal all fastener heads penetrating subsill flashing with Dow 995 sealant.

Shim beneath subsill to be a maximum of 1/4”. Attach subsill flashing to structure with non-structural fasteners using attachment holes shown on Page 12. Wedge shims tightly between end dams and jamb substrate at each end prior to installing frame panels. These shims prevent the end dams from being dislodged while frame panels are being installed. Completely seal end dams as shown.

Run a continuous bead of Dow 995 sealant along the full length of the subsill “C” slot as shown above just prior to installing frame panels. Do not allow sealant to harden prior to installing frame panels. Remove excess sealant after panels are installed.
SPECIAL CONDITIONS
SPLICE SLEEVE AT SUBSILL

STEP 1. Locate splice sleeves near center of D.L.O. at panel positioned over splice.

1/2"

SS519 Break Metal
Splice sleeve

Apply bond breaker tape to subsill and splice sleeve full length of joint and seal over it.

Seal full length of splice

A minimum 1/2" expansion joint is required every 24 ft.

To avoid a three side adhesion, apply bond breaker tape to outside of sleeve before installation.

FL519
FRAME INSTALLATION
Panelized Assembly

STEP 1.
Install assembled frame panels into opening starting with jamb and continue working toward the last bay. Reference illustrations shown below. Use option “A” or “B” as required. Caution: SR504 steel slide fits into FL554 and must be inserted and attached prior to installing panels.

Note: Make sure FL552 is positioned flush at bottom and not on an angle as shown in Detail “C”.

Note: Interior NG14 spacer gasket is omitted for clarity in these panel illustrations.
FRAME INSTALLATION
Panelized Frame Attachment to Substrate

STEP 2.
Shim beneath subsill as required at fasteners. Match drill holes through sill into substrate for perimeter fasteners. Match drill holes in head and wall jamb into substrate. Shim and anchor panels to substrate.

STEP 3.
Completely seal exterior and interior perimeter with a continuous bead of Dow 795 sealant.

CAUTION
Do Not Penetrate back of subsill flashing with a fastener

For D.L.O. heights 72" or greater, attach FL555 to FL554 at midpoint and 18" above and below midpoint with AS27 (#12 x 1-1/2" #3 PFH self drill) and snap off excess using pliers.
PREPARATION OF FRAME OPENING FOR GLASS

Note: Mark glass as shown with 1” long reference lines to ensure proper glass bite is achieved in vertical mullions.

1. Prepare the frame opening by removing all dirt and debris from the glazing pockets and gasket reglets.

2. SETTING BLOCKS
   Glass should be set on two identical setting blocks having a Shore A Durometer of 85 + or -5. The preferred location is at the 1/4 points.
   
   If the 1/4 point location causes excessive deflection of the intermediate horizontal, move the setting blocks equally towards the corners of the lite as far as the 1/8 points. The outer end of the block CANNOT be closer than 6” to the corner of the glass.

3. DEFLECTION
   The intermediate horizontal must not exceed 1/8” and a door header is limited to 1/16”. Check deadload charts for proper setting block locations.
1. Make sure NG14 spacer gaskets are installed.
2. Prepare frame openings for glass as instructed on Page 20 and install CS500-1 setting chairs in sill.
3. Glaze from bottom to top following the four step procedure shown.
4. Center glass into opening making sure proper glass penetration is achieved. Rest glass on setting blocks and press tightly against NG14 gasket.
5. Apply Dow 995 sealant to one end of WD300 Water Diverter and position at each end of horizontal, as shown, after glazing lower lites.

*Note: FL556 may be inverted to facilitate glazing large lites.
GLAZING

6. Continue glazing following the four step procedure.
7. Install FL553 hook-in glass stops as shown.
8. Prepare NG1 top load gaskets and install as instructed on Page 23.
9. Mask off glass and aluminum with 2" wide low adhesion masking tape. Fill cavity with Dow 995 sealant as shown, Detail “A” and tool. Remove masking tape immediately after installation of sealant and tooling. Take care not to damage or pull sealant from cavity when removing masking tape.

Non-Structural Fastener

Structural Fastener
(Ref. Anchor Charts, Pages 50-52)
INSTALLATION OF TOP LOAD GLAZING GASKETS

1. Cut NG1 gaskets a minimum of 3/16” longer per foot than aluminum extrusion.

2. Do not stretch gaskets to make them fit.

It is very important that gaskets are installed correctly as shown in Detail “A”, to prevent shrinkage at corners.

3. Lift NG1 exterior gaskets and pull back 2” in both directions at corner intersections & seal with DOW 795 silicone.
GLASS SIZE FORMULAS

Glass Sizes for FL550 System:

Glass Width and Height = D.L.O. + 1-1/8"

Note: Glass tolerances are not addressed in the above formula. Consult glass manufacturer for glass tolerances prior to ordering.
**TRANSOM GLASS SIZE FORMULA**

FT5 Frame for Offset Hung Door for Surface Closer

*(See Glazing for Glass Installation)*

Glass Height = D.L.O. +1-1/8"

Glass Width = Door Opening minus (-7/8")

3/8" Ø anchor typical

AS38 (1/4 - 20 x 3/8" HH Type “F” self tapping) for attaching SR504 optional steel when required. Locate 1 each at top and bottom. (Reference Page 9).

Transom Bar - Offset Hung Door for Surface Closer

AS39 (#8 x 2” FHPUC self drilling)

DS500-1 with NG5 weathering

AS18 (#10 x 1-1/4” FHP self drilling fastener) at vertical door stop. Holes are punched at factory.

Jamb at Wall

Intermediate Jamb with SR504 steel

Glass Width = Door Opening minus (-7/8")
TRANSOM GLASS SIZE FORMULA
FT5 Frame for Offset Hung Door with C.O.C.
(See Glazing for Glass Installation)

**Glass Height** = D.L.O. + 1-1/8"

**Transom Bar**
Offset Hung Door for C.O.C. with Offset Arm

**D101** for Series 281 Door

**AS29** (#8 x 2” FHP self drilling)
**AS18** (#10 x 1-1/4” FHP self drilling fastener) at vertical door stop

**Glass Width** = Door Opening minus (-7/8")

AS38 (1/4 - 20 x 3/8” HH Type “F” self tapping) for attaching SR504 optional steel when required. Locate 1 each at top and bottom. (Reference **Page 9**).
DS501-1 Door Stop
ATTACHMENT HOLE LOCATIONS
For 84” or 96” Door Height

ATTACHMENT HOLE LOCATIONS
For 84” or 96” Door Height

DS501 Door Stop
INSTALLATION

Caution: Do not attach DS501-1 until frame has been anchored to structure. See Anchor Charts (Pages 51-53).

Step 1: Install DS501 full length at header with AS39 (#10 x 1-3/4” FHPUC self drill) fasteners in factory punched holes.

Step 2: Tilt vertical door stop DS501 as shown in Detail “A” and push up into slot.

Step 3: Push DS501 in at bottom. Attach with AS18 (#10 x 1-1/4” self drill) fasteners in factory punched holes.

Step 4: Repeat on opposite side.

Detail A
DS202-1 Offset Arm Door Stop at Head and DS500-1 at Jambs
For 84” or 96” Door Height

**Detail A**

---

**Caution:** Do not attach until frame has been anchored to structure. See *Door Frame Anchor Charts* (Pages 51-53).

**Step 1:** Install full length at header with AS39 (#10 x 1-3/4” FHPUC self drill) fasteners in factory punched holes.

**Step 2:** Tilt vertical door stop as shown in *Detail “A”* and push up into slot.

**Step 3:** Push in at bottom. Attach with AS18 (#10 x 1-1/4” self drill) fasteners in factory punched holes.

**Step 4:** Repeat steps 2 and 3 on opposite side.
TYPICAL ASSEMBLY & INSTALLATION
For F5 or FT5 Door Frames

ASSEMBLY:

Note: See INSTALLATION, Item 1 below.

1. Verify opening size. Allow for 1/4" minimum sealant space at jambs and frame head.
2. Reduce frame transom height when required. Use drill jig for drilling spline hole locations for frame head.
3. Attach TH403 threshold clips to jambs using AS24 fasteners.
4. Assemble head and transom bar to jambs as shown.
5. Install FL567 sash with NG14 gasket in transom.

INSTALLATION:

1. Drill 3/8 Ø anchor holes in wall jamb and frame head as shown on Anchor Charts, (Pages 51-53), prior to assembly.
2. Set frame plumb and square into opening.
3. Anchor frame to substrate with fastener types as shown in anchor charts.
4. Attach DS500-1 door stop with NG5 weathering to jambs and transom bar or door header.
5. Position setting blocks in door header at quarter or eighth points as required and glaze transom. Glazing sash is required in transom. See details on Pages 25 and 26.
ENTRANCE DOOR FRAME INSTALLATION
With Subsill for Sidelights

When entrances occur, install entrance frames first. Subsill butts against door jamb(s). The subsill abutting the door jamb does not require an end dam.

Note: SR504 steel slide fits into FL504 and must be installed prior to installing door frame.

Note: Subsill sealant is applied after frame panels have been installed and anchored.

Note: Door jambs rest on finished floor Line.

Note: Cap Seal non-structural fastener.

Note: 1/4" shim removed for clarity.
F5 or FT5 FRAME with Transom - Butt Hung Door - for Surface Closer

Note: Attach jamb at wall to substrate prior to installing DS500-1 door stop. Reference Pages 50-52.
FLUSH BOLT & 3 PT. LOCK STRIKE LOCATIONS
F5 or FT5 Open Back Frame - Butt Hung Door -
For Surface or Concealed Overhead Closer

FL507 Header Fabrication Shown for Surface Closer.
FL562 Header Fabrication Similar for C.O.C.

Inactive Side

Active Side

Flush Bolt cut-out
3/4" x 17/32"

3-Pt. Lock cut-out
3/4" x 17/32"

Dimension to Center of Header & Threshold

29/32"

Active Side

Inactive Side

Locate anchor holes as shown in anchor charts.
See Pages 48-50.

3-Pt. Lock cut-out
3/4" x 17/32"

DP200-1
2" Long located at center of pair door opening.

3-Pt. Lock cut-out

3-Pt. Lock cut-out

3-Pt. Lock cut-out

R. H. shown, L.H. opposite

FL507

FL562

AS39

AS20 (#10-16 x 1/2" FHP S.D.)

TH4

Exterior

Exterior

Drill and countersink for #12 F.H. fasteners as shown on Anchor Charts.
STRIKE LOCATIONS
At Door Header and Threshold
For DH2086HR Concealed Panic
(Top and bottom strikes must be installed)

DH2086HR concealed panic device is factory installed in “Panic doors”.

Panic is shipped in dogged position and must be undogged. This can be done with the use of flat head screwdriver.

Note: FL507 header for surface closer shown. FL562 header for C.O.C. similar.
F5 or FT5 FRAME - OFFSET BUTT HUNG
DOOR - C.O.C. and Offset Arm

Note: FL512 is header for F5 frame

**FL567 FASTENER CHART**

<table>
<thead>
<tr>
<th>Spacing from end</th>
<th>Single Door</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3/4&quot;, 16-3/4&quot;, 33-1/2&quot;</td>
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<table>
<thead>
<tr>
<th>Spacing from each end</th>
<th>toward center</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pair</td>
<td>3/4&quot;, 16-3/4&quot;, 33-1/2&quot;</td>
</tr>
</tbody>
</table>

* Repeat this connection on opposite jamb for pair.

**HC100 Header mounting clip.**
Closer clip not shown but included in closer package. (See Hardware Installation and Page 34-36).

**AS3 (4)**
#12 - 24 x 1/2”

**AS16**
#14 x 1”
H.H.S.T.S.

**BP459**
Butt Hinge Back-Up Plate

**DH109**
Butt Hinge w/ AS3 (4) #12 - 24 x 1/2”

**AS29**
(#6 x 2” PFHUC self drilling)
See Page 27.

**DS202-1**
Applied door stop with NG5 weathering at head

**DS500-1**
Applied door stop with NG5 weathering

**Note:** FL512 is header for F5 frame.
FT5 FRAME WITH FL562 HEADER
for C.O.C. with Offset Arm

To mount closer into FL562 headers, a B3 1/2" x 1-1/2" flat bar is required.
For balance of header installation, see pages 32 through 37.

Secure closer mounting clip to header with (2) AS45 fasteners (#10-32 x 1-1/4" FH).

B3 1/2" x 1-1/2 x 4-3/8" Flat Bar

Type “A” Standard Clip
Closer mounting bracket
(included with closer)

(2) AS45 fasteners (#10-32 x 1-1/4" FH)

B3 1/2" x 1-1/2 x 4-3/8" Flat Bar

Closer type “A”
Mounting Clip

HC100 Mounting Clips

Header / Jamb for Single Door
Opposite end from closer

See Page 35 for clip location.

105° swing
for butt hung door
C.O.C. FOR BUTT HUNG DOOR
With 105° Swing for F5 or FT5 Frame

For door preparation and slide channel installation, see Pages 36-37.

1. Mount corner clip into header with (2) AS45 10-32 x 1-1/4" FHMS. See Page 35 for clip location.

2. Mount angle bracket to closer with (2) 1/4-20 x 1/2" Hex Head M.S. and washers.

3. Install (2) 1/4-20 x 1/2" Fillister Head M.S. with washers into lugs of closer. Do not tighten screws.

4. Set closer onto header and align angle bracket holes with holes in header. Closer lugs shall rest on corner bracket.

5. Fasten angle bracket to header with (2) 10-24 x 3/8" FHMS. Tighten Fillister Head screws.

6. Install cover plate and secure to angle with (2) #8-32 x 1" FHP.

7. Attach cover plate to closer at hinge side with (2) #8-32 x 1" FHMS fasteners included with cover plate.

8. Mount arm on spindle and secure with 1/4-20 x 7/8" Socket Head Cap Screw.

Note: Corner clips at jambs are attached prior to installing header.
HEADER FOR C.O.C. -
Butt Hung Door - with 105° Swing

FL562 Header Preparation

FL562 2” x 5” Header requires a B3 1/2” x 1-1/2” x 4-3/8” flat bar.

HEADER TOP VIEW
At Closer End

- Drill and countersink 82° for (2) #8 F.H.

(2) AS45 fasteners (#10-32 x 1-1/4” FH)

HC100 Mounting Clips

B3 1/2” x 1-1/2” x 4-3/8” Flat Bar

Concealed Overhead Closer

HEADER SIDE VIEW
At Closer End

- Drill and countersink 82° for (2) #8 F.H.

- Exterior edge

- 3-3/4” clearance hole

- 3-3/4”Dia. clearance hole

- 1-3/4”Dia. clearance slot

HEADER BOTTOM VIEW At Closer End

- 7/16” x 1-1/4” clearance slot

- 3/8” Dia. clearance hole

- Drill and countersink 82° for (4) #10 F.H.

DH117 12-1/2” cover plate

DUCT for a 105º swing

2” x 5” Header requires a B3 1/2” x 1-1/2” x 4-3/8” flat bar.
C.O.C. Closer Location
in FL562 Header for 105° Swing

SIDE VIEW OF HEADER AT CLOSER

FL562

1-7/16” C of fasteners for closer mounting

Concealed closer

FL562

3-3/4” C of spindle

SLIDE CHANNEL LOCATION IN DOOR TOP RAIL FOR OFFSET ARM

1-1/2” 6-7/16” 17-3/16” Slide channel and DB122-1 spacer

D102

7/16” Top Rail

3-7/8”

VIEW FROM INSIDE

OFF-SET ARM COVER CHANNEL
LEFT HAND SHOWN RIGHT HAND OPPOSITE

DS202-1

1-1/4” 16” Notch out

3/4”
BUTT HINGE DOOR WITH JACKSON C.O.C. FOR 105° SWING

For layout see Pages 35 and 36

1. Mount slide channel with (2) AS20 fasteners. Reverse side block if necessary (from 90° to 105°) for proper installation. See closer template.

2. Attach butt hinges to door. Install door by fastening hinges to frame. Backup plates for door and frame are factory installed.

3. Remove retainer ring from pin using retainer ring pliers. With door in open position, slip arm over slide pin and secure with retainer ring.

4. Adjust closer to desired door speed.

5. Attach DS202-1 to door header with AS29. Take care not to puncture door closer.
Butt hinge installation
Door and Frame

Prepare frame and door for hinges, as shown.

Back-up plates are factory installed in prepared doors and frames.

Install butt hinges in door.
Set door in place and fasten hinges to frame.

For butt hinge location, see Page 40.

(bp459)
Frame back-up plate

(bp450)
Door back-up plate

(4) AS3 (12-24 x 1/2 PFHUCMS) fasteners

Front view
Side view
Front view
Side view

Frame preparation
Door preparation
STANDARD DH109 BUTT HINGE LOCATION
For F5 Frame and Series 381 Door

Top of frame

Header Dimension

Top of door

6-1/8" (FOR 84" DOOR OPENING)

73-3/8" (FOR 84" DOOR OPENING)

9-11/16"

2-1/4"

Threshold

Door Jamb

Door Stile

3/16" clearance

1/8" clearance

3/16" clearance

1/2" clearance

4-1/2" Typ.

1/8" clearance

Equal

Equal

9-11/16"

72-11/16"

9"

Note: Reference Page 49 for other standard hardware locations.
Drill and countersink for #8 F.H. screw 4 places.

**DETAIL B**
Use BP380 combination Corner Plate/Flush Bolt guides at top and bottom

**DETAIL A**
Use DH176-96 for doors exceeding 84" in height

**DETAIL C**
Flush Bolt Cut Out

**Note:** Top flush bolt cut-out location for door opening height of 84" or less should be 10" from top of door stile. See **DETAIL A**.

1. Insert flush bolts through cut in nose of door stile and push latching rod through corner plate hole.
2. Attach top and bottom flush bolts with (2) #8-32 x 1/2" F. H. screws each.
3. Place each lever in the lock position.
4. Adjust flush bolt rods to extend 1/2" beyond ends of door stile. See **DETAIL B**.
5. Flip levers to retract both flush bolts.
Series 381 Doors
ATTACHMENT HOLE LOCATIONS
For CS501-1 Glass Stop Clip

1. Position DG501-1 with NG13 spacer gasket as instructed on Page 43.

2. Position CS501-1 clips as shown above and attach with AS7 fasteners. Reference Detail A on Page 43.
SERIES 381
DOOR GLAZING INSTRUCTIONS

1. Raise leveling screw to maximum retracted position.
2. DG501 glass stop may be installed on either interior or exterior side of door. It is recommended that DG501 be installed on the interior side of doors receiving panic devices to allow for re-glazing without removing the panic bars.
3. Determine side of door you desire to place DG501 and secure with CS501-1 anchor clips. Match drill holes in stop into door and attach as shown below in Detail "A" with AS7.
4. Position SB11 setting/side blocks in locations as shown.
5. Center glass into opening on setting blocks and align with side blocks.
6. Once the glass is in the correct position, lightly screw the glass jack down on top of the glass to create a uniform clearance between the top rail and header.
7. Adjust astragal screws for proper clearance between meeting stiles.
9. Roll NG1 gasket into DG502.
10. Mask off glass with 2" wide low adhesive masking tape and apply Dow 995 sealant into the cavity between the glass and DG501 glass stop. Remove masking tape immediately after installation of sealant taking care not to damage or pull sealant from the cavity.

NOTE: Use AS6 Leveling screw for D101 Top Rail.
INSTRUCTIONS FOR ATTACHING DH300 SERIES PUSH BAR WITH P1 INSERT TO DOOR

1. Slide P1 insert to right and left as illustrated and attach to door with assembly screws as shown.

2. After attaching push bar, slide P1 insert 1" - 1 1/2" toward the hinge stile and twist the insert 15° - 20° counter clockwise as shown. Then use a rubber mallet to tap the insert flush with end of PB1 bar.

   **Note:** Use smooth part of plier-bite to avoid scratching finish on insert.
1. Slide P1 insert down and attach pull handle to door as shown.

2. Move P1 insert up and install AS22 screw.

3. After attaching pull handle, slide P1 insert 1" - 1 1/2" toward the bottom of handle and twist the insert 15° - 20° counter clockwise as shown. Then tap the insert flush with end of PH1 handle using a rubber mallet.

Note: Use smooth part of plier-bite to avoid scratching finish on insert.
OFFSET HUNG DOOR HARDWARE SET
DH400 (OPTIONAL)

Set screw (4) at each pull handle
1/4-20 Shoulder screw (2) at each pull handle

PH401 Pull handle
Lock stile

AS12 Nutsert (4)

PB401 Push bar
Set screw (1) at each push bar
1/4-20 FH Screw

3.71/2" to bottom of door & bottom of pull handle
1/4-20 Shoulder screw (1) at each push bar

Hinge stile

Lock stile
CAPSTYLE TRADITIONAL

PULL HARDWARE SET FOR PANIC DOOR

DH40P (STANDARD FOR PANIC DOORS)

See Chart on Page 49.
Concealed panic device is factory installed with Hurricane-Impact rod guides.

Panic is shipped in dogged position and must be undogged. This can be done with the use of an allen wrench (supplied) or the cylinder key.

Dogging Instructions:
To dog: Depress panic bar, hold down and turn dogging key 1/4 clockwise.
To undog: Turn dogging key counterclockwise.

Installation Procedure
1. Hang door, as required. The clearance between top of door and bottom of header must not exceed 1/8”.
2. Undog panic.
3. Note: Panic devices are preset at the factory. Due to various field conditions, they may require minor adjustment.

Outside Key Functions
The DH2086HR panic is factory installed for key entry with dogging key option. To key dog device for continued outside entry, hold bar in fully depressed position and turn key approximately one quarter turn clockwise; then, return key to vertical position and remove. To lock door again, fully depress bar and turn key approximately one quarter turn counter clockwise; then return key to vertical position and remove.
STANDARD HARDWARE LOCATIONS
Series 381 and 281 Hurricane Impact-Resistant Doors

Series 281 doors are limited to a maximum size of 72" x 84" at +/- 65 p.s.f.

INTERMEDIATE HINGE

<table>
<thead>
<tr>
<th>D.O. HEIGHT</th>
<th>DIM. &quot;M&quot;</th>
<th>BUTT HUNG</th>
</tr>
</thead>
<tbody>
<tr>
<td>84&quot;</td>
<td>45-11/32&quot;</td>
<td>96&quot;</td>
</tr>
<tr>
<td>96&quot;</td>
<td>51-11/32&quot;</td>
<td></td>
</tr>
</tbody>
</table>

Note: All doors require an intermediate hinge.

HARDWARE LOCATIONS FOR PANIC DOORS

<table>
<thead>
<tr>
<th>MANUFACTURER</th>
<th>PANIC DEVICE</th>
<th>DIM &quot;X&quot;</th>
<th>DIM &quot;Y&quot;</th>
<th>DIM &quot;Z&quot;</th>
<th>TOP OF PULL</th>
</tr>
</thead>
<tbody>
<tr>
<td>JACKSON</td>
<td>2086 C.V.R.</td>
<td>37 - 7/8&quot;</td>
<td>38 - 5/32&quot;</td>
<td>42 - 7/8&quot;</td>
<td></td>
</tr>
</tbody>
</table>

Note: Dimensions and part numbers are provided for standard hardware locations, lock & flush bolt.

PART NO. | DESCRIPTION                                      | DIM. "FB" |
----------|--------------------------------------------------|-----------|
DH176-96  | TOP FLUSH BOLT (FOR 96" DOOR)                    | 22"       |
DH176     | TOP FLUSH BOLT (FOR 84" DOOR)                    | 10"       |
DH176     | BOTTOM FLUSH BOLT (FOR 84" / 96" DOOR)           | 10"       |
PERIMETER FASTENER LOCATIONS

TYPICAL INSTALLATION INTO:
CONCRETE SUBSTRATE MIN. 2,500 P.S.I.

<table>
<thead>
<tr>
<th>DOOR OPENING HEIGHT</th>
<th>&quot;A&quot;</th>
<th>&quot;B&quot;</th>
<th>&quot;C&quot;</th>
<th>&quot;D&quot;</th>
<th>&quot;E&quot;</th>
<th>&quot;F&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>84&quot;</td>
<td>45&quot;</td>
<td>51&quot;</td>
<td>76&quot;</td>
<td>82&quot;</td>
<td>89&quot;</td>
<td>95&quot;</td>
</tr>
<tr>
<td>96&quot;</td>
<td>45&quot;</td>
<td>51&quot;</td>
<td>88&quot;</td>
<td>94&quot;</td>
<td>100&quot;</td>
<td>106&quot;</td>
</tr>
</tbody>
</table>

PERIMETER FASTENER LOCATIONS

TYPICAL INSTALLATION INTO:
2,500 PSI CONCRETE SUBSTRATE

- EMBEDMENT WITH FULL LENGTH OF MULLION
- 3/8" x 2 1/2" LDT, 2" MIN. EMBEDMENT
- 1/4" x 2 1/2" SFH TAPCON, 1 3/4" MIN. EMBEDMENT
- 6" MIN. SPACING @ 3/8" TAPCON
- 3" MIN. SPACING @ 1/4" TAPCON

MAX. DESIGN PRESSURE
+70/80 P.S.F.

NOTES:
Δ = STRUCTURAL FASTENERS NOT REQUIRED AT THRESHOLD.

LEGEND:
Each line represents one fastener.
PERIMETER FASTENER LOCATIONS

TYPICAL INSTALLATION INTO:
1/4" MIN. THICK STEEL SUBSTRATE

PERIMETER FASTENER LOCATIONS

TYPICAL INSTALLATION INTO:
STEEL SUBSTRATE

MAX. DESIGN PRESSURE:
+70/80PS.F.

TYPICAL INSTALLATION INTO:
STEEL SUBSTRATE

- FILLER PLATE FULL LENGTH OF MILLION
- 3/8"-16 X 1 1/2" PAN TYPE "F" TCS SCREW
- 1/4"-12 X 1 1/2" FRH #3 TEK SCREW 2" MIN SPACING

NOTES:
Δ = STRUCTURAL FASTENERS NOT REQUIRED AT THRESHOLD.

LEGEND
Each Line Represents One Fastener

January 2013
52 • FL550-HR Stormfront (Series 381/281 Entrance Doors • FL550 Frames)
PERIMETER FASTENER LOCATIONS

TYPICAL INSTALLATION INTO:
MIN. #2 SYP WOOD SUBSTRATE

<table>
<thead>
<tr>
<th>DOOR OPENING HEIGHT</th>
<th>ANCHOR LOCATIONS FOR &quot;LETTER&quot; DIM.</th>
</tr>
</thead>
<tbody>
<tr>
<td>84&quot;</td>
<td>&quot;A&quot; 45° 48° 51° 78° 80° 83° 85° 91° 93°</td>
</tr>
<tr>
<td>96&quot;</td>
<td>&quot;A&quot; 45° 48° 51° 90° 92° 94° 100° 102° 104°</td>
</tr>
</tbody>
</table>

TYPICAL INSTALLATION INTO:
WOOD SUBSTRATE

- 3/8" LAG BOLT WITH FILLER PLATE
  - FULL LENGTH, 3" MIN. EMBEDMENT
- 3/8" X 3-1/2" LAG BOLT, 3" MIN. EMBEDMENT
- #14 X 2-1/2" WOOD SCREW

EDGE DISTANCE 1 1/2", MIN. SPACING IS 2";
WOOD STRUCTURE IS MIN. #2 SYP

MAX. DESIGN PRESSURE:
+70/80 P.S.F.

NOTES:
Δ = STRUCTURAL FASTENERS
NOT REQUIRED AT THRESHOLD.

LEGEND:
- EACH LINE REPRESENTS ONE FASTENER
PERIMETER FASTENER LOCATIONS

TYPICAL ATTACHMENT TO: WOOD/STEEL/CONCRETE SUBSTRATE

BASED ON 2500 P.S.I. CONCRETE

HEAD / SILL
@ WOOD SUBSTRATE
3/8" x 3-1/2" LONG LAG BOLTS TYP. @ WOOD WITH 3" MIN. EMBEDMENT. LOCATE FIRST ANCHOR 2" FROM EDGE OF MULLION AND ADDITIONAL FASTENERS @2" MIN. SPACING BETWEEN ANCHORS.

HEAD / SILL
@ STEEL SUBSTRATE
3/8" -16 x 1-1/2" HWH TYPE "F" TCS TYP. @ STEEL. LOCATE FIRST ANCHOR 2" FROM EDGE OF MULLION.

WALL JAMB
@ CONCRETE SUBSTRATE
LOCATE (1) EA. 3" ABOVE AND BELOW MIDPOINT: 3/8" X 2-1/2" LONG LDT TYP. @ CONCRETE WITH 2" MIN. EMBEDMENT.

OR
STEEL SUBSTRATE
LOCATE (1) EA. 1-1/2" ABOVE AND BELOW MIDPOINT: 3/8" -16 x 1-1/2" HWH TYPE "F" TCS TYP. @STEEL 2" MIN. SPACING BETWEEN ANCHORS

OR
WOOD SUBSTRATE
LOCATE (1) EA. @ MIDPOINT AND (2) EA. ABOVE AND BELOW MIDPOINT: 3/8" X 3-1/2" LONG LAG BOLTS TYP. @ WOOD. 3" MIN. EMBEDMENT, 2" MIN SPACING BETWEEN ANCHORS.

SILL / HEAD
@ CONCRETE SUBSTRATE
3/8" x 2-1/2" LONG LDT TYPICAL @ CONCRETE WITH 2" MIN. EMBEDMENT. LOCATE ANCHOR 2" FROM EDGE OF MULLION.

TYPICAL ELEVATION HEAVY ALUM. MULLION WITHOUT STEEL
- LONG SPAN -
PERIMETER FASTENER LOCATIONS

TYPICAL ATTACHMENT TO:
WOOD/STEEL/CONCRETE SUBSTRATE

BASED ON 2500 P.S.I. CONCRETE

HEAD / SILL

@ WOOD SUBSTRATE

3/8" x 3-1/2" LONG LAC BOLTS TYP. @ WOOD WITH
3" MIN. EMBEDMENT. LOCATE
FIRST ANCHOR 2" FROM EDGE
OF MULLION AND ADDITIONAL
FASTENERS @ 2" MIN.
SPACING BETWEEN ANCHORS.

@ CONCRETE SUBSTRATE

3/8" x 2-1/2" LONG L.D.T
TYPICAL @ CONCRETE WITH
2" EMBEDMENT. LOCATE
FIRST ANCHOR 2" FROM
EDGE OF MULLION.

HEAD / SILL

@ STEEL SUBSTRATE

3/8" -16 x 1-1/2" HWH
TYPE "F" TCS TYP. @ STEEL.
LOCATE FIRST ANCHOR 2"
FROM EDGE OF MULLION.

TYPICAL ELEVATION LIGHT ALUM. MULLION WITHOUT STEEL REINFORCEMENT
-SHORT SPAN-

LEGEND

\[ \text{EACH LINE REPRESENTS ONE FASTENER} \]

NOTE: WOOD STRUCTURE: MIN. #2 SYP.

DESIGN PRESSURE
+60/-65 PSF