Project Name: Decatur Police Department Training Facility

Building Use: Occupancy Classification “B” Business. The building has two use areas. One half of the building is table and chair instruction, the other half is for video training. At times, video training requires a patrol vehicle inside this half of the building (at rollup door bay side).

General Information: Enclose an existing 50’x40’, 2000 square foot, open-sided pre-engineered metal building. Pre-engineered metal building was provided by:

Big Bee Steel Buildings, Inc.
P.O. Box 2314
Muscle Shoals, AL 35662
256-383-7322
Job Number 11052

Included with this package are the plans and material list for the existing Big Bee PEMB. Provide Big Bee Steel Buildings, Inc. (or equal) metal building components to provide an enclosed building. Provide R-13 insulation in PEMB exterior walls. Interior finish of enclosing walls to have ½” wall board on wood or metal studs – floor to ceiling wall board. Provide R-13 fiberglass batt insulation in wood or metal studs. Tape and sand smooth wall board. Primer coat + two top coats latex paint. Owner selected color.

The existing roof is not insulated. Clean underside of existing roof deck. Paint underside of roof deck. Owner selected color. Cover existing roof panels with fluted insulation, R-20 polyisocyanurate insulation, and 50 mil PVC thermoplastic membrane. See specifications.

Portions of interior exposed PEMB: Clean and paint. Owner selected color.

Interior partition (at column line #2 of existing PEMB) wall may be constructed of metal or wood (2”x6”) framing materials. Use recognized and current industry standard span tables for structural member section. Provide sound deadening fiberglass unfaced batt insulation. Finish wall with ½’ wallboard on both sides, tape and sand smooth joints. Primer + two topcoats of latex paint, owner selected color. Provide a minimum of two anchors to slab at each wall section – anchor similar to Simpson Titen HD Heavy-Duty Screw Anchor 5⁄8” x 8” #THDB62800HMG. Attach framing along clear-span beam.

Pre-construction meeting required. Topics: site access, work schedule, Q&A.

ALTERNATE #1: Six course 4” split face block on exterior. All four sides. Split-face CMU (color to match existing tower building onsite), 4”x8”x16” CMU with solid concrete or clay brick rollock sill with mitered corners with thru-wall flashing. Provide thru-wall flashing at bottom of first course watertight (*) provide 20-gauge GALV flashing installed behind house wrap — NOTE Drop Edge at Slab – drop 1”.
Masonry ties at 32” on-center horizontal, and vertical masonry ties.
(*): Slab does not have a drop ledge for CMU. Provide details for watertight materials.

ALTERNATE #2 Epoxy Coat Floor: See details below.

Life/Safety Information: Building does not require fire alarm or fire sprinklers. Use 2009 International Building Code. Provide exit signage at personnel doors and emergency illumination.

Steel Doors: Provide 3'0" egress doors. Egress doors must have interior exit sign with emergency illumination. The exterior side of egress doors must have emergency illumination.

- Provide new concrete landing at EAST door. Landing shall have minimum width of the door and 48" in the travel distance. Landing shall be sloped ¼"/foot away from door for drainage.
- Provide accessible hardware for all doors.
- 1-3/4" thick insulted flush panel insulated metal door with hinge and closer reinforcement, and flush top and bottom channel.
- 3 Butt Hinges
- 3 Silencers
- 1 dead bolt. Key outside only, thumb interior. With plate.
- All locks keyed the same.
- Weatherstripping for exterior use.
- Surface mounted closer.
- Lever handle hardware.

Steel door face skins shall be minimum 18 gauge.

Store Front Entrance Door (Door swing to exterior):
Similar to Kawneer Series 350, double 3'0" doors, single acting.
With Transom
Deadbolt – all locks keyed the same.
Surface mounted closer.
Weatherstripping for exterior use.
Push/Pull bars.
Flush bolts in the inactive leaf.
U-factor and glazing to 2009 International Energy Conservation Code.

Exterior Garage Door: 16'x9' Amarr 2412 Insulated commercial door with NO vision lights, with follow the roof-line track, with a Liftmaster ATSW motor with two remotes and keyless entry, installed (jobsite check verifying follow roofline will work).

- Heavy duty 2" ribbed panel steel sectional door.
- Exterior 24-gauge, Color: White
- Vinyl-Coated Polystyrene insulation, R-7.0.
- Equal products accepted with owner approved cut-sheets.

Interior Wall Finish: Full height – floor to roof deck, ½" gypsum wallboard, taped and sanded smooth joints. Prime and coat with two coats of latex paint. Color selected by owner.

Ceiling Finish: Exposed metal roof panels. Clean underside of existing roof deck. Paint underside of roof deck. Owner selected color.

PEMB Frame: Clean building frame and paint. Owner selected color.

Exterior: See Plans. Provide new gutters for enclosed building and existing restroom building. Provide new roof for existing restroom building. Flash existing restroom building to new enclosed building.

Electrical: 2008 National Electric Code for installation and wiring methods. Electrical Service is onsite, see plans for photos. Adjacent restroom building has an exterior 200 ampere, single phase panel. See plans for receptacle layout. Provide three-way switching at store front door and side door for overhead lighting in both areas. Interior partition wall divides overhead lights into two separate groups. Each group shall be switched independently by three-way switch. Each group has separate dimmer control.

Lighting Fixtures: Provide Nicor HBL3 series (or equal to), model HBL3110UNV50K
5000K color temperature
>80 CRI

0–10-volt dimmer control circuit
Minimum of 49-foot candles at floor level
Mounted at 12 to 15 feet above finished floor. Hang level by chain and strut from sloped ceiling. MC wiring method to fixture.
See plans for switching.
Receptacles: space 12 feet apart along exterior wall. Both sides of interior partition at each wall section. Wall sections equal to or greater than 2 feet in length shall have receptacle.
Exterior Lighting Fixtures: Simular to Litelume Wallpack LL-WPL-125-50-UNV-BZ, 125 watt LED floodlight. Provide two fixtures facing EAST at east corners. Snap switch controlled at East door (video training side of building).

Mechanical:
4 each 24,000 BTU/hr. single zone DX mini split. Low Temperature heat pump.
Similar to Fujitsu 24RLXWH heat pump.
Mount condenser on concrete pad.

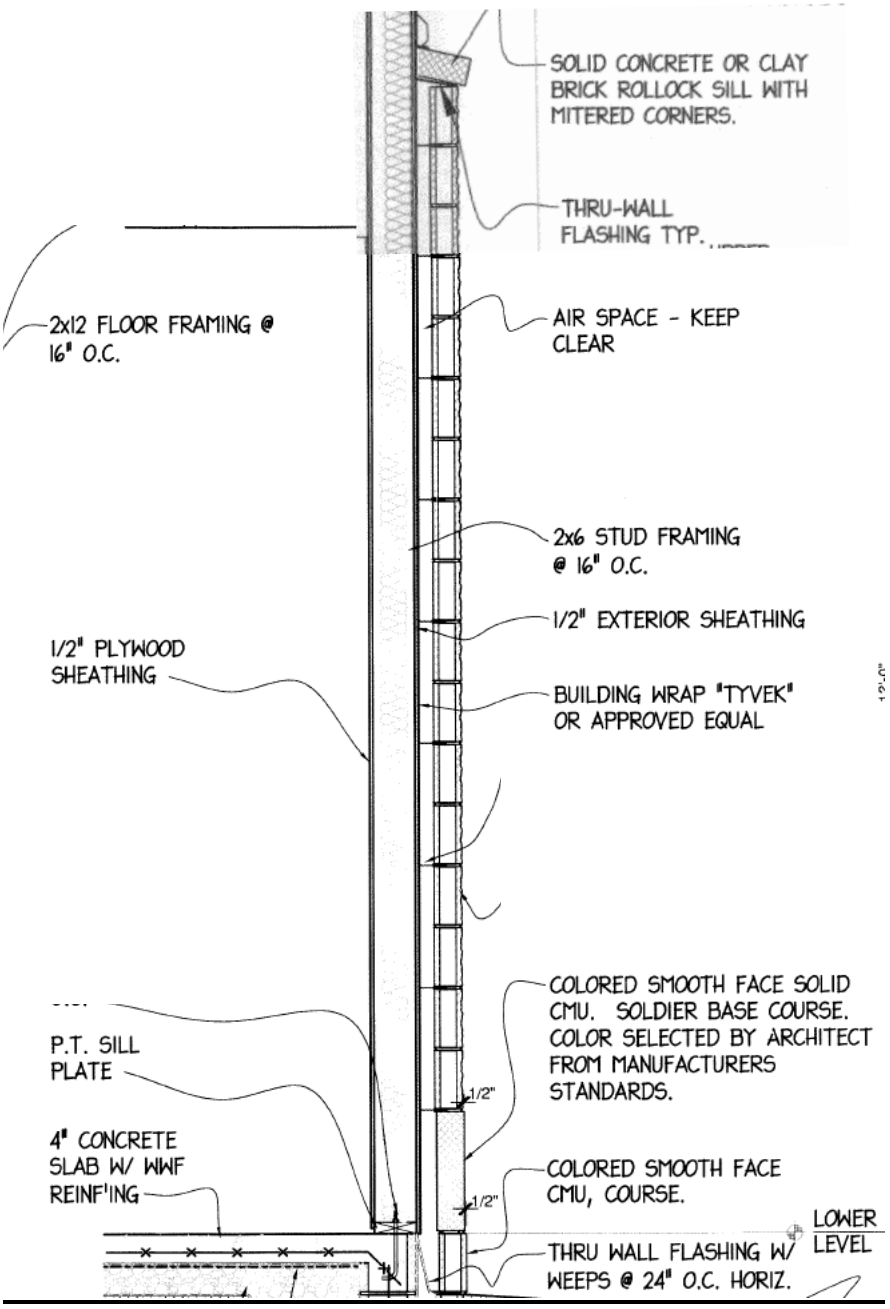
120v GFCI receptacle at each exterior compressor with in-use cover.

Provide 1000 cfm exhaust fan in louver with damper. Mount as high as possible in video training side of building (east side). Provide lower louver with interlocked damper.

WINDOWS:
2009 International Energy Conservation Code compliant.
1” insulated tinted glass in bronze anodized aluminum frames. Storefront vendor.

ALTERNATE #1 EXTERIOR WALL SECTION:

Below is not to scale and is for details and information. Alternate #1 is to provide six courses high split-face CMU on building exterior.
>>> Slab does not have a drop ledge for CMU. Provide details in bid for watertight materials.
>>>> See plans for flashing details.



ALTERNATE #2 Epoxy Coat Floor:

Sherwin Williams ARMORSEAL 1000 HS (or equal) is a high solids, heavy duty, two-component,
catalyzed, polyamide epoxy coating formulated for demanding marine and industrial requirements. Dries rapidly to a tough, high gloss fi nish with excellent resistance to alkalies, abrasion, corrosion, and chemical attack.

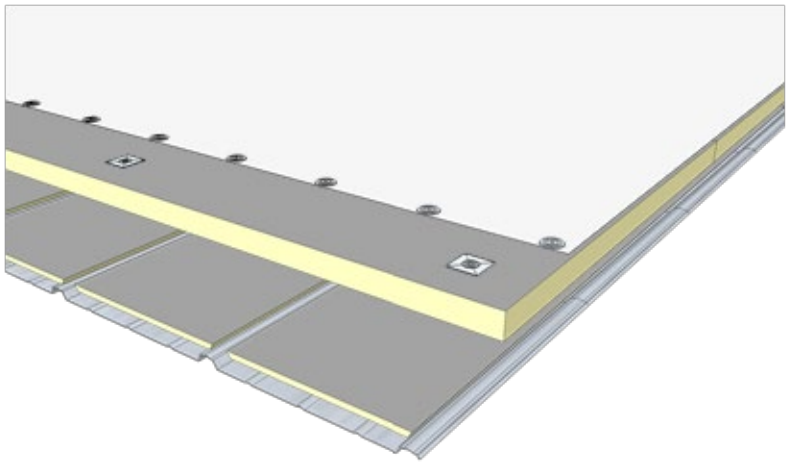
OR

Sherwin Williams RESUFLOR 3746 High Performance Epoxy (or equal) is a two-component, recoatable epoxy and binder resin. It may be used directly over primed substrates, or as a gloss seal coat over decorative slurry and mortar systems. Resufl or 3746 is extremely hard wearing, chemical, impact and abrasion resistant.

Color selected by owner.
Closely follow manufanctures installation manual.
Two products are specified, both are considered equal products – use product that will meet project schedule. Equals will be concidered.

Reroof for Decatur Police Department Tactical Training Facility

North Seneca Drive
Trinity, AL 35673



Roof Assembly Description

- **PVC thermoplastic membrane**
  Membrane Thickness: 50 mil, nominal
  Color: White
  Attachment: Attached with mechanical fasteners
- **Polyisocyanurate (flat)**
  Attachment: Attached with mechanical fasteners
- **Polyisocyanurate (Flute Filler)**
  Attachment: Loosely laid
- **Existing Metal Roof**
- **Total Insulation Value to be R-20.**

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Overlay existing metal roof.

B. PVC thermoplastic membrane attached with mechanical fasteners.

C. Polyisocyanurate (flat), attached with mechanical fasteners.

D. Polyisocyanurate (Flute Filler), loosely laid.

E. Prefabricated flashings, corners, parapets, stacks, vents, and related details.

F. Fasteners, adhesives, and other accessories required for a complete roofing installation.

G. Traffic Protection.

1.2 REFERENCES

A. NRCA - The NRCA Roofing and Waterproofing Manual.

B. ASCE 7 - Minimum Design Loads For Buildings And Other Structures.

C. UL - Roofing Materials and Systems Directory, Roofing Systems (TGFU.R10128).

D. ASTM C 1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.

E. ASTM D 751 - Standard Test Methods for Coated Fabrics.

F. ASTM D 4434 - Standard Specification for Poly(Vinyl Chloride) Sheet Roofing.

G. ASTM E 108 - Standard Test Methods for Fire Tests of Roof Coverings.

H. ASTM E 119 - Standard Test Methods for Fire Tests of Building Construction and Materials.

1.3 SYSTEM DESCRIPTION

A. General: Provide installed roofing membrane and base flashings that remain watertight; do not permit the passage of water; and resist specified uplift pressures, thermally induced movement, and exposure to weather without failure.

B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by roofing membrane manufacturer based on testing and field experience.

C. Sustainability:

   a. Conform to NSF/ANSI Standard 347, “Sustainability Assessment for Single-Ply Roofing Membranes. Minimum certification level: Gold.

   b. Type III product-specific Environmental Product Declaration.

   c. Membrane is recyclable at end of use.

D. Physical Properties:

   1. Roof product must meet the requirements of Type III PVC sheet roofing as defined by ASTM D 4434 and must meet or exceed the following physical properties.

   2. Thickness: 50 mil, nominal, in accordance with ASTM D 751.

   3. Thickness Over Scrim: ≥ 26 mil in accordance with ASTM D 751.

4. Breaking Strengths: ≥ 423 lbf. (MD) and ≥ 278 lbf. (XMD) in accordance with ASTM D 751, Grab Method.
5. Elongation at Break: ≥ 31% (MD) and ≥ 30% (XMD) in accordance with ASTM D 751, Grab Method.
6. Heat Aging in accordance with ASTM D 3045: 176 °F for 56 days. No sign of cracking, chipping or crazing. (In accordance with ASTM D 4434).
7. Factory Seam Strength: ≥ 423 lbf. in accordance with ASTM D 751, Grab Method.
8. Tearing Strength: ≥ 90 lbf. (MD) and ≥ 143 lbf. (XMD) in accordance with ASTM D 751, Procedure B.
9. Low Temperature Bend (Flexibility): Pass at -40 °F in accordance with ASTM D 2136.
10. Accelerated Weathering: No cracking, checking, crazing, erosion or chalking after 5,000 hours in accordance with ASTM G 154.
11. Linear Dimensional Change: < 0.20% (MD) and 0.10% (XMD) in accordance with ASTM D 1204 at 176 ± 2 °F for 6 hours.
12. Water Absorption: < 2.60% in accordance with ASTM D 570 at 158 °F for 166 hours.
13. Static Puncture Resistance: ≥ 33 lbs. in accordance with ASTM D 5602.
14. Dynamic Puncture Resistance: ≥ 14.7 ft-lbf. in accordance with ASTM D 5635.

E. Cool Roof Rating Council (CRRC):
   1. Membrane must be listed on CRRC website.
      a. Initial Solar Reflectance: ≥ 85%
      b. Initial Thermal Emittance: ≥ 89%
      c. Initial Solar Reflective Index (SRI): ≥ 108

F. Insulation
   1. Provide overall thermal resistance for roofing system as follows:
   a. Minimum R-value: 30.
   2. Install using a minimum of two layers.
   3. Configuration as indicated on the Drawings.

1.4 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.

4. Maintenance requirements.

C. Sustainability Documentation:

a. NSF/ANSI Standard 347 Certificate.

b. Type III product-specific Environmental Product Declaration.

D. Shop Drawings: Indicate insulation pattern, overall membrane layout, field seam locations, joint or termination detail conditions, and location of fasteners.

E. Verification Samples: For each product specified, two samples, representing actual product, color, and finish.

1. 4 inch by 6 inch sample of roofing membrane, of color specified.

~~2. 4 inch by 6 inch sample of walkway pad.~~

3. Termination bar, fascia bar with cover, drip edge.

4. Each fastener type to be used for installing membrane, insulation/recover board, termination bar and edge details.

F. Installer Certification: Certification from the roofing system manufacturer that Installer is approved, authorized, or licensed by manufacturer to install roofing system.

G. Manufacturer's warranties.

1.5 QUALITY ASSURANCE

A. Perform work in accordance with manufacturer's installation instructions.

B. Manufacturer Qualifications: A manufacturer specializing in the production of PVC membranes systems and utilizing a Quality Control Manual during the production of the membrane roofing system that has been approved by and is inspected by Underwriters Laboratories.

C. Installer Qualifications: Company specializing in installation of roofing systems similar to those specified in this project and approved by the roofing system manufacturer.

D. Source Limitations: Obtain components for membrane roofing system from roofing membrane manufacturer.

E. There shall be no deviations from the roof membrane manufacturer's specifications or the approved shop drawings without the prior written approval of the manufacturer.

1.6 REGULATORY REQUIREMENTS

A. Conform to applicable code for roof assembly wind uplift and fire hazard requirements.

B. Fire Exposure: Provide membrane roofing materials with the following fire-test-response characteristics. Materials shall be identified with appropriate markings of applicable testing and inspecting agency.

1. Exterior Fire-Test Exposure:

a. Class A; ASTM E 108, for application and roof slopes indicated.

2. Fire-Resistance Ratings: Comply with ASTM E 119 for fire-resistance-rated roof assemblies of which roofing system is a part.
3. Conform to applicable code for roof assembly fire hazard requirements.

C. Conform to 2009 IECC (International Energy Conservation Code).

D. Wind Uplift:

1. Roofing System Design: Provide a roofing system designed to resist uplift pressures calculated according to the current edition of the ASCE-7 Specification *Minimum Design Loads for Buildings And Other Structures*. 90 MPH/hr. 3-second gust.

1.7 PRE-INSTALLATION MEETING

A. Convene meeting not less than one week before starting work of this section.

B. Review methods and procedures related to roof deck construction and roofing system including, but not limited to, the following.

1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing installer, roofing system manufacturer's representative, deck installer, and installers whose work interfaces with or affects roofing including installers of roof accessories and roof-mounted equipment.
2. Review and finalize construction schedule and verify availability of materials, installer's personnel, equipment, and facilities needed to make progress and avoid delays.
3. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
4. Review structural loading limitations of roof deck during and after roofing.
5. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
6. Review governing regulations and requirements for insurance and certificates if applicable.
7. Review temporary protection requirements for roofing system during and after installation.
8. Review roof observation and repair procedures after roofing installation.

1.8 DELIVERY, STORAGE AND HANDLING

A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, and directions for storing and mixing with other components.

B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.

C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.

D. Store roof materials and place equipment in a manner to avoid permanent deflection of deck.

E. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.9 WARRANTY

A. Contractor's Warranty: The contractor shall warrant the roof application with respect to workmanship and proper application for two (2) years from the effective date of the warranty issued by the manufacturer.

B. Manufacturer's Warranty: Must be no-dollar limit type and provide for completion of repairs, replacement of membrane or total replacement of the roofing system at the then-current material and labor prices throughout the life of the warranty. In addition the warranty must meet the following criteria:

1. Warranty Period: 15 years from date issued by the manufacturer.
2. No exclusion for damage caused by ponding water.
3. Issued direct from and serviced by the roof membrane manufacturer.
4. Transferable for the full term of the warranty.
5. No additional charge for the warranty.

PART 2 PRODUCTS

2.1 MANUFACTURER

A. All roofing system components to be provided or approved by roof system manufacturer.

B. Acceptable Manufacturers:

1. Duro-Last, Inc.
2. Approved Equal
3.

2.2 ROOFING SYSTEM COMPONENTS

A. Roofing Membrane: PVC thermoplastic membrane conforming to ASTM D 4434, type III, fabric-reinforced, PVC. Membrane properties as follows:

1. Thickness:
    a. 50 mil, nominal.
2. Exposed Face Color:
    a. White.

B. Minimum NSF 347 Gold certified.

C. Accessory Materials: Provide accessory materials supplied by or approved for use by roof system manufacturer

1. Sheet Flashing: Manufacturer's standard reinforced PVC sheet flashing.
2. Factory Prefabricated Flashings: manufactured using Manufacturer's standard reinforced PVC membrane.
    a. Stack Flashings.
    b. Curb Flashings.
    c. Inside and Outside Corners.

3. Sealants and Adhesives: Compatible with roofing system and supplied by roof system manufacturer.
    a. Caulk.
    b. Strip Mastic.
4. Slip Sheet: Compatible with roofing system and supplied by roof system manufacturer.
5. Fasteners and Plates: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening membrane and insulation to substrate. Supplied by roof system manufacturer.
    a. #14 Heavy Duty Fasteners.
    b. Steel Membrane Plates.
    c. 3 inch Metal Plates.
6. PV Anchors
7. Termination and Edge Details: Supplied by roof system manufacturer.
    a. Termination Bar.
    b. Vinyl Drip Edge.
8. Vinyl Coated Metal: 24 gauge, hot-dipped galvanized, grade 90 metal with a minimum of 17 mil of PVC roofing membrane laminated to one side.
9. Two-Way Roof Vents: Supplied by roof system manufacturer. Install a minimum of 1 vent for each 1,000 ft² (93 m²) of roof area.

D. Walkways:
1. Provide non-skid, maintenance-free walkway pads in areas of heavy foot traffic and around mechanical equipment.
    a. Walkway Pad.

2.3 ROOF INSULATION

A. General:
1. Provide preformed roof insulation boards that comply with requirements and referenced standards, as selected from manufacturer's standard sizes.
2. Provide preformed saddles, crickets, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.

B. Polyisocyanurate Board Insulation: Complying with ASTM C 1289, Type II, felt or glass-fiber mat facer on both major surfaces. Material as supplied by roof system manufacturer.
1. Polyisocyanurate (flat).

C. Flute Filler: Material as supplied by roof system manufacturer.
1. Provide precut insulation to fill the flutes between the ribs of the metal roof.
    a. Polyisocyanurate Insulation.

2.4 ROOF INSULATION ACCESSORIES

A. General: Provide roof insulation accessories approved by the roof membrane manufacturer and as recommended by insulation manufacturer for the intended use.

B. Fasteners: Provide factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening insulation and/or insulation cover boards in conformance to specified design requirements.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that the surfaces and site conditions are ready to receive work.

B. Verify that the deck is supported and secured.

C. Verify that the deck is clean and smooth, free of depressions, waves, or projections, and properly sloped to drains, valleys, eaves, scuppers or gutters.

D. Verify that the deck surfaces are dry and free of standing water, ice or snow.

E. Verify that all roof openings or penetrations through the roof are solidly set.

F. If substrate preparation is the responsibility of another contractor, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Surfaces shall be clean, smooth, free of fins, sharp edges, loose and foreign material, oil, grease, and bitumen.

3.3 INSTALLATION

A. Install insulation in accordance with the roof manufacturer's requirements.

B. Insulation: Polyisocyanurate (flat).

1. Install insulation in accordance with the roof manufacturer’s requirements.
2. Insulation shall be adequately supported to sustain normal foot traffic without damage.
3. Where field trimmed, insulation shall be fitted tightly around roof protrusions with no gaps greater than ¼ inch.
4. No more insulation shall be applied than can be covered with the roof membrane by the end of the day or the onset of inclement weather.
5. If more than one layer of insulation is used, all joints between subsequent layers shall be offset by at least 6 inches.
6. Mechanical Attachment: Use only fasteners, stress plates and fastening patterns accepted for use by the roof manufacturer. Fastening patterns must meet applicable design requirements.
    a. Install fasteners in accordance with the roof manufacturer’s requirements. Fasteners that are improperly installed must be replaced or corrected.
7. Mechanically attach Polyisocyanurate (flat) insulation boards in parallel courses with end joints staggered 50% and adjacent boards butted together with no gaps greater than ¼ inch.

C. Roof Membrane: 50 mil, nominal, PVC thermoplastic membrane.

1. Use only fasteners, stress plates and fastening patterns accepted for use by the roof

manufacturer. Fastening patterns must meet the applicable design requirements.

2. Install fasteners in accordance with the roof manufacturer's requirements. Fasteners that are improperly installed shall be replaced or corrected.
3. Mechanically fasten membrane to the structural deck utilizing fasteners and fastening patterns that in accordance with the roof manufacturer's requirements.
4. Cut membrane to fit neatly around all penetrations and roof projections.
5. Unroll roofing membrane and positioned with a minimum 6 inch overlap.

D. Seaming:

1. Weld overlapping sheets together using hot air. Minimum weld width is 1-1/2 inches.
2. Check field welded seams for continuity and integrity and repair all imperfections by the end of each work day.

E. Membrane Termination/Securement: All membrane terminations shall be completed in accordance with the membrane manufacturer's requirements.

1. Provide securement at all membrane terminations at the perimeter of each roof level, roof section, curb flashing, skylight, expansion joint, interior wall, penthouse, and other similar condition.
2. Provide securement at any angle change where the slope or combined slopes exceeds two inches in one horizontal foot.

F. Flashings: Complete all flashings and terminations as indicated on the drawings and in accordance with the membrane manufacturer's requirements.

1. Provide securement at all membrane terminations at the perimeter of each roof level, roof section, curb flashing, skylight, expansion joint, interior wall, penthouse, and other similar condition.
    a. Do not apply flashing over existing thru-wall flashings or weep holes.
    b. Secure flashing on a vertical surface before the seam between the flashing and the main roof sheet is completed.
    c. Extend flashing membrane a minimum of 6 inches (152 mm) onto the main roof sheet beyond the mechanical securement.
    d. Use care to ensure that the flashing does not bridge locations where there is a change in direction (e.g. where the parapet meets the roof deck).
2. Penetrations:
    a. Flash all pipes, supports, soil stacks, cold vents, and other penetrations passing through the roofing membrane as indicated on the Drawings and in accordance with the membrane manufacturer's requirements.
    b. Utilize custom prefabricated flashings supplied by the membrane manufacturer.
    c. Existing Flashings: Remove when necessary to allow new flashing to terminate directly to the penetration.
3. Pipe Clusters and Unusual Shapes:
    a. Clusters of pipes or other penetrations which cannot be sealed with prefabricated membrane flashings shall be sealed by surrounding them with a prefabricated vinyl-coated metal pitch pan and sealant supplied by the membrane manufacturer.
    b. Vinyl-coated metal pitch pans shall be installed, flashed and filled with sealant in

accordance with the membrane manufacturer’s requirements.

c. Pitch pans shall not be used where prefabricated or field fabricated flashings are possible.

G. Roof Drains:

1. Coordinate installation of roof drains and vents specified in Section 15146 - Plumbing Specialties.
2. Remove existing flashing and asphalt at existing drains in preparation for sealant and membrane.
3. Provide a smooth clean surface on the mating surface between the clamping ring and the drain base.

H. Edge Details:

1. Provide edge details as indicated on the Drawings. Install in accordance with the membrane manufacturer’s requirements.
2. Join individual sections in accordance with the membrane manufacturer’s requirements.
3. Coordinate installation of metal flashing and counter flashing specified in Section 07620.
4. Manufactured Roof Specialties: Coordinate installation of copings, counter flashing systems, gutters, downspouts, and roof expansion assemblies specified in Section 07710.

I. Walkways:

1. Install walkways in accordance with the membrane manufacturer’s requirements.
2. Provide walkways where indicated on the Drawings.
3. Install walkway pads at roof hatches, access doors, rooftop ladders and all other traffic concentration points regardless of traffic frequency. Provided in areas receiving regular traffic to service rooftop units or where a passageway over the surface is required.
4. Do not install walkways over flashings or field seams until manufacturer’s warranty inspection has been completed.

J. Water cut-offs:

1. Provide water cut-offs on a daily basis at the completion of work and at the onset of inclement weather.
2. Provide water cut-offs to ensure that water does not flow beneath the completed sections of the new roofing system.
3. Remove water cut-offs prior to the resumption of work.
4. The integrity of the water cut-off is the sole responsibility of the roofing contractor.
5. Any membrane contaminated by the cut-off material shall be cleaned or removed.

3.4 FIELD QUALITY CONTROL

A. The membrane manufacturer’s representative shall provide a comprehensive final inspection after completion of the roof system. All application errors shall be addressed and final punch list completed.

3.5 PROTECTION

A. Protect installed roofing products from construction operations until completion of project.

B. Where traffic is anticipated over completed roofing membrane, protect from damage using durable materials that are compatible with membrane.

C. Repair or replace damaged products after work is completed.

END OF SECTION

Titen HD® Heavy-Duty Screw Anchor

Titen HD Anchor Product Data — Mechanically Galvanized

Size (in.)	Model No.	Thread Length (in.)	Drill Bit Diameter (in.)	Wrench Size (in.)	Quantity	
					Box	Carton
⅜ x 3	THD37300HMG	2½	⅜	9⁄16	50	200
⅜ x 4	THD37400HMG	3½			50	200
⅜ x 5	THD37500HMG	4½			50	100
⅜ x 6	THD37600HMG	5½			50	100
½ x 4	THD50400HMG	3½	½	¾	20	80
½ x 5	THD50500HMG	4½			20	80
½ x 6	THD50600HMG	5½			20	80
½ x 6½	THD50612HMG	5½			20	40
½ x 8	THD50800HMG	5½			20	40
½ x 12	THD501200HMG	5½			5	20
⅝ x 5	THDB62500HMG	4½	⅝	15⁄16	10	40
⅝ x 6	THDB62600HMG	5½			10	40
⅝ x 6½	THDB62612HMG	5½			10	40
⅝ x 8	THDB62800HMG	5½			10	20
¾ x 5	THD75500HMG	4½	¾	1⅛	5	20
¾ x 6	THDT75600HMG	4½			5	20
¾ x 8½	THD75812HMG	5½			5	10
¾ x 10	THD75100HMG	5½			5	10

Mechanical galvanizing meets ASTM B695, Class 65, Type 1. Intended for some pressure-treated wood sill plate applications. Not for use in other corrosive or outdoor environments. See p. 261 or visit **strongtie.com/info** for more corrosion information.

Titen HD Installation Information and Additional Data[1]

IBC LW*

Characteristic	Symbol	Units	Nominal Anchor Diameter, d_a (in.)										
			¼		⅜		½		⅝		¾		
Installation Information													
Drill Bit Diameter	d_{bit}	in.	¼		⅜		½		⅝		¾		
Baseplate Clearance Hole Diameter	d_c	in.	⅜		½		⅝		¾		⅞		
Maximum Installation Torque	$T_{inst,max}$	ft.-lbf	24[2]		50[2]		65[2]		100[2]		150[2]		
Maximum Impact Wrench Torque Rating	$T_{impact,max}$	ft.-lbf	125[3]		150[3]		340[3]		340[3]		385[3]		
Minimum Hole Depth	h_{hole}	in.	1¾	2⅝	2¾	3½	3¾	4½	4½	6	4½	6	6¾
Nominal Embedment Depth	h_{nom}	in.	1⅝	2½	2½	3¼	3¼	4	4	5½	4	5½	6¼
Critical Edge Distance	c_{ac}	in.	3	6	2 11⁄16	3⅝	3 9⁄16	4½	4½	6⅜	6	6⅜	7 5⁄16
Minimum Edge Distance	c_{min}	in.	1½		1¾								
Minimum Spacing	s_{min}	in.	1½		3						2¾	3	
Minimum Concrete Thickness	h_{min}	in.	3¼	3½	4	5	5	6¼	6	8½	6	8¾	10
Additional Data													
Anchor Category	Category	—	1										
Yield Strength	f_{ya}	psi	100,000		97,000								
Tensile Strength	f_{uta}	psi	125,000		110,000								
Minimum Tensile and Shear Stress Area	A_{se}	in²	0.042		0.099		0.183		0.276		0.414		
Axial Stiffness in Service Load Range — Uncracked Concrete	β_{uncr}	lb./in.	202,000		672,000								
Axial Stiffness in Service Load Range — Cracked Concrete	β_{cr}	lb./in.	173,000		345,000								

1. The information presented in this table is to be used in conjunction with the design criteria of ACI 318-14 Chapter 17 and ACI 318-11 Appendix D.
2. $T_{inst,max}$ is the maximum permitted installation torque for the embedment depth range covered by this table using a torque wrench.
3. $T_{impact,max}$ is the maximum permitted torque rating for impact wrenches for the embedment depth range covered by this table.

* See p. 12 for an explanation of the load table icons.

Titen HD® Design Information — Concrete

Titen HD Tension Strength Design Data[1]

Characteristic	Symbol	Units	Nominal Anchor Diameter, d_a (in.)										
			¼		⅜		½		⅝		¾		
Nominal Embedment Depth	h_{nom}	in.	1⅝	2½	2½	3¼	3¼	4	4	5½	4	5½	6¼
Steel Strength in Tension — ACI 318-14 Section 17.4.1 or ACI 318-11 Section D.5.1													
Tension Resistance of Steel	N_{sa}	lb.	5,195		10,890		20,130		30,360		45,540		
Strength Reduction Factor — Steel Failure	ϕ_{sa}	—	0.65[2]										
Concrete Breakout Strength in Tension[6] — ACI 318-14 Section 17.4.2 or ACI 318-11 Section D.5.2													
Effective Embedment Depth	h_{ef}	in.	1.19	1.94	1.77	2.40	2.35	2.99	2.97	4.24	2.94	4.22	4.86
Critical Edge Distance[6]	c_{ac}	in.	3	6	2¹¹⁄₁₆	3⅝	3⁹⁄₁₆	4½	4½	6⅜	6	6⅜	7⅝
Effectiveness Factor — Uncracked Concrete	k_{uncr}	—	30		24						27	24	
Effectiveness Factor — Cracked Concrete	k_{cr}	—	17										
Modification Factor	$\Psi_{c,N}$	—	1.0										
Strength Reduction Factor — Concrete Breakout Failure	ϕ_{cb}	—	0.65[7]										
Pullout Strength in Tension — ACI 318-14 Section 17.4.3 or ACI 318-11 Section D.5.3													
Pullout Resistance, Uncracked Concrete (f'_c = 2,500 psi)	$N_{p,uncr}$	lb.	—[3]	—[3]	2,700[4]	—[3]	—[3]	—[3]	—[3]	9,810[4]	—[3]	—[3]	—[3]
Pullout Resistance, Cracked Concrete (f'_c = 2,500 psi)	$N_{p,cr}$	lb.	—[3]	1,905[4]	1,235[4]	2,700[4]	—[3]	—[3]	3,040[4]	5,570[4]	—[3]	6,070[4]	7,195[4]
Strength Reduction Factor — Concrete Pullout Failure	ϕ_p	—	0.65[5]										
Tension Strength for Seismic Applications — ACI 318-14 Section 17.4.2.3.3 or ACI 318-11 Section D.3.3.3													
Nominal Pullout Strength for Seismic Loads (f'_c = 2,500 psi)	$N_{p,eq}$	lb.	—[3]	1,905[4]	1,235[4]	2,700[4]	—[3]	—[3]	3,040[4]	5,570[4]	3,840[4]	6,070[4]	7,195[4]
Strength Reduction Factor — Breakout or Pullout Failure	ϕ_{eq}	—	0.65[5]										

1. The information presented in this table is to be used in conjunction with the design criteria of ACI 318-14 Chapter 17 and ACI 318-11 Appendix D, except as modified below.
2. The tabulated value of ϕ_{sa} applies when the load combinations of Section 1605.2.1 of the IBC, ACI 318-14 Section 5.3 or ACI 318-11 Section 9.2 are used. If the load combinations of ACI 318-11 Appendix C are used, the appropriate value of ϕ_{sa} must be determined in accordance with ACI 318-11 D.4.4. Anchors are considered brittle steel elements.
3. Pullout strength is not reported since concrete breakout controls.
4. Adjust the characteristic pullout resistance for other concrete compressive strengths by multiplying the tabular value by $(f'_{c,specified} / 2{,}500)^{0.5}$.
5. The tabulated value of ϕ_p or ϕ_{eq} applies when the load combinations of Section 1605.2.1 of the IBC, ACI 318-14 Section 5.3 or ACI 318-11 Section 9.2 are used and the requirements of ACI 318-14 17.3.3.(c) or ACI 318-11 D.4.3(c) for Condition B are met. If the load combinations of ACI 318-11 Appendix C are used, appropriate value of ϕ must be determined in accordance with ACI 318-11 Section D.4.4(c).
6. The modification factor $\Psi_{cp,N}$ = 1.0 for cracked concrete. Otherwise, the modification factor for uncracked concrete without supplementary reinforcement to control splitting is either:
   (1) $\Psi_{cp,N} = 1.0$ if $c_{a,min} \geq c_{ac}$ or (2) $\Psi_{cp,N} = \frac{c_{a,min}}{c_{ac}} \geq \frac{1.5h_{ef}}{c_{ac}}$ if $c_{a,min} < c_{ac}$
   The modification factor, $\Psi_{cp,N}$ is applied to the nominal concrete breakout strength, N_{cb} or N_{cbg}.
7. The tabulated value of ϕ_{cb} applies when both the load combinations of Section 1605.2.1 of the IBC, ACI 318-14 Section 5.3 or ACI 318-11 Section 9.2 are used and the requirements of ACI 318-14 17.3.3(c) or ACI 318-11 D.4.3(c) for Condition B are met. Condition B applies where supplementary reinforcement is not provided. For installations where complying supplementary reinforcement can be verified, the ϕ_{cb} factors described in ACI 318-14 17.3.3(c) or ACI 318-11 D.4.3(c) for Condition A are allowed. If the load combinations of ACI 318-11 Appendix C are used, the appropriate value of ϕ_{cb} must be determined in accordance with ACI 318-11 D.4.4(c).

* See p. 12 for an explanation of the load table icons.

Titen HD® Design Information — Concrete

Titen HD Shear Strength Design Data[1]

Characteristic	Symbol	Unit	Nominal Anchor Diameter, d_a (in.)										
			¼		⅜		½		⅝		¾		
Nominal Embedment Depth	h_{nom}	in.	1⅝	2½	2½	3¼	3¼	4	4	5½	4	5½	6¼
Steel Strength in Shear													
Shear Resistance of Steel	V_{sa}	lb.	2,020		4,460		7,455		10,000		14,950	16,840	
Strength Reduction Factor — Steel Failure	ϕ_{sa}	—	0.60[2]										
Concrete Breakout Strength in Shear													
Outside Diameter	d_a	in.	0.25		0.375		0.500		0.625		0.750		
Load Bearing Length of Anchor in Shear	ℓ_e	in.	1.19	1.94	1.77	2.40	2.35	2.99	2.97	4.24	2.94	4.22	4.86
Strength Reduction Factor — Concrete Breakout Failure	ϕ_{cb}	—	0.70[3]										
Concrete Pryout Strength in Shear													
Coefficient for Pryout Strength	k_{cp}	lb.	1.0				2.0						
Strength Reduction Factor — Concrete Pryout Failure	ϕ_{cp}	—	0.70[4]										
Steel Strength in Shear for Seismic Applications													
Shear Resistance for Seismic Loads	V_{eq}	lb.	1,695		2,855		4,790		8,000		9,350		
Strength Reduction Factor — Steel Failure	ϕ_{eq}	—	0.60[2]										

1. The information presented in this table is to be used in conjunction with the design criteria of ACI 318-14 Chapter 17 and ACI 318-11 Appendix D, except as modified below.
2. The tabulated value of ϕ_{sa} and ϕ_{eq} applies when the load combinations of Section 1605.2.1 of the IBC, ACI 318-14 Section 5.3 or ACI 318-11 Section 9.2 are used. If the load combinations of ACI 318-11 Appendix C are used, the appropriate value of ϕ_{sa} and ϕ_{eq} must be determined in accordance with ACI 318 D.4.4.
3. The tabulated value of ϕ_{cb} applies when both the load combinations of Section 1605.2.1 of the IBC, ACI 318-14 Section 5.3 or ACI 318-11 Section 9.2 are used and the requirements of ACI 318-14 17.3.3(c) or ACI 318-11 D.4.3(c) for Condition B are met. Condition B applies where supplementary reinforcement is not provided. For installations where complying supplementary reinforcement can be verified, the ϕ_{cb} factors described in ACI 318-14 17.3.3(c) or ACI 318-11 D.4.3(c) for Condition A are allowed. If the load combinations of ACI 318-11 Appendix C are used, the appropriate value of ϕ_{cb} must be determined in accordance with ACI 318-11 D.4.4(c).
4. The tabulated value of ϕ_{cp} applies when both the load combinations of IBC Section 1605.2, ACI 318-14 5.3 or ACI 318-11 Section 9.2 are used and the requirements of ACI 318-14 17.3.3(c) or ACI 318-11 D.4.3(c) for Condition B are met. If the load combinations of ACI 318-11 Appendix C are used, appropriate value of ϕ_{cp} must be determined in accordance with ACI 318-11 Section D.4.4(c).

Titen HD Tension and Shear Strength Design Data for the Soffit of Normal-Weight or Sand-Lightweight Concrete over Steel Deck[1,6,7]

Characteristic	Symbol	Units	Nominal Anchor Diameter, d_a (in.)									
			Lower Flute						Upper Flute			
			Figure 2		Figure 1				Figure 2		Figure 1	
			¼		⅜		½		¼		⅜	½
Nominal Embedment Depth	h_{nom}	in.	1⅝	2½	1⅞	2½	2	3½	1⅝	2½	1⅞	2
Effective Embedment Depth	h_{ef}	in.	1.19	1.94	1.23	1.77	1.29	2.56	1.19	1.94	1.23	1.29
Pullout Resistance, concrete on steel deck (cracked)[2,3,4]	$N_{p,deck,cr}$	lb.	420	535	375	870	905	2,040	655	1,195	500	1,700
Pullout Resistance, concrete on steel deck (uncracked)[2,3,4]	$N_{p,deck,uncr}$	lb.	995	1,275	825	1,905	1,295	2,910	1,555	2,850	1,095	2,430
Steel Strength in Shear, concrete on steel deck[5]	$V_{sa,\ deck}$	lb.	1,335	1,745	2,240	2,395	2,435	4,430	2,010	2,420	4,180	7,145
Steel Strength in Shear, Seismic	$V_{sa,\ deck,eq}$	lb.	870	1,135	1,434	1,533	1,565	2,846	1,305	1,575	2,676	4,591

1. The information presented in this table is to be used in conjunction with the design criteria of ACI 318-14 Chapter 17 and ACI 318-11 Appendix D, except as modified below.
2. Concrete compressive strength shall be 3,000 psi minimum. The characteristic pullout resistance for greater compressive strengths shall be increased by multiplying the tabular value by $(f'_{c,specified}/3{,}000)^{0.5}$.
3. For anchors installed in the soffit of sand-lightweight or normal-weight concrete over steel deck floor and roof assemblies, as shown in Figure 1 and Figure 2, calculation of the concrete breakout strength may be omitted.
4. In accordance with ACI 318-14 Section 17.4.3.2 or ACI 318-11 Section D.5.3.2, the nominal pullout strength in cracked concrete for anchors installed in the soffit of sand-lightweight or normal-weight concrete over steel deck floor and roof assemblies $N_{p,deck,cr}$ shall be substituted for $N_{p,cr}$. Where analysis indicates no cracking at service loads, the normal pullout strength in uncracked concrete $N_{p,deck,uncr}$ shall be substituted for $N_{p,uncr}$.
5. In accordance with ACI 318-14 Section 17.5.1.2(C) or ACI 318-11 Section D.6.1.2(c), the shear strength for anchors installed in the soffit of sand-lightweight or normal-weight concrete over steel deck floor and roof assemblies $V_{sa,deck}$ and $V_{sa,deck,eq}$ shall be substituted for V_{sa}.
6. Minimum edge distance to edge of panel is $2h_{ef}$.
7. The minimum anchor spacing along the flute must be the greater of $3h_{ef}$, or 1.5 times the flute width.

*See p. 12 for an explanation of the load table icons.

Titen HD Anchor Tension and Shear Strength Design Data in the Topside of Normal-Weight Concrete or Sand-Lightweight Concrete over Steel Deck

IBC *

Design Information	Symbol	Units	Nominal Anchor Diameter, d_a (in.)	
			Figure 3	Figure 3
			¼	⅜
Nominal Embedment Depth	h_{nom}	in.	1⅝	2½
Effective Embedment Depth	h_{ef}	in.	1.19	1.77
Minimum Concrete Thickness	$h_{min,deck}$	in.	2½	3¼
Critical Edge Distance	$c_{ac,deck,top}$	in.	3¾	7¼
Minimum Edge Distance	$c_{min,deck,top}$	in.	3½	3
Minimum Spacing	$s_{min,deck,top}$	in.	3½	3

1. For anchors installed in the topside of concrete-filled deck assemblies, as shown in Figures 2 and 3, the nominal concrete breakout strength of a single anchor or group of anchors in shear, V_{cb} or V_{cbg}, respectively, must be calculated in accordance with ACI 318-14 Section 17.5.2 or ACI 318-11 Section D.6.2, using the actual member thickness, $h_{min,deck}$, in the determination of A_{vc}.
2. Design capacity shall be based on calculations according to values in the tables featured on p. 84.
3. Minimum flute depth (distance from top of flute to bottom of flute) is 1½" (see Figures 2 and 3).
4. Steel deck thickness shall be minimum 20 gauge.
5. Minimum concrete thickness ($h_{min,deck}$) refers to concrete thickness above upper flute (see Figures 2 and 3).

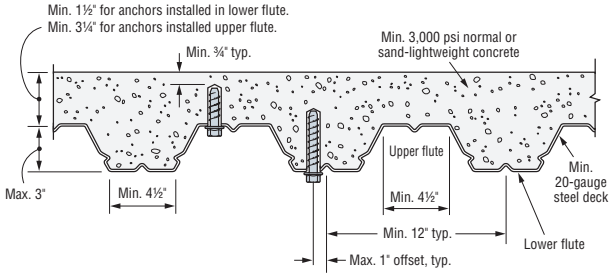


Figure 1. Installation of ⅜"- and ½"-Diameter Anchors in the Soffit of Concrete over Steel Deck

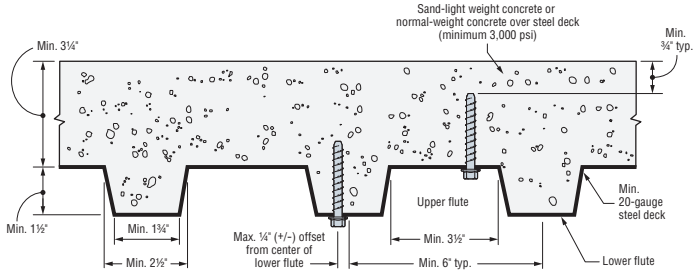


Figure 2. Installation of ¼"-Diameter Anchors in the Soffit of Concrete over Steel Deck

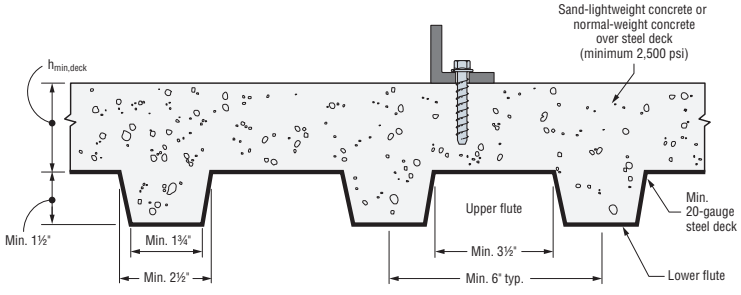


Figure 3. Installation of ¼"- and ⅜"-Diameter Anchors in the Topside of Concrete over Steel Deck

* See p. 12 for an explanation of the load table icons.

Features

- 190 narrow stile has 2-1/8" (54) vertical stile, 2-1/4" (57.2) top and 3-7/8" (98.4) bottom rail
- 350 medium stile has 3-1/2" (88.9) vertical stile, 3-1/2" (88.9) top and 6-1/2" (165.1) bottom rail
- 500 wide stile has 5" (127) vertical stile, 5" (127) top and 6-1/2" (165.1) bottom rail
- Door is 1-3/4" (44.5) deep
- Dual moment welded corner construction
- Single or double acting
- Infills range from 1/4" (6.4) to 1" (25.4)
- Offset pivots, butt hinges, continuous geared hinge or center pivots
- MS locks or panic hardware
- Surface mounted or concealed closers
- Architects Classic push/pulls
- Adjustable astragal utilizing pile weathering with polymeric fin at meeting stiles
- Polymeric bulb weatherstripping in door frames
- Permanodic™ anodized finishes in seven choices
- Painted finishes in standard and custom choices

Optional Features

- Paneline™ exit device or Paneline™ MEL exit device
- Wide variety of bottom rail and cross rail

Product Applications

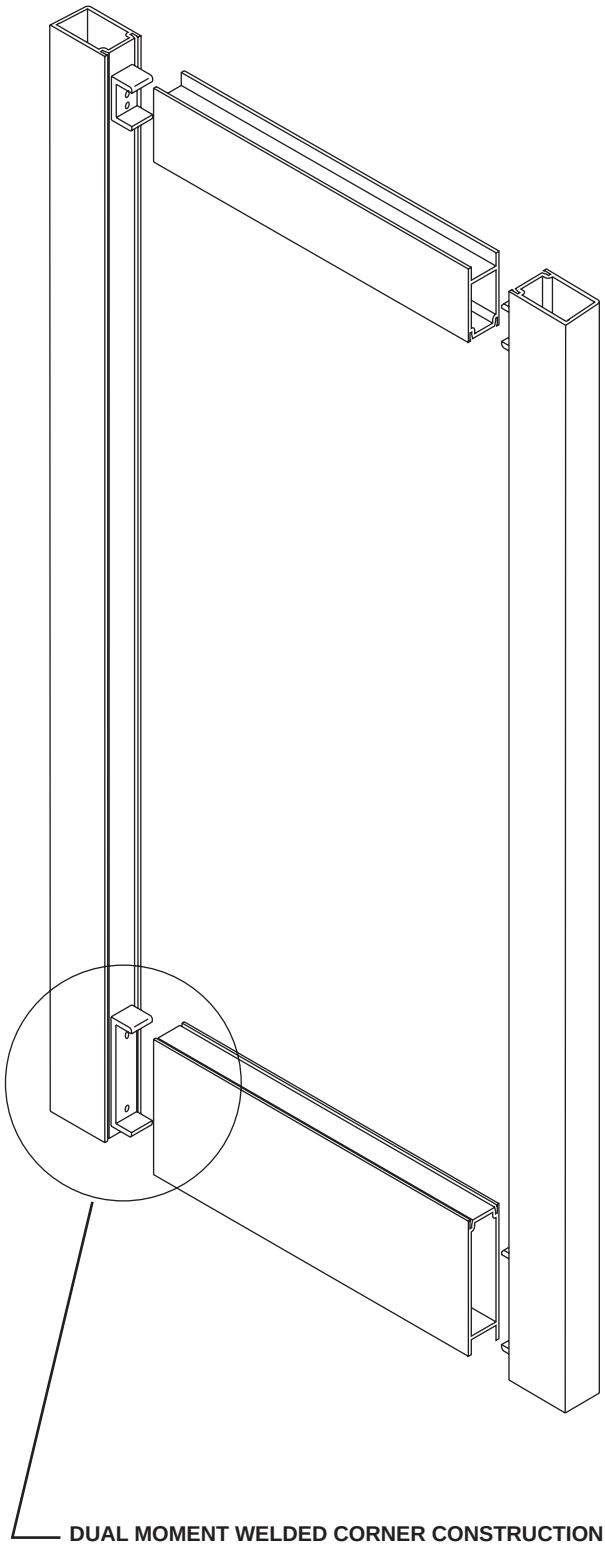
- 190 narrow stile - engineered for moderate traffic in applications such as offices and stores
- 350 medium stile - provides extra strength for schools, institutions and other high traffic applications
- 500 wide stile - creates a monumental visual statement for banks, libraries or buildings that experience heavy traffic conditions

For specific product applications,
consult your Kawneer representative.

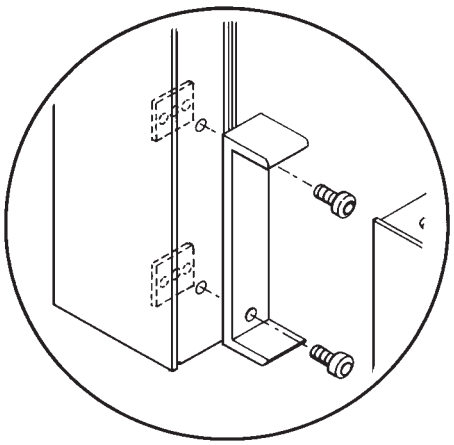
Metric (SI) conversion figures are included throughout these details for reference. Numbers in parentheses ( ) are millimeters unless otherwise noted.

The following metric (SI) units are found in these details:

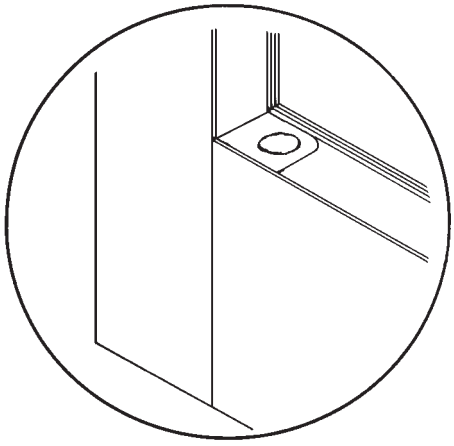
m – meter
cm – centimeter
mm – millimeter
s – second
Pa – pascal
MPa – megapascal



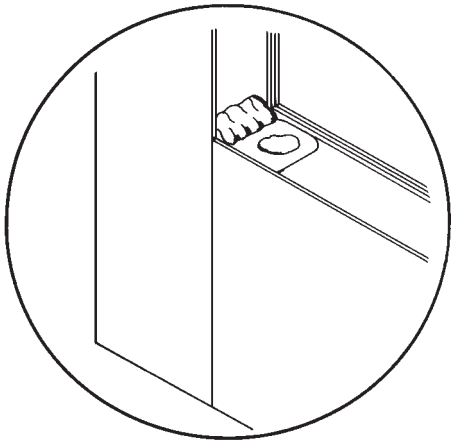
DUAL MOMENT WELDED CORNER CONSTRUCTION



#1 MECHANICAL FASTENING is accomplished by attaching a 5/16" (7.9) thick extruded aluminum channel clip to the vertical stile with 1/4"-20 heat strengthened bolts and 3/16" thick steel nut plates for a high strength welding base for attachment horizontal member.



#2 SIGMA* DEEP PENETRATION PLUG WELDS are made top and bottom after the horizontal is properly positioned over the channel clip to help provide the strongest door corner joint currently available.

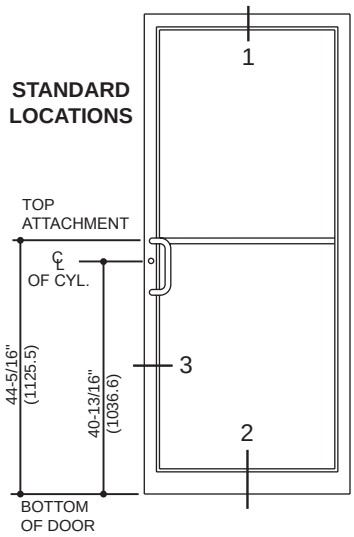


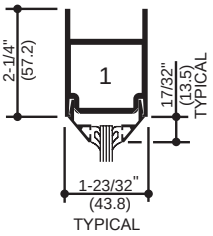
#3 SIGMA* FILLET WELDS along both top and bottom webs of the rail extrusion complete the welded corner construction.

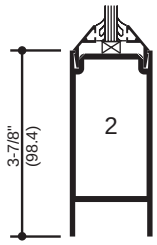
*** An arc welding process known as Shielded Inert Gas Metal Arc (SIGMA) or also known as Metal Inert Gas (MIG).**

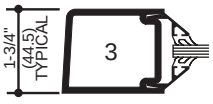
Additional information and CAD details are available at www.kawneer.com

190 NARROW STILE

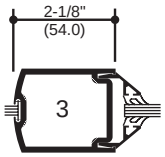






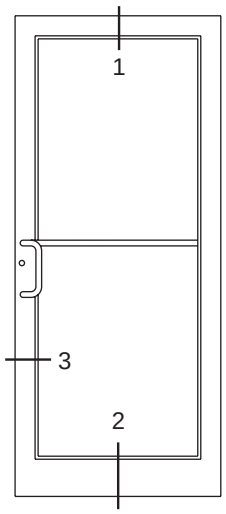


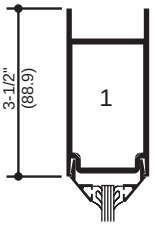
SINGLE ACTING

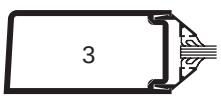


DOUBLE ACTING

350 MEDIUM STILE







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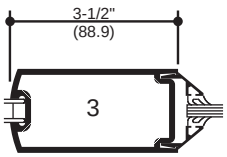
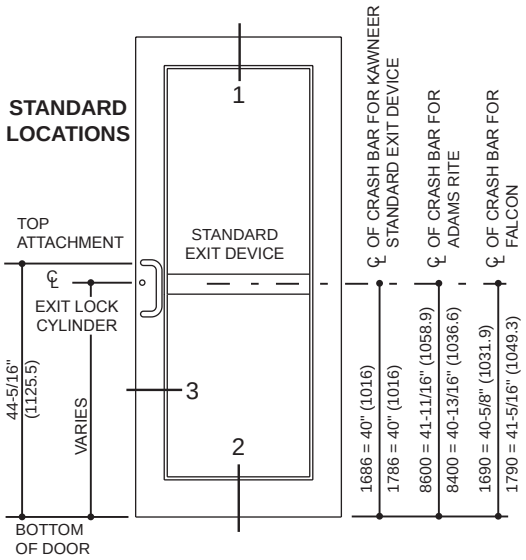
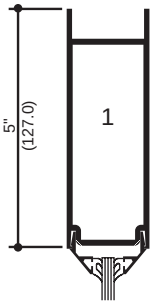
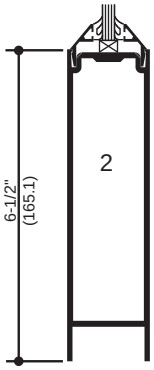


DOUBLE ACTING

500 WIDE STILE







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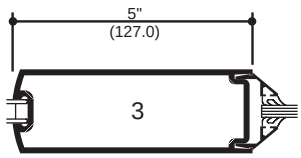


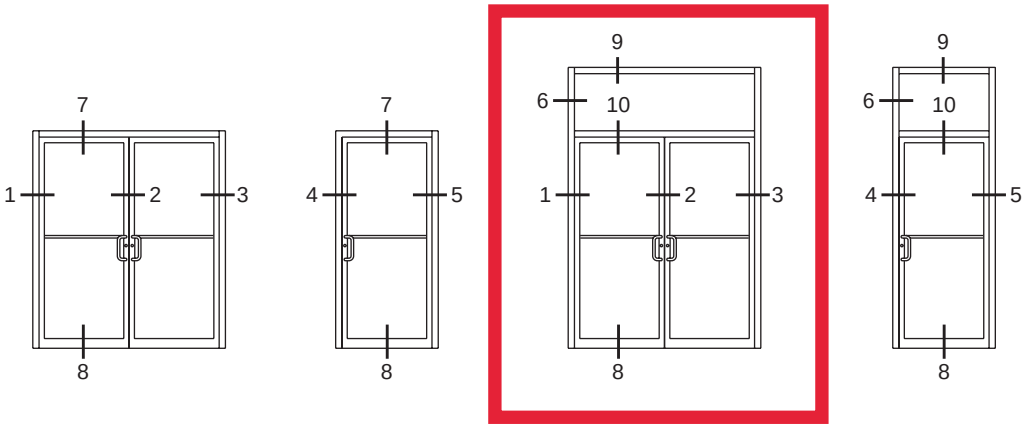
DOUBLE ACTING

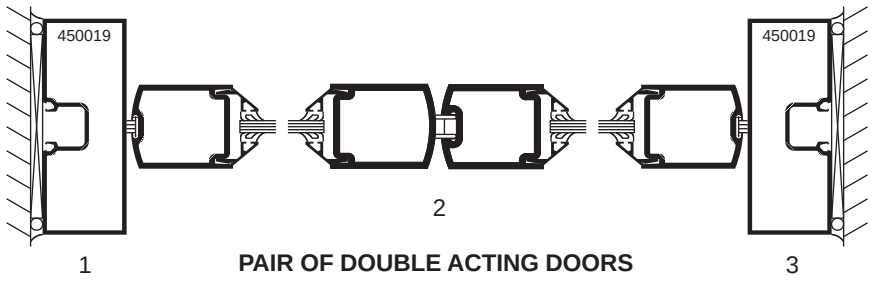
Additional information and CAD details are available at www.kawneer.com

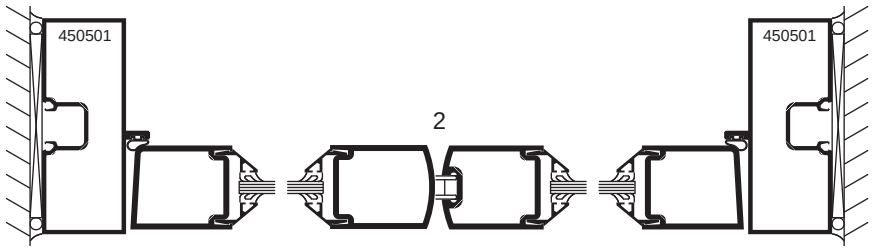
NOTE:

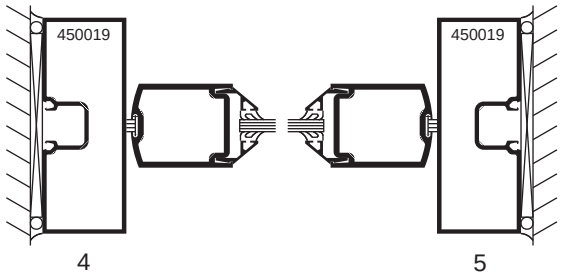
1. SERIES 190 NARROW STILE DOORS ARE DETAILED, MEDIUM STILE 350 DOORS AND WIDE STILE 500 DOORS ALSO MAY BE USED.

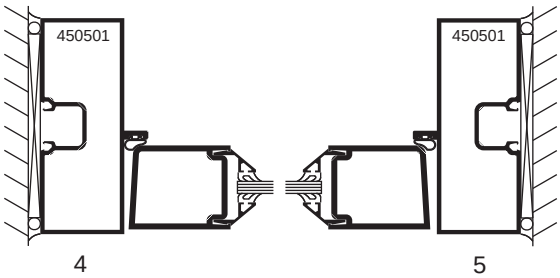
2. TRIFAB™ VG 450 CENTER, 1-3/4" X 4-1/2" (44.5 X 114.3) FRAMING IS DETAILED WITH THE DOORS FOR REFERENCE. OTHER KAWNEER FRAMING SERIES OR CURTAIN WALL SYSTEMS MAY BE USED. REFER TO THE CATALOG INDEX FOR THE APPROPRIATE DETAIL SECTION.

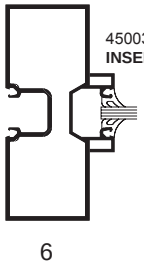






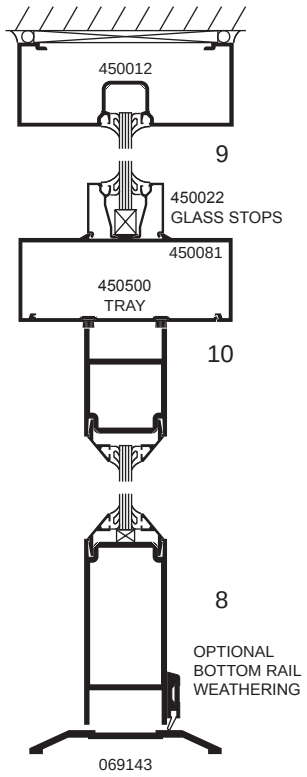




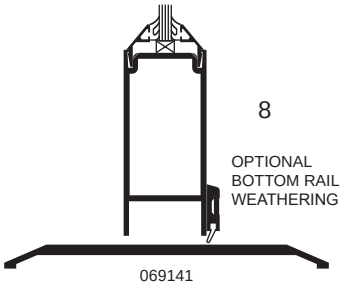


Additional information and CAD details are available at www.kawneer.com

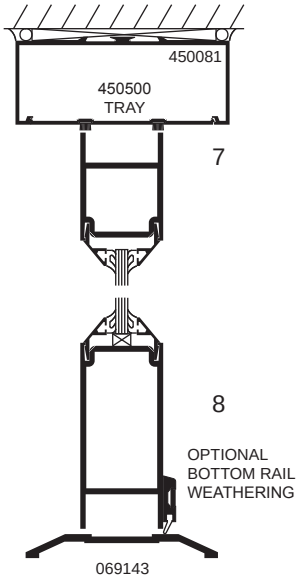
DOUBLE ACTING DOORS



OVERHEAD CLOSER

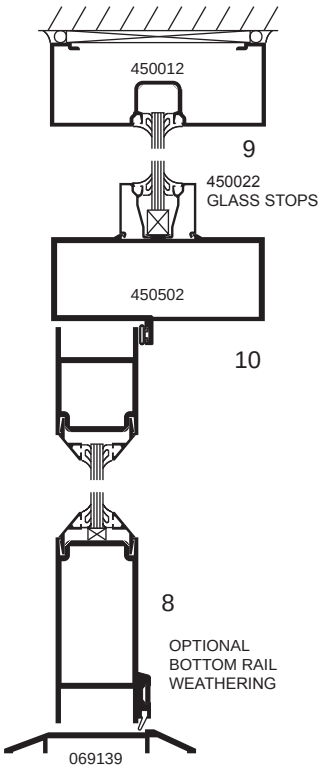


FLOOR CLOSER

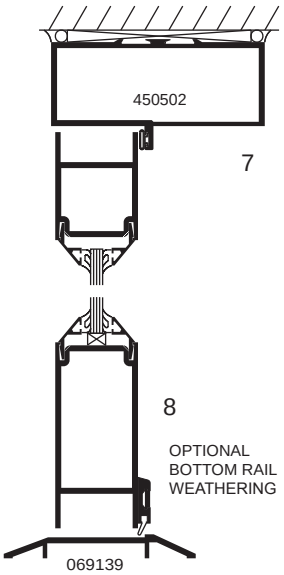


OVERHEAD CLOSER

SINGLE ACTING DOORS

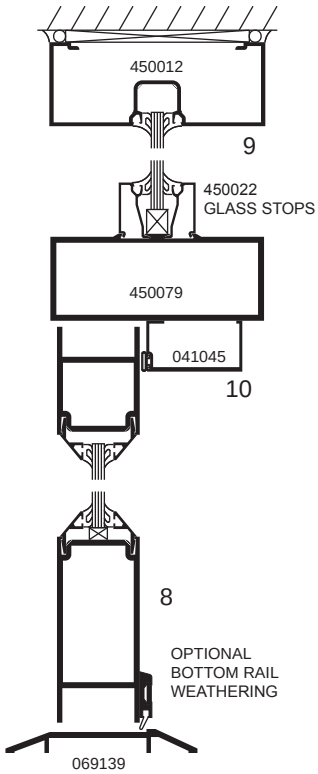


OVERHEAD CLOSER

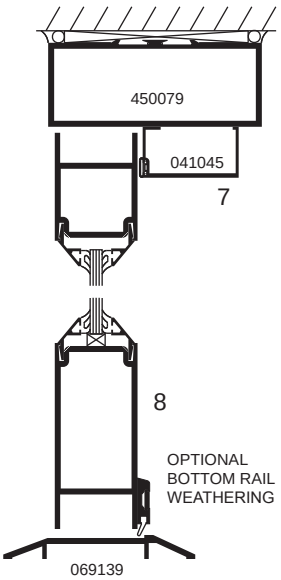


OVERHEAD CLOSER

COC WITH SINGLE ACTING OFFSET ARM



OVERHEAD CLOSER

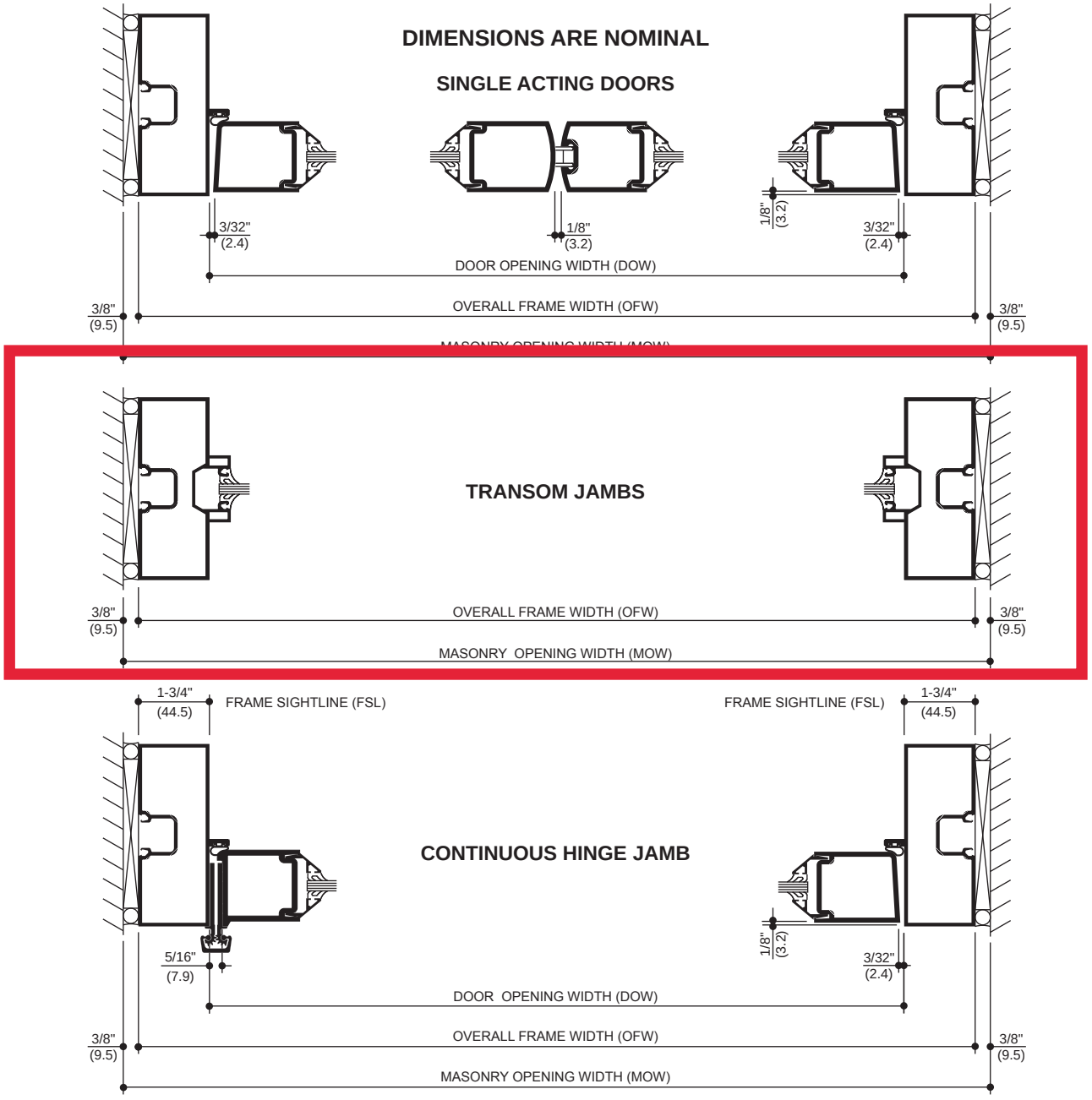


OVERHEAD CLOSER

LEFT BLANK INTENTIONALLY

Additional information and CAD details are available at www.kawneer.com

Trifab™ VG 450 center door frames shown, Trifab™ VG 451 center door frames similar.



STANDARD SIZES (TRIFAB™ 400 & TRIFAB™ VG 450 CENTER FRAMES)

WITH AND WITHOUT TRANSOM

Door Opening Dimension (DOW)		**Overall Frame Dimension** (OFW)		**Masonry Opening Dimension** (MOW)	
3' 0"	(914)	3' 3-1/2"	(1,003)	3' 4-1/4"	(1,022)
3' 6"	(1,067)	3' 9-1/2"	(1,156)	3' 10-1/4"	(1,175)
6' 0"	(1,829)	6' 3-3/4"	(1,924)	6' 4-1/4"	(1,937)

STANDARD SIZES (TRIFAB™ VG 451 CENTER FRAMES)

WITH AND WITHOUT TRANSOM

Door Opening Dimension (DOW)		**Overall Frame Dimension** (OFW)		**Masonry Opening Dimension** (MOW)	
3' 0"	(914)	3' 4"	(1,016)	3' 4-3/4"	(1,035)
3' 6"	(1,067)	3' 10"	(1,168)	3' 10-3/4"	(1,187)
6' 0"	(1,829)	6' 4"	(1,930)	6' 4-3/4"	(1,949)

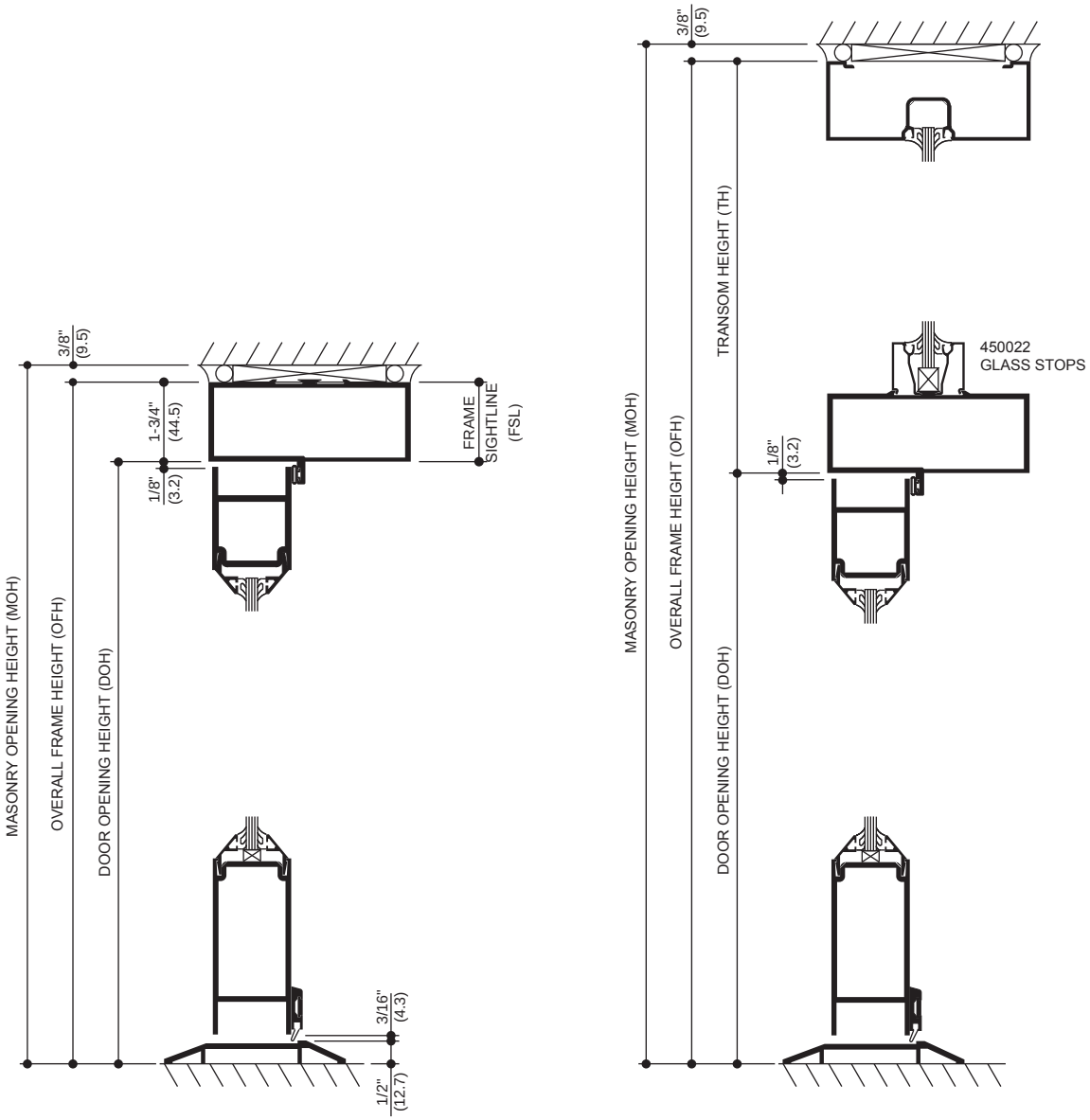
WITH AND WITHOUT TRANSOM

OFW = DOW + 2 FSL

MOW = OFW + 3/4"

Note: Dimensions shown above reflect A1 Price Book standard stock door frame height with transom at 10' 3-1/2" (3,137).

Additional information and CAD details are available at www.kawneer.com



STANDARD SIZES (TRIFAB™ 400 & TRIFAB™ VG 450 CENTER FRAMES)					
WITHOUT TRANSOM					
Door Opening Dimension (DOH)		**Overall Frame Dimension** (OFH)		**Masonry Opening Dimension** (MOH)	
7' 0"	(2,134)	7' 1-3/4"	(2,178)	7' 2-1/8"	(2,188)
7' 0"	(2,134)	7' 1-3/4"	(2,178)	7' 2-1/8"	(2,188)
7' 0"	(2,134)	7' 1-3/4"	(2,178)	7' 2-1/8"	(2,188)

STANDARD SIZES (TRIFAB™ VG 451 CENTER FRAMES)					
WITHOUT TRANSOM					
Door Opening Dimension (DOH)		**Overall Frame Dimension** (OFH)		**Masonry Opening Dimension** (MOH)	
7' 0"	(2,134)	7' 2"	(2,184)	7' 2-3/8"	(2,194)
7' 0"	(2,134)	7' 2"	(2,184)	7' 2-3/8"	(2,194)
7' 0"	(2,134)	7' 2"	(2,184)	7' 2-3/8"	(2,194)

WITHOUT TRANSOM

OFH = DOH + FSL
MOH = OFH + 3/8"

WITH TRANSOM

OFH = DOH +TH
MOH = OFH + 3/8"

Note: Dimensions shown above reflect A1 Price Book standard stock door frame height with transom at 10' 3-1/2" (3,137).

	STANDARD	OPTIONAL
Doors	Narrow stile 190 doors prepared for attachment hardware.	Medium stile 350 or wide stile 500.
Door Sizes Std.	Standard sizes shown on pages 10 and 11.	Any size up to 4'-0" x 8'-0" (1,219 x 2,438).
Glass Stops	Beveled glass stops for 1/4" (6.4) or 3/16" (4.0) infill.	Square glass stops for 3/16" (4.0) or 1/4" (6.4) infill. Also 1" (25.4) stops.
Door Frames	**Trifab™ 400** - 1-3/4" x 4" (44.5 x 101.6) for single glazing. **Trifab™ VG 450** Center - 1-3/4" x 4-1/2" (44.5 x 114.3) for single glazing or **Trifab™ VG 451** Center - 2" x 4-1/2" (50.8 x 114.3) for double glazing.	Any Kawneer framing system suitable for door frames may be selected, but manufactured per order.
Push-Pulls	**Single Acting:** Architects Classic Hardware CO-9 Pull and CP-II Push Bar. Architects Classic Hardware CO-9 Pull and CP Push Bar. **Double Acting:** Architects Classic Hardware CP Push Bars.	**Single Acting:** Architects Classic Hardware CO-12 and CP-II push bar. Architects Classic Hardware CO-12 and CP push bar. Architects Classic Hardware CO-9/CO-9 Pulls. Architects Classic Hardware CO-12/CO-12 Pulls. **Double Acting:** Architects Classic Hardware CO-9/CO-9 Pulls. Architects Classic Hardware CO-12/CO-12 Pulls.
Door Closers	**Single Acting:** Norton 1601 adjustable or 1601 BF adjustable surface closer with back-check and with or without adjustable hold-open. Standard concealed overhead closer with single acting offset arm. **Double Acting:** Standard concealed overhead closer with 90 degree or 105 degree hold-open or without hold open. For heavy traffic & high wind applications, a supplemental door stop is recommended.	**Single Acting:** LCN 4040 surface closer with or without adjustable hold-open. LCN 2010, 2030 or 5010 concealed overhead closers with or without hold-open. LCN 1260 adjustable surface closer. Norton 8100 surface closer with a 50% spring power adjustment (for opening forces of less than 8 pounds). Closer is available with standard back-checks and with or without the hold-open feature. International single acting concealed overhead closer. Falcon SC 60 Surface closer. **Double Acting:** International overhead concealed closer.
Hinging	**Single Acting:** Kawneer top and bottom offset pivots (or) Kawneer top and bottom 4 1/2" x 4" (114.3 x 101.6) ball bearing butt hinge with non-removable pin (NRP) (or) Kawneer continuous gear hinge. **Double Acting:** Kawneer bottom center pivots for use with concealed overhead closer.	**Double Acting:** Kawneer top center (walking beam) pivot for use with floor closers.
Intermediate Pivots/Butts	**Single Acting:** Kawneer intermediate offset pivot (or) Kawneer 4-1/2" x 4" (114.3 x 101.6) ball bearing butt hinge with non-removable pin (NRP).	**Single Acting:** Rixson M-19 or IVES #7215-INT intermediate offset pivot.
Power Transfers	**Single Acting:** Kawneer EL intermediate offset pivot (or) Kawneer EL 4 1/2" x 4" (114.3 x 101.6) ball bearing butt hinge with wire transfer (or) EPT (Electric Power Transfer).	
Power Supply	**SP-1000X Power Supply:** For use with Paneline™ EL exit devices. For use with Falcon EL 1690 and EL 1790 exit devices. **SP-2000 Power Supply:** For use with Paneline™ MEL exit devices.	**NP1 Power Supply:** For use with Kawneer 1686 MEL and 1786 MEL exit devices only.
Locks - Active Leaf	Adams-Rite MS 1850A deadlock with two 1-5/32" (29.4) diameter 5 pin cylinders.	Adams-Rite #4510 latch lock. Adams-Rite #1850A-500 short throw deadlock. Adams-Rite #1850A-505 hookbolt lock. Adams-Rite #4015 two-point Lock. Adams-Rite #4085 three-point Lock. Adams-Rite #4089 exit indicator. Kawneer cylinder guard. Kawneer thumbturn (in lieu of cylinder).

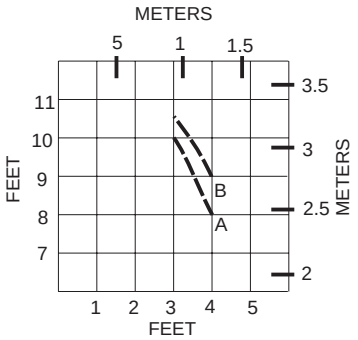
	STANDARD	OPTIONAL
Locks - Inactive Leaf	One pair of Kawneer flush bolts in the inactive leaf of a pair of doors.	**Controller™** is a 3-point locking system consisting of a two point locking device in the inactive leaf in lieu of flush bolts, working in conjunction with the MS 1850A deadlock in the active leaf. This combination provides for greater security than possible with flush bolts and complies with the life safety considerations of building codes which prohibit the use of flush bolts.
Thresholds	A 1/2" x 4" (12.7 x 101.6) aluminum mill finish threshold.	A 1/2" x 6-3/4" (12.7 x 171.5) aluminum mill finish threshold.
Weathering	**Single Acting:** Weathering system in the door and frame consisting of a dense, bulb polymeric material, which remains resilient and retains its weathering ability under temperature extremes. (The system is complete with an optional EPDM blade gasket sweep strip applied to the bottom door rail with concealed fasteners). **Double Acting:** Pile cloth weathering in the door and frame.	Bottom Door Sweep
Exit Device	**Kawneer 1686 Concealed Rod Exit Device** with or without a mortised type cylinder. **Kawneer 1786 Rim Exit Device** is a rim type exit device with or without a rim type cylinder. Pairs of doors require a Kawneer RM-86 removable mullion. **Paneline™** exit device is a concealed rod exit device applicable to single or pairs of doors. It features an activating panel contained within the door cross rail.	**Kawneer 1686 MEL Concealed Rod Exit Device** electric modification is available. **Kawneer 1786 MEL Rim Exit Device** electric modification is available. **Kawneer 1686 CD Concealed Rod Exit Device** available with cylinder dogging. **Kawneer 1786 CD Rim Exit Device** available with cylinder dogging. **Kawneer 1686 Lever Handle** is available for the Kawneer 1686 concealed rod exit device. **Kawneer 1786 Lever Handle** is available for the Kawneer 1786 rim type exit device. **Falcon 1690 Concealed Rod Exit Device** with or without a mortised type cylinder. **Falcon 1790 Rim Exit Device** is a rim type exit device with or without a rim type cylinder. **Falcon EL 1690** electric modification is also available. **Falcon EL 1790** electric modification is also available **Paneline™ MEL** electric modification is also available. **Falcon 1990** is a concealed rod exit device with or without a rim type cylinder. **Falcon 2090** is a rim type exit device with or without a rim type cylinder. Pairs of doors require a removable aluminum mullion. RM-70 with the Falcon 2090 exit device.
	Exit Device Pulls: Architects Classic CO-9 Pull with Kawneer 1686 and 1786 exit devices. Architects Classic CPN Pull for Paneline™ and Paneline™ MEL exit devices.	**Optional Exit Device Pulls:** Architects Classic CO-12 Pull with Kawneer 1686 and 1786 exit devices.

APPLICATION CRITERIA

As indicated on Page 10, the standard sizes of swing doors are 3'-0" x 7'-0" (914.4 x 2,133.6) or 3'-6" x 7'-0" (1,067 x 2,134) for single doors and 6'-0" x 7'-0" (1,828.8 x 2,133.6) for pairs of doors. When these sizes are exceeded the following criteria should be administered.

1. Larger doors should not be subject to heavy traffic or strong prevailing wind conditions.
2. Larger doors should use a door closer with a good back check action.
3. When a door exceeds 9'-0" (2,743.2) in height, a cross rail or push bar is recommended to reinforce the vertical stiles.
4. When an offset hung door exceeds 7'-6" (2,286.0) in height, an intermediate butt or offset pivot should be used.
5. Tall doors should be prevented from racking by proper utilization of hardware, including door closers, door holders and door stops.

NOTE:
SOME OF THESE CRITERIA ARE OF A SUBJECTIVE NATURE, CONTACT YOUR FACTORY REPRESENTATIVE FOR APPLICATION ASSISTANCE.



MAXIMUM SIZE DOOR LEAFS GLAZED WITH 1/4" (6.4) GLASS

A = NARROW STILE 190

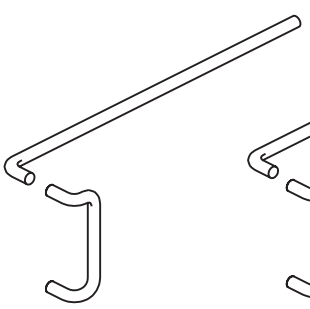
B = MEDIUM STILE 350 OR WIDE STILE 500

MAXIMUM DOOR HEIGHT FOR PANELINE™ MEL = 8'-0"

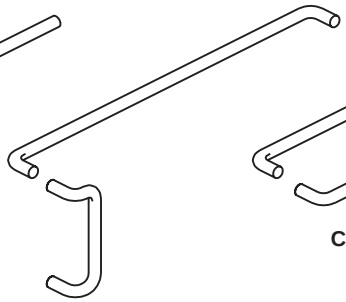
REFER TO **HARDWARE SECTION** FOR COMPLETE HARDWARE INFORMATION.

ARCHITECTS CLASSIC (PUSH PULL SETS)

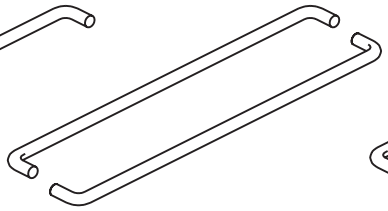
SINGLE ACTING DOORS USE A PULL HANDLE AND PUSH BAR AS STANDARD
DOUBLE ACTING DOORS USE CP PUSH BARS BACK TO BACK AS STANDARD.



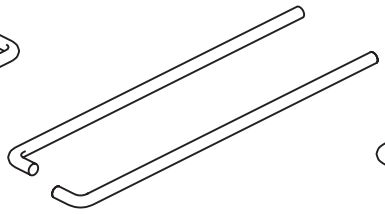
CO-9/CP
CO-12/CP



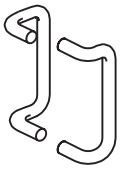
CO-9/CP-II
CO-12 /CP-II



CP-II/CP-II*

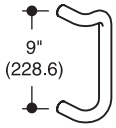


CP/CP

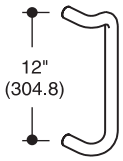


CO-9/CO-9
CO-12/CO-12

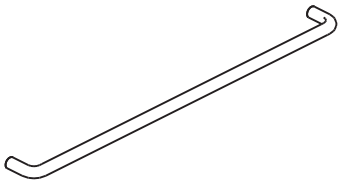
ARCHITECTS CLASSIC (COMPONENTS)



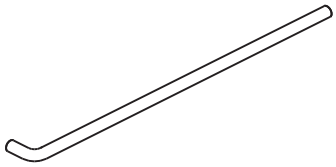
CO-9 PULL



CO-12 PULL



CP-II* PUSH BAR

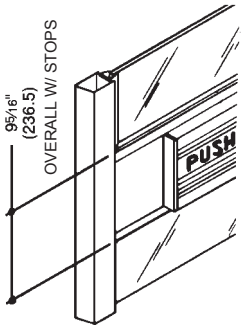


CP PUSH BAR

* CP-II PUSH BAR IS NOT TO BE USED FOR BACK TO BACK MOUNTING ON D/A DOORS.

EXIT DEVICES

KAWNEER PANELINE™ / PANELINE™ MEL



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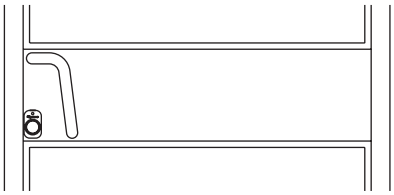
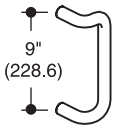
CPN PULL ON EXTERIOR OF DOOR



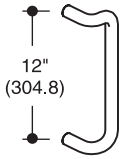
EXTERIOR VIEW OF 190 DOOR (350/500 SIMILAR)
CPN PULL AND OPTIONAL CYLINDER GUARD SHOWN.

SEE PAGE 15 AND 16 FOR COMPLETE PANELINE™ INFORMATION

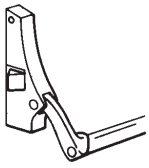
EXIT DEVICES AND PULLS



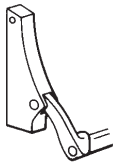
CO-9 PULL



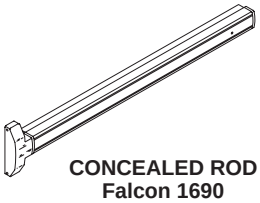
CO-12 PULL



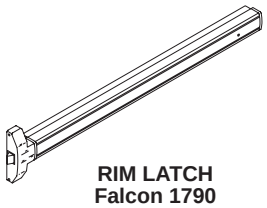
RIM LATCH
Falcon 2090



CONCEALED ROD
Falcon 1990

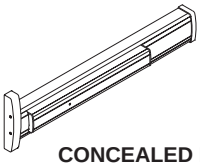


CONCEALED ROD
Falcon 1690
Falcon EL 1690

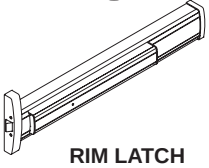


RIM LATCH
Falcon 1790
Falcon EL 1790

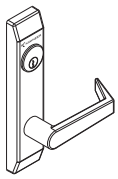
c UL US LISTED



CONCEALED ROD
Kawneer 1686
Kawneer 1686 MEL
Kawneer 1686 CD



RIM LATCH
Kawneer 1786
Kawneer 1786 MEL
Kawneer 1786 CD



LEVER HANDLE
Kawneer 1686
Kawneer 1786

c UL us LISTED

The Paneline™ concealed rod exit device for 190, 350 and 500 doors will accommodate variations in stile width and door width as shown in the following illustrations. Sidelites adjacent to Paneline™ equipped doors not requiring exit devices may be fitted with fixed panels as detailed below to match the general appearance of the Paneline™ cross rail.

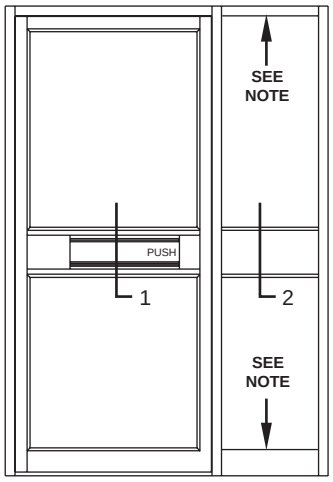
The Optional Paneline™ MEL device is designed for electrified access control and is compatible with most key pad and card reader systems.

See **Hardware Section** for complete description of Paneline™ hardware, including finish of units.

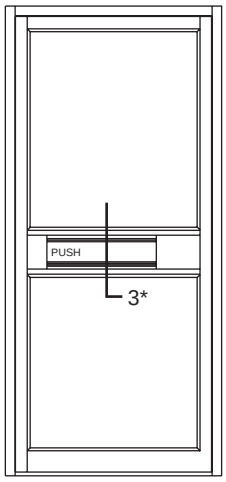
Paneline™ uses mortise cylinder in lieu of the normal rim-type.
Dummy Paneline™ units are not for use with any type of lock.

INTERIOR ELEVATIONS

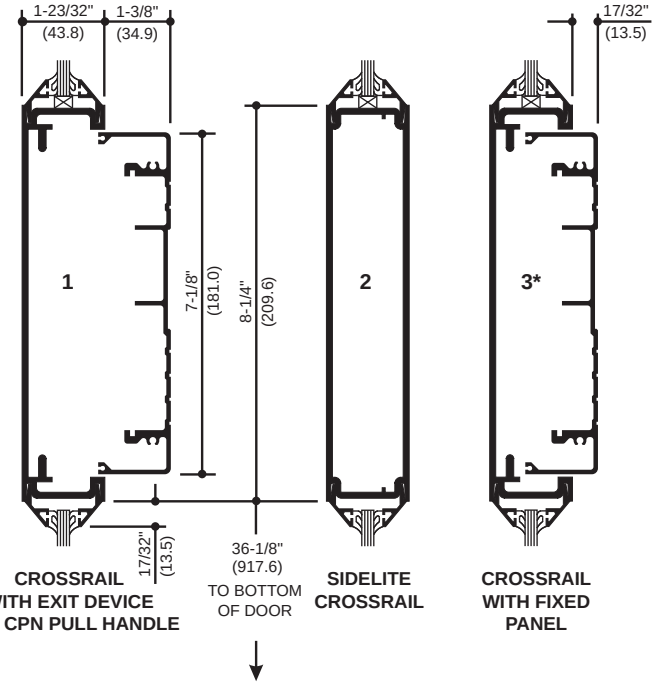
NOTE: Sidelites must be stop glazed above and below rail.



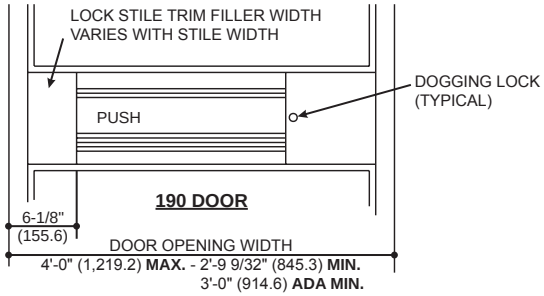
ACTIVE DOOR **SIDELITE**



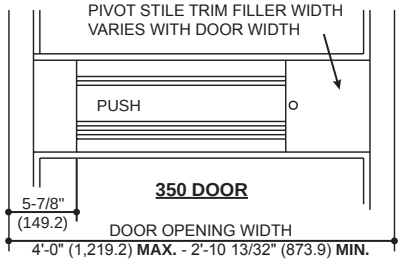
***VESTIBULE DOOR**
(Without Exit Device or Lock)



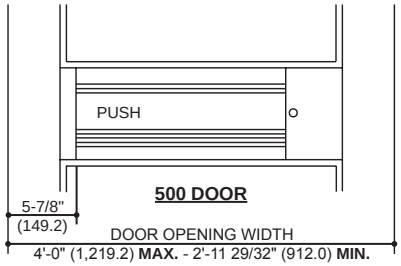
CROSSRAIL WITH EXIT DEVICE AND CPN PULL HANDLE **SIDELITE CROSSRAIL** **CROSSRAIL WITH FIXED PANEL**



190 DOOR
4'-0" (1,219.2) **MAX.** - 2'-9 9/32" (845.3) **MIN.**
3'-0" (914.6) **ADA MIN.**

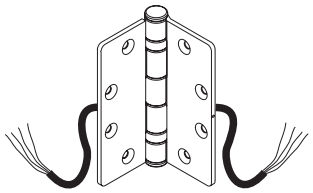


350 DOOR
4'-0" (1,219.2) **MAX.** - 2'-10 13/32" (873.9) **MIN.**
3'-0" (914.6) **ADA MIN.**

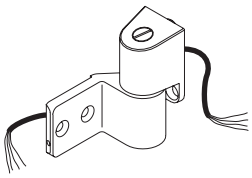


500 DOOR
4'-0" (1,219.2) **MAX.** - 2'-11 29/32" (912.0) **MIN.**
3'-0" (914.6) **ADA MIN.**

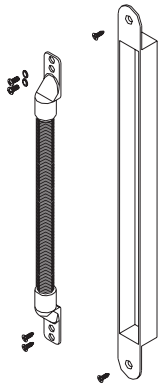
PANELINE™ MEL COMPONENTS



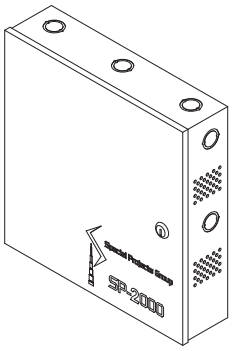
POWER TRANSFER INTERMEDIATE BUTT HINGE



POWER TRANSFER INTERMEDIATE OFFSET PIVOT



ELECTRIC POWER TRANSFER (EPT)



SP-2000 POWER SUPPLY

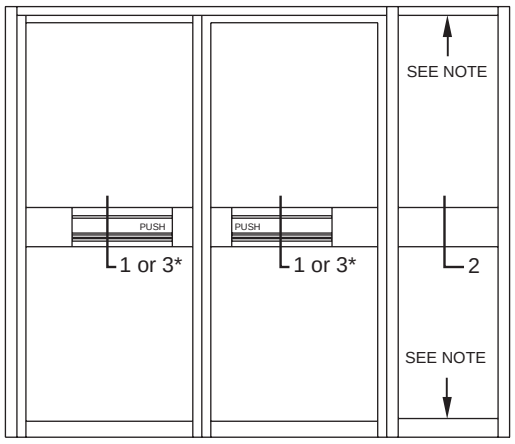
Sidelites adjacent to Paneline™ equipped doors not requiring exit devices may be fitted with fixed panels as detailed below to match the general appearance of the Paneline™ cross rail.

See **Hardware Section** for complete description of Paneline™ hardware, including finish of units.

Paneline™ uses mortise cylinder in lieu of the normal rim-type.
Dummy Paneline™ units should not use any type of lock.

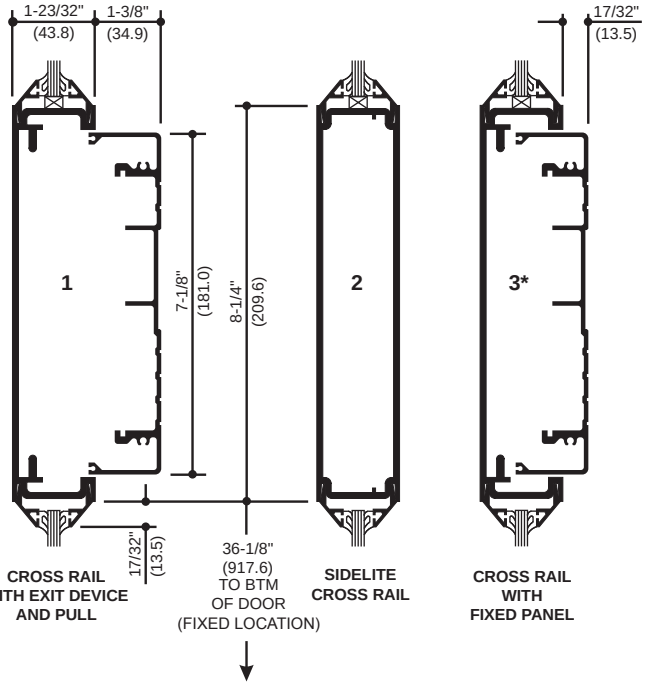
INTERIOR ELEVATION

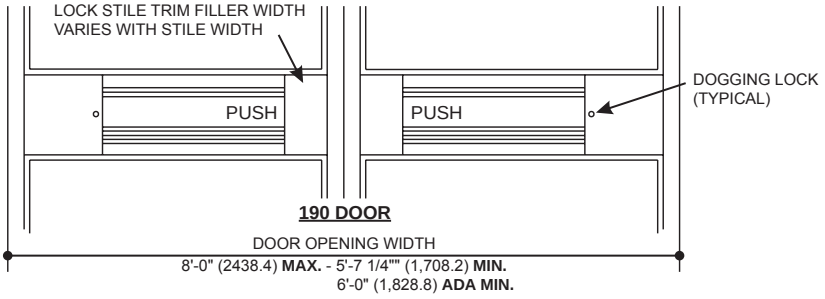
NOTE: Sidelites must be stop glazed above and below rail.

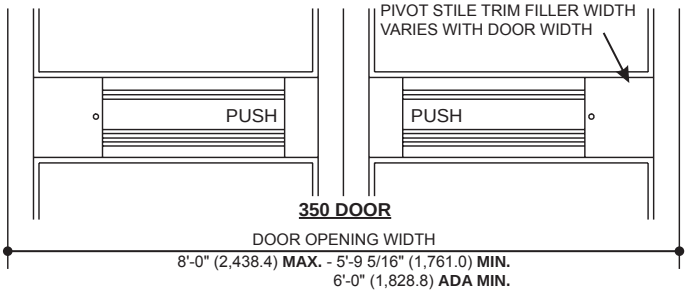


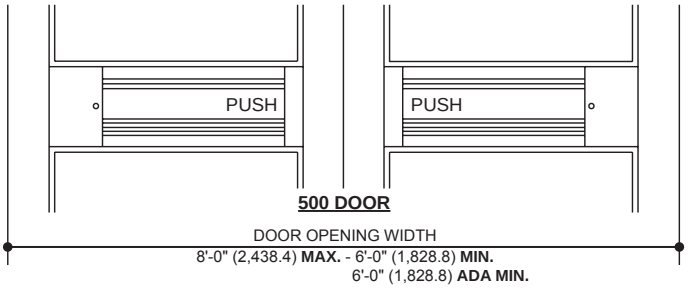
*** ALTERNATE CROSSRAIL FOR VESTIBULE DOORS (Without Exit Device or Lock)**

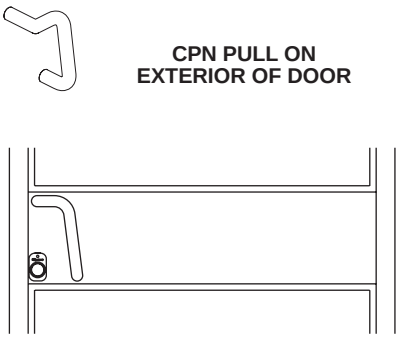
c UL US LISTED







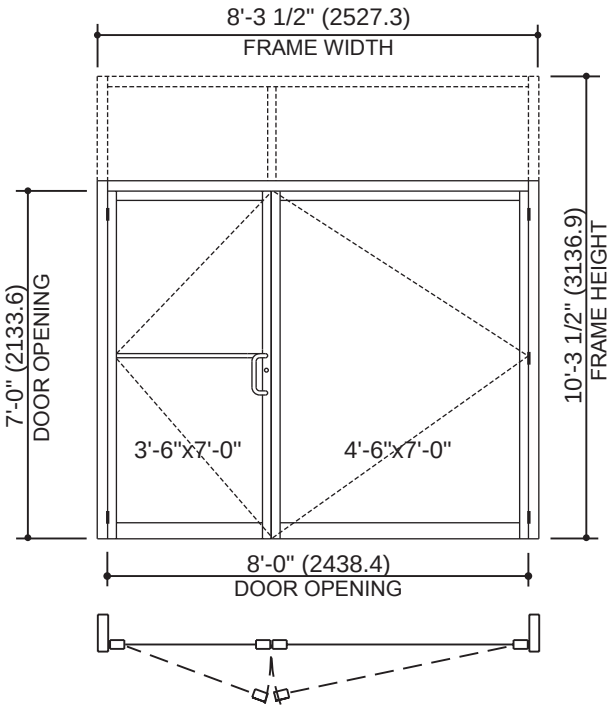




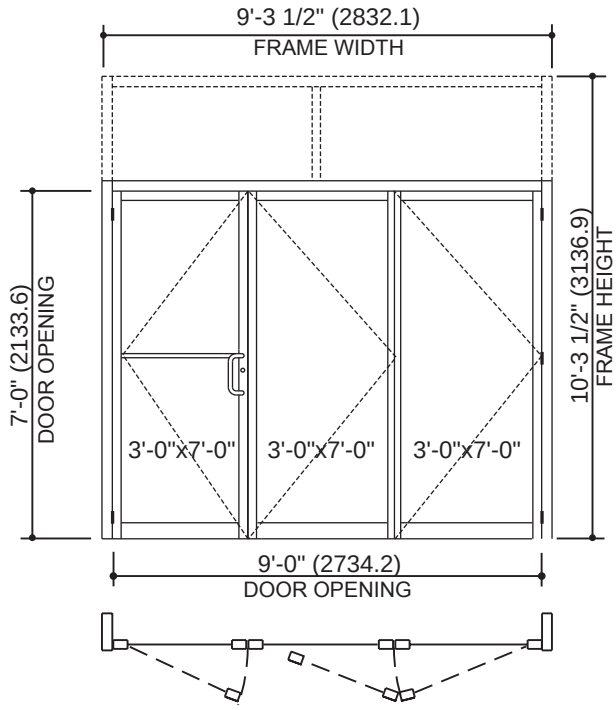
EXTERIOR VIEW OF 190 DOOR (350-500 SIMILAR) WITH CPN PULL AND STANDARD CYLINDER GUARD SHOWN

NOTE: 1/4" GLAZING INFILL ONLY

SWING TYPE



BIFOLD TYPE



MAXIMUM ALLOWABLE SIZES

- DOOR OPENING WIDTH TO 9'-0" (2,743.2)
- DOOR OPENING HEIGHT TO 8'-0" (2,438.4)
- OVERALL FRAME HEIGHT TO 8'-1 3/4" (2,482.9) W/O TRANSOM
- OVERALL FRAME HEIGHT TO 12'-0" (3,657.6) WITH TRANSOM

AUTO SHOWROOM PACKAGE

DOORS ..... 190 NARROW STILE, 350 MEDIUM STILE AND 500 WIDE STILE DOORS.

FRAME..... TRIFAB™ VG 450 CENTER.

CLOSER..... NORTON 1601 ADJUSTABLE OR 1601 BF ADJUSTABLE SURFACE CLOSER (ACTIVE LEAF ONLY).

BUTT HINGES ..... ONE PAIR 4-1/2" x 4" (114.3 x 101.6) BALL BEARING BUTTS ON ACTIVE LEAF, ONE AND ONE HALF PAIR ON INACTIVE LEAVES AT HINGE JAMB. CONTINUOUS HINGE ON INACTIVE LEAVES.

LOCKS ..... ADAMS-RITE MS1850A WITH (2) CYLINDERS ON ACTIVE LEAF.

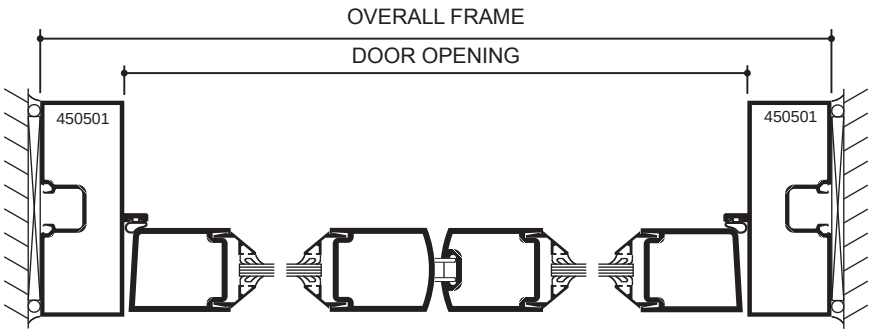
FLUSHBOLTS..... ONE PAIR EDGE MOUNTED FOR INACTIVE LEAVES (FACE MOUNTED ON #2 INACTIVE LEAF OF BIFOLD TYPE).

THRESHOLD ..... 1/2" x 4" (12.7 x 101.6) ALUMINUM.

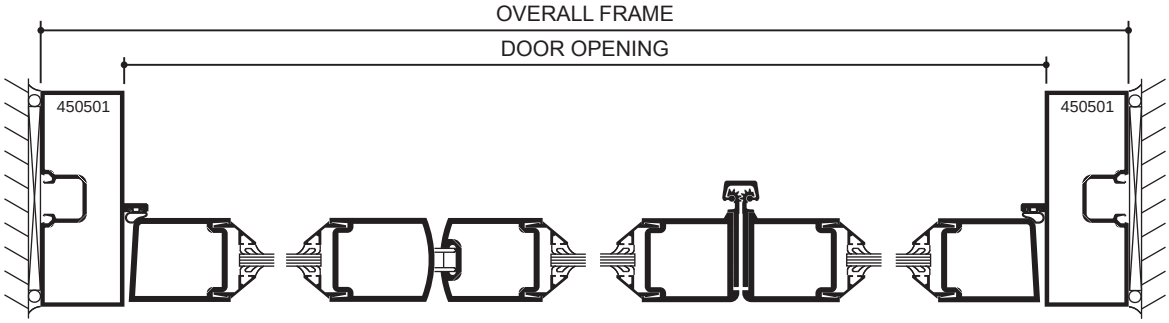
RISER BLOCK..... EXTRUDED ALUMINUM BLOCK APPLIED TO BOTTOM RAIL OF EACH INACTIVE LEAF.

OPTIONAL CASTER ..... IN LIEU OF RISER BLOCK, FACE APPLIED CASTER TO LEADING STILE OF INACTIVE LEAF.

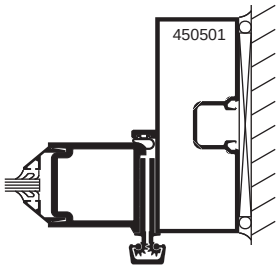
Additional information and CAD details are available at www.kawneer.com



SWING TYPE



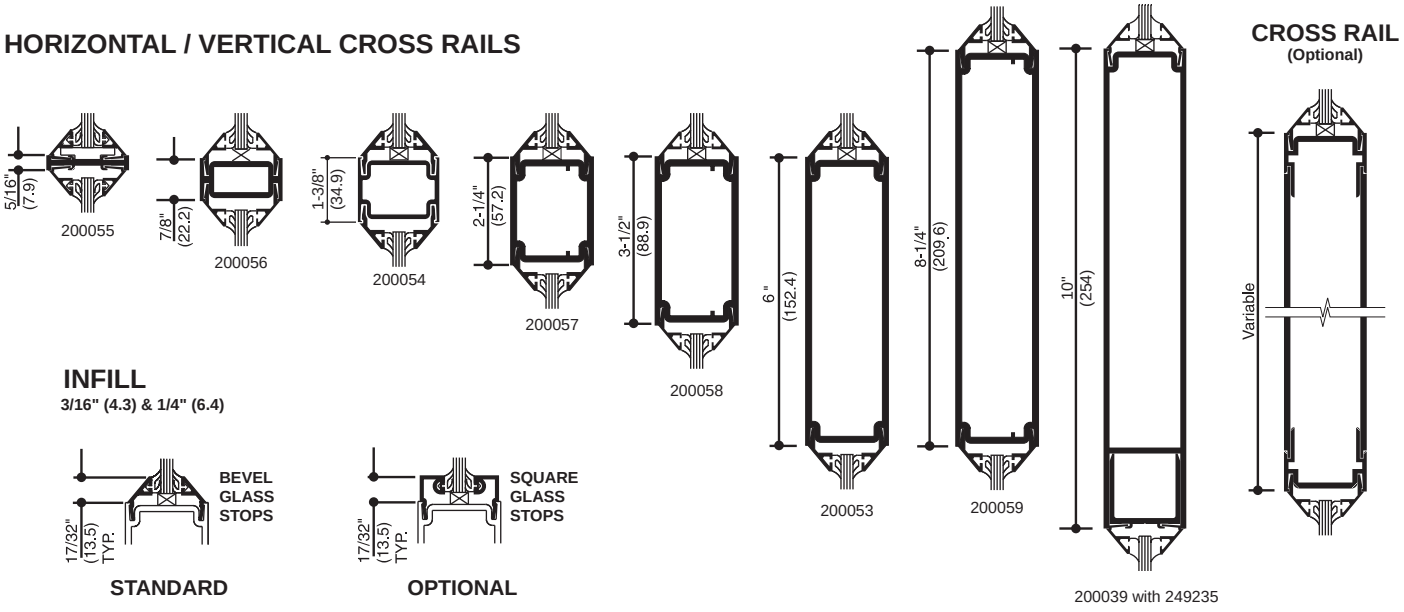
BIFOLD TYPE



OPTIONAL CONTINUOUS HINGE JAMB

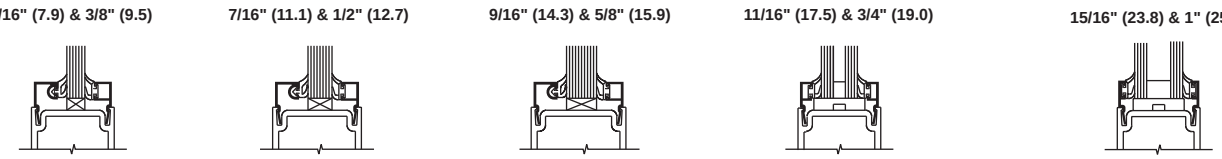
Additional information and CAD details are available at www.kawneer.com

HORIZONTAL / VERTICAL CROSS RAILS

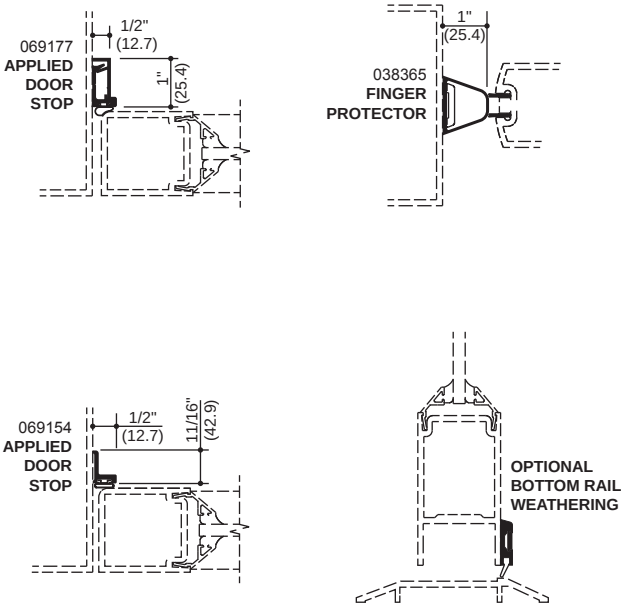


INFILL
3/16" (4.3) & 1/4" (6.4)

INFILL OPTIONS



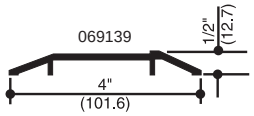
ACCESSORY ITEMS



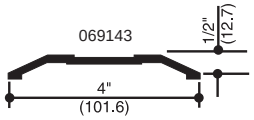
THRESHOLDS

APPLICATION

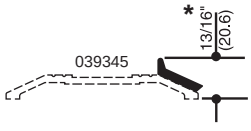
FOR SINGLE ACTING DOOR



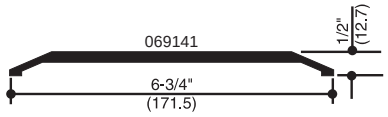
FOR CENTER HUNG CONCEALED CLOSER



APPLIED STOP FOR SINGLE ACTING DOOR

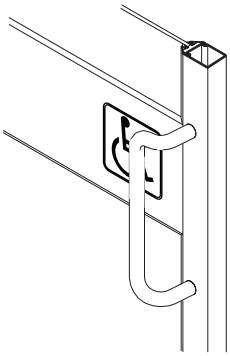
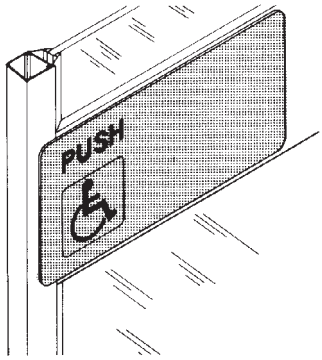


FOR CENTER HUNG FLOOR CLOSERS



***SOME BUILDING CODES LIMIT THRESHOLD HEIGHT TO 1/2" (12.7) MAX.**

PUSH-PULLS

		
Description	Architects Classic CO-12 Pull	BF3 Push Shield with symbol
Application	Door with or without exit device	Door cross rail (omit w/exit device)
Length/Size	12" OC Pull attachment	15-7/8" x 7-7/8" (403.2 x 200.0) 1/8" (3.2) Thick
Height Location	44-5/16" from Top Mounting Hole to Btm. of Door	
Total Projection	3-1/4" (82.6)	1/8" (3.2)
Material / Finish	See Hardware Section	Black Plastic Pebble Finish

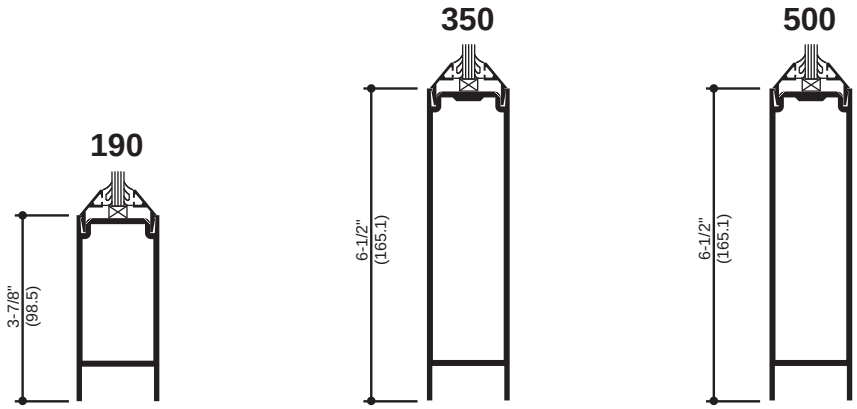
Note: The symbol of access is an adhesive backed decal applied to the surface of the optional cross rail. Letters and symbols on plastic push shield are engraved and filled with white epoxy enamel.

Additional information and CAD details are available at www.kawneer.com

STANDARD BOTTOM RAILS

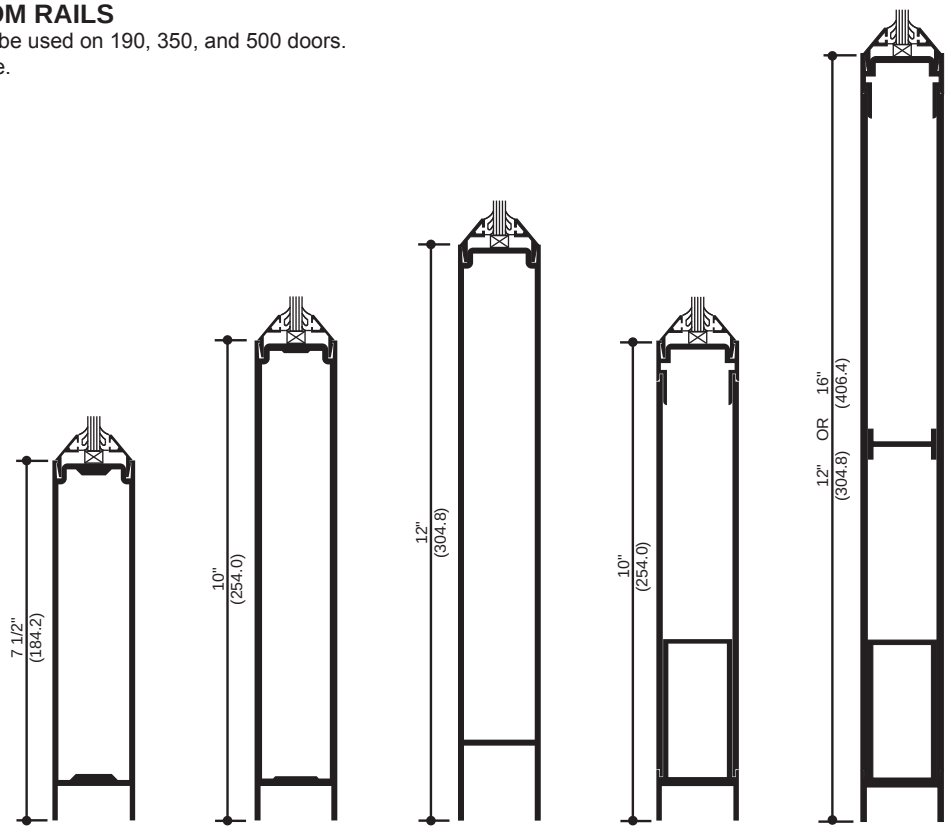
Rail heights shown may be used on 190, 350, and 500 doors.

NOTE:
See Page 19 for available Horizontal Intermediate Members.

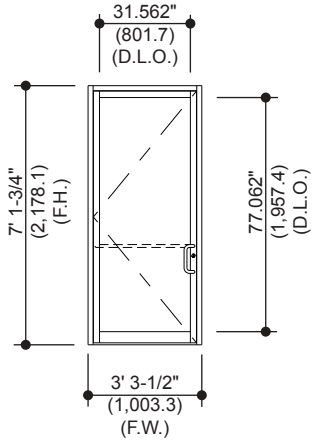


OPTIONAL BOTTOM RAILS

Rail heights shown may be used on 190, 350, and 500 doors.
Custom heights available.



Generic Project Specific U-factor Example Calculation
(Percent of Glass will vary on specific products depending on sitelines)



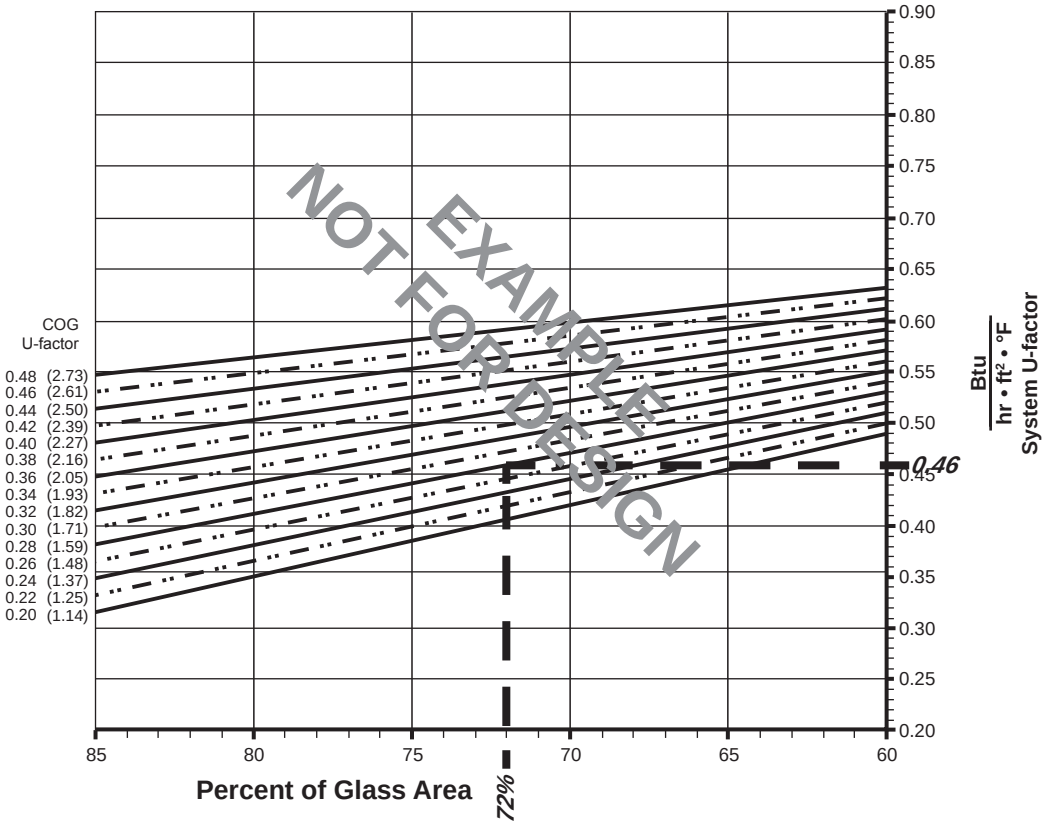
Example Glass U-Factor = 0.28 Btu/hr • ft² • °F

Total Daylight Opening = 31.562" x 77.062" = 16.89 ft²

Total Projected Area = 3' 3-1/2 x 7' 1-3/4" = 23.52 ft²

Percent of Glass = (Total Daylight Opening ÷ Total Projected Area)100
= (16.89 ÷ 23.52)100 = 72%

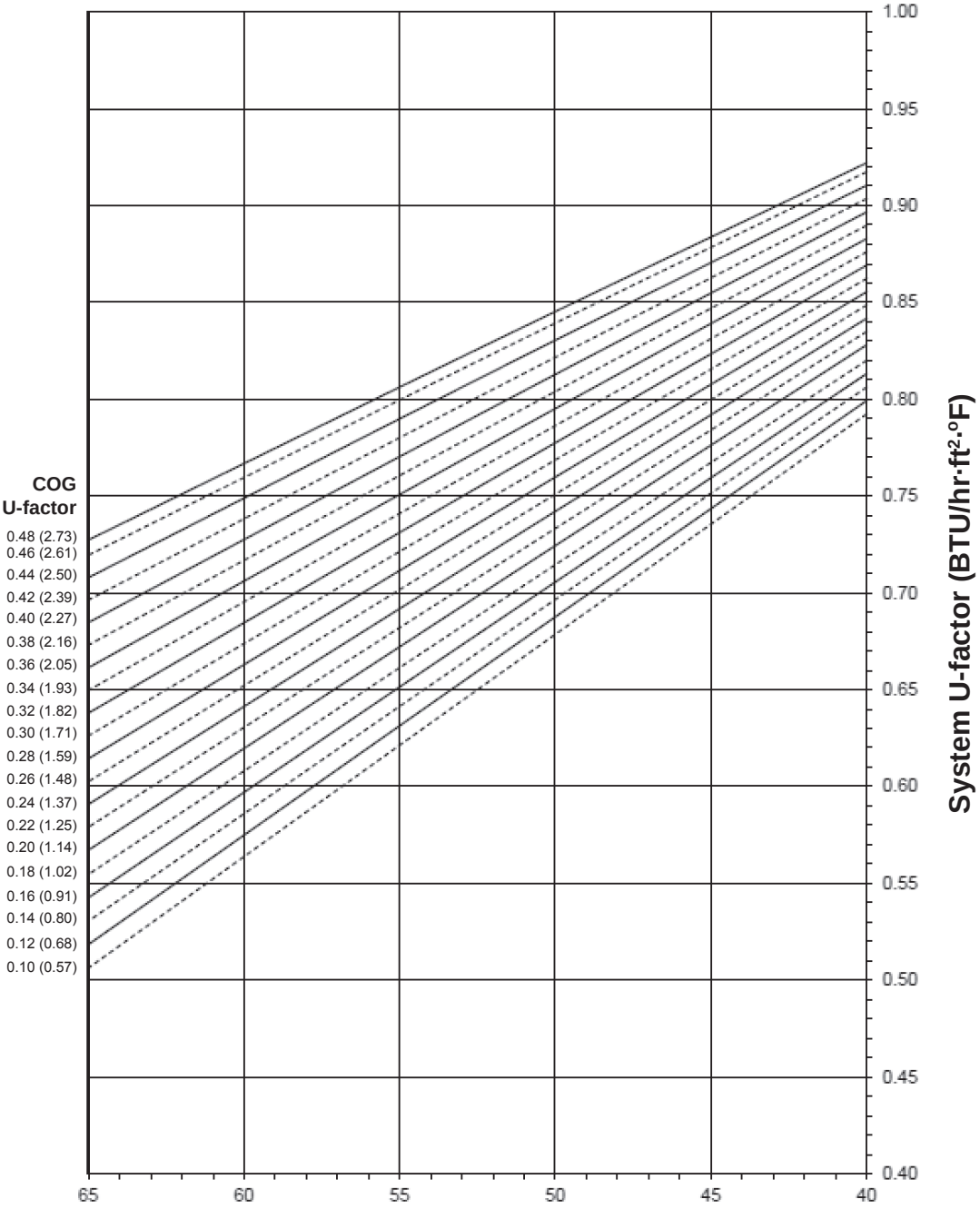
System U-factor vs Percent of Glass Area



Based on 72% glass and center of glass (COG) U-factor of 0.28
System U-factor is equal to 0.46 Btu/hr • ft² • °F

350 (SINGLE DOOR)

System U-factor vs Percent of Glass Area



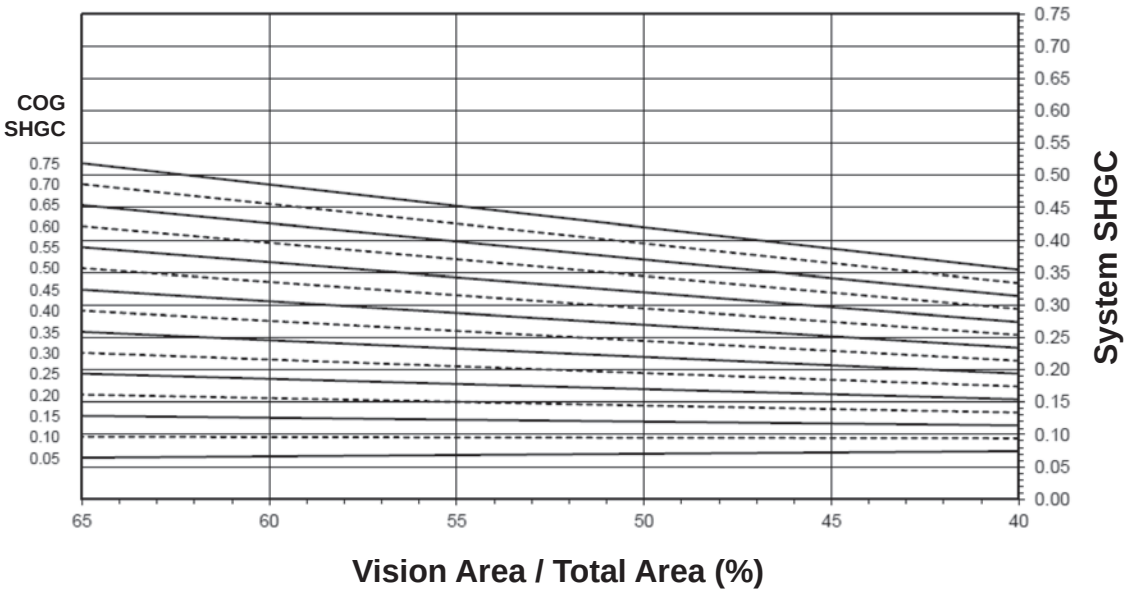
Percent of Glass = Vision Area/Total Area
(Total Daylight Opening / Projected Area)

Notes for System U-Factor, SHGC and VT charts:

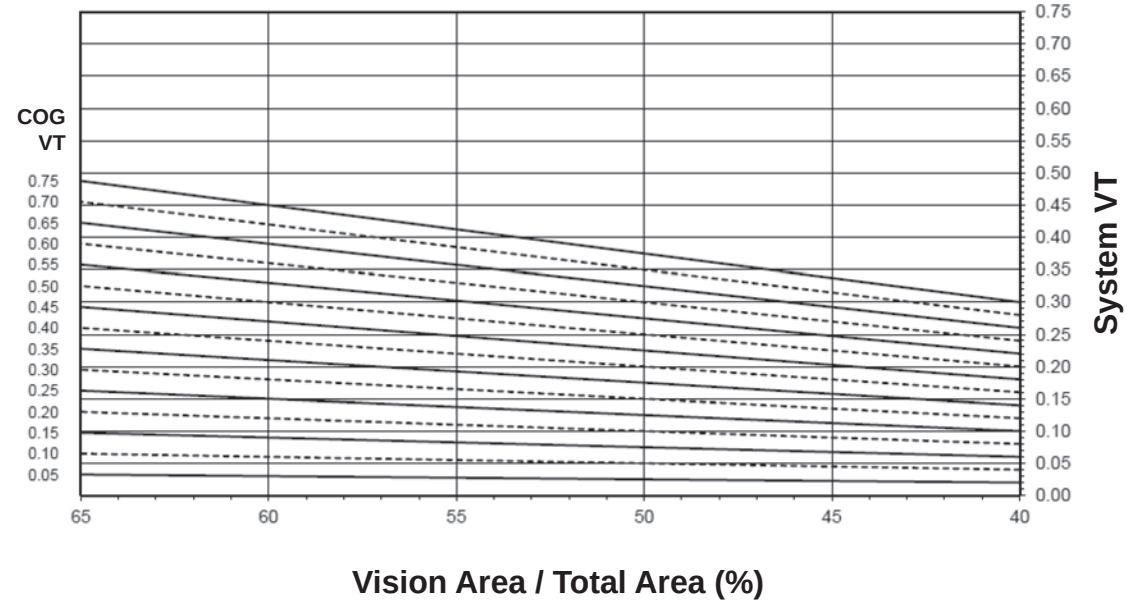
For glass values that are not listed, linear interpolation is permitted.
Glass properties are based on center of glass values (winter conditions) and are obtained from your glass supplier.

350 (SINGLE DOOR)

System Solar Heat Gain Coefficient (SHGC) vs Percent of Vision Area



System Visible Transmittance (VT) vs Percent of Vision Area



350 (SINGLE DOOR)

Thermal Transmittance [1] (BTU/hr • ft [2] • °F)

Glass U-Factor [3]	Overall U-Factor [4]
0.48	0.83
0.46	0.82
0.44	0.81
0.42	0.81
0.40	0.80
0.38	0.79
0.36	0.78
0.34	0.77
0.32	0.76
0.30	0.75
0.28	0.74
0.26	0.73
0.24	0.72
0.22	0.71
0.20	0.70
0.18	0.69
0.16	0.68
0.14	0.68
0.12	0.67
0.10	0.66

NOTE: For glass values that are not listed, linear interpolation is permitted.

1. U-Factors are determined in accordance with NFRC 100.
2. SHGC and VT values are determined in accordance with NFRC 200.
3. Glass properties are based on center of glass values and are obtained from your glass supplier.
4. Overall U-Factor, SHGC, and VT Matricies are based on the standard NFRC specimen size of 960 mm wide by 2,090 mm high (37-3/4" by 82-3/8").

SHGC Matrix [2]

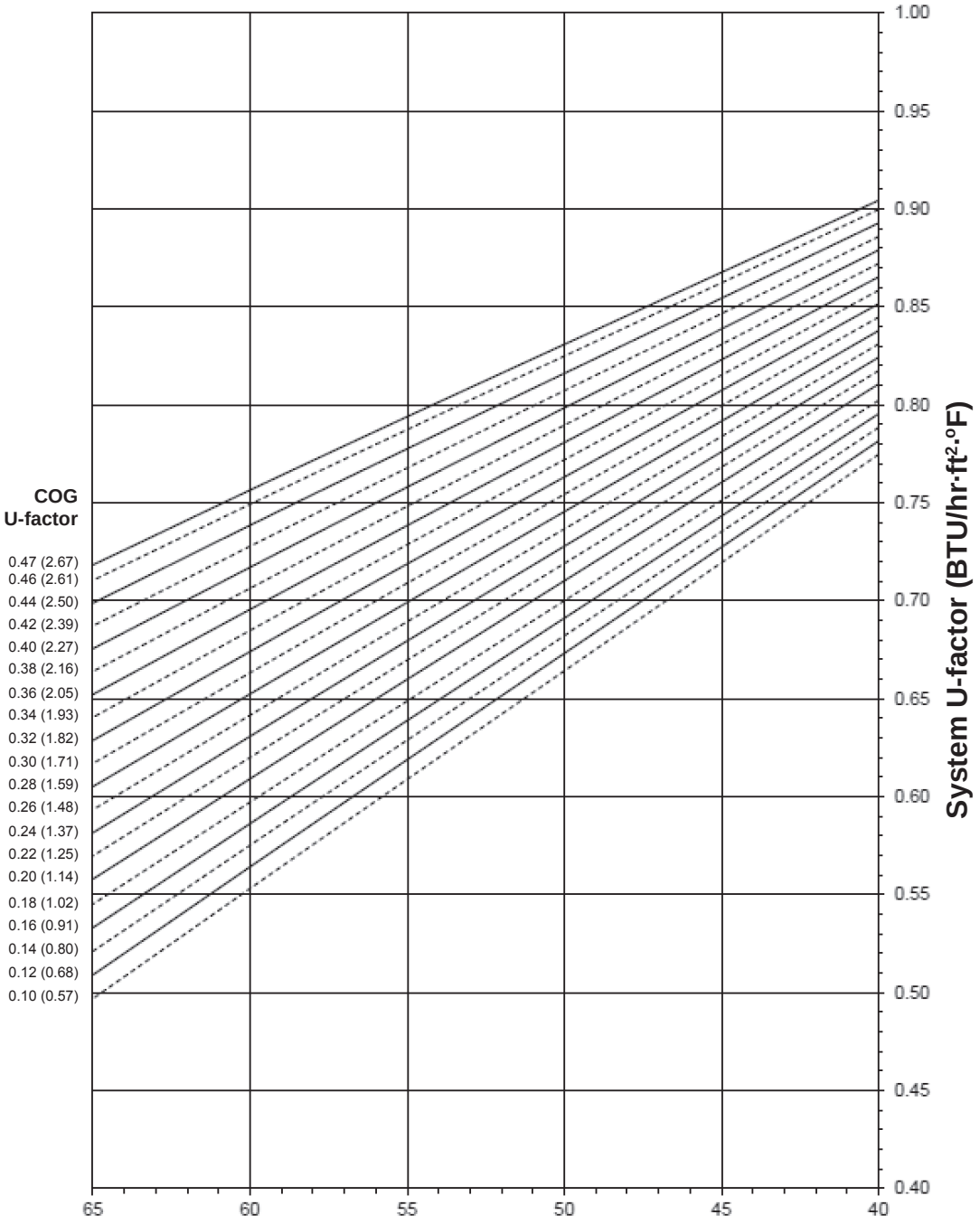
Glass SHGC [3]	Overall SHGC [4]
0.75	0.43
0.70	0.41
0.65	0.38
0.60	0.36
0.55	0.33
0.50	0.30
0.45	0.28
0.40	0.25
0.35	0.23
0.30	0.20
0.25	0.17
0.20	0.15
0.15	0.12
0.10	0.10
0.05	0.07

Visible Transmittance [2]

Glass VT [3]	Overall VT [4]
0.75	0.39
0.70	0.36
0.65	0.34
0.60	0.31
0.55	0.29
0.50	0.26
0.45	0.23
0.40	0.21
0.35	0.18
0.30	0.16
0.25	0.13
0.20	0.10
0.15	0.08
0.10	0.05
0.05	0.03

350 (PAIR OF DOORS)

System U-factor vs Percent of Glass Area



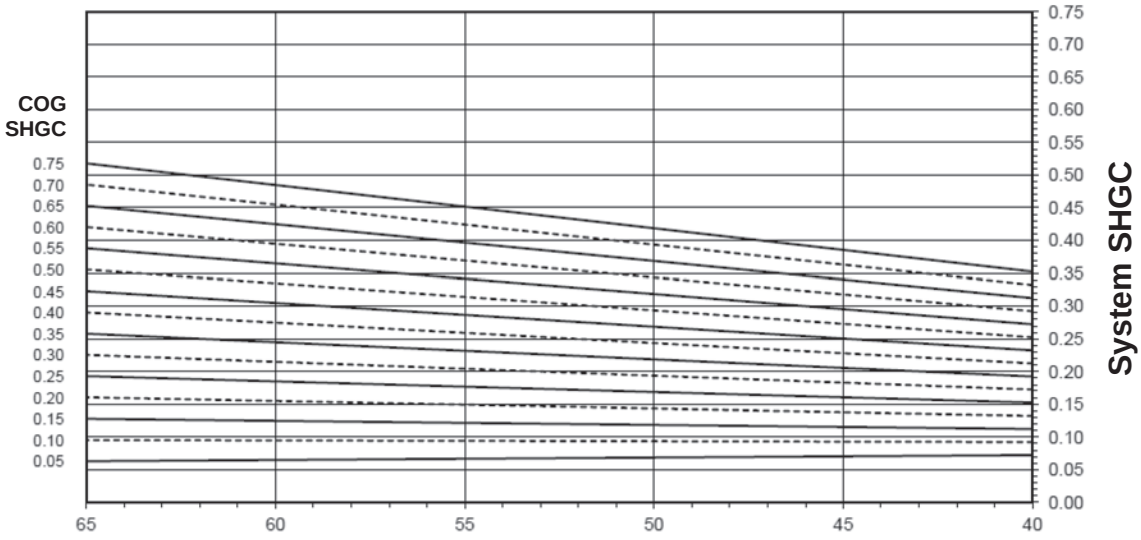
Notes for System U-Factor, SHGC and VT charts:

For glass values that are not listed, linear interpolation is permitted.

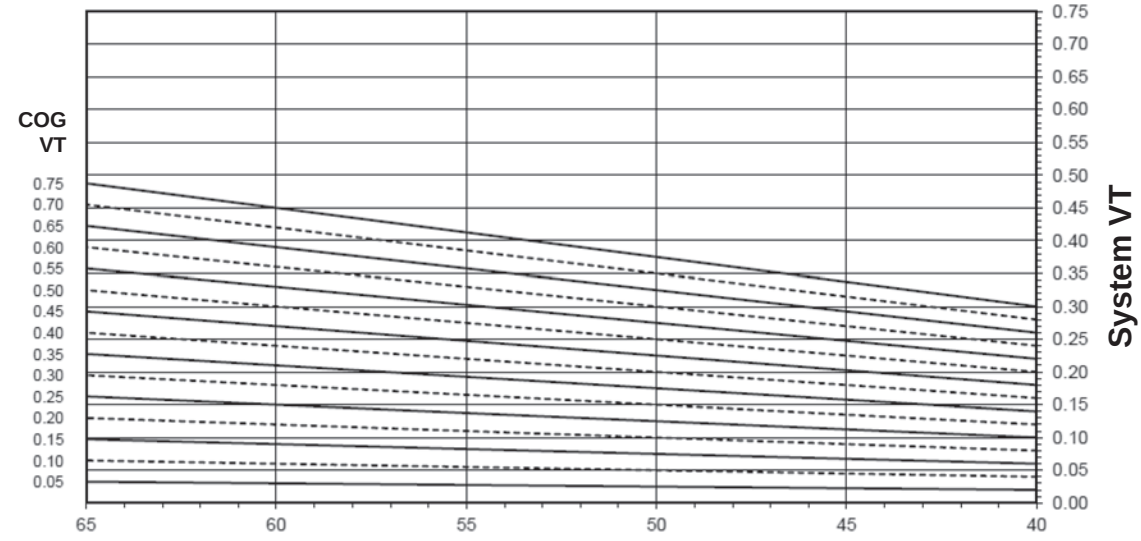
Glass properties are based on center of glass values (winter conditions) and are obtained from your glass supplier.

350 (PAIR OF DOORS)

System Solar Heat Gain Coefficient (SHGC) vs Percent of Vision Area



System Visible Transmittance (VT) vs Percent of Vision Area



350 (PAIR OF DOORS)

Thermal Transmittance [1] (BTU/hr • ft [2] • °F)

Glass U-Factor [3]	Overall U-Factor [4]
0.47	0.79
0.46	0.78
0.44	0.77
0.42	0.76
0.40	0.75
0.38	0.74
0.36	0.73
0.34	0.72
0.32	0.71
0.30	0.70
0.28	0.69
0.26	0.68
0.24	0.67
0.22	0.66
0.20	0.65
0.18	0.64
0.16	0.63
0.14	062
0.12	0.61
0.10	0.60

NOTE: For glass values that are not listed, linear interpolation is permitted.

1. U-Factors are determined in accordance with NFRC 100.
2. SHGC and VT values are determined in accordance with NFRC 200.
3. Glass properties are based on center of glass values and are obtained from your glass supplier.
4. Overall U-Factor, SHGC, and VT Matricies are based on the standard NFRC specimen size of 1,920 mm wide by 2,090 mm high (75-1/2" by 82-3/8").

SHGC Matrix [2]

Glass SHGC [3]	Overall SHGC [4]
0.75	0.46
0.70	0.43
0.65	0.40
0.60	0.37
0.55	0.35
0.50	0.32
0.45	0.29
0.40	0.26
0.35	0.23
0.30	0.21
0.25	0.18
0.20	0.15
0.15	0.12
0.10	0.09
0.05	0.07

Visible Transmittance [2]

Glass VT [3]	Overall VT [4]
0.75	0.42
0.70	0.39
0.65	0.36
0.60	0.34
0.55	0.31
0.50	0.28
0.45	0.25
0.40	0.22
0.35	0.20
0.30	0.17
0.25	0.14
0.20	0.11
0.15	0.08
0.10	0.06
0.05	0.03

ENTRE/MATIC

2" Ribbed Panel Steel Sectional Doors

Amarr 2002 / 2012 / 2022
Amarr 2402 / 2412 / 2422
Amarr 2502 / 2512 / 2522

Amarr 2" ribbed panel steel sectional doors are the industry workhorses and our most versatile door models.

These open-back commercial steel doors are available in a variety of steel gauges and feature tongue and groove construction with a bottom weather seal to guard against the elements. These doors can be factory- or field-modified with CFC-free polystyrene insulation to fit the needed application.

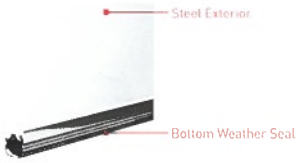
CONSTRUCTION

Amarr 2002, 2012, 2022
Extra Heavy-duty, 20-gauge steel

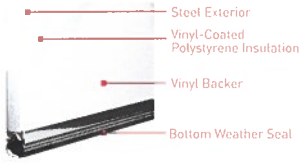
Amarr 2402, 2412, 2422
Heavy-duty, 24-gauge steel

Amarr 2502, 2512, 2522
Medium-duty, nominal 24-gauge steel

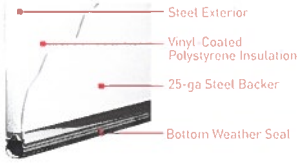
SINGLE-LAYER
Steel
Amarr 2002/2402/2502



R-Value 7.0
DOUBLE-LAYER
Steel + Insulation
Amarr 2012/2412/2512



R-Value 7.0
TRIPLE-LAYER
Steel + Insulation + Steel Backer
Amarr 2022/2422/2522



Track: All Amarr doors are available with both 2" or 3" track in Standard Lift, High Lift, Vertical Lift, Low Headroom, and Follow the Roof Pitch. Custom track configurations are also available. For drawings and more information, please visit **www.amarr.com.**

Springs: Torsion springs are oil tempered, helical wound and custom computed for each door for a minimum 10,000 cycle life. Optional springs are available up to 100,000 cycle life.

Standard Hardware: Galvanized steel hinges and track brackets. All rollers have minimum 10-ball bearings.

SPECIFICATIONS

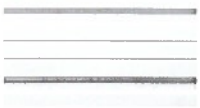
Amarr	Extra Heavy-Duty			Heavy-Duty			Medium-Duty		
	Amarr 2002	Amarr 2012	Amarr 2022	Amarr 2402	Amarr 2412	Amarr 2422	Amarr 2502	Amarr 2512	Amarr 2522
EXTERIOR STEEL THICKNESS	20 ga	20 ga	20 ga	24 ga	24 ga	24 ga	Nominal 24 ga	Nominal 24 ga	Nominal 24 ga
END STILE	19 ga (16 ga optional)	19 ga (16 ga optional)	19 ga (16 ga optional)	19 ga (16 ga optional)	19 ga (16 ga optional)	19 ga (16 ga optional)	19 ga (16 ga optional)	19 ga (16 ga optional)	19 ga (16 ga optional)
PANEL DESIGN	Deep Ribbed	Deep Ribbed	Deep Ribbed	Deep Ribbed	Deep Ribbed	Deep Ribbed	Deep Ribbed	Deep Ribbed	Deep Ribbed
STEEL EMBOSSMENT	Smooth	Smooth	Smooth	Smooth	Smooth	Smooth	Smooth	Smooth	Smooth
DOOR THICKNESS	2" (5.1cm)	2" (5.1cm)	2" (5.1cm)	2" (5.1cm)	2" (5.1cm)	2" (5.1cm)	2" (5.1cm)	2" (5.1cm)	2" (5.1cm)
CONSTRUCTION LAYERS	Single	Double	Triple	Single	Double	Triple	Single	Double	Triple
INSULATION[1]		Vinyl-Coated Polystyrene	Polystyrene		Vinyl-Coated Polystyrene	Polystyrene		Vinyl-Coated Polystyrene	Polystyrene
R-VALUE[2]		7.0	7.0		7.0	7.0		7.0	7.0
MINIMUM WIDTH	6'	6'	6'	6'	6'	6'	6'	6'	6'
MAXIMUM WIDTH	26' 2"	26' 2"	26' 2"	30' 2"	30' 2"	30' 2"	20' 2"	20' 2"	20' 2"
MINIMUM HEIGHT	7'	7'	7'	7'	7'	7'	7'	7'	7'
MAXIMUM HEIGHT	26' 1"	26' 1"	26' 1"	26' 1"	26' 1"	26' 1"	14' 1"	14' 1"	14' 1"
WIND LOAD[3] AVAILABLE	•	•	•	•	•	•	•	•	•
PAINT FINISH WARRANTY[4]	10 Years	10 Years	10 Years	10 Years	10 Years	10 Years	10 Years	10 Years	10 Years
WORKMANSHIP/HARDWARE WARRANTY[4]	1 Year	1 Year	1 Year	1 Year	1 Year	1 Year	1 Year	1 Year	1 Year

RAPID INSTALL

Rapid Install Vertical Lift: Designed specifically for commercial warehouse and dock doors and saves approximately 20 minutes of installation time per door due to fewer jamb attachments and a pre-assembled, one-piece track. Available for door sizes up to 9' x 10'. For more information, please visit **www.amarr.com.**

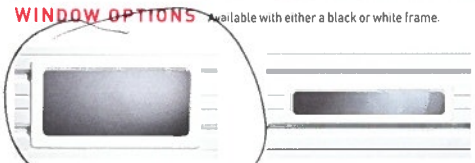
1 Insulation has passed self-ignition, flamespread and smoke developed index fire testing.
2 Calculated door section R-value.
3 It is your responsibility to make sure your garage door meets local building codes.
4 For complete warranty details, visit amarr.com or contact your local Amarr dealer.

PANEL DESIGN



RIBBED PANEL

WINDOW OPTIONS
Available with either a black or white frame.

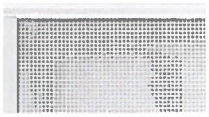


24" X 12" SINGLE PLEXIGLAS®
24" X 12" INSULATED PLEXIGLAS®

24" X 6" DSB or PLEXIGLAS®

ALUMINUM SECTION OPTIONS

GLAZED ALUMINUM



PERFORATED ALUMINUM†
0.312" square perforations on ½" centers

LOUVERED ALUMINUM
6 columns of (12) 3"x 3/4" vents on a 4'x 24" panel

STEEL COLORS
Actual paint colors may vary from samples shown.

COMMERCIAL WHITE (WH)

COMMERCIAL GRAY (CY)
2402/2412/2422 only

COMMERCIAL BROWN (CB)
2402/2412/2422 only

COMMERCIAL BLACK (BG)*
2402/2412/2422 only

CLEAR ANODIZE

DARK BRONZE ANODIZE

BLACK ANODIZE

WHITE POWDER COAT

Actual color may vary from samples shown.
Additional finish options available. Visit Amarr.com
†Also available in Mill finish.

Amarr steel doors are pre-painted; owners can use exterior latex paint for custom colors. Visit amarr.com for painting instructions. Painting your door voids the warranty.

*Price upcharge applies.

SUPERFLEX SECTION OPTION

Impact resistant sections are the answer to lower door section damage common in today's busy warehouses. Made with high-performance TPO skins on a flexible fiberglass tube frame. Available in widths up to 12' 2".

ENTREMATIC

Entrematic
165 Carriage Court
Winston-Salem, NC 27105
800.503.DOOR
www.amarr.com

FOR TECHNICAL QUESTIONS:
1.866.366.4814

MADE IN USA
RECYCLED STEEL
SUSTAINABLE

Valley Overhead Door

PROPOSAL

DATE: 12/6/2021

1948 Central Parkway S.W.
P.O. Box 5858
Decatur, AL 35601

Decatur 256-353-6777
Huntsville 256-837-1277
Madison 256-464-6506
Fax 256-353-4777

Bill To:
Decatur City

For:
Tom Polk

	DESCRIPTION		AMOUNT
	Thank you for the opportunity to quote your job. We are pleased to quote the following:		
1	16x9 Amarr 2412 Insulated Commercial door with 4 vision lights, with follow the roof line track, with a Liftmaster ATSW motor with 2 remotes and keyless entry, installed (motor estimate pending jobsite check varifying follow roof line will work)		$4,200
	Lead times are around 17 to 18 weeks.		
	Pricing good for 15 days.		
		TOTAL	

THANK YOU FOR YOUR BUSINESS!

"Serving All Your Door Needs"

brian@valleyohd.com

Brian Yarbrough

Valley Overhead Door

1948 Central Pkwy. S.W.
P.O. Box 5858
Decatur, AL 35601

Decatur 256-353-6777
Huntsville 256-837-1277
Fax 256-353-4777

www.valleyohd.com

Results

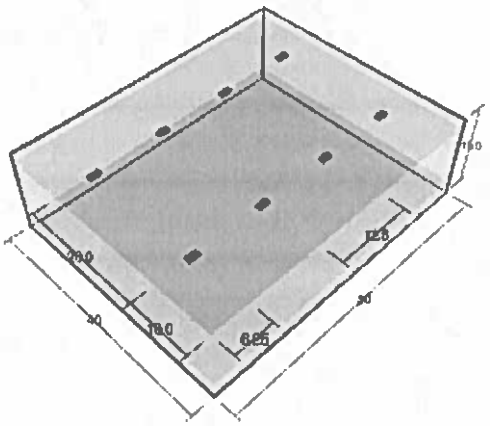
49 fc **8** luminaires **0.43** W/ft²

Luminaire

HBL3110UNV50K.ies

HBL3110UNV50K
HBL3110UNV50K

Luminaire Watts	108	W
Ballast/Driver Factor	1.00	
Light Loss Factor	1.00	
Total Proration Factor	1.00	
Luminaire Lumens	14399	lms



Room

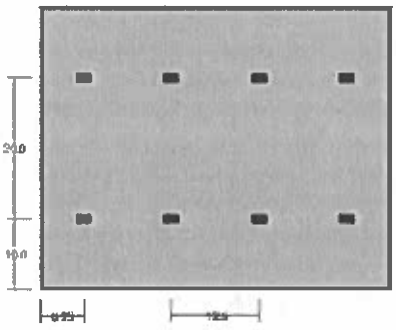
Length	50	ft
Width	40	ft
Height	15.0	ft
Workplane Height	2.50	ft
Suspension Length	1.50	ft

Reflectance

Ceiling	80	%
Walls	50	%
Floor	20	%

Layout

	⋮		•••	
Layout	4		2	
Spacing	12.5		20.0	ft
Offset	6.25		10.0	ft
Spacing Criteria	1.30	⚠	1.30	



Travis 2022-10-10

HBL3

LED Linear Low Bay / High Bay

Project

Catalog

Type

Date

Product Description

The HBL3 LED Linear Low Bay/High Bay improves on the HBL model by providing higher performance with a slim new design. The ideal lumen package for replacing metal halide and linear fluorescent high bay systems the fixture supplies an output greater than 130 lumens per watt, meeting DLC premium. This energy-efficient and economical fixture offers high performance and long life, excellent color rendering, and even uniformity. The HBL3 is available in 4000K and 5000K color temperatures and has suggested mounting heights from 15ft and above, making it the perfect solution for warehouses, gymnasiums, garages and other storage areas, commercial and manufacturing facilities, as well as open and stack aisle applications.

117.14E

Construction
- Durable steel construction with powder coat finish
- Vented steel housing provides thermal management through natural convection
- Top mounted wireway cover for easy wire access
- Offers four power level categories 110W, 162W, 223W, 321W
- Rated for use in damp locations.

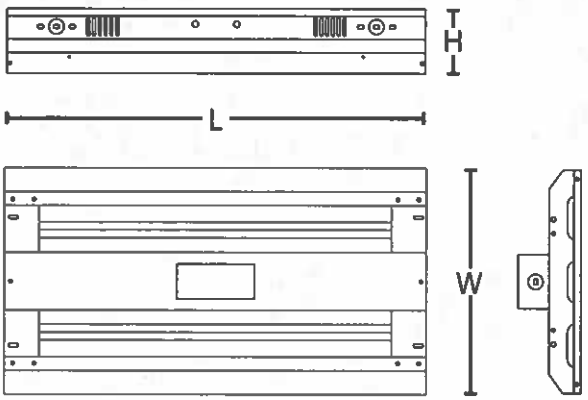
Optical System
- Clear acrylic lens protects LEDs and provides optimal lumen output
- Frosted diffused acrylic lens also available

Electrical
- Long-life LED system coupled with electrical driver to deliver optimal performance with over 130 lumens per watt with clear lens
- Utilizes advanced LED technology with CCT of 4000K and 5000K with >80 CRI
- Operating temperature rating of -40°F to 113°F (-40°C to 45°C)
- Industry leading, 10kA surge protection standard, per ANSI C82.77-5-2015
- Input voltage of 120-277V
- 347-480V input option available, includes 20kA surge protection, per ANSI C82.77-5-2015
- Dimming: 0-10V standard
- Now available with a PIR sensor option to meet ASHRAE 90.1 energy efficiency requirements

Mounting and Installation
- V-hook and chain (41.3 in. 1050 mm) mounting system included
- Optional pendant mount kit available
- Motion Sensor options available
- Six foot cord or FMC option available
- Wireguard option available for increased fixture protection
- For installations where power surge may be possible, NICOR recommends installing additional surge protection at the fixture or electrical distribution panel

Warranty
- 5-year limited system warranty standard
- Warranty does not cover product failure due to an overvoltage event (power surge)

Listings
- UL and cUL listed for damp location
- DesignLights Consortium (DLC) Premium qualified
- ASHRAE 90.1 compliance when specified with P sensor option
- TM-21 Projected L70 (9K) Life > 122,000 hours
- LM-79, LM-80 testing performed in accordance with IESNA standards



Product Measurements

	HBL3110	HBL3162	HBL3223	HBL3321
Length:	23.8 in. (605mm)		23.8 in. (605mm)	46 in. (1166mm)
Width:	12.6 in. (320mm)		17.3 in. (440mm)	12.6 in. (320mm)
Height:	3.6 in. (92mm)		3.6 in. (92mm)	3.6 in. (92mm)

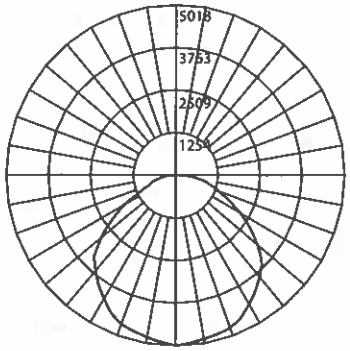
DLC PREMIUM · c UL us LISTED · DAMP LOCATION RATED · 5 YEAR WARRANTY

NICOR® LED

Photometric Data

5000K 110W HBL3

Luminaire	5000K
Input Voltage (VAC)	120-277
System Level Power (W)	107.8
Delivered Lumens* (Lm)	14399
System Efficacy (Lm/W)	133.6
Correlated Color Temp (K)	5012
Color Rendering Index (CRI)	84
Total Harmonic Distortion	10%
Power Factor	0.995
Beam Angle	115.1
Spacing Criteria	1.32



Intensity Summary (Candle Power)		
Angle	Along	Across
0	5009	5009
5	5002	4996
15	4876	4897
25	4601	4631
35	4168	4166
45	3517	3551
55	2706	2754
65	1732	1798
75	728	455
85	74	40
90	9	9

CCT Data Multiplier	
HBL3110UNV40K	0.999

Diffused Lens Multiplier	
HBL3110162-FROS-DIFU	0.97

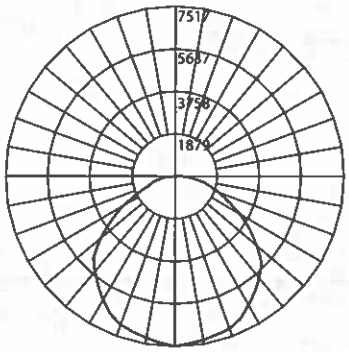
Cone of Light Tabulation		
Mounted height (Feet)	Footcandles Beam Center	Diameter (Feet)
15	22.6	19.4
17	17.6	22.0
20	12.8	25.7
23	9.6	30.0
25	8.2	32.1
28	6.5	36.1
30	5.7	39.0

Zonal Lumen Summary		
Zone	Lumens	%of Luminaire
0-30	3989	27.7%
0-40	6605	45.9%
0-60	11777	81.8%
0-90	14252	99.0%
90-180	147	1.0%
0-180	14399	100.0%

Fixture tested per LM-79-08. Photometric data is of the performance of a representative fixture. Results may vary in the field.

5000K 162W HBL3

Luminaire	5000K
Input Voltage (VAC)	120-277
System Level Power (W)	159.5
Delivered Lumens* (Lm)	21356
System Efficacy (Lm/W)	133.9
Correlated Color Temp (K)	4996
Color Rendering Index (CRI)	84
Total Harmonic Distortion	10%
Power Factor	0.995
Beam Angle	114.1°
Spacing Criteria	1.32



Intensity Summary (Candle Power)		
Angle	Along	Across
0	7509	7509
5	7505	7470
15	7315	7301
25	6916	6924
35	6295	6246
45	5317	5335
55	4121	4152
65	2643	2252
75	1100	776
85	110	54
90	11	5

CCT Data Multiplier	
HBL3162UNV40K	0.990

Diffused Lens Multiplier	
HBL3110162-FROS-DIFU	0.97

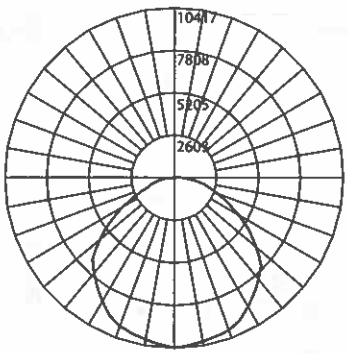
Cone of Light Tabulation		
Mounted height (Feet)	Footcandles Beam Center	Diameter (Feet)
15	35.9	19.3
17	27.9	21.9
20	20.1	24.0
23	15.2	29.5
25	12.9	32.2
28	10.3	35.7
30	8.9	38.7

Zonal Lumen Summary		
Zone	Lumens	%of Luminaire
0-30	5971	28.0%
0-40	9902	46.4%
0-60	17700	82.9%
0-90	21278	99.6%
90-180	77	0.4%
0-180	21356	100.0%

Fixture tested per LM-79-08. Photometric data is of the performance of a representative fixture. Results may vary in the field.

5000K 223W HBL3

Luminaire	5000K
Input Voltage (VAC)	120-277
System Level Power (W)	217.3
Delivered Lumens* (Lm)	29234
System Efficacy (Lm/W)	134.5
Correlated Color Temp (K)	5024
Color Rendering Index (CRI)	84
Total Harmonic Distortion	10%
Power Factor	0.995
Beam Angle	113.1
Spacing Criteria	1.31



Intensity Summary (Candle Power)		
Angle	Along	Across
0	10384	10384
5	10383	10357
15	10136	10067
25	9572	9509
35	8534	8676
45	7185	7345
55	5502	5627
65	3512	3149
75	1421	1206
85	120	71
90	13	10

CCT Data Multiplier	
HBL3223UNV40K	0.979

Diffused Lens Multiplier	
H8L3223-FROS-DIFU	0.97

Cone of Light Tabulation		
Mounted height (Feet)	Footcandles Beam Center	Diameter (Feet)
15	47.6	19.4
17	37.1	21.9
20	26.7	25.8
23	20.2	29.8
25	17.2	32.2
28	13.7	36.0
30	11.9	38.8

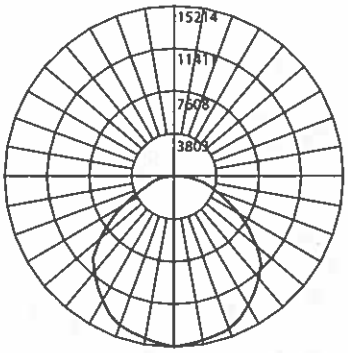
Zonal Lumen Summary		
Zone	Lumens	%of Luminaire
0-30	8236	28.2%
0-40	13631	46.6%
0-60	24224	82.9%
0-90	29164	99.8%
90-180	69	0.2%
0-180	29234	100.0%

Fixture tested per LM-79-08. Photometric data is of the performance of a representative fixture. Results may vary in the field.

Ordering Information

5000K 321W HBL3

Luminaire	5000K
Input Voltage (VAC)	120-277
System Level Power (W)	318.7
Delivered Lumens* (Lm)	43026
System Efficacy (Lm/W)	135.0
Correlated Color Temp (K)	5014
Color Rendering Index (CRI)	84
Total Harmonic Distortion	10%
Power Factor	0.995
Beam Angle	115.1°
Spacing Criteria	1.32



Intensity Summary (Candle Power)

Angle	Along	Across
0	15182	15182
5	15137	15196
15	14769	14833
25	13962	14040
35	12656	12635
45	10764	10718
55	8340	8251
65	5428	4576
75	2288	1637
85	230	109
90	15	9

CCT Data Multiplier

HBL3321UNV40K	0.979

Diffused Lens Multiplier

HBL3321-FROS-DIFU	0.97

Cone of Light Tabulation

Mounted height (Feet)	Footcandles Beam Center	Diameter (Feet)
15	68.5	19.4
17	53.4	22.0
20	38.6	25.9
23	29.2	29.8
25	24.7	32.3
28	19.7	36.2
30	17.1	38.8

Zonal Lumen Summary

Zone	Lumens	% of Luminaire
0-30	12076	28.1%
0-40	20010	46.5%
0-60	35711	83.0%
0-90	42935	99.8%
90-180	91	0.2%
0-180	43026	100.0%

Fixture tested per LM-79-08. Photometric data is of the performance of a representative fixture. Results may vary in the field.

Performance Data

Model Number	Lumens	Watts	Lumens/Watt
HBL3110UNV40K	14389	108.4	132.7
HBL3110UNV50K	14399	107.8	133.6
HBL3162UNV40K	21132	158.6	133.2
HBL3162UNV50K	21356	159.5	133.9
HBL3223UNV40K	28615	216.3	132.3
HBL3223UNV50K	29234	217.3	134.5
HBL3321UNV40K	42115	318.9	132.1
HBL3321UNV50K	43026	318.7	135.0

Performance Data With Diffused Lens

Model Number	Lumens	Watts	Lumens/Watt
HBL3110UNV40K	13734	108.4	127.7
HBL3110UNV50K	13824	107.8	128.2
HBL3162UNV40K	20215	158.6	127.5
HBL3162UNV50K	20497	159.5	128.5
HBL3223UNV40K	27764	216.3	128.4
HBL3223UNV50K	28047	217.3	129.1
HBL3321UNV40K	40390	318.9	126.7
HBL3321UNV50K	41244	318.7	129.4

Recommended Dimmers*

Lutron NTSTV
Lutron DVSTV
Cooper SF10P
Legrand RH4FBL3PW

*Not a complete list. Check compatibility before installation

Ordering Information

Example: HBL3162UNV40K

Series	Version	Wattage	Voltage	CCT	Lens	Sensor	Emergency	Wiring Options	Field Installed Plug Options[1]
HBL	3	☑ **110** (110 Watts) 14,000 lms	☑ **UNV** (120-277V)	☐ **40K** (4000K)	☐ (Blank) Clear	☐ (Blank) No Sensor	☐ (Blank) No Backup	☐ (Blank) No Cord	☐ (Blank) No Plug
		☐ **162** (162 Watts) 21,000 lms	☐ **HV** (347-480V)[4]	☑ **50K** (5000K)	☐ D (Diffuse)	☐ P (HB011-PDX)	☐ **E3** (EMB250)	☐ C (Cord)[2]	☐ 1 (515P)15 amp 120V Straight Blade Plug
		☐ **223** (223 Watts) 29,000 lms				☐ R (MWOS360R)		☐ F (Flexible Metal Conduit)[3]	☐ 2 (LS15P) 15 amp 120V Twist Lock Plug
		☐ **321** (321 Watts) 43,000 lms							☐ 3 (L615P) 15 amp 250V Twist Lock Plug
									☐ 4 (L715P) 15 amp 277V Twist Lock Plug
									☐ 5 (L720P) 20 amp 277V Twist Lock Plug
									☐ 6 (L2320P) 20 amp 347V Twist Lock Plug
									☐ 7 (L820P) 20 amp 480V Twist Lock Plug

Specifications and dimensions subject to change without notice.

1. Field installed plugs are placed inside the carton for field attachment only. Plug not available on emergency enabled fixtures
2. Cord is 18/3 wire, 6' long, black. Other lengths available upon request
3. Flexible metal conduit is 6' long, 18/3 wire configuration. Other lengths available upon request
4. The HV option is not available in 321W unit.

FUJITSU

SUBMITTAL 24RLXFWH

Halcyon

Inverter Driven Heat Pump | **24,000 BTU Single Zone XLTH Wall Mounted System**

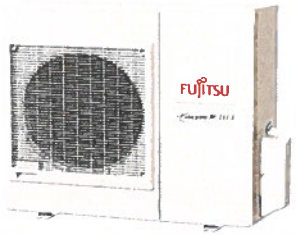
Job Name _____ Date _____
Location _____ Approval _____
Engineer _____ Construction _____
Submitted To _____ Unit No _____
Submitted By _____ Drawing No _____
Reference _____

PRODUCT FEATURES

Auto Changeover
24 hr. Timer
Auto Louver: 4 way
Minimum Heat Mode
Wireless Remote control
Auto Restart
Economy Mode
Base Pan Heater

Halcyon XLTH Extra Low Temperature Heating

Heating down to -15°F outdoor temperatures



MODEL NUMBERS			
Indoor Unit			ASU24RLF
Outdoor Unit			AOU24RLXFWH
System			24RLXFWH
EFFICIENCIES			
SEER			19.5
EER			12.5
HSPF			10.5
COP	kW/kW		3.40
	Btu/hW		11.6
OUTDOOR TEMPERATURE OPERATION RANGE			
Cooling	°F(°C)		-5 to 115 (-20 to 46)
Heating			-15 to 75 (-26 to 24)
CAPACITIES			
Cooling	Rated	BTU/hW	22,000
	Min.–Max.		9900–27300
Heating	Rated		25,500
	Min.–Max.		7500–36200
LINESET REQUIREMENTS			
Connection Method			Flare
Liquid	in (mm)		Ø 3/8 (Ø 9.52)
Gas			Ø 5/8 (Ø 15.88)
Pre-Charge Length	ft (m)		66 (20)
Minimum Length			16 (5)
Maximum Length			164 (50)
Max. Height Diff.			98 (30)
INDOOR DIMENSIONS & WEIGHT			
Net (H x W x D)	in		12-5/8 × 39-1/4 × 9
	mm		320 × 998 × 228
Gross (H x W x D)	in		12-3/5 × 42-15/16 × 16-7/8
	mm		319 × 1090 × 429
Net Weight	lb (kg)		31 (14)
Gross Weight			40 (18)
OUTDOOR DIMENSIONS & WEIGHT			
Net (H x W x D)	in		32-11/16 × 35-7/16 × 13
	mm		830 × 900 × 330
Gross (H x W x D)	in		39-3/8 × 41-5/16 × 17-1/2
	mm		1,000 × 1,050 × 445
Net Weight	lb (kg)		135 (61)
Gross Weight			152 (69)

Warranty Information

7 Year Compressor, 5 Year Parts WARRANTY

7 Year Compressor, 5 Year Parts out-of-the-box Warranty

10 YEAR WARRANTY

10 Year Compressor, 10 Year Parts Warranty when registered within 60 days of installation in a residence

12 YEAR WARRANTY

12 Year Compressor, 12 Year Parts Warranty when registered within 60 days of installation in a residence, and installed by a Fujitsu Elite contractor

ACCESSORIES	
UTY-TTRX	3rd Party Thermostat Converter
UTY-RNNUM	Wired Remote
UTY-RVNUM	Wired Remote w/backlight
UTY-RSNUM	Simple Remote
UTY-XWZX	Dry Contact Wire Kit
FJ-RC-WIFI-1NA	Intesis Wired WiFi Module
FJ-IR-WIFI-1NA	Intesis IR WiFi Module
UTY-TFNXZ2	WiFi Interface Module

ENERGY STAR

This system combination is Energy Star qualified

c ETL us Intertek

Indoor Unit ETL#: 3170288
Outdoor Unit ETL#: 91987

Due to continuous product improvements, specifications are subject to change without notice. Please log in to the Fujitsu Portal for the most up-to-date documentation https://portal.fujitsugeneral.com

Effective Date: 2/28/2019 Version 24RLXFWH -2019B

FUJITSU

SUBMITTAL 24RLXFWH

Halcyon

Inverter Driven Heat Pump — **24,000 BTU Single Zone XLTH Wall Mounted System**

FAN DATA

Indoor Unit Airflow Rate	Cooling	High	CFM (m3/h)	659 (1120)
		Medium		530 (900)
		Low		435 (740)
		Quiet		365 (620)
	Heating	High		677 (1150)
		Medium		530 (900)
		Low		435 (740)
		Quiet		365 (620)
Outdoor Unit Airflow Rate	Cooling			2,001 (3,400)
	Heating			2,119 (3,600)

SOUND PRESSURE

Indoor Unit	Cooling	High	dB (A)	49
		Medium		42
		Low		37
		Quiet		33
	Heating	High		49
		Medium		42
		Low		37
		Quiet		33
Outdoor Unit	Cooling			54
	Heating			55

REFRIGERANT

Type		R410A
Charge	lb oz	4 lb 10.1 oz
	kg	2,100
Oil Type		POE (RB68)

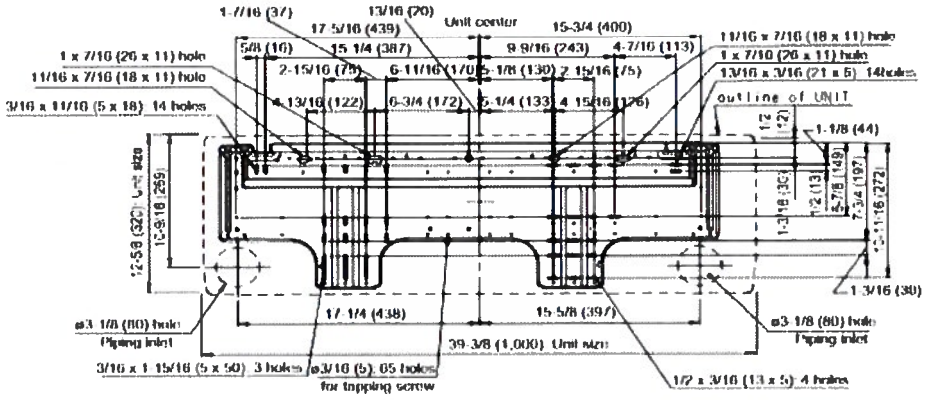
ELECTRICAL SPECIFICATIONS

Voltage/Frequency/Phase				208/230V~60HZ
Voltage Range				187-253V~60HZ
Current	Cooling	Rated	A	7.9
	Heating	Rated		10.5
Maximum Operating Current		Cooling		15
		Heating		15.5
Starting Current				8.6
MCA				18
Maximum Circuit Breaker				20
Input Power	Cooling	Rated	kW	1.76
		Min.–Max.		0.58–3.42
	Heating	Rated		2.38
		Min.–Max.		0.50–3.53
Power Factor	Cooling		%	97
	Heating			99

OTHER

Moisture Removal		pints/h (L/h)	3(6.3)
Energy Star			YES
Drain hose	Material		PVC
Size	in (mm)	Ø 15/32 (Ø 12) (I.D.), Ø 5/8 (Ø 16) (O.D.)	
Operation Range	Cooling	°F (°C)	64 to 90 (18 to 32)
		%RH	80 or less
	Heating	°F (°C)	88 (30) or less

Wall Bracket Data:



Note: Specifications are based on the following conditions:
Cooling: Indoor temperature of 80°F (26.7°C) DB/67°F (19.4°C) WB, and outdoor temperature of 95°F (35°C) DB/75°F (23.9°C) WB. Heating: Indoor temperature of 70°F (21.1°C) DB/60°F (15.6°C) WB, and outdoor temperature of 47°F (8.3°C) DB/43°F (6.1°C) WB. Pipe length: 25ft. (7.5m), Height difference: 0ft. (0m) (Outdoor unit – Indoor unit).

FUJITSU

SUBMITTAL 24RLXFWH

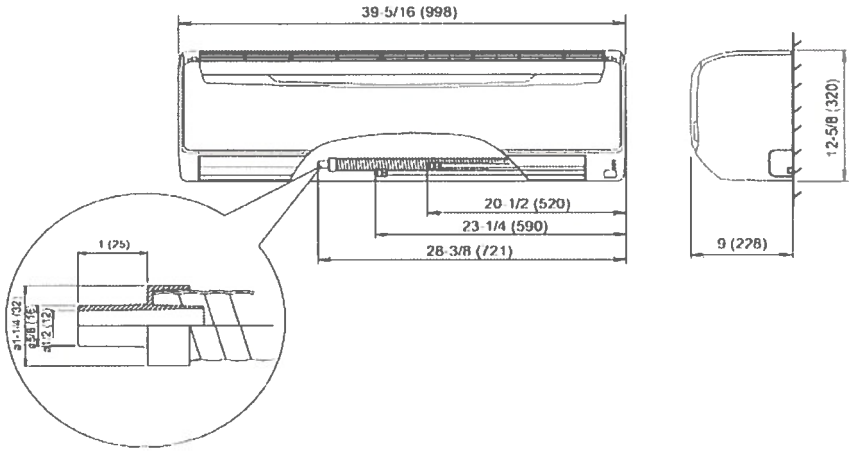
Halcyon

Inverter Driven Heat Pump | **24,000 BTU Single Zone XLTH Wall Mounted System**

DIMENSIONS

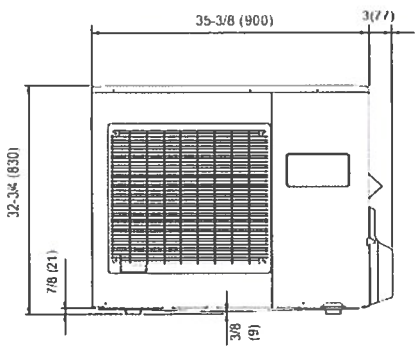
Units: In. (mm)

Unit: in (mm)

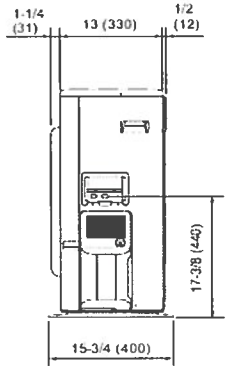


Unit: in (mm)

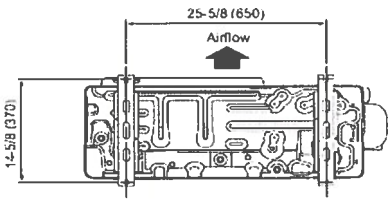
Top view



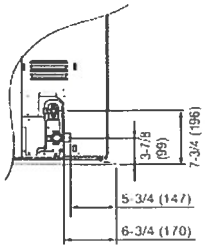
Front view



Side view



Bottom view



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DC CEILING FAN

MODELS ICF72, ICF88, ICF96

Made in Taiwan.

VARTIFY CLARANCES TO BLADES

- **INSTALLATION**
- **OPERATION**
- **MAINTENANCE**
- **WARRANTY INFORMATION**

Need more help with your install?

Scan the QR code at left to watch our installation video, or visit the video directly by typing in the following link into your browser:

https://youtu.be/b55PHe3E3rw

Or call our Customer Service Line at 1-800-433-1626

CAUTION

READ AND SAVE THESE INSTRUCTIONS FOR SAFE INSTALLATION AND OPERATION.

CONGRATULATIONS ON YOUR PURCHASE

Congratulations on purchasing the latest in energy saving ceiling fans. This fan runs on DC (direct current) power which gives it the benefit of being super energy efficient whilst still maintaining high volume air-movement and silent operation.

Energy Saving – The DC motor is the latest technology in fan design. Its highly efficient motor saves up to 65% more energy than ceiling fans with traditional AC motors.

Silent Operation – This DC fan motor is programmed with a stabilized current which efficiently reduces motor noise.

Low Operating Temperature – The DC power is managed effectively which brings down the motor operating temperature to less than 50degs. This results in a much cooler motor than a standard AC fan and increases the longevity of the motor.

6 Speed Remote Control – While regular AC ceiling fans usually come with only 3 speeds, this DC fan comes complete with a 6 speed remote, which gives greater choice of comfort levels.

SAFETY PRECAUTIONS

1) This appliance is NOT intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.
2) Children should be supervised to ensure that they do not play with the appliance.
3) An all-pole disconnection switch must be incorporated in the fixed wiring in accordance with the wiring rules.
4) Do not dispose of electrical appliances as unsorted municipal waste, use separate collection facilities. Contact your local government for information regarding the collection systems available. If electrical appliances are disposed of in landfills or dumps, hazardous substances can leak into the groundwater and get into the food chain, damaging your health and well-being.

5) The structure to which the fan is to be mounted must be capable of supporting a weight of 90 lbs.
6) The fan should be mounted so that the blades are at least **7 ½** feet above the floor.
7) The ceiling fan must be positioned in a location protected from water, wind, dust and salt. Exposure to these elements will void the warranty. Mounting the fan in a situation where it is subject to water or moisture is dangerous.
8) Only an authorized electrician should execute the installation.
9)  **WARNING:** To Reduce The Risk Of Fire Or Electric Shock, Do Not Use This Fan With Any Solid-State Speed Control Device.
10)  **WARNING:** To Reduce The Risk Of Personal Injury, Do Not Bend The Blade Brackets When Installing The Brackets, Balancing The Blades, Or Cleaning The Fan. Do Not Insert Foreign Objects In Between Rotating Fan Blades.
11) Installation shall be in accordance with the National Electrical Code, ANSI/NFPA 70 and local codes.
12) To reduce the risk of electric shock, ensure electricity has been turned off at the circuit breaker or fuse box before beginning.
13) To avoid personal injury or damage to the fan and other items, be cautious when working around or cleaning the fan. Do not use water or detergents when cleaning the fan or fan blades. A dry dust cloth or lightly dampened cloth will be suitable for most cleaning.

BEFORE INSTALLATION

Unpack your fan and check contents. You should have the following:

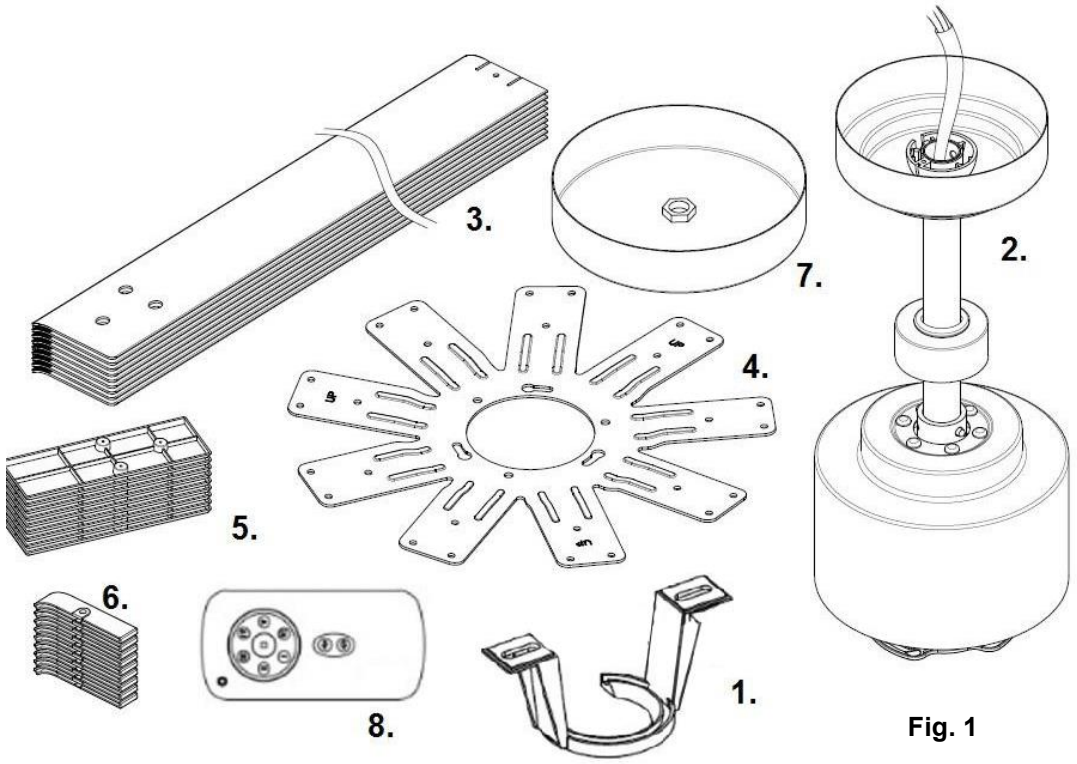


Fig. 1

1 Mounting bracket x 1

2 Fan assembly with hanger cover, down rod, canopy cover and canopy x 1

3 Blades x 9

4 Blade holder x 1

5 Blade bracket kit x 9

6 Blade decorative kit x 9

7 Bottom cover x 1

8 Remote transmitter with holder and 12V A23 battery x 1 set

9 Extra motor screws with spring washers x 7 1/4”-20 x 5/16” (*not shown*)

10 Blade screws with washers x 28 #10-24 x 1/4” (*not shown*)

11 Blade bracket kit screws x 10 #10-24 x 5/32” (*not shown*)

12 Wooden screws x 2 #10 x 1-1/2” (*not shown*)

13 Balancing kits x 1 set (*not shown*)

14 Screws for remote holder x 2 #4 x 1/2” (*not shown*)

15 Down rod attachment screws x 2 #10-24 x 7/16” and retainer pin x 1 (*not shown*)

16 Safety cable kit x 1 (*not shown*)

17 Wire nuts x 3 (*not shown*)

INSTALLING THE FAN

TOOLS REQUIRED:

- Phillips / flat head screwdriver
- Pair of pliers
- Adjustable spanner
- Step ladder
- Wire cutter
- Wiring, supply cable as required by local provincial and national wiring codes and regulations.

INSTALLING THE MOUNTING BRACKET

The ceiling fan must be installed in a location so that the blades are 1 ft. spacing from the tip of the blade to the nearest objects or walls.

Secure the hanging bracket to the ceiling joist or structure that is capable of carrying a load of at least 90lbs., with two long screws provided. Ensure at least 1 ½ in. of the screw is threaded into the support.

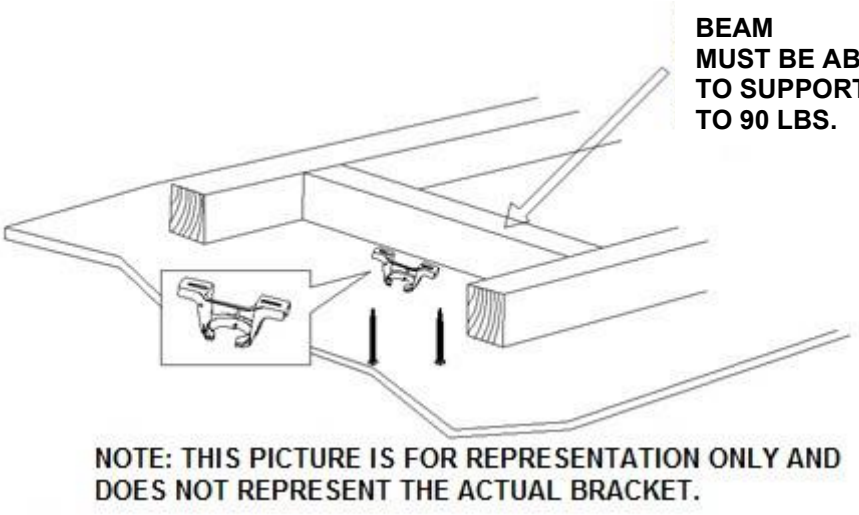


Fig. 2

NOTE: The bracket screws provided are for use with wooden structures only. For structures other than wood, the appropriate screw type MUST be used.

ANGLED CEILING INSTALLATION

This fan hanging system supports a maximum 20 degree angled ceiling installation.

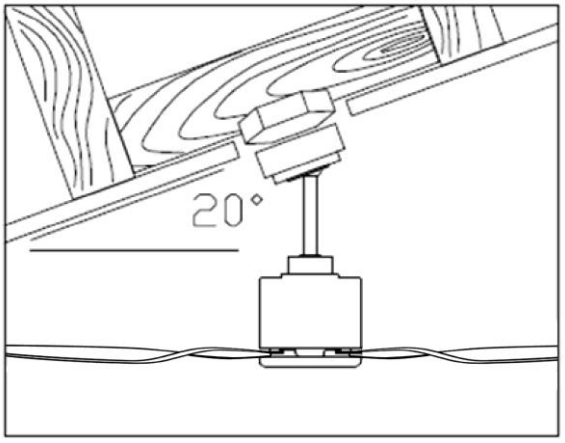
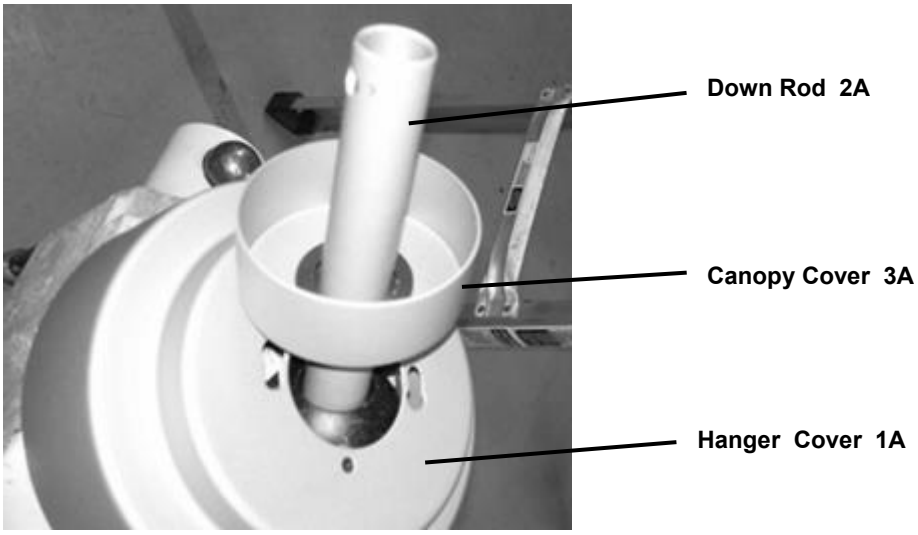


Fig. 3

DOWNROD AND HANGER ASSEMBLY

- Prior to assembly slide hanger cover (1A) and canopy cover (3A) onto downrod (2A). Hanger cover will be facing ceiling to cup over mounting bracket and canopy cover will face down to cover motor screws.



- Run the black and white wires and safety cable through the center of the downrod (2a). Use the gold keeper pin (Photo 4) to connect the motor to the downrod. Where the downrod attaches to the motor there are two set screws that must be installed and tightened. **If you fail to tighten these bolts the fan will seem to be out of balance**. These bolts **MUST BE TIGHT**. See Photo 3 to see these two bolts.

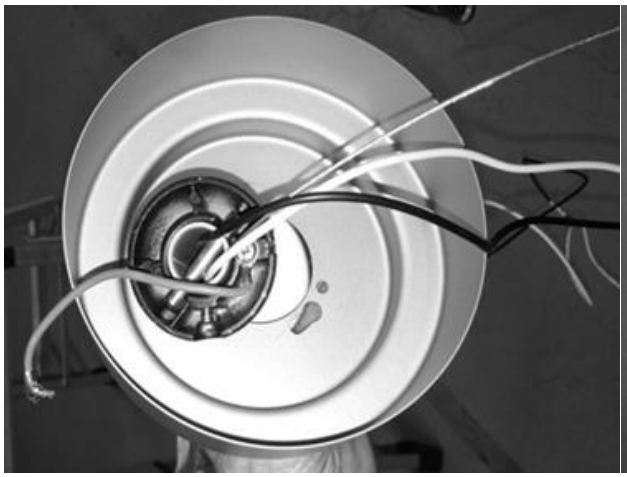


Photo 2: Running wires through the center of the downrod

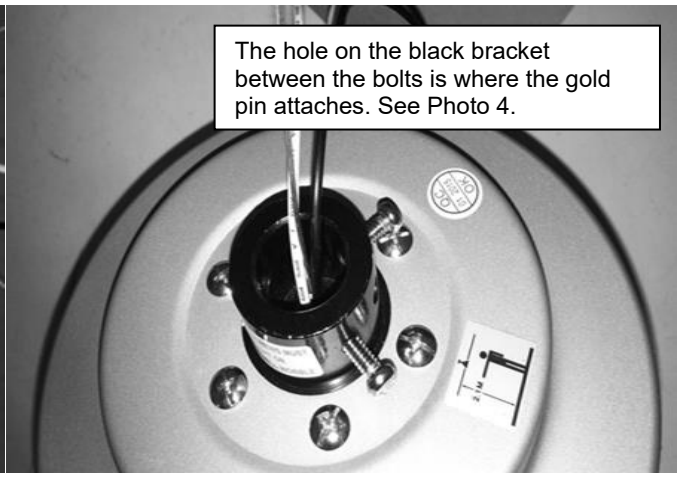


Photo 3: Motor end where two bolts and safety pin attaches

Photo 4: Gold Keeper Pin

- Adjust the safety cable to the desired length. It is recommended to attach a safety cable near the mounting bracket to a secure mounting point to allow the hanger cover to cover the safety cable as well as the hanger.

Photo 5: Safety cable attached near hanger

Photo 6: Complete hanger assembly

HANGING THE FAN MOTOR ASSEMBLY

- Lift the fan assembly onto mounting bracket. Fig. 4
- The hanger bracket has two screws on the bottom with key holes that are designed to hold the cover. See Photo 7. When the holes are lined up, tighten the screws to keep the cover in place. Access to the screws are hidden by a plastic cover that snaps in or out. When the screws are tight, slide the plastic hide strip back up the downrod and snap back into place.

Photo 7: Key holes on the bottom of the hanger cover.

- Ensure the notch of the ball joint is positioned on the stopper of the mounting bracket to prevent the fan from rotating when in operation. Fig. 5

Fig. 4

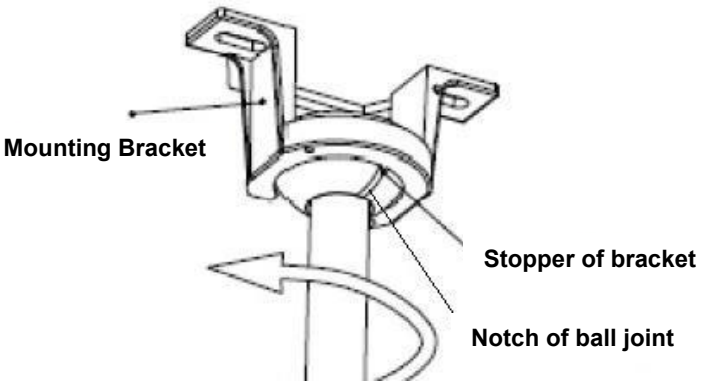


Fig. 5

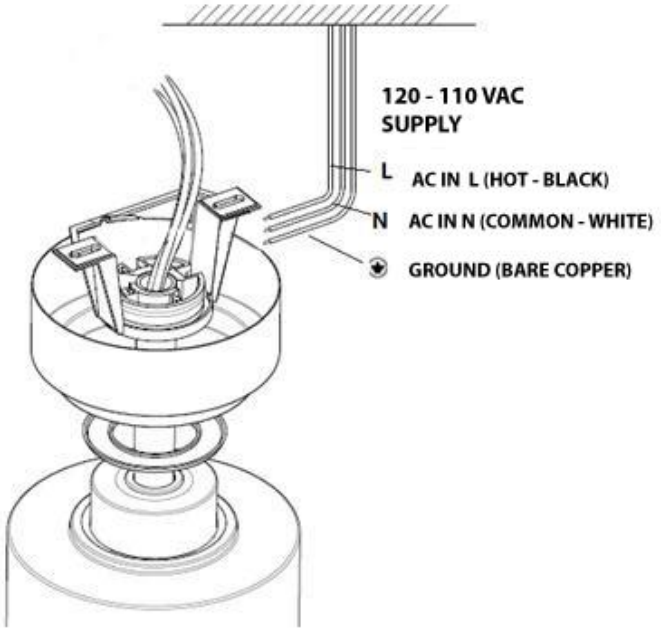
PREPARE AND COMPLETE THE ELECTRICAL WIRING — WIRING DIAGRAM (FIG. 6)

WARNING: FOR YOUR SAFETY ALL ELECTRICAL CONNECTIONS MUST BE UNDERTAKEN BY A LICENSED ELECTRICIAN.

NOTE: AN ADDITIONAL ISOLATING WALL SWITCH MUST BE INCLUDED IN THE FIXED WIRING.

NOTE: IF THERE ARE TWO OR MORE DC CEILING FANS INSTALLED IN THE ONE LOCATION, AN ISOLATION SWITCH IS REQUIRED FOR EACH CEILING FAN. THIS IS REQUIRED WHEN PROGRAMMING THE REMOTE AND RECEIVER TO PAIR TOGETHER.

Fig. 6



INSTALL CANOPY COVER

- Loosen 2 screws from the bottom of the mounting bracket.
- Slide the canopy up to the mounting bracket and place the key hole on the canopy over the screw on the mounting bracket, turn canopy until it locks in place at the narrow section of the key holes, secure it by tightening the two set screws. Avoid damaging the electrical wiring prepared previously.
- Finally attach the canopy cover to canopy and secure it by pushing the lugs into the holes.

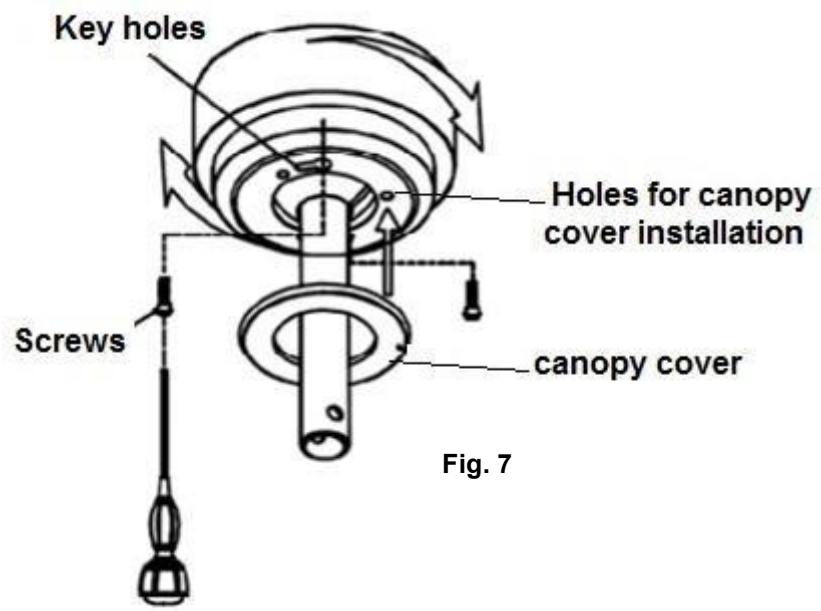


Fig. 7

BLADE INSTALLATION

- Attach the blade holder to the motor by lining up the position label (1, Fig. 8) and secure it by tightening 6 screws (Fig 9.)
- Insert the blade screws through the blade assembly in the following order—blade holder, blade and blade bracket kit. Then secure the blade to the blade holder by tightening the 3 screws (Fig. 10).
- Push the blade decorative kit into the end of the blade and secure it by tightening the screw.
- Repeat to install the other blades to the blade holder.
- Finally install the bottom cover to the shaft of the motor by rotating it clockwise (Fig.11).

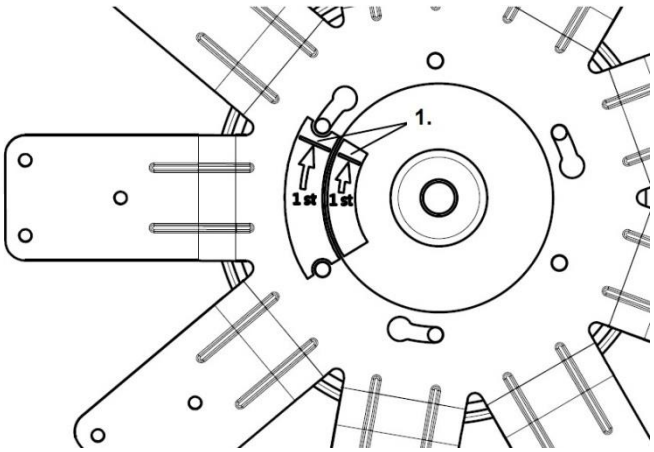


Fig. 8

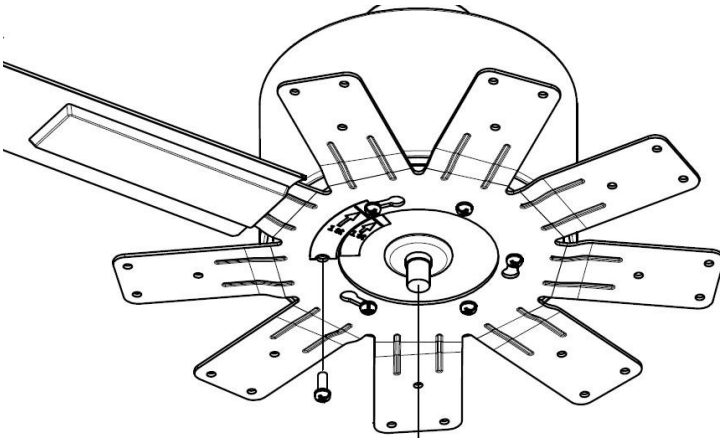


Fig. 9

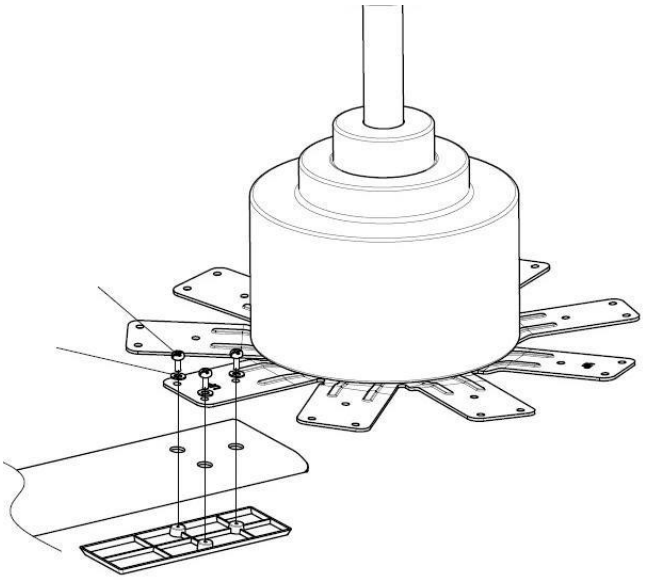


Fig. 10

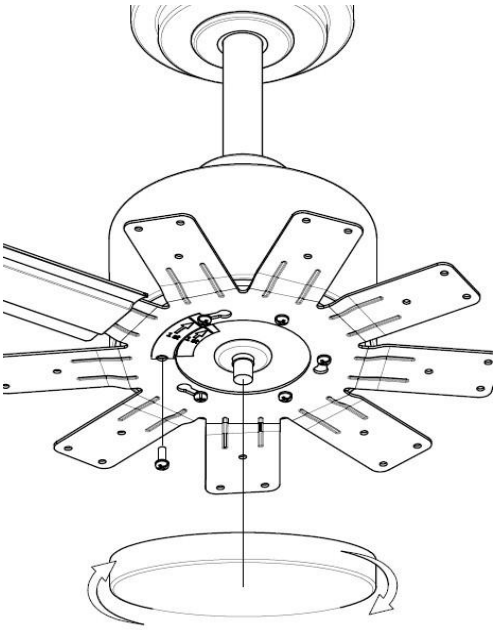


Fig. 11

USING YOUR CEILING FAN

Pairing Transmitter and Receiver – when 2 or more DC ceiling fans are installed in one location

When two or more fans are located near each other, you may want to have the receiver/transmitter for each fan set to a different code, so that the operation of one fan does not affect the operation of the other fans.

The DIP switches for the transmitter (remote hand piece) are located in the battery compartment of the transmitter. Configuring the DIP switches will allow a unique transmission code assigned to each fan ceiling.

NOTE: Ensure that you have installed an isolating wall switch in the fixed wiring for each fan, when using DIP code function.

NOTE: Ensure power to the Receiver is **ON** prior to pairing the transmitter with the receiver.

Transmitter/Receiver pairing for ceiling fan 1:

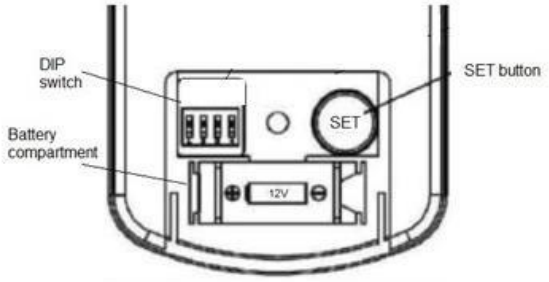
- Turn off both ceiling fans 1 and 2 via the mains supply to the receiver.
- Slide the cover of the battery compartment of the transmitter to access the DIP switches. This will be transmitter 1.
- Change the position of the DIP switches in the remote transmitter 1, so that it will be different to transmitter 2. Fig. 8
- Install the 12VDC battery in the compartment. Please make sure the polarity of the battery is correct.
- Turn on the power to receiver 1. Keep the power OFF to receiver 2. (Each ceiling fan must have its own isolation switch, so that only the ceiling fan that needs to be paired with the transmitter will be ON).

- Press and hold the SET button of **transmitter 1** for 6 seconds within 60 seconds of switching the power to the receiver of ceiling fan 1.
- Now the transmitter should be paired with the receiver of ceiling fan 1. Turn ON/OFF or change the speed of ceiling fan 1 by the transmitter to check the operation.

Setting DC Ceiling fan 2:

- Turn off both ceiling fans 1 and 2 via the mains supply to the receiver.
- Slide the cover of the battery compartment of the transmitter to access the DIP switches. This will be transmitter 2.
- Change the position of the DIP switches in the remote transmitter 2, so that it will be different to transmitter 1. Fig. 8
- Install the 12VDC battery in the compartment. Please make sure the polarity of the battery is correct.
- Turn on the power to receiver 2. Keep the power OFF to receiver 1. (Each ceiling fan must have its own isolation switch, so that only the ceiling fan that needs to be paired with the transmitter will be ON).
- Press and hold the SET button of **transmitter 2** for 6 seconds within 60 seconds of switching the power to the receiver of ceiling fan 2.
- Now the transmitter should be paired with the receiver of ceiling fan 2. Turn ON/OFF or change the speed of the ceiling fan 2 by the transmitter to check operation.

Note: The pairing of Transmitter and Receiver is not required if only one ceiling fan is installed. When more than two ceiling fans are installed near each other, please refer to the instruction above.



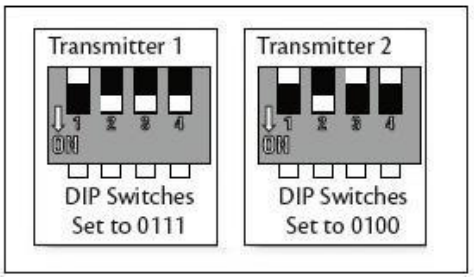


Fig. 8

Remote Control Buttons

① - FAN SPEED CONTROL BUTTON:

There are 6 available speeds. Ⅰ button is for the lowest speed, and Ⅵ button is for the fastest speed.

NOTE: WHEN YOU TURN ON THE FAN FOR THE FIRST TIME OR SWITCH THE MAIN POWER TO THE CONTROLLER, YOU NEED TO START THE FAN ON HIGH "Ⅵ" SPEED FIRST AND THEN CHOOSE A LOWER SPEED.

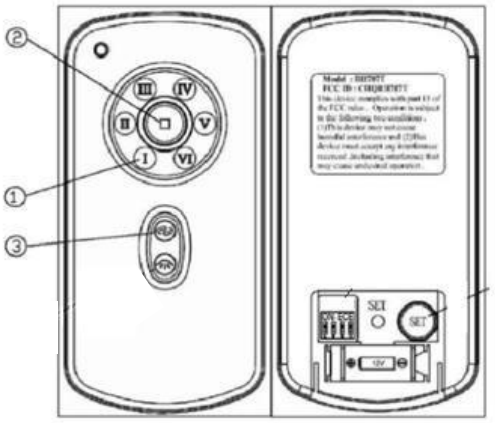


Fig. 9

5-10 SECONDS IS REQUIRED TO ALLOW THE DC FAN TO RESPOND TO THE REMOTE'S SPEEDS OR FAN DIRECTION SELECTIONS, AS DC FANS INCORPORATE A SENSOR CONTROL WHICH CONTROLS THE POWER TO THE MOTOR.

②- FAN OFF BUTTON:

Press the button to turn the fan off.

③- REVERSE FUNCTION BUTTON:

Press the button to activate the reverse running function. The fan must be operating to activate the reverse function.

THE RECEIVER PROVIDES THE FOLLOWING LEVEL OF PROTECTION AGAINST:

- Lock position: the receiver has a built in safety feature to protect against obstruction during operation. The motor will be locked from operation and will disconnect from power after 30 seconds of interruption. Please remove obstacles before re-starting. To reset, simply turn off the power supply to the fan motor and re-start.
- Over 80W protection: When the receiver detects power consumption which is greater than 80W, the receiver power will be stopped and operation will immediately discontinue. Turn the receiver power on after 5 seconds to restart the fan.

RE-PAIRING THE FAN RECEIVER & REMOTE PAIRING

Should the remote and receiver lose control after installation or during use, the pairing of the remote and the receiver must be re-paired. Below are the operating symptoms and method to re-pair the pairing of the DC ceiling fan remote and receiver.

Issues:

- Loss of control - Fan is only running at high speed after installation
- Loss of control - No reverse function after installation
- Loss of control - Remote cannot communicate with the receiver

Solution:

If the fan runs at the highest speed continuously, it means the wiring of the installation is correct. When the fan operates on high speed only, or fails to operate in reverse function or any other command/s, it is recommended to re-pair the communication pairing of the remote and receiver. Please follow the steps below:

A. Remove the battery cover on the remote. Make sure the battery is installed correctly and the red LED light indicator will be flashing. This means the remote function is okay.

B. Turn off the main power supply to the receiver for more than 30 seconds and turn on the main supply to receiver again. Press and hold the SET button on the remote for 6 seconds within 60 seconds of turning the power on to the receiver.

C. Press the buttons on the remote to run the fan. In general, performing point A, B, and C should re-pair the remote and receiver and will allow full control of the fan. If not, please do the next step.

D. The DIP switches on the fans are set up at the factory. The DIP switch can be changed to any location in 16 options. (Eg. up-up-down-down).

E. Please repeat the (A)-(C) steps to check the function.

If the issues still persist after following point (A) to (D) and there is still no control, then please contact the local retailer for a new remote or transmitter.

NOTE: For your safety, a new receiver must be installed by a licensed electrician.
NOTE: While re-pairing the DC ceiling fan remote and receiver is in process, the fan operates at highest speed with REVERSE mode automatically for 90 seconds, and then operates with FORWARD mode for 90 seconds. During the paring process, do not press any key on the remote.

BALANCING / WOBBLING TROUBLESHOOTING

Please note that not all ceiling fans are the same, even in the same model—some may move more or less than others. Movement of a couple of centimeters is quite acceptable and does not suggest that the fan will fall down.

Even though all blades are weighted and grouped by weight, it is impossible to eliminate wobble altogether. This s hould not be considered a fault. Ceiling fans tend to move during operation due to the fact that they are not generally rigidly mounted.

You may do the following action to reduce the wobbling:

1) Check all the blade mounting screws are tightened and securely.
2) Wobbling problems may result from inconsistent blade level. To check blade level, measure the distance from each blade tip to the ceiling.

Note: If measurements are inconsistent:

- Check that the blade mount screws are not over tightened or loose, which can cause the blade tip to not sit level;
- An out of shape blade can cause wobbling, check by removing the blade and lay it on a flat surface. A good flat blade will lay flat on the surface.

3) Blade tracking may be checked simply by use of a household ruler as shown in the below figure. Place the ruler vertically against the ceiling and even with the outside leading edge of a blade. Note the distance of the edge of a blade is the same as the others. Turn the blade slowly by hand to check the remaining blades. If a blade is not in alignment, the blade is either out of shape/warped or the blade screws are not evenly tightened or loose.

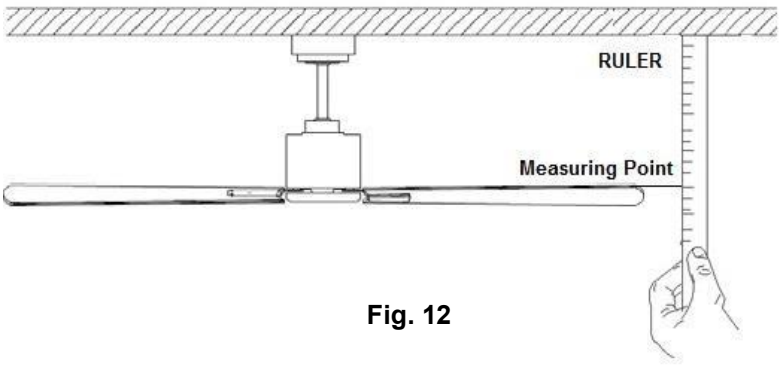


Fig. 12

BALANCING KIT

1. A balancing kit is provided to balance the ceiling fan on initial installation. Please refer to the instruction on how to use the balancing kit, that is included.
2. The balancing kit can be used to assist re-balancing if the ceiling fan becomes un-balanced overtime. Do not discard the balancing kit, retain for future use.

FAN CARE AND WARRANTY INFORMATION

- Periodic cleaning of your ceiling fan is the only maintenance required. Use a soft brush or lint free cloth to avoid scratching the paint/plated finish. Please make sure the fan is not operating when cleaning.
- Do not use water when cleaning your ceiling fan. It could damage the motor or the blades and create the possibility of an electrical shock.

WARRANTY SERVICE

The manufacturer's warranty covers actual faults that may develop, but NOT minor complaints, e.g. noise from motor run—ALL ELECTRIC MOTORS ARE AUDIBLE TO SOME EXTENT.

WOBBLE

- Ceiling fans tend to move during operation due to the fact that they are not generally rigidly mounted—if they were, they could generate excessive ceiling vibration and stress on their mountings.
- Movement of a couple of centimetres is quite acceptable and does not suggest the fan will fall down.
- Ceiling fans are mounted very securely on steel brackets with rubber cushioning or with ball-joints to allow free movement.
- Please note that not all ceiling fans are the same, even in the same model—some may move more or less than others.

NORMAL WEAR AND TEAR

Threaded components working slightly loose or blade carriers even slightly bent due to vigorous cleaning or bumping can cause extra wobble and noise. THIS IS NOT COVERED UNDER WARRANTY- but a little care and maintenance can reduce or prevent this problem.

BUMP-IN-THE-NIGHT

This is outside the manufacturer 's warranty. If a fan has a fault, it will be noticeable at all times. Naturally, when everything is quiet at night, you will be more inclined to hear small noises which may not be noticeable at other times. Even slight power fluctuations and power mains frequency signals superimposed in your electricity supply may cause a change in fan motor noise, this is normal.

FAN LIGHT

Except for actual faults in manufacture, which are extremely rare, FAN LIGHTS AND GLOBES ARE NOT COVERED UNDER YOUR FAN WARRANTY. Noises and vibration etc. are often more accentuated when a fan light is fitted.

For instance a fan light glass that has not been tightened or worked loose can cause a rattle. Again, care and maintenance will reduce this.

TROUBLESHOOTING CHECKLIST

Always check the "Troubleshooting Checklist" included in this booklet before calling for service.

For your safety, ensure the ceiling fan is OFF before carrying out any troubleshooting.

TROUBLE	PROBABLE CAUSES	SUGGESTED REMEDY
1. Fan will not start (Warning: The ceiling fan must be switched OFF and the assistance of a licensed electrician may be required.)	A. Fuse or circuit breaker blown.	Check main and branch circuit fuses or circuit breakers.
	B. Loose power connections to the fan. (Normally occurs during installation.)	Check power connection to the fan. This must be performed be a licensed electrician.
	C. No response from the remote transmitter.	- Battery is low. Replace batteries. - Check if correct remote transmitter is paired with the receiver.
	D. Switch the fan ON via the mains switch.	Check if there is power to the fan.
2. Fan Wobbles. (Refer to Wobble section of the manual for further information.)	A. Fan blades are not horizontal to the ceiling.	Refer to "wobbling fixing" section of manual. - The blade may require adjustment at the blade mounting screws. - The blade is out of shape, thus causing wobbling. A new blade set will be required to be replaced. Contact retailer for further details.
	B. Blade screws are loose.	Make sure all screws are securely fastened.
	C. Blades are out of shape.	Remove blade and lay on a flat surface to check if blades are out of shape. Contact retailer for further details.
3. Fan sound is noisy.	A. Top canopy is touching the ceiling.	Lower canopy from ceiling to ensure minimum $1/10^{th}$ in. clearance.
	B. Loose fan blade screws.	Re-tighten all screws on the fan blades but never over-tighten.
	C. Ceiling fan not secured against ceiling.	Re-tighten all screws in the hanging bracket or plate.
	D. Incorrect speed controller.	Change the controller to the one supplied. (Must be performed by a licensed electrician.)
4. Mechanical noise.	A. Allow at least for 8 hours settling-in period.	
5. Light will not turn ON. (Optional light kit ONLY.)	The globe/lamp has failed.	Replace globe/lamp.

WARNING: THE CEILING FAN MUST BE SWITCHED OFF BEFORE TROUBLE SHOOTING IS PERFORMED.

NOTES TO INSTALLERS

- Some fans wobble more than others—even in the same model.
- Fan lights can rattle but are not covered under warranty.
- Fan wall controllers make a slight buzzing noise and get warm especially on a lower setting. These occurrences are not covered by the manufacturer's warranty.

TECHNICAL INFORMATION

DC FAN models	Rated Voltage	Rated power (motor)	Battery for remote
ICF72 – 72 in. ceiling fan	110VAC	35W	1 x 12V 23AE
ICF88 – 88 in. ceiling fan	110VAC	35W	1 x 12V 23AE
ICF96 – 96 in. ceiling fan	110VAC	35W	1 x 12V 23AE

WARRANTY CONDITIONS

This warranty is underwritten by Falco Insurance Company and is extended to the original retail purchaser of this model or, if this unit is purchased and requires installation by a building contractor, to the original owner of the home. No subsequent purchaser of the unit or of a home in which it is installed is entitled to any of the benefits of this warranty.

This product is warranted against defects in materials and workmanship for a period of one (1) year from the date of original retail purchase. No other parts or components are warranted. There is no warranty for defects caused by abuse, faulty installation, or the like.

Repairs or replacement parts supplied under this warranty are warranted only for the period of this warranty; that is, one (1) year from the date of the original retail purchase of the unit.In the event of a defect or malfunction, we will replace or repair the defective part or component only and return the new or repaired part to you freight prepaid.

You must bear all other expenses incurred in obtaining repairs, including labor required for field repair or replacement, and the cost of shipping the defective part to us. You must also bear the cost of repair to or replacement of any part or component and the shipping charges incurred for the repair or replacement and return to you of any part or component not covered by this warranty, including parts or components damaged by you.

The company reserves the right to demand and receive written evidence of the date of purchase before undertaking its obligations under this warranty. The right to demand and receive written evidence of date of purchase extends to all licensed dealers of Ventamatic, Ltd. products.

You should, therefore, retain your sales slip and attach a copy of it to the warranty claim.

To start a warranty claim you must:
Contact Ventamatic, Ltd.

An RGA (Returned Goods Authorization) form is required for returns to the factory to ensure your return can be processed efficiently and quickly. Please contact Ventamatic, Ltd. toll-free at 800-433-1626 or via web at www.MYMAXXAIR.com to obtain an RGA and follow the instructions given.

There is no informal dispute settling mechanism available in the event of a controversy involving this warranty.
Any and all implied warranties which may exist terminate upon the expiration of this warranty one (1) year from the date of the original retail purchase. Some states do not allow limitations on how long an implied warranty lasts, so this limitation may not apply to you.

Ventamatic, Ltd. is not liable to you for incidental or consequential damages arising out of defect or malfunction of a unit or its installation or out of any alleged breach of this warranty. Some states do not allow the exclusion or limitation of incidental or consequential damages, so this limitation may not apply to you.

This warranty gives you specific legal rights and you may also have other rights which may vary from state to state.

rev.4/19

Wallpack Large

Description

The LITELUME™ Wallpack (LL–WPL) features a die-cast aluminum housing with a UV-resistant polycarbonate lens, suitable for commercial application.

Fixture Information

Size:	70W/100W
Housing:	Die-cast Aluminum Housing
Finish:	Protective powdercoat
Color:	Standard: Bronze Custom Options: Black (BK) White (WH) Grey (GY)
Mounting:	Stadard: Wall Mount
Lens:	Polycarbonate
Surge Protector:	Optional: 10 kVA
Voltage:	Standard: 120-277V
Power Factor:	.90
CRI:	80
Operating Temperature:	-40°F to 104°F
Sensor:	Standard: No sensor Custom: Button Photocell (120-277V)
Warranty:	10-Year Limited Warranty

Performance Data

Lumen Output:

9,600 to 13,200 lm

Lumens Per Watt (typical):

132-137 lm/W

CCT:

3000K
4000K
5000K

Lifespan:

Features Philip Lumileds with up to 100,000 running hours

Ratings & Certificates

UL Listed For Wet Location

Wattage Replacement

Existing Watts	Litelume Watts
250-400W	70W-100W

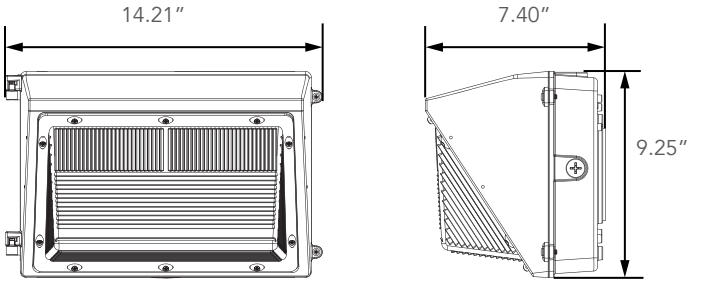
Quick Ship Ordering Information

Part #
LL-WPL-[70][100]-3CCT-UNV-BZ

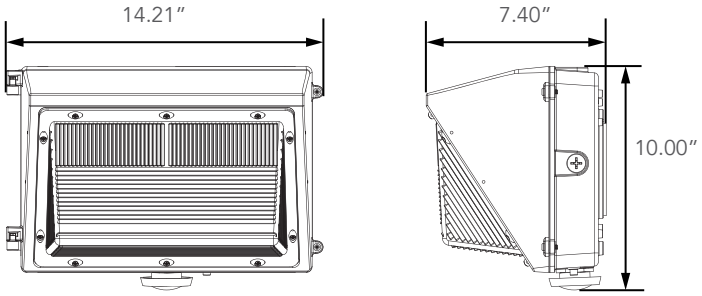
Dimension

Item	Width	Length	Height	Weight
Wallpack Large	7.40″	14.21″	9.25″	15 lb
Wallpack Large w/Sensor	7.40″	14.21″	10.00″	15 lb

Without Sensor

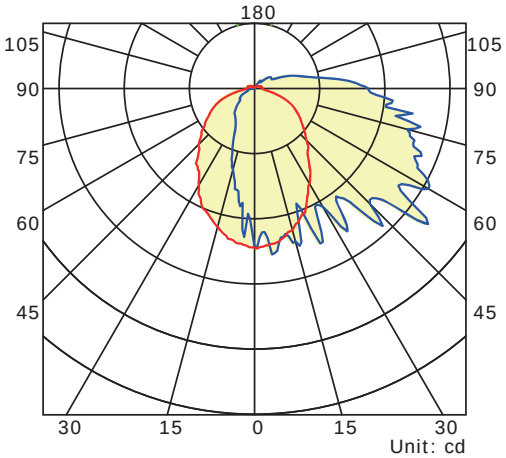


With Sensor



Photometrics

Luminous Intensity Distribution Curve



Average Diffuse Angle(50%): 93.0°

ArmorSeal Heavy Duty Floor Coatings

ARMORSEAL® 1000 HS

PART A B67-2000 **SERIES**
PART B B67V2002 **HARDENER**

Revised: August 10, 2021

PRODUCT INFORMATION

PRODUCT DESCRIPTION

ARMORSEAL 1000 HS is a high solids, heavy duty, two-component, catalyzed, polyamide epoxy coating formulated for demanding marine and industrial requirements. Dries rapidly to a tough, high gloss finish with excellent resistance to alkalies, abrasion, corrosion, and chemical attack.

- Chemical Resistant
- Impact Resistant
- Abrasion Resistant
- Outstanding application properties

PRODUCT CHARACTERISTICS

Finish:	Gloss
Color:	Clear, Haze Gray, Deck Gray, White, Sandstone, Tile Red, Safety Yellow, and a wide range of tinted colors
Volume Solids, mixed:	colors - 65% ± 2% may vary by color clear - 61% ± 2%
Weight Solids, mixed:	74% ± 2%, may vary by color
VOC (EPA Method 24):	Unreduced (mixed): <340 g/L; 2.8 lb/gal
Mix Ratio:	1:1 by volume

Recommended Spreading Rate per coat:

	Minimum	Maximum
Wet mils (microns)	**5.0** (125)	**8.0** (200)
Dry mils (microns)	**3.0** (75)	**5.0** (125)
~Coverage sq ft/gal (m^2/L)	**206** (5.0)	**350** (8.6)
Theoretical coverage **sq ft/gal** (m^2/L) @ 1 mil / 25 microns dft	**1040** (25.5)	

NOTE: Brush or roll application may require multiple coats to achieve maximum film thickness and uniformity of appearance.

Drying Schedule @ 6.0 mils (150 microns):

	@ 50°F/10°C	@ 77°F/25°C *50% RH*	@ 120°F/49°C
To touch:	4 hours	2 hours	30 minutes
To recoat:			
minimum:	24 hours	8 hours	4 hours
maximum:	7 days	7 days	7 days
Foot traffic:	48 hours	24 hours	12 hours
Heavy traffic:	4-5 days	48-72 hours	24-36 hours
To cure:	10 days	7 days	4 days

If maximum recoat time is exceeded, abrade surface before topcoating.
Drying time is temperature, humidity, and film thickness dependent.

Pot Life:	6 hours	4 hours	2 hours
Sweat-in-Time:	2 hours	30 minutes	10 minutes

PRODUCT CHARACTERISTICS (CONT'D)

Shelf Life:	36 months, unopened Store indoors at 40°F (4.5°C) to 100°F (38°C)
Flash Point:	>105°F (41°C), Seta, mixed
Reducer*:	VOC Restricted Areas (≤340 g/L): Not recommended
Clean Up:	Reducer #54 (R7K54)

*In other VOC areas (>340 g/L): use Reducer #54 (R7K54). Confirm compliance with state and local air quality rules before use.

RECOMMENDED USES

- For industrial, commercial, or marine applications where a heavy duty epoxy coating is required.
- Superior resistance to chemicals, moisture, abrasion, and impact
- Excellent resistance to alkalies, dilute acids, spillage of solvents, chemicals, jet fuel, grease, etc.
- Clear finish for interior use only
- Suitable for use in USDA inspected facilities

PERFORMANCE CHARACTERISTICS

Substrate*: Concrete
Surface Preparation*: Clean, dry, sound
System Tested*:
1 ct. ArmorSeal 1000 HS (reduced)
1 ct. ArmorSeal 1000 HS @ 3.0-5.0 mils (75-125 microns) dft
*unless otherwise noted below

Test Name	Test Method	Results
Abrasion Resistance	ASTM D4060, CS17 wheel, 1000 cycles, 1 Kg load	64.8 mg loss
Adhesion, over concrete	ASTM D4541	350 psi, 100% concrete failure
Direct Impact Resistance (steel)	ASTM D2794	58 in. lbs
Dry Heat Resistance	ASTM D2485	180°F (82°C)
Flexibility (steel)	ASTM D522, 180° bend, 1/8" mandrel	Passes
Pencil Hardness	ASTM D3363	HB
Slip Resistance, Floors	ASTM C1028**, .60 minimum Static Coefficient of Friction	Passes wet and dry, with and without SharkGrip Additive

**Test method withdrawn in 2014 without replacement

Epoxy coatings may darken or yellow following application and curing.

continued on back

ArmorSeal Heavy Duty Floor Coatings

ARMORSEAL® 1000 HS

PART A B67-2000 **SERIES**
PART B B67V2002 **HARDENER**

PRODUCT INFORMATION

Revised: August 10, 2021

RECOMMENDED SYSTEMS

		Dry Film Thickness / ct. Mils	(Microns)
Concrete/Wood:			
1 ct.	ArmorSeal 1000 HS*	2.5-4.0	(63-100)
1-2 cts.	ArmorSeal 1000 HS (with anti-slip aggregate if required)	3.0-5.0	(75-125)
Concrete:			
1 ct.	ArmorSeal 33 Epoxy Primer/Sealer	8.0	(200)
1-2 cts.	ArmorSeal 1000 HS (with anti-slip aggregate if required)	3.0-5.0	(75-125)
Steel:			
1 ct.	Recoatable Epoxy Primer	4.0-5.0	(100-125)
1-2 cts.	ArmorSeal 1000 HS	3.0-5.0	(75-125)
Painted Surfaces in Sound Condition:			
1-2 cts.	ArmorSeal 1000 HS	3.0-5.0	(75-125)

*In VOC Restricted Areas (≤340 g/L), reduction is not recommended. In other areas (>340 g/L), Reducer #54 (R7K54) may be used as necessary up to 1 pt/gal. Confirm compliance with state and local air quality rules before use.

The systems listed above are representative of the product's use, other systems may be appropriate.

SURFACE PREPARATION

Surface must be clean, dry, and in sound condition. Remove all oil, dust, grease, dirt, loose rust, and other foreign material to ensure adequate adhesion.

Refer to product Application Bulletin for detailed surface preparation information.

Minimum recommended surface preparation:

* Iron & Steel:	SSPC-SP6/NACE 3
Concrete & Masonry:	SSPC-SP13/NACE 6, or ICRI No. 310.2R, CSP 1-3
Wood, interior:	Clean, smooth, dust free

*Primer Required

Surface Preparation Standards

	Condition of Surface	ISO 8501-1 BS7079:A1	Swedish Std. SIS055900	SSPC	NACE
White Metal		Sa 3	Sa 3	SP 5	1
Near White Metal		Sa 2.5	Sa 2.5	SP 10	2
Commercial Blast		Sa 2	Sa 2	SP 6	3
Brush-Off Blast		Sa 1	Sa 1	SP 7	4
Hand Tool Cleaning	Rusted	C St 2	C St 2	SP 2	-
	Pitted & Rusted	D St 2	D St 2	SP 2	-
Power Tool Cleaning	Rusted	C St 3	C St 3	SP 3	-
	Pitted & Rusted	D St 3	D St 3	SP 3	-

TINTING

White and Ultradeep may be tinted with Maxitoner Colorants at 200% tinting strength into Part A. Five minutes minimum mixing on a mechanical shaker is required for complete mixing of color.

APPLICATION CONDITIONS

Temperature:	50°F (10°C) minimum, 120°F (49°C) maximum (air, surface, and material) At least 5°F (2.8°C) above dew point
Relative humidity:	85% maximum

Refer to product Application Bulletin for detailed application information.

ORDERING INFORMATION

Packaging:	
Part A:	1 gallon (3.78L) containers
Part B:	1 gallon (3.78L) containers (clear available in 5 gallon /18.9L containers)
Weight:	12.51 ± 0.2 lb/gal ; 1.5 Kg/L mixed, may vary by color

SAFETY PRECAUTIONS

Refer to the SDS sheet before use.

Published technical data and instructions are subject to change without notice. Contact your Sherwin-Williams representative for additional technical data and instructions.

WARRANTY

The Sherwin-Williams Company warrants our products to be free of manufacturing defects in accord with applicable Sherwin-Williams quality control procedures. Liability for products proven defective, if any, is limited to replacement of the defective product or the refund of the purchase price paid for the defective product as determined by Sherwin-Williams. NO OTHER WARRANTY OR GUARANTEE OF ANY KIND IS MADE BY SHERWIN-WILLIAMS, EXPRESSED OR IMPLIED, STATUTORY, BY OPERATION OF LAW OR OTHERWISE, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

DISCLAIMER

The information and recommendations set forth in this Product Data Sheet are based upon tests conducted by or on behalf of The Sherwin-Williams Company. Such information and recommendations set forth herein are subject to change and pertain to the product offered at the time of publication. Consult your Sherwin-Williams representative to obtain the most recent Product Data Information and Application Bulletin.

ArmorSeal Heavy Duty Floor Coatings

ARMORSEAL® 1000 HS

PART A B67-2000
PART B B67V2002
SERIES HARDENER

Revised: August 10, 2021

APPLICATION BULLETIN

SURFACE PREPARATIONS

Surface must be clean, dry, and in sound condition. Remove all oil, dust, grease, dirt, loose rust, and other foreign material to ensure adequate adhesion.

Iron & Steel (atmospheric service)
Remove all oil and grease from surface by Solvent Cleaning per SSPC-SP1. Minimum surface preparation is Commercial Blast Cleaning per SSPC-SP6/NACE 3. For better performance, use Near White Metal Blast Cleaning per SSPC-SP10/NACE 2. Blast clean all surfaces using a sharp, angular abrasive for optimum surface profile (2 mils / 50 microns). Prime any bare steel the same day as it is cleaned or before flash rusting occurs.

Concrete and Masonry
For surface preparation, refer to SSPC-SP13/NACE 6, or ICRI No. 310.2R, CSP 1-3. Surfaces should be thoroughly clean and dry. Concrete and mortar must be cured at least 28 days @ 75°F (24°C). Remove all loose mortar and foreign material. Surface must be free of laitance, concrete dust, dirt, form release agents, moisture curing membranes, loose cement and hardeners. Fill bug holes, air pockets and other voids with Steel-Seam FT910. Primer required.

Follow the standard methods listed below when applicable:
ASTM D4258 Standard Practice for Cleaning Concrete.
ASTM D4259 Standard Practice for Abrading Concrete.
ASTM D4260 Standard Practice for Etching Concrete.
ASTM F1869 Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete.
SSPC-SP 13/Nace 6 Surface Preparation of Concrete.
ICRI No. 310.2R Concrete Surface Preparation.

Previously Painted Surfaces
If in sound condition, clean the surface of all foreign material. Smooth, hard or glossy coatings and surfaces should be dulled by abrading the surface. Apply a test area, allowing paint to dry one week before testing adhesion. If adhesion is poor, or if this product attacks the previous finish, removal of the previous coating may be necessary. If paint is peeling or badly weathered, clean surface to sound substrate and treat as a new surface as above.

Surface Preparation Standards

	Condition of Surface	ISO 8501-1 BS7079:A1	Swedish Std. SIS055900	SSPC	NACE
White Metal		Sa 3	Sa 3	SP 5	1
Near White Metal		Sa 2.5	Sa 2.5	SP 10	2
Commercial Blast		Sa 2	Sa 2	SP 6	3
Brush-Off Blast		Sa 1	Sa 1	SP 7	4
Hand Tool Cleaning	Rusted	C St 2	C St 2	SP 2	-
	Pitted & Rusted	D St 2	D St 2	SP 2	-
Power Tool Cleaning	Rusted	C St 3	C St 3	SP 3	-
	Pitted & Rusted	D St 3	D St 3	SP 3	-

APPLICATION CONDITIONS

Temperature:	50°F (10°C) minimum, 120°F (49°C) maximum (air, surface, and material) At least 5°F (2.8°C) above dew point
Relative humidity:	85% maximum

APPLICATION EQUIPMENT

The following is a guide. Changes in pressures and tip sizes may be needed for proper spray characteristics. Always purge spray equipment before use with listed reducer. Any reduction must be compliant with existing VOC regulations and compatible with the existing environmental and application conditions.

Reducer* ..... VOC Restricted Areas (≤340 g/L): Not recommended
Clean Up ..... Reducer #54 (R7K54)

Airless Spray
Pressure ..... 2500 psi
Hose ..... 3/8" ID
Tip ..... .015" - .021"
Filter ..... 60 mesh
Reduction* ..... Not recommended

Brush
Nylon/Polyester or Natural Bristle
Reduction* ..... Not recommended

Roller
Cover ..... 3/8" woven with solvent resistant core
Reduction* ..... Not recommended

*In other VOC areas (>340 g/L): Reducer #54 (R7K54) may be used up to 10% by volume. Confirm compliance with state and local air quality rules before use.

If specific application equipment is not listed above, equivalent equipment may be substituted.

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ArmorSeal Heavy Duty Floor Coatings

ARMORSEAL® 1000 HS

PART A B67-2000
PART B B67V2002
SERIES HARDENER

Revised: August 10, 2021

APPLICATION BULLETIN

APPLICATION PROCEDURES

Surface preparation must be completed as indicated.

Mix contents of each component thoroughly with low speed power agitation. Combine one Part A with one Part B by volume and mix for 3 minutes and until uniform. Allow the material to sweat-in as indicated. Re-stir before using.

Apply paint at the recommended film thickness and spreading rate as indicated below:

Recommended Spreading Rate per coat:

	Minimum	Maximum
Wet mils (microns)	**5.0** (125)	**8.0** (200)
Dry mils (microns)	**3.0** (75)	**5.0** (125)
~Coverage sq ft/gal (m^2/L)	**206** (5.0)	**350** (8.6)
Theoretical coverage **sq ft/gal** (m^2/L) @ 1 mil / 25 microns dft	**1040** (25.5)	

NOTE: Brush or roll application may require multiple coats to achieve maximum film thickness and uniformity of appearance.

Drying Schedule @ 6.0 mils (150 microns):

	@ 50°F/10°C	@ 77°F/25°C *50% RH*	@ 120°F/49°C
To touch:	4 hours	2 hours	30 minutes
To recoat:			
minimum:	24 hours	8 hours	4 hours
maximum:	7 days	7 days	7 days
Foot traffic:	48 hours	24 hours	12 hours
Heavy traffic:	4-5 days	48-72 hours	24-36 hours
To cure:	10 days	7 days	4 days
If maximum recoat time is exceeded, abrade surface before topcoating.			
Drying time is temperature, humidity, and film thickness dependent.			
Pot Life:	6 hours	4 hours	2 hours
Sweat-in-Time:	2 hours	30 minutes	10 minutes

Application of coating above maximum or below minimum recommended spreading rate may adversely affect coating performance.

CLEAN UP INSTRUCTIONS

Clean spills and spatters immediately with Reducer #54 (R7K54). Clean tools immediately after use with Reducer #54 (R7K54). Follow manufacturer's safety recommendations when using any solvent.

DISCLAIMER

The information and recommendations set forth in this Product Data Sheet are based upon tests conducted by or on behalf of The Sherwin-Williams Company. Such information and recommendations set forth herein are subject to change and pertain to the product offered at the time of publication. Consult your Sherwin-Williams representative to obtain the most recent Product Data Information and Application Bulletin.

PERFORMANCE TIPS

Stripe coat all crevices, welds, and sharp angles to prevent early failure in these areas.

When using spray application, use a 50% overlap with each pass of the gun to avoid holidays, bare areas, and pinholes. If necessary, cross spray at a right angle.

Spreading rates are calculated on volume solids and do not include an application loss factor due to surface profile, roughness or porosity of the surface, skill and technique of the applicator, method of application, various surface irregularities, material lost during mixing, spillage, overthinning, climatic conditions, and excessive film build.

No reduction of material is recommended as it can affect film build, appearance, and adhesion.

Do not apply the material beyond recommended pot life.

Do not mix previously catalyzed material with new.

In order to avoid blockage of spray equipment, clean equipment before use or before periods of extended downtime with Reducer #54 (R7K54).

Material can not be sprayed if anti-slip aggregate is use.

Anti-slip additives, such as H&C SharkGrip®, may be added to the coating to provide some slip resistance. This product should not be used in place of a non-skid finish.

Anti-slip additive may be mixed into the final coat just prior to application. Exception: if anti-slip is desired with Clear finish, it should be hand broadcast.

In VOC Restricted Areas (≤340 g/L), reduction is not recommended. In other areas (>340 g/L), the prime coat for concrete may be reduced with Reducer #54 (R7K54) up to 1 pt/gal. Confirm compliance with state and local air quality rules before use.

Clear is for interior use only.

Refer to Product Information sheet for additional performance characteristics and properties.

SAFETY PRECAUTIONS

Refer to the SDS sheet before use.

Published technical data and instructions are subject to change without notice. Contact your Sherwin-Williams representative for additional technical data and instructions.

WARRANTY

The Sherwin-Williams Company warrants our products to be free of manufacturing defects in accord with applicable Sherwin-Williams quality control procedures. Liability for products proven defective, if any, is limited to replacement of the defective product or the refund of the purchase price paid for the defective product as determined by Sherwin-Williams. NO OTHER WARRANTY OR GUARANTEE OF ANY KIND IS MADE BY SHERWIN-WILLIAMS, EXPRESSED OR IMPLIED, STATUTORY, BY OPERATION OF LAW OR OTHERWISE, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

Protective & Marine Coatings

RESUFLOR™ 3746
HIGH PERFORMANCE EPOXY

PART A	GP3746	SERIES
PART A	GP8746	WITH ANTIMICROBIAL AGENT
PART B	GP3746B01	HARDENER
PART B	GP3746B02	FAST CURE HARDENER

Revised: January 6, 2022

PRODUCT INFORMATION

PRODUCT DESCRIPTION

RESUFLOR 3746 High Performance Epoxy is a two-component, recoatable epoxy and binder resin. It may be used directly over primed substrates, or as a gloss seal coat over decorative slurry and mortar systems. Resuflor 3746 is extremely hard wearing, chemical, impact and abrasion resistant.

ADVANTAGES

- Impact and abrasion resistant
- Durable, easy to clean
- Chemical resistant
- Suitable for use in USDA inspected facilities
- Acceptable for use in Canadian Food Processing facilities, categories: D2 (confirm acceptance of specific part numbers/rexes with your Sherwin-Williams representative)
- Available with an antimicrobial agent (GP8746 series)
- Tint bases can be tinted using Maxitoner @ 50% tint strength - see Tinting section on next page for details

TYPICAL USES

RESUFLOR 3746 High Performance Epoxy should be used in areas where maintenance of a high performance, aesthetically appealing and chemical resistant epoxy system is required. Resuflor 3746 is suited for use in clean rooms, laboratories, workshops, and light assembly areas.

LIMITATIONS

- Slab on grade requires vapor/moisture barrier
- Substrate must be structurally sound, dry and free of bond inhibiting contaminants
- During installation and initial cure cycle substrate and ambient air temperature must be at a minimum of 50°F (10°C). Substrate temperature must be at least 5°F (3ºC) above the dew point (for lower temperature installation contact your Sherwin-Williams representative).
- Maximum dry surface temperature not to exceed 160°F (71°C)
- Strictly adhere to published coverage rates
- Apply clear at only 10-15 mils (250-375 microns) maximum per coat

SURFACE PREPARATION

Proper inspection and preparation of the substrate to receive resinous material is critical. Read and follow the “Instructions for Concrete Surface Preparation” (Form G-1) for complete details.

PRODUCT CHARACTERISTICS

Finish:	Gloss
Color:	Clear, Standard Colors Wide range of colors possible Tintable: W01 (white tint base) and T04 (ultra deep tint base) See page 2 for additional tint details.
Volume Solids:	99%, mixed
Weight Solids:	99%, mixed
Mix Ratio:	2:1
VOC (EPA Method 24):	<100 g/L; 0.83 lbs/gal, mixed

PRODUCT CHARACTERISTICS (CONT'D)

Recommended Spreading Rate per coat:

	Minimum	Maximum
Wet mils (microns)**:**	**10.0** (250)	**30.0** (750)
~Coverage sq ft/gal (m^2/L)**:**	**53** (1.3)	**159** (3.9)

Drying Schedule @ 10.0 mils (250 microns) wet:

	@ 55ºF (13ºC)	@ 72°F(22°C) 50% RH	@ 95°F(35°C)
Standard Hardener:			
To touch:	16-24 hours	6-12 hours	4-8 hours
To recoat:			
minimum	24 hours	8 hours	6 hours
maximum	48 hours	24 hours	24 hours
Foot traffic:	48 hours	24 hours	18 hours
Heavy traffic:	96 hours	72 hours	60 hours
Full cure:	7 days	7 days	7 days

Fast Cure Hardener:	
To touch:	3-4 hours
To recoat:	
minimum	6
maximum	12
Foot traffic:	10-12 hours
Heavy traffic:	24 hours
Full cure:	7 days

If maximum recoat time is exceeded, abrade surface before recoating.

Drying time is temperature, humidity, and film thickness dependent.

Pot Life (Standard) gallon mass	60 minutes	40 minutes	20 minutes
Pot Life (Fast Cure) gallon mass		25 minutes	

Shelf Life:
Part A: 18 months, unopened
Part B (Standard): 12 months, unopened
Part B (Fast Cure): 12 months, unopened
Store indoors at 40°F (4.5°C) to 100°F (38°C)

PERFORMANCE CHARACTERISTICS

Test Name	Test Method	Results
Abrasion Resistance	ASTM D4060, CS17 wheel, 1000 cycles	76 mg loss
Adhesion	ACI 503R	300 psi, concrete failure
Flammability		Self-extinguishing over concrete
Flexural Strength	ASTM D 790	~12,400 psi
Hardness, Shore D	ASTM D 2240	77
Impact Resistance	MIL-D-3134J	Direct: 160 in-lb Reverse: 20 in-lb
***Surface Burning**	ASTME84/ NFPA 255	Flame Spread Index 20; Smoke Development Index 90
Tensile Strength	ASTM D 638	3527.4 psi

*Resuflor Aqua 3477 at 1.5 mils (40 microns) DFT topcoated with Resuflor 3746 at 17.5 mils (438 microns) DFT

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Protective & Marine Coatings

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HIGH PERFORMANCE EPOXY

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Revised: January 6, 2022

PRODUCT INFORMATION

STORAGE / APPLICATION

MATERIAL DELIVERY AND STORAGE:

Store materials in accordance instructions, with seals and labels intact and legible. Keep resins, hardeners, and solvents separated from each other and away from sources of ignition. 18 months shelf life is expected for products stored between 40°F (4.5°C) - 100°F (38°C).

APPLICATION INSTRUCTIONS:

1. Premix GP3746 (resin) using a low speed drill and Jiffy blade. Mix for one minute and until uniform, exercising caution not to introduce air into the material.

2. Add 2 parts GP3746 (resin) to 1 part GP3746B (hardener) by volume. Mix with low speed drill and Jiffy blade for three minutes and until uniform. To insure proper system cure and performance, strictly follow mix ratio recommendations.

3. Apply GP3746 using a squeegee or trowel and back roll with a 3/8" nap roller at a spread rate of 50-160 square feet per gallon (1.3-4.0 meters squared per liter) to yield 10-30 mils (250-750 microns) WFT making sure of uniform coverage. Take care not to puddle materials and insure even coverage.

4. Allow to cure 24 hours minimum before opening to traffic and 72 hours before water exposure.

Note: Epoxy materials will appear to be cured and “dry to touch” prior to full chemical cross linking. Allow epoxy to cure a minimum of 3 days prior to exposure to water or other chemicals for best performance.

TINTING

Tint bases can be tinted using Maxitoners @ 50% tint strength. No more than 6 oz. of Maxitoner colorant for the Ultra Deep Base (T04) and no more than 2 oz. of Maxitoner colorant for the White Base (W01).

Ensure that the colorant is thoroughly incorporated prior to use.

Do not tint package colors.

CHEMICAL RESISTANCE

For comprehensive chemical resistance information, consult the Chemical Resistant Guide and contact your Sherwin-Williams representative.

CLEANUP

Clean up mixing and application equipment immediately after use. Use toluene or xylene. Observe all fire and health precautions when handling or storing solvents.

SAFETY

Refer to the SDS sheet before use.

Published technical data and instructions are subject to change without notice. Contact your Sherwin-Williams representative for additional technical data and instructions.

MAINTENANCE

Occasional inspection of the installed material and spot repair can prolong system life. For specific information, contact your Sherwin-Williams representative.

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