

**SECTION 08 90 00
LOUVERS AND VENTS**

SPEC WRITER NOTE: Delete between // // if not applicable to project. Also delete any other item or paragraph not applicable in the section and renumber the paragraphs.

PART 1 - GENERAL

1.1 DESCRIPTION:

- A. This section specifies fixed and operable wall louvers, door louvers and wall vents.

1.2 RELATED WORK:

- A. Louvers in Steel Doors: Section 08 11 13, HOLLOW METAL DOORS AND FRAMES.
- B. Color of finish: Section 09 06 00, SCHEDULE FOR FINISHES.
- C. Louvers in lead lined wood doors: Section 13 49 00, RADIATION PROTECTION.

1.3 SUBMITTALS:

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Shop Drawings:
 - 1. Each type, showing material, finish, size of members, // operating devices, // method of assembly, and installation and anchorage details.
- C. Manufacturer's Literature and Data:
 - 1. Each type of louver and vent.
- D. Color samples.

1.4 APPLICABLE PUBLICATIONS:

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.
- B. The Master Painters Institute (MPI):
Approved Product List - Updated Monthly
- C. ASTM International (ASTM):
A240/A240M-14.....Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications

- A653/A653M-13.....Steel Sheet Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot Dip Process
- A1008/A1008M-13.....Steel, Sheet, Carbon, Cold Rolled, Structural, and High Strength Low-Alloy with Improved Formability
- B209-14.....Aluminum and Aluminum Alloy, Sheet and Plate
- B209M-14.....Aluminum and Aluminum Alloy, Sheet and Plate (Metric)
- B221-14.....Aluminum and Aluminum Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes
- B221M-13.....Aluminum and Aluminum Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes (Metric)
- D1187/D1187M-97(R2011)..Asphalt-Base Emulsions for Use as Protective Coatings for Metal
- D. National Association of Architectural Metal Manufacturers (NAAMM):
AMP 500-06.....Metal Finishes Manual
- E. National Fire Protection Association (NFPA):
90A-15.....Installation of Air Conditioning and Ventilating Systems
- G. American Architectural Manufacturers Association (AAMA):
2605-13.....High Performance Organic Coatings on Architectural Extrusions and Panels
- H. Air Movement and Control Association, Inc. (AMCA):
500-L-07.....Testing Louvers

PART 2 - PRODUCTS

SPEC WRITER NOTE: Make material requirements agree with applicable requirements specified in the referenced Applicable Publications. Update and specify in both only that, which applies to the project.

2.1 MATERIALS:

- A. Aluminum, Extruded: ASTM B221M (B221).
- B. Stainless Steel: ASTM A240/A240M, Type 302B.
- C. Galvanized Steel Sheet: ASTM A653/A653M; G90 min.
- D. Carbon Steel and Sheet: ASTM A1008/A1008M (interior use louvers only).
- E. Aluminum, Plate and Sheet: ASTM B209M (B209); alloy 3003 or 5005 with temper as required for forming.

- F. Fasteners: Fasteners for securing louvers and wall vents to adjoining construction, except as otherwise specified or indicated in construction documents, to be toggle or expansion bolts of size and type as required for each specific type of installation and service condition.
1. Where type, size, or spacing of fasteners is not shown or specified, submit shop drawings showing proposed fasteners, and method of installation.
 2. Fasteners for louvers, louver frames, and wire guards to be of stainless steel or aluminum with same finish as louvers.
 3. Fasteners for louvers, louver frames and wire guards within mental health areas to be non-removable/tamper-proof type.
- G. Inorganic Zinc Primer: MPI No. 19.
- H. Bituminous Coating: ASTM D1187/D1187M; cold applied asphalt mastic emulsion.

SPEC WRITER NOTES:

1. Louvers in acid fume areas such as battery rooms, and chlorinate rooms are to be of stainless steel. Verify existence of such spaces with Mechanical and Electrical Engineers.
2. Specify all louvers required or shown, including those shown in connection with mechanical work.

2.2 EXTERIOR WALL LOUVERS:

- A. General:
1. Provide // fixed // // and operable // type louvers of size and design shown.
 2. Heads, sills and jamb sections are to have formed caulking slots or be designed to retain caulking. Head sections are to have exterior drip lip, and sill sections an integral water stop.
 3. Furnish louvers with sill extension or separate sill as shown.
 4. Frame is to be mechanically fastened or welded construction with welds dressed smooth and flush.

SPEC WRITER NOTE: Percent free area, free area velocity, pressure drop and amount of water passage for insertion in following paragraph is to be obtained from Mechanical Engineer.

- B. Performance Characteristics:

1. Weather louvers are to have a minimum of // // percent free area and to pass // // mm/s (// // fpm) free area velocity at a pressure drop not exceeding // // mm (// // inch) water gage and carry not more than // // g (// // ounces) of water per square meter (// // square foot) of free area for 15 minutes when tested per AMCA Standard 500-L.
2. Louvers are to bear AMCA certified rating seals for air performance and water penetration ratings.

C. Aluminum Louvers:

SPEC WRITER NOTE: Consult Mechanical Engineer to determine if standard or drainable type blades are required.

1. General: Frames, blades, // sills // and mullions (sliding interlocking type); 2 mm (0.078-inch) thick extruded 6063-T5 or -T52 aluminum. Blades to be // standard // // drainable // type and have reinforcing bosses.
2. Louvers, fixed: Make frame sizes 13 mm (1/2-inch) smaller than openings. Single louvers frames are not to exceed 1676 mm (66 inches) wide. When openings exceed 1676 mm (66 inches), provide twin louvers separated by mullion members.
3. Louvers are to withstand the effects of gravity loads and the following wind loads and stresses within limits and under conditions indicated without permanent deformation of louver components, noise or metal fatigue caused by louver-blade rattle or flutter, or permanent damage to fasteners and anchors.
 - a. Wind load acting inward or outward of not less than 1436 //_____// Pa (30 //_____// lb. per sq. ft.).
4. Louvers, operable: Louver frame opening sizes, single louver sizes and mullion requirements are to be as specified for fixed louvers.
 - a. Blades: Attach blades to frame with aluminum pivot pins through nylon bearings. Fasten each blade to stainless steel operation arms that are connected to minimum 3 mm (1/8-inch) thick stainless steel operating // bar // // handle // arranged for simultaneous operation of blades.
 - b. //Spring/chain operation: Exposed operator activated by spring attached to operating // bar // // handle // and mounted on frame.//
//Control of louver to be by pull chain of required length to be operable from floor. Provide pulleys and brackets as required.//

//c. Hand crank operation: Hand crank operator activated by case hardened gears concealed in aluminum housing. Operators are to be removable and located at jambs. Provide one right-handed operator for each louver. //

//d. Motor operation: Motor operated by approved electric motor. Motors are to be removable and located at jambs of louver. Connect motor operator lever arm to operating bar by means of stainless steel connecting rod. //

//e. Automatic operation: Louvers are to be complete with // weights, // // pull chain, // // chain holder and brackets, // // cables, // // sheaves, // // spring, // // 70 degrees C (160 degrees F) fusible link, // and other related items meeting requirements of NFPA 90A. Provide non-ferrous bearings and spindles of replaceable type. // Control of louver to be by pull chain of required length to be operable from floor. // Louvers are to close automatically in case of fire. //

D. Stainless Steel Louvers: Form stainless steel louvers using 1.6 mm (0.063-inch) thick sheet for frames, blades, sills and mullions.

1. Provide louver with fixed 45 degree // standard // // drainable // blades with water baffle. Make overall frame size 13 mm (1/2-inch) less than opening, unless otherwise indicated in construction documents.

2. Single louver sections are not to exceed 1676 mm (66 inches) in width. For openings larger than 1676 mm (66 inches) wide, provide multiple sections not larger than 1676 mm (66 inches) wide separated by mullions.

E. Formed Steel Louvers: Form // galvanized // louvers using 1.5 mm (0.059-inch) thick sheet for frames, blades, sills and mullions.

1. Provide louver with fixed 45 degree // standard // // drainable // blades with water baffle. Make overall frame size 13 mm (1/2-inch) less than opening, unless otherwise indicated in construction documents.

2. Single louver sections are not to exceed 1676 mm (66 inches) in width. For openings larger than 1676 mm (66 inches) wide, provide multiple sections not larger than 1676 mm (66 inches) side separated by mullions.

2.3 CLOSURE ANGLES AND CLOSURE PLATES:

A. Fabricate from 2 mm (0.078-inch) thick stainless steel or aluminum.

- B. Provide continuous closure angles and closure plates on inside head, jambs and sill of exterior wall louvers.
- C. Secure angles and plates to louver frames with screws, and to masonry or concrete with fasteners as indicated in construction documents.

2.4 WIRE GUARDS:

- A. Provide wire guards on outside of all exterior louvers, except on exhaust air louvers.
- B. Fabricate frames from // 2 mm (0.078-inch) thick extruded or sheet aluminum // // 1.5 mm (0.059-inch) thick stainless steel // designed to retain wire mesh.
- C. Wire mesh to be woven from not less than // 1.6 mm (0.063-inch) diameter aluminum wire // // 1.3 mm (0.05-inch) diameter stainless steel wire // in 13 mm (1/2-inch) square mesh.
- D. Miter corners and join by concealed corner clips or locks extending not less than 57 mm (2-1/4 inches) into rails and stiles. Equip wire guards over 1219 mm (4 feet) in height with a mid-rail constructed as specified for frame components.
- E. Fasten frames to outside of louvers with aluminum or stainless steel devices of same finish as louvers designed to allow removal and replacement without damage to the wire guard or the louver.

2.5 BLANK-OFF PANELS:

- A. Uninsulated panels attached with clips or screws as follows: Panel finish is to be // same finish applied to louvers // // same finish type applied to louvers but black color //.
 - 1. Aluminum sheet for aluminum louvers, 1.27 mm (0.050 inch) minimum thickness.
 - 2. Galvanized-steel sheet for galvanized-steel louvers, 1.02 mm (0.040 inch) minimum.
 - 3. Stainless-steel sheet for stainless-steel louvers, not less than 0.95 mm (0.038 inch) minimum.
- B. Insulated laminated panels consisting of an insulating core surfaced on back and front with metal sheets and attached to back of louver with clips on screws and gasketed or sealant sealed perimeter. Panel finish is to be // same finish applied to louvers // //same type of finish applied to louvers but black color //.
 - 1. Thickness: // 25 mm (1 inch) // // 50 mm (2 inches) // .
 - 2. Aluminum sheet for aluminum louver 0.81 mm (0.032 inch) minimum.

3. Galvanized-steel sheet for galvanized-steel louver 0.71 mm (0.028 inch) minimum.
4. Stainless-steel sheet for stainless-steel louvers 0.79 mm (0.031 inch) minimum.
5. Insulating Core: // Rigid, glass-fiber-board insulation // // extruded-polystyrene foam //.

2.6 EXTERIOR DOOR LOUVERS:

- A. Fabricate of 1.6 mm (0.063-inch) thick extruded aluminum. Miter frames at corners and join by concealed corner brackets. Louvers are to be weather resistant type.
- B. Equip louvers on outside with wire guards, except omit wire guards for louvers in doors located completely below enclosed areaways.

2.7 INTERIOR DOOR LOUVERS:

- A. Fabricate louvers for interior doors // and partitions of // // 1.2 mm (0.0472-inch) thick steel // // 1.6 mm (0.063-inch) thick extruded aluminum //.
- B. Make louvers sight-proof type with stationary blades, // except where light-proof louvers are required //.
- //C. Lightproof louvers are to have stationary blades and be designed to exclude passage of light but permit free ventilation. //

2.8 WALL VENTS:

- A. Fabricate exterior wall vents from either 4.7 mm (0.185-inch) thick aluminum plate or 6 mm (1/4-inch) thick cast iron, perforated in diamond lattice pattern, with not over 19 mm (3/4-inch) openings.
- B. Vents are to have aluminum screen frame with aluminum alloy insect screening mounted on back of vent by means of 19 mm x 5 mm (3/4-inch by 3/16-inch) top and bottom bars screwed to grille.
- C. Vent Frames in Masonry: Fabricate of 45 mm x 30 mm x 5 mm (1-3/4 inch by 1-1/4 inch by 3/16-inch) steel angles bolted with 6 mm (1/4-inch) diameter expansion bolts at jambs.

2.9 AIR INTAKE VENTS:

- A. Fabricate exterior louvered wall ventilators for fresh air intake for air conditioning units from extruded aluminum, ASTM B221M (B221). Form with integral horizontal louvers and frame, with drip extending beyond face of wall and integral water stops.
- //B. Provide aluminum closures where shown for inside face of dummy vents.//

- C. Provide 0.8 mm (0.032-inch) thick aluminum sleeves // in cavity walls // // where indicated in construction documents //.

2.10 BRICK VENTS:

- A. Vents are to be of size shown formed of approximately 3 mm (0.125 inch) thick cast aluminum, or 3 mm (0.118 inch) extruded aluminum.
- B. Provide vents complete with aluminum screen frame with corrosion resistant insect screening mounted on back of vent.
- C. Provide vents with required anchors.

SPEC WRITE NOTE: If more than one finish is used on project, precede finish spec with "Finish for (list items):"

2.11 FINISH:

- A. In accordance with NAAMM Metal Finishes Manual: AMP 500-505
- B. Aluminum Louvers // Air Intake Vents // // Wire Guards // // Blank Off Panels //:
 - 1. Anodized finish
 - //a. AA-M1X, Mill finish, as fabricated.//
 - //b. AA-M10C22A41, Chemically etched medium matte, with clear anodic coating, Class I Architectural, 0.17 mm (0.7 mils) thick.//
 - //c. AA-M10C22A42, Chemically etched medium matte, with integrally colored anodic coating, Class I Architectural, 0.17 mm (0.7 mils) thick.//
 - //d. AA-M10C22A44, Chemically etched medium matte, with electronically deposited metallic compound, Class I Architectural, 0.17 mm (0.7 mils) thick color anodic coating. Dyes will not be accepted.//
 - 2. Organic Finish: AAMA 2605 (Fluorocarbon coating) with total dry film thickness of not less than 0.03 mm (1.2 mil), color as indicated in Section 09 06 00, SCHEDULE FOR FINISHES.
- C. Aluminum // Wall Vents // // and Brick Vents //: Sand blasted satin finish.
- D. Stainless Steel: Mechanical finish No. 4 in accordance with NAAMM Metal Finishes Manual.
- E. Galvanized Sheet Steel: Two-coat baked-enamel or powder-coat finish consisting of prime coat and thermosetting topcoat, with a minimum dry film thickness of 0.05 mm (2 mils).
 - 1. Paint interior surfaces of lightproof louvers with two (2) additional finish shop coats of baked-on flat black enamel.

//2. Finish painting of exposed surfaces of shop primed louvers is specified in Section 09 91 00, PAINTING. //

//3. Manufacturer finished louvers // and blank-off panels // are to have color as indicated in Section 09 06 00, SCHEDULE FOR FINISHES. //

- F. Steel: Surfaces of steel work, for which no other finish is specified, are to be cleaned free from scale, rust, oil and grease, and then given a light colored prime paint after fabrication, except ferrous metals concealed in finished work. Paint all contact surfaces of assembled work (except welded contact surfaces) with an additional shop coat of similar paint.

2.12 PROTECTION:

- A. Provide protection for aluminum against galvanic action wherever dissimilar materials are in contact, by painting the contact surfaces of the dissimilar material with a heavy coat of bituminous coating (complete coverage), or by separating the contact surfaces with a performed synthetic rubber tape having pressure sensitive adhesive coating on one side.
- B. Isolate the aluminum from plaster, concrete and masonry by coating aluminum with zinc-chromate primer.
- C. Protect finished surfaces from damage during fabrication, erection, and after completion of the work. Strippable plastic coating on // colored anodized // // organic // finish is not approved.

PART 3 - EXECUTION

3.1 INSTALLATION:

- A. Set work accurately, in alignment and where indicated in construction documents. Install plumb, level, free of rack and twist, and set parallel or perpendicular as required to line and plane of surface.
- B. Furnish setting drawings and instructions for installation of anchors and for the positioning of items having anchors to be built into masonry construction. Provide temporary bracing for such items until masonry is set.
- C. Provide anchoring devices and fasteners as shown and as necessary for securing louvers // and vents // to building construction as specified. Power actuated drive pins may be used, except for removal items and where members would be deformed or substrate damaged by their use.
- D. Set wall louvers // and vents // in masonry walls during progress of the work. If wall louvers // and vents // are not delivered to job in

time for installation in prepared openings, make provision for later installation. Set in cast-in-place concrete in prepared openings.

3.2 CLEANING AND ADJUSTING:

- A. After installation, all exposed prefinished and plated items and all items fabricated from stainless steel and aluminum are to be cleaned as recommended by the manufacturer and protected from damage until completion of the project.
- B. All movable parts, including hardware, are to be cleaned and adjusted to operate as designed without binding or deformation of the members, so as to be centered in the opening of frame, and where applicable, to have all contact surfaces fit tight and even without forcing or warping the components.
- C. Restore louvers and vents damaged during installation and construction so no evidence remains of corrective work. If results of restoration are unsuccessful, as determined by Contracting Officer Representative (COR) damaged units and replace with new units.

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