UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated July 2023
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08/20

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USACE / NAVFAC / AFCEC / NASA	**UFGS-08 91 00 (August 2020)**

Preparing Activity: NAVFAC	**Superseding**
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UNIFIED FACILITIES GUIDE SPECIFICATIONS

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SECTION 08 91 00

METAL [WALL] [AND] [DOOR] LOUVERS
08/20

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NOTE: This guide specification covers the requirements for average metal wall louvers, metal louvers in wood doors, screens and frames, and accessories.

Adhere to UFC 1-300-02 Unified Facilities Guide Specifications (UFGS) Format Standard when editing this guide specification or preparing new project specification sections. Edit this guide specification for project specific requirements by adding, deleting, or revising text. For bracketed items, choose applicable item(s) or insert appropriate information.

Remove information and requirements not required in respective project, whether or not brackets are present.

Comments, suggestions and recommended changes for this guide specification are welcome and should be submitted as a Criteria Change Request (CCR).
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NOTE: For very large or special louvers and louvers subject to snow or seismic loads, insert additional paragraphs as required.
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NOTE: On the drawings, show:

1. Locations, sizes, and types of louvers.

2. Details of louver construction and installation, including subframes, sills, and flashing.

3. Locations and arrangement of mullions.

4. Colors of factory-finished louvers, unless color is specified.

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PART 1 GENERAL

1.1 REFERENCES

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NOTE: This paragraph is used to list the publications cited in the text of the guide specification. The publications are referred to in the text by basic designation only and listed in this paragraph by organization, designation, date, and title.

Use the Reference Wizard's Check Reference feature when you add a Reference Identifier (RID) outside of the Section's Reference Article to automatically place the reference in the Reference Article. Also use the Reference Wizard's Check Reference feature to update the issue dates.

References not used in the text will automatically be deleted from this section of the project specification when you choose to reconcile references in the publish print process.

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The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AIR MOVEMENT AND CONTROL ASSOCIATION INTERNATIONAL, INC. (AMCA)

AMCA 500-L	(2015) Laboratory Methods of Testing Louvers for Rating
AMCA 511	(2010; R 2016) Certified Ratings Program for Air Control Devices

ALUMINUM ASSOCIATION (AA)

AA DAF45	(2003; Reaffirmed 2009) Designation System for Aluminum Finishes

AMERICAN ARCHITECTURAL MANUFACTURERS ASSOCIATION (AAMA)

AAMA 611	(2014) Voluntary Specification for Anodized Architectural Aluminum
AAMA 2603	(2020) Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels
AAMA 2605	(2020) Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic

Coatings on Aluminum Extrusions and Panels

ASTM INTERNATIONAL (ASTM)

ASTM A123/A123M	(2017) Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A653/A653M	(2023) Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
ASTM A780/A780M	(2020) Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings
ASTM A1008/A1008M	(2021a) Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable
ASTM B209	(2014) Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate
ASTM B209M	(2014) Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric)
ASTM B221	(2021) Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes
ASTM B221M	(2021) Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric)

1.2 SUBMITTALS

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NOTE: Review Submittal Description (SD) definitions in Section 01 33 00 SUBMITTAL PROCEDURES and edit the following list, and corresponding submittal items in the text, to reflect only the submittals required for the project. The Guide Specification technical editors have classified those items that require Government approval, due to their complexity or criticality, with a "G." Generally, other submittal items can be reviewed by the Contractor's Quality Control System. Only add a "G" to an item if the submittal is sufficiently important or complex in context of the project.

For Army projects, fill in the empty brackets following the "G" classification, with a code of up to three characters to indicate the approving authority. Codes for Army projects using the Resident Management System (RMS) are: "AE" for Architect-Engineer; "DO" for District Office

(Engineering Division or other organization in the District Office); "AO" for Area Office; "RO" for Resident Office; and "PO" for Project Office. Codes following the "G" typically are not used for Navy, Air Force, and NASA projects.

The "S" classification indicates submittals required as proof of compliance for sustainability Guiding Principles Validation or Third Party Certification and as described in Section 01 33 00 SUBMITTAL PROCEDURES.

Choose the first bracketed item for Navy, Air Force, and NASA projects, or choose the second bracketed item for Army projects.

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Government approval is required for submittals with a "G" or "S" classification. Submittals not having a "G" or "S" classification are [for Contractor Quality Control approval.][for information only. When used, a code following the "G" classification identifies the office that will review the submittal for the Government.] Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Wall Louvers

SD-03 Product Data

Metal Wall Louvers

Door Louvers

SD-04 Samples

Wall Louver Samples; G[, [_____]]

Door Louver Samples; G[, [_____]]

1.3 DELIVERY, STORAGE, AND PROTECTION

Deliver materials to the site in an undamaged condition. Carefully store materials off the ground to provide proper ventilation, drainage, and protection against dampness. Louvers must be free from nicks, scratches, and blemishes. Replace defective or damaged materials with new.

1.4 DETAIL DRAWINGS

Show all information necessary for fabrication and installation of wall louvers. Indicate materials, sizes, thicknesses, fastenings, and profiles.

1.5 COLOR SAMPLES

Colors of finishes for wall louver samples and door louver samples must closely approximate colors indicated. Where color is not indicated, submit the manufacturer's standard colors to the Contracting Officer for selection.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Galvanized Steel Sheet

ASTM A653/A653M, coating designation Z275 G90.

2.1.2 Aluminum Sheet

ASTM B209M ASTM B209, alloy 3003 or 5005 with temper as required for forming.

2.1.3 Extruded Aluminum

ASTM B221M ASTM B221, alloy 6063-T5 or -T52.

[2.1.4 Stainless Steel

Type 302 or 304, with 2B finish.

]2.1.5 Cold Rolled Steel Sheet

ASTM A1008/A1008M, Class 1, with matte finish. Use for interior louvers only.

2.2 METAL WALL LOUVERS

****

NOTE: Louver free areas vary from 25 to 65 percent, depending on blade design. When a certain free area is required, indicate blade type as well as louver size. CAUTION: Even "weather-resistant" louvers will allow water penetration. Quantity and velocity specified are for wall louvers in mechanical rooms and similar locations. Where water penetration would be a problem, specify acceptable quantity of water penetration at air velocity required, or provide operable louvers or operable dampers to exclude wind-driven rain.

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[Weather][Wind driven rain] resistant type, with bird screens and made to withstand a wind load of not less than [1.44] [_____] kilopascals [30] [_____] pounds per square foot. Wall louvers must bear the AMCA certified ratings program seal for air performance and water penetration in accordance with AMCA 500-L and AMCA 511. The rating must show a water penetration of 0.06 kilograms or less per square meter 0.20 or less ounce per square foot of free area at a free velocity of 244 meters 800 feet per minute.

****

NOTE: Use only Aluminum or Stainless Steel louvers in humid locations or project locations with Environmental Severity Classifications (ESC) of C3 thru C5. Humid locations are those in ASHRAE climate zones 0A, 1A, 2A, 3A, 3C, 4C and 5C (as identified in ASHRAE 90.1). See UFC 1-200-01 for determination of ESC for project locations.

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2.2.1 Extruded Aluminum Louvers

Fabricated of extruded 6063-T5 or -T52 aluminum with a wall thickness of not less than 2 mm 0.081 inch.

2.2.2 Formed Metal Louvers

Formed of [zinc-coated] [stainless] steel sheet not thinner than 16 U.S. gage, or aluminum sheet not less than 2 mm 0.08 inch thick.

2.2.3 Mullions and Mullion Covers

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NOTE: Large louvers may require bracing for given wind loads and with a maximum deflection of L/180.

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Same material and finish as louvers. Provide mullions [where indicated] [for all louvers more than 1500 mm 5 feet in width at not more than 1500 mm 5 feet on centers]. Provide mullion covers on both faces of joints between louvers.

2.2.4 Screens and Frames

For aluminum louvers, provide 12.5 mm 1/2 inch square mesh, 1.8 or 1.5 mm 14 or 16 gage aluminum or 6 mm 1/4 inch square mesh, 1.5 mm 16 gage aluminum bird screening. For steel louvers, provide 12.5 mm 1/2 inch square mesh, 2.5 or 1.5 mm 12 or 16 gage zinc-coated steel; 12.5 mm 1/2 inch square mesh, 1.5 mm 16 gage copper; or 6 mm 1/4 inch square mesh, 1.5 mm thick 16 gage zinc-coated steel or copper bird screening. Mount screens in removable, rewirable frames of same material and finish as the louvers.

2.3 DOOR LOUVERS

****

NOTE: Avoid louvered doors on exterior locations in humid locations or project locations with Environmental Severity Classifications (ESC) of C3 thru C5 as they are very susceptible to weather deterioration. Humid locations are those in ASHRAE climate zones 0A, 1A, 2A, 3A, 3C, 4C and 5C (as identified in ASHRAE 90.1). See UFC 1-200-01 for determination of ESC for project locations. Consider other means of providing the venting functions.

Ensure that louvers in doors are drainable, weatherproof and factory primed. Doors with factory-installed louvers are also recommended.

NOTE: Avoid louvered doors on exterior locations in buildings subject to the antiterrorism requirements of UFC 4-010-01.

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[Inverted "Y"][or][Inverted "V"] sightproof type not less than 25 mm one

inch thick with matching metal trim. Louvers for exterior doors must be weather resistant type.

2.3.1 Extruded Aluminum Door Louvers

Fabricate of 6063-T5 or -T52 aluminum alloy with a wall thickness of not less than 1.25 mm 0.050 inch thick. Frames and trim must be clamp-in "L" type.

2.3.2 Formed Metal Door Louvers

Fabricate of [0.9 mm thick 20 U.S. gage steel sheet][or][sheet aluminum not less than 1.25 mm 0.050 inch thick]. Trim must be beveled "Z" molding both sides.

2.3.3 Screens and Frames

For exterior doors, provide aluminum insect screens, 18 by 16 or 18 by 14 mesh. Mount screens in removable, rewirable frames of same material and finish as the louvers.

2.4 FASTENERS AND ACCESSORIES

Provide stainless steel screws and fasteners for aluminum louvers and zinc-coated or stainless steel screws and fasteners for steel louvers. Provide other accessories as required for complete and proper installation.

2.5 FINISHES

****
NOTE: Specify anodic and organic coatings meeting the selection requirements in the Notes below as Contractor's option when these finishes are determined to be available in similar colors an economically competitive in the project area, unless the project requires use of one or the other to match an existing condition.
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NOTE: The selection of anodic or organic coating is based primarily on the desired appearance: anodized finishes provide a metallic appearance and organic finishes provide a painted or metal-like finish (organic finishes are available in a variety of colors). Only allow both types as a Contractor option when the Designer confirms that the desired appearance is available in both types of finishes.
****

2.5.1 Aluminum

Exposed aluminum surfaces must be factory finished with an [anodic coating][or][organic coating].[Color must be [_____][as indicated].] Louvers [for each building] must have the same finish.

2.5.1.1 Anodic Coating

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NOTE: Specify Architectural Class I for harsh atmospheres where dust, gases, salts, and other destructive elements will attack metal finish. Also specify Class I for humid locations or project locations with Environmental Severity Classifications (ESC) of C3 thru C5. Humid locations are those in ASHRAE climate zones 0A, 1A, 2A, 3A, 3C, 4C and 5C (as identified in ASHRAE 90.1). Specify Architectural Class II for all atmospheric conditions not requiring Class I. See UFC 1-200-01 for determination of ESC for project locations.

****

Clean exposed aluminum surfaces and provide an anodized finish conforming to AA DAF45 and AAMA 611. Finish must be:

[a. Architectural Class II (0.01 to 0.0175 mm 0.4 mil to 0.7 mil), designation AA-M10-C22-[A31, clear (natural)] [A32, integral color] [A34, electrolytically deposited color] anodized.

][b. Architectural Class I (0.0175 mm 0.7 mil or thicker), designation AA-M10-C22-[A41, clear (natural)] [A42, integral color] [A44, electrolytically deposited color] anodized.

]2.5.1.2 Organic Coating

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NOTE: For organic coatings, to provide enhanced resistant to corrosion, weathering, ozone, and UV radiation utilize superior performance powder coat finishes conforming to AAMA 2605 in humid locations and project locations with an ESC of C3 thru C5; baked enamel finishes conforming to AAMA 2603 may be utilized for non-humid locations and ESC C1 or C2 project locations. Humid locations are those in ASHRAE climate zones 0A, 1A, 2A, 3A, 3C, 4C and 5C (as identified in ASHRAE 90.1). Refer to UFC 1-200-01 for determination of ESC for a specific project location.

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Clean and prime exposed aluminum surfaces. Provide a [baked enamel finish conforming to AAMA 2603, with total dry film thickness not less than 0.02 mm 0.8 mil] [superior performance finish in accordance with AAMA 2605 with total dry film thickness of not less than 0.03 mm 1.2 mil], color [_____].

2.5.2 Steel

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NOTE: Include the bracketed item below for projects that include louvers on both the exterior and interior conditioned spaces of the building.

****

Surfaces specified must have a zinc coating, a phosphate treatment, and a shop prime coat of rust-inhibitive paint. The galvanized coating must conform to ASTM A653/A653M, coating designation Z275 (G90)[, except that louvers located in conditioned spaces on interior of the building may be

Z180 (G60)]. The weight of zinc coatings must be as designated in Table I of ASTM A123/A123M for the thickness of base metal to be coated. The prime coat must be a type especially developed for materials treated by phosphates and adapted to application by dipping or spraying. Repair damaged zinc-coated surfaces by the materials and methods conforming to ASTM A780/A780M and spot prime. At the option of the Contractor, a two-part system including bonderizing, baked-on epoxy primer, and baked-on enamel top coat may be applied before forming, in lieu of prime coat specified.

PART 3 EXECUTION

3.1 INSTALLATION

3.1.1 Wall Louvers

Install using stops or moldings, flanges, strap anchors, or jamb fasteners as appropriate for the wall construction and in accordance with manufacturer's recommendations.

3.1.2 Door Louvers

Install louvers in wood doors by using metal "Z" or "L" moldings. Fasten moldings to door with screws.

3.1.3 Screens and Frames

Attach frames to louvers with screws or bolts.

3.2 PROTECTION FROM CONTACT OF DISSIMILAR MATERIALS

3.2.1 Copper or Copper-Bearing Alloys

Paint copper or copper-bearing alloys in contact with dissimilar metal with heavy-bodied bituminous paint or separate with inert membrane.

3.2.2 Aluminum

Where aluminum contacts metal other than zinc, paint the dissimilar metal with a primer and two coats of aluminum paint.

3.2.3 Metal

Paint metal in contact with mortar, concrete, or other masonry materials with alkali-resistant coatings such as heavy-bodied bituminous paint.

3.2.4 Wood

Paint wood or other absorptive materials that may become repeatedly wet and in contact with metal with two coats of aluminum paint or a coat of heavy-bodied bituminous paint.

-- End of Section --