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USACE / NAVFAC / AFCEC / NASA UFGS-08 91 00 (May 2011)  
Change 2 - 11/18  
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Preparing Activity: NAVFAC Superseding  
UFGS-08 91 00 (August 2008)

UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated July 2019

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05/11

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SECTION 08 91 00

METAL [WALL] [AND] [DOOR] LOUVERS  
05/11

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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) 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 (2017a) Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels

AAMA 2604 (2017a) Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels

AAMA 2605	(2017a) Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels
ASTM INTERNATIONAL (ASTM)	
ASTM A653/A653M	(2018) Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
ASTM A1008/A1008M	(2016) 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	(2014) Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes
ASTM B221M	(2013) 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 to reflect only the submittals required for the project.**

The Guide Specification technical editors have designated 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 submittals requiring Government approval on Army projects, a code of up to three characters within the submittal tags may be used following the "G" designation 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" following a submittal item indicates that the submittal is required for the Sustainability eNotebook to fulfill federally mandated sustainable requirements in accordance with Section 01 33 29 SUSTAINABILITY REPORTING. Locate the "S" submittal under the SD number that best describes the submittal item.

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" designation; submittals not having a "G" designation are [for Contractor Quality Control approval.][for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government.] Submittals with an "S" are for inclusion in the Sustainability eNotebook, in conformance to Section 01 33 29 SUSTAINABILITY REPORTING. 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

SD-04 Samples

Wall louvers; G[, [\_\_\_\_]]

Door louvers; 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 shall 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 louvers and door louvers shall 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

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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.

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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 mullions 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

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**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.**

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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 shall 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 shall 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 shall 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

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**NOTE: Specify anodic and organic coatings 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: Use anodized coating finishes on aluminum 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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### 2.5.1 Aluminum

Exposed aluminum surfaces shall be factory finished with an [anodic coating] [or] [organic coating]. [Color shall be [\_\_\_\_\_] [as indicated].] Louvers [for each building] shall 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). See UFC 1-200-01 for determination of ESC for project locations. Specify Architectural Class II for all atmospheric conditions not requiring Class I.

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Clean exposed aluminum surfaces and provide an anodized finish conforming to AA DAF45 and AAMA 611. Finish shall 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: When anodic and organic coatings are determined to be available in similar colors and economically competitive in the project area, specify baked enamel finish (AAMA 2603) as an option to Architectural Class II, anodic coating or high-performance finish (AAMA 2605) as an option to Architectural Class I, anodic coating. AAMA 2605 roughly equates to 70 percent resin polyvinylidene fluoride.

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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][high-performance finish in accordance with [AAMA 2604][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: Coordinate this finish with other exterior building components. If a more durable finish is used on the building exterior or needed for weather resistance, edit the finish coat to describe the paint system.

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Provide factory-applied coating. Clean and phosphate treat exposed surfaces and apply rust-inhibitive primer and baked enamel finish coat, 0.025 mm one mil minimum total dry film thickness, color [\_\_\_\_\_].

## 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 --