
USACE / NAVFAC / AFCEC / NASA UFGS-08 52 00 (August 2011)
Change 2 - 05/16

Preparing Activity: NAVFAC Superseding
UFGS-08 52 00 (July 2006)

UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated October 2017

SECTION TABLE OF CONTENTS

DIVISION 08 - OPENINGS

SECTION 08 52 00

WOOD WINDOWS

08/11

PART 1 GENERAL

- 1.1 REFERENCES
- 1.2 SUBMITTALS
- 1.3 DELIVERY AND STORAGE
- 1.4 MATERIAL IDENTIFICATION REQUIREMENTS
 - 1.4.1 Plastic Identification

PART 2 PRODUCTS

- 2.1 PRODUCT SUSTAINABILITY CRITERIA
 - 2.1.1 Reduced VOC's for Window Materials
 - 2.1.2 Energy Efficient Equipment for Residential Windows
- 2.2 MATERIALS
 - 2.2.1 Virgin Lumber
 - 2.2.2 Engineered Wood Products
- 2.3 WOOD WINDOWS
 - 2.3.1 Single-Hung and Double-Hung Windows
 - 2.3.2 Awning Windows (Top Hinged)
 - 2.3.3 Casement Windows
 - 2.3.4 Horizontal-Sliding Windows
 - 2.3.5 Stationary Windows
- 2.4 ACCESSORIES
 - 2.4.1 Adhesives
 - 2.4.2 Fasteners
- 2.5 FINISHES
 - 2.5.1 Paint
 - 2.5.2 Vinyl (PVC) Cladding
 - 2.5.3 Aluminum Cladding
 - 2.5.3.1 Aluminum Finish
 - 2.5.3.2 Anodic Coating
 - 2.5.3.3 Organic Coating
- 2.6 INSECT SCREENS
- 2.7 STORM SASH
 - 2.7.1 Finishes

PART 3 EXECUTION

3.1 INSTALLATION

3.1.1 Wood and Wood Clad Windows

3.1.2 Insect Screen

3.1.3 Storm Windows

3.2 ADJUSTMENTS

3.3 CLEANING

-- End of Section Table of Contents --

USACE / NAVFAC / AFCEC / NASA UFGS-08 52 00 (August 2011)
Change 2 - 05/16

Preparing Activity: NAVFAC Superseding
UFGS-08 52 00 (July 2006)

UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated October 2017

SECTION 08 52 00

WOOD WINDOWS 08/11

NOTE: This guide specification covers the requirements for wood windows of the following types: single-hung, double-hung, awning, casement, horizontal sliding, and non-operative (stationary window unit).

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).

PART 1 GENERAL

1.1 REFERENCES

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.

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.

ALUMINUM ASSOCIATION (AA)

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

AMERICAN ARCHITECTURAL MANUFACTURERS ASSOCIATION (AAMA)

AAMA 2603 (2015) Voluntary Specification,
Performance Requirements and Test
Procedures for Pigmented Organic Coatings
on Aluminum Extrusions and Panels

AAMA 2604 (2013) Voluntary Specification,
Performance Requirements and Test
Procedures for High Performance Organic
Coatings on Aluminum Extrusions and Panels

AAMA/WDMA/CSA 101/I.S.2/A440 (2011; Update 1 2014) North American
Fenestration Standard/Specification for
Windows, Doors, and Skylights

ASTM INTERNATIONAL (ASTM)

ASTM D1784 (2011) Standard Specification for Rigid
Poly(Vinyl Chloride) (PVC) Compounds and
Chlorinated Poly(Vinyl Chloride) (CPVC)
Compounds

ASTM D3656/D3656M (2013) Insect Screening and Louver Cloth
Woven from Vinyl-Coated Glass Yarns

ASTM D6007 (2014) Standard Test Method for
Determining Formaldehyde Concentration in
Air from Wood Products Using a Small Scale
Chamber

ASTM D6330 (1998; R 2014) Standard Practice for
Determination of Volatile Organic
Compounds (Excluding Formaldehyde)
Emissions from Wood-Based Panels Using
Small Environmental Chambers Under Defined
Test Conditions

ASTM E1333 (2014) Determining Formaldehyde
Concentrations in Air and Emission Rates
from Wood Products Using a Large Chamber

NATIONAL FENESTRATION RATING COUNCIL (NFRC)

NFRC 100 (2014) Procedure for Determining
Fenestration Product U-Factors

NFRC 200 (2014) Procedure for Determining
Fenestration Product Solar Heat Gain
Coefficient and Visible Transmittance at
Normal Incidence

SCREEN MANUFACTURERS ASSOCIATION (SMA)

SMA 1004 (1987; R 1998) Aluminum Tubular Frame
Screens for Windows

U.S. DEPARTMENT OF ENERGY (DOE)

Energy Star (1992; R 2006) Energy Star Energy
Efficiency Labeling System (FEMP)

WINDOW AND DOOR MANUFACTURERS ASSOCIATION (WDMA)

WDMA I.S.4 (2013) Preservative Treatment for Millwork

1.2 SUBMITTALS

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.

Use the "S" classification only in SD-11 Closeout
Submittals. 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.

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

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 with Section 01 33 29
SUSTAINABILITY REPORTING. Submit the following in accordance with Section
01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Wood Windows; G[, [_____]]

Indicate elevations of units, full-size sections, fastenings,
methods of installation and anchorage, method of glazing,
locations of operating hardware, mullion details, method and
material for weatherstripping, [bar and muntin layouts,] method of
attaching [insect screens] [storm windows], details of
installation, and connections with other work.

SD-03 Product Data

Wood Windows; G[, [_____]]

[Engineered Wood Products

Submit documentation verifying that no urea-formaldehyde resins
were used.

] Fasteners

[Adhesives

] SD-08 Manufacturer's Instructions

Wood Windows

Submit manufacturer's written instructions for installation.

SD-10 Operation and Maintenance Data

Wood Windows, Data Package 1; G[, [_____]]

Submit data package in accordance with Section 01 78 23
OPERATION AND MAINTENANCE DATA.

Plastic Identification

When not labeled, identify types in Operation and Maintenance
Manual.

SD-11 Closeout Submittals

Reduced VOC's for Window Materials; S

**NOTE: The Energy Star designation below is for
residential windows only.**

[Energy Efficient Equipment for Residential Windows; S

]1.3 DELIVERY AND STORAGE

Deliver windows to site in sealed undamaged cartons or in palletized multiple units. Protect from damage, dampness and extreme temperature or humidity changes. Store under cover in well-ventilated enclosed space. Do not store in a building under construction until concrete, masonry, and plaster are dry. Replace defective or damaged windows.

1.4 MATERIAL IDENTIFICATION REQUIREMENTS

1.4.1 Plastic Identification

**NOTE: The marking system indicated below is
intended to provide assistance in identification of
products for making subsequent decisions as to
handling, recycling, or disposal.**

Label plastic products provided to indicate their polymeric composition according to the following list. Where products are not labeled, provide product data indicating polymeric information in Operation and Maintenance Manual.

Type 1: Polyethylene Terephthalate (PET, PETE).

Type 2: High Density Polyethylene (HDPE).

Type 3: Vinyl (Polyvinyl Chloride or PVC).

Type 4: Low Density Polyethylene (LDPE).

Type 5: Polypropylene (PP).

Type 6: Polystyrene (PS).

Type 7: Other. Use of this code indicates that the package in question is made with a resin other than the six listed above, or is made of more than one resin listed above, and used in a multi-layer combination.

PART 2 PRODUCTS

2.1 PRODUCT SUSTAINABILITY CRITERIA

For products in this section, where applicable and to extent allowed by performance criteria, provide and document the following:

2.1.1 Reduced VOC's for Window Materials

Products must not contain added urea formaldehyde and must meet other reduced VOC requirements as stated within this section. Provide documentation in accordance with Section 01 33 29 SUSTAINABILITY REPORTING paragraph REDUCE VOLATILE ORGANIC COMPOUNDS.

NOTE: Include Energy Star requirement below for residential windows only.

[2.1.2 Energy Efficient Equipment for Residential Windows

Provide Energy Star residential windows in accordance with Section 01 33 29 SUSTAINABILITY REPORTING paragraph ENERGY EFFICIENT EQUIPMENT.

]2.2 MATERIALS

NOTE: Wood is a renewable resource. Non-sustainable harvesting of wood can produce soil erosion, pollutant runoff, increased levels of atmospheric carbon dioxide, global warming, and habitat loss. Supplies of clear grades and large-dimension timbers are limited. Specify lower grades and engineered wood products for large-dimension timbers when appropriate.

2.2.1 Virgin Lumber

NOTE: Old growth timber comes from trees over 200 years old. In industry, it is high quality lumber in "upper" or "architectural" grades. Lumber suppliers should know which timber is old growth and which is not, but sources are not always tracked.

Lumber fabricated from old growth timber is not permitted. Avoid companies who buy, sell, or use old growth timber in their operations, when possible.

2.2.2 Engineered Wood Products

NOTE: Engineered wood products include plywood, OSB, composite wood panels, fiberboard, particleboard, glue-laminated beams, structural composite lumber, including laminated veneer lumber and parallel strand lumber, as well as I-joists and metal plate connected wood trusses. The use of engineered wood products can result in higher resource efficiencies than conventional lumber/timber construction. Waste is minimized due to uniformity of product. Spans and/or spacing may be increased for engineered joists over spans for same depth dimensional lumber. However, adhesive binders used in engineered wood products are any of several synthetic resins that pose varying degrees of human health risks. Engineered wood products might be more difficult to recycle than standard, solid sawn lumber due to the binders used in manufacturing.

NOTE: Choose one of the formaldehyde options. If products are known to contain no added formaldehyde, testing for formaldehyde concentration is not required. Formaldehyde can be harmful (as an allergen or carcinogen) at any level of concentration above zero. At concentrations of about 40 ppb (cumulative for the indoor air space), formaldehyde can cause eye, nose, and lung irritations.

NOTE: Using formaldehyde-free interior wood window products contributes to the requirements of Section 01 33 29 SUSTAINABILITY REPORTING. Army projects shall specify formaldehyde free requirements only for wood windows that are not part of the building weatherproofing system.

[Products cannot contain added urea-formaldehyde. [Determine formaldehyde concentrations in air from engineered wood products under test conditions of temperature and relative humidity in accordance with ASTM D6007 or ASTM E1333. Products must not be used if formaldehyde concentration is found to be greater than [0][____].]Determine Volatile Organic Compounds (VOCs), excluding formaldehyde, emitted from manufactured wood-based panels in accordance with ASTM D6330. Products must not be used if VOC emissions exceed [____].]

2.3 WOOD WINDOWS

NOTE: Where operating hardware is located 1980 mm 6 feet 6 inches or more above floor, specify poles and pole-operated handles to operate windows.

NOTE: Show locations where storm units are to be installed. Do not provide storm units for windows in equipment rooms, laundry rooms and similar spaces. Storm windows are not required over double-glazed insulating type windows.

Specify window screens in medical facilities, food preparation areas, dining areas, sleeping areas, and similar locations. Show screen locations on drawings.

NOTE: Window properties are critical to energy performance and visual satisfaction. Specify low U value (rate of heat transfer) to reduce winter heat loss and summer heat gain.

Energy Star labeling is applicable to residential units only.

For non-residential applications, refer to UFC 1-200-02, High Performance and Sustainable Building Requirements, for minimum requirements for energy efficiency and meeting minimum building envelope insulation requirements of UFC 3-101-01 including fenestrations and glazing. Coordinate with Section 08 81 00 GLAZING. Designer must verify availability and adequate competition for products meeting bracketed energy performance requirements before specifying and edit as needed.

Wooden sashes have relatively high R-values, but require relatively high maintenance.

Wood windows must consist of complete units including sash, glass, frame, weatherstripping, [insect screen,] and hardware. Window units must meet the Grade 40 requirements of AAMA/WDMA/CSA 101/I.S.2/A440, except maximum air infiltration must not exceed 0.00016 cu m per second 0.34 CFM per linear foot of sash crack when tested under uniform static air pressure difference of 75 pascals 1.57 psf. [Residential glazed systems (including frames and glass) must be Energy Star qualified products as appropriate to [Northern] [North/Central] [Southern] climate zone.][Non-residential glazed systems (including frames and glass) must be certified by the National Fenestration Rating Council with a whole-window Solar Heat Gain Coefficient (SHGC) maximum of [_____] determined according to NFRC 200 procedures and a U-factor maximum of [_____] W per square m by K Btu per square foot by ht by degree F in accordance with NFRC 100.]In addition to general hardware requirements of AAMA/WDMA/CSA 101/I.S.2/A440, provide hardware for various window types as indicated below. Glass and glazing materials must conform to Section 08 81 00 GLAZING. For good sash insulation performance, preference must be given to engineered wood core clad in wood veneer or PVC-wood composite (uninsulated), using post-industrial wood fiber and 100 percent post-consumer HDPE plastic. [Storm windows must conform to Section 08 51 69.10 ALUMINUM STORM WINDOWS]. [Wood members which will receive transparent finish must be in one piece, not finger-jointed.]

2.3.1 Single-Hung and Double-Hung Windows

NOTE: Provide double-hung or single-hung windows for living quarters, where storm sash are to be provided or window air-conditioners used. Single-hung have less air leakage and should be considered over double-hung where feasible.

Provide with one sash fastener and two sash lifts, except provide one sash lift when window is fitted with a balance that counterbalances weight of sash.

2.3.2 Awning Windows (Top Hinged)

Awning window ventilators in same bay must operate [separately] [in unison]. Provide two or more hinges, pivots, or sash-supporting arms for each operative sash to allow easy operation, substantial support and cleaning of both sides of sash from inside. Provide latches for securing each sash if operating devices do not include locking features. Provide operating devices for controlling position of sash, including full open,

tight close, and intermediate firm hold. Provide operating devices with rotary operators of worm-gear type with wear-resistant and impact-resistant gears or lever operators of lever handle, off-set arm type. Provide venting sash with corrosion resistant steel hinges connected to top and bottom rails of sash. When lever operators are used, operating arms must be adjustable so that even sash edge contact can be maintained. Provide compression-type weatherstripping.

2.3.3 Casement Windows

Provide two or more hinges, pivots, or sash-supporting arms for each operative sash to allow easy operation, substantial support and cleaning of both sides of sash from inside. Provide latches for securing each sash if operating devices do not include locking features. Provide operating devices for controlling the position of the operative sash, including full open, tight close, and intermediate firm hold. Operating devices must include rotary gears and adjustable operating arms so that even sash contact can be maintained. Provide compression-type weatherstripping.

2.3.4 Horizontal-Sliding Windows

Provide latches, pulls, and corrosion resistant steel slides necessary to control and secure window. Provide for cleaning of both sides of sash from inside.

2.3.5 Stationary Windows

Provide fixed sash and basic frame in accordance with AAMA/WDMA/CSA 101/I.S.2/A440.

2.4 ACCESSORIES

2.4.1 Adhesives

NOTE: Adhesives are potential sources of VOCs in indoor air. Using interior low-VOC products contributes to the reduced VOC requirements in Section 01 33 29 SUSTAINABILITY REPORTING.

Comply with applicable regulations regarding toxic and hazardous materials, and as specified in Section 07 92 00 JOINT SEALANTS. For interior application of joint sealants comply with applicable regulations regarding reduced VOC's as specified in Section 07 92 00 JOINT SEALANTS and Section 01 33 29 SUSTAINABILITY REPORTING.

2.4.2 Fasteners

Provide fastener types as standard with the window manufacturer for windows, trim, and accessories.

2.5 FINISHES

NOTE: Factory-applied finishes are typically more durable and release fewer solvents to the environment than field-applied finishes.

[2.5.1 Paint

Furnish windows with factory-primed surfaces which will be exempt from first paint coat application required in Section 09 90 00 PAINTS AND COATINGS.

]2.5.2 Vinyl (PVC) Cladding

NOTE: Select the applicable paragraphs(s) from the following:

Preservative treat all basic wood frame and sash members in accordance with WDMA I.S.4 and Section 06 10 00 ROUGH CARPENTRY, except do not use pentachlorophenol. Clad all exterior surfaces with rigid polyvinyl sheathing, complying with ASTM D1784, class 14344-C, not less than 0.9 mm 35 mil average thickness.

]2.5.3 Aluminum Cladding

Preservative treat all basic wood frame and sash members in accordance with WDMA I.S.4, except do not use pentachlorophenol. Clad all exterior surfaces with roll formed aluminum with joints sealed during assembly. Aluminum clad frames and sash must meet performance requirements of AAMA/WDMA/CSA 101/I.S.2/A440.

2.5.3.1 Aluminum Finish

Factory finish with [anodic coating] [or] [organic coating].

2.5.3.2 Anodic Coating

NOTE: Select the applicable paragraphs(s) from the following:

Conform to AA DAF45. Finish must be [clear (natural), designation AA-M10-C22-A31, Architectural Class II 0.010 to 0.0175 mm 0.4 mil to 0.7 mil] [clear (natural), designation AA-M10-C22-A41, Architectural Class I 0.0175 mm 0.7 mil or thicker] [integral color-anodized, designation AA-M10-C22-A32, Architectural Class II 0.010 to 0.0175 mm 0.4 mil to 0.7 mil] [integral color-anodized, designation AA-M10-C22-A42, Architectural Class I 0.0175 mm 0.7 mil or thicker] [electrolytically deposited color-anodized designation AA-M10-C22-A34, Architectural Class II 0.010 to 0.0175 mm 0.4 mil to 0.7 mil] [electrolytically deposited color-anodized, designation AA-M10-C22-A44, Architectural Class I 0.0175 mm 0.7 mil or thicker].
[Finish Color: [_____] [as indicated].]

2.5.3.3 Organic Coating

Clean and prime exposed aluminum surfaces. Provide [baked enamel finish in accordance with AAMA 2603 with total dry film thickness not less than 0.020 mm 0.8 mil] [high performance finish in accordance with AAMA 2604 with total dry film thickness of not less than 0.030 mm 1.2 mils]. Finish color [_____] [as indicated].

][2.6 INSECT SCREENS

ASTM D3656/D3656M, Class 2, 18 by 14 mesh, color [charcoal] [grey] [_____].
Aluminum frames to meet SMA 1004.

][2.7 STORM SASH

As specified in Section 08 51 69.10 ALUMINUM STORM WINDOWS.

[2.7.1 Finishes

Factory finish exposed aluminum surfaces with anodic coating or organic coating.

][PART 3 EXECUTION

3.1 INSTALLATION

Any materials that show visual evidence of biological growth due to the presence of moisture must not be installed on the building project.

3.1.1 Wood and Wood Clad Windows

Install in accordance with the approved installation instructions. Securely anchor windows in place. Install and seal windows in a manner that will prevent entrance of water and wind.

[3.1.2 Insect Screen

Install screen panels in accordance with manufacturer's instructions.
Install aluminum framed screens in accordance with SMA 1004.

][3.1.3 Storm Windows

Install storm windows in accordance with manufacturer's standards and instructions.

]3.2 ADJUSTMENTS

Make final adjustment for proper operation of ventilating unit after glazing. Make adjustments to operating sash or ventilators to assure smooth operation. Units must be weathertight when locked closed. Verify products are properly installed, connected, and adjusted.

3.3 CLEANING

Clean windows on both exterior and interior in accordance with manufacturer's recommendations.

-- End of Section --