



# Standard Specification for Domestic Use Doors and Frames, Steel, Interior, Marine<sup>1</sup>

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## 1. Scope

1.1 This specification covers the construction of standard and custom-built interior steel doors and frames for ships including U.S. Coast Guard certificated vessels with domestic routes.

1.2 Doors and frames are to be hollow metal construction with the door insulated for sound or fire.

1.3 The doors are intended for use in staterooms, lavatories, passageways, and other areas protected from weather.

1.4 The values stated in either inch-pound units or SI units are to be regarded separately as standard. Within the text, the SI units are shown in brackets. The values stated in each system are not exact equivalents; therefore, each system must be used independently of the other.

## 2. Referenced Documents

### 2.1 ASTM Standards:<sup>2</sup>

A240/A240M Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications

A582/A582M Specification for Free-Machining Stainless Steel Bars

A1008/A1008M Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable

E136 Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C

2.2 Code of Federal Regulations (CFR) Title 46—Shipping: Subchapter D—Tank Vessels, Subpart 32.57—Structural Fire Protection<sup>3</sup>

<sup>1</sup> This specification is under the jurisdiction of ASTM Committee F25 on Ships and Marine Technology and is the direct responsibility of Subcommittee F25.03 on Outfitting and Deck Machinery.

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<sup>2</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

<sup>3</sup> Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

Subchapter H—Passenger Vessels, Subpart 72.05—Structural Fire Protection<sup>3</sup>

Subchapter I—Cargo and Miscellaneous Vessels, Subpart 92.07—Structural Fire Protection<sup>3</sup>

Subchapter T—Small Passenger Vessels, Subpart 177.300—Hull Structure<sup>3</sup>

Subchapter U—Oceanographic Vessels, Subpart 190.07—Structural Fire Protection<sup>3</sup>

Structural Insulations, Subpart 164.007<sup>3</sup>

Structural Insulations, Subpart 164.107<sup>3</sup>

Noncombustible Materials for Merchant Vessels, Subpart 164.009<sup>3</sup>

Noncombustible Materials, Subpart 164.109<sup>3</sup>

2.3 Builders Hardware Manufacturers Association, Inc.: A 156.18 Materials and Finishes<sup>4</sup>

2.4 U.S. Public Health Service:

Publication No. 393, Handbook on Sanitation of Vessel Construction<sup>5</sup>

## 3. Terminology

### 3.1 Definitions of Terms Specific to This Standard:

3.1.1 *hands of doors*—a term used to describe a door from the outside or key side of the door.

3.1.2 *right-hand regular door*—a door having hinges on the right side when swinging door away from the individual opening it.

3.1.3 *left-hand regular door*—a door having hinges on the left side when swinging door away from the individual opening it.

3.1.4 *right-hand reverse bevel door*—a door having hinges on right side when swinging door towards the individual opening it.

3.1.5 *left-hand reverse bevel door*—a door having hinges on left side when swinging door towards the individual opening it.

3.1.6 *face plates*—the exterior metal skins that enclose the internal supporting structure of the door.

<sup>4</sup> Available from BHMA, Inc., 355 Lexington Ave., 17th Floor, New York, NY 10017.

<sup>5</sup> Available from United States Public Health Services, Division of Engineering Services, Parklawn Library, Room 1315, 5600 Fishers Lane, Rockville, MD 20857, Attention: Ms. Bonnie Scott.

3.1.7 *latch*—a device normally installed in the vertical edge of door, opposite hinge edge, that when latched retains door in closed position.

3.1.8 *throw*—the extension, or reach, of the latch bolt. This throw is measured from latch face plate to extreme outer edge of latch bolt with latch bolt in fully extended position.

3.1.9 *padlock eye*—a means for securing door in closed position by the use of a padlock.

#### 4. Classification

4.1 Classes of doors and frames shall be as indicated in the ordering information. (See [Annex A1](#) for definition of various class divisions.)

4.1.1 Class A-O for installation in Class A-O divisions.

4.1.2 Class A for installation in Class A-15, A-30, and A-60 divisions.

4.1.3 Class B for installation in Class B divisions.

4.1.4 Class C for installation in Class C divisions.

4.2 Doors and frames shall be of the following types as indicated in ordering information.

4.2.1 Type I standard doors are of the following widths. Height and details shall conform to [Tables 1-6](#) and [Figs. 1-3](#).

Size 1—22-in. (559-mm) clear jamb width

Size 2—24-in. (610-mm) clear jamb width

Size 3—26-in. (660-mm) clear jamb width

Size 4—30-in. (762-mm) clear jamb width

Size 5—36-in. (914-mm) clear jamb width

4.2.2 Type II doors conforming generally to specifications but requiring special requirements as indicated in the ordering information (see also [6.7.9](#)).

4.2.3 Type III double doors using two of Type I doors.

4.2.4 Type IV double doors using two of Type II doors.

NOTE 1—Door widths are *approximately* 1¼ in. (approximately 32 mm) greater than clear jamb width.

#### 5. Ordering Information

5.1 Orders for items under this specification shall include the following information by the purchaser:

5.1.1 Class A-O, A, B, or C.

5.1.2 Type, hand, clear jamb width, and sill height.

5.1.3 Options such as vent grills, louvers, vision lights, and hose ports.

5.1.4 Hardware, sill caps, lock sets, latches, door closers, and hold backs if other than manufacturer's standard. Master

keying of door locks will not be provided unless required and defined by ordering documents. Instead, each door lock will be keyed differently.

5.1.5 Color chip and desired painting specifications or other commercial designation for final finish. If not specified, doors will have manufacturer's prime coat applied.

5.1.6 For Type II and III doors, sizes and any other supplementary requirements.

5.1.7 *Sill Heights*—0 in. (0 mm), 1½ in. (38 mm), or 6 in. (152 mm). See [Figs. 1-3](#).

5.1.8 Cut out for light switch; if not requested in ordering data, no provisions will be made.

#### 6. Materials and Manufacture

6.1 For typical design, see [Figs. 1-3](#).

6.2 Steel for doors and frames shall be cold-rolled sheet, commercial quality in accordance with Specification [A1008/A1008M](#). Other materials shall be as indicated.

6.3 Class A-O Doors (See [Fig. 1](#) and [Table 1](#) and [Table 2](#)):

6.3.1 Door shall be 1¾-in. (45-mm) thick hollow steel with 0.055-in. (1.4-mm) minimum face plates or equivalent metal construction.

6.3.2 Doors shall have a latch with a minimum throw of ¾ in. (19 mm).

6.3.3 Door frames shall be of steel with a nominal thickness of 0.055 in. (1.4 mm) and shall be installed so that any flame penetration would be through at least two thicknesses of 0.055 in. (1.4 mm) or equivalent.

6.3.4 Door frames shall provide a stop of ⅝ in. (16 mm) minimum at the sides and top.

6.3.5 For undercut at bottom of door, see [Fig. 1](#) and [Table 2](#).

6.3.6 Doors other than those that are normally locked shall be self closing and capable of closing against a 3½° list.

6.3.7 Doors shall be insulated with sufficient noncombustible fibrous insulation to sound dampen the door adequately. This insulation shall be selected from those listed under Section 164.007, Structural Insulations, or Section 164.009, Noncombustible Materials.

6.3.8 *Options for Class A-O and A Doors:*

6.3.8.1 Vision lights may be installed using wire-inserted glass of not more than 100 in.<sup>2</sup> (645 cm<sup>2</sup>) in size.

6.3.8.2 An escape panel of 16- by 18-in. (406- by 457-mm) minimum size in lower half of door.

6.3.8.3 Where hose ports are required, they shall be cut in the lower corner of the door on the side opposite the hinges so

**TABLE 1 Class A-O and Class A Door Dimension  
Table of Dimensions—Door**

Designation		in.	mm
Thickness	A	1¾	45
Clear height from structural deck	B	78½	1994
Clear height from finished deck	C	approximately 78	approximately 1981
Height from structural deck to center line of vision light	D	64	1626
Height from structural deck to center line of cutout for switch	E	48	1219
Height from structural deck to center line of knob	F	38	965
Undercut	G	see <a href="#">Table 2</a>	see <a href="#">Table 2</a>
Sill height	H	see <a href="#">Table 2</a>	see <a href="#">Table 2</a>

**TABLE 2 Class A-O and A Sill Details**

Sill Height ( <i>H</i> )		Maximum Door Undercut ( <i>G</i> )	
in.	mm	in.	mm
0	0	½ max above finished floor	13 max above finished floor
1½	38	½	13
6 <sup>A</sup>	152	½	13

<sup>A</sup>Max coaming height under sill is 5 in. (127 mm).

**TABLE 3 Class B Door and Frame Dimensions  
Table of Dimensions—Door**

Designation		in.	mm
Thickness	<i>A</i>	1¾	45
Clear height from structural deck	<i>B</i>	78½	1994
Clear height from finished deck	<i>C</i>	Approximately 78	Approximately 1981
Height from structural deck to center line of cutout for switch	<i>D</i>	48	1219
Height from structural deck to center line of knob	<i>E</i>	38	965
Undercut	<i>F</i>	See Table 4	See Table 4
Sill height	<i>G</i>	See Table 4	See Table 4

**TABLE 4 Class B Sill Details**

Sill Height ( <i>G</i> )		Maximum Door Undercut ( <i>F</i> ) <sup>A</sup>	
in.	mm	in.	mm
0	0	1 max above finished floor	25 max above finished floor
1½	38	1	25
6 <sup>B</sup>	152	1	25

<sup>A</sup>In passageways and areas in which ratproofing requirements are invoked, the height of the door undercut shall not exceed ½ in. (13 mm).

<sup>B</sup>Max coaming height under sill is 5 in. (127 mm).

that when hose is passed through the door when the door is open, it may be closed over the hose. The cut for the host port should be approximately 8 by 8 in. (200 by 200 mm). A hinged or pivoted steel metal cover shall be fitted in the cut, equipped with a method of holding it in a closed position yet will permit easy and automatic operation of the hinged cover. See Fig. 1 for location.

6.4 *Class A Doors* (see Fig. 1 and Table 1 and Table 2):

6.4.1 Doors and frames shall follow the requirements of 6.3.1 – 6.3.6 and 6.3.8.

6.4.2 Doors shall be filled solidly with one half the thickness of structural insulation with USCG Approval Number 164.007. Insulation with USCG Approval Number 164.107 (A-15 rating) may also be used.

6.5 *Class B doors* (see Fig. 2 and Table 3 and Table 4):

6.5.1 Doors shall be 1¾-in. (45-mm) thick hollow steel and constructed of a minimum of 0.044-in. (1.1-mm) face plates.

6.5.2 Doors shall have a latch with a minimum throw of ½ in. (13 mm).

6.5.3 Door frames shall be steel with a minimum 0.055-in. (1.4-mm) thickness if they are an open channel design and a minimum 0.044 in. (1.1 mm) if they are a tubular design.

6.5.4 Door frames shall provide a stop of ⅝ in. (16 mm) minimum at the sides and top.

6.5.5 For undercut at bottom of door, see Fig. 2 and Table 4.

6.5.6 Doors shall be insulated with sufficient noncombustible insulation to sound damp the door adequately. This

insulation shall be selected from one of the following USCG approval categories: 164.007, 164.009, 164.107, or 164.109.

6.5.7 *Options for Class B Doors:*

6.5.7.1 Doors may be fitted with any amount of wire inserted glass, as door construction permits.

6.5.7.2 The lower half of such doors may have a louver. The total net area of louver plus any door undercut shall not exceed 78 in.<sup>2</sup> (0.05 m<sup>2</sup>).

6.5.7.3 An escape panel of 16- by 18-in. (406- by 457-mm) minimum size.

6.6 *Class C Doors* (see Fig. 3 and Table 5 and Table 6):

6.6.1 Doors shall be 1¾-in. (45-mm) thick hollow steel and constructed of 0.044-in. (1.1-mm) face plates. Aluminum construction is acceptable and other noncombustible materials will also be considered.

6.6.2 Doors shall have a latch with a minimum throw of ½ in. (13 mm).

6.6.3 Door frames shall be steel with a minimum 0.055 in. (1.4 mm) if they are an open channel design and a minimum 0.044 in. (1.1 mm) if they are a tubular design. Aluminum construction is acceptable and other noncombustible materials will also be considered.

6.6.4 Door frames shall provide a stop of ⅝ in. (16 mm) minimum at the sides and top.

6.6.5 For undercut at bottom of door, see Fig. 3 and Table 6.

6.6.6 Doors shall be insulated with sufficient noncombustible fibrous insulation to sound damp the door adequately. This insulation shall be selected from those listed in the Section 164.007, Structural Insulations, or Section 164.009, Noncombustible Materials.

6.6.7 *Options for Class C Doors:*

6.6.7.1 Doors may be fitted with any amount of clear safety glass (laminated or heat treated) as door construction permits.

6.6.7.2 There are no restrictions on louver size, except that dictated by door size and construction.

6.6.7.3 Padlock eyes for crew wardrobes may be furnished if specified in ordering information, see Fig. 3 for location.

6.7 *Other Requirements for All Doors:*

TABLE 5 Class C Door Dimensions

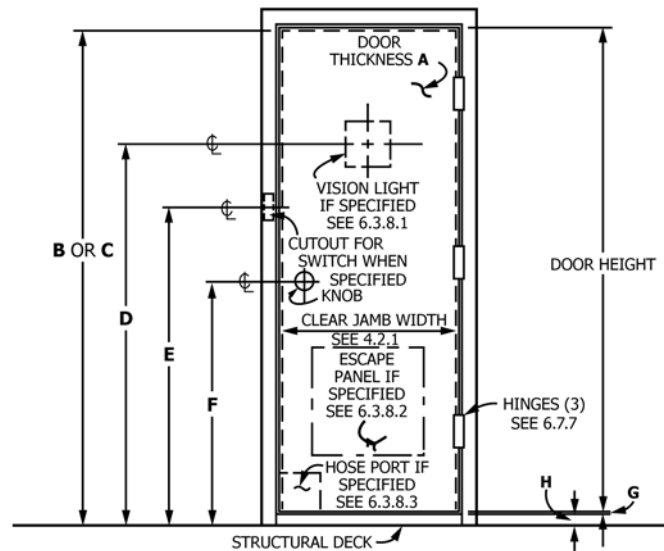
	Designation		in.	mm
1	Thickness	A	1¾	45
	Clear height from structural deck	B	78½	1994
	Clear height from finished deck	C	Approximately 78	Approximately 1981
	Height from structural deck to center line of cutout for switch	D	48	1219
	Height from structural deck to center line of padlock eye	E	46	1168
	Height from structural deck to center line of knob	F	38	965
	Undercut	G	See Table 6	See Table 6
	Sill height	H	See Table 6	See Table 6

TABLE 6 Class C Sill Details

Sill Height (H)		Maximum Door Undercut (G) <sup>A</sup>	
in.	mm	in.	mm
0	0	1 max above finished floor	25 max above finished floor
1½	38	1	25
6 <sup>B</sup>	152	1	25

<sup>A</sup>In passageways and areas in which ratproofing requirements are invoked, the height of the door undercut shall not exceed ½ in. (13 mm).

<sup>B</sup>Max coaming height under sill is 5 in. (127 mm).



NOTE 1—For Class A-O and Class A door requirements, see 6.3 and 6.4, respectively.

FIG. 1 Class A-O and Class A Door and Frame

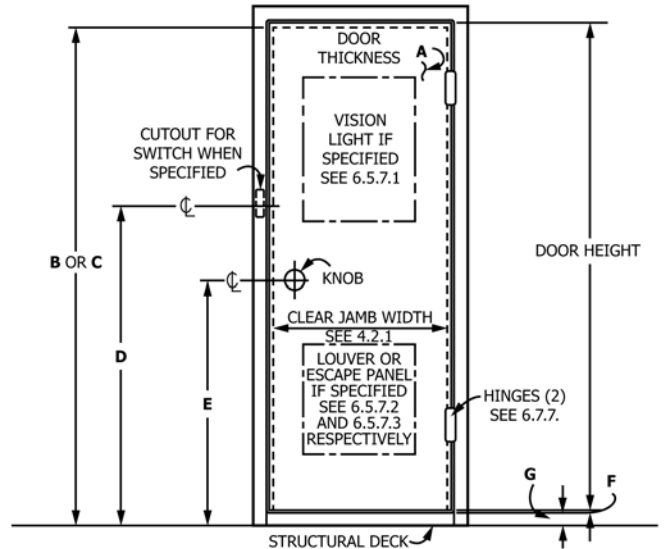
6.7.1 Doors and frames shall be made square and parallel to vessel baseline, without sheer or camber.

6.7.2 Sills or sill caps shall be Type 300 stainless steel in accordance with Specification A240/A240M with a mill finish.

6.7.3 Where glass is required in doors, it shall be at least ¼ in. (6 mm) thick.

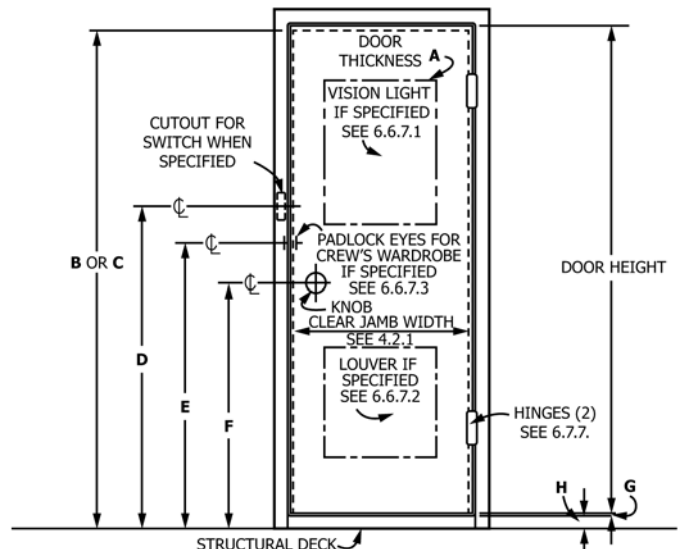
6.7.4 Double doors capable of independent operation and latching shall have a clearance between doors not to exceed ⅛ in. (3 mm). Double doors incapable of independent operation shall have a ½ (13-mm) stop or astragal between doors.

6.7.5 Doors that require door closers shall be reinforced in way of attachments to door and frame. Doors that require hold open hooks and bumpers shall be reinforced in way of attachment to the door.



NOTE 1—For Class B door requirements, see 6.5.

FIG. 2 Class "B" Door and Frame



NOTE 1—For Class C door requirements, see 6.6.

FIG. 3 Class C Door and Frame

6.7.6 Hinges shall be Series 300 stainless steel in accordance with Specification A240/A240M with a Series 300 stainless steel pin in accordance with Specification A582/A582M. Where fire performance requirements permit, brass or bronze hinges and fasteners may be used. The hinges shall be

mortise type 4½ in. (114 mm) high with ⅛-in. (3-mm) thick leaves with Series 300 stainless steel fasteners.

6.7.6.1 All doors shall be equipped with three hinges, equally spaced. Suitable reinforcements shall be installed in doors and frames to support all hinges properly.

6.7.7 Locksets shall be heavy-duty design, key in knob type, with Series 300 stainless steel mechanism. Knob roses and other exposed parts may be brass or bronze, chrome plated per BHMA A 156.18, finish code number 626 or equivalent brushed finish Series 300 stainless steel.

6.7.8 Where construction of door and frame is of steel, it shall be of welded construction with spot welds spaced 6 in. (152 mm) on centers or equivalent arc welds.

6.7.9 *Special Construction*—The following special construction will be furnished only if specified in ordering information.

6.7.9.1 Dutch doors will be furnished with hinged shelf of Series 300 stainless steel in accordance with Specification **A240/A240M** fitted to bottom half of door. Unless specified otherwise in ordering documents, width of hinged shelf shall be 8 in. (200 mm). Bottom half shall be fitted with lock as for similar doors and with slide bolt between door halves. Padlock eyes or custom seal eyes shall be provided if specified.

6.7.9.2 Double-acting doors, doors equipped with hinges that permit doors to swing both ways, with double bevel latch bolt or dead lock with key on outside and thumb turns on inside.

6.7.9.3 Fume tight door with gasket installed in stop of door frame and around the entire perimeter of door.

6.7.9.4 Door with acoustically lined louver shall have a noise reduction factor equal to that of the joiner bulkhead in which it is hung or 20 decibels, whichever is lowest. Door frames shall be equipped with gasket similar to that for a fume tight door.

**6.7.10 Operating Requirements:**

6.7.10.1 All doors shall be capable of operation from either side by one person. Doors shall swing easily and freely on their hinges. The latch set or lock set shall operate freely.

6.7.10.2 Wherever practicable, interior doors are to open into compartments served and not into passageways. In public spaces, stairway enclosures, corridor exits, and so forth, all doors shall open in the direction of escape where practicable.

6.7.10.3 If it is desirable to use decorative doors in addition to those required, they shall be constructed of material classified as noncombustible by CFR 46, Subpart 164.009 and 164.109. These decorative doors shall not interfere with the normal operation of the required doors, and shall open in the same direction if the required doors are in a main avenue of escape.

## **7. Dimensions**

7.1 For dimensions, see **Tables 1 and 6**.

## **8. Workmanship and Quality Assurance**

8.1 All workmanship and materials to be of specified quality in keeping with this specification and the best commercial marine practice so as to produce each item suitable for its intended use. Doors and frames shall be visually inspected for any defects.

## **9. Finish**

9.1 All steel, unless corrosion resistant or with corrosion-resistant plating, shall be cleaned and a commercial prime coat applied unless otherwise required by the ordering data.

9.2 All exposed burrs and raw or sharp edges on doors and frames which might be injurious to personnel shall be removed.

## **10. Certification**

10.1 The producer or manufacturer shall furnish to the purchaser a certification that the doors and frames were manufactured and inspected in accordance with this specification and have been found to meet the requirements.

## **11. Packaging**

11.1 Packaging shall be provided and be acceptable to a common carrier.

## **12. Keywords**

12.1 A Class doors; B Class doors; C Class doors; hollow metal construction; interior steel doors; marine doors; marine frames; ships; steel doors

# **ANNEX**

## **(Mandatory Information)**

### **A1. DEFINITIONS OF INTERIOR DIVISIONS—JOINERWORK**

A1.1 *Class A Construction*—Bulkheads, decks, and related structure of steel or equivalent metal construction made intact with the main structure of the vessel. Class A construction shall be capable of preventing the passage of smoke and flame for 1 h. If of steel, the minimum thickness for Class A construction of 0.1196 in. or 3.0 mm. Doors and other penetrations must be

constructed to the same requirement to provide this integrity. Class A-O division have no insulating requirements but by the addition of approved structural insulations, Class A divisions can prevent thermal conduction of heat to the unexposed side of the division for time periods of 60, 30, or 15 min as required for Classes A-60, A-30, and A-15, respectively.

A1.2 *Approved Structural Insulation*—Noncombustible insulation that has been subjected to an approved fire test (CFR 46 164.007) and, in the proper, approved thickness, prevents the average temperature rise on the unexposed side from rising more than 250°F (139°C) above ambient and also prevents the temperature of one point from rising more than 325°F (180°C) above ambient for a period of 1 h.

A1.3 *Class B Construction*—Noncombustible bulkheads that are capable of preventing the passage of flame for 30 min.

A1.4 *Class C Construction*—Bulkheads or decks constructed of noncombustible materials.

A1.5 *Noncombustible Material*—Any material that has been subjected to an approved fire test (CFR 46 164.009 or Test Method **E136**).

A1.5.1 *Average Weight Loss*—Not more than 50 %.

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