



Standard Specification for Rat Guards, Ship's (Metric)¹

This standard is issued under the fixed designation F1099M; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

This standard has been approved for use by agencies of the U.S. Department of Defense.

1. Scope

1.1 This specification covers the materials, dimensions, and assembly of steel and aluminum rat guards.

1.2 Rat guards are intended to prevent rats from boarding ships by way of mooring lines.

1.3 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.4 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.5 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*²

A653M Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process

B209M Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric) (Withdrawn 2021)³

3. Classification

3.1 Rat guards shall be classified into three types as follows:

¹ This specification is under the jurisdiction of ASTM Committee F25 on Ships and Marine Technology and is the direct responsibility of Subcommittee F25.07 on General Requirements.

Current edition approved May 1, 2023. Published May 2023. Originally approved in 1987. Last previous edition approved in 2018 as F1099M – 18. DOI: 10.1520/F1099M-18R23.

² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

³ The last approved version of this historical standard is referenced on www.astm.org.

3.1.1 *Type I*—Multiple-line (doubling up), self-adjustable, accommodating the mooring line combinations listed in **Table 1**.

3.1.2 *Type II*—Single-line, self-adjustable, accommodating a single 5 mm wire to a 76 mm diameter mooring line.

3.1.3 *Type III*—Conical shape with tapered, slotted sleeve. Type III rat guards shall be of the following sizes: (a) 75 mm, (b) 125 mm, and (c) 200 mm.

3.2 Types I and II rat guards (see 3.1.1 and 3.1.2) are designed to be installed from the deck or pier without a person physically coming in contact with the mooring lines or hawser, by lowering and positioning the guards away from the ship's hull with two ropes that are permanently attached as guide and tie ropes (see **Fig. 1**).

3.3 Type III rat guards (see 3.1.3) require a person to contact the mooring line to pull the two halves of the conical guard around the mooring line, wrap the slotted sleeves (see **Fig. 2**) to the line, and physically close any opening between the mooring line and the circular opening at the center of the guard.

4. Ordering Information

4.1 Orders for rat guards under this specification shall include the following information:

4.1.1 ASTM designation.

4.1.2 Type required (see 3.1):

4.1.2.1 If Type III, material required (see 5.1.3).

4.1.2.2 If Type III, size required (see 3.1.3).

4.1.3 Quantity required.

4.1.4 Optional requirements, if any (see Supplementary Requirements S1 through S3).

5. Materials and Manufacture

5.1 *Materials:*

5.1.1 Type I rat guards shall be made of aluminum-alloy sheet metal conforming to the requirements of Specification **B209M**, 6061-T6, or 5052-H32.

5.1.2 Type II rat guards shall be made of galvanized sheet steel conforming to the requirements of Specification **A653M**, Coating Designation 450. The coating shall be a minimum of 450 g/m² in accordance with the triple-spot test of Specification **A653M**.

TABLE 1 Mooring Line Combinations for Type I Rat Guards

Mooring Lines Diameter, mm	Number of Lines
5 wire	as required
25–33 line	3 or more
41–50 line	3
50–82 line	2

5.1.3 Type III rat guards shall be made of either of the materials specified in 5.1.1 and 5.1.2 (see 4.1.2.1).

5.2 *Manufacture:*

5.2.1 Types I and II rat guards shall be provided with the following:

5.2.1.1 *Hinge Bolt*—An M 7 × 1 hexagon head bolt 20 mm long with elastic stop nut and washer. All parts shall be corrosion-resistant steel.

5.2.1.2 *Guide and Tie Rope*—Polyester or nylon of good commercial quality, 6 mm or 9 mm diameter by 6 m long.

5.2.1.3 *Grommet*—Good commercial quality brass and of size suitable for the guide and tie ropes.

5.2.2 *Type III Rat Guards*—Type III rat guards shall consist of two half disks and two half tapered sleeves. Both halves shall be identical except one half shall be provided with a “U” shaped sleeve.

5.2.2.1 The hinge bolt provided with each rat guard shall consist of a commercial M 7 × 1 hexagon head bolt, 20 mm long nut, and washer. All parts shall be corrosion-resistant steel.

5.2.2.2 The galvanized steel or aluminum sleeve shall be slotted as specified in Table 2 and Fig. 2, so that when the rat guard is in place, it may be drawn tightly against the hawser, with lashing. The formed sleeves shall be tapered to permit nesting of the rat guards, for compact shipping.

5.2.2.3 When the rat guard is made of galvanized steel, the sleeve shall be riveted and soldered to the disk with tinner’s type rivets, No. 3, 4 mm diameter for each half sleeve. The number of rivets shall be the same as the number of prongs. Soldering of the half sleeve flange to the half disk shall be continuous, inside and outside (see Fig. 2).

5.2.2.4 When the rat guard is made of aluminum alloy sheets, the sleeve shall be spot welded and riveted to the disk. Spacing of spot welds shall not exceed 50 mm with a minimum of four spot welds provided on each half of the rat guard. The rivets shall be equivalent to No. 3, 4 mm diameter. Five rivets shall be installed in each half of the guard. Rivets shall be located equidistant, between adjacent spot welds (see Fig. 2).

6. Dimensions and Permissible Variations

6.1 Dimensions of Type I rat guards ±6 mm shall be as follows:

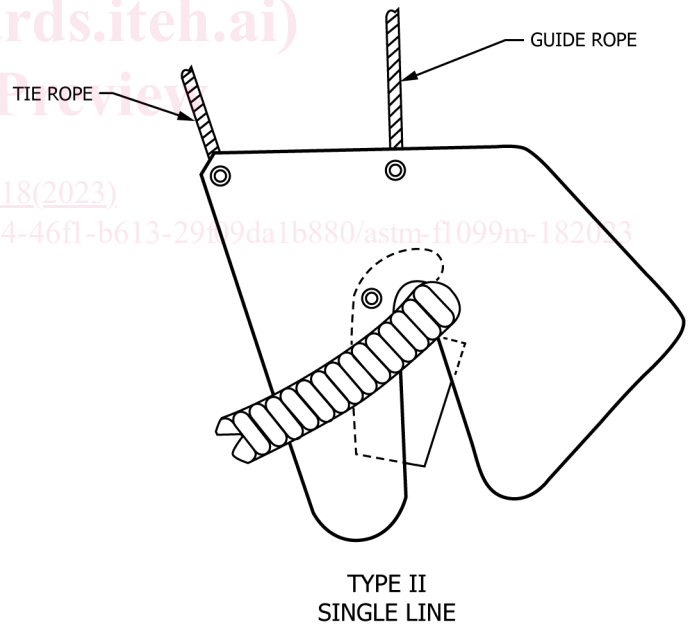
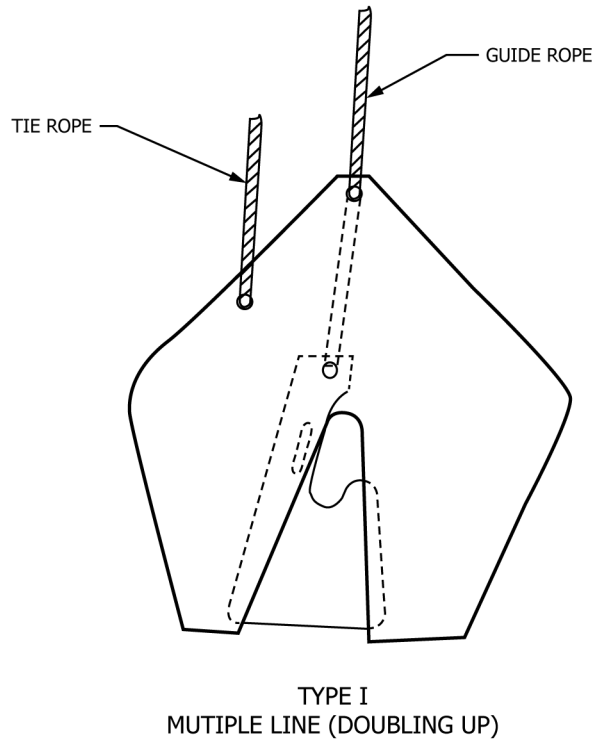


FIG. 1 Types I and II Rat Guard Configuration

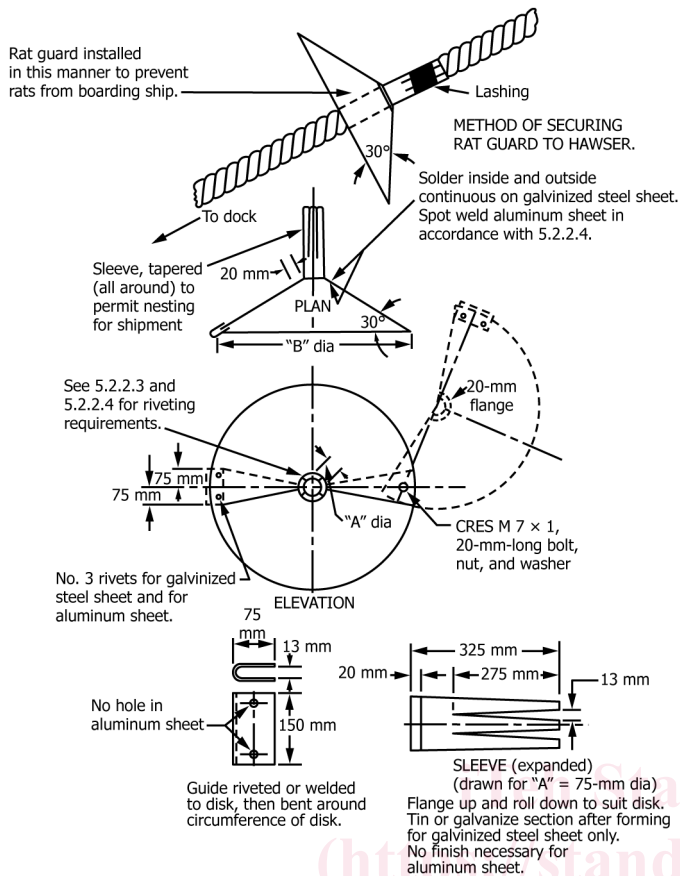


FIG. 2 Assembly of Type III Rat Guards

- 6.1.1 Overall height shall be 1000 mm.
- 6.1.2 Overall thickness shall be 40 mm maximum.
- 6.2 Dimensions of Type II rat guards ± 6 mm shall be as follows:
 - 6.2.1 Overall length shall be 1000 mm.
 - 6.2.2 Overall thickness shall be 40 mm maximum.

SUPPLEMENTARY REQUIREMENTS

The following supplementary requirements shall apply only when specified by the purchaser in the contract or order (see 4.1.4).

S1. Referenced Documents

- S1.1 The following documents are applicable only when the requirements of S3 are specified in the contract or purchase order (see 4.1.4).
 - S1.1.1 *Military Standards:*⁴
 - MIL-STD-129 Standard for Marking for Shipment and Storage
 - MIL-C-52950 Specification for Crates, Wood, Open, and Covered

⁴ Available from DLA Document Services, Building 4/D, 700 Robbins Ave., Philadelphia, PA 19111-5094, <http://quicksearch.dla.mil>.

TABLE 2 Dimensions for Type III Rat Guards

Size	Dimensions (see Fig. 2), mm		Number of Prongs in Complete Sleeve (See 5.2.2.2)	Thickness of Disk, Sleeve, and Guide, mm	
	A	B		Steel, Galvanized Sheet	Aluminum Alloy Sheet
75	75	1000	6	1.4	1.6
125	125	1300	10	1.4	1.6
200	200	1300	16	1.4	1.6

6.3 Dimensions of Type III rat guards shall be as specified in Table 2 and Fig. 2.

7. Workmanship, Finish, and Appearance

- 7.1 Workmanship shall be of the highest quality throughout and in conformance with the accepted commercial standard practice for this type of equipment.
- 7.2 Guards shall be free of exposed burrs, raw or sharp edges, or other imperfections that may be injurious to personnel or lines.

8. Product Marking

- 8.1 Each rat guard shall be stenciled with black paint or stamped with the ASTM standard designation and size in letters and numbers approximately 25 mm high.
- 8.2 The manufacturer may stamp his brand name or logo.

9. Packaging and Package Marking

- 9.1 Unless otherwise specified in the contract or purchase order (see 4.1.4), packaging shall conform to manufacturer's normal commercial practice, and in such a manner that will ensure acceptance by common carrier and afford protection against physical and mechanical damage during shipment. Shipping containers shall conform to carrier regulations as applicable to the mode of transportation.

10. Keywords

- 10.1 mooring lines; ratguards; ships

S1.1.2 Federal Standards:⁵

- PPP-B-601 Specification for Boxes, Wood, Cleated-Plywood
- PPP-B-621 Specification for Boxes, Wood, Nailed and Lock Corner
- PPP-T-97 Specification for Tape, Packaging/Individual, Filament Reinforced

⁵ Available from U.S. Government Printing Office, Superintendent of Documents, 732 N. Capitol St., NW, Washington, DC 20401-0001, <http://www.access.gpo.gov>.