



# Standard Specification for Rat Guards, Ship's (Metric)<sup>1</sup>

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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

## 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 the 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 and health practices and determine the applicability of regulatory limitations prior to use.*

## 2. Referenced Documents

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

**A525M Specification for General Requirements for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process (Withdrawn 1994)**<sup>3</sup>

**B209M Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric)**

## 3. Classification

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

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.

<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 F25.07 on General Requirements.

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<sup>2</sup> 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.

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

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 **A525M**, Coating Designation 450. The coating shall be a minimum of 450 g/m<sup>2</sup> in accordance with the triple-spot test of Specification **A525M**.

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).

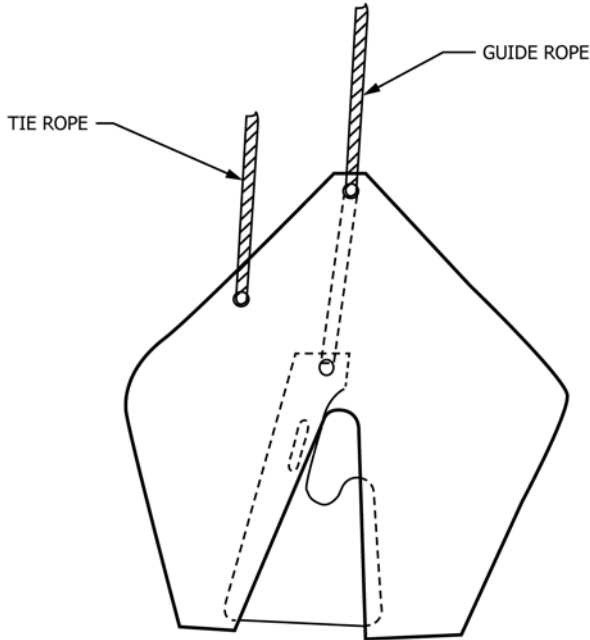
5.2 *Manufacture:*

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

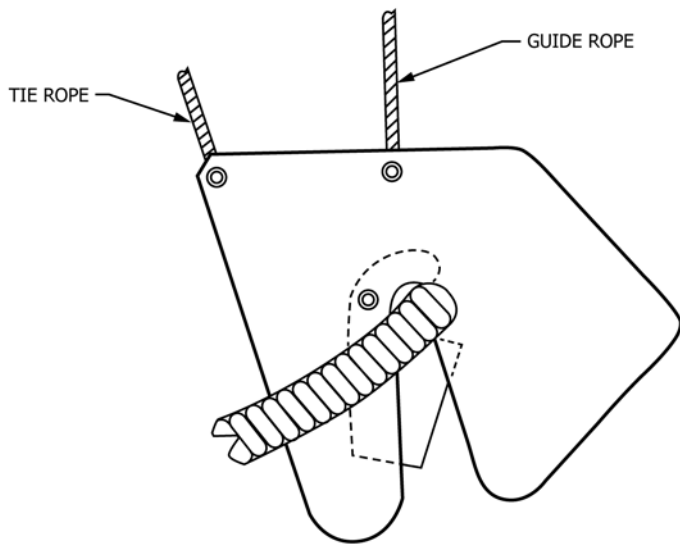
5.2.1.1 *Hinge Bolt*—An M 7 × 1 hexagon head bolt 20 mm long with elastic stop nut and washer. All parts shall be corrosion-resistant steel.

**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

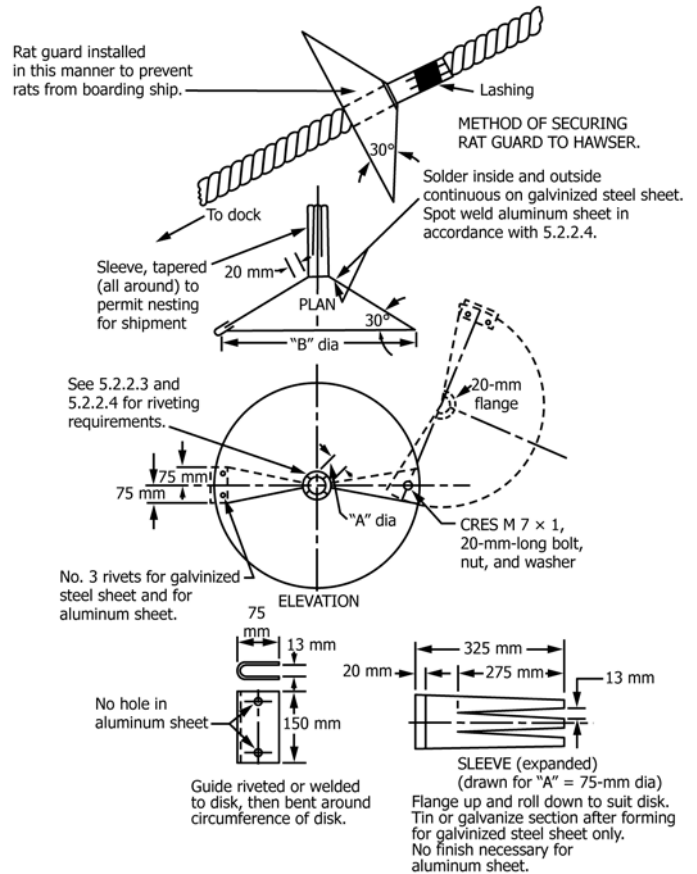


**TYPE I  
MUTIPLE LINE (DOUBLING UP)**



**TYPE II  
SINGLE LINE**

**FIG. 1 Types I and II Rat Guard Configuration**



**FIG. 2 Assembly of Type III Rat Guards**

5.2.1.2 *Guide and Tie Rope*—Polyester or nylon of good commercial quality, 6- 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,

**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

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  $\pm 6$  mm shall be as follows:

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  $\pm 6$  mm shall be as follows:

6.2.1 Overall length shall be 1000 mm.

6.2.2 Overall thickness shall be 40 mm maximum.

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

## 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:*

MIL-STD-129 Standard for Marking for Shipment and Storage<sup>4</sup>

MIL-C-52950 Specification for Crates, Wood, Open, and Covered<sup>4</sup>

S1.1.2 *Federal Standards:*

PPP-B-601 Specification for Boxes, Wood, Cleated-Plywood<sup>5</sup>

PPP-B-621 Specification for Boxes, Wood, Nailed and Lock Corner<sup>5</sup>

PPP-T-97 Specification for Tape, Packaging/Individual, Filament Reinforced<sup>5</sup>

S1.1.3 *Official Classification Committee Standard:*

Uniform Freight Classification Ratings, Rules, and Regulations<sup>6</sup>

S1.1.4 *National Motor Freight Traffic Association Standard:*

National Motor Freight Classification<sup>7</sup>

### S2. Quality Assurance Provisions

S2.1 *Sampling:*

S2.1.1 Rat guards of the same type and size offered for delivery at one time shall be considered a lot.

S2.1.2 A random sample of rat guards shall be selected in accordance with Table S1.1 for the examination specified in S2.2 and the trial assembly specified in S2.3.

S2.1.2.1 Any rat guard in the sample containing one or more defects shall not be offered for delivery, and if the number of defective rat guards in any sample exceeds the acceptance number specified in Table S1.1, it shall be cause for rejection of the lot.

<sup>4</sup> Available from Standardization Documents Order Desk, DODSSP, Bldg. 4, Section D, 700 Robbins Ave., Philadelphia, PA 19111-5098, <http://dodssp.daps.dla.mil>.

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

<sup>6</sup> Available from Uniform Classification Committee Agent, Tariff Publication Officer, Room 1106, 222 S. Riverside Plaza, Chicago, IL 60606.

<sup>7</sup> Available from National Motor Freight Traffic Association, Inc. (NMFTA), 1001 N. Fairfax St., Suite 600, Alexandria, VA 22314, <http://www.nmfta.org>.

**TABLE S1.1 Sampling for Examination and Trial Assembly**

Number of Rat Guards in Lot	Number of Rat Guards in Sample	Acceptance Number (Defective)	Rejection Number (Defective)
25 and under	5	0	1
26 to 40	7	0	1
41 to 65	10	0	1
66 to 110	15	0	1
111 to 300	25	1	2
301 to 800	35	1	2

S2.1.2.2 **Table S1.1** shall be applied separately to major and minor defects (see **Table S2.1**) for purpose of lot acceptance and rejection.

S2.2 *Examination*—Rat guards selected in accordance with S2.1.2 shall be examined as specified in **Table S2.1** and measured to verify conformance to the requirements of this specification.

S2.3 *Trial Assembly*—Rat guards selected in accordance with S2.1.2 shall be assembled in the specified dimensional size to verify conformance with the functional requirements of this specification.

S2.4 *Inspection of Packaging*—Sample packages and packs, and the inspection of the preservation-packaging, packing, and product marking for shipment and storage shall be in accordance with the requirements of Sections 8, 9, and S3, and the documents specified therein.

### S3. Packaging and Package Marking

S3.1 *Preservation (Type III only)*—Preservation shall be Level A or C, as specified (see 4.1.4).

**TABLE S2.1 Classification of Defects (Applicable to All Types of Rat Guards, Unless Otherwise Specified)**

Categories	Defects
<i>Critical:</i>	None defined
<i>Major:</i>	
101	At trial assembly (see S2.3) guard does not fit properly over specified hawser sizes.
102	Guard does not maintain a secure and correct position when lashed to the hawser (see Fig. 2).
103	Thickness of material not as specified (see Section 6).
104	Sleeves not tapered to allow for nesting closely for shipment, Type III only (see 5.2.2.2).
105	Sleeve or guide not properly assembled as specified in 5.2.1 and Fig. 1 or 5.2.2 and Fig. 2 as applicable.
106	Rat guard is warped.
107	Galvanizing is less than 450 g/m <sup>2</sup> for Types II and III rat guards (see 5.1.2 and 5.1.3).
<i>Minor:</i>	
201	Dimensions do not conform to 6.1, 6.2, and 6.3.
202	Bolt, nut, and washer not as specified in 5.2.1.1 and 5.2.2.1.
203	Outside edges sharp or inside of rat guard rough.
204	Galvanizing not uniform.

S3.1.1 *Level A:*

S3.1.1.1 Preservatives shall not be used.

S3.1.1.2 Eight complete rat guards shall be nested together by disassembling each guard and securing the two halves together at the funnel with filament reinforced pressure sensitive tape conforming to PPP-T-97. The hinge bolt, nut, and washer for each guard shall be secured to one half of the guard to prevent loss or damage.

S3.1.2 *Level C*—Rat guards, assembled or disassembled at the contractor's option, shall be unit packed to afford protection against damage during shipment from the supply source to the first using activity for immediate use. The contractor's retail or wholesale preservation methods may be used when such meets the requirements of this level.

S3.2 *Packing*—Packing shall be Level A, B, or C, as specified (see 4.1.4).

S3.2.1 *Level A*—Eight rat guards (for Type III, eight disassembled rat guards) unit packed as specified in S3.1 shall be packed in wood cleated plywood, nailed wood, or open wood crates conforming to PPP-B-601 overseas type, PPP-B-621 class 2, or MIL-C-52950 boxes or crates respectively. Selection of the box or crate shall be at the option of the contractor. Protection shall be provided by means of blocking, bracing, or cushioning, or other media to prevent damage during handling, shipment, and storage.

S3.2.2 *Level B*—Eight rat guards (for Type III, eight disassembled rat guards) unit packed as specified in S3.1 shall be packed as specified in Level A, except that containers shall conform to the domestic class or grade of the type used.

S3.2.3 *Level C*—Packing shall be accomplished in a manner that will ensure acceptance by common carrier at the lowest rate and will afford protection against physical or mechanical damage during direct shipment from the supply source to the using activity for early installation. The shipping containers or method of packing shall conform to the Uniform Freight Classification Rules, National Motor Freight Classification, or other carrier regulations, as applicable to the mode of transportation.

S3.3 *Product Marking*—In addition to any special marking required (see 4.1.4), unit packs and shipping containers shall be marked in accordance with MIL-STD-129. Unit packs in open crates shall be marked with waterproofed tags.

S3.3.1 When specified (see 4.1.4), manufacturers shall assign a part number containing a five digit numerical manufacturer's code as assigned by the U.S. Government under the Federal Cataloging Program.

S3.3.2 When specified (see 4.1.4), the marking specified in 8.1 shall include a National Stock Number.

NOTE 1—The packaging requirements specified apply only for direct government acquisition.

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