MILITARY SPECIFICATION

SPRINKLER HEAD, 180 DEGREES FULL CONE

This specification is approved for use within the Naval Sea Systems Conmmand, Department of the Navy, and is available for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers 180 degree full cone sprinkler heads. Sprinkler heads shall be for pendent or upright installation in overhead sprinkler systems

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications and standards. The following specifications and standards form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of these documents shall be those listed in the issue of the Department of Defense Index of Specifications and Standards (DoDISS) and supplement thereto, cited in the solicitation.

SPECIFICATIONS

FEDERAL

QQ-C-390 - Copper Alloy Castings (Including Cast Bar).
PPP-B-601 - Boxes, Wood, Cleated-Plywood.
PPP-B-621 - Box, Wood, Nailed and Lock-Corner.
PPP-B-636 - Boxes, Shipping, Fiberboard.
PPP-B-640 - Boxes, Fiberboard, Corrugated, Triple-Wall.

MILITARY

MIL-P-116 - Preservation, Methods of.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, Naval Sea Systems Command, SEA 5523, Department of the Navy, Washington, DC 20362-5101 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

FSC 4210

STANDARDS

MILITARY

MIL-STD-105 - Sampling Procedures and Tables for Inspection By Attributes .

MIL-STD-129 - Marking for Shipment and Storage.

(Copies of specifications and standards required by contractors in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting activity.)

2.2 Other publications. The following documents form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of the documents which are DoD adopted shall be those listed in the issue of the DoDISS specified in the solicitation. Unless otherwise specified, the issues of documents not listed in the DODISS shall be the issue of the non-government documents which is current on the date of the solicitation.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

B 16 - Standard Specification for Free-Cutting Brass Rod, Bar, and Shapes for Use in Screw Machines. (DoD adopted)

B 584 - Standard Specification for Sand Castings for General Applications . (DoD adopted)

D 3951 - Standard Practice for Commercial Packaging. (DoD adopted)

(Application for copies should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.)

(Nongovernment standards and other publications are normally available from the organizations which prepare or which distribute the documents. These documents also may be available in or through libraries or other informational services.)

2.3 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein (except for associated detail specifications, specification sheets or MS standards), the text of this specification shall take precedence. Nothing in this specification, however, shall supersede applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 General requirements. Sprinkler heads shall meet the minimum spray pattern shown on figure 1 and shall not exceed the maximum delivery rates shown in table I. The sprinkler head shall provide a surface area coverage on the deck below of not less than 80 percent within the minimum spray pattern of figure 1.

3.2 Material. Sprinkler head bodies shall be made of copper alloy conforming to QQ-C-390, alloy C953, ASTM B 584, alloys 836 or 838, or ASTM B 16, alloy 360. Heads having deflector plates and support arms may be made of the same copper alloys noted herein.

3.2.1 Recovered materials. Unless otherwise specified herein, all equipment, material, and articles incorporated in the products covered by this specification shall be new and may be fabricated using materials produced from recovered materials to the maximum extent practicable without jeopardizing the intended use The term "recovered materials" means materials which have been collected or recovered from solid waste and reprocessed to become a source of raw materials, as opposed to virgin raw materials. None of the above shall be interpreted to mean that the use of used or rebuilt products is allowed under this specification unless otherwise specifically specified.

3.3 Construction. The sprinkler head may have a single or multiple open orifice directing the stream at a minimum homogeneous conical spray angle of 180 degrees. The body shall be designed with 1/2-inch tapered male pipe threads for installation. The thread length shall suit the fitting. The minimum size of any orifices shall be as specified in table I (see 6.2). The base shall be no larger than 1-3/4 inches square or hexagonal in shape. The overall maximum length shall not exceed 2-1/2 inches and the overall weight shall not exceed 13 ounces, The angle of discharge, orifice size, and manufacturer's name or trademark shall be stamped, cast or engraved on one side of the base.

TABLE I. Discharge capacity and orifice sizes for 180 degrees sprinkler heads.

Orifice size	Inches minimum orifice	Capacity gallons per minute (gal/rein)			
		50 pounds per square inch (lb/in2)		100 lb/in2	
		Minimum	Maximum	Minimum	Maximum
16	0.203	7	9	11	13
18	.250	13	15	18	20
21	.281	15	17	21	25
24	,328	20	24	28	32
28	,375	26	30	37	41
32	.438	36	40	52	58

3.4 Workmanship. Fittings shall be sound. smoothly cored, true to form, uniform in texture, and free from cold shunts, porosity, or any-other defects which may affect their serviceability. They shall be thoroughly cleaned, both inside and outside, and all fins and roughness shall be removed. Defects to sprinkler heads shall be repaired or welded only when the maximum depth does not exceed 20 percent of the casting thickness and individual repair areas do not involve more than 4 percent of the casting surface. Any repair shall not adversely affect the strength, use or machinability of the sprinkler head.

4. QUALITY ASSURANCE PROVISIONS

4,1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or purchase order, the contractor may use his own or any

other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.1.1 Responsibility for compliance. All items must meet all requirements of sections 3 and 5. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of assuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling in quality conformance does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to acceptance of defective material.

4.2 Quality conformance inspection.

4.2,1 Lot . Sprinkler heads of the same design and orifice size offered for delivery at one time shall be considered a lot for purposes of inspection.

4.2.2 Sampling for visual and dimensional examination. A random sample of sprinkler heads shall be selected from each lot in accordance with MIL-STD-105 at inspection level II for the examination of 4.3. The acceptable quality level shall be 1.5 percent defective. Any sprinkler head in the sample containing one or more visual or dimensional defects shall be rejected, and if the number of defective sprinkler heads in any sample exceeds the acceptance number for that sample, the lot represented by the sample shall be rejected.

4.2.3 sampling for tests. A random sample of sprinkler heads shall be selected from each lot in accordance with MIL-STD-105 at inspection level III for lots of 65 and under, inspection level 11 for lots of 66 to 500, and inspection level I for lots of 501 and over for the tests of 4.4. The acceptable quality level shall be 2.5 percent defective. Any sprinkler head not meeting the requirements of this specification shall be rejected, and if the number of nonconforming sprinkler heads in any sample exceeds the acceptance number for that sample, the lot represented by the sample shall be rejected.

4.3 Visual and dimensional examination. Each of the sample sprinkler heads selected in accordance with 4.2.2 shall be visually and dimensionally examined to verify compliance with the requirements specified herein.

4.4 Test procedures. Each sample sprinkler head shall be subjected to a performance test to determine compliance with the flow characteristics specified herein (see figure 1 and table I).

4.5 Inspection of packaging. Sample packages and packs, and the inspection of the preservation-packaging, packing and marking for shipment and storage shall be in accordance with the requirements of section 5 and the documents specified therein.

5. PACKAGING

(The packaging requirements specified herein apply only for direct Government acquisition. For the extent of applicability of the packaging requirements of referenced documents listed in section 2, see 6.3.)

5.1 Preservation. Preservation shall be level A, C, or commercial, as specified (see 6.2).

5.1.1 Level A. The sprinkler heads shall be individually preserved method III of MIL-P-116 in a water resistant folding or set-up paperboard box.

5.1.2 Level C. Sprinkler heads shall be preserved as specified for level A except that boxes may be of the non-water resistant domestic type or grade.

5 1.3 Commercial. Sprinkler heads shall be preserved in accordance with ASTN D 3951.

5.2 Packing. Packing shall be level A, B, C or commercial, as specified (see 6.2).

5.2.1 Level A. Sprinkler heads preserved as specified in 5.1 shall be packed in nailed wood or wood cleated plywood boxes conforming to PPP-B-621, class 2, or PPP-B-601, overseas type, at the option of the contractor. Shipping containers shall be closed and banded in accordance with the applicable container specification or appendix thereto. The gross weight of the boxes shall not exceed 200 pounds.

5.2.2 Level B. Sprinkler heads packaged as specified shall be packed in a fiberboard box conforming to PPP-B-636, class weather resistant, grade v, or triple wall corrugated fiberboard box conforming to PPP-B-640, class 2. Variety and style of the box shall be at the contractor's option. Adhesive shall not be used for box closure. The gross weight of fiberboard boxes shall not exceed the weight limitation of the box specification.

5.2.3 Level C. Sprinkler heads packaged as specified shall be packed in a fiberboard box conforming to PPP-B-636, class domestic, or triple wall corrugated box conforming to PPP-B-640, class 1. Variety and style of the box shall be at the contractor's option, Adhesive shall not be used for closure. The gross weight of fiberboard boxes shall not exceed the weight limitation of the box specification.

5.2.4 commercial. Sprinkler heads preserved as specified (see 6.2) shall be packed in accordance with ASTM D 3951.

5.3 Marking. In addition to any special marking specified in the contract or purchase order, lnterior packages and exterior shipping containers shall be marked in accordance with MIL-STD-129 for levels A, B, and C; in accordance with ASTM D 3951 for commercial.

5.4 Use of loose-fill material.

5.4.1 For all levels and commercial packing. Unless otherwise approved by the contracting activity (see 6.2), use of loose-fill materials for domestic shipment and early equipment installation and commercial packaging and packing applications such as cushioning, filler and dunnage is prohibited. When approved, unit packages and containers (interior and exterior) shall be marked and labeled as follows:

"CAUTION

Contents cushioned with loose-fill material. Not to be taken aboard ship. Remove and discard loose-fill material before shipboard storage. If required, recushion with cellulosic material, bound fiber, fiberboard or transparent flexible cellular q aterial. "

5.4.2 For preservation and levels A, B, and C packing. Use of loose-fill material is prohibited for preservation and levels A, B, and C packing applications such as cushioning, filler and dunnage.

6. NOTES

6.1 Intended use. The sprinkler heads covered by this specification are for use in sprinkler systems installed in q agazines with high density cargo Ioadouts.

6.2 Ordering data. Acquisition documents should specify the following:

(a) Title, number, and date of this specification.
(b) Orifice size (see 3.3 and table I).
(c) Level of preservation and packing required (see 5.1 and 5.2).
(d) When loose-fill material is approved (see 5.4.1).

6.3 Sub-contracted material and parts. The packaging requirements of referenced documents listed in section 2 do not apply when material and parts are acquired by the contractor for incorporation into the equipment and lose their separate identity when the equipment is shipped.

Preparing activity:
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(Project 4210-N199)

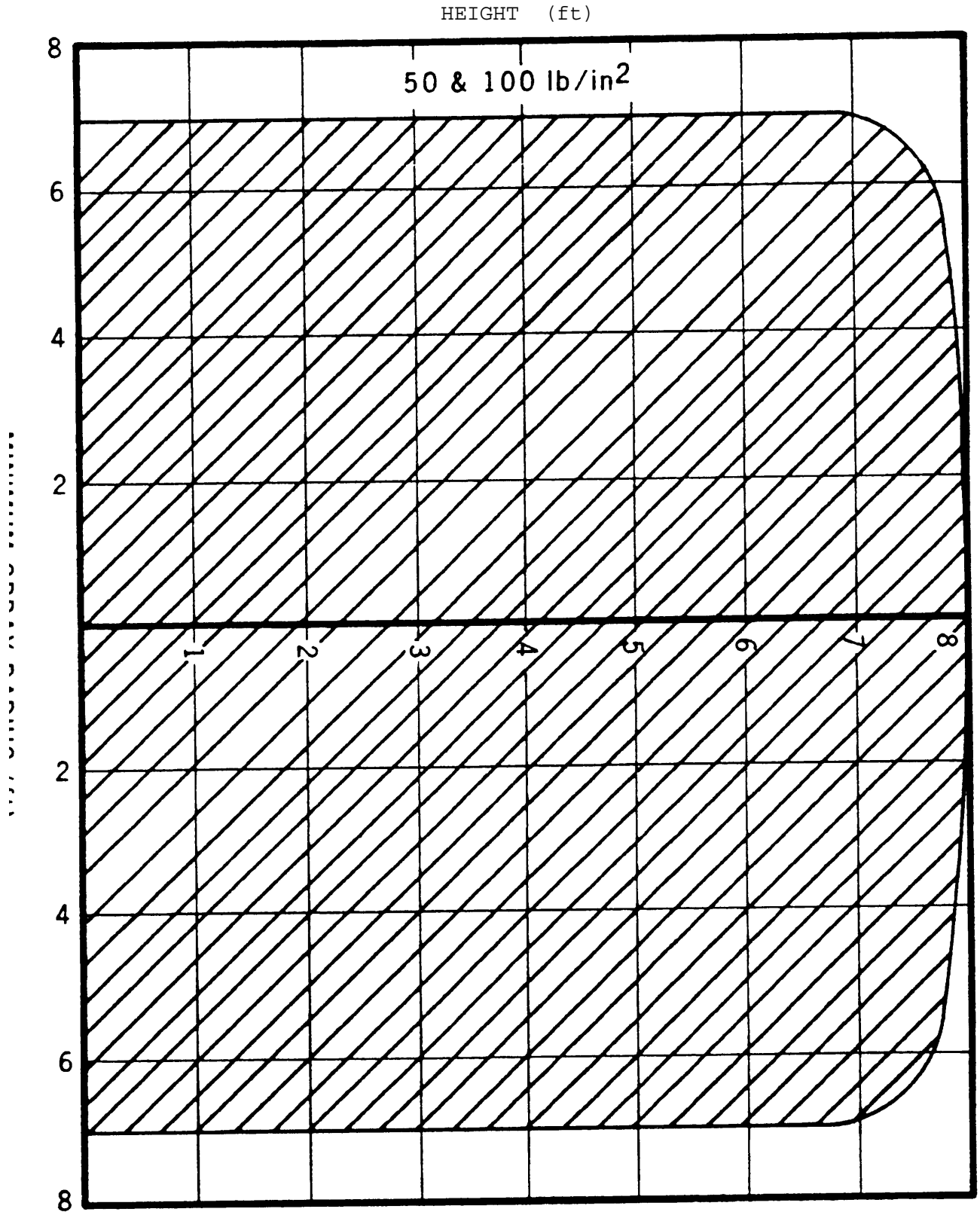

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FIGURE 1. Spray pattern.

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STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

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1. DOCUMENT NUMBER	2. DOCUMENT TITLE
MIL-S-24660(SH)	SPRINKLER HEAD, 180DEGREES FULL CONE

3a. NAME OF SUBMITTING ORGANIZATION	4. TYPE OF ORGANIZATION *(Mark one)*
b. ADDRESS *(Street, City, State, ZIP Code)*	☐ VENDOR ☐ USER ☐ MANUFACTURER ☐ OTHER *(Specify)*:

5. PROBLEM AREAS

a. Paragraph Number and Wording:

b. Recommended Wording:

c. Reason/Rationale for Recommendation:

6. REMARKS

7a. NAME OF SUBMITTER *(Last, First, MI)* – Optional	b. WORK TELEPHONE NUMBER *(Include Area Code)* – Optional
c. MAILING ADDRESS *(Street, City, State, ZIP Code)* – Optional	8. DATE OF SUBMISSION *(YYMMDD)*

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