

MIL-L-970C(SH)  
 3 January 1977  
 SUPERSEDING  
 MIL-L-970B  
 17 June 1966  
 (See 6.6)

# MILITARY SPECIFICATION

## LAMP HOLDERS AND STARTER SOCKETS.

### GENERAL SPECIFICATION FOR (NAVAL SHIPBOARD USE)

This specification is approved for use by the Naval Sea Systems Command, 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 lampholders and starter sockets for use with lamps of various types on Naval ships.

#### 2. APPLICABLE DOCUMENTS

2.1 Issue of documents. The following documents, of the issue in effect on date of invitation for bids or request for proposal, form a part of this specification to the extent specified herein.

#### SPECIFICATIONS

##### MILITARY

- MIL-S-901 - Shock Tests, H.I. (High-Impact); Shipboard Machinery, Equipment and Systems, Requirements for.
- MIL-P-15037 - Plastic Sheet, Laminated, Thermosetting, Glass-Cloth, Melamine-Resin.
- MIL-F-16377 - Fixtures, Lighting, Shipboard Use, General Specification.
- MIL-E-17555 - Electronic and Electrical Equipment, Accessories, and Repair parts: Packaging and Packing of.
- MIL-I-45208 - Inspection System Requirements.

#### STANDARDS

##### MILITARY

- MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes.
  - MIL-STD-167-1 - Mechanical Vibrations of Shipboard Equipment (Type I - Environmental and Type II Internally Excited).
  - MIL-STD-883 - Test Reports, Preparation of.
- (See Supplement 1 for list of associated specification sheets.)

(Copies of specifications, standards, drawings, and publications required by contractors in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

2.2 Other publications. The following documents form a part of this specification to the extent specified herein. Unless otherwise indicated, the issue in effect on date of invitation for bids or request for proposal shall apply.

##### NATIONAL BUREAU OF STANDARDS (NBS)

Handbook H28-Screw-Thread Standards for Federal Services.

(Application for copies should be addressed to the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402.)

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, Naval Ship Engineering Center, Department of the Navy, SEC 6124, Washington, L.C. 20362 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

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NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)  
No. 70 - National Electric Code

(Application for copies should be addressed to National Fire Protection Association,  
60 Batterymarch Street, Boston, Mass. 02110.)

UNDERWRITERS LABORATORIES, INC. (UL)  
UL-496 - Edison-Base Lampholders.  
UL-542 - Standard for Lampholders, Starters and Starter Holders For  
Fluorescent Lamps.

(Application for copies should be addressed to Underwriters Laboratories, Incorporated,  
207 East Ohio Street, Chicago, Illinois 60611.)

(Technical society and technical association specifications and standards are generally  
available for reference from libraries. They are also distributed among technical groups  
and using Federal agencies.)

### 3. REQUIREMENTS

3.1 First article inspection. Prior to beginning production, a sample lampholder or  
starter socket manufactured by production tools and processes shall be inspected as specified  
in 4.2. (see 6.2).

3.2 Specification sheets. The individual part requirements shall be as specified  
herein and in accordance with the applicable specification sheets. In the event of any  
conflict between requirements of this specification and the specification sheets, the latter  
shall govern (see 6.1.1).

#### 3.3 General.

3.3.1 Materials. Materials used in the construction of lampholders and starter sockets  
shall be in accordance with the applicable specification sheet and as specified herein.

3.3.1.1 Molded plastic material. Molded plastic material shall be as specified on  
the individual specification sheets.

3.3.1.2 Laminated plastic material. Unless otherwise specified on the specification  
sheet, the laminated plastic material shall be in accordance with type GME of MIL-P-  
15037.

#### 3.3.2 Stress relief.

3.3.2.1 Plastic. Adequate measures shall be taken in molding or processing plastics  
to insure that stress build-up does not occur or, shall be treated to relieve these stresses  
to prevent deterioration or failure of the part or assembly.

3.3.2.2 Metal. All metals used in fabrication and assembly shall be treated or heat  
treated to prevent deterioration or failure due to stresses or other conditions resulting  
from working, forming, welding and so forth, during the manufacturing process.

3.3.3 Finish. Molded parts of lampholders and starter sockets shall have a smooth  
finish. The finish shall not blister, peel, or chip.

3.3.4 Design, sizes, and electrical ratings. The lampholders and starter sockets  
shall be of the design, sizes, and electrical ratings shown on the applicable specification  
sheet.

3.3.5 Flash. Flash shall be removed from molded plastic parts. Flash edges shall then  
be buffed smooth and width of flash edges made thereby shall be not greater than 1/32 inch.

3.3.6 Dimensions. Dimensions shall be as shown on the applicable specification sheet.  
All dimensions are in inches.

3.3.6.1 Dimensional tolerances. Unless otherwise specified on the specification sheet,  
the following tolerances apply:

Fractional dimensions . . . . .	Plus or minus 1/64 inch.
Decimal dimensions . . . . .	Plus or minus 0.005 inch.
Angle degree . . . . .	Plus or minus 1/2 degree.

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3.4 Detail.

3.4.1 Screw threads and screw shell threads. Lampholder screw shells shall be threaded to fit screw base lamps and shall be as specified in Handbook H2A and as shown on the applicable specification sheet.

3.4.2 Inserts, tapping and threaded devices. Self-tapping screws and sheet metal screws are not permitted. Molds-in-place inserts shall be furnished for screw threads in plastic. Inserts, bolts, nuts, screws, or other type fasteners shall not break, strip, fracture, become loose or bent.

3.4.3 Current carrying parts. Where specified, all current carrying parts shall be plated as specified on the individual specification sheet.

3.4.4 Contact strips. Contact strips shall be a minimum of 0.060 inch thick brass.

3.4.5 Metal parts. Metal parts shall be of brass or copper alloy except as otherwise specified on the specification sheet.

3.4.6 Screws. Screws shall be secured with locking devices or methods to prevent loosening or removal.

3.4.7 Shells. Unless otherwise specified on the specification sheet, material for shells shall be brass or copper.

3.4.8 Shock. The lampholders and starter sockets shall withstand the grade A, class II, shock test of MIL-S-901 without breakage (except lamps), damage or loosening of lamps or other parts when subjected to the test of 4.5.2.1.

3.4.9 Vibration. The lampholders and starter sockets shall withstand the Type I vibration test of MIL-STD-167-1 without breakage (except lamps), damage or loosening of lamps or other parts (see 4.5.2.2).

3.4.10 Heat. Heat tests shall be conducted as specified on the individual specification sheets and as specified in 4.5.3. The lampholders and starter sockets shall not burn, char, deteriorate, become inoperable.

3.4.11 Strength. The screw shell of the screw type lampholders shall not turn, pull out, become loose or distort in the lampholder, and the connection of a wire lead to the current carrying parts shall not rupture when subjected to the test of 4.5.4.

3.4.12 Torque. The screw shell of the screw shell type lampholders, shall not turn, pull out, become loose or distort in the lampholder when subjected to the test of 4.5.5.

3.4.13 Dielectric strength. There shall be no evidence of breakdown when the lampholders and starter sockets are subjected to the dielectric test specified in 4.5.6.

3.4.14 Insulation resistance. The insulation resistance between all current-carrying parts and between all current-carrying and non-current-carrying parts shall be not less than 100 megohms when tested as received at an ambient temperature of approximately 20 degrees Celsius ( $^{\circ}\text{C}$ ) (see 4.5.7).

3.4.15 Creepage, clearances, and spacing. Creepage, clearance and spacing between current carrying parts and between current carrying parts and ground shall be as specified in the National Electric Code Handbook NFPA No. 70.

3.5 Identification. The lampholders shall be marked with the name, monogram, or initials of the prime manufacturer.

3.6 Workmanship. The lampholders and starter sockets, including all parts and accessories, shall have a smooth finish, smooth flash edges, be buffed smooth; fasteners shall not break, strip, fracture, become loose or bent; the shell shall not turn, pull out, become loose or distorted. The finish shall not blister, peel or chip. Parts shall show no breakage, damage, or loosening.

3.7 Technical data. The contractor shall prepare the following technical data in accordance with the data ordering documents included in the contract (see 6.1.2):

- (a) First article test report (see 4.2.3).

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## 4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract, 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 Inspection system. The inspection system which the contractor is required to maintain shall be in accordance with MIL-I-45208.

4.1.2 Classification of inspection. The methods of examination and testing shall fall within the following classifications:

- (a) First article inspection (see 4.2).
- (b) Quality Conformance (see 4.3).

4.2 First article inspection. The sample for first article inspection shall be subjected to the examination and the tests shown in table I.

TABLE I. First article inspection.

Test	Requirement paragraph	Test paragraph
Visual and dimensional examination	3.3 - 3.6	4.4
General operation	-----	4.5.1
Shock	3.4.8	4.5.2.1
Vibration	3.4.9	4.5.2.2
Strength	3.4.11	4.5.4
Torque	3.4.12	4.5.5
Dielectric strength	3.4.13	4.5.6
Insulation resistance	3.4.14	4.5.7
Heat (when applicable)	3.4.10	4.5.3

4.2.1 Government inspection. When the contract specifies the first article inspection to be performed by the Government, the supplier shall submit the first article sample to the Laboratory specified (see 6.1.1 and 6.4) for the performance of the first article inspection.

4.2.2 Contractor inspection. When the contract specifies that first article inspection be performed by the contractor, the contractor shall assure that the inspection will be witnessed and the test results will be verified by the Government inspector.

4.2.3 First article inspection report. For each procurement, the contractor (or the Government laboratory, see 4.2.1) shall submit to the contracting officer (see 6.2.1) for approval a complete report of all the first article inspection tests conducted. The first article inspection report shall be prepared in accordance with MIL-STD-831.

4.3 Quality conformance inspection. Quality conformance inspection shall consist of the following:

- (a) Examination and tests shown in table II.
- (b) Examination for preparation of delivery of 4.6.

TABLE II. Quality conformance inspection.

Inspection	Requirement paragraph	Test paragraph
Visual and dimensional examination	3.3, 3.6	4.4
General operation	----	4.5.1
Dielectric strength	3.4.13	4.5.6
Insulation resistance	3.4.14	4.5.7

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#### 4.3.1 Sampling for quality conformance inspection.

4.3.1.1 Lot. For the purpose of sampling, a lot shall be the number of identical items on the contract.

4.3.1.2 Sampling for visual and dimensional examination. Samples shall be selected at random from each lot in accordance with MIL-STD-105 at inspection level II for the examination of 4.4. The acceptable quality level (AQL) shall be 1.5 percent defective. Samples containing one or more defects shall not be offered for delivery, and if the number of nonconforming items in a sample exceeds the acceptance number for that sample, the lot represented by the sample shall not be offered for delivery.

4.3.1.3 Sampling for quality conformance tests. Samples shall be selected at random from each lot in accordance with MIL-STD-105 at inspection level S-2 for the quality conformance tests specified in 4.5. If any sample fails to conform to these tests, the sample and the lot represented thereby shall not be offered for delivery.

4.3.1.4 Sampling for examination for preparation of delivery. Samples shall be selected at random from each lot in accordance with MIL-STD-105 for the examination of 4.6. The level shall be level S-2, and the AQL shall be 4.0 expressed as defects per hundred units. Any deviation from the requirements specified shall be classified as a defect.

4.4 Visual and dimensional examination. The lampholders and starter sockets shall be subjected to a thorough visual and dimensional examination as specified in table III to determine that the materials, workmanship and design are in accordance with this specification.

TABLE III. Visual and dimensional examination.

Examination	Defect
Materials	Materials not as specified.
Stress relief	Stress relief process not adequate
Finish	Finish not as specified--finish blistered, peeled, chipped. Color not as specified.
Design and rating	Design and rating not as specified.
Flash	Flash not removed from molded parts. Edges not buffed smooth.
Dimensions	Dimensions not as specified.
Bolts, nuts, screws, inserts and other types of fasteners	Missing, broken, stripped, fractured, loose, or bent.
Clearances	Clearances not as specified.
Identification	Missing, incomplete, not legible.
Workmanship	Part missing--fractured, split, punctured, dented, deteriorated--Not in proper alignment, Sharp burrs or edges.

4.5 Test procedures. Underwriter's Laboratories Standards UL 496 and UL 542 may be used as a guide for test procedures.

4.5.1 General operation. General operation shall include all inspection and tests necessary to determine that the general service operation required of the lampholders and starter sockets have been fully complied with. This includes proper insertion, fit and operation of lamps and starters.

#### 4.5.2 Shock and vibration tests.

4.5.2.1 Shock. The lampholders and starter sockets shall conform to the requirements of 3.4.8 when subjected to the shock test of MIL-S-901. Breakage, damage, or loosening of any part shall constitute a failure. Breakage of the lamp will not be cause for rejection. The lamp shall not loosen.

4.5.2.2 Vibration. The lampholders and starter sockets shall conform to the requirements of 3.4.9 when subjected to the vibration test of MIL-STD-167-1. Breakage, damage or loosening of any part shall constitute a failure. Breakage of lamp will not be cause for rejection. The lamp shall not loosen.

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4.5.2.3 Mounting for shock and vibration. The lampholders and starter sockets shall be mounted on the shock and vibration machines and shall have lamps installed in lampholders, and starters installed in starter sockets. When lampholders and starter sockets are installed in lighting fixtures specified in MIL-F-16377 and the lighting fixtures are mounted on the shock and vibration machines, this mounting arrangement is also acceptable.

4.5.3 Heat. When specified on the specification sheet, the heat test shall be conducted in an ambient temperature of 96°C. The lampholders and starter sockets shall be installed in a proper heat chamber and shall have lamps or starters installed as applicable. The lampholders and starter sockets shall be operated at rated voltage for a period of 100 hours. This test shall be conducted prior to shock, vibration and electrical tests. Burning, charring, or deterioration of parts to the extent that the part is unreliable or not operable shall constitute failure.

4.5.4 Strength. When specified on the specification sheet, the lampholder shall be fastened in a vertical position and a plug shall be threaded into the screw shell of the screw-shell type lampholders or, a weight shall be attached to each of the wire leads on lampholders or starter sockets furnished with such leads. A weight shall be suspended vertically from the plug or lead. The lampholders shall then be subjected to a pull of 20 pounds for a period of 1 minute. The lampholder shall be examined to determine conformance with 3.4.11.

4.5.5 Torque. The screw-shell lampholders shall be secured in any position and a plug shall be threaded into the screw shell. A 20 inch-pound torque shall then be applied. The lampholder shall be examined to determine conformance with 3.4.12.

4.5.6 Dielectric strength. Lampholders shall be subjected, for 1 minute, to a dielectric test voltage whose effective potential is twice rated voltage plus 1000 volts (V) or as otherwise specified on the applicable specification sheet, applied between points of different polarity and also between live parts and ground. The frequency of the test voltage shall be 60-Hertz a.c., and shall approximate a true sine wave. For first article inspection this test shall be conducted before and after the shock and vibration tests specified in 4.5.2.

4.5.7 Insulation resistance. Insulation resistance shall be measured between all current-carrying parts and also between all current-carrying and noncurrent-carrying parts with a 500-V d.c. insulation resistance indicating instrument to determine conformance with 3.4.14. For first article inspection, this test shall be conducted before and after the shock and vibration tests specified in 4.5.2.

4.6 Examination of preparation for delivery. An examination shall be made to determine that preservation-packaging, packaging and marking as required by section 5 of this specification are complied with. Examination shall be in accordance with MIL-E-17555 for samples selected in accordance with 4.3.1.4.

## 5. PREPARATION FOR DELIVERY

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

5.1 Preservation-packaging, packing and marking. Lampholders and starter sockets shall be preserved-packaged level A or C, packed level A, B, or C and marked in accordance with MIL-E-17555, as specified (see 6.1.1).

## 6. NOTES

### 6.1 Ordering data.

#### 6.1.1 Procurement requirements. Procurement documents should specify the following:

- (a) Title, number and date of this specification.
- (b) Title, number date and part number of the applicable specification sheet (see 3.2).
- (c) Type of inspection required and designation of laboratory (see 4.2 and 6.1).
- (d) Preservation-packaging, packing, and marking requirements; if other than required by 5.1.

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6.1.1 Data requirements. When this specification is used in a procurement which incorporates a SI Form 1423 and invoke the provisions of 7-104.9(n) of the Armed Services Procurement Regulations, the data requirements identified below will be developed as specified by an approved Data Item Description (DD Form 1664) and delivered in accordance with the approved Contract Data Requirements List (DD Form 1423) incorporated into the contract. When the provisions of ASPP-7-104.9(n) are not invoked, the data specified below will be delivered by the contractor in accordance with the contract requirements. Deliverable data required by this specification is cited in the following paragraphs:

<u>Specification paragraph</u>	<u>Data requirement</u>	<u>Service</u>	<u>Applicable DID</u>
4.2.3	Report, First Article Inspection	SH	UDI-T-23450

(Copies of data item descriptions required by the contractors in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer).

6.2 First article. Invitations for bid should provide that the Government reserves the right to waive the requirement for samples for first article, as to those bidders offering a product which has been previously procured or tested by the Government, and that bidders offering such products who wish to rely on such production or test, must furnish evidence with the bid that prior Government approval is presently appropriate for the pending procurement.

6.2.1 Approval of first article inspection report. The Purchasing Contracting Officer (Naval Shipyards, Private Shipyards/Supervisor of Shipbuilding Conversion and Repair, Naval Ship Engineering Center field activities and Defense Supply Agencies) should, by written notice to the contractor, waive, approve, conditionally approve, or disapprove the first article inspection report. When it is deemed necessary, the Purchasing Contracting Officer should forward the first article inspection report to NAVSEC for resolution on acceptance or non-acceptance of marginal or nonconforming supplies.

6.3 Sub-contracted material and parts. The preparation for delivery requirements of referenced documents listed in Section 7 do not apply when material and parts are procured by the contractor for incorporation into the equipment and lose their separate identity when the equipment is shipped.

6.4 Government inspection. Unless otherwise directed by NAVSEC, Government inspection (see 4.2) should be performed at the Portsmouth Naval Shipyard, Equipment Testing Laboratory, Portsmouth, New Hampshire 03801.

6.4.1 The contractor may perform the first article inspection at laboratory specified in 6.4 at his own expense and risk. This action, however, neither constitutes an obligation by the Government to purchase nor authorizes the expenditure of Government funds.

6.4.2 Contractors and testing laboratories may contact NAVSEC before conducting tests to discuss technical details of testing if so desired.

6.5 NAVSEC. The word "NAVSEC" as used herein refers to the Naval Ship Engineering Center, Department of the Navy, Magnetic Defense, Propulsion and Batteries Branch, System Components Section, Washington, D.C. 20362.

6.6 Changes from previous issue. "I" are not used in this revision to identify changes with respect to the previous issue, due to the extensiveness of the changes.

Preparing activity  
Navy - SH  
(Project 6250-N125)





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