INCH-POUND

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MILITARY SPECIFICATION

LIGHTS, INDICATORS, PRESS TO TEST

This specification is approved for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers functional, self-testing, press to test indicator lights.

1.2 Classification. Light assemblies shall be of the following classes as specified (see 6.2).

Class 1 - Light, Indicator Press to Test, Small (MS25041-1 to -13).
Class 2 - Light Assembly, Press to Test Indicator (MS25331-1 to -0).

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in section 3, 4, or 5 of this standard. This section does not include documents cited in other sections of this standard or recommend for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements of documents cited in sections 3, 4, or 5 of this standard, whether or not they are listed.

2.2 Government documents.

2.2.1 Specifications, standards, and handbooks. The following specifications and standards form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

DEPARTMENT OF DEFENSE SPECIFICATIONS

MIL-A-8625	Anodic Coating for Aluminum and Aluminum Alloys
MIL-DTL-6363/8	Lamps, Incandescent, Aircraft Service, Single Contact Midget Flanged Base T-1-3/4 Bulb.

Comments, suggestions, or questions on this document should be addressed to Defense Supply Center Philadelphia (DSCP), ATTN: DSCP-NASA, 700 Robbins Avenue, Philadelphia, PA 19111-5096 or e-mail to dscpg&inspecomments@dla.mil. Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at http://assist.daps.dla.mil.

DEPARTMENT OF DEFENSE STANDARDS

MIL-STD-130	Identification Marking of U.S. Military Property
MIL-STD-810	Environmental Engineering Considerations and Laboratory Tests
MIL-STD-889	Dissimilar Metals
MS25041	Light, Indicator, Press to test, Small
MS25231	Lamp, Incandescent, Center Contact, Miniature Bayonet Base (T-3-1/4 Bulb)
MS25331	Light Assembly, Press to Test Indicator

(Copies of these documents are available online at http://assist.daps.dla.mil/quicksearch/ or from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

2.3 Non-Government publications. The following documents form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

SOCIETY OF AUTOMOTIVE ENGINEERS (SAE)

SAE AS25050	Colors, Aeronautical lights and Lighting Equipment, General Requirements for

(Copies of this document are available from www.sae.org or the Society of Automotive Engineers, Inc., 400 Commonwealth Drive, Warrendale, PA 15096-0001.)

2.4 Order of precedence. In the event of a conflict between the text of this document and the reference cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 MS sheets. The individual item requirements shall be as specified herein and in accordance with the applicable MS sheet. In the event of any conflict between the requirements of this specification and the MS sheet, the latter shall govern.

3.2 First article. When specified (see 6.2), a sample shall be subjected to first article inspection in accordance with 4.3.

3.3 Selection of specifications and standards. Specifications and standards for necessary commodities and services not specified herein shall be selected as specified in 3.4.1.

3.4 Materials. Materials shall be as specified herein. However, when a definitive material has not been specified, a material shall be chosen of the quality used for the purpose in good commercial practice. Materials shall be free from all defects and imperfections that might otherwise affect the serviceability of the finished product.

3.4.1 Commercial parts. Commercial (non-standard) parts having suitable properties may be used where, on the date of invitation for bids, there are no suitable standard parts. In any case, commercial utility parts such as screws, bolts, nuts, washers, cotter pins, etc., having suitable properties may be used provided:

a. They can be replaced by the standard parts (AN, MS, or NAS) without alteration.
b. The corresponding standard part numbers are referenced in the parts list and on the contractors drawings.

3.4.2 Fungus proof materials. Materials that are nutrients for fungi shall not be used where it is practical to avoid them. Where used and not hermetically sealed, they shall be treated with a fungicide agent acceptable to the procuring activity. However, if they will be used in a hermetically sealed enclosure, fungicide treatment will not be necessary.

3.4.3 Metals. Metals shall be corrosion resistant or treated to resist corrosion caused by fuels, salt spray, or atmospheric conditions as may be encountered in storage or normal service usage.

3.4.3.1 Dissimilar metals. Dissimilar metals as defined by MIL-STD-889, shall not be used in intimate contact with each other unless adequately protected against galvanic corrosion.

3.4.4 Recycled, recovered, or environmentally preferable materials. Recycled, recovered, or environmentally preferable materials should be used to the maximum extent possible, provided that the material meets or exceeds the operational and maintenance requirements, and promotes economically advantageous life cycle costs.

3.5 Design and construction. The light assemblies with or without the dimming feature shall be designed and constructed in accordance with MS25041 or MS25331, as applicable.

3.5.1 Mounting. The light assemblies shall be mountable on panels up to .375 inch thick.

3.5.2 Lamp. The light assemblies shall be designed to use a MS2523I-313S (28 Vdc) lamp having a length of 1.088 inches or a MS25237-327 (28 Vdc) lamp, as applicable. Unless otherwise specified, the lamp shall not be included.

3.5.3 Dimming. The design of the dimming feature shall be such that when the cap is turned to the full dim position a small diffused ring of light will be emitted through the lens.

3.5.4 Reliability. The light assemblies shall be so designed as to provide reliable operation throughout its normal life under all of the specified conditions.

3.5.5 Circuit. The circuits in each of the light assemblies shall be designed so that the indicating circuit will be open before and during the time that the test circuit is closed and the test circuit shall be open before and during the time that the indicating circuit is closed.

3.5.6 Insulation. The light assemblies shall be so constructed as to provide an insulating factor between the terminals and the shell. The light assemblies shall incorporate an inner sheath of sufficient length so that when the lamp (or lamp holding shell in the case of MS25041 lights) is inserted and removed, a short circuit between the exterior shell and the lamp socket cannot be made.

3.5.7 Filters. The light assemblies shall be furnished with glass or plastic filters of the color specified (see 6.2*).*

3.5.7.1 Colors. The colors specified (see 6.2) shall meet the requirements for identification colors as specified in SAE-AS25050, except that for red, the minimum transmittance shall be .07 when tested with a light source having a color temperature of 2,355 °K.

3.5.8 Weight. Each light assembly shall not exceed .04 pounds for assemblies included on MS25041 and .06 pounds for assemblies included on MS25331.

3.5.9 Finishes and protective coatings.

3.5.9.1 Finish. The aluminum or aluminum-alloy parts of the light assembly shall have an anodized finish in accordance with MIL-A-8625.

3.5.9.2 Locknut and cover. The visible locknut and cover shall have a dull black finish.

3.5.9.3 Terminal strips. The terminal strips shall be tinned.

3.6 Performance. The light assemblies shall be capable of operating satisfactorily under the following conditions when tested as specified (see 4.5).

3.6.1 Environmental. The light assemblies shall perform satisfactorily when subjected to the following environmental conditions specified in MIL-STD-810.

3.6.1.1 Fungus. After extended, non-operating exposure to fungus conditions, the light assemblies shall be capable of satisfactory operation to determine conformance to the specified test procedure (see 4.5.2.1).

3.6.1.2 Humidity. After extended, non-operating exposure to a hot relative humidity up to 100 percent, including conditions wherein condensation takes place in the form of both water and frost, the light assemblies shall be capable of satisfactory operation to determine conformance to the specified test procedure (see 4.5.2.2).

3.6.1.3 Salt fog. After extended, non-operating exposure to salt fog atmospheric conditions such as those encountered in areas of high saline content, the light assemblies shall be capable of satisfactory operation to determine conformance to the specified test procedure (see 4.5.2.3).

3.6.1.4 Altitude. After completion of the specified test procedure, remaining under test conditions, the light assemblies shall be capable of satisfactory operation as specified (see 4.5.2.4).

3.6.1.5 Low temperature. After non-operating exposure to the specified low temperature test procedure, the light assemblies shall be capable of satisfactory operation as specified (see 4.5.2.5).

3.6.1.6 High temperature. After completion of the specified test procedure, the light assemblies shall be capable of operating for a minimum of four (4) hours at the specified high temperature (see 4.5.2.6).

3.6.1.7 Sand and dust. After extended, non-operating exposure to sand and dust conditions such as those encountered in desert areas, the light assemblies shall be capable of satisfactory operation to determine conformance to the specified test procedure (see 4.5.2.7).

3.6.1.8 Vibration. After extended, non-operating exposure to vibration conditions such as those encountered in off-road vehicle use, shipboard, or normal aircraft service, the light assemblies shall be capable of satisfactory operation to determine conformance to the specified test procedure (see 4.5.2.8).

3.6.2 Pressure resistance. The light assemblies mounted on a suitable panel shall operate satisfactorily after being subjected to a pressure of 200 pounds as specified (see 4.5.3).

3.6.3 Press to test operation. The light assembly shall be such that when tested by pressing on the cap of the assembly, thereby closing the circuit, the lamp shall light indicating the circuit is operative. When pressure is released, the test circuit to the lamp shall be opened and the cap shall be returned to its normal position. The light assembly, excluding lamp, shall be capable of withstanding the required cycles when tested as specified (see 4.5.4).

3.6.4 Shutter operation. The light assembly shutter shall be capable of operation for 5000 cycles when tested as specified (see 4.5.5).

3.6.5 Dielectric insulation. The light assemblies shall be insulated so that terminals are isolated from the exterior shell. The light assemblies shall incorporate an insulating inner sheath of sufficient length so that when the lamp (or lamp holding shell in the case of MS25041 lights) is inserted and removed, a short circuit between the exterior shell and the lamp socket cannot be made when tested as specified (see 4.5.6).

3.7 Identification of product. Unless otherwise specified on the detail specification or MS sheet, all items shall be marked for identification in accordance with MIL-STD-130. Markings shall be clear, legible, and durable (see 4.5.1).

3.7.1 Specification reference number. The specification reference number shall be the MS sheet part number and used as part of the MIL-STD-130 identification on the product if it is large enough and on the immediate exterior container if it is too small.

3.8 Anti-counterfeiting protection. When it has been determined that the Item is susceptible to be counterfeited by either alteration, duplication, or simulation, the product shall be protected in such a manner as to allow it to be traced to the true manufacturer and authenticated as their product. The manner of this protection shall be proprietary to the true manufacturer and released only to the final procuring activities quality assurance department by secure means.

3.9 Workmanship. Each item, including all parts and accessories, shall be fabricated and finished, free of blemishes and defects which will adversely affect its life, form, fit, or function. All soldering, welding, brazing. grinding, cuts, shall be accurate and clean. All edges, comers, and exterior hardware shall be free from burrs, sharp edges, corrosion, or any other defect which would affect the safety of personnel handling the product (see 4.5.1).

4. VERIFICATION

4.1 Classification of inspections. The inspection requirements specified herein are classified as follows:

a. First article inspection (see 4.3).
b. Conformance inspection (see 4.4).

4.2 Inspection conditions. Unless otherwise specified (see 6.2) all inspections shall be performed in accordance with the applicable test conditions specified in MIL-STD-810.

4.3 First article inspection. First article inspection shall be performed at a laboratory acceptable to the procuring activity (see 6.3), on sample items produced with equipment and procedures normally used in production.

4.3.1 First article sample. The First article test sample shall consist of five (5) light assemblies. The test samples shall be marked with the manufacturer's own part number and shall be subjected to and pass all the inspections of section 4.

4.3.2 Failures.

4.3.2.1 Test sample failures. If one or more sample units fail to pass the inspection, the sample shall be considered to have failed. The procuring activity shall be notified when an unrelated failure occurs and reserve items are used, prior to the continuance of testing. Lamp failure not caused by a malfunction of the assemblies shall not be cause for rejection.

4.4 CONFORMANCE INSPECTION.

4.4.1 Sampling. Sampling from each lot for examination and inspection shall be established by the procuring activity.

4.4.1.1 Inspection lot. All items of the same type, class, and size offered for delivery at one time, from one manufacturer and from one plant location, shall be considered a lot for purposes of inspection.

4.4.2 Examination. The samples selected in accordance with 4.5.1 shall be examined for compliance with the requirements specified in section 3 of this specification.

4.4.3 Inspections. Conformance inspections shall consist of all the inspections specified in 4.5. Presence of one or more defects shall be cause for rejection.

4.4.4 Noncompliance. If a sample fails to pass the inspection, the manufacturer shall notify the procuring activity and the cognizant inspection activity of such failure and take corrective action on the materials or processes, or both, as warranted, and on all units of the product which can be corrected and which were manufactured with essentially the same materials and processes, and which are considered subject to the same failure. Acceptance and shipment of the product shall be discontinued until corrective action, acceptable to the procuring activity has been taken. After corrective action has been taken the inspections shall be repeated on additional sample units (all tests and examinations, or the test which the original sample failed, at the option of the procuring activity). Complete inspections may be reinstituted; however, final acceptance and shipment shall be withheld until the inspections have shown that the corrective action was successful. In the event of failure after reinspection, information concerning the failure shall be furnished to the cognizant inspection activity and the procuring activity.

4.4.5 Disposition of samples. Samples which have been subjected to the first article inspection shall not be delivered to the Government on contract or purchase order, unless a specific exception has been granted by the cognizant procuring activity.

4.5 TEST METHODS AND EXAMINATIONS.

4.5.1 Examination of product. Each light assembly shall be inspected or examined to determine compliance with the requirements specified herein with respect to design and construction, materials, markings, and workmanship.

4.5.1.1 Operation. The light assemblies shall be tested for operation by installing the specified lamp and applying the design voltage (28 Vdc) across the terminals. The press to test feature shall also be tested for operation. If the light has the dimmer feature, the dimmer shall also be tested for operation. Failure of any component (exclusive of the lamp) of the light assembly during the test shall be cause for rejection.

4.5.2 Environmental. The light assemblies shall be subjected to the following tests in accordance with the specified procedures of MIL-STD-810 and as specified herein. Upon completion of each test, any damage which would affect the operation or cause malfunction of the unit shall be cause for rejection. Unless otherwise specified the assemblies shall be mounted on a panel that will allow the indicator circuit to be energized to 28 Vdc for all tests.

4.5.2.1 Fungus. The light assemblies, non energized, shall be subjected to fungus in accordance with Method 508.5, MIL-STD-810. Evidence of excessive fungi growth or malfunctioning of the assemblies shall be cause for rejection.

4.5.2.2 Humidity. The light assemblies, non energized, shall be subjected to relative humidity of 100 percent, including conditions wherein condensation takes place in the form of both water and frost, in accordance with Method 507.4, MIL-STD-810, for a period of 10 cycles. Any loosening or deformation of parts or discoloration of the lens during this test shall be cause for rejection.

4.5.2.3 Salt fog, The Light assemblies, non energized, shall be subjected to salt fog for a period of 100 hours in accordance with Method 509.4, MIL-STD-810. Evidence of excessive corrosion or malfunctioning of the assemblies shall be cause for rejection.

4.5.2.4 Altitude. The light assemblies shall be subjected to altitude in accordance with Method 500.4, Procedure II, MIL-STD-810, except that the ambient temperature shall be -73°C and a pressure altitude ranging from 30 inches Hg down to 3.4 inches Hg (approximately an altitude of 70,000 feet). The assemblies shall be connected for operation on a 28 Vdc circuit, but shall not be energized during a soak period of not less than one (1) hour for stabilization of the temperature. After the soak period and at the required test conditions, the assemblies shall be cycled four (4) times with 5-minute on and 5-minute off periods.

4.5.2.5 Low temperature. The light assemblies, non energized, shall be subjected to basic cold temperature in accordance with Method 502.4, Procedures I & II, MIL-STD-810, except that the temperature attained during the initial soak period shall be -73°C.

4.5.2.6 High temperature. The light assemblies, energized, shall be subjected to three (3) basic hot temperature cycles in accordance with Method 501.4, Procedure II, MIL-STD-810, except that the maximum temperature for each cycle shall be +71°C. The light assemblies shall then be operated for a period of four (4) hours. Any damage or discoloration of the lens as a result of this test shall be cause for rejection.

4.5.2.7 Sand and dust. The light assemblies, non energized shall be subjected to 24 hours of sand and dust in accordance with Method 510.4, Procedure I, MIL-STD-810. Each assembly shall be so located that the sand and dust does not impinge directly on it. Any damage which causes a malfunction of the assemblies shall be cause for rejection.

4.5.2.8 Vibration. The light assemblies, non energized, shall be subjected to vibration in accordance with Method 514.5, Procedure I, MIL-STD-810. Any damage which causes a malfunction of the assemblies shall be cause for rejection. Any failure of the lamp which is not caused by a malfunction of the assembly is not cause for rejection.

4.5.3 Pressure resistance. One (1) light assembly, non energized, shall be separately mounted on a suitable panel and a force of 200 pounds applied to the dimmer cover. Evidence that the phenolic base housed in the barrel has been forced out or that the assembly has been damaged or malfunctions shall be cause for rejection.

4.5.4 Press to test operation. The light assemblies, non energized, shall have a 30 pound force applied to the lens cap in the normal direction of operation of the test sequence for a total of 3,000 cycles. The force shall be applied gradually and at a rate not to exceed 10 times per minute. Evidence of damage or malfunction of the assembly shall be cause for rejection.

4.5.5 Shutter. The dimmer light assemblies, energized, shall have the dimmer cover subjected to 5,000 cycles of operation from the extreme dim to the extreme bright positions. Failure of any component to complete the required number of cycles without breakage, exclusive of the lamp, shall be cause for rejection.

4.5.6 Dielectric insulation. The light assemblies shall be removed from the power circuit, have the lamp removed, and shall be subjected to the application of a 500 V rms, 60 cycle potential for one (1) minute between each terminal and the mounting plate and then between the terminals. Evidence of damage or malfunction of the assembly after this test shall be cause for rejection.

5. PACKAGING.

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When packaging of materiel is to be performed by DoD or in-house contractor personnel, these personnel need to contact the responsible packaging activity to ascertain packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activities within the Military Service or Defense Agency, or within the military service's system commands. Packaging data retrieval is available from then managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity

6. Notes.

(This section contains Information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended use. The light assemblies are intended for use as warning indicator lights to be used in conjunction with a component of an electrical system to indicate a functional operation.

6.2 Acquisition requirements. Acquisition documents should specify the following:

a. Title, number, and date of this specification.
b. Class and MS part number (see 1.2 and applicable MS sheet).
c. When lamps shall be furnished (see 3.5.2).
d. If first article samples are required (see 3.2).
e. Packaging requirements (see 5.1).

6.3 First article. When first article inspection is required, the contracting officer should provide specific guidance to offerers whether the first article (s) should be a preproduction sample, an initial production sample, a first production item or a standard production item from the contractor's current inventory; the number of samples to be inspected as specified in 4.3; and (when applicable) the specific tests to be performed on each sample. The contracting officer should also include specific instructions in acquisition documents regarding arrangements for examinations, approval of first article test results, and disposition of first articles. Invitations for bid should provide that the Government reserves the right to waive the requirement for samples for first article inspection to those bidders offering a product which has been previously acquired 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 contract. Bidders should not submit alternate bids unless specifically requested to do so in the solicitation.

6.4 Definition. For purposes of defining various types of defects or terminology which is referred to in this specification, the following definition will apply:

Amplitude - Amplitude is defined as the total movement measured from one extreme position to the opposite extreme position.

6.5 Subject term (key word) listing.

Indicator, light assembly
Light assembly, press to test
Light assembly, Indicator
Press to test light assembly
Dimmer light assembly

6.6 Changes from previous issue. Asterisks or vertical lines are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

Custodians:
Navy - AS
Army - CR4
Air Force - 99

Preparing activity:
DLA - IS

(Project 6210-2006-011)

Review activities:
Army - AR, AV, MI
Navy - SH

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change. You should verify the currency of the information above using the ASSIST online database at http://assist.daps.dla.mil.