MIL-L-6273D

9 November 1983
SUPERSEDING
MIL-L-6273C (ASG)
29 May 1967

MILITARY SPECIFICATION

LIGHT, NAVIGATIONAL, BEACON, OBSTACLE FOR CODE, TYPE G-1

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

1. SCOPE

1.1 Scope. This specification covers one type of 300-millimeter, fresnel lensed, obstacle or code, beacon navigational light, designed type G-1.

2. APPLICABLE DOCUMENTS

2.1 Government documents.

*2.1.1 Specifications and standards. Unless otherwise specified (see 6.2), the following specifications and standards of the issue listed in that issue of the Department of Defense Index of Specifications and Standards (DoDISS) specified in the solicitation, form a part of this specification to the extent specified herein.

SPECIFICATIONS

FEDERAL

PPP-B-601	Boxes, Wood, Cleated-Plywood
PPP-B-636	Boxes, Shipping, Fiberboard

MILITARY

MIL-P-116	Preservation, Methods Of
MIL-T-704	Treatment And Painting of Material
MIL-C-7989	Cover, Light-Transmitting, For Aeronautical Lights, General Specification For
MIL-C-25050	Color, Aeronautical Lights And Lighting Equipment, General Requirements for

STANDARDS

FEDERAL

FED-STD-595	Colors

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: the Engineering Division, San Antonio Air Logistics Center, Kelly AFB, Texas 78241 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

MILITARY

DOD-STD-100	Engineering Drawing Practices
MIL-STD-129	Marking for Shipment And Storage
MIL-STD-130	Identification Marking of US Military Property
MIL-STD-143	Standards and Specifications, Order OF Precedence For The Selection Of
MIL-STD-810	Environmental Test Methods
MIL-STD-831	Test Reports, Preparation Of
MIL-STD-1186	Cushioning, Anchoring, Bracing, Blocking, And Waterproofing, With Appropriate Test Methods

* (Copies of specifications and standards required by manufacturers in connection with specified acquisition functions should be obtained form the contracting activity or as directed by the contracting officer.)

2.1.2 Other publications. The following document(s) form a part of this specification to the extent specified herein. The issues of the documents which are indicated as DoD adopted shall be the issue listed in the current DoDISS and the supplement thereto, if applicable.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 3951-82	Packaging, Commercial

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

*2.1.3 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein, the text of this specification shall take precedence.

3. REQUIREMENTS

*3.1 First article. This specification makes provisions for first article inspection (see 4.3).

3.2 Selection of specifications and standards. Specifications and standards for necessary commodities and services not specified herein shall be selected in accordance with MIL-STD-143.

3.3 Materials.

3.3.1 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 fungicidal agent acceptable to the procuring activity. However, if they will be used in a hermetically sealed enclosure, fungicidal treatment will not be necessary.

3.3.2 Metals. Metals shall be of the corrosion-resistant type or treated to resist corrosion due to fuels, salt spray, or atmospheric conditions likely to be encountered in storage or normal service.

*3.3.3 Reclaimed materials. Reclaimed materials shall be used to the maximum extent possible without jeopardizing the intended use of the item.

3.4 Design and construction. The light shall be so designed and constructed that no parts will work loose in service. It shall be built to withstand the strains, jars, vibrations, and other conditions incident to shipping, storage, installation, and service. The light shall be so constructed that adjustments and repairs can be easily made by personnel of operating units and overhaul bases with tools normally available commercially. The light shall be so designed that weight is held to the minimum consistent with the necessary strength and rigidity.

3.4.1 General arrangement. The light shall be essentially in accordance with Figure 1. It shall be designed to operate two lamps simultaneously, one in the upper section with base up, and one in the lower section with base down. The light shall be provided with suitable filter holders which shall permit easy installation of the color filters specified. The design of the light shall be such that continuous operation will not cause the temperature to rise to values which will cause damage to any of its parts. If ventilation is used, all vent holes shall be screened with corrosion-resistant screen of not less than No. 16 mesh with a 38 percent to 48 percent open area.

3.4.2 Focus. The entire optical system shall be of the fixed prefocus type requiring no focusing at installation or in service.

3.4.3 Lens. The upper lens and lower lens shall each consist of a 300-millimeter cylindrical lens. Each may be a single unit or in two horizontally divided sections. The glass shall be type 1, grade D, aviation white conforming to MIL-C-25050.

3.4.4 Lens frame. A hinged lens frame, fabricated from a nonferrous metal or from a ferrous metal protected to prevent corrosion, shall be provided between the upper and lower lens to permit the light to be opened at the midpoint for relamping and installation of filters. The hinge between the two frames shall be of sufficient strength to hold the upper lens when the unit is opened. The hinge shall be equipped with a stop to prevent the upper lens from being opened more than approximately 100 degrees. A method shall be provided for securely holding the upper and lower sections together when closed. Loops shall be so provided on the frame so that when closed it can be locked by means of a padlock. A weatherproof seal shall be provided between the upper and lower sections to prevent water leakage. Each frame shall be equipped with holders for holding the color filters shown on Figure 2. The filter holders shall be padded to prevent breakage of the filters due to expansion caused by heat from the lamps. The filter holders shall be so located that spilled light will be reduced to a minimum.

3.4.5 Braces. Not more than three vertical braces or support bars shall be used in each section of the light The braces shall be equally spaced and so arranged that the resultant dark spots of one section are offset from the dark spots of the other section.

3.4.6 Base. The base of the light shall be cast or fabricated from a nonferrous metal or a ferrous metal protected to prevent corrosion. The upper flange of the base shall serve as the lower lens frame. Screened drain holes shall be incorporated in the base. The screen shall be corrosion-resistant and of not less than No. 16 mesh. A watertight bushing box of a size that will accommodate the power supply cable shall be provided in the side of the base. The bushing box shall be attached to the assembly through a 3/4 inch standard conduit tapped hole to permit removal of the box and installation of a 3/4 inch conduit, if desired. The base shall also house the lower lamp socket and terminal block. The lower flange on the base shall be provided with four 13/16 inch diameter holes located 90 degrees apart on a 13 1/4 inch diameter circle.

3.4.7 Cap. The cap shall be fabricated from a nonferrous metal or a ferrous metal protected to prevent corrosion. The upper lamp socket shall be housed in the cap. The lower flange of the cap shall act as the upper lens frame.

3.4.8 Socket. The lamp socket shall be of the mogul prefocused type. It shall be manufactured of glazed porcelain and of nonferrous, corrosion-resistant metal. The design shall be such that the lamps will be located in the proper position in the light without use of socket extensions and with a minimum freedom of motion. The

light shall be so designed that the specified 620W lamps shall be correctly focused in the top and bottom sections without the use of shims or adapters under the sockets. The conductors to the upper socket shall be located in the light in such a manner that they will not come into contact with the lamps. The insulation of the conductors shall be satisfactory for use at the high temperatures which may exist inside the light.

3.4.9 Lamp. The light shall be designed to utilize a 620W, 120V, PS-40 clear bulb, C-7A filament, 10,000 lumen, 5-11/16 inch light center length, 10-1/16 inch maximum overall length, 3,000-hour life lamp in both the top and bottom sections. Unless otherwise specified (see 6.2), the lamp shall not be furnished with the light.

3.4.10 Filters. When specified (see 6.2), filters shall be furnished with the light. The filters shall be of class B, heat-resistant glass in accordance with MIL-C-7989. The color specified (see 6.2) shall be type I, grade C in accordance with MIL-C-25050. Each filter shall be in accordance with figure 2.

3.4.11 Insulation. All electrical wiring shall be fully insulated from the light housing. The insulation shall be such that it will withstand, at room temperature, a 1,000V, 60 hertz root mean square potential between the conductors of the electrical circuit and between the conductor and ground, for 1 minute without failure.

3.5 Performance.

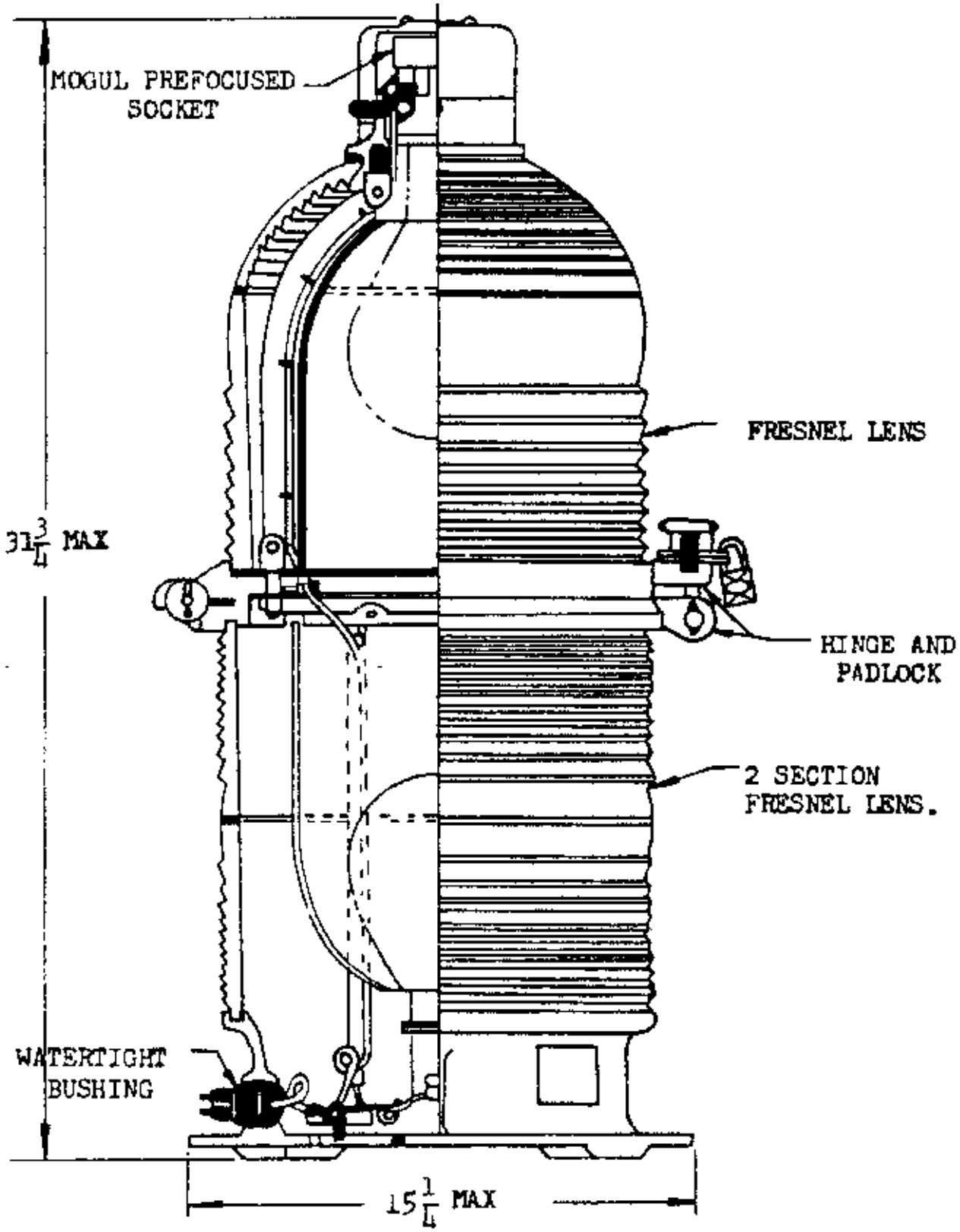
3.5.1 Photometric. The light shall emit light from the horizontal to the zenith through the entire 360-degree horizontal area around the unit. The main beam, when the light is equipped with the specified lamps, shall be at an angle of 3 degrees above the horizontal when either upper or lower lamp is operated.

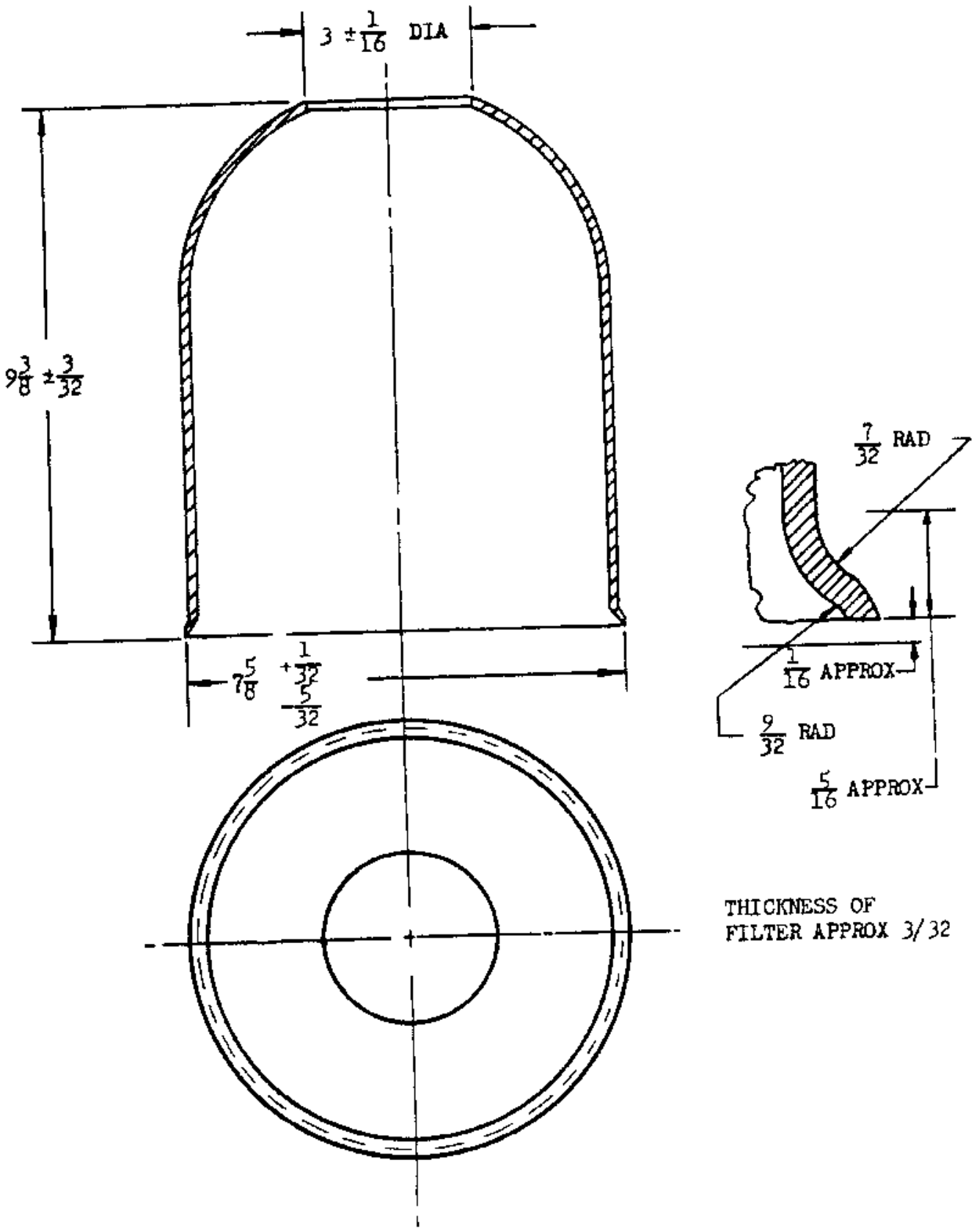
3.5.1.1 Clear (white) lights. The light distribution from both the upper and lower sections of the light assembly shall equal or exceed the values shown on figures 3 and 4. The minimum values shown thereon shall apply to the respective section when the light is provided with a single specified 620W lamp operating at, or corrected to, 10,000 lumens. If the vertical distribution curve for a section, when tested, conforms to the requirements of figure 4, except for the location of the curve, a 1-degree tolerance will be permitted; that is, if shifting the specification curve 1 degree either way, with reference to the test curve, will make the test curve meet all other requirements of the specification curve, the light will be acceptable.

3.5.1.2 Colored lights. Colored lights shall be obtained by adding two color filters to white lights. When filters are installed, all the requirements for white lights shall apply, except that the minimum candlepower values shall be multiplied by the transmission factors specified in table I.

TABLE I. Transmission factors.

Color	Factors
White	1.00
Yellow	0.40
Green	0.15
Red	0.13





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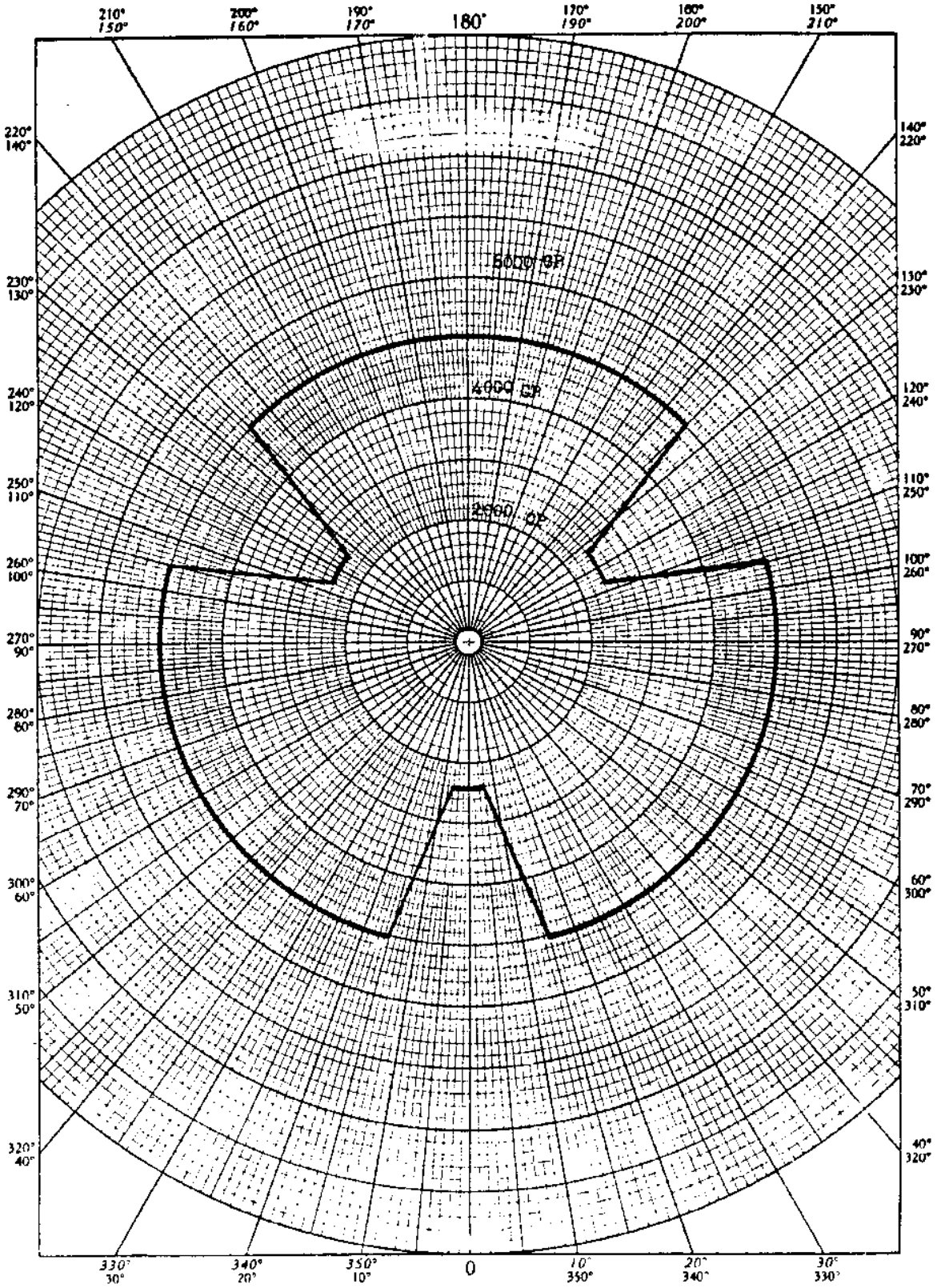

Figure 3. Horizontal distribution at a vertical angle of 3°

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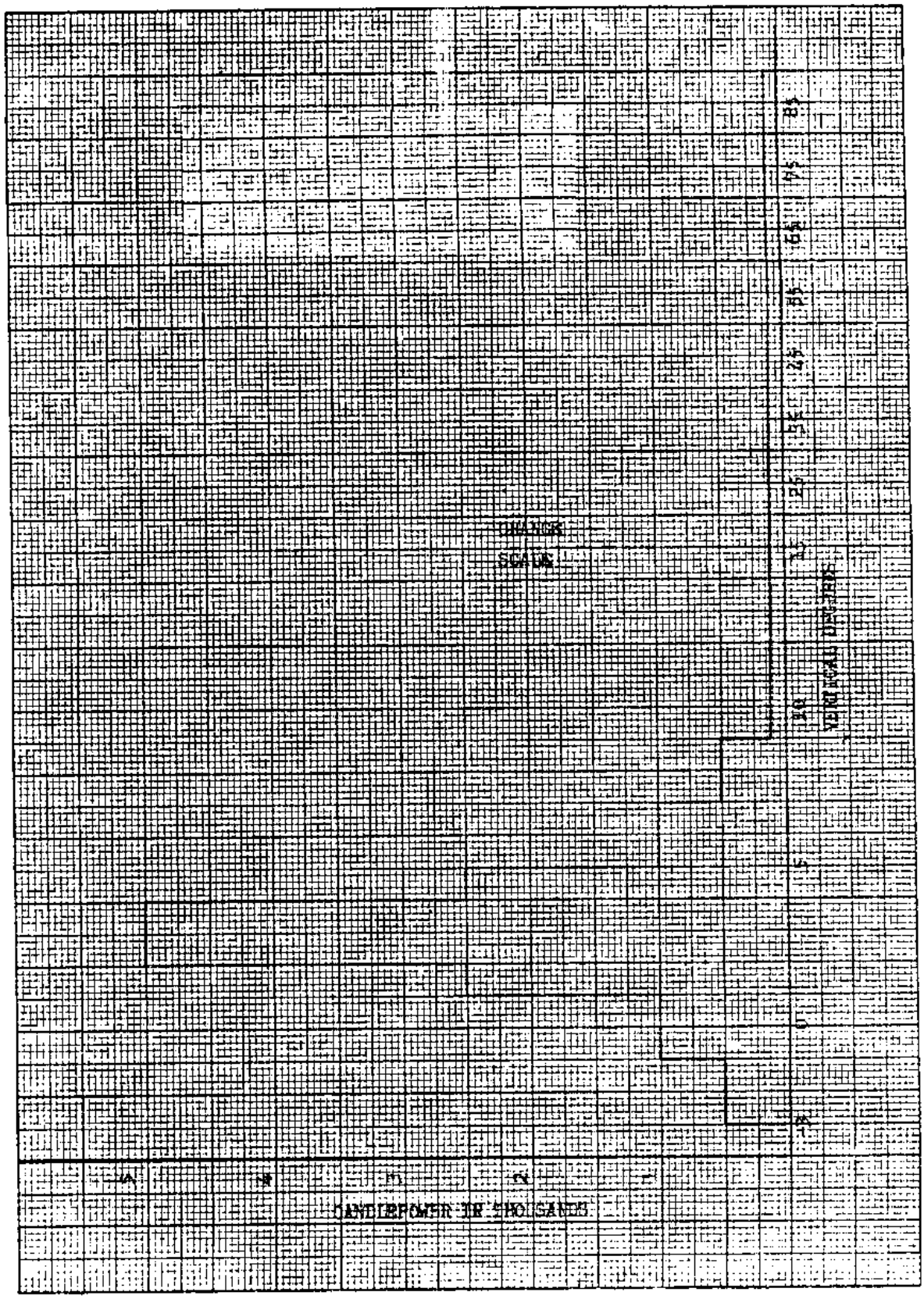

3.5.2 Environmental. The light shall be capable of continuous outdoor duty under all weather conditions and shall operate satisfactorily when subjected to the following environmental conditions:

(a) Temperatures up to +/- 55 deg. C
(b) Rainfall as encountered in any locale

3.6 Part number of interchangeable parts. All parts having the same manufacturer's part number shall be functionally and dimensionally interchangeable. The item identification and part number requirements of DOD-STD-100 shall govern the manufacturer's part number and changes thereto.

3.7 Weight. The weight of the light, without lamps or filters, shall be not more than 65 pounds.

3.8 Finishes and protective coatings. The outside of the light except for the lens shall be finished in accordance with MIL-T-704, type C. The color shall be yellow, color No. 23655, in accordance with FED-STD-595. All paint and finishes used shall be suitable for the operating temperatures involved.

3.9 Operational markings.

3.9.1 Instructions and wiring diagram. Brief instructions for installation, operation, and maintenance, together with a wiring diagram, shall be permanently and legibly mounted on the light.

3.10 Identification of product. Equipment, assemblies, and parts shall be marked for identification in accordance with MIL-STD-130.

3.11 Workmanship. The light, including all parts and accessories, shall be constructed and finished in a thoroughly workmanlike manner. Particular attention shall be given to neatness and thoroughness of soldering, wiring, marking of parts and assemblies, welding and brazing, painting, riveting, machine-screw assemblies, and freedom of parts from burrs and sharp edges.

3.11.1 Dimensions and tolerances. Dimensions and tolerances not specified shall be as close as is consistent with the best shop practices. Where dimensions and tolerances may affect the interchangeability, operation, or performance of the light, they shall be held or limited accordingly.

3.11.2 Screw assemblies. Assembly screws or bolts shall be tight. The word "tight" means that the screw or bolt cannot be appreciably tightened further without damage or injury to the screw, bolt, or threads.

3.11.3 Riveting. Riveting operations shall be carefully performed to insure that the rivets are tight and satisfactorily headed.

3.11.4 Cleaning. The light shall be thoroughly cleaned of loose, spattered, or excess solder, metal chips, and other foreign material, after final assembly. Burrs and sharp edges, as well as resin flash that may crumble, shall be removed.

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.

*4.2 Classification of inspections. The examination and testing of the light shall be classified as follows:

(a) First article inspection (see 4.3)
(b) Quality conformance inspection (see 4.4)

4.3 First article inspections. First article inspection shall consist of the examination and tests specified under 4.5.

4.3.1 First article test sample tested by the contractor. Unless otherwise specified (see 6.2), the contractor shall subject one complete white light and two filters of each color, representative of the production items, to the first article inspection.

4.3.2 First article test report. After the contractor completes the first article inspection, he shall prepare a test report in accordance with MIL-STD-831.

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

(a) Individual tests (see 4.4.1)
(b) Sampling plan and test (see 4.4.2)

4.4.1 Individual tests. Each light shall be subjected to the following:

(a) Examination of product (see 4.5.1)
(b) Operation (see 4.5.2)

4.4.2 Sampling plan and tests.

4.4.2.1 Lot. A lot shall consist of lights manufactured under essentially the same conditions and submitted for inspection at substantially the same time.

4.4.2.2.1 Rejection and retest. When one or more items form a lot fails to meet the specification, acceptance of all items in the lot shall be withheld until the extent and cause of failure have been determined. The contractor shall explain fully to the Government representative the cause of failure and the action taken to preclude recurrence. After correction, all of the sampling tests shall be repeated.

4.4.2.2.2 Individual tests may continue. for production reasons, individual tests may be continued pending the investigation of a sampling test failure. Final

acceptance of the entire lot shall not be made until it is determined that all items meet the requirements of this specification.

4.4.3 Defects in lights already accepted. If investigation of a test failure indicates that defects may exist in lights already accepted, the contractor shall fully advise the procuring activity of all defects likely to be found and the method of correcting them.

4.5 Inspection methods.

4.5.1 Examination of product. The light and color filters shall be inspected to determine compliance with the requirements specified herein with respect to materials and workmanship.

4.5.2 Operation. The light shall be completely assembled and operated. It shall be inspected to determine proper operation.

4.5.3 Photometric. Photometric tests shall be performed to determine compliance with light distribution and color requirements of 3.5.1. All parts shall reach normal operating temperatures before any readings are taken.

4.5.4 Environmental. The light shall be subjected to the following tests, performed in accordance with MIL-STD-810, to determine proper operation and lack of damage. No damage that would affect proper operation of the light shall result from these tests.

4.5.4.1 High temperature. The light shall be subjected to high temperature in accordance with Method 501, Procedure I, except with a temperature of 55 deg. +/- 2 deg. C for a period of 7 hours, with both lights operating at rated voltage and with green filters installed. Abnormal bulb blackening, blistering, smoking, or other evidence of heat damage of any part shall be cause for rejection.

4.5.4.2 Rain. The light shall be subjected to rain in accordance with Method 506, Procedure I, except that the light shall be operated in the rain chamber for at least 6 hours, with alternate periods of 30 minutes ON and 30 minutes OFF. During the ON period, the light shall be operated at rated current.

4.5.5 Thermal shock. The light, with green color filters and two 620W lamps installed, shall be operated at rated voltage at room temperature for a period of 3 hours, after which the light shall be immediately splashed with water at 10 deg. +/- 2 deg. C. Any breakage or cracking shall be cause for rejection.

4.6 Examination of preparation for delivery. Preparation for delivery shall be examined for conformance to section 5.

5. PACKAGING

5.1 Packaging. Packaging shall be level A or commercial as specified (see 6.2).

5.1.1 Level A. Each completely assembled light, with lens installed shall be packaged Method III in accordance with MIL-P-116. The unit container shall be the shipping container specified in 5.2. Each filter, when provided, shall be individually packaged Method III in accordance with MIL-P-116, in a container as specified in 5.2, and placed within the light unit container. Interior cushioning,

anchoring, bracing, and blocking shall be in accordance with MIL-STD-1186.

*5.1.2 Commercial. Each light and filter when provided shall be package in accordance with ASTM D 3951.

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

*5.2.1 Level A. Each light shall be packed in a shipping container conforming to PPP-B-601, style A or B overseas type. Filters when provided, shall be boxed in a fiberboard container conforming to PPP-B-636, style RSC, class weather resistant, and placed within the light shipping container. Container closure and strapping shall be in accordance with the applicable container appendix.

*5.2.2 Level B. Each light shall be packed in a shipping container conforming to PPP-B-601, style A or B domestic type. Filters when provided, shall be boxed in a fiberboard container conforming to PPP-B-636, Style RSC, class domestic, and placed within the light shipping container. Container closure and strapping shall be in accordance with the applicable container appendix.

*5.3.2 Commercial. Each light and filter when provided shall be packaged in accordance with ASTM D 3951.

*5.3 Marking. In addition to any special marking required by the contract or order, the unit packages and exterior shipping containers shall be marked in accordance with MIL-STD-129.

6. NOTES

6.1 Intended use. The type G-1 light is intended for use in flashing signals to aircraft in flight.

*6.2 Ordering data.

6.2.1 Acquisition requirements. Acquisition documents should specify the following:

(a) Title, number, and date of this specification.
(b) If filters are to be furnished with the light, and the color of filters desired (see 3.4.10).
(c) Selection of applicable levels of preservation, packaging, and packing (see 5.1 and 5.2).
(d) That rough handling tests in accordance with MIL-P-116 will be performed to determine adequacy of packaging, and packing.
* (e) Whether first article inspection and test report are required (see 4.3.1 and 4.3.2).
(f) Specify if lamps are to be furnished with lights (see 3.4.9).

*6.3 Changes from previous issue. The margins of this specification are marked with asterisks to indicate where changes (additions, modifications, corrections, deletions) from previous issue were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the last previous issue.

Custodians:
Navy - AS
Air Force - 99

Review activities:
Navy - YD
Air Force - 01, 11
DLA - GS

Preparing activity:
Air Force - 82

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