

Federal Aviation Agency



Repl. by 37C

AC NO : AC 150/5345-37B

AIRPORTS

EFFECTIVE :

1/8/68

SUBJECT : FAA SPECIFICATION L-850, LIGHT ASSEMBLY, AIRPORT RUNWAY CENTERLINE AND TOUCHDOWN ZONE

1. PURPOSE. This circular describes FAA Specification L-850, Light Assembly, Airport Runway Centerline and Touchdown Zone for the guidance of the public.
2. CANCELLATION. AC 150/5345-37A, FAA Specification L-850, Light Assembly, Airport Runway, Centerline, dated April 29, 1966, is cancelled.
3. DESCRIPTION OF SPECIFICATION. This equipment specification establishes the performance requirements and pertinent construction details for unidirectional and bidirectional semiflush inset light assemblies to be used for lighting airport runway touchdown zones and centerlines.
4. EXPLANATION OF REVISION.
 - a. A new unidirectional fixture for use as a touchdown zone light was added.
 - b. The vibration test was revised and a humidity test was added.
 - c. The section on environmental conditions was expanded to include humidity and the design requirements include fungus-proof materials.
5. HOW TO GET THIS CIRCULAR. Additional copies of this circular, AC 150/5345-37B, FAA Specification L-850, Light Assembly, Airport Runway Centerline and Touchdown Zone, may be obtained from the Department of Transportation, Distribution Unit, TAD-484.3, Washington, D.C. 20590.

William M. Flener
Acting Director
Airports Service

TABLE OF CONTENTS

	<u>Page No.</u>
1. Scope.	1
2. Applicable Documents.	1
3. Requirements.	2
4. Quality Assurance Provisions.	9
5. Preparation for Delivery.	14
APPENDIX 1. DRAWINGS (3 pages)	
Figure 1. Isocandela Curve for Minimum Output in White Light for Class A Top Assembly.	1
Figure 2. Isocandela Curve for Minimum Output in White Light for Class B Top Assembly.	2
Figure 3. Receptacle.	3

1. SCOPE. The equipment covered by this specification includes bidirectional and unidirectional semiflush inset light assemblies complete with a base receptacle. The light assembly is designed for mounting in a hole drilled in the runway pavement and is to be used for lighting airport runway centerlines and touchdown zones. Critical dimensions of the top assembly and base receptacles are specified to insure interchangeability of these two major components within types regardless of manufacturer. Two classes of top assemblies differing in photometric output and two types of base receptacles varying only in receptacle depth are covered by this specification. Either class of top assemblies designed to fit Type I base receptacles shall also fit Type II base receptacles.

Class A - Bidirectional light for use in centerlines

Class B - Unidirectional light for use in touchdown zones

Type I - Shallow Base Receptacle--2.75 Inches Deep

Type II - Deep Base Receptacle--8.25 Inches Deep

2. APPLICABLE DOCUMENTS. The following documents of the issue in effect on the date of application for qualification (paragraph 4a) form a part of this specification to the extent specified herein:

- a. Military Specifications. Copies of the following military specifications may be obtained from the Commanding Officer, Naval Supply Depot, 5801 Tabor Avenue, Philadelphia, Pennsylvania 19120, Attention: Code CDS:

- (1) MIL-C-7989, Covers, Light-Transmitting, for Aeronautical Lights, General Specification for
- (2) MIL-C-25050, Colors, Aeronautical Lights and Lighting Equipment, General Requirements for
- (3) MIL-E-5272, Environmental Testing, Aeronautical and Associated Equipment, General Specification for
- (4) MIL-P-26915 (USAF), Primer Coating, Zinc Dust Pigmented, for Steel Surfaces
- (5) MIL-STD-10, Surface Roughness Waviness and Lay
- (6) MS33586, Metals, Definition of Dissimilar

- b. Federal Specifications. Copies of the following Federal specifications may be obtained from the Business Service Centers of the General Services Administration Regional Offices:

- (1) QQ-Z-325, Zinc Coating, Electrodeposited, Requirements for
- (2) QQ-P-416, Plating, Cadmium (Electrodeposited)
- (3) ZZ-R-765, Rubber, Silicone, High and Low Temperature Resistant

3. REQUIREMENTS.

a. Performance Requirements.

- (1) Photometric Output. Class A and Class B top assemblies including the light source or lamp(s) shall be designed to meet the intensity distribution requirements shown in Figure 1 and Figure 2, respectively.
- (2) Lamp Rating. The lamp(s) used in either Class A or Class B top assemblies shall be series lamp(s) having a maximum total rating of 200 watts, having a rated life of at least 500 hours, and having a 6.6-ampere filament.
- (3) Power Requirements. In each class of top assembly, all current carrying parts requiring insulation shall be insulated for at least 600 volts and shall have a current carrying capacity of 1.5 times the normal operating current. The total input to the light assembly shall not exceed 220 watts.
- (4) Environmental Conditions. Each class and type of light assembly shall be capable of performing satisfactorily under the following conditions:
 - (a) Temperature. Temperature which ranges from +55°C. to -43°C. See paragraphs 4a(3) and 4a(5).
 - (b) Temperature Shock. Temperature shock as required in paragraph 4a(4).
 - (c) Humidity. Relative humidity up to 100 percent including conditions where condensation takes place in the form of both water and frost. See paragraph 4a(11).
 - (d) Vibration. Vibration as required in paragraph 4a(1).
 - (e) Static Load. Static load as required in paragraph 4a(9).

b. Design Requirements for Type I and Type II Light Assemblies.

- (1) Top Assembly. The metal components for each class of top assembly, excluding bolts, nuts, and washers which are specified elsewhere, shall be fabricated from metal having a minimum tensile strength of 50,000 p.s.i. and a minimum hardness of 163 Brinell. Pry bar slots, indentations, or other suitable provisions shall be made for prying or jacking the top assembly free of the base receptacle when the light assembly is installed in the pavement.
- (a) Dimensional Requirements. The principal critical dimensions of the top assembly shall be as listed in this paragraph and as shown in Figure 3. The outside diameter of the upper portion of the top assembly shall be 11.938 inches, ± 0.050 inch. At its outer diameter, the overall thickness of the flange portion that rests on the base flange shall be 0.75 inch, ± 0.05 inch.
- 1 The top assembly flange shall have a portion extending at least 1/4-inch down into the base receptacle to restrict side motion and resist shear action when the unit is struck. The diameter of this extension into the base receptacle shall be 9.935 inches ($+0.000$ inch, -0.020 inch). The protrusion into the base receptacle shall contain no fillet or other obstruction to prevent metal-to-metal seating of the bearing surface on the base receptacle. No part of the top assembly shall be more than 1.250 inches above the bearing surface of the flange.
- 2 All interfaces of the top assembly and base receptacle shall be machined to the same finish as shown in Figure 3. The flange of the upper portion of the top assembly shall have six bolt holes equally spaced 60 degrees apart on a bolt-hole diameter of 11.250 inches, ± 0.010 inch. The bolt holes shall each be 7/16-inch in diameter and shall not be tapped. The bolt holes shall be counterbored or recessed so that the resultant thickness of metal left between the bottom of the counterbored holes and the underneath flange surface is 0.400 inch, ± 0.015 inch. The counterbored holes shall be of sufficient diameter to permit easy removal of the bolts with a standard socket wrench. The light channel(s) shall be centered between the bolt holes. The light channels for the Class A top assembly shall be oriented so that the centers of the two light beams emitted are 180 degrees apart.

1/8/68

- 3 The external portion of the top surface extending above the pavement shall be smoothly sloped upward from the edges at angles not exceeding 10 degrees in the direction parallel to the light channel(s) and not exceeding 15 degrees in all other directions. These maximum slope angles shall not apply to the light channels, optical windows, and such indentations as bolt hole recesses.
- 4 The top assembly shall be provided with an external rib or other suitable means in the area of the lens(es) to mitigate damage to the head assembly due to action of snowplow blades and aircraft tailhooks.
- (b) Lamp Optical Assembly. The design of the top assembly shall be such that the entire top assembly, or the lamp(s) and optical parts of the unit, can be quickly and easily removed as an assembly or package for maintenance in a shop. A completely encapsulated or sealed lamp optical subassembly designed as a "throwaway" item or for rehabilitation by the manufacturer will be acceptable. Special tools shall not be required to remove and/or replace the optical assembly. The lamp(s) and optical assembly shall be so designed that consistent optical performance of the fixtures can be assured in accordance with the specification requirements. These performance requirements shall be obtained when any part of the installed assembly is replaced. Suitable holders shall be furnished for receiving color filters. Two terminal connections shall be provided for connecting the power supply leads to the top assembly.
- (c) Rubber Materials. Rubber, when used in the top assembly, shall be of silicone rubber suitable for the application.
- (d) Bolts, Studs, Nuts, and Washers. All bolts, studs, nuts, and washers, and other similar fasteners used in the top assembly shall be fabricated from 18-8 stainless steel. This requirement shall not apply to current carrying components.
- (e) Current Carrying Components. Current carrying components shall be fabricated of non-corrosive, high-conductivity materials. Aluminum shall not be acceptable for this purpose. Electrical contacts shall be made of coin-silver material or other equally high-conductivity corrosion resisting materials.

- (f) Dissimilar Materials. Dissimilar materials in contact with each other which will lead to electrolytic corrosive action shall not be used. Dissimilar metals are as defined in Military Standard MS33586.
- (g) Finish. All surfaces of the finished top assembly shall be smooth, without burrs or sharp edges. The top surface protruding above the pavement, when installed, shall contain no bolts, bolt heads, nuts, or other protrusions above the smooth top surface that could be damaged by snowplow blades, by aircraft tailhooks, or by vehicles. In addition, all edges above the pavement including the metal edges above the lens(es), the top edges of the light channel(s) and rib(s), and the top edge of the outer periphery of the finished top assembly shall be rounded to not less than 1/8-inch radius.
- (h) Protective Plating. All ferrous structural and hardware parts of the top assembly, not made of stainless steel, shall be plated after fabrication, machining, and drilling. This plating shall be zinc conforming to Class 2, Type I of Federal Specification QQ-Z-325, or cadmium conforming to Class 1, Type I of Federal Specification QQ-P-416. The plating shall be applied as required by the applicable specification.
- (i) Color of Light. Colored lights shall be obtained by adding color filters to white lights. All color emitted from colored lights shall conform to Type I (aviation) colors specified in Specification MIL-C-25050. When no color is specified by the purchaser, aviation white ware shall be supplied. Certification of compliance with this specification shall be furnished to the Federal Aviation Administration, Airports Service, Washington, D.C. 20590.
- (j) Reflectors. All reflectors utilized in a lamp optical assembly shall be provided with a finish of high specular reflectivity and shall be protected from dirt, tarnishing, and corrosion.
- (k) Optical Components. All prisms, lenses, filters, and reflectors shall be Grade B of MIL-C-7989, except that they shall be tempered to withstand the temperature shock specified in paragraph 4a(4).

- (1) Adjustment and Repairs. Each class of top assembly shall be so constructed that adjustments and repairs can be made easily by maintenance personnel with normally available commercial tools.
- (m) Fungus-Proof Materials. Materials that are nutrients for fungi shall not be used in the top assembly where it is practical to avoid them. When 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.
- (2) Base Receptacle. Type I and Type II base receptacles for both classes of fixtures as shown in Figure 3 shall be fabricated from a suitable ferrous material by welding, drawing, or casting. All dimensions and requirements shown in Figure 3, except references to welding, shall apply to all fabricating methods. Reference to welding shall apply only to fabrication methods where welding is required. For all types of construction, the "free" interior space defined by the note No. 2 in Figure 3 for both the Type I and Type II base receptacles shall be maintained. The exterior surface shall contain no protrusions except for the allowable protrusion required for sealing of leads, and for a vertical weld, where used. A reference line indicating the direction of the horizontal beam axis shall be cast, stamped, or painted on the inside surface of the receptacle bottom. Castings and drawings shall be in accordance with standard practices for the method involved.
- (a) Flange. The top face and inside edge of the flange shall be machine finished. Six blind holes, 5/8-inch deep and tapped at least 1/2-inch, shall be provided in the top face. After the protective plating has been applied, the flange shall conform to the requirements shown in Figure 3. The level of the top surface of the flange shall be such that it shall not vary more than 0.010 inch from a reference plane perpendicular to the vertical axis of the cylindrical body. Surface finishes shall be determined as roughness height ratings in micro-inches in accordance with Military Standard MIL-STD-10. The effect of flaws shall be included in the roughness height measurements.

- (b) Welding. When a welding process is used, all welding shall consist of continuous watertight welds of a strength at least equal to the material welded.
 - (c) Protective Plating. After fabrication, machining, and drilling, the entire base receptacle shall be plated for corrosion protection. This plating shall be zinc per Class 2, Type I of Federal Specification QQ-Z-325 or cadmium conforming to Class 1, Type I of Federal Specification QQ-P-416. The plating shall be applied as required by the applicable specification.
 - (d) Protective Painting. After the protective plating has been applied to the receptacle, all inside surfaces, including the underside of the cover flange, shall be given one coat of paint in compliance with Military Specification MIL-P-26915.
- (3) Leads. Two leads shall be furnished with each type of base receptacle to supply power to the lamp. The leads shall enter the base receptacle through the wire entrance shown in Figure 3. The wire entrance shall be sealed in the factory to assure a water and air tight seal. The integrity of the seal shall be checked as specified in paragraphs 4a(6) and 4a(10). The seal and wire shall be installed to prevent water from wicking into the base. The method used in sealing the leads shall not result in a protrusion of more than 1/4 inch on the exterior surface of the base receptacle. On the interior surface, the sealing method shall not result in an encroachment on the minimum free interior space specified in note No. 2 in Figure 3. The leads shall be terminated inside the base by means of Number 8 screw terminals appropriately insulated from the base receptacle. The lead wire used to connect the top fitting terminals with the screw terminals in the base shall have suitable lugs on both ends.
- (a) Rating. The leads shall be single conductors with suitable insulation rated for at least 600 volts. The exterior leads sealed in the base shall have wires with insulation rated for at least 125°C. operation. The replaceable interior leads shall have wires with insulation rated for at least 250°C. operation.
 - (b) Conductors. The lead conductors shall be copper No. 12 AWG with at least 19 strands.

- (c) Length. The leads shall have sufficient length inside the base receptacle to permit servicing of the top assembly without requiring disconnection of the wires. External leads are to be at least 18 inches long.
- (4) "O" Ring Gasket. The "O" ring gasket for use in the "O" ring groove of the cover flange of the base receptacle shall be molded from silicone rubber conforming to Federal Specification ZZ-R-765.
- (5) Hold-Down Bolts. Six hex-head machine screws 3/8 inch in diameter, 3/4 inch in length, and suitable for use in the tapped holes in the flange as shown in Figure 3 shall be furnished. These shall be used for fastening the top assembly to the base receptacle. In addition, six 3/8-inch internal tooth lock washers shall be furnished for use under the bolt heads. Bolts and lock washers shall be fabricated of 18-8 stainless steel.
- (6) Plywood Covers. A plywood cover shall be furnished with each base receptacle to protect the machined flange surface during shipment, handling, and installation. This plywood cover shall be mounted on and concentric with the base receptacle in lieu of the top assembly. Prior to mounting on the base, the perimeter of this cover shall be immersed to a depth of at least 2.0 inches in melted paraffine and rotated one complete turn. Such treatment shall provide a non-adhesive surface to the top, edge, and bottom contact surfaces of the cover. The cover furnished shall be of exterior commercial Grade C-D, 5-ply plywood, 3/4 inch thick. It shall be 12 inches in diameter (+1/8 inch or -0 inch) and shall contain six holes corresponding to the tapped holes in the base receptacle flange. These holes shall be 7/16 inch in diameter and shall be counterbored on the Grade D side 1-1/8 inches in diameter to a depth of 1/4 inch. The Grade D side of the cover shall have painted on it a suitable reference line to indicate the light axis.
- (7) Parts List and Installation Instructions. A complete parts list and installation instructions shall be furnished with each shipment of light assemblies or each shipment of light assembly components. Sufficient drawings or illustrations shall be provided to indicate clearly the method of assembly and installation.

4. QUALITY ASSURANCE PROVISIONS.

a. Qualification Testing. Each class of top assembly shall be tested in accordance with the applicable tests cited below and in a testing laboratory acceptable to the Federal Aviation Administration, Airports Service, Washington, D.C. 20590. These tests shall be performed in the order shown and may be witnessed by a representative of FAA, Airports Service. This testing is required to certify the manufacturer's ability to produce a light assembly meeting the requirements of this specification. More than one light assembly may be submitted for the tests. In the event a light assembly fails, it may be resubmitted for test after the cause of the failure has been corrected. Prior to tests, the top assembly hold-down bolts shall be torqued to a value specified by the manufacturer. The manufacturer shall furnish one light assembly, two certified copies of the testing laboratory's report, and installation instructions to the Airports Service of the Federal Aviation Administration for inspection, review, and approval. When approved, the name of the qualified manufacturer and a description of his equipment will be included in AC 150/5345-1A, Approved Airport Lighting Equipment. The manufacturer shall bear all testing costs.

(1) Vibration Tests. The base receptacle shall be mounted securely in place on the surface of the test table of the vibration testing machine. It shall be mounted in a horizontal position corresponding to its position in place on a runway. Small angles or brackets may be welded to the base receptacle to hold it in place on the test table. The top assembly, with an electrical shunt across the lamp terminals, and with the lamp in place, shall be installed in the receptacle with provisions to determine whether continuity of the electrical circuit is maintained during the tests.

(a) Vibration Planes. The light assembly, mounted in place on the test table as specified above, shall be vibrated in three planes, or directions of vibration, as follows:

- 1 In a direction perpendicular to the plane of the test table, i.e., vibrated vertically.
- 2 Vibrated horizontally in a direction parallel to the light axis, i.e., parallel to the line through the centers of the light channels.

- 3 Vibrated horizontally in a direction at right angles to the light axis, i.e., normal to the line through the centers of the light channels.
- (b) Vibration Frequencies. This test shall be conducted in two parts, if required. In the initial test, the light assembly shall be vibrated in each direction through frequency ranges of 10 to 2,000 CPS until the G's shown in Table I are reached. The duration of each sweep on the light assembly shall be 10 minutes and electrical continuity shall be continuously monitored through the initial vibration tests. If the lamp envelope and filament remain intact, the vibration tests are considered complete. If the lamp envelope and/or filament fail, the second part of the test shall be initiated. In the second part, the shunt shall be removed from the lamp terminals, the damaged lamp shall be removed from the lampholder, and a new lamp of the type specified for use in the light assembly shall be inserted in the lampholder. Without energizing the lamp filament, the light assembly shall be vibrated again, as specified in paragraph 4a(1)(a), through the frequencies shown in Table I, until the acceleration reaches 3 G's in each plane. The duration of each sweep on the light assembly shall be 10 minutes.

TABLE I - VIBRATION FREQUENCIES

<u>Acceleration G's</u>	<u>Frequency CPS</u>
10	10 to 500
15	500 to 2000

- (c) Inspection. After the above required tests have been completed, the light assembly shall be inspected. Mechanical failure of any component, loosening of any part or fastener, or any discernible movement of lamps in lampholders during the initial test shall be cause for rejection. If the second test is required, breakage of the lamp filament and/or envelope shall also be cause for rejection.

- (2) Photometric Tests. The optical performance of the unit shall be determined by photometric readings with a clear lens and the type lamp for which the unit is designed. The lamp shall be operated at its rated current. The photometric axis of the fixture shall be established in relation to a fixture properly installed in the pavement with the horizontal axis lying on the plane of the pavement, passing through the center of the fixture, and parallel to the centerline. The vertical axis shall lie on a line passing through the center of the fixture, perpendicular to the pavement plane. Horizontal intensities shall be determined for both beams of the Class A top assembly at each lateral degree, at elevation angles of 0°, 1°, 1-1/2°, 2°, 3°, 4°, 5°, and 6°, and the intensities shall meet the distribution requirements of Figure 1. Horizontal intensities shall be determined for the beam of the Class B top assembly at each lateral degree, at elevation angles of 0°, 1°, 2°, 3°, 4°, 5°, 6°, and 7° and the intensities shall meet the distribution requirements of Figure 2. If either class of top assembly is so designed that any light channel has a negative slope and any portion of the exterior lens or prism is below pavement level, such portion shall then be obscured by opaqued tape. The intensity distribution shall then be measured as described above and the intensities shall be not less than 65 percent of those prescribed in Figure 1 and Figure 2 for Class A and Class B top assemblies, respectively.
- (3) High Temperature Test. The light assembly shall be subjected to a high temperature of +55°C. (±2°C.) for a period of 7 hours with the lamp operating at rated current. Any blistering, smoking, corrosion, abnormal bulb blackening, or other evidence of heat damage to any part shall be cause for rejection.
- (4) Cycling and Temperature Shock Test. The light assembly mounted on a base receptacle shall be subjected to a cycling test by operating the unit at rated current at room temperature (dry) for a period of not less than four hours. At the expiration of the "on" part of the cycle, the fixture shall be de-energized and immediately submerged under at least one foot of water. The temperature of the water before submersion shall be 50°C., or lower. The unit shall remain under water for at least four hours. At the expiration of the "off" part of the cycle, the fixture shall be subjected to repetition of the above tests until a total of three "on-off" cycles have been completed. The fixture shall be immediately inspected at the completion of the third cycle. Any evidence of glass breakage or lens damage, any leakage of water into the assembly, damage to any part of the unit, or equipment failure during the tests shall be cause for rejection.

1/8/68

- (5) Low Temperature Test. The light assembly mounted on a base receptacle shall be totally immersed in water, and while immersed, subjected to a low temperature of minus 43°C , $\pm 2^{\circ}\text{C}$, for a period of 24 hours followed immediately by operation at rated current for 30 minutes or until free of ice. This shall be repeated for a total of three cycles. Any evidence of damage shall be cause for rejection.
- (6) Insulation Resistance Test. The light assembly shall be operated at rated current in distilled water with a power source isolated from ground, at room temperature, until the voltage across the leads has maintained a stable value for at least 10 minutes. The stabilized value of voltage at rated current shall be measured and recorded. The light assembly, except for the ends of the leads, shall then be completely submerged in a bath containing a saturated salt solution and operated continuously. The salt water bath shall be adequately grounded. A uniform temperature between 16°C . to 27°C . shall be maintained throughout the solution by occasional stirring. The current through the leads shall be maintained at rated current during this immersion. After three hours or more of operation in the bath, the voltage across the leads shall be adjusted to, and maintained at, the recorded value. Current readings shall be taken under the following conditions:
- (a) With one lead grounded.
 - (b) With the ground removed from the first lead and the other lead grounded.
 - (c) With neither of the leads grounded.

If any of the three current readings exceed rated current by more than 1.5 percent, the light shall be rejected.

- (7) Accelerated Life Test. The light assembly shall have an accelerated life test performed on it after it has successfully passed all the above tests. The top assembly mounted on a base receptacle shall be set in dry sand simulating its installation in pavement. The sand shall be at least 5 inches thick around the sides and bottom of the receptacle. Fine sand shall be spread over the top assembly and base receptacle to fill any openings in the assembled light which would be below pavement level. The unit shall then be operated for at least one-half

the rated lamp life at rated current and at room temperature. After this, all sand shall be removed and the photometric performance of the unit shall be measured as described in paragraph 4a(2). Intensities shall be not less than 80 percent of the intensities specified in Figure 1 and Figure 2 for Class A and Class B top assemblies, respectively. After this test, the light assembly shall be taken apart and thoroughly examined. Any visible deformation, blistering, evidence of heat damage, or corrosion shall be cause for rejection.

- (8) Protective Plating Test. Zinc plating shall be tested by the appropriate method described in Federal Specification QQ-Z-325, cadmium plating shall be tested by the appropriate method described in Federal Specification QQ-P-416.
- (9) Load Test. This shall be a static load test. The assembled unit, with the top assembly (including gasket, lamp, and optical assembly) mounted on a base receptacle shall be placed on a flat steel plate mounted in a standard testing machine. The load shall be applied to the top part of the fixture through a block of rubber, 11 inches in diameter and 1-1/2 inches thick, having a Shore A hardness of 55 to 70. A total load of 50,000 pounds shall be applied uniformly over the area of the rubber at a rate not greater than 10,000 pounds per minute. The light assembly shall be considered unsatisfactory if there is any permanent deformation, cracking of material or finish, breaking, or damage to any part of the light.
- (10) Leakage Test. This test shall be performed after the assembled light unit has undergone the load test described in paragraph 4a(9). For the leakage test the top assembly shall be securely bolted to a base receptacle having a suitable means for pressurizing and all bolts torqued to the manufacturer's specifications. Prior to performing this test, the two wire leads shall be subjected to a 30-pound tension for five minutes to test the integrity of the seal where the leads enter the base receptacle. With a minimum internal pressure of 10 p.s.i., the assembled unit shall be tested using a bubble test material (high foam detergent producing a low surface tension). The assembly shall be considered watertight if no air bubbles appear.

(11) Humidity Test. The light assembly shall withstand a humidity test conducted in accordance with procedure III of Specification MIL-E-5272 for 360 hours. Any evidence of damage, rusting, or corrosion shall be cause for rejection.

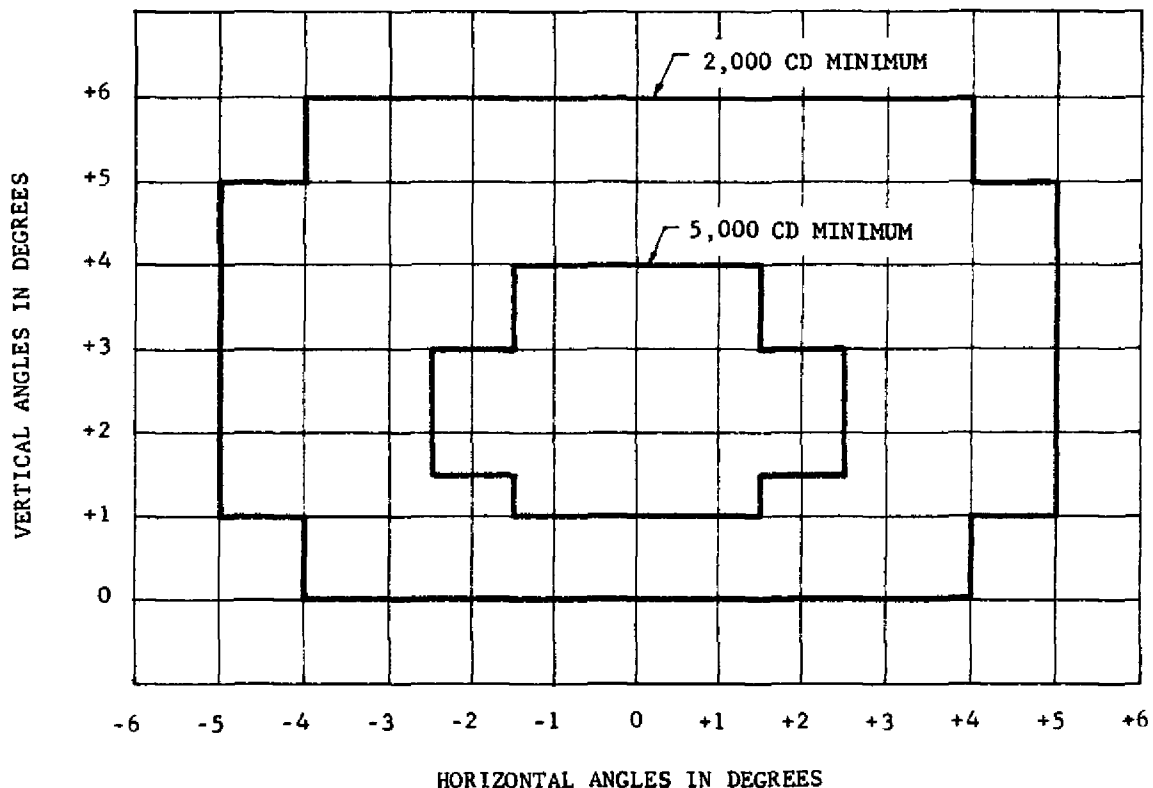
- b. Production Testing. Each Class A and Class B top assembly shall be subjected to photometric and leakage tests. In the photometric tests, the Class A and Class B top assemblies shall meet the intensity distribution requirements of Figures 1 and 2, respectively. If abbreviated photometric test methods are used for production testing, these methods must have prior approval of the contracting agency. Each top assembly shall meet the requirements of the leakage test specified in paragraph 4a(10). Leakage tests on production units shall be accomplished by means of a standard test head and a standard test base. The test head and test base shall be production units properly fitted with pressure fittings to permit the internal pressure of each assembly to be raised to 10 p.s.i. No units which have been tested and have failed to meet these production tests shall be shipped in fulfillment of an order. These tests shall be performed by the manufacturer and may be witnessed by a Government representative. Each light assembly shall be identified by a serial number and test records kept by the manufacturer for at least two years. These records shall be available to the Federal Aviation Administration upon written request.

5. PREPARATION FOR DELIVERY.

- a. Light Assembly. The light assembly shall be prepared for delivery as two separate components, the base receptacle and the top assembly. All exterior surfaces of the assembly shall be cleaned of all oil, grease, and other foreign material, prior to packaging, to insure proper sealing and seating of the components at the time of installation.
- (1) Top Assembly. The top assembly shall be individually packaged in a durable, domestic type, corrugated cardboard carton. It shall be properly cushioned inside the carton to provide the necessary mechanical and physical protection to the fragile optical system and the critical machined surfaces. For convenience of shipment, four packaged top assemblies may be packed in a wooden container.

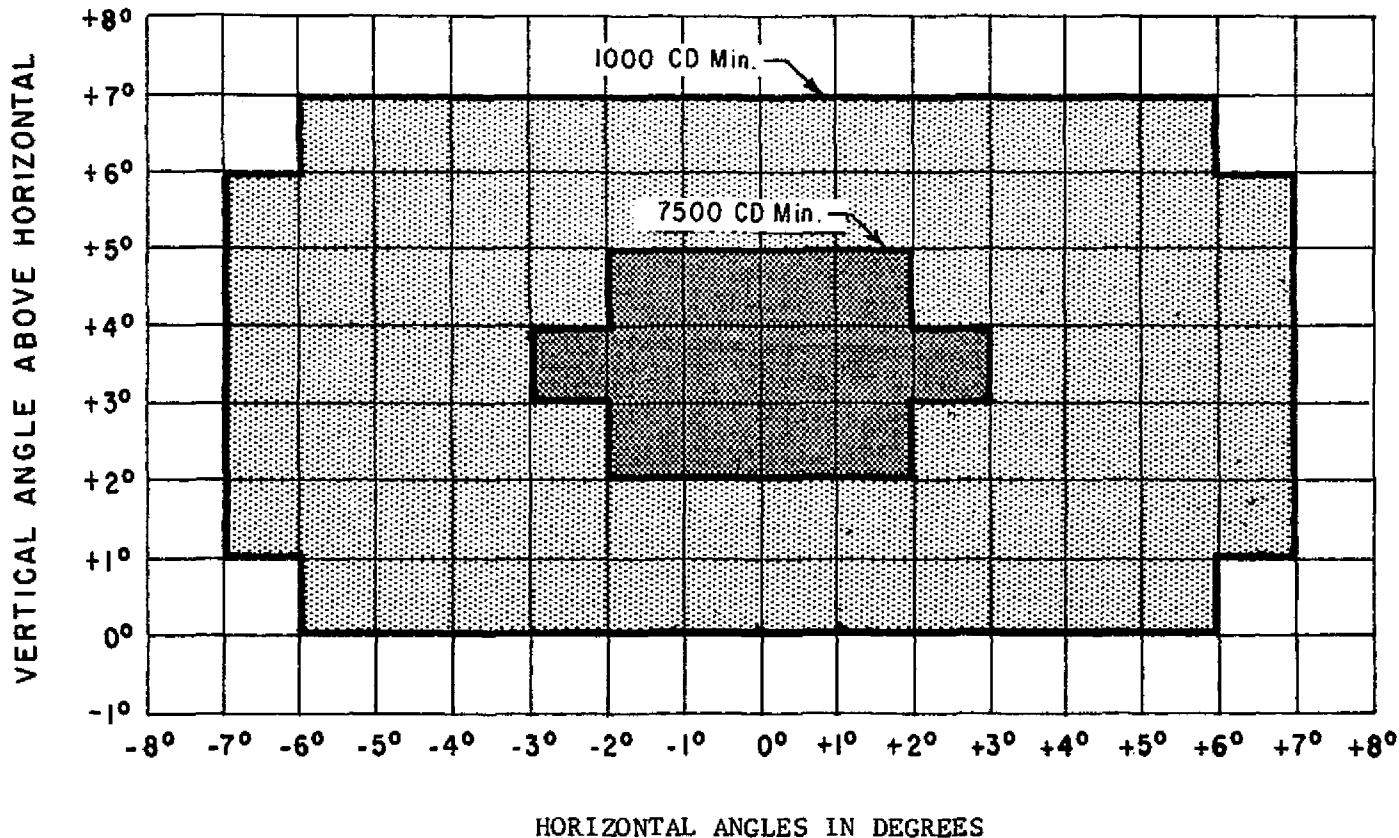
- (2) Base Receptacle. The gasket and lock washers shall be packed in two separate envelopes and placed inside the base. The top surface of the flange including the gasket groove shall have a wax film not exceeding 0.001 inch in thickness. The plywood cover coated with paraffine, specified in paragraph 3b(6), shall be properly positioned and secured to the top of the base receptacle with the hold-down bolts specified in paragraph 3b(5). The wire leads extending from the sealed aperture in the side of the base receptacle shall be coiled and held close to base. The base receptacle shall be crated or boxed in a container, either singly, or in multiple, so as to protect the sealed aperture and external wires during shipment and storage.
- b. Shipping Marking. The top assembly cartons and, when used, the wood boxes and the base receptacle plywood cover shall be durably and legibly marked with:

Consignee's Name and Address
Component Name and Part No.
Specification No.
Contract No.
Manufacturer's Name and Address



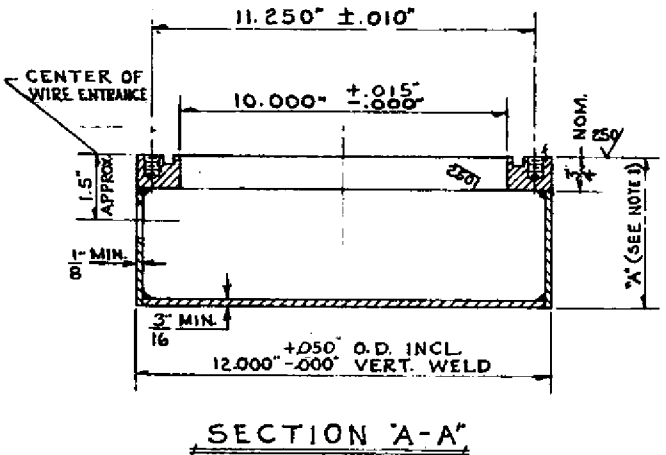
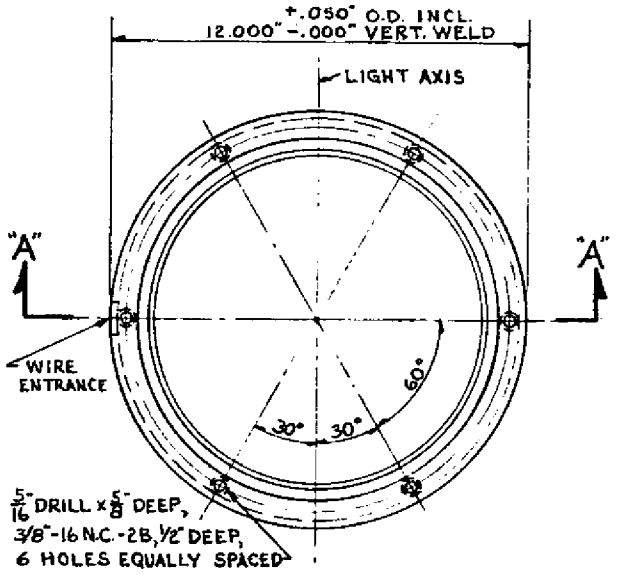
- NOTES:
- (a) The above minimum intensities apply to the light beam emitted in each direction.
 - (b) A horizontal shift of plus or minus one degree and a vertical shift of plus or minus one-half degree is permitted for inspection, qualification, and approval procedures.
 - (c) The peak candela output within the above curve shall not exceed 25,000 CD.
 - (d) There shall be gradual fall-off of intensity to an intensity of no less than 5 candelas within a curve whose limits are $\pm 18^\circ$ horizontal and 15° vertical.

FIGURE 1. ISOCANDELA CURVE FOR MINIMUM OUTPUT IN WHITE LIGHT FOR CLASS A TOP ASSEMBLY



- NOTES:
- (a) A horizontal shift of plus or minus one degree and a vertical shift of plus or minus one-half degree is permitted for inspection, qualification, and approval procedures.
 - (b) The peak intensity within the above curve shall not exceed 25,000 candelas.
 - (c) There shall be a gradual fall-off of intensity to an intensity value of no less than 5 candelas within a curve whose limits are $\pm 18^\circ$ horizontal and 15° vertical.

FIGURE 2. ISOCANDELA CURVE FOR MINIMUM OUTPUT IN WHITE LIGHT FOR CLASS B TOP ASSEMBLY



NOTES

1. FOR TYPE I UNIT, DEPTH DIMENSION "A" IS 2.75" +0.1 -0.0
FOR TYPE II UNIT, DEPTH DIMENSION "A" IS 8.25" +0.1 -0.0
2. CLEAR INSIDE SPACE BELOW BOTTOM OF FLANGE SHALL BE NOT LESS THAN 11 INCHES IN DIAMETER, CONCENTRIC ABOUT THE CENTER OF THE BASE, WITH A DEPTH OF 1.75 INCHES FOR THE TYPE I AND A DEPTH OF 7.25 INCHES FOR THE TYPE II.
3. NORMAL MILL TOLERANCES OF MATERIAL WILL BE ACCEPTABLE.
4. THE BOTTOM SHALL BE FLAT, WITH NO UPWARD DEVIATION AND MAXIMUM DOWNWARD DEVIATION OF 0.25".
5. WHERE NOT SPECIFIED, DIMENSIONS SHALL BE HELD WITHIN A TOLERANCE OF ±0.05".
6. THERE SHALL BE METAL TO METAL CONTACT BETWEEN THE TOP FITTING AND BASE RECEPTACLE.
7. THE TOP SURFACE OF THE BASE RECEPTACLE FLANGE SHALL CONTAIN A SUITABLE GASKET GROOVE AS INDICATED.
8. IF USED, VERTICAL WELD ON EXTERIOR SHALL NOT PROTRUDE MORE THAN 0.125".

FIGURE 3. RECEPTACLE

**DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
Washington, D.C. 20590**

Official Business

**POSTAGE AND FEES PAID
FEDERAL AVIATION ADMINISTRATION**