FAA-E-2891
May 10, 1989

# DEPARTMENT OF TRANSPORTATION
## FEDERAL AVIATION ADMINISTRATION
## SPECIFICATION

STEADY-BURNING, SEMI-FLUSH, THRESHOLD APPROACH LIGHT ASSEMBLY FOR THE MEDIUM APPROACH LIGHTING SYSTEM WITH RUNWAY ALIGNMENT INDICATOR LIGHTS (MALSR)

## 1. SCOPE

1.1 Scope. This specification sets forth the requirements for a steady-burning, semi-flush threshold approach light assembly for the Medium Approach Lighting System with Runway Alignment Indicator Lights (MALSR) to be used in paved operational surfaces of airport runways.

## 2. APPLICABLE DOCUMENTS

2.1 FAA documents. The following FAA specifications, standards, and drawings of the issues in effect on the date of the invitation for bids or request for proposals, form a part of this specification and are applicable to the extent specified herein.

2.1.1 FAA specifications

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|---|---|
| FAA-D-2494 | Technical Instruction Book Manuscript: Electronic, Electrical, and Mechanical Equipment, Requirements for Preparation of Manuscript and Production of Books |
| FAA-E-2803 | Potential Isolation Transformers for Airport Lighting Systems |

2.1.2 FAA standards

| | |
|---|---|
| FAA-STD-013 | Quality Control Program Requirements |

2.2 Military and federal publications. The following military and federal publications of the issues in effect on the date of the invitation for bids or request for proposals, form a part of this specification and are applicable to the extent specified herein.

2.2.1 Military specifications

| | |
|---|---|
| MIL-A-8625 | Anodic Coatings for Aluminum and Aluminum Alloys |
| MIL-C-7989 | Covers, Light Transmitting for Aeronautical Lights, General Specification for |
| MIL-C-13924 | Coating, Oxide, Black, for Ferrous Metals |
| MIL-E-17555 | Electronic and Electrical Equipment, Accessories and Repair Parts, Packaging and Packing of |
| MIL-P-26915 | Primer Coating, Zinc Dust Pigmented, for Steel Surfaces |

2.2.2 Military standards

| | |
|---|---|
| MIL-STD-276 | Impregnation of Porous, Non-Ferrous Metal Castings |
| MIL-STD-801C | Environmental Test Methods |
| MIL-STD-889 | Metals, Definition of Dissimilar |

MIL-STD-21029 Insert, Screw Thread, Coarse and Fine, Screw Locking, Helical Coi1, CRES

2.2.3 Federal specifications

QQ-P-416 Plating, Cadmium (Electrodeposited)

QQ-Z-325 Zinc Coating, Electrodeposited, for

ZZ-R-765 Rubber, Silicone; Low and High Temperature and Tear Resistant

(Copies of this specification and other applicable FAA specifications, standards, and drawings may be obtained from the Contracting Officer in the Federal Aviation Administration Office issuing the invitation for bids or request for proposals. Requests should fully identify material desired, i.e., specification, standard, amendment, and drawing number and date. Requests should cite the invitation for bids, request for proposals, or the contract involved or other use to be made of the requested material).

(Information on obtaining copies of military and federal specifications and standards may be obtained from General Services Administration offices in Atlanta; Auburn, Washington; Boston; Chicago; Denver; Forth Worth; Kansas City, Missouri; Los Angeles; New Orleans; New York; San Francisco; and Washington, DC.)

3. REQUIREMENTS

3.1 General functional requirements. The steady-burning, semi-flush threshold approach light assembly specified herein shall be designed for use in airport runways as a unidirectional threshold light. The light assembly will be subjected to the forces of landing, taking off, and taxiing aircraft, as well as airport service vehicles, including snowplows. The light assembly shall be designed for installation in a Type L-868 base having a diameter of 15 inches (38 centimeters (cm)). The light base will be embedded in a concrete or asphalt runway. The light base is depicted in figure 1 (for reference only). The light base shall not be furnished with the equipment. However, the contractor shall provide light bases and 200 watt (W) isolation transformers, in accordance with FAA-E-2803, for testing purposes as specified in section 4.

3.1.1 Lamp rating. The lamp in each light assembly shall be a series lamp having a nominal rating of 200 watts. The lamp shall have a rated average life of at least 500 hours and shall have a filament

rated for 6.6 amperes (A). The light emitted by a new, unused light assembly shall meet the photometric requirements shown in figure 2.

Figure 1. Type L-868 Base Receptacle

Figure 2. Light Assembly Isocandela Curve

3.1.2 Power requirements. The total input power to each light assembly shall not exceed 200W. 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 maximum operating current.

3.2 Environmental conditions. The light unit shall operate under the following environmental conditions:

3.2.1 Temperature. Any ambient temperature from -55° centigrade (C)(-67° Fahrenheit (F)) to +70° C (158° F).

3.2.2 Altitude. Sea level to 10,000 feet above mean sea level.

3.2.3 Humidity. Up to 100 percent from sea level to 10,000 feet above sea level and +70° C (158° F).

3.2.4 Sand and dust. Exposure to wind blown sand and dust particles as may be encountered in arid regions.

3.2.5 Salt spray. Exposure to atmosphere containing salt laden moisture.

3.2.6 Thermal shock. The top surface of the light assembly, including the light window, shall withstand thermal shock such as would be imposed by application or flooding with water when operating at maximum temperature.

3.3 Static loading. The light assembly shall be able to support static loads when installed in a Type L-868 light base.

3.4 Dynamic loading. The light assembly shall be designed to withstand impact and vibration caused by aircraft and service vehicles such as snowplows.

3.5 Heat dissipation. Temperature inside and outside of the light assembly shall be held to a minimum by utilizing efficient heat dissipation techniques and materials with high coefficients of heat transfer.

3.6 Vibration. The light assembly shall be able to withstand, without damage or deterioration of its performance, sinusoidal vibrations at frequencies ranging from 100 to 1500 hertz (Hz), with an amplitude corresponding to acceleration of 10 gravities (g) in the transverse, longitudinal, and vertical directions. In addition, the light assembly shall be able to withstand, without damage, pulse shocks lasting between 5 and 45 milliseconds (ms) with an amplitude corresponding to a maximum acceleration of 15 g in the three directions indicated above.

3.7 Hydraulic impact. The light assembly shall be designed to withstand, without damage, hydraulic pressures which may be formed by aircraft tires moving at high speeds during operations in wet weather.

3.8 Design requirements. Design requirements for the steady-burning semi-flush threshold approach light assembly are defined in the following subparagraphs.

3.8.1 General. The light assembly shall consist of three parts; an outer ring assembly, a top unit assembly, and an optical assembly (see figure 3). Also see subparagraphs below. The outer ring assembly and the top unit assembly shall be secured together without the use of gaskets, with at lease six fully recessed, high strength stainless steel bolts as specified in 3.9.1.4. The seating surfaces of the outer ring assembly and the top unit assembly shall be flat and smooth to ensure seating without rocking before being secured. The top unit assembly shall be removable from the light base (figure 1)

without disturbing the alignment of the outer ring assembly. The maximum outside diameter of the light assembly, in the plan view, shall be 24 inches (60.96 cm) in diameter. The top edge of the outer ring assembly shall be at

Figure 3. Top View of Steady-Burning, Semi-flush Threshold Approach Light Assembly

pavement elevation when installed in the light base with the top of the light base recessed 1-1/4 inches (3.175 cm) below the pavement surface. No part of the light assembly shall exceed 1 inch (2.54 cm) in height above the pavement. No part of the top surface of the light assembly, excluding the light window and light channel, shall have a slope greater than 12 degrees. Means shall be provided on the top unit assembly to permit its removal from the light base for maintenance purposes. The top surfaces of the light assembly shall be smooth and free of sharp projections which could engage with snowplow blades or damage tires.

3.8.2 Outer ring assembly. The outer ring assembly shall be installed on the light base without the use of gaskets. The outer ring assembly will be field installed on the flange of the light base, on a 14-1/4 inch (36.19 cm) bolt circle, with six 3/8 inch (0.95 cm) high strength stainless steel bolts as specified in 3.9.1.4. The bolts shall be installed in the outer ring assembly from the underside of the light base flange. The outer ring assembly shall have a permanent mark, located in front of the light output window, to permit field installation and alignment of the light beam direction.

3.8.3 Top unit assembly. The top unit assembly shall be capable of resisting all static and dynamic wheel loads without damage.

The top unit assembly shall be capable of being easily inserted and removed from the outer ring assembly (3.8.2). The top unit assembly shall attach to the outer ring assembly by means of six 3/8 inch (O.95 cm)- 16 N.C. bolts on an 11.25 +/- 0.010 inch (28.57 + 0.025 cm) diameter bolt circle. The bolt holes shall be located so that four of the holes will be located 30 degrees +/- 10 minutes from an axis which would be parallel to the runway centerline. The remaining two bolts will be 60 degrees +/- 10 minutes from two of the other bolts on a line perpendicular to the runway centerline (see figure 4). The top unit assembly shall contain a heat-resistant prismatic glass (figure 3). Care shall be taken to avoid negative slope that will result in an accumulation of water in front of the prismatic glass. The top unit assembly shall house the removable optical assembly (3.8.4). Pry bar slots, indentations, or other suitable provisions shall be made for prying or jacking the top unit assembly free of the L-868 base when the light assembly is installed in the pavement.

3.8.4 Optical assembly. The optical assembly shall contain the lamp, lamp holder or lamp retaining hardware, lenses, reflector, and terminals for connecting the lamp to the power leads installed the L-868 light base (figure 1). The reflector shall be provided with a finish of high specular reflectivity and shall be protected from dirt, tarnishing, and corrosion. The design of the optical assembly shall be such that no adjustment of the optics will be required in the field. The optical assembly shall be secured to the top unit assembly by means of one or two hexagonal nut(s), so that replacement of the optical assembly, when a lamp fails, requires a minimum of time. Removing the optical assembly from the top unit assembly shall automatically disconnect the lamp from the lighting circuit (3.12.1). An O-ring gasket shall be used to provide a watertight seal between the top unit assembly and the optical assembly.

3.9 Materials and components. Materials and equipment components shall be as specified herein. Parts or materials not specifically designated shall be suitable for the intended purpose and shall be in accordance with industrial standards and practices. All parts of the light assembly shall deter corrosion and oxidation when, subjected to continuous operating temperature in the confined atmosphere of the light base.

3.9.1 Metals. Metals shall withstand the mechanical stresses involved and shall be inherently corrosion resistant, or suitably

protected after fabrication, to prevent corrosion or oxidation under the service conditions. The use of dissimilar metals in

Figure 4. Top Unit Assembly Hole Position

contact with one another shall be avoided wherever practicable. However, if the use of dissimilar metals cannot be avoided, they shall be in accordance with MIL-STD-889.

3.9.1.1 Ductile iron. Heat treated ductile iron, if used, shall have the proper tensile and yield strength to meet the requirements set forth herein. Particular attention shall be paid to the proper Brinell hardness and elongation of the material. Protective plating as specified in 3.9.3.1 shall be used on all cast and machined ductile iron surfaces. In deep cast areas, external to the removable optical assembly where the specified minimum plating thickness may be impossible to attain, a coating of zinc paint in accordance with MIL-P-26915 shall be applied.

3.9.1.2 Stainless steel. Type 18-8 stainless steel shall be used for all bolts, nuts, and washers not subject to high stress requirements. Bolts subject to direct stresses resulting from forces applied to the top surface of the light assembly shall be high strength Type 410 stainless steel, heat treated to Rockwell C-21 to C-23 (110,000 pounds per square inch (psi) tensile strength) and given a black oxide coating per Mil-C-13924, Class 3, after heat treatment.

3.9.1.3 Aluminum. Aluminum castings, if used, shall be impregnated in accordance with MIL-STD-276. Where screws or bolts

are used in tapped aluminum parts, inserts conforming to MIL-STD-21209 shall be installed.

3.9.1.4 Bolts, studs, nuts, and washers. All bolts, studs, nuts, and other similar fasteners used in the light assembly and base shall be fabricated from either 18-8, 410, or 416 stainless steel, passivated and free from discoloration. Bolts or screws made of 410 or 416 stainless steel shall be given a black oxide finish in accordance with MIL-C-13924, Class 3. Al1 lock washers shall be made of 410 stainless steel. All screw threads shall be Class 2 or Class 3 in accordance with National Bureau of Standards Handbook H28. This requirement does not apply to current-carrying components.

3.9.2 Lamp holder. The lamp holder shall securely and accurately position the lamp. It shall permit easy relamping without disturbing the color filter or any other element of the optical assembly. After relamping, the light assembly shall still meet the intensity distribution requirements shown in figure 2. The lamp holder shall be indexed to prevent improper relamping.

3.9.3 Protective Coatings. Protective coatings used for prevention of corrosion shall be as specified herein.

3.9.3.1 Plating. Plating shall be zinc or cadmium. Zinc plating shall conform to Class 2, Type I, of QQ-Z-325. Cadmium plating shall be in accordance with Class 1, Type II, of QQ-P-416.

3.9.3.2 Anodizing. Aluminum parts on the exterior of the light assembly which would be exposed to continuous moisture, salt laden atmosphere, or mechanical damage shall be teflon penetrated hardcoat anodized meeting the requirements of MIL-A-8625, Type III. Other aluminum parts shall be anodized per MIL-A-8625, Type I, or Type II, Class 1 or Class 2, as applicable.

3.9.4 Optical components. All prisms, lenses, and filters shall be in accordance with MIL-C-7989 Class B glass. Class C glass may be used if required for impact strength. The glass shall be tempered to withstand the thermal shock specified in 3.2.6. Glass parts shall be supported in such a way that they will not be damaged by vibration, shock, or deflection of any component part.

3.9.4.1 Color Screens. Color screens (or filters) shall be aviation green. Mounts shall be designed to prevent the color screens from cracking due to thermal shock or tire impact loads.

3.9.4.2 Reflectors. All reflectors utilized in the optical assembly shall be provided with finish of high specular reflectivity and shall be protected from dirt, tarnishing, and corrosion.

3.9.5.Silicone rubber. Rubber, when used, shall be of the silicone type. Gaskets used at separable joints for cushioning and sealing purposes shall be capable of sustained operation at ambient temperature, as specified in 3.2.1; and shall be low compression set, silicone rubber conforming to ZZ-R-765, Class IIb, Grade 60 or better

3.9.6 Sealing compounds. Compounds used for sealing shall be run proof and shall not harden or crack, shall remain mastic, and shall not lose their water sealing properties after exposure under the specified operating conditions.

3.9.7 Fungus-proof materials. Materials that are nutrients for fungi shall not be used in the top unit assembly, where it is practical to avoid such materials. When such materials are used and are not hermetically sealed, they shall be treated with a fungicidal agent acceptable to the procuring activity. However, if the materials are used in hermetically sealed enclosure, fungicidal treatment will not be necessary.

3.9.8 Current-carrying components. Electrical 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 equal material.

3.10. Adjustments and repairs. The top unit assembly shall be constructed so that adjustments and repairs can be made easily. Maintenance personnel shall use normally available commercial tools for these adjustments and repairs.

3.11 Markings. The contractor shall provide a standard permanent marking for each light assembly. The marking shall consist of the following:

(a) Model number (FA- )
(b) Date of manufacture
(c) Wattage of lamp to be used

3.12. Cable and connections. Cable and connections for the light assembly shall consist of the following:

3.12.1 Internal wiring. Wires shall be furnished with each optical assembly (3.8.4) to supply power to the lamps. The internal wire

insulation shall be made of a material highly resistant to heat. Quickly dismountable connections shall be

provided for the optical assembly for removal of a lamp when it fails. The dismountable connections shall be provided for the optical assembly for removal of a lamp when it fails. The dismountable connections shall automatically disconnect the lamps from the lighting circuit when the optical assembly is removed from the top unit assembly. The wires shall be copper No. 12 American Wire Gage (AWG) with at least 19 strands.

3.12.2 External wiring. Two wire leads shall be furnished with each light assembly to connect the secondary of the 200 W isolation transformer (FA-E-2803) to the optical assembly dismountable connections. The wire leads shall terminate in an L-823 connector that will mate with the 200 W isolation transformer secondary receptacle. The wire leads shall be single conductor copper No. 12 AWG minimum with suitable insulation rated for at least 600 volts. The wire leads shall have sufficient length inside the L-868 base receptacle to permit servicing the top unit assembly without disconnecting the wires. The wire leads shall be at least 18 inches (45.72 cm) long.

3.13 Instruction book. A draft copy and a camera-ready copy of the instruction book for the light assembly shall be prepared in accordance with FAA Specification FAA-D-2494.

## 4. QUALITY ASSURANCE PROVISIONS

4.1 General. The contractor shall provide and maintain a quality control program in accordance with FAA-STD-013. All tests and inspections made by the contractor shall be subjected to government inspection. The term “government inspection”, as used in this specification, means that an FAA representative will witness the contractor’s testing and inspection, and will carry out such visual and other inspection as deemed necessary to assure compliance with contract requirements. The light assembly shall be energized and operated at rated current during the conduct of the tests described in 4.2. It may also be necessary to install the light in a L-868 base receptacle during the conduct of the tests. Failure of the light assembly to pass the tests described in 4.3 shall be cause for rejection.

4.2 Test classification. Testing shall be accomplished in two categories as follows: (a) production model and (b) production units.

4.2.1 Production model. The first unit of production, referred to herein as a “production model”, shall undergo all tests specified in 4.3. Upon successful completion of all tests on the production model, the government will witness testing of the production units. Testing will include the physical, chemical, and electrical

characteristics of the light assembly and its material properties, which the contractor proposes to furnish under contract terms.

4.2.2 1 Production Units. Production units shall undergo the tests specified in 4.3.1, 4.3.2, and 4.3.18.

4.3 Tests

4.3.1 Visual inspection. The light assembly shall be visually inspected for workmanship, fabrication, finish, painting, and adequacy of selected parts.

4.3.2 Photometric tests. Photometric andlike tests shall be conducted on the production model to determine compliance with the requirements depicted in figure 2. Photometric tests shall be conducted on the production model before and after static load, impact, and snowplows tests to determine the ability of the steady-burning, semi-flush threshold approach light assembly to comply with therequirements as depicted in figure 2 when submittedto these tests.

4.3.3 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.

4.3.4 Cycling and thermal shock test. The light assembly mounted on a light 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 4 hours. At the expiration of the "on" part of the cycle, the test unit shall be deenergized and immediately submerged under at least 1 foot of water. The temperature of the water before submersion shall be 5°C (41° F) or lower. The test unit shall remain under water for at least 4 hours. At the expiration of the "off" part of the cycle, the test unit shall be subjected to repetition of the above tests until a total of three "on-off" cycles have been completed. The test unit 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.

4.3.5 Low temperature test. The low temperature test shall be conducted in accordance with procedure II, Method 502.2, of MIL-STD-810, except that the temperature shall be constant, -55° C (-67° F),

and maintained for a period of 6 hours. The temperature sensors shall be installed around the production model in the test chamber.

4.3.6 High temperature test. The high temperature test shall be conducted in accordance with Procedure II, Method 501.2, extreme induced conditions, of MIL-STD-810, except the temperature shall be constant, +70C (158 F), and maintained for 6 hours. The temperature sensors shall be installed around the production model in the test chamber.

4.3.7 Low Pressure (altitude). The low pressure test shall be conducted in accordance with Method 500.2, Procedure I of MIL-STD-810. The light assembly shall be tested at atmospheric pressures corresponding to sea level and 10,000 feet (3,048 meters) altitude at both -55°C (-67° F) and 10°C (+158° F).

4.3.8 Humidity test. The humidity test shall be in accordance with Procedure II, Method 507.2, of MIL-STD-810C except that a total of three complete 24 hour cycles (72 hours) shall be required (Table 507.2-I (cycle 5)). The maximum temperature shall be +70° C (158° F) and the highest relative humidity shall be 95 percent instead of 75 percent.

4.3.9 Sand and dust. The sand and dust test shall be performed in accordance with Procedures I and II, Method 510.2, of MIL-STD-810. The air velocities used in the sand and dust test shall be 29 meters/second (m/s) (5,700 ft/min) and 8.9 m/s (1,750 ft/min), respectively. The test duration shall be 6 hours, and the equipment shall be rotated twice during the conduct of the test.

4.3.10 Salt spray. The salt spray test shall be performed in accordance with Procedure I, Method 509.2, of MIL-STD-810. The light assembly shall be exposed to salt spray for period of 72 hours, followed by a 48 hour drying period. At the conclusion of the test, salt build-up may be removed with tap water.

4.3.11 Vibration test. The light assembly, complete with all parts and lamp, shall be installed on an L-868 light base and mounted securely on the test machine in a manner to simulate installed conditions.

(a) Vibration planes. The test assembly shall be vibrated in three planes, or directions, as follows:

(1) In a direction perpendicular to the test table (vertically).

(2) Horizontally, parallel to the light beam axis.

(3) Horizontally, at right angles to the light beam axis.

(b) Frequencies. The test assembly shall be vibrated through a frequency range of 100 to 1500 Hz, in each plane, and as described in 3.6.

The duration of each sweep shall be 10 minutes. Electrical continuity thorough the lamp shall be continuously monitored. After the vibration test, the light assembly shall be thoroughly examined for mechanical failure of any component, loosening of any part, cracked or broken seals, continuity of electrical circuits, and possible damage to the lamp filaments, supports, etc.

4.3.12 Snow plow test. The production model light assembly for this test shall be installed inpavement and traversed five times, at speeds up to 30 mph, by a Walters Snow Fighter, Model FBCS, or similar vehicle with its blade set to a clearance of not more than 1/4 inch above the pavement. The vehicle shall be equipped with snow chains. During this test the blade shall pass over the test unit from different directions five times. In three of these passes, the tires and snow chains shall also pass over the test unit. There shall be no damagewhich would render the test unit unfit for service.

4.3.13 Impact test. The light assembly shall be mounted rigidly on either a 1-inch thick (2.5 cm) steel plate or a 4-inch(10 cm) or thicker concrete base. The dimensions of the steel or concretebase shall beat least 3 by 3 feet (1 by 1 meters).The light assemblyshall beturned on at full brightness for at least 2 hours prior to starting the test. With the light assembly still on at full brightness, a steel ball weighing 5 pounds (2.27 kilograms (kg)) shall be dropped at the center of the top unit assembly from a height of 6 feet (1.83 meters). The steel ball shall be dropped 10 times on the top unitassembly witha 5-minute interval between each drop. Upon conclusion, the light assembly shall be opened to determine if the optical assembly has been damaged or any component displaced in any way.

4.3.14 Hydraulic impact test. The light assembly shall be submerged in water to a depth of approximately 1/2 inch (1.27 cm). The upper surfaces of the light assembly around the windows shall be encased in a leak-proof metal housing containing a 1-3/4 inch (4.54 cm) diameter steel piston. The chamber shall be filled with water and purged of all air. A 5-pound (2.27 kg) steel ball shall be dropped 6 feet (1.83 meters) onto the steel piston. The light assembly shall show no visible damage after the above test has been repeated five times. The

test procedure and a detailed drawing of the test setup shall be submitted to FAA for approval before this test is conducted.

4.3.15 Horizontal static-load test. The light assembly shall be placed in a hydraulic press with a bar attached to the top surface. A load of 3,000 pounds (1,360 kg) shall be applied parallel to the light beam. This test shall be repeated 20 times. There shall be no sign of structural damage, movement of any part, or loosening of fasteners.

4.3.16 Surface temperature test. Tests shall be conducted to assurethat the maximum temperature on top of the light assembly will not exceed 160° C (320 F) when the light is covered with the tire of a heavy ground vehicle for a period of 10 minutes. The light assembly shall be operated at high intensity for at least 2 hours before this 10 minute test period. The test shall be conducted in still air whose ambient temperature is 24° C (17° F). The thermocouple shall be located between the hottest point of the lamp and the tire to register the test temperature.

4.3.17 Leakage test. A leakage test shall be performed after the light assembly has undergone the static loud test described in 4.3.18. For the leakage test, the top unit assembly shall be securely bolted to a light base receptacle. A suitable means shall be provided for pressurizing the test unit. All bolts shall be torqued to the manufacturer's specifications. With a minimum internal pressure of 20 pounds per squareinch (psi) (1.41 kg/sq cm), the assembled unit shall be tested using a bubble test material (high foam detergent producing a low-surface tension). The light assembly shall be considered watertight if no air bubbles appear.

4.3.18 Static load test. The light assembly, with the top unit assembly (including gasket, lamp, and optical assembly) mounted on a base receptacle, shall be placedon a flat steel plate mounted in a standard testingmachine. The static load shall be applied to the top part of the light assembly fixture through a block of rubber, 11 inches (27.94 cm) in diameter and 1-1/2 inches (3.81 cm) cm thick, having a Shore A hardness of 55 to 70. A total load of 50,000 pounds (22,675 kg) kg) shall be applied uniformly over the area of the rubber at a rate not greater than 10,000 pounds (4,535 kg) per minute. The light assembly shall be considered unsatisfactory it there is any permanent deformation, cracking of material or finish, breaking, or damage to any part of the light assembly.

## 5. PREPARATION FOR DELIVERY

5.1 General. Unless otherwise specified in the contract, each light assembly shall be prepared for domestic shipment in accordance with the following subparagraphs:

5.2 Packaging. Packaging shall be in accordance with Specification MIL-E-17555, Method III. Separate packaging shall be provided for each optical assembly and outer ring assembly.

5.3 Packing. Packing shall be in accordance with Specification Mil-E-17555, Level B.

5.4 Marking. Packages shall be durably and legibly marked with the following information:

Item – Semi-flush approach light – (if top unit assembly and outer ring assembly are packed in separate cartons, add the appropriate part names).

Quantity _____
Type _____
Style _____
Specification Number _____
Contract Number _____
National Stock Number _____
Manufacturing Name or Trade Mark _____

6. NOTES

6.1 Intended use. The steady-burning, semi-flush threshold approach light assembly described in this specification is intended for use in a type L-868 base receptacle.

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