

Federal Aviation Agency

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AIRPORTS

EFFECTIVE :

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Replaces
L-819



ADVISORY CIRCULAR

SUBJECT : SPECIFICATION FOR L-819 FIXED FOCUS
BIDIRECTIONAL HIGH INTENSITY RUNWAY LIGHT

AC 150/5345-9A
dated 4/22/65

1. PURPOSE. This circular describes the subject specification requirements and is published by the Federal Aviation Agency for the guidance of the public. The use of this specification is required for project activity under the Federal-aid Airport Program.
2. CANCELLATION. This advisory circular replaces Federal Aviation Agency Specification L-819, "Fixed Focus Bidirectional High Intensity Runway Light," dated November 1, 1960. No substantive changes have been made to the prior specification in placing it in the Advisory Circular System.
3. DESCRIPTION OF PUBLICATION. The specification requirements presented are for a fixed focus bidirectional high intensity runway light. This runway light consists essentially of an optical system, a lamp, a lamp holder mounted in a suitable housing, and a mounting assembly. The runway light shall be furnished complete and ready for installation on a base mounting.
4. APPLICABLE SPECIFICATIONS. The following specifications and standard, as referred to hereinafter, of the issues in effect on date of application for qualification (paragraph 8) are applicable to this specification. In case of conflict between this specification and the applicable specification, this specification shall govern.
 - a. Federal Specifications. Copies of Federal specifications may be obtained from the appropriate Regional General Services Administration Office.
 - (1) QQ-A-591 - Aluminum Alloy Special Shaped Section.
 - (2) QQ-A-601 - Aluminum-Alloy Sand Castings.
 - b. Federal Standard. Copies of the Federal standard may be obtained from the appropriate Regional General Services Administration Office.
 - (1) Federal Standard No. 595, Colors.

11/4/63

- c. Military Specifications. Copies of Military specifications may be obtained from Armed Service Electro-Standards Agency, Fort Monmouth, New Jersey.
- (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.
- d. ASTM Specifications. Copies of ASTM specifications may be obtained from the American Society for Testing and Materials, 1916 Race Street, Philadelphia 3, Pennsylvania.
- (1) A 120-61 T - Specification for Black and Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless Steel Pipe for Ordinary Uses.
- e. Federal Aviation Agency Specifications. Copies of Federal Aviation Agency specifications may be obtained from the Federal Aviation Agency, Distribution Section, HQ-438, Washington, D. C. 20553.
- (1) Specification for L-809 Airport Light Base and Transformer Housing (AC 150/5345-6).
 - (2) L-823 - Plug and Receptacle, Cable Connectors.
 - (3) L-834 - Individual Lamp Series-to-Series Type Insulating Transformer for 5000 Volt Series Circuit.
 - (4) L-837 - Large-Size Light Base and Transformer Housing.

5. PERFORMANCE REQUIREMENTS.

- a. The runway light shall be designed to provide a light distribution not less than the minimum candlepower values shown on Figure 1 of this specification when tested with a clear lens and a 200-watt, 6.6 ampere lamp operated at, or corrected to, 4800 lumens. The maximum candlepower restrictions shown in Figure 1 shall apply from 0° to 15° above the horizontal.
- b. When color is specified, the candlepower values shall be not less than those obtained by multiplying the candlepower values shown on the applicable photometric curves of this specification by the following:
- (1) Yellow - .400
 - (2) Green - .150

- c. All current carrying parts of the unit, except the insulating transformer, shall be suitable for the service intended.
- d. The unit shall be designed and constructed for continuous service under the following operating conditions:
 - (1) Temperature. Any ambient temperature from a minimum of -45° F. to a maximum of $+120^{\circ}$ F. at sea level.
 - (2) Weather. Continuous outdoor operation under all normal weather conditions, including wind velocities up to 100 miles per hour.

6. DETAIL REQUIREMENTS.

- a. Optical System. The optical system shall consist of a glass lens assembly, or combination of lenses, and may include reflectors and shields. Glass lenses shall be fabricated from heat-resistant glass conforming to Military Specification MIL-C-7989, Class B. Colored lenses or colored screens used shall conform to the requirements of Military Specification MIL-C-25050, Type I. Reflectors, if used, shall be aluminum with a specular finish similar and equal to "Alzak".
- b. Socket. The socket shall be the medium prefocus base type and shall be mounted rigidly in the metal fitting. The socket shall have a rating suitable for the service intended.
- c. Lamp. The lamp used shall be a 200-watt, 6.6 ampere, T-14 bulb, medium prefocus base, C-13 filament, 2-3/16 light center length, 4800 lumens, with rated life of 75 hours.
- d. Housing. All metal parts of the housing shall be fabricated from nonferrous metal or from ferrous metal suitably protected against corrosion. Copper bearing hardware in contact with aluminum shall be cadmium, nickel, or zinc plated. Aluminum castings shall conform to Federal Specification QQ-A-601, Alloy 43 or 214, and aluminum die castings shall conform to Federal Specification QQ-A-591, Alloy 13 or A13. A means for drainage shall be provided in the bottom of the housing to drain condensation and water. The joints between metal and glass shall be sealed by heat-resisting and watertight gaskets or by a sealing compound where joints are not to be disturbed for relamping.
 - (1) Suitable means shall be provided for holding the lens and reflector assembly securely in place on the metal housing. The unit shall be designed to require no special tools for relamping or for cleaning the lenses. The housing shall be provided with a means for leveling, when mounted on the breakable coupling, and a means for determining when a level condition has been achieved. The housing shall support the lens and lamp so that they are tilted 4° downward toward the runway side after the assembly has been leveled.

- e. Orientation. The outside of the housing shall be marked to indicate correct orientation with respect to the runway centerline. Where the lens and/or reflector assembly is removable for relamping, it shall be keyed for correct orientation. A sighting device shall be included on each unit to check alignment of the optical system with respect to adjacent units when installed in place.
- f. Leads. A connecting lead assembly shall be supplied to connect to the receptacle on the secondary lead of the insulating transformer. The lead shall consist of an appropriate length of two-conductor, 300-volt minimum, #16 AWG stranded wire conforming to the provisions of the Underwriters' Laboratories, Incorporated requirements for Type SJ cord. This lead shall terminate in a plug conforming to Figure 1a of FAA Specification L-823. A cable clamp or similar device shall be provided in the fitting or housing to prevent strain at the socket terminals.
- g. Mounting Assembly. The mounting assembly shall consist of a breakable coupling, base plate, and pipe column if required. The overall height of the unit, mounted in place, shall not exceed 14 inches above ground level. All parts of the mounting assembly shall be made of nonferrous metal or of ferrous metal suitably protected against corrosion. Aluminum sand castings shall conform to Federal Specification QQ-A-601, Alloy 43 or 214; and, aluminum die castings shall conform to Federal Specification QQ-A-591, Alloy 13 or A13.
- (1) The breakable coupling shall have a 2-inch tapered male thread for mounting on the base plate. This thread shall conform to the requirements of ASTM Specification A 120-61 T. The coupling shall have a "shearing groove" produced by scoring, molding, etc. It shall withstand a static load of 300 pounds applied perpendicular to the axis of the coupling at a point 12 inches from the shearing groove and shall break cleanly at the groove when a static load of 500 pounds is applied at the same position. In addition, deflection at a point 12 inches from the shearing groove shall not be more than 1/2 inch when a static load of 300 pounds is applied as described above. The breakable coupling shall have a hexagonal section between the thread and the shearing groove to facilitate removal of a broken coupling. The breakable coupling shall also be provided with one or more drainage holes near the shearing groove.
 - (2) The metal base cover plate shall be cast or fabricated to fit a base conforming to FAA Advisory Circular No. 150/5345-6 or to FAA Specification L-837, whichever is specified.
 - (3) The plate shall be designed to receive the threaded end of the breakable coupling specified above. Means shall be provided for attaching disconnecting receptacle per Figure 1c of FAA

Specification L-823 to the bottom surface of the base plate to obtain a watertight seal. This connector is specified under an FAA Specification L-834 transformer and is not a part of this specification. The base plate shall be designed so that when assembled to the breakable coupling, the shearing groove on the coupling shall be not more than 3-1/2 inches above the top of the base flange.

- (4) A rubber gasket for the base flange shall be supplied to obtain a watertight seal with the base cover plate. This gasket shall have a minimum thickness of 1/8 inch and shall fit the bolt hole circle of the base flange shown in Figure 1 of FAA Advisory Circular No. 150/5345-6 or Figure 1 of FAA Specification L-837, whichever is specified.
- h. Base. The base to be used with this unit shall conform to FAA Advisory Circular No. 150/5345-6 or FAA Specification L-837, whichever is specified. The base is not a part of this specification.
- i. Insulating Transformer. The insulating transformer to be used with this unit shall conform to FAA Specification L-834. The transformer is not a part of this specification.
- j. Painting. Paint for the finish coat shall be of a high quality enamel type suitable for the drying process used. The color shall conform to Federal Standard No. 595, Colors, Table X, Aviation Yellow No. 13538. Paint for the prime coat shall be suitable for the metal treatment involved. The parts of the unit to be painted and the number of coats to be applied to the surfaces of each part are as follows:
- (1) Base Plate, Exterior Surface. One prime and one finish coat.
 - (2) Central Column and Breakable Coupling, Exterior Surface. One prime and one finish coat.
 - (3) Housing, Exterior Surface. One prime and one finish coat.
- b. Parts List and Installation Instructions. A complete parts list and installation instructions shall be furnished with each installation. Sufficient drawings or illustrations shall be provided to indicate clearly the method of installation.

7. TESTING.

a. Qualification Testing.

- (1) Each light fixture shall be subjected to the tests described below and to the applicable detail requirements under paragraph 6.

- (a) The optical performance of the unit shall be determined by photometric tests which show compliance with light distribution requirements of Figure 1 of this specification. The lamp used for this test shall be of the type specified under paragraph 6c.
 - (b) The manufacturer shall provide certification from the lens manufacturer that the lens assembly meets the transmissivity, color, and ware requirements of referenced specifications under paragraph 6a.
 - (c) The manufacturer shall furnish certified test reports showing that the breakable coupling meets the static load requirements of paragraph 6g(1). All tests of the breakable coupling shall be performed with the couplings screwed tightly in place in a base plate, and with the base plate securely bolted to a firm and rigid foundation. For these tests, there shall be inserted in the breakable coupling a 16-inch length of round aluminum rod, suitably turned down at one end to fit tightly in the breakable coupling. Do not apply the load faster than 50 pounds per minute, and continue to apply load until the coupling breaks. It is required to test and break five couplings and use the average results obtained in determining the static load tests. The average breaking strength shall not exceed 500 pounds. A description of the test methods, together with test results, shall accompany the request for approval.
- (2) Additional inspections and tests will be made as deemed necessary by the Federal Aviation Agency, Airports Service, Washington, D. C. 20553, to determine compliance with this specification.

8. QUALIFICATION.

- a. The manufacturer shall furnish a sample fixture to a disinterested testing laboratory to be tested as described herein to obtain certification regarding the ability to manufacture lighting fixtures meeting the requirements of this specification. The disinterested testing laboratory shall be a laboratory acceptable to the Federal Aviation Agency, Airports Service, Washington, D. C. 20553. The manufacturer shall furnish two copies of the testing laboratory's reports to the Federal Aviation Agency, Airports Service, Washington, D. C. 20553, for review and approval consideration. Upon approval of the test reports which show satisfactory certification of compliance, the Airports Service will list the name of the qualified manufacturer and a description of their fixture in the Advisory Circular No. 150/5345-1, "Approved Airport Lighting Equipment." The cost of testing shall be borne by the manufacturer offering the material for qualification. A preproduction model shall be furnished to the Airports Service for physical inspection and approval.

- b. Parts list and installation instructions shall be submitted to the Federal Aviation Agency, Airports Service, Washington, D. C. 20553, for review and approval.
 - c. A certificate of compliance from the lens manufacturer that the lenses conform to the detail requirements specified in paragraph 6 shall be submitted to the Federal Aviation Agency, Airports Service, Washington, D. C. 20553, for review and approval.
 - d. At any time after approval has been granted under the above conditions, a certified copy of factory test reports on the latest production run of any one of the fixtures produced under this specification shall be made available by the manufacturer upon written request by the Federal Aviation Agency, Airports Service, Washington, D. C. 20553.
- HOW TO GET THIS PUBLICATION.

- a. Order copies of this publication from:

Federal Aviation Agency
Distribution Section, HQ-438
Washington, D. C. 20553

- b. Identify the publication in your order as:

FAA Advisory Circular No. 150/5345-9
Specification for L-819 Fixed Focus Bidirectional High Intensity
Runway Light.
Dated 11/4/63

- c. There is no charge for this publication.


Cole Morrow, Director
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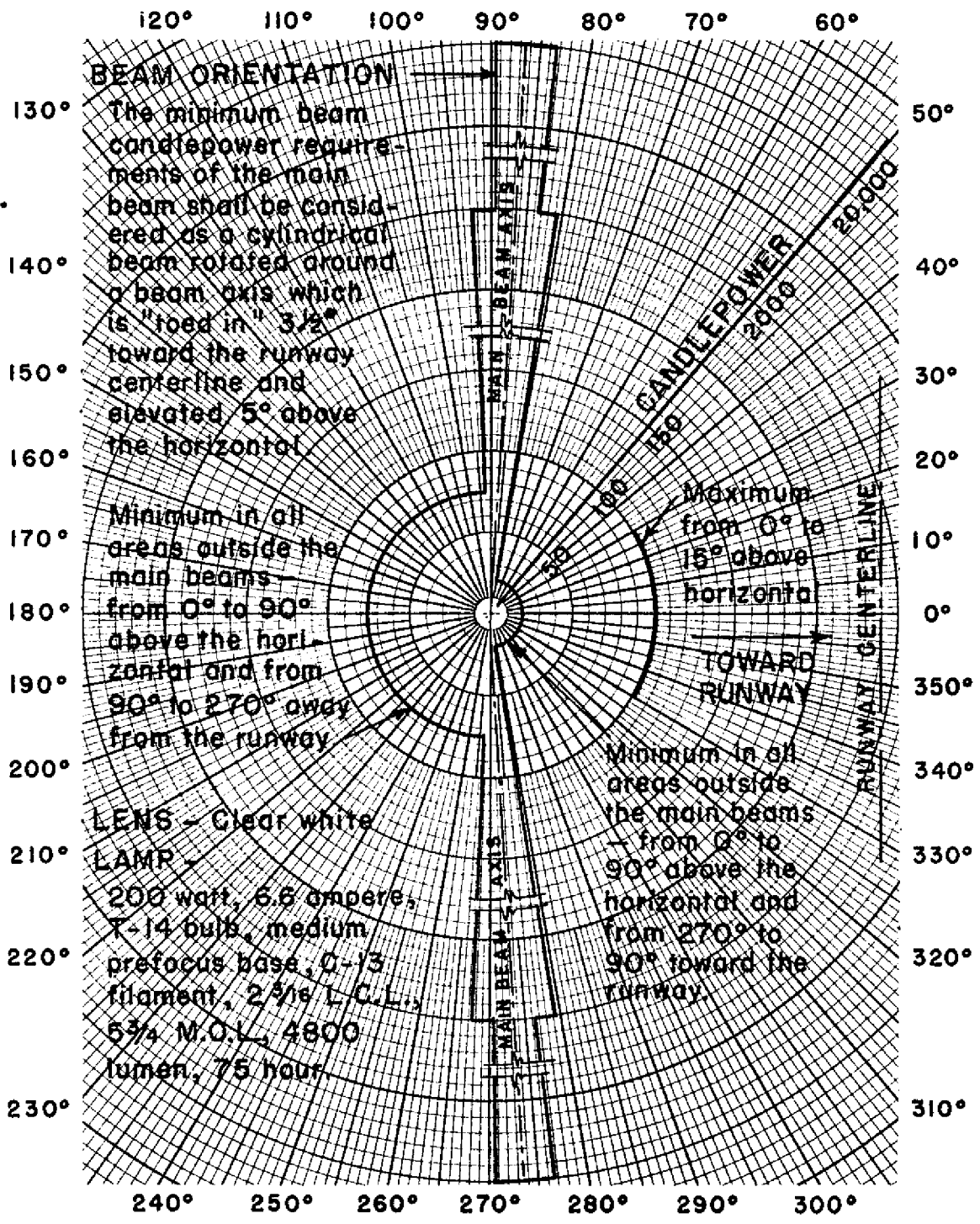


FIGURE 1. HORIZONTAL DISTRIBUTION AT 5° ABOVE THE HORIZONTAL