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AEROSPACE STANDARD

AS 271A

AIRCRAFT POSITION LIGHTS

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1. PURPOSE - To specify minimum requirements for aircraft position lights.

2. SCOPE - This specification covers three types of aircraft position lights.

Type I - Forward Position Light (red wing tip light)

Type II - Forward Position Light (green wing tip light)

Type III - Rear Position Light (white tail light)

3. GENERAL REQUIREMENTS

3.1 Materials and Workmanship

3.1.1 Materials - Materials shall be of a quality which experience and/or tests have demonstrated to be suitable and dependable for the purpose intended.

3.1.2 Choice of Materials - Choice and treatment of materials shall be such as to eliminate or minimize corrosion, fire hazard, and fungus growth.

3.1.3 Workmanship - Workmanship shall be consistent with high-grade aircraft electrical equipment practice.

3.2 Identification

3.2.1 Nameplate - The following information shall be legibly and permanently marked on the unit or attached thereto:

a. Name of unit (Position Light, Type)
b. SAE Specification AS 271A
c. Minimum lamp c.p. or lamp part number
d. Manufacturer's part number
e. Manufacturer's name and/or trademark
f. Weight
g. Date of manufacture

3.3 Environmental Conditions - The complete unit shall operate under the following environmental conditions and shall meet the following performance requirements.

3.3.1 Temperature - When mounted in accordance with the manufacturer's recommendations, the unit shall function over the range of ambient temperature from -50 to +55 C. It shall not be adversely affected by exposure to temperatures in the range of -65 to +70 C.

3.3.2 Humidity - The unit shall function and shall not be adversely affected by exposure to a relative humidity in the range of 5 to 90% throughout a temperature range of -35 to +55 C.

3.3.3 Altitude - The unit shall function and shall not be adversely affected when subjected Ø to a pressure and temperature equivalent to -1000 to +50,000 ft standard altitude.

3.3.4 Vibration - The design of the light assembly should be such that it will give satis- Ø factory operation when installed on the aircraft for which it is intended.

3.3.4.1 The light assembly, including lamp, shall function and shall not be adversely af- Ø fected when subjected to vibration of 0.060 in. double amplitude from 10 to 55 cps, and with the direction of vibration either parallel or perpendicular to the normal mounting surface.

3.3.4.2 The light assembly with lamp installed shall meet the requirements of Procedure Ø XII of Military Specification MIL-E-5272C; however, under this condition, a failure of the lamp filament is not considered to be a failure of the light assembly.

3.3.5 Dust - The unit shall function and shall not be adversely affected when subjected to severe sand and dust conditions.

3.3.6 Salt Spray - The unit shall function and shall not be adversely affected when subjected to a salt spray for a period of 100 hr.

4. DETAIL REQUIREMENTS

4.1 Dihedral Angle Coverage, Forward Position Lights, Types I and II, and Rear Position Lights, Type III - When mounted on aircraft in accordance with the manufacturer's Ø instructions, the forward and rear position lights shall show unbroken light within the dihedral angles specified in Figure 1, and defined in 4.1.1.

Position Light Type	Dihedral Angle
Type I (forward, red)	L (left)
Type II (forward, green)	R (right)
Type III (rear, white)	A (aft)

Figure 1 Dihedral Angle Coverage, Forward and Rear Position Lights

4.1.1 Definitions of Dihedral Angles

1. Dihedral Angle L (left) - The dihedral angle formed by two intersecting vertical planes, one parallel to the longitudinal axis of the airplane, and the other at 110 deg to the left of the first, when looking forward along the longitudinal axis.

2. Dihedral Angle R (right) - The dihedral angle formed by two intersecting vertical planes, one parallel to the longitudinal axis of the airplane, and the other at 110 deg to the right of the first, when looking forward along the longitudinal axis.

3. Dihedral Angle A (aft) - The dihedral angle formed by two intersecting vertical planes making angles of 70 deg to the right and 70 deg to the left, respectively, looking aft along the longitudinal axis, to a vertical plane passing through the longitudinal axis.

4.2 Position Light Intensity Distribution

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4.2.1 General - The intensities specified in this section shall be provided by new equipment with all light covers and color filters in place, when mounted on aircraft in accordance ø with the manufacturer's instructions. Intensities shall be determined with the light source operating at the normal operating voltage of the airplane.

4.2.2 Minimum Intensity Distribution, Forward Position Lights, Types I and II, and Rear ø Position Lights, Type III

4.2.2.1 Minimum Intensities in the Horizontal Plane - The intensities in the horizontal plane shall not be less than the values given in Figure 2. The horizontal plane is ø defined as the plane containing the longitudinal axis of the airplane and is perpendicular to the plane of symmetry of the airplane.

Position Light Considered	Angle from Right or Left of Longitudinal Axis, Measured from Dead Ahead (deg)	Minimum Intensity (Candles)
	0 to 10	40
Type I (fwd., red)	10 to 20	30
Type II (fwd., green)	20 to 110	5
Type III (rear, white)	110 to 180	20

Figure 2 Minimum Intensities in the Horizontal Plane, Forward and Rear Position Lights

4.2.2.2 Minimum Intensities above and below the Horizontal Plane - The intensities in any vertical plane shall not be less than the appropriate value given in Figure 3 when Ø I is the minimum intensity specified in Figure 2 for the corresponding angles in the horizontal plane. Vertical planes are defined as planes perpendicular to the horizontal plane.

Angles above or below Horizontal, in any Vertical Plane (deg)	Minimum Intensity (I)
0	1.00
0 to 5	0.90
5 to 10	0.80
10 to 15	0.70
15 to 20	0.50
20 to 30	0.30
30 to 40	0.10
40 to 90	0.05

Figure 3 Minimum Intensities in any Vertical Plane, Forward and Rear Position Lights

4.2.3 Maximum Intensities in Overlap Regions, Forward Position Lights, Types I and II, and Rear Position Lights Type III - The intensities in overlaps between any forward or rear position light shall not exceed the values given in Figure 4. Area A includes all Ø directions in the adjacent dihedral angle which pass through the light source and which intercept the common boundary plane at more than 10 but less than 20 deg. Area B includes all directions in the adjacent dihedral angle which pass through the light source and which intercept the common boundary plane at more than 20 deg.

Overlaps	Maximum Intensity (Candles) Area A	Area B
Type I (fwd., red) in dihedral angle R	10	1
Type I (fwd., red) in dihedral angle A	5	1
Type II (fwd., green) in dihedral angle L	10	1
Type II (fwd., green) in dihedral angle A	5	1
Type III (rear, white) in dihedral angle L	5	1
Type III (rear, white) in dihedral angle R	5	1

Figure 4 Maximum Intensities in Overlaps between Forward and Rear Position Lights