Designation: F3234/F3234M – 17

Standard Specification for Exterior Lighting in Small Aircraft[1]

This standard is issued under the fixed designation F3234/F3234M; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This specification covers international standards for the exterior lighting aspects of airworthiness and design for "small" aircraft.

1.2 The applicant for a design approval must seek the individual guidance of their respective CAA body concerning the use of this specification as part of a certification plan. For information on which CAA regulatory bodies have accepted this specification (in whole or in part) as a means of compliance to their Small Aircraft Airworthiness regulations (hereinafter referred to as "the Rules"), refer to ASTM F44 webpage (www.ASTM.org/COMMITTEE/F44.htm) which includes CAA website links.

1.3 The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in non-conformance with the standard.

1.4 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 Following is a list of external standards referenced throughout this specification; the earliest revision acceptable for use is indicated. In all cases later document revisions are acceptable if shown to be equivalent to the listed revision, or if otherwise formally accepted by the governing civil aviation authority; earlier revisions are not acceptable.

2.2 *ASTM Standards:*[2]

F3060 Terminology for Aircraft

F3061/F3061M Specification for Systems and Equipment in Small Aircraft

2.3 *SAE Standards:*[3]

SAE AS8017, Rev A Minimum Performance Standard for Anticollision Light Systems

SAE AS8037, Rev – Minimum Performance Standard for Aircraft Position Lights

3. Terminology

3.1 Terminology specific to this specification is provided below. For general terminology, refer to Terminology F3060.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *aircraft type code, n*—an Aircraft Type Code (ATC) is defined by considering both the technical considerations regarding the design of the aircraft and the airworthiness level established based upon risk-based criteria; the method of defining an ATC applicable to this specification is defined in Specification F3061/F3061M.

4. Exterior Lighting

NOTE 1—Table 1 provides correlation between various Aircraft Type Codes and the individual requirements contained within this section; refer to 3.2.1. For each subsection, an indicator can be found under each ATC character field; three indicators are used:

An empty cell ( ) in all applicable ATC character field columns indicates that an aircraft must meet the requirements of that subsection.

A white circle (○) in multiple columns indicates that the requirements of that subsection are not applicable to an aircraft *only* if all such ATC character fields are applicable.

A mark-out (×) in any of the applicable ATC character field columns indicates that the requirements of that subsection are not applicable to an aircraft if that ATC character field is applicable.

Example—An aircraft with an ATC of 1SRLLDLN is being considered. Since all applicable columns are empty for 4.2.1, that subsection is applicable to the aircraft; however, since the "D" meteorological column for 4.1.1 contains an ×, then that subsection is not applicable.

4.1 *Taxi and Landing Lights:*

4.1.1 Each taxi and landing light must be designed and installed so that no dangerous glare is visible to the pilots.

4.1.2 Each taxi and landing light must be designed and installed so that the pilot is not seriously affected by halation.

4.1.3 Each taxi and landing light must be designed and installed so that it provides enough light for night operations.

[1] This specification is under the jurisdiction of ASTM Committee F44 on General Aviation Aircraft and is the direct responsibility of Subcommittee F44.50 on Systems and Equipment.

Current edition approved Feb. 15, 2017. Published March 2017. DOI: 10.1520/F3234_F3234M-17.

[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[3] Available from SAE International (SAE), 400 Commonwealth Dr., Warrendale, PA 15096, http://www.sae.org.

TABLE 1 ATC Compliance Matrix, Section 4

Section	Airworthiness Level				Number of Engines		Type of Engine(s)		Stall Speed			Cruise Speed		Meteorological Conditions			Altitude		Maneuvers	
	1	2	3	4	S	M	R	T	L	M	H	L	H	D	N	I	L	H	N	A
4																				
4.1																				
4.1.1														×						
4.1.2														×						
4.1.3														×						
4.1.4														×						
4.2																				
4.2.1																				
4.2.2																				
4.2.3																				
4.2.4																				
4.3																				
4.3.1																				
4.3.2																				
4.3.3																				
4.4																				
4.5																				
4.6																				
4.6.1																				
4.6.2																				
4.6.3																				
4.7																				
4.7.1																				
4.7.2																				
4.7.3																				

4.1.4 Each taxi and landing light must be designed and installed so that it does not cause a fire hazard in any configuration.

4.2 *Position Light Systems:*

4.2.1 Each part of each position light system must meet the applicable requirements of this section, and each system as a whole must meet the requirements of SAE AS8037.

4.2.2 Left and right position lights must consist of a red and green light spaced laterally as far apart as practicable and installed on the aircraft such that, with the aircraft in the normal flying position, the red light is on the left side and the green light is on the right side.

4.2.3 The rear position light must be a white light mounted as far aft as practicable on the tail or on each wing tip.

4.2.4 Each light cover or color filter must be at least flame resistant and may not change color or shape or lose any appreciable light transmission during normal use.

4.3 *Position Light Dihedral Angles:*

4.3.1 Dihedral angles are defined in SAE AS8037.

4.3.2 Except as provided in 4.3.3, each position light must, as installed, show unbroken light within the dihedral angles defined in 4.3.1.

4.3.3 If the rear position light, when mounted as far aft as practicable in accordance with 4.2.3, cannot show unbroken light within a dihedral angle A as defined in 4.3.1, a solid angle, or angles of obstructed visibility totaling not more than 0.04 steradians is allowable within that dihedral angle, if such solid angel is within a cone whose apex is at the rear position light and whose elements make an angle of 30° with a vertical line passing through the rear position light.

4.4 *Position Light Distribution and Intensities*—The light distribution and intensity of each position light, as installed, including overlap between adjacent signals, must meet the requirements of SAE AS8037.

4.5 *Color Specifications*—Each position light color must have the applicable International Commission on Illumination chromaticity coordinates as described in SAE AS8017 or SAE AS8037, or both, as applicable.

4.6 *Riding Lights:*

4.6.1 Each riding (anchor) light required for a seaplane or amphibian must be installed so that it can show a white light for at least 3.2 km [2 miles] at night under clear atmospheric conditions.

4.6.2 Each riding (anchor) light required for a seaplane or amphibian, must be installed so that it can show the maximum unbroken light practicable when the aircraft is moored or drifting on the water.

4.6.3 Externally hung lights may be used to meet the requirements of 4.6.1 and 4.6.2.

4.7 *Anticollision Light Systems:*

4.7.1 The aircraft must have an anticollision light system that consists of one or more approved anticollision lights located so that their light will not impair the flight crew members' vision or detract from the conspicuity of the position lights.

4.7.2 The anticollision light system, as installed, must consist of enough lights to illuminate the vital areas around the aircraft, considering the physical configuration and flight characteristics of the aircraft. The field of coverage must extend in each direction within at least 75° above and 75° below the horizontal plane of the aircraft, except that there may be solid angles of obstructed visibility totaling not more than 0.5 steradians.

4.7.3 The arrangement of the system, that is, the number of light sources, beam width, speed of rotation, and other characteristics, must meet the requirements of SAE AS8017.

5. Keywords

5.1 anticollision lights; landing lights; lighting; position lights; riding lights; taxi lights