

# **INTERTEK AIRPORT LIGHTING EQUIPMENT CERTIFICATION PROGRAM**

## **IESALC Government Contacts Subcommittee Meeting**

**Washington, DC, April 20, 2023**

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# INTRODUCTION



- **Purpose / Outline**

- Applicability and outline of ALECP
- Update of Current Program Status
- Update on Current Initiatives



# AIRPORT LIGHTING EQUIPMENT CERTIFICATION

Certification Program covers all equipment specified in the FAA AC 150/5345 series:

- Rotating Beacons
- Obstruction Lights
- Wind Cones
- Isolation Transformers
- Taxiway/ Runway Inpavement and Elevated Lights
- Retroreflective Markers
- Cable Connectors
- Underground Cable
- Runway & Taxiway Signs
- Portable Runway Lights
- Light Bases
- Constant Current Regulators
- Precision Approach Path Indicators (PAPI)
- Runway End Identification Lights (REIL)



# ALECP PURPOSE AND APPLICABILITY



- **Purpose is to assist in enhancing aviation safety by:**
  - Standardizing performance, quality, reliability of airfield lighting and obstruction lighting products
  - Goal is that all pilots receive reliable, standardized visual queues.
- **Applicability of ALECP Certification**
  - **Airfield Lighting Products:**
    - One of the FAA acceptable means to satisfy Title 14 CFR Part 139 Section 139.311 Certification of Airports
    - Mandatory for all projects funded by Federal AIP for PFC monies
    - Widely used around the world to insure a standard level of performance



# ALECP PURPOSE AND APPLICABILITY



- **Applicability of ALECP Certification**

- **Obstruction Lighting Products:**

- **FAA Regulations - 14 CFR Part 77**
  - 77.7 – Specifies the requirements for notifying the FAA of construction or alteration of an obstruction.
    - FAA Form 7460-1, Notice of Proposed Construction or Alteration
  - 77.9 - Specifies what types of construction requires notification to the FAA.
  - 77.17 – Provides the definitions of obstructions.
  - 77.29 – Describes the aeronautical study that the FAA does to evaluate the impact of the proposed obstruction.
  - 77.31 – Describes the determination that FAA makes for each obstruction.
    - Determination of No Hazard to Air Navigation is issued with conditions including the lighting and marking.
  - 77.33 – Determination of No Hazard to Air Navigation is good for 18 months.

# ALECP PURPOSE AND APPLICABILITY



- **Applicability of ALECP Certification**

- **Obstruction Lighting Products:**

- **FAA AC 70/7460-1M**

- Describes how obstructions must be marked and lighted

- Section 15.4 states that lighting equipment should conform to the latest version of FAA AC 150/5345-43.

FAA AC 150/5345-53 lists the manufacturers that have demonstrated compliance

Other manufacturers' equipment may be used if it meets the requirements of -43





- **GENERAL OUTLINE**

- Manufacturer submits certification request via AL-2 application form
- Qualification testing
- Documentation submittal and engineering review
- Initial manufacturing facility audit (semi-annual inspections continue)
- License Agreement
- Certificate issued and product listed in 53D Addendum
- Certification process covered under ANSI accreditation to ISO 17065



- **DOCUMENTATION REVIEW**

## AL-2 Application Form

5. Required Supporting Documentation (send with this form)	
<input type="checkbox"/>	List of Types, Classes, Styles, Sizes, manufacturer's catalog numbers (product variants)
<input type="checkbox"/>	Electrical Schematics
<input type="checkbox"/>	Assembly Drawings
<input type="checkbox"/>	Bill of Materials showing manufacturer's name and part numbers
<input type="checkbox"/>	Statement of Warrantee
<input type="checkbox"/>	Instruction/Installation/Operating Manual
<input type="checkbox"/>	Product Description sheet (marketing material)
<input type="checkbox"/>	AL-2B Light Source Form with referenced documents for each light source (if applicable)
<input type="checkbox"/>	Test Reports for all testing not done by Intertek Cortland, NY





- **DOCUMENTATION REVIEW**

## Marketing Material

FAA AC 150/5345-53D Appendix 2, Section 5.a.vi and 5.e.iv

“FAA Approved” or “FAA Certified” cannot be used.

# CURRENT ALECP PROGRAM STATISTICS



- 59 program participants
  - 3 new
  - 5 removed
  - 4 pending
- 65 licensed manufacturing facilities
  - 3 new
  - 5 removed
  - 4 pending

# CURRENT ALECP PROGRAM STATISTICS



- Certifications since the Fall Technology Meeting in October 2022
  - 31 new or full re-qualification certificates
  - 20 revised certificates
  - 12 de-listings

# NEW SPECIFICATIONS



## Cancelation dates:

Each new AC states that it cancels the previous version.

## Effective dates:

FAA AC 150/5345-53D section 12.a.v

The previous equipment certificates automatically expire on the given effective date.

Effective dates are usually six months from the issue date.

# NEW SPECIFICATIONS



## FAA Engineering Brief #105 – Vertiport Design

Issue date: September 21, 2022

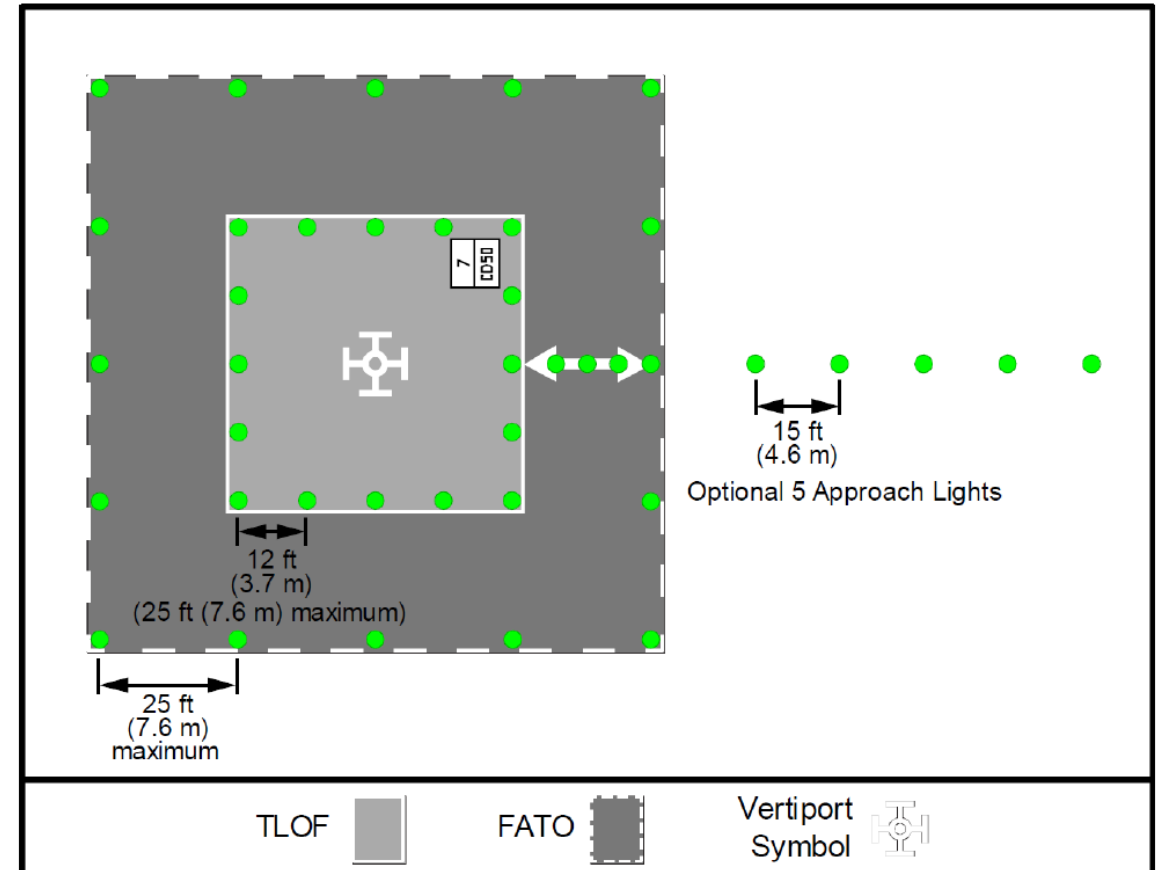
Interim guidance for the design of vertiports

### Lighting References

FAA AC 150/5390-2

FAA AC 150/5345-46

Figure 3-7: TLOF/FATO Perimeter Lighting



# NEW SPECIFICATIONS



## FAA Engineering Brief #105 – Vertiport Design

Issue date: **September 21, 2022**

L-806 Wind cones (FAA AC 150/5345-27)

L-801H/802H Heliport beacon (FAA AC 150/5345-12)

L-882/883 – VGSI (Visual Glideslope Indicator) (FAA AC 150/5345-52)

L-861H - Elevated heliport perimeter light

L-852H - Inpavement heliport perimeter light



# NEW SPECIFICATIONS

## FAA AC 150/5390-2D Heliport Design

Issued January 5, 2023

### Principal Changes

Complete re-organization

Incorporation of FAA EB87 (Heliport Perimeter Lights For Visual Meteorological Conditions (VMC)-January 2012) as Appendix G



# NEW SPECIFICATIONS

## FAA AC 150/5390-2D

### Applicable Lighting (Section 4.13 and 6.1):

L-853 Retroreflective Markers (FAA AC 150/5345-39)

L-806 Wind cones (FAA AC 150/5345-27)

L-852T and L-861T Taxiway edge lights (FAA AC 150/5345-46)

L-852 Taxiway centerline lights (FAA AC 150/5345-46)

L-801H/802H Heliport beacon (FAA AC 150/5345-12)

L-882/883 – VGSI (Visual Glideslope Indicator) (FAA AC 150/5345-52)

HILS (Heliport Instrument Lighting System) – 200W PAR 56

HALS (Heliport Approach Lighting System, or lead-in lights) - 200W PAR 56

L-860H - Elevated heliport perimeter light (FAA AC 150/5345-46)

L-852H - Inpavement heliport perimeter light (FAA AC 150/5345-46)



# NEW SPECIFICATIONS

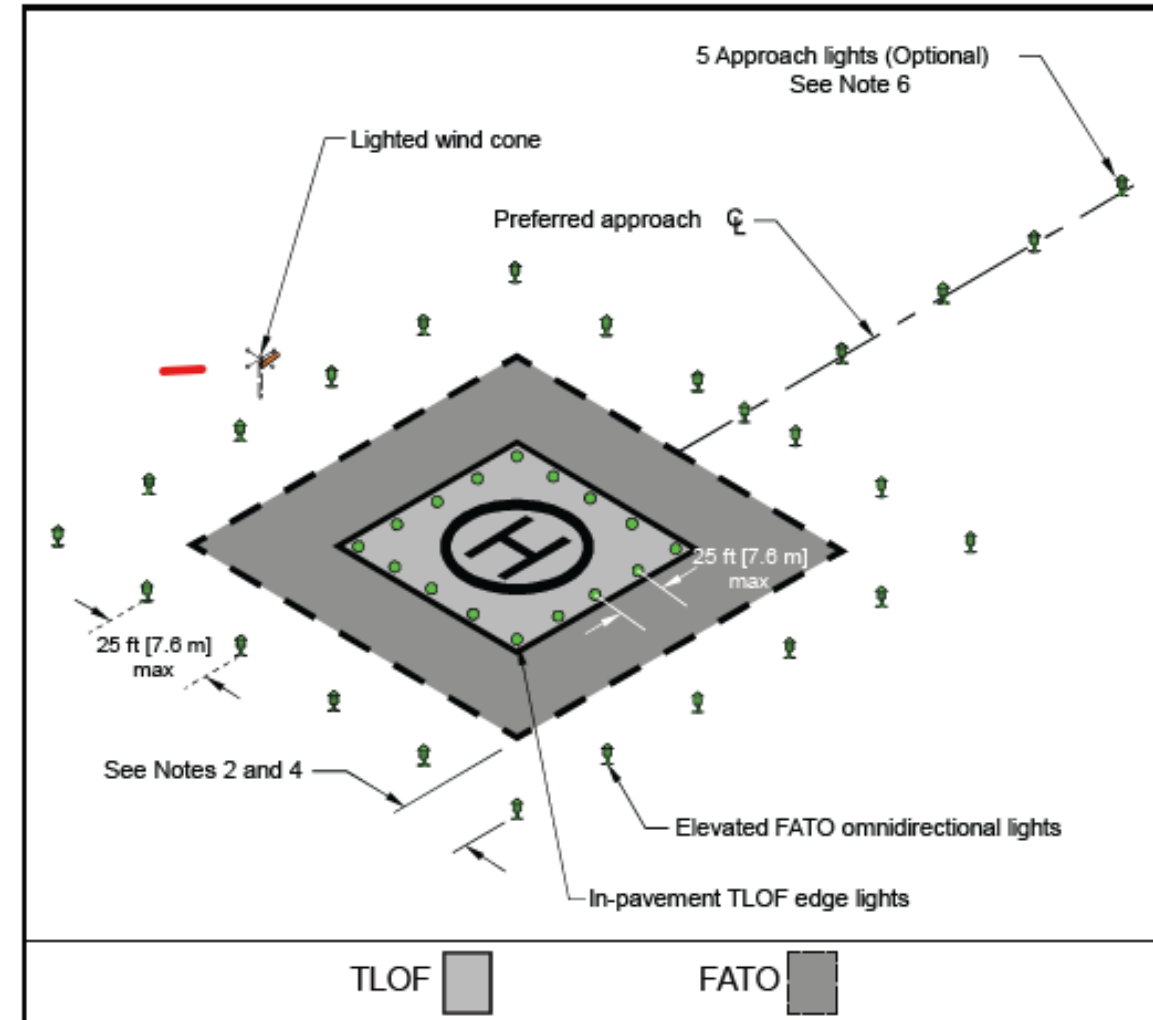


## FAA AC 150/5390-2D (continued)

L-860H - Elevated heliport perimeter light

L-852H - Inpavement heliport perimeter light

Figure 4-11. TLOF In-pavement and FATO Elevated Perimeter Lighting

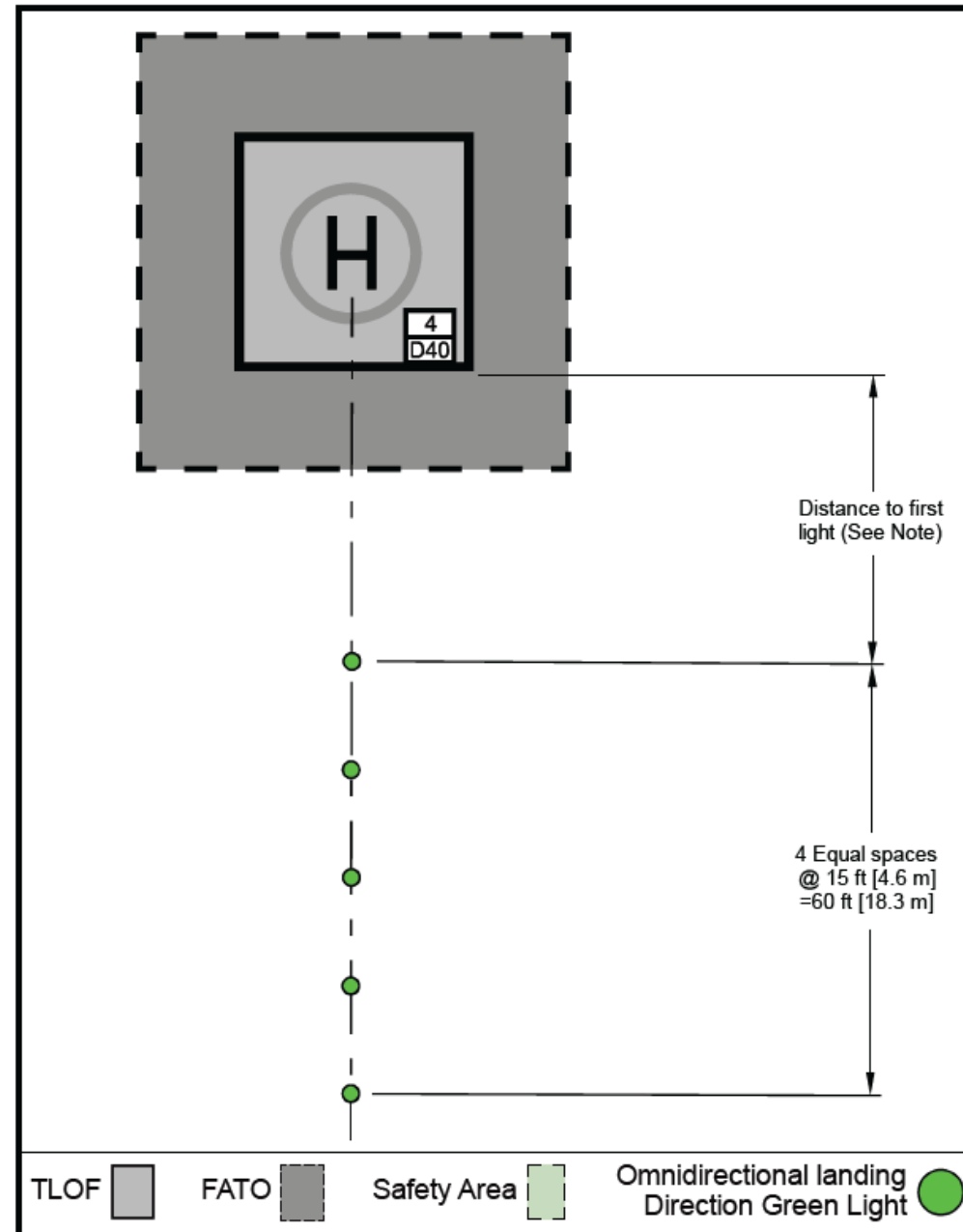


# NEW SPECIFICATIONS

FAA AC 150/5390-2D (continued)

Landing Direction / Approach

Figure 4-13. Landing Direction Lights.

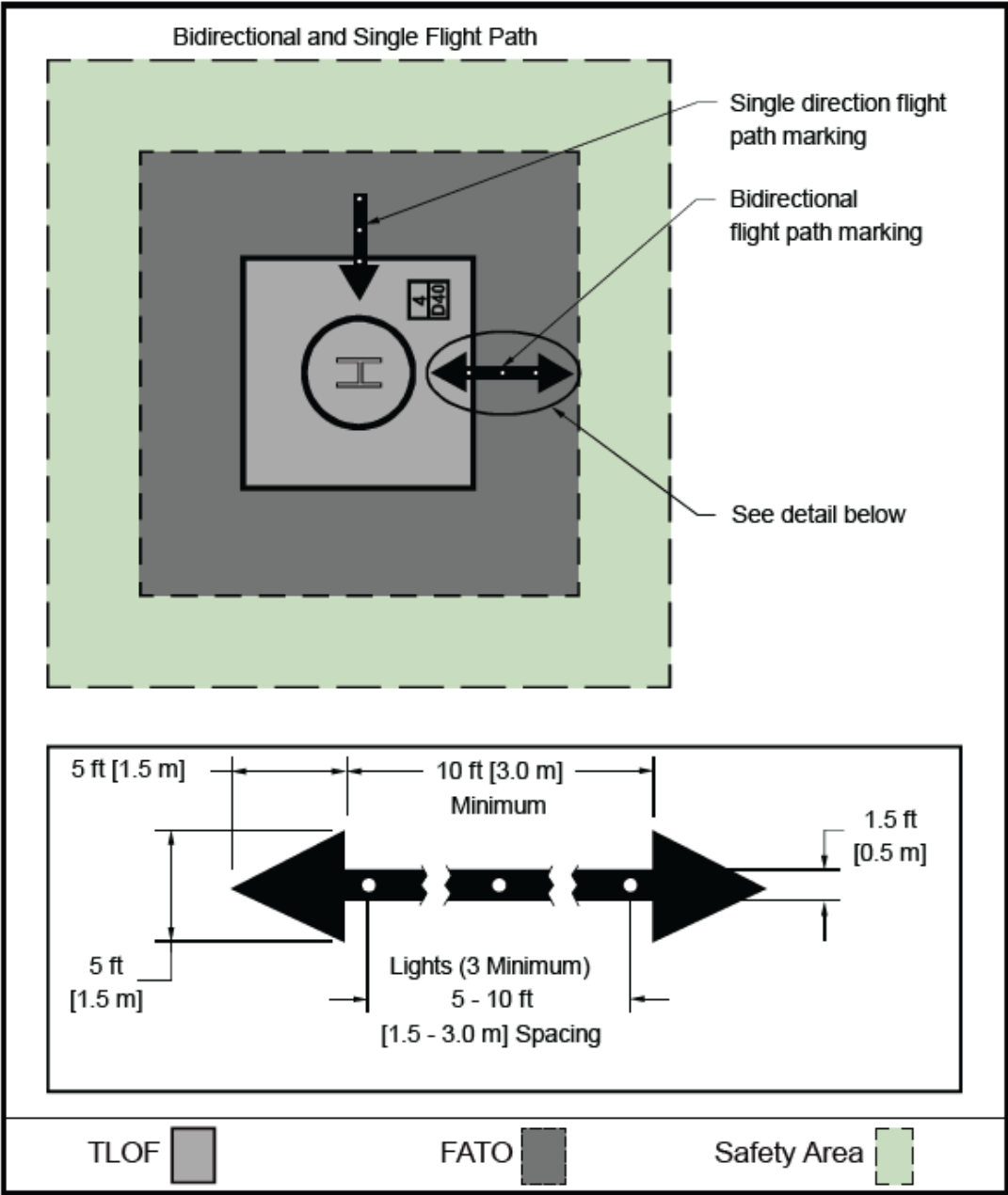


# NEW SPECIFICATIONS

FAA AC 150/5390-2D (continued)

## Flight Path Alignment

Figure 2-19. Flight Path Alignment Marking and Lights





# DRAFT SPECIFICATIONS

## FAA AC 150/5345-46F – Specification for Runway, Taxiway, Heliport, and Vertiport Light Fixtures

Comments were due January 6, 2023

### Principal Changes

- General clarifications

- Addition of Heliport and Vertiport application fixtures (L-861H and L-852H)

- Modification of specified horizontal shear force

### Impact on Certifications

- L-861H and L-852H will now be eligible for certification.

- Horizontal shear test for all in-pavement light casting designs.

# DRAFT SPECIFICATIONS



## **FAA AC 150/5345-42K – Specification for Airport Light Bases, Transformer Housings, Junction Boxes, and Accessories**

Comments were due November 30, 2022

### **Principal Changes**

General organization and clarifications

### **Impact on Certifications**

None at this time

# COMMON QUESTIONS



## FAA EB67D Light Sources Other Than Incandescent and Xenon For Airport and Obstruction Lighting Fixtures

### Section 2.5 Light Fixture Performance Criteria

Requires that manufacturers publish the worst-case W and VA at both the light fixture input leads, and primary of the isolation transformer.

Must be included on the product datasheet.

Verified with testing by the third-party certifier.

# COMMON QUESTIONS



## FAA EB67D Light Sources Other Than Incandescent and Xenon For Airport and Obstruction Lighting Fixtures

### Section 2.5.1 Power Factor

Must be done with a pulse sine wave source

CCR?? Type?? Load??

# COMMON QUESTIONS



**FAA AC 150/5345-26E Specification for L-823 Plug and Receptacle, Cable Connectors**

**FAA AC 150/5345-47C Specification for Series to Series Isolation Transformers For Airport Lighting Systems**

**FAA AC 150/5345-7F Specification for L-824 Underground Electrical Cable for Airport Lighting Circuits**

ANSI/ICEA S-95-658 / NEMA WC70 – 2009 (cable for 2000V or less)

ANSI/ICEA S-96-659 / NEMA WC71 – 1999 (non-shielded cable 2001-5000V)

ANSI/ICEA S-93-639 / NEMA WC74 – 2000 (shielded cable 5-46kV)



# COMMON QUESTIONS



## FAA AC 150/5345-7F Specification for L-824 Underground Electrical Cable for Airport Lighting Circuits

Most requirements come from:

ANSI/ICEA S-95-658 / NEMA WC70 – 2009 (cable for 2000V or less)

ANSI/ICEA S-96-659 / NEMA WC71 – 1999 (non-shielded cable 2001-5000V)

ANSI/ICEA S-93-639 / NEMA WC74 – 2000 (shielded cable 5-46kV)

Section 1.1 Scope states that this AC does not apply to cable used in L-823 class A connectors, or for cable used in L-830 isolation transformer leads.

# COMMON QUESTIONS



## **FAA AC 150/5345-26E Specification for L-823 Plug and Receptacle, Cable Connectors**

Section 3.4.4.1 Class A (factory molded) connectors must use primary cables that meet:

ANSI/ICEA S-96-659 / NEMA WC71 (non-shielded cable 2001-5000V)

...and secondary cables that meet:

ANSI/ICEA S-95-658 / NEMA WC70 (cable for 2000V or less)

# COMMON QUESTIONS



## FAA AC 150/5345-47C Specification for Series to Series Isolation Transformers For Airport Lighting Systems

### Section 3.4.2.1 Primary leads

Must use L-823 style 2 and 9 per FAA AC 150/5345-26.

Cable must be 8 AWG, 19 strand conforming to:

ANSI/ICEA S-96-659 / NEMA WC71 (non-shielded cable 2001-5000V)

### Section 3.4.2.2 Secondary leads

Must use L-823 style 7 or 8 per FAA AC 150/5345-26.

Cable must be 12 or 14 AWG conforming to:

ANSI/ICEA S-95-658 / NEMA WC70 (cable for 2000V or less)

# COMMON QUESTIONS



**FAA AC 150/5345-26E Specification for L-823 Plug and Receptacle, Cable Connectors**

**FAA AC 150/5345-47C Specification for Series to Series Isolation Transformers For Airport Lighting Systems**

Cables used in L-823 class A, and L-830/831 must comply with the applicable NEMA standards, but are not required to be certified to -7F.

# COMMON QUESTIONS

## FAA AC 150/5345-7F Specification for L-824 Underground Electrical Cable for Airport Lighting Circuits

AC 150/5345-7F

08/19/2013



Table 1. Cable Requirements

CABLE TYPE	B		C	
VOLTAGE RATING, VOLTS	600	5000	600	5000
<b>1. CONDUCTOR</b>				
a. Material: Coated and uncoated copper	X	X	X	X
b. General Requirements:				
ICEA S-95-658, Section 2	X	--	X	--
ICEA S-96-659, Section 2, non-shielded	--	X	--	X
ICEA S-93-639, Section 2, shielded	--	X	--	X
c. Stranding: 7-wire Class B strand or	X	X	X	X
19-wire Class C strand	X	X	X	X
d. Size: AWG	12-4	8-4	12-4	8-4
e. Conductor stress control (conductor shield)				
ICEA S-96-659, Section 3, non-shielded	--	optional	--	optional
ICEA S-93-639, Section 3, shielded	--	X	--	X
<b>2. INSULATION</b>				
a. Material:				
Ethylene Propylene Rubber				
ICEA S-95-658, Class E-1 or E-2	X	--	--	--
ICEA S-96-659, Class E-1 or E-2 or E-4, non-shielded	--	X	--	--
ICEA S-93-639, Class I, II, or IV, shielded	--	X	--	--
Cross-linked Polyethylene				
ICEA S-95-658, Class X-1 or X-2 or X-3	--	--	X	--
ICEA S-96-659, Class X-1 or X-2 non-	--	--	--	X



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