



**ANSI E1.32 – 2012 (R2017)**  
**Guide for the Inspection of Entertainment  
Industry Incandescent Lamp Luminaires**  
(Document number EP/2006-7016r11)

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U = user

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## 1 Scope

This document provides guidance in the inspection of luminaires used in the entertainment industry that use incandescent lamps, with the exception of automated luminaires. This inspection guide is intended to aid those who wish to create a luminaire inspection program and to assist a technician in identifying defects that may be hazardous to life or health and defects that may impair the appearance and/or functioning of the luminaire.

Sections of the program may be required to be modified to meet the particular requirements or needs of a facility and/or user.

The information contained in this document is intended to supplement, not replace, the information contained in manufacturer's maintenance instructions.

When there is a conflict between this recommended practice and the manufacturer's instructions, the manufacturer's instructions shall be followed.

The current version of this document does not include luminaires that use power supplies, ballast or starters. Future versions may include luminaires that use power supplies, ballasts, or starters.

Appendices are for information or illustration only and not part of the requirements of this standard.

## 2 Entertainment Industry Luminaire Inspections and Preventative Maintenance

The inspections in this document are Before Use, Routine and Comprehensive inspection of entertainment luminaires without powers supplies. The frequency of routine and comprehensive inspections should be determined by the owner/user based on usage and the working environment of the luminaire. Unless it is practical to do a comprehensive inspection in place, it is recommended that all luminaires on running productions and permanent installations be replaced with newly inspected units or removed, inspected and replaced.

Inspections should be at minimum directed by and preferably conducted by a qualified person or persons knowledgeable in the equipment being inspected the facility and/or owner's operating procedures.

In the event that any luminaire is involved in an incident, such as a batten run-away or other similar incident, it is recommended that each luminaire receives an inspection based on the inspection checklists described in sections 4 thru 6 of this document.

Any luminaire that has been removed from service because it has failed inspection or was otherwise determined to be defective shall be repaired, re-inspected, or tagged noting the defect. Tagged equipment shall not be placed in service until repaired and passes re-inspection. Tags shall not be removed until the luminaire is repaired and passes re-inspection.

All inspections shall include any additional inspections and checks required by the equipment manufacturer.

All repairs shall be made using materials that are known to meet or exceed the original materials being replaced.

*(FPN) Entertainment industry luminaires often operate at higher temperatures than general use luminaires. Wire that looks like Type SFF2 rated 150°C, normally not marked, is actually special wire rated 250°C. Crimp terminals that look like common items are actually special nickel-plated high-temperature terminals.*

All luminaire repairs should be recorded.

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### 3 Definitions

**3.1 portable:** Fed with portable cords or cables and intended to be moved from place to place.

**3.2 service:** Use

**3.3 qualified person:** A person who, by possession of a recognized degree, certificate or professional standing, or who by extensive knowledge, training and experience, has successfully demonstrated their ability to solve or resolve problems relating to the subject matter, the work, or the project.

### 4 Before Use Luminaire Inspections

1. Disconnect luminaire from power before inspecting.
2. Clean power cord and connectors of all extraneous tape, dirt, etc.
3. Inspect electrical power cord for wear and tear.
  - a. Inspect power cord strain relief clamps or grips for proper gripping of luminaire power cord.
  - b. Check power cord for cracking, abrasion, missing strain relief or other damage.
  - c. Check that the protective cord sleeve has not pulled out of the connector.
4. Inspect Connector.
  - a. Check connector housing for heat, physical or impact damage.
  - b. Check for burnt, bent and missing pins and damage.
  - c. Spread pins on pin connectors as needed.
5. Inspect gel-frame retaining clips for cracks, breakage or proper operation, including locking.
6. Inspect mounting hardware and safety cable. Replace missing or damaged safety cables.
7. If luminaire is found faulty, repair as necessary, or remove luminaire from service, tag and log in to repair system for repair.

### 5 Routine Luminaire Inspections

1. Carry out all inspections in Section 4 "Before Use Luminaire Inspections".
2. Disconnect luminaire from power before inspecting.
3. Clean exterior and interior of luminaire housing of all extraneous tape, gel, dirt, insects, etc.
4. Check that handles, knobs, or grips are not chipped or broken.
5. Test for continuity through connector/plug pins and the lamp filament.
6. Test for ground continuity between the ground pin of the connector/plug, and socket carriage, and any exposed dead metal parts of the housing.
7. Test the power cable for intermittent problems by flexing the cable throughout the entire cable length where applicable. This inspection may require the application of power.
8. Inspect yoke attachment points and adjustment hardware for damage. Ensure that all hardware is the proper grade and type as per the manufacturer.

9. Check that all fasteners are tight and are not missing or damaged.
10. Inspect exterior of cast luminaire housings for visible cracks and/or severe abrasions.
11. Inspect exterior of sheet metal luminaire housings for dents and other damage that affect the proper and safe operation of the luminaire.
12. Inspect exterior optical focus assembly for proper operation.
13. Inspect lens door hinges, lens clips, and focus knob/crank for proper operation.
14. Inspect the condition and tension of the lens retaining clips or rings.
15. Check for correct lens parts, location and orientation.
16. Inspect lens rotation assembly for proper operation.
17. Inspect lens(es) and reflector assemblies and clean with recommended cleaner.
18. Check for presence of lamp safety screen or shield if part of or required for the luminaire.
19. If luminaire is found faulty, repair as necessary, or remove luminaire from service, tag and log in to repair system for repair.
20. Results of inspection to be recorded. Omit if continuing to comprehensive inspection.

## **6 Comprehensive Luminaire Inspections**

1. Disconnect luminaire from power before inspecting.
2. Carry out all inspections in Section 5 “Routine Luminaire Inspections.”
3. Adjust, repair or replace all failed parts as required or remove from service and tag any failed luminaire for repair.
4. If present, inspect the barn doors to determine they are not bent, scratched or have broken leaves, and that they can rotate over their full range smoothly.
5. Inspect the lamp bulb or globe’s filament, envelope, pinch seal, base and contacts for discoloration, shape distortions, pits or burns.  
  
*(FPN): Ensure the bulb is cool before removing from the luminaire. Make sure to properly clean the lamp bulb per manufacturer’s recommendations before it is re-installed.*
6. Inspect lamp housing/bulb centering device for proper operation.
7. Inspect gobo and iris slots and their covers.
8. Inspect shutters for proper operation.
9. Inspect irises, shutters, and handles, if any of these are present, for burns, cracks, abrasions or warping. Clean or replace as required.
10. Inspect lens(es) and reflector assemblies and replace cracked, chipped, discolored or warped optical parts.

11. Inspect reflectors for scratches, loss of coating, discoloration and damage.
12. Make sure reflector does not rub against bulb or interior of housing.
13. Clean reflector as required using only the manufacturer recommended cleaner.
14. Inspect for excessive paint flaking. Clean and repaint as necessary.

*(FPN) Excessive paint flaking can be an indication that the luminaire's convection cooling has been compromised. The interior should be checked to ensure that other problems do not exist. The reflector and all wire insulation should get extra attention.*

15. Adjust optical system for optimal field illumination consistency or as otherwise directed.
- 16 Results of inspection to be recorded.

## **7 Replacement Of Burned Out or Defective Lamps**

Every time a burned out or defective lamp is replaced, inspect the lamp for pitted or burned contacts. If the lamp contacts are damaged it is likely that the lamp base (socket) is also damaged and needs to be inspected for pitted or burned parts, plus wear and tear. Clean, repair, and/or replace the base as needed.

*(FPN) Damaged lamp bases (sockets) contribute to premature lamp failure.*

## **8 Safety Ground and Leakage**

It is important that exposed conductive surfaces not be a possible shock hazard to users of the equipment. See clause 5, item 6, Test for ground continuity. . . .

## **9 Luminaires Containing Asbestos**

Asbestos is a known carcinogen. Luminaires having this material present shall be abated by qualified persons licensed, trained, and experienced in this work.

Luminaires with asbestos wiring, heat shields or other uses of this material, either internal or external shall be removed from service and secured until the asbestos is properly abated.

## Appendix A, Sample Inspection Checklists

**Not part of the requirements of this standard.**

<b>BEFORE USE LUMINAIRE INSPECTIONS</b>		
PASS	Repair/Remove from Service	
		Disconnect luminaire from power before inspecting.
		Clean power cord and connectors of all extraneous tape, dirt, etc.
		Inspect electrical power cord for wear and tear: a. Inspect power cord strain relief clamps or grips for proper holding. b. Check power cord for cracking, abrasion, missing strain relief or other damage. c. Check that the protective cord sleeve has not pulled out of the connector.
		Inspect Connector: a. Check connector housing for heat, physical or impact damage. b. Check for burnt, bent and missing pins and damage c. Spread pins on pin connectors as needed.
		Inspect gel-frame retaining clips for cracks, breakage or proper operation, including locking.
		Inspect mounting hardware and safety cable. Replace missing safety cables when required.
		If luminaire is found faulty, repair as necessary, or remove luminaire from service, tag and log in to repair system for repair.

<b>ROUTINE LUMINAIRE INSPECTIONS</b>					
Pass	Complete	Check Next Cycle	Repair/Replace	N/A	
					Carry out all inspections in "BEFORE USE LUMINAIRE INSPECTIONS" checklist.
					Disconnect luminaire from power before inspecting.
					Clean exterior and interior of luminaire housing of all extraneous tape, gel, dirt, insects, etc.
					Check that handles, knobs, or grips are not chipped or broken.
					Test for continuity through connector/plug pins and the lamp filament.
					Test for ground continuity between the ground pin of the connector/plug, and socket carriage, and any exposed dead metal parts of the housing.
					Test the power cable for intermittent problems by flexing the cable throughout the entire cable length where applicable. This inspection may require the application of power.

<b>ROUTINE LUMINAIRE INSPECTIONS</b>					
Pass	Complete	Check Next Cycle	Repair/ Replace	N/A	
					Inspect yoke attachment points and adjustment hardware for damage. Ensure that all hardware is the proper grade and type as per the manufacturer.
					Check that all fasteners are tight and are not missing or damaged.
					Inspect exterior of cast luminaire housings for visible cracks and/or severe abrasions.
					Inspect exterior of sheet metal luminaire housings for dents and other damage that affect the proper and safe operation of the luminaire.
					Inspect exterior of sheet metal luminaire housings for dents and other damage that affect the proper and safe operation of the luminaire.
					Inspect exterior optical focus assembly for proper operation.
					Inspect lens door hinges, lens clips, and focus knob/crank for proper operation.
					Inspect the condition and tension of the lens retaining clips or rings.
					Check for correct lens parts, location and orientation.
					Inspect lens rotation assembly for proper operation.
					Inspect lens(es) and reflector assemblies and clean with recommended cleaner.
					Check for presence of lamp safety screen or shield if part of or required for the luminaire.
					Recorded results of inspection. Omit for Comprehensive Luminaire Inspections
If luminaire is found faulty, repair as necessary, or remove luminaire from service, tag and log in to repair system.					

<b>COMPREHENSIVE LUMINAIRE INSPECTIONS</b>					
Pass	Complete	Check Next Cycle	Repair/ Replace	N/A	
					Carry out all inspections in Section 5 "ROUTINE LUMINAIRE INSPECTIONS"
					Adjust, repair or replace all failed parts as required or remove from service and tag any failed luminaire for repair.
					If present, Inspect that barn doors are not bent, scratched or have broken leaves and they can rotate over their full range smoothly.



COMPREHENSIVE LUMINAIRE INSPECTIONS					
Pass	Complete	Check Next Cycle	Repair/ Replace	N/A	
					Inspect the lamp bulb or globe's filament, envelope, pinch seal, base and contacts for discoloration, shape distortions, pits or burns. <i>(FPN) Make sure to properly clean the lamp bulb per manufacturer's recommendations before it is re-installed.</i>
					Inspect gobo and iris slots and their covers and test shutters for proper operation.
					Inspect and clean iris and shutters for burns, cracks, abrasions or warping.
					Inspect lens(es) and reflector assemblies and replace cracked, chipped, discolored or warped optical parts.
					Inspect reflectors for scratches, loss of coating, discolorations and damage.
					Make sure reflector does not rub against bulb or interior of housing.
					Clean reflector as required only using recommended cleaner.
					Inspect for excessive paint flaking and clean and repaint as necessary. <i>(FPN) Excessive paint flaking can be an indication that the luminaire's convection cooling has been compromised. The interior should be checked to ensure that other problems do not exist. The reflector and all wire insulation should get extra attention.</i>
					Adjust optical system for optimal field illumination consistency or as otherwise directed.
					Results of inspection to be recorded.
If luminaire is found faulty, repair as necessary, or remove luminaire from service, tag and log in to repair system.					

**NOTES:**

- ⤴ The "check next cycle column" is to be used for items that do not yet require attention but may require attention in the near future.
- ⤴ Completed checklist may be used as record of the inspection.
- ⤴ The appendices can be used as provided with check boxes or prepared as lists without check boxes to guide the person making the inspection(s).

## **Appendix B, Responsible Mercury-Containing Lamp Use**

### **Not part of the requirements of this standard.**

Mercury is extremely useful in lamps. In metal-halide lamps and fluorescent lamps it helps establish and regulate the arc, produces useful ultra-violet and visible light, and helps make these lamps produce more light per watt of electricity used than any other type of lamp. Unfortunately, mercury in the environment can pollute rivers and streams, make fish unfit to eat, and harm humans.

Proper waste disposal and recycling are essential for minimizing the hazards of mercury-containing products. It is important to make sure that the lamps you use don't contribute to mercury pollution in the environment. Disposal of mercury-containing products in the trash by businesses is illegal in many states and is not environmentally responsible in any of them. Spent mercury-containing lamps need to be recycled at their end-of- life rather than put in the general trash.

## **Appendix C. Bibliography**

**Not part of the requirements of this standard.**

NFPA 70B-2006, Recommended Practice for Electrical Equipment Maintenance

NFPA 70E-2009, Standard for Electrical Safety in the Workplace

UL 1573, Stage and Studio Luminaires and Connector Strips, fourth edition

29 CFR 1910, OSHA General Industry Safety Orders

29 CFR 2610, OSHA Construction Safety Orders