

# Federal Aviation Agency



AC NO: 20-38A

AIRCRAFT

EFFECTIVE :

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**SUBJECT :** MEASUREMENT OF CABIN INTERIOR EMERGENCY ILLUMINATION  
IN TRANSPORT AIRPLANES

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1. PURPOSE. This circular outlines acceptable methods, but not the only methods, for finding compliance with respect to measuring the cabin interior emergency illumination on transport airplanes, and provides information as to suitable measuring instruments.
  2. CANCELLATION. Advisory Circular 20-38 dated June 18, 1965.
  3. REFERENCE REGULATIONS. FAR 25.811(d), FAR 25.811(f)(2), FAR 121.310(b)(2), and FAR 121.310(c).
  4. BACKGROUND. Subsequent to the issuance of Advisory Circular 20-38 dated June 18, 1965, operators have raised questions regarding availability of suitable instruments capable of measuring values of light intensity as low as 0.05 foot candles. Additional questions have arisen as to an acceptable means of measuring the 160 microlambert minimum luminescence value for self, or electrically, illuminated marking and locating signs required by FAR 25.811(d) and FAR 121.310(b)(2).
  5. ACCEPTABLE MEANS OF COMPLIANCE.
    - a. FAR 25.811(d) and 121.310(b)(2).
      - (1) It is customary for the manufacturer of radioactive locating signs and exit markers to specify a minimum half-life brightness of at least 160 microlamberts for new signs. Such signs generally are acceptable for initial installation, with respect to brightness, if the sign manufacturer certifies that the sign will have a brightness of at least 160 microlamberts during its half-life period. However, this does not relieve the operator from the responsibility of replacing signs when their brightness goes below 160 microlamberts.
      - (2) Acceptable means of determining the adequacy of signs lighted by an internal or external light source include measurements
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2/8/66

using the instruments listed herein or a visual comparison by several observers that such a sign is as bright as a radioactive sign known to be at least 160 microlamberts. When the comparison method is used in judging the adequacy of externally lighted "Scotchlite" reflective signs, care should be taken to evaluate its adequacy from all likely viewing angles because the "Scotchlite" reflectivity can be highly directional. It is preferable that an external light source be located as close to the sign as practicable to minimize obstructions. For example, a spotlight located remotely with respect to the sign may be obscured by smoke, passengers, or other objects, and attention may be attracted to the spotlight rather than the exit under smoke conditions.

b. FAR 25.811(d) and 121.310(b)(2).

Instruments available for measuring 160 microlamberts are:

- (1) "Macbeth Illuminometer"  
The Macbeth Corporation  
P. O. Box 950  
Newburgh, New York
- (2) "Spectra Spot Brightness Meter"  
Photo Research Corporation  
837 North Cahuenga Boulevard  
Hollywood, California

An order for either of the above instruments should state the purpose and range of illumination to be measured.

c. FAR 25.811(f)(2) and 121.310(c).

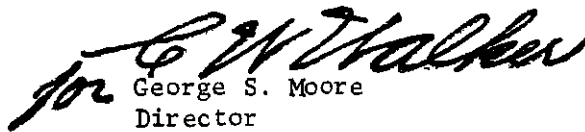
An acceptable means of compliance is to take illumination readings by using a color-corrected, photoelectric, brightness meter of a diffused surface of known reflectance such as a magnesium carbonate or white blotter target. Alternatively, a color corrected, cosine corrected, photoelectric, illumination meter may be used. The illuminated surface should not be shadowed by any person or any object. Prior to taking measurements, the cabin interior should be in its normal configuration except for being made dark. A positive way to make the cabin interior

dark is to cover each window with opaque paper so as to exclude all traces of airport or hangar light. Readings, at 40-inch intervals along the center-line of the aisle at seat arm rest height, should be taken after the emergency lights have been actuated. The readings should be made in the fuselage area normally occupied by passengers. The source of electrical power should be that provided for the operation of the cabin interior emergency lighting system. If the aircraft electrical system is used to maintain the emergency system in a charged condition, the aircraft system should be turned off prior to taking the readings.

d. FAR 25.811(f)(2) and 121.310(c).

The following instruments are available which are suitable for measuring 0.05 foot candles. These are:

- (1) "Macbeth Illuminometer"  
The Macbeth Corporation  
P. O. Box 950  
Newburgh, New York
- (2) "Spectra Micro-candela"  
Photo Research Corporation  
837 Cahuenga Boulevard  
Hollywood, California

  
George S. Moore  
Director  
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