



Standard Specification for Photoluminescent (Phosphorescent) Safety Markings¹

This standard is issued under the fixed designation E 2072; 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.

ε¹ NOTE—Editorial changes were made throughout in June 2002.

1. Scope

1.1 This specification covers minimum photometric requirements for newly applied photoluminescent (phosphorescent) safety materials used to provide supplemental markings of escape routes, emergency equipment, and other potentially dangerous objects. (see also Test Method E 2073, Test Method for Photopic Luminance of Photoluminescent (Phosphorescent) Markings, and Guide E 2030, Guide for Recommended Uses of Photoluminescent (Phosphorescent) Safety Markings).

1.2 This specification establishes minimum luminance values for photoluminescent (phosphorescent) markings for detection in clear air under blackout conditions.

1.3 This specification applies to all types of photoluminescent (phosphorescent) markings, including but not limited to plastics, coatings, ceramics, films, etc.

1.4 This specification does not cover potentially diminished performance due to wear and tear and aging.

1.5 This specification applies only to photoluminescent (phosphorescent) markings emitting the majority of spectral energy within the 515 to 535 nanometer range.

1.6 When reference is made regarding photoluminescence in the text of this standard, it implies phosphorescence.

1.7 The values stated in SI units are the standard. The values given in parentheses are provided for information purposes only.

2. Referenced Documents

2.1 ASTM Standards:

E 284 Terminology of Appearance²

E 1316 Terminology for Nondestructive Examinations³

E 2030 Guide for Recommended Uses of Photoluminescent (Phosphorescent) Safety Markings²

E 2073 Test Method for Photopic Luminance of Photoluminescent (Phosphorescent) Markings²

¹ This specification is under the jurisdiction of ASTM Committee E 12 on Color and Appearance, and is the direct responsibility of Subcommittee E12.13 on Photoluminescent Safety Markings.

Current edition approved February 10, 2000. Published April 2000.

² Annual Book of ASTM Standards, Vol 06.01.

³ Annual Book of ASTM Standards, Vol 03.03.

3. Terminology

3.1 Definitions of terms in Terminology E 284 and Terminology E 1316 are applicable to this specification.

4. Performance Requirements

4.1 Optical Requirements:

4.1.1 *Luminance in a Test Laboratory*—The photopic luminance of all three specimens of the photoluminescent marking, measured in compliance with Test Method E 2073, shall be not less than: 20.0 mcd/m² at 10 min after activation has ceased; and 2.8 mcd/m² at 60 min after activation has ceased.

5. Installation Site

5.1 *On-Site Luminance*—The photopic luminance of on-site installed photoluminescent markings shall be measured in compliance with Test Method E 2073, except for XENON activation. The on-site lighting shall be used as activation. Markings may be any width from 40 to 100-mm. For markings of width *W*, in this range, the required photopic luminance shall, at all times, be not less than:

$$\text{mcd/m}^2 \text{ at 10 min after activation has ceased} = 1500/W \quad (1)$$

$$\text{mcd/m}^2 \text{ at 60 min after activation has ceased} = 220/W \quad (2)$$

NOTE 1—*W* is the number of millimeters.

Table of Required Value Examples

| Width of Marking, mm | 10 minutes after activation has ceased, mcd/m ² | 60 minutes after activation has ceased, mcd/m ² |
|----------------------|--|--|
| 40 | 37.5 | 5.5 |
| 75 | 20.0 | 2.9 |
| 100 | 15.0 | 2.2 |

5.2 *Activation*—The required recharging activation level for photoluminescent safety markings depends on the ambient luminance level, the type of light source utilized, and the duration of exposure to the activating light source. Consult manufacturers for performance levels under various lighting conditions.

6. Keywords

6.1 blackout conditions; escape routes; luminance; photoluminescent safety markings

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