

Entertainment Services and Technology Association



American National Standard E1.25 - 2006 Entertainment Technology Recommended Basic Conditions for Measuring the Photometric Output of Stage and Studio Luminaires by Measuring Illumination Levels Produced on a Planar Surface

Entertainment Services and Technology Association



American National Standard E1.25 - 2006 Entertainment Technology Recommended Basic Conditions for Measuring the Photometric Output of Stage and Studio Luminaires by Measuring Illumination Levels Produced on a Planar Surface

Photo/2003-5001r6

This edition of ANSI E1.23 was approved by American National Standards Institute on July 13, 2006.

©2006 ASC E1, Safety and Compatibility of Entertainment Technical Equipment and Practices, and its secretariat the Entertainment Services and Technology Association. All rights reserved. No part of this publication may be reproduced in any material form (including photocopying or storing by electronic means) without the written permission of the copyright holder. Any parties wishing to translate and publish this document in another language must receive permission from the copyright holder.

Notice and Disclaimer

ESTA and ANSI Accredited Standards Committee E1 (for which ESTA serves as the secretariat) do not approve, inspect, or certify any installations, procedures, equipment or materials for compliance with codes, recommended practices or standards. Compliance with an ESTA standard or recommended practice, or an American National Standard developed under Accredited Standards Committee E1 is the sole and exclusive responsibility of the manufacturer or provider and is entirely within their control and discretion. Any markings, identification or other claims of compliance do not constitute certification or approval of any type or nature whatsoever by ESTA or Accredited Standards Committee E1.

ESTA and ANSI Accredited Standards Committee E1 (ASC E1) neither guaranty nor warrant the accuracy or completeness of any information published herein and disclaim liability for any personal injury, property or other damage or injury of any nature whatsoever, whether special, indirect, consequential or compensatory, directly or indirectly resulting from the publication, use of, or reliance on this document.

In issuing and distributing this document, ESTA and ASC E1 do not either (a) undertake to render professional or other services for or on behalf of any person or entity, or (b) undertake any duty to any person or entity with respect to this document or its contents. Anyone using this document should rely on his or her own independent judgment or, as appropriate, seek the advice of a competent professional in determining the exercise of reasonable care in any given circumstance.

Published By:

**Entertainment Services and
Technology Association**

875 Sixth Avenue, Suite 1005
New York, NY 10001 USA
Phone: 1-212-244-1505
Fax: 1-212-244-1502
Email: standards@esta.org

For Additional Copies of this Document Contact:

ESTA Publications

The ESTA Foundation
875 Sixth Avenue, Suite 1005
New York, NY 10001 USA
Phone: 1-212-244-1505
Fax: 1-212-244-1502
www.estafoundation.org

The ESTA Technical Standards Program

The ESTA Technical Standards Program was created to serve the ESTA membership and the entertainment industry in technical standards related matters. The goal of the Program is to take a leading role regarding technology within the entertainment industry by creating recommended practices and standards, monitoring standards issues around the world on behalf of our members, and improving communications and safety within the industry. ESTA works closely with the technical standards efforts of other organizations within our industry including USITT, PLASA, and VPLT as well as representing the interests of ESTA members to ANSI, UL, and the NFPA. The Technical Standards Program is accredited by the American National Standards Institute as Accredited Standards Committee E1, Safety and Compatibility of Entertainment Technical Equipment and Practices.

The Technical Standards Committee (TSC) was established by ESTA's Board of Directors to oversee and coordinate the Technical Standards Program. Made up of individuals experienced in standards-making work from throughout our industry, the Committee approves all projects undertaken and assigns them to the appropriate working group. The Technical Standards Committee employs a Technical Standards Manager to coordinate the work of the Committee and its working groups as well as maintain a "Standards Watch" on behalf of members. Working groups include: Camera Cranes, Control Protocols, Electrical Power, Floors, Fog and Smoke, Photometrics, and Rigging.

ESTA encourages active participation in the Technical Standards Program. There are several ways to become involved. If you would like to become a member of an existing working group, as have over two hundred people, you must complete an application which is available from the ESTA office. Your application is subject to approval by the working group and you will be required to actively participate in the work of the group. This includes responding to letter ballots and attending meetings. Membership in ESTA is not a requirement. You can also become involved by requesting that the TSC develop a standard or a recommended practice in an area of concern to you.

The Photometrics Working Group, which authored this standard, consists of a cross section of entertainment industry professionals representing manufacturers, consultants, dealers, and end-users. ESTA is committed to developing consensus-based standards and recommended practices in an open setting. Future Photometrics Working Group projects will include updating this publication as changes in technology and experience warrant, as well as developing new standards and recommended practices for the benefit of the entertainment industry.

1 Scope

This document describes the basic conditions for measuring the photometric output of a stage or studio luminaire by testing methods that measure the illumination levels produced by the luminaire on a planar surface. These testing methods include, but are not limited to, measurements taken by digital cameras or hand-held meters. This standard is not intended to give guidance on testing conditions for testing methods that use goniophotometers.

2 Selection of Luminaire, Lamps, and Ballasts

2.1 The luminaire selected for testing shall be representative of the manufacturer's product being tested.

2.2 The lamp used for the testing shall be representative of the lamps that are intended to be used in the luminaire.

2.3 With luminaires that use discharge lamps, the ballast used shall be representative of the ballasts recommended by the luminaire manufacturer for the luminaire.

3 Basic Conditions

Precautions shall be taken to eliminate stray light from the test so that the stray light is less than the margin of error of the testing equipment.

The temperature of the test area shall be maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$ ($77^{\circ}\text{F} \pm 2^{\circ}\text{F}$) for fluorescent lamps and at $25^{\circ}\text{C} \pm 5^{\circ}\text{C}$ ($77^{\circ}\text{F} \pm 9^{\circ}\text{F}$) for all other types of lamps.

4 Test Lamp Calibration

This standard does not require test lamp calibration in all cases, but test lamp calibration may be appropriate depending on the intended use of the data being collected by the measurements. Some consideration of the variability of lamp output must be used if the measurements from the testing are to be extrapolated to a population of luminaires.

4.1 If a statistically small number of luminaires are to be tested, and some statement about the performance an end-user can expect from any luminaire out of the population of luminaires of the same type is intended to be made, the test lamp's output shall be calibrated using the calibration method used by the lamp manufacturer. This will allow normalizing the measured data relative to the rated lumen output of the lamp.

4.2 If some statement about the performance an end-user can expect from any luminaire out of the population of luminaires of the same type is intended to be made, but a statistically significant number of luminaires are to be tested, lamp calibration is not required. In lieu of lamp calibration, the output of the luminaires in a significantly large sampling may be measured. This will allow the mean to be reported, along with the standard deviation and sample size, or along with the confidence interval of the true population mean. Lamp calibration, as described in 4.1, may be used.

4.3 If the intention is to make a statement about the efficiency of the optical system, the lamp must be calibrated while operated in the conditions found in the luminaire. These conditions would include the temperatures, operating position, current, and voltage found in the luminaire.