

ANSI/ASHRAE/ICC/USGBC/IES Addendum be to ANSI/ASHRAE/ICC/USGBC/IES Standard 189.1-2017

Standard for the Design of High-Performance Green Buildings

Except Low-Rise Residential Buildings

The Complete Technical Content of the International Green Construction Code®

Approved by ASHRAE and the American National Standards Institute on August 18, 2020; by the International Code Council on July 24, 2020; and by the U.S. Green Building Council and Illuminating Engineering Society on July 23, 2020.

These addenda were approved by a Standing Standard Project Committee (SSPC) for which the Standards Committee has established a documented program for regular publication of addenda or revisions, including procedures for timely, documented, consensus action on requests for change to any part of the standard. Instructions for how to submit a change can be found on the ASHRAE® website (www.ashrae.org/continuous-maintenance).

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ASHRAE obtains consensus through participation of its national and international members, associated societies, and public review.

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- c. offering constructive criticism for improving the Standard, or
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FOREWORD

Addendum be updates the lighting quality section to include new requirements for dimming controls, color rendition, and flicker. It also clarifies the applicability of the requirements and adds relevant normative references.

Note: In this addendum, changes to the current standard are indicated in the text by underlining (for additions) and ~~striketrough~~ (for deletions) unless the instructions specifically mention some other means of indicating the changes.

Addendum be to Standard 189.1-2017

Modify Section 3.2 as shown.

3.2 Definitions

general lighting: see ANSI/ASHRAE/IES Standard 90.1.

Revise Section 8.3.5 as shown.

8.3.5 Lighting Quality. The interior lighting and lighting controls shall be installed to meet the requirements of Sections 8.3.5.1 and 8.3.5.2.

8.3.5.1 Enclosed Office Spaces. Lighting for at least 90% of enclosed office *spaces* with less than 250 ft² (23.3 m²) of floor area shall comply with at least one of the following:

- a. Provide ~~multilevel lighting control~~.
- b. Provide ~~bilevel lighting control~~ and separate ~~task lighting~~.

8.3.5 Indoor Lighting Quality. Lighting in *spaces* where one or more occupants are expected to be continuously present for a period of at least one hour per workday shall comply with all the requirements of Sections 8.3.5.1 through 8.3.5.4.

8.3.5.1 Controllability. *General lighting* shall be continuously dimmable to 10% or less of full light output and be controlled by a local control capable of manual dimming. Forward phase-cut *dimmers* shall comply with NEMA SSL 7A, Section 3.

Exception to 8.3.5.1: General lighting in manufacturing areas, workshops, laboratories, kitchens, loading docks, and storage spaces.

8.3.5.2 Lighting Control Labeling for Multioccupant Spaces. *General lighting* Lighting for conference rooms, meeting rooms, multipurpose rooms, gymnasiums, auditoriums, ball-rooms, cafeterias, *classrooms*, and other training or lecture rooms shall ~~be provided with multi-level lighting control~~. have lighting settings of ~~or the lighting controlled by~~ each manual control shall be labeled at the control devices. The lighting in gymnasiums, auditoriums, ball-rooms, and cafeterias shall also consist of at least two separately controlled groups of luminaires.

8.3.5.3 Color Rendition. At least 95% of lighting power of nominally white lighting within each *enclosed space* shall be provided by luminaires that meet the following criteria at full light output in accordance with IES-TM-30, Annex E, P2 and F3:

- a. R_f of at least 85
- b. $R_{f,h1}$ of at least 85
- c. R_g of at least 92
- d. $R_{cs,h1}$ of at least -7% but no greater than +19%

Nominally white lighting is lighting that has chromaticity within the basic or extended nominal color correlated temperature (CCT) specifications of ANSI C78.377.

Where a lighting system is capable of changing its spectrum, it shall be capable of meeting the color rendition requirements within each nominal CCT of 2700 K, 3500 K, 4000 K, and 5000 K, as defined in ANSI C78.377, that the system is capable of delivering.

Table 8.3.5.4.1 Maximum Percent Modulation for Light Sources Tested in Accordance with California Title 24, JA10.

T-24 JA10 Cut-off frequency (Hz)	<u>Integrated Lamps with the Following ANSI Standard Base Types: E26, E26d, E17, E11, E12, G4, G9, GU10, GU24, GU5.3, or GX5.3</u>		<u>All Other Lamps and Light Sources</u>	
	<u>Amplitude Modulation at Full Output</u>	<u>Amplitude Modulation at Greater of 20% and Minimum Output</u>	<u>Amplitude Modulation at Full Output</u>	<u>Amplitude Modulation at Greater of 20% and Minimum Output</u>
40	1.0%	1.0%	1.0%	1.0%
90	2.3%	3.2%	1.6%	1.6%
200	16.0%	22.4%	9.6%	9.6%
400	32.0%	32.0%	24.0%	24.0%
1000	80.0%	80.0%	56.0%	56.0%

Lighting systems where spectrum changes through dimming alone shall meet the color rendition requirements at full light output.

8.3.5.4 Flicker. All general lighting shall comply with Section 8.3.5.4.1 or 8.3.5.4.2.

8.3.5.4.1 Percent Amplitude Modulation. General lighting shall be tested and calculated in accordance with California Title 24, Part 6, Joint Appendix JA10. Nondimmable sources shall be tested at full light output. Dimmable sources shall be tested at full light output and at a dimmed state that is the greater of 20% of full light output and minimum light output.

All lamps and light sources shall have percent amplitude modulation no greater than the values listed in Table 8.3.5.4.1 for all listed cut-off frequencies at full light output. Dimmable lamps and dimmable light sources shall also comply with the requirements in Table 8.3.5.4.1 at the dimmed state.

8.3.5.4.2 Stroboscopic Visibility Measure and Short-Term Flicker Indicator. The stroboscopic visibility measure (SVM) and short-term flicker indicator (Pst) of general lighting shall be tested and calculated in accordance with NEMA 77. Nondimmable sources shall be tested at full light output. Dimmable sources shall be tested at full light output and at a dimmed state that is the greater of 20% of full light output and minimum light output.

All light sources shall have an SVM of no greater than 0.4 and a Pst of no greater than 1.0 at all required test conditions.

Modify Section 11 as shown.

11. NORMATIVE REFERENCES

Section numbers indicate where the reference occurs in this document.

Reference	Title	Section
American National Standards Institute (ANSI) 25 West 43rd Street New York, NY 20036, United States 1-212-642-4900; www.ansi.org		
<u>ANSI C78.377-2017</u>	<u>American National Standard for Electric Lamps— Specifications for the Chromaticity of Solid State Lighting (SSL) Products</u>	<u>8.3.5.3</u>
California Energy Commission 1516 Ninth St. Sacramento, CA 95814, United States 1-916-654-5106, www.energy.ca.gov		
<u>2019 Title 24 Part 6, JA 10</u>	<u>Reference Appendices for the 2019 Building Energy Efficiency Standards. Joint Appendix JA10. Test Method for Measuring Flicker of Lighting Systems and Reporting Requirements</u>	<u>8.3.5.4</u>
National Electrical Manufacturers Association (NEMA) 1300 North 17th Street, Suite 900 Rosslyn, VA 22209 United States 1-703-841-3200 www.nema.org		
<u>NEMA SSL7A-2015</u>	<u>Phase-Cut Dimming for Solid State Lighting—Basic Compatibility</u>	<u>8.3.5.1</u>
<u>NEMA 77-2017</u>	<u>Standard for Temporal Light Artifacts: Test Methods and Guidance for Acceptance Criteria</u>	<u>8.3.5.4</u>
Illuminating Engineering Society (IES) 120 Wall Street, Floor 17 New York, NY 10005-4001, United States 1-212-248-5017, www.ies.org		
<u>IDA/IES Model Lighting Ordinance</u>	<u>Model Lighting Ordinance (MLO)</u>	<u>5.3.6</u>
<u>TM-30-2018</u>	<u>IES Method for Evaluating Light Source Color Rendition</u>	<u>8.3.5.3</u>

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ASHRAE is concerned with the impact of its members' activities on both the indoor and outdoor environment. ASHRAE's members will strive to minimize any possible deleterious effect on the indoor and outdoor environment of the systems and components in their responsibility while maximizing the beneficial effects these systems provide, consistent with accepted Standards and the practical state of the art.

ASHRAE's short-range goal is to ensure that the systems and components within its scope do not impact the indoor and outdoor environment to a greater extent than specified by the Standards and Guidelines as established by itself and other responsible bodies.

As an ongoing goal, ASHRAE will, through its Standards Committee and extensive Technical Committee structure, continue to generate up-to-date Standards and Guidelines where appropriate and adopt, recommend, and promote those new and revised Standards developed by other responsible organizations.

Through its *Handbook*, appropriate chapters will contain up-to-date Standards and design considerations as the material is systematically revised.

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The effects of the design and selection of equipment and systems will be considered within the scope of the system's intended use and expected misuse. The disposal of hazardous materials, if any, will also be considered.

ASHRAE's primary concern for environmental impact will be at the site where equipment within ASHRAE's scope operates. However, energy source selection and the possible environmental impact due to the energy source and energy transportation will be considered where possible. Recommendations concerning energy source selection should be made by its members.

Standard 189.1 and the International Green Construction Code

Standard 189.1 serves as the complete technical content of the International Green Construction Code® (IgCC). The IgCC creates a regulatory framework for new and existing buildings, establishing minimum green requirements for buildings and complementing voluntary rating systems. For more information, visit www.iccsafe.org.

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