§ 430.3 Materials incorporated by reference.

(a) The Department of Public Service incorporates by reference the following standards into part 430.


2. ANSI/AMCA 210–07, ANSI/ASHRAE 51–07 (“AMCA 210–2007”), Laboratory Methods of Testing Fans for Certified Aerodynamic Performance Rating, ANSI approved August 17, 2007, Section 8—Report and Results of Test. Section 8.2—Performance graphical representation of test results, IBR approved for appendix M to subpart B, as follows:

(i) Figure 2A—Static Pressure Tap, and

(ii) Figure 12—Outlet Chamber Setup—Multiple Nozzles in Chamber.


(i) Section 3—Units of Measurement;

(ii) Section 4—Symbols and Subscripts; (including Table 1—Symbols and Subscripts);

(iii) Section 5—Definitions (except 5.1);

(iv) Section 6—Instruments and Section Methods of Measurement;

(v) Section 7—Equipment and Setups (except the last 2 bulleted items in 7.1—Allowable test setups);

(vi) Section 8—Observations and Conduct of Test;

(vii) Section 9—Calculations (except 9.5); and

(viii) Test Figure 1—Vertical Airflow Setup with Load Cell (Ceiling Fans).


(i) Section 6—Rating Requirements, Section 6.1—Standard Ratings, 6.1.3—Standard Rating Tests, 6.1.3.2—Electrical Conditions;

(ii) Section 6—Rating Requirements, Section 6.1—Standard Ratings, 6.1.3—Standard Rating Tests, 6.1.3.4—Outdoor–Coil Airflow Rate;

(iii) Section 6—Rating Requirements, Section 6.1—Standard Ratings, 6.1.3—Standard Rating Tests, 6.1.3.5—
Requirements for Separated Assemblies;

(iv) Figure D1—Tunnel Air Enthalpy Test Method Arrangement;
(v) Figure D2—Loop Air Enthalpy Test Method Arrangement; and
(vi) Figure D4—Room Air Enthalpy Test Method Arrangement.


(i) Section 3—Definitions (except 3.8, 3.9, 3.13, 3.14, 3.15, 3.16, 3.23, 3.24, 3.26, 3.27, 3.28, 3.29, 3.30, and 3.31);
(ii) Section 5—Test Requirements, Section 5.1 (untitled), 5.1.3–5.1.4;
(iii) Section 6—Rating Requirements, Section 6.1—Standard Ratings, 6.1.5—Airflow Requirements for Systems with Capacities <65,000 Btu/h [19,000 W];
(iv) Section 6—Rating Requirements, Section 6.1—Standard Ratings, 6.1.6—Outdoor–Coil Airflow Rate (Applies to all Air–to–Air Systems);
(v) Table 4—Refrigerant Line Length Correction Factors.

(d) AATCC. American Association of Textile Chemists and Colorists, P.O. Box 12215, Research Triangle Park, NC 27709, (919) 549–3526, or go to https://www.aatcc.org/test/methods/.

(1) AATCC Test Method 79–2010, Absorbency of Textiles, Revised 2010, IBR approved for Appendix J2 to Subpart B. $70

(2) AATCC Test Method 118–2007, Oil Repellency: Hydrocarbon Resistance Test, Revised 2007, IBR approved for Appendix J2 to Subpart B. $70

(3) AATCC Test Method 135–2010, Dimensional Changes of Fabrics after Home Laundering, Revised 2010, IBR approved for Appendix J2 to Subpart B. $70


(1) ANSI C78.3–1991 (“ANSI C78.3”), American National Standard for Fluorescent Lamps—Instant-start and Cold-Cathode Types—Dimensional and Electrical Characteristics, approved July 15, 1991; IBR approved for § 430.32. $33


(3) ANSI C78.21–1989, American National Standard for Electric Lamps—PAR and R Shapes, approved March
(4) ANSI C78.21–2003, Revision of ANSI C78.21–1995 with all supplements, American National Standard for Electric Lamps—PAR and R Shapes, approved October 30, 2003, IBR approved for § 430.2. $201


(12) ANSI C82.1–2004, (“ANSI C82.1”), American National Standard for Lamp Ballast—Line Frequency Fluorescent Lamp Ballast, approved November 19, 2004; IBR approved for appendix Q to subpart B. $99


(16) ANSI C82.13–2002 (“ANSI C82.13”), American National Standard for Lamp Ballasts—Definitions for Fluorescent Lamps and Ballasts, approved July 23, 2002; IBR approved for appendix Q to subpart B. $74

(17) ANSI/NEMA WD 6–2016, Wiring Devices—Dimensional Specifications, ANSI approved February 11, 2016, IBR approved for Appendix Y to subpart B; as follows: $204

(i) Figure 1–15—Plug and Receptacle; and

(ii) Figure 5–15—Plug and Receptacle.

December 13, 2005, IBR approved for appendix P to subpart B. $1,623


(i) Section 5—Requirements;

(ii) Section 6—Instruments;

(iii) Section 7—Methods of Testing; and

(iv) Section 8—Compressor Testing.


(i) Section 5—Instruments, Section 5.1—Temperature Measuring Instruments: 5.1.1;

(ii) Section 5—Instruments, Section 5.2—Refrigerant, Liquid, and Barometric Pressure Measuring Instruments;

(iii) Section 5—Instruments, Section 5.5—Volatile Refrigerant Flow Measurement;
(iv) Section 6—Airflow and Air Differential Pressure Measurement Apparatus, Section 6.1—Enthalpy Apparatus (Excluding Figure 3): 6.1.1–6.1.2 and 6.1.4;

(v) Section 6—Airflow and Air Differential Pressure Measurement Apparatus, Section 6.2—Nozzle Airflow Measuring Apparatus (Excluding Figure 5);

(vi) Section 6—Airflow and Air Differential Pressure Measurement Apparatus, Section 6.3—Nozzles (Excluding Figure 6);

(vii) Section 6—Airflow and Air Differential Pressure Measurement Apparatus, Section 6.4—External Static Pressure Measurements;

(viii) Section 6—Airflow and Air Differential Pressure Measurement Apparatus, Section 6.5—Recommended Practices for Static Pressure Measurements;

(ix) Section 7—Methods of Testing and Calculation, Section 7.3—Indoor and Outdoor Air Enthalpy Methods (Excluding Table 1);

(x) Section 7—Methods of Testing and Calculation, Section 7.4—Compressor Calibration Method;

(xi) Section 7—Methods of Testing and Calculation, Section 7.5—Refrigerant Enthalpy Method;

(xii) Section 7—Methods of Testing and Calculation, Section 7.7—Airflow Rate Measurement, Section 7.7.2—Calculations—Nozzle Airflow Measuring Apparatus (Excluding Figure 10), 7.7.2.1–7.7.2.2;

(xiii) Section 8—Test Procedures, Section 8.1—Test Room Requirements: 8.1.2–8.1.3;

(xiv) Section 8—Test Procedures, Section 8.2—Equipment Installation;

(xv) Section 8—Test Procedures, Section 8.6—Additional Requirements for the Outdoor Air Enthalpy Method, Section 8.6.2;

(xvi) Section 8—Test Procedures, Section 8.6—Additional Requirements for the Outdoor Air Enthalpy Method, Table 2a—Test Tolerances (SI Units), and

(xvii) Section 8—Test Procedures, Section 8.6—Additional Requirements for the Outdoor Air Enthalpy Method, Table 2b—Test Tolerances (I–P Units);

(xix) Section 9—Data to be Recorded, Section 9.2—Test Tolerances; and

(xx) Section 9—Data to be Recorded, Table 3—Data to be Recorded.


(i) Section 4—Classifications;

(ii) Section 5—Requirements, Section 5.3—Airstream Temperature Measurements;
(iii) Section 6—Instruments; and

(iv) Section 7—Temperature Test Methods (Informative).


(i) Section 5.2—Test Ducts,, Section 5.2.2—Mixers, 5.2.2.1—Performance of Mixers (excluding Figures 11 and 12 and Table 1); and

(ii) Figure 14—Outlet Chamber Setup for Multiple Nozzles in Chamber.


(i) Section 4—Classifications;

(ii) Section 5—Requirements;

(iii) Section 6—Instruments and Calibration; and

(iv) Section 7—Humidity Measurement Methods.


(i) Section 5—Requirements;

(ii) Section 6—Instruments;

(iii) Section 7—Secondary Refrigerant Calorimeter Method;

(iv) Section 8—Secondary Fluid Calorimeter Method;

(v) Section 9—Primary Refrigerant Calorimeter Method; and

(vi) Section 11—Lubrication Circulation Measurements.

(11) ANSI/ASHRAE Standard 103–1993, (“ASHRAE 103–1993”), Methods of Testing for Annual Fuel Utilization Efficiency of Residential Central Furnaces and Boilers, (with Errata of October 24, 1996), except for sections 7.1, 7.2.2.2, 7.2.2.5, 7.2.3.1, 7.8, 8.2.1.3, 8.3.3.1, 8.4.1.1, 8.4.1.1.2, 8.4.1.2, 8.4.2.1.4, 8.4.2.1.6, 8.6.1.1, 8.7.2, 8.8.3, 9.1.2.2.1, 9.1.2.2.2, 9.5.1.1, 9.5.1.2.1, 9.5.1.2.2, 9.5.2.1, 9.7.1, 9.7.4, 9.7.6, 9.10, 11.5.11.1, 11.5.11.2 and appendices B and C, approved October 4, 1993, IBR approved for § 430.23 and appendix N to subpart B. $76


(13) ANSI/ASHRAE Standard 116–2010, (“ASHRAE 116–2010”), Methods of Testing for Rating Seasonal Efficiency of Unitary Air Conditioners and Heat Pumps, ANSI approved February 24, 2010, Section 7—Methods of Test, Section 7.4—Air Enthalpy Method—Indoor Side (Primary Method), Section 7.4.3—Measurements, Section 7.4.3.4—Temperature, Section 7.4.3.4.5, IBR approved for appendices M and M1 to subpart B. $60

(h) ASME. American Society of Mechanical Engineers, Service Center, 22 Law Drive, P.O. Box 2900, Fairfield, NJ 07007, 973–882–1170, or go to http://www.asme.org. https://www.asme.org/shop

(1) ASME A112.18.1–2012, (“ASME A112.18.1–2012”), “Plumbing supply fittings,” section 5.4, approved December, 2012, IBR approved for appendix S to subpart B. $130

(2) ASME A112.19.2–2008, (“ASME A112.19.2–2008”), “Ceramic plumbing fixtures,” sections 7.1, 7.1.1, 7.1.2, 7.1.3, 7.1.4, 7.1.5, 7.4, 8.2, 8.2.1, 8.2.2, 8.2.3, 8.6, Table 5, and Table 6 approved August 2008, including Update No. 1, dated August 2009, and Update No. 2, dated March 2011, IBR approved for § 430.2 and appendix T to subpart B. $95


(1) ANSI/AHAM DH–1–2008 (“ANSI/AHAM DH–1”), Dehumidifiers, ANSI approved May 9, 2008, IBR approved for appendices X and XI to subpart B. $25

(2) ANSI/AHAM DW–1–2010, Household Electric Dishwashers, (ANSI approved September 18, 2010), IBR approved for appendix C1 to subpart B. $60

(3) AHAM HLD–1–2009 (“AHAM HLD–1”), Household Tumble Type Clothes Dryers, (2009), IBR approved for appendix D1 and D2 to subpart B. $50


(2) ASTM D2156–09 (Reapproved 2013) (“ASTM D2156R13”), Standard Test Method for Smoke Density in Flue Gases from Burning Distillate Fuels, approved October 1, 2013, IBR approved for appendix N to subpart B. $40


(1) CEA Standard, CEA–770.3–D, High Definition TV Analog Component Video Interface, published February 2008; IBR approved for § 430.2. $68


measuring performance, (June 3, 2013). IBR approved for appendix I to subpart B, as follows:

(i) Section 5—General conditions for the measurements, (excluding 5.4);

(ii) Section 6—Dimensions and mass, Section 6.2—Cooking zones per hob;

(iii) Section 7—Cooking zones and cooking areas, Section 7.1—Energy consumption and heating up time, (excluding 7.1.Z1, 7.1.Z5, 7.1.Z7);

(iv) Annex ZA—Further requirements for measuring the energy consumption and heating up time for cooking areas;

(v) Annex ZB—Aids for measuring the energy consumption;

(vi) Annex ZC—Examples how to select and position a cookware set for measuring the heating up time (7.1.Z5) and energy consumption (7.1.Z6);

(vii) Annex ZD—Example—Multiple zones; and

(viii) Annex ZF—Normative references to international publications with their corresponding European publications. $289.56

(m) 4 CIE. Commission Internationale de l’Eclairage (CIE), Central Bureau, Kegelgasse 27, A–1030, Vienna, Austria, 011+43 1 714 31 87 0, or go to http://www.cie.co.at/index.php/Publications.


(n) Environmental Protection Agency (EPA), ENERGY STAR documents published by the Environmental Protection Agency are available online at http://www.energystar.gov or by contacting the Energy Star hotline at 1–888–782–7937.


(2) ENERGY STAR Program Requirements for Dehumidifiers, approved January 1, 2001, IBR approved for appendix X to subpart B. FREE

(3) Energy Star Program Requirements for Single Voltage External Ac–Dc and Ac–Ac Power Supplies, Eligibility Criteria (Version 2.0), effective date for EPS Manufacturers November 1, 2008, IBR approved for subpart C, § 430.32. FREE

(4) Test Methodology for Determining the Energy Performance of Battery Charging Systems, approved December 2005, IBR approved for appendix Y to subpart B. FREE

(o) HDMI®. High-Definition Multimedia Interface Licensing, LLC, 1140 East Arques Avenue, Suite 100, Sunnyvale, CA 94085, 408–616–1542, or go to http://www.hdmi.org/manufacturer/hdmi_2_1/index.aspx.

(1) HDMI Specification Informational Version 1.0, High-Definition Multimedia Interface Specification, published September 4, 2003; IBR approved for § 430.2. FREE

(2) IES LM–9–09, ("IES LM–9"), IES Approved Method for the Electrical and Photometric Measurement of Fluorescent Lamps, approved January 31, 2009; IBR approved for § 430.2 and appendices R, V, and V1 to subpart B. $29

(3) IES LM–9–09 (“IES LM–9–09–DD”), IES Approved Method for the Electrical and Photometric Measurement of Fluorescent Lamps, approved January 31, 2009; IBR approved for appendix DD to subpart B, as follows: $29

(i) Section 4.0—Ambient and Physical Conditions;

(ii) Section 5.0—Electrical Conditions;

(iii) Section 6.0—Lamp Test Procedures; and

(iv) Section 7.0—Photometric Test Procedures: Section 7.5—Integrating Sphere Measurement.


(6) IES LM–20–13, IES Approved Method for Photometry of Reflector Type Lamps, approved February 4, 2013; IBR approved for appendix DD to subpart B, as follows: $30

(i) Section 4.0—Ambient and Physical Conditions;

(ii) Section 5.0—Electrical and Photometric Test Conditions;

(iii) Section 6.0—Lamp Test Procedures; and

(iv) Section 8.0—Total Flux Measurements by Integrating Sphere Method.


(8) IES LM–45–15, IES Approved Method for the Electrical and Photometric Measurement of General Service Incandescent Filament Lamps, approved August 8, 2015; IBR approved for appendix DD to subpart B as follows:

(i) Section 4.0—Ambient and Physical Conditions;

(ii) Section 5.0—Electrical Conditions;

(iii) Section 6.0—Lamp Test Procedures; and

(iv) Section 7.0—Photometric Test Procedures: Section 7.1—Total Luminous Flux Measurements with an Integrating Sphere $30

(9) IESNA LM–49–01 ("IESNA LM–49"), IESNA Approved Method for Life Testing of Incandescent Filament
Lamps, approved December 1, 2001, IBR approved for § 430.2 and appendix R to subpart B. \$15

(10) IES LM–54–12, IES Guide to Lamp Seasoning, approved October 22, 2012; IBR approved for appendix W to subpart B, as follows: \$20

(i) Section 4—Physical/Environmental Test Conditions;

(ii) Section 5—Electrical Test Conditions;

(iii) Section 6—Test Procedure Requirements: Section 6.1—Test Preparation; and

(iv) Section 6—Test Procedure Requirements, Section 6.2—Seasoning Test Procedures: Section 6.2.2.1—Discharge Lamps: Discharge Lamps except T5 fluorescent.


(12) IES LM–65–14, IES Approved Method for Life Testing of Single–Based Fluorescent Lamps, approved December 30, 2014; IBR approved for appendix W to subpart B, as follows: \$20

(i) Section 4.0—Ambient and Physical Conditions;

(ii) Section 5.0—Electrical Conditions; and

(iii) Section 6.0—Lamp Test Procedures


(14) IES LM–66–14, (“IES LM–66”), IES Approved Method for the Electrical and Photometric Measurements of Single–Based Fluorescent Lamps, approved December 30, 2014; IBR approved for appendix W to subpart B, as follows: \$20

(i) Section 4.0—Ambient and Physical Conditions;

(ii) Section 5.0—Power Source Characteristics; and

(iii) Section 6.0—Testing Procedures Requirements.

(15) IESNA LM–78–07, IESNA Approved Method for Total Luminous Flux Measurement of Lamps Using an Integrating Sphere Photometer, approved January 28, 2007; IBR approved for appendix W to subpart B. \$29

(16) IES LM–79–08, (“IES LM–79–08”), IES Approved Method for the Electrical and Photometric Measurements of Solid–State Lighting Products, approved December 31, 2007; IBR approved for appendices V1 and BB to subpart B.

(17) IES LM–79–08 (“IES LM–79–08–DD”), Approved Method: Electrical and Photometric Measurements of Solid–State Lighting Products, approved December 31, 2007; IBR approved for appendix DD to subpart B as follows: \$29

(i) Section 1.0 Introduction: Section 1.3—Nomenclature and Definitions (except section 1.3f);

(ii) Section 2.0—Ambient Conditions;

(iii) Section 3.0—Power Supply Characteristics;
(iv) Section 5.0—Stabilization of SSL Product;

(v) Section 7.0—Electrical Settings;

(vi) Section 8.0—Electrical Instrumentation;

(vii) Section 9.0—Test Methods for Total Luminous Flux measurement: Section 9.1 Integrating sphere with a spectroradiometer (Sphere-spectroradiometer system); and Section 9.2—Integrating sphere with a photometer head (Sphere-photometer system).


(19) ANSI/IES RP–16–10 ("ANSI/IES RP–16"), Nomenclature and Definitions for Illuminating Engineering, approved October 15, 2005; IBR approved for § 430.2. $50


(1) IEC Standard 933–5:1992, ("IEC 60933–5 Ed. 1.0"), Audio, video and audiovisual systems—Interconnections and matching values—Part 5: Y/C connector for video systems—Electrical matching values and description of the connector, First Edition, 1992–12; IBR approved for § 430.2. (Note: IEC 933–5 is also known as IEC 60933–5.) $26

(2) IEC Standard 60081, ("IEC 60081"), Double-capped fluorescent lamps—Performance specifications, (Amendment 4, Edition 5.0, 2010–02); IBR approved for appendix Q to subpart B. $944

(3) IEC Standard 62040–3 Ed. 2.0, ("IEC 62040–3 Ed. 2.0"), Uninterruptible power systems (UPS)—Part 3: Method of specifying the performance and test requirements, Edition 2.0, 2011–03, IBR approved for appendix Y to subpart B, as follows: $143

(i) Section 5, Electrical conditions, performance and declared values, Section 5.2, UPS input specification, Section 5.2.1—Conditions for normal mode of operation;

(ii) Clause 5.2.2.k;

(iii) Section 5.3, UPS output specification, Section 5.3.2, Characteristics to be declared by the manufacturer, Clause 5.3.2.d;

(iv) Clause 5.3.2.e;

(v) Section 5.3.4—Performance classification;

(vi) Section 6.2, Routine test procedure, Section 6.2.2.7—AC input failure;

(vii) Section 6.4, Type test procedure (electrical), Section 6.4.1—Input—a.c. supply compatibility (excluding 6.4.1.3, 6.4.1.4, 6.4.1.5, 6.4.1.6, 6.4.1.7, 6.4.1.8, 6.4.1.9 and 6.4.1.10);

(viii) Annex G—Input mains failure—Test method

(ix) Annex J—UPS Efficiency—Methods of measurement.
(4) IEC Standard 62087:2011, (“IEC 62087 Ed. 3.0”), Methods of measurement for the power consumption of audio, video, and related equipment, Edition 3.0, 2011–04, Sections 3.1.1, 3.1.18, 11.4.1, 11.4.2, 11.4.5, 11.4.6, 11.4.8, 11.4.9, 11.4.10, 11.4.11, 11.5.5, and annex C; IBR approved for Appendix H to subpart B of this part.


(7) IEC 62301, (“IEC 62301–DD”), Household electrical appliances—Measurement of standby power, (Edition 2.0, 2011–01); Section 5—Measurements, IBR approved for appendix DD to subpart B.

(8) IEC 62301 ("IEC 62301–U"), Household electrical appliances—Measurement of standby power, (Edition 2.0, 2011–01), IBR approved for appendix U to this subpart, as follows:

(i) Section 4.3—General conditions for measurements: Power supply: Section 4.3.1—Supply voltage and frequency (first paragraph only),

(ii) Section 4.3—General conditions for measurements: Power supply: Section 4.3.2—Supply voltage waveform;

(iii) Section 4.4—General conditions for measurements: Power measuring instruments;

(iv) Section 5.3—Measurements: Procedure: Section 5.3.1—General (except the last bulleted item), and

(v) Section 5.3—Measurements: Procedure: Section 5.3.2—Sampling method (first two paragraphs and Note 1).


(3) International Efficiency Marking Protocol for External Power Supplies, Version 3.0, September 2013, IBR approved for § 430.32. FREE


§ 430.2. FREE

(u) SMPTE. Society of Motion Picture and Television Engineers, 3 Barker Ave., 5th Floor, White Plains, NY 10601, 914–761–1100, or go to https://www.smpte.org/standards.


§ 431.15 Materials incorporated by reference.

(a) The Department of Public Service incorporates by reference the following standards and test procedures into subpart B of part 431.

(b) CSA. Canadian Standards Association, Sales Department, 5060 Spectrum Way, Suite 100, Mississauga, Ontario, L4W 5N6, Canada, 1–800–463–6727, or go to http://www.shop.csa.ca/onlinestore/welcome.asp.

(1) CSA C390–10, Test methods, marking requirements, and energy efficiency levels for three-phase induction motors, March 2010, IBR approved for §§ 431.12; 431.19; 431.20; appendix B to subpart B of part 431. $277

(c) IEC. International Electrotechnical Commission Central Office, 3, rue de Varembé, P.O. Box 131, CH–1211 GENEVA 20, Switzerland, +41 22 919 02 11, or go to http://webstore.iec.ch.

(1) IEC 60034–1 Edition 12.0 2010–02, (“IEC 60034–1”), Rotating Electrical Machines, Part 1: Rating and Performance, February 2010, IBR approved as follows: section 4: Duty, clause 4.2.1 and Figure 1, IBR approved for § 431.12. $405

(2) IEC 60034–12 Edition 2.1 2007–09, (“IEC 60034–12”), Rotating Electrical Machines, Part 12: Starting Performance of Single–Speed Three–Phase Cage Induction Motors, September 2007, IBR approved as follows: clauses 5.2, 5.4, 6, and 8, and Tables 1, 2, 3, 4, 5, 6, and 7, IBR approved for § 431.12. $94


(4) IEC 60072–1, Dimensions and Output Series for Rotating Electrical Machines—Part 1: Frame numbers 56 to 400 and flange numbers 55 to 1080, 1991, IBR approved as follows: clauses 2, 3, 4.1, 6.1, 7, and 10, and Tables 1, 2, and 4, IBR approved for § 431.12. $405

(d) IEEE. Institute of Electrical and Electronics Engineers, Inc., 445 Hoes Lane, P.O. Box 1331, Piscataway, NJ 08855–1331, 1–800–678–IEEE (4333), or http://www.ieee.org/web/publications/home/index.html.

(1) IEEE Std 112–2004, Test Procedure for Polyphase Induction Motors and Generators, approved February 9, 2004, IBR approved as follows: section 6.4, Efficiency Test Method B, Input–Output with Loss Segregation, IBR approved for §§ 431.12; 431.19; 431.20; appendix B to subpart B of part 431. $113

(e) NEMA. National Electrical Manufacturers Association, 1300 North 17th Street, Suite 1752, Rosslyn, Virginia 22209, 703–841–3200, or go to http://www.nema.org/pages/default.aspx

(1) NEMA Standards Publication MG1–2009 (“NEMA MG1–2009”), Motors and Generators, copyright 2009, IBR approved as follows: $484

(i) Section I, General Standards Applying to All Machines, Part 1, Referenced Standards and Definitions, paragraphs 1.18.1, 1.18.1.1, 1.19.1.1, 1.19.1.2, 1.19.1.3, and 1.40.1, IBR approved for § 431.12;

(ii) Section I, General Standards Applying to All Machines, Part 4, Dimensions, Tolerances, and Mounting, paragraphs 4.1, 4.2.1, 4.2.2, 4.4.1, 4.4.2, 4.4.4, 4.4.5, and 4.4.6, Figures 4–1, 4–2, 4–3, 4–4, and 4–5, and Table 4–2, IBR approved for § 431.12;

(iii) Section II, Small (Fractional) and Medium (Integral) Machines, Part 12, Tests and Performance—AC and DC Motors:


(B) Paragraph 12.58.1, IBR approved for § 431.12 and appendix B to subpart B of part 431;
(C) Paragraph 12.58.2, IBR approved for § 431.31.

(D) Paragraphs 12.62 and 12.63, IBR approved for § 431.12.

(iv) Section II, Small (Fractional) and Medium (Integral) Machines, Part 14, Application Data—AC and DC Small and Medium Machines, paragraphs 14.2 and 14.3, IBR approved for § 431.12.

(2) NEMA Standards Publication MG1–1967, (“NEMA MG1–1967”), Motors and Generators, January 1968, IBR approved as follows: $0

(i) Part 11, Dimensions, IBR approved for § 431.12;


(f) NFPA. National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169–7471, 617–770–3000, or go to http://www.nfpa.org/codes-and-standards

Federal Statutes and Regulations Incorporated by Reference

1 CFR Part 51

10 CFR Part 429

10 CFR Part 1003
https://www.law.cornell.edu/cfr/text/10/part-1003

10 CFR Part 1004
https://www.law.cornell.edu/cfr/text/10/part-1004

15 CFR Part 285
https://www.law.cornell.edu/cfr/text/15/part-285

5 U.S.C. 552(a)

42 U.S.C. 6291(1)-(2) and 6292

§ 430.3(b)
Welcome to the new home for AMCA's technical documents. Our partners at Techstreet are the official outlet for all AMCA Standards.

New and Featured Standards:

NEW! **AMCA 501-17, Louver Application Manual and Design Guide**
This publication outlines the application of louvers, including selection for pressure drop, air leakage, water penetration and sound reduction. Examples of louver selection are included. "System Effects," An important section in this publication, should not be overlooked when applying performance data (see Section 7). For information on testing, see Section 6.1; for information on certified ratings, see Section 6.2.

Common industry practices in louver construction, mounting and suggested fastening methods for typical structures have been included to assist the installer.

NEW! **AMCA 207-17, Fan System Efficiency and Fan System Input Power**
The scope of this standard includes all electric motor driven fan systems that use a specific combination of components as defined below:

1. Fan airflow performance tested in accordance with ANSI/AMCA Standard

2. Polyphase induction motors within the scope of EPCA [6], IEC 60034-30-1 [7], or GB 18613 [8]. Other types of motors are explicitly excluded.

3. Pulse-width modulated variable frequency drives (VFDs).

4. Mechanical power transmissions that use V-belts, synchronous belts, or flexible couplings.

NEW! AMCA 200-95 (R2011), Air Systems
This publication is intended to provide basic information needed to design effective and energy efficient air systems. In those cases where the system handles a gas other than air, the design data must be modified to allow for the different physical properties of the gas being used.

NEW! AMCA 201-02 (R2011), Fans and Systems
This part of the AMCA Fan Application Manual includes general information about how fans are tested in the laboratory, and how their performance ratings are calculated and published. It also reviews some of the more important reasons for the "loss" of fan performance that may occur when the fan is installed in an actual system.

Allowances, called System Effect Factors (SEF), are also given in this part of the manual. SEF must be taken into account by the system design engineer if a reasonable estimate of fan/system performance is to be determined.

NEW! AMCA 203-90 (R2011), Field Performance Measurement of Fan Systems
The recommendations and examples in this publication may be applied to all types of centrifugal, axial, and mixed flow fans in ducted or nonducted installations used for heating, ventilating, air conditioning, mechanical draft, industrial process, exhaust, conveying, drying, air cleaning, dust collection, etc. Although the word air is used when reference is made in the general sense to the medium being handled by the fan, gases other than air are included in the scope of this publication.

Measurement of sound, vibration, and stress levels are not within the scope of this publication.
NEW! AMCA 202-17, Troubleshooting
AMCA 202-17 covers both new and existing fan installations. It covers aerodynamic performance as well as noise, vibration and mechanical issues.

AMCA 311-16, Certified Ratings Program Product Rating Manual for Fan Sound Performance
The purpose of this manual is to prescribe/establish definitions and specifications to be used in connection with the AMCA Certified Ratings Program for the sound performance of fans.

AMCA 211-13 (Rev. 10-16), Certified Ratings Program - Product Rating Manual for Fan Air Performance
The purpose of this manual is to prescribe technical procedures to be used in connection with the AMCA Certified Ratings Program for fan air performance.

AMCA 210-16, Laboratory Methods of Testing Fans for Certified Aerodynamic Performance Rating
This standard establishes uniform test methods for a laboratory test of a fan or other air moving device to determine its aerodynamic performance in terms of airflow rate, pressure developed, power consumption, air density, speed of rotation and efficiency for rating or guarantee purposes.

AMCA 99-16, Standards Handbook
AMCA 99-16 serves as a collection of information that can be used in the development of other AMCA documents.
AMCA 11-16, Certified Ratings Program Operating Manual
The purpose of the AMCA International Certified Ratings Program (CRP) is to provide the buyer, user and specifier assurance that the manufacturer's published performance ratings of air system components are reliable, accurate and in compliance with applicable national and international standards.

AMCA 600-16, Application Manual for Airflow Measurement Stations
The purpose of this document is to help avoid problems associated with misapplied or incorrectly installed AMSs. Problems may include incorrect location, inappropriate measurement range, mismatched accompanying instrumentation and an AMS incompatible with intended application.

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§ 430.3(c)
Standards

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Through the use of industry standards and voluntary participation in AHRI's certification programs, consumers can be assured manufacturers' performance claims are accurate and rated uniformly, enabling fair comparisons. AHRI provides access to its standards and guidelines, as well as information about how they are developed and advanced globally.

Download a full listing of AHRI's Standards and Guidelines here (/App_Content/ahri/files/standards%20pdfs/STANDARDS_ENG.pdf)

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AHRI Canadian Work Program (/App_Content/ahri/files/standards/AHRI_Work_Program-March_2016.pdf)

§ 430.3(d)
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§ 430.3(e)
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Browse for standards

Use the list below to browse our local catalogue of over 3000 New Zealand standards, handbooks and other documents, as well as over 50 000 documents from overseas standards bodies. The catalogue is organised by ICS (International Classification for Standards) codes. ICS is a convention managed by the International Organization for Standardization (ISO) and is a way of classifying standards into fields, for example, food technology, electrical engineering, or mining and minerals.

Standards New Zealand is a business unit of Ministry of Business, Innovation and Employment.

- 01 Generalities. Terminology. Standardization. Documentation
- 07 Mathematics. Natural sciences
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- 13 Environment and health protection. Safety
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91 Construction materials and building
93 Civil engineering
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97 Domestic and commercial equipment, Entertainment, Sports
§ 430.3(g)
ASHRAE develops standards for both its members and others professionally concerned with refrigeration processes and the design and maintenance of indoor environments.

ASHRAE writes standards for the purpose of establishing consensus for: 1) methods of test for use in commerce and 2) performance criteria for use as facilitators with which to guide the industry. ASHRAE publishes the following three types of voluntary consensus standards: Method of Measurement or Test, Standard Design and Standard Practice. ASHRAE does not write rating standards unless a suitable rating standard will not otherwise be available.

Consensus standards are developed and published to define minimum values or acceptable performance, whereas other documents, such as design guides, may be developed and published to encourage enhanced performance.

ASHRAE is accredited by the American National Standards Institute (ANSI) and follows ANSI's requirements for due process and standards development.

ASHRAE Standards Addenda

Addenda for ASHRAE Standards, including continuous maintenance standards, are available online in PDF format. Standards that are on continuous maintenance are continuously updated through addenda and ASHRAE makes these available free online.

Complete listing and access to Standards Addenda

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When it is determined that a published standard or guideline contains an error or errors, an errata sheet may be published.

Standards Errata

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Since 1960, ASHRAE has sponsored research studies at universities and research firms. The results of these studies have been used:

To prepare chapters in the ASHRAE Handbook series

As foundational material in special publications

In the formulation of standards

To train university students as they prepare for service in the HVAC&R industry

To spread the knowledge gained through presentation at Society Conferences and publication in ASHRAE Transactions or conference proceedings.

Learn More
An official interpretation is defined as a written explanation of the meaning of a specific provision of a standard or guideline, as determined by an existing cognizant Project Committee (PC) or an Interpretation Committee (IC), in response to a written request. An unofficial or personal interpretation is a written explanation of the meaning of a specific provision of a standard or guideline.

Standards Interpretations

Service Life & Maintenance Cost Database

Engineers depend on accurate owning and operating data to make decisions involving the life cycle and functionality of buildings. This database, sponsored by ASHRAE Technical Committee 7.8, Owning and Operating Costs, exists to provide current information to engineers. Data can be submitted after registration. Learn more

Research Project Manual

The complete version of the Research Project Manual (PDF) (updated 09/2016), including all appendices has been posted. The purpose of this manual is to present, in one document, all of the information and procedures needed by individuals who initiate, approve, conduct, monitor and utilize ASHRAE research.

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Numeric Index

Subject Index

Withdrawn and Discontinued Projects

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ASHRAE supports the use of ASHRAE Standards and ASHRAE Handbook internationally. Procedures and policies are in place to promote such uses while protecting ASHRAE's intellectual property and technical credibility. Agreements vary depending on source of requests (ASHRAE chapters, Associate Societies, commercial publishers or other commercial firms, government, standards bodies, other associations, and educational institutions). ASHRAE also considers requests for translation of other ASHRAE books, articles, and papers. To request a translation agreement, contact W. Stephen Comstock, Publisher/Director of Publications & Education, at scomstock@ashrae.org.

TCs, TGs, and TRGs

ASHRAE Technical Committees approved a General Section Realignment at the Kansas City Annual Meeting, June 2003. The organizational changes include revising the scopes and renaming and renumbering several Technical Committees and the change of five Task Groups to Technical Committees.

A complete list of the changes can be found in the Complete List of Current ASHRAE TC/TG/TRGs with Scopes.
§ 430.3(h)
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- **PD721 - Plant Design Project Management and Design using 3D CAD/CAE and Laser Scanning Technology**
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- **Journal of Applied Mechanics**
  - JOURNAL: $135.00+
- **Safety Code for Elevators and Escalators**
  - STANDARD: $325.00
- **Handbook on Safety Codes for Elevators and Escalators**
  - STANDARD: $245.00
§ 430.3(i)
### Sustainability Standard for Household Refrigeration Appliances - ANSI-AHAM 7001.2-2015

This new standard is the first consensus standard in a family of product sustainability standards under development by AHAM, CSA Group, and UL Environment intended for use by manufacturers, governments, retailers, and others to identify environmentally responsible products. The standard is based on a lifecycle approach for identifying the environmental impacts of refrigeration products in five key areas: product performance, energy, materials, end-of-life, and manufacturing. This standard serves as an objective and practical measurement tool to assist refrigeration product manufacturers in evaluating the environmental sustainability of home appliances.
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<td>This new standard is the third in a family of product sustainability standards under development by AHAM, CSA Group, and UL Environment intended for use by manufacturers, governments, retailers, and others to identify environmentally responsible products. The standard is based on a lifecycle approach for identifying the environmental impacts of household portable and floor care products in six key areas: consumables, energy, materials, end-of-life, performance, and manufacturing. This standard serves as an objective and practical measurement tool to assist portable and floor care manufacturers in evaluating the environmental sustainability of home appliances.</td>
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<td>This new standard is the second in a family of product sustainability standards under development by AHAM, CSA Group, and UL Environment intended for use by manufacturers, governments, retailers, and others to identify environmentally preferable products. The standard is based on a lifecycle approach for identifying the environmental impacts of household clothes washing products in five key areas: consumables, energy, materials, end-of-life, performance, and manufacturing. This standard serves as an objective and practical measurement tool to assist clothes washing manufacturers in evaluating the environmental sustainability of household clothes washing appliances.</td>
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<td>Sustainability Standard for Household Cooking Appliances - AHAM 7004-2017</td>
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<tr>
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<td>This new standard is the fourth in a family of product sustainability standards under development by AHAM, CSA Group, and UL Environment intended for use by manufacturers, governments, retailers, and others to identify environmentally responsible products. The standard is based on a lifecycle approach for identifying the environmental impacts of household portable and floor care products in five key areas: energy, materials, end-of-life, manufacturing and innovation. This standard serves as an objective and practical measurement tool to assist portable and floor care manufacturers in evaluating the environmental sustainability of household cooking appliances.</td>
</tr>
<tr>
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<td>This new standard is in a family of product sustainability standards under development by AHAM, CSA Group, and UL Environment intended for use by manufacturers, governments, retailers, and others to identify environmentally responsible products. The standard is based on a lifecycle approach for identifying the environmental impacts of household clothes dryers in five key areas: energy, materials, end-of-life, manufacturing and innovation. This standard serves as an objective and practical measurement tool to assist clothes dryer manufacturers in evaluating the environmental sustainability of household clothes drying appliances.</td>
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<td>This standard establishes a uniform, repeatable procedure or standard method for evaluating the performance of home laundry equipment. The standard methods provide a means to compare and evaluate different brands and models of household clothes dryers regarding characteristics significant to product use. The standard methods are not intended to inhibit improvement and innovation in product testing, design or performance.</td>
</tr>
<tr>
<td>6.</td>
<td>This standard establishes a uniform, repeatable procedure or standard method for determining and expressing the overall volume, and usable oven space, of the cooking cavity of individual household ovens.</td>
</tr>
<tr>
<td>11.</td>
<td>This standard establishes a uniform, repeatable procedure and standard methods for measuring specified product characteristics of Refrigerators, Refrigerator-Freezers and Freezers.</td>
</tr>
<tr>
<td>13.</td>
<td>This standard establishes a uniform, repeatable procedure or standard method for measuring specified product characteristics of household Room Air Conditioners.</td>
</tr>
<tr>
<td>Page size: 20</td>
<td>Page: 1 of 4</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------</td>
</tr>
<tr>
<td><strong>Product Link</strong></td>
<td></td>
</tr>
</tbody>
</table>
§ 430.3(j)
More than 12,000+ ASTM standards are used worldwide to improve product quality, enhance safety and facilitate trade. You can purchase individual standards; a volume that groups like standards together; a section that's comprised of several volumes covering an industry segment; or the entire collection. Print and online subscriptions are available.
§ 430.3(k)
Audio Systems Standards

Describes how to determine the frequency response, directivity and maximum output capability of a residential loudspeaker. CTA-2034-A

CTA-2034-A (ANSI) Nov 2013

Describes how to determine the frequency response, directivity and maximum output capability of a residential loudspeaker. CTA-2034-A
### Television Data Standards

<table>
<thead>
<tr>
<th>NAME</th>
<th>DATE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTA-CEB21-A</td>
<td>Jun 2011</td>
<td>Recommends the actions ATSC receivers with a single audio decoder should take in the presence or absence of AC-3 audio metadata carried in ATSC standards-based broadcasts.</td>
</tr>
<tr>
<td>CTA-516 S-2013</td>
<td>May 1988</td>
<td>Specifies the transmission technique, coding language and user interface for one-way broadcast teletext-service applications in North America.</td>
</tr>
<tr>
<td>CTA-608-E R-2014</td>
<td>Apr 2008</td>
<td>Used for providing Closed Captioning services or other data services.</td>
</tr>
</tbody>
</table>
### Video Systems Standards

<table>
<thead>
<tr>
<th>Name</th>
<th>Date</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTA-CEB32.5</td>
<td>Jun 2017</td>
<td>This bulletin makes recommendations related to the audio capabilities of ATSC 3.0 Television Sets.</td>
</tr>
<tr>
<td>CTA-CEB3 R-2009 (Withdrawn)</td>
<td>Aug 1998</td>
<td>This bulletin includes essential information for the camcorder user and to standardize the format for the presentation of the information.</td>
</tr>
<tr>
<td>CTA-CEB4 S-2013</td>
<td>Aug 1998</td>
<td>Includes essential information for the VHS VCR user. Standardizes the format for the presentation of the information. NOTE: This bulletin has been stabilized.</td>
</tr>
<tr>
<td>CTA-CEB11-C</td>
<td>Jan 2015</td>
<td>Addresses the source levels, gain structure and output levels of any consumer digital television broadcast receiver, set top box.</td>
</tr>
<tr>
<td>CTA-CEB16-A</td>
<td>Jun 2013</td>
<td>Provides guidance for the development and implementation of consumer devices that process information related to aspect ratio signaling, Active Format Description (AFD) and bar data.</td>
</tr>
</tbody>
</table>
### DTV Interface Standards

<table>
<thead>
<tr>
<th>Name</th>
<th>Date</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTA-761-B R-2012</td>
<td>May 2007</td>
<td>Defines minimum specifications for a one-way data path utilizing an 8 VSB trellis or a 16 VSB remodulator in compliance with ATSC Standard A/53, Annex D.</td>
</tr>
<tr>
<td>CTA-762-B (ANSI)</td>
<td>Jul 2009</td>
<td>Defines minimum specifications for a one-way data path utilizing an 8-VSB trellis remodulator in compliance with ATSC A/53.</td>
</tr>
<tr>
<td>CTA-770.2-D R-2012</td>
<td>Apr 2007</td>
<td>Defines the physical characteristics of an interface and the parameters of the signals carried across that interface.</td>
</tr>
<tr>
<td>CTA-770.3-E</td>
<td>Jun 2013</td>
<td>Defines two raster-scanning systems for the representation of stationary or moving two-dimensional images.</td>
</tr>
</tbody>
</table>

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**Portable Handheld and In-Vehicle**
## Electronics Standards

<table>
<thead>
<tr>
<th>Name</th>
<th>Date</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTA-2063 (ANSI)</td>
<td>May 2017</td>
<td>This standard outlines the elements and characteristics of a serial number to be used by small unmanned aerial systems.</td>
</tr>
<tr>
<td>CTA-2051 (ANSI)</td>
<td>Jan 2017</td>
<td>This standard includes technical performance metrics and associated target values for consumer products which provide personal sound amplification.</td>
</tr>
<tr>
<td>CTA-803-B (ANSI)</td>
<td>Feb 2013</td>
<td>Defines the terms, abbreviations and definitions used in the sales and installation of vehicle aftermarket audio and security equipment.</td>
</tr>
<tr>
<td>CTA-885 R-2013 (ANSI)</td>
<td>Feb 2013</td>
<td>Addresses automotive accessories that allow the operator to start a vehicle while away from the vehicle and the safety of such devices.</td>
</tr>
</tbody>
</table>

## Health Fitness & Wellness Standards

<table>
<thead>
<tr>
<th>Name</th>
<th>Date</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTA/NSF-2052.1 (ANSI)</td>
<td>Jan 2016</td>
<td>This standard specifies terms and definitions for sleep wearable devices.</td>
</tr>
</tbody>
</table>
This standard creates definitions and performance criteria for measuring step counting on consumer wearable or app-based physical activity monitoring devices.

### Consumer Electronics Networking Standards

<table>
<thead>
<tr>
<th>NAME</th>
<th>DATE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTA-709.1-D (ANSI)</td>
<td>Apr 2014</td>
<td>Applies to a communication protocol for networked control systems. This specification applies to a communication protocol for networked control systems.</td>
</tr>
<tr>
<td>CTA-709.3 R-2015 (ANSI)</td>
<td>Dec 1999</td>
<td>Specifies the CTA-709.3 free-topology twisted-pair channel and serves as a companion document to the CTA-709.1.</td>
</tr>
<tr>
<td>CTA-709.4 (ANSI)</td>
<td>Feb 2013</td>
<td>Defines a complete 7-layer protocol stack for communications on a CTA-709.4 single-fiber (half-duplex) fiber-optic channel.</td>
</tr>
</tbody>
</table>
## Modular Communication Interface for Energy Management Standards

<table>
<thead>
<tr>
<th>NAME</th>
<th>DATE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANSI/CTA-2045</td>
<td>Jan 2013</td>
<td>Specifies a modular communications interface (MCI) to facilitate communications with residential devices for applications such as energy management.</td>
</tr>
<tr>
<td>ANSI/CTA-2045.1</td>
<td>Jul 2014</td>
<td>This specification is an extension of the ANSI/CTA-2045 Modular Communications Interface (MCI) for Energy Management standard.</td>
</tr>
<tr>
<td>ANSI/CTA-2045.2</td>
<td>Jul 2014</td>
<td>This specification is an extension of the ANSI/CTA-2045 Modular Communications Interface (MCI) for Energy Management Specification.</td>
</tr>
<tr>
<td>ANSI/CTA-2045.3</td>
<td>Aug 2014</td>
<td>This specification is an extension of the ANSI/CTA-2045 Modular Communications Interface (MCI) for Energy Management standard.</td>
</tr>
</tbody>
</table>
### Residential Systems Standards

<table>
<thead>
<tr>
<th>Name</th>
<th>Date</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTA/CEDIA-CEB24-A</td>
<td>Jun 2017</td>
<td>Focuses on sound abatement (ingress/egress) for air handling equipment, proper air exchanges, treating equipment racks and spaces to maintain adequate operating temperatures and humidity.</td>
</tr>
<tr>
<td>CTA/CEDIA-CEB23-B</td>
<td>Mar 2017</td>
<td>Provides a standardized approach to theater installation and performance objectives outlines with recommendations for the design of high performance home theaters that meet or exceed the commercial experience.</td>
</tr>
<tr>
<td>ANSI-J-STD-710 (CTA/CEDIA-2039)</td>
<td>Apr 2015</td>
<td>Provides a standardized set of architectural floor plan and reflected ceiling plan symbols for audio, video and control systems.</td>
</tr>
<tr>
<td>CTA/CEDIA-CEB17-A</td>
<td>Aug 2012</td>
<td>This recommended practice is an informative reference for the installation, application and placement of speakers in residential environments.</td>
</tr>
<tr>
<td>CTA/CEDIA-CEB29</td>
<td>Mar 2012</td>
<td>The development of the Smart Grid may entail the interconnection of numerous consumer electronic devices and appliances to each other and to the outside world.</td>
</tr>
</tbody>
</table>

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European Committee for Electrotechnical Standardization (CENELEC)

Adhere to European requirements for electronic and electrical products

The European Committee for Electrotechnical Standardization (CENELEC) authors standards that satisfy industry and legislative requirements for electric and electronic goods sold in Europe. CENELEC standards remove barriers to trade, ensure quality and safety, and enable you to:

- Expand market position
- Improve interoperability
- Remain compliant

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<thead>
<tr>
<th>Full Online Standards Solution</th>
<th>Individual Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multiple standards</td>
<td>Minimal standards</td>
</tr>
<tr>
<td>Frequent purchases ($3000+/year)</td>
<td>Infrequent purchases</td>
</tr>
<tr>
<td>Standards access or budget management, organization-wide</td>
<td>Less than 5 employees use standards</td>
</tr>
</tbody>
</table>
Industry Success Stories

*Trimble Ensures Regulatory Compliance and Adequate Supplies for Tens of Thousands of Components*

This provider of location-based technologies ensures compliance with complex EHS regulations as well as avoiding disruptions to its supply chain. Managers instantly find data on thousands of parts each quarter versus manually looking up each one, reducing delivery time of RoHS and REACH documentation from weeks to under 2 days – an 86% increase in efficiency.

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**China Display Conference 2017** | **2017中国显示产业研讨会**
*Sep 07-08, 2017*
*China, Asia*

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**Industrial installations**  |  Jul 07
---
Please I need to know about Lv connections & installations in factories where food beverages and plastics are produced?

**Elevated bus now said to be a scam**  |  Jul 07
---
The elevated bus that cars could drive under was talked about a few months ago. I saw the news this morning that reported it to be a scam.

**Alfa Laval Tank Cleaning Machines**  |  Jul 06
---
The company I work for are distributor for the Alfa Laval GamaJet tank cleaning machines. I am trying to get a better understanding on...
I was in Qinuangdao a couple months ago and while I didn't go to every part of the city, I didn't see anywhere that it had been much planned for. NPR

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Swiss Association for Standardization (SNV) Standards

EITRACK Risk Mitigation and Environment (ANSI) Standards

American National Standards Institute (ANSI) Standards

JEDEC Solid State Technology Committee (JEDEC) Standards

Italian Electrical Committee (CEI) Standards

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Electronics

Topic

Standards management

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§ 430.3(m)
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- CIE Publications on CDs
- International Standards
- International Draft Standards
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§ 430.3(n)
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• ENERGY STAR Ends the Thermostat Wars by Introducing First-Ever Smart Thermostat Specification

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Discover ways to save in your home and track progress in your "My ENERGY STAR" savings dashboard.

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Track and assess energy and water consumption across your entire portfolio of buildings.

SAVE AT HOME WITH ENERGY STAR
A home improvement expert takes you through a real home to learn energy-saving tips.

ENERGY STAR MOST EFFICIENT 2017
These exceptional products represent the leading edge in energy efficient products this year.

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See who’s helping us save energy and find an ENERGY STAR event in your area.

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Learn how to set your thermostat for savings.

LOW CARBON IT CAMPAIGN
Tips and tools to reduce energy consumed by IT equipment in your organization.

SAVE ENERGY @HOME
Take a room-by-room tour and learn what you can do to save in your own home.
WHAT'S NEW

The Energy Source
Plugging you into the latest from ENERGY STAR

Image

Room-by-Room Savings: The Laundry Room
Feb 21
The Lawrence Berkeley National Laboratory found that homeowners typically spend about $2,000 every year on their...

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§ 430.3(o)
Overview

HDMI Specification 2.1 is the most recent update of the HDMI specification featuring advanced features for the HDMI ecosystem. It supports a range of Higher Video Resolutions and refresh rates including 8K60 and 4K120, Dynamic HDR, and increased bandwidth with a new 48G cable. Version 2.1 of the HDMI Specification is backward compatible with earlier versions of the Specification.

HDMI Specification 2.1 Feature Highlights Include:

- Higher Video Resolutions support a range of higher resolutions and faster refresh rates including 8K60Hz and 4K120Hz for immersive viewing and smooth fast-action detail.
- Dynamic HDR ensures every moment of a video is displayed at its ideal values for depth, detail, brightness, contrast, and wider color gamuts—on a scene-by-scene or even a frame-by-frame basis.
- 48G cables enable up to 48Gbps bandwidth for uncompressed HDMI 2.1 feature support including 8K video with HDR. The cable is backwards compatible with earlier versions of the HDMI Specification and can be used with existing HDMI devices.
- eARC supports the most advanced audio formats such as object-based audio, and enables advanced audio signal control capabilities including device auto-detect.
- Game Mode VRR features variable refresh rate, which enables a 3D graphics processor to display the image at the moment it is rendered for more fluid and better detailed gameplay, and for reducing or eliminating lag, stutter, and frame tearing.

The new specification will be available to all HDMI 2.0 Adopters and they will be notified when it is released early in Q2 2017.

FAQS

Q: What is the testing policy for HDMI 2.1 products?
A: An Adopter’s first product in a designated product category that implements any function of the HDMI 2.1 Specification needs to be submitted to an ATC for testing and pass all applicable and available HDMI compliance tests before shipment. An Adopter’s subsequent product in a designated product category that implements any additional function of the HDMI 2.1 Specification should be submitted to an ATC for testing and pass all applicable and available HDMI compliance tests before shipment.

Q: What are the testing requirements for HDMI 2.1 Specification?
A: Compliance testing will continue to be an essential aspect to the success of the HDMI Specifications. When the HDMI 2.1 Specification is released, it will be accompanied by a new Compliance Testing Specification (CTS 2.1). All 1.4b products will continue to be tested to CTS 1.4b. Refer to the HDMI.org website for testing requirements.

Q: When will the HDMI 2.1 Compliance Test Specification be available?
A: The HDMI 2.1 Compliance Test Specification (CTS) will be published in Q2-Q3 2017.

Q: When will ATCs start to provide 2.1 testing services?
A: Each individual ATC will decide on when to offer HDMI 2.1 testing services. Please contact your local ATC for more information.

Q: What is the relationship of HDMI Specification 2.1 to HDMI 2.0b and 1.4b Specifications?
A: HDMI 2.1 Specification supersedes 2.0b and 2.1 continues to make reference to, and rely upon, HDMI 1.4b Specification.

Q: Is HDMI 2.1 Specification backwards compatible with previous versions of the specification?
A: Yes.

Q: How do you license HDMI 2.1 Specification?
A: In order to license the HDMI 2.1 Specification, you must first become an HDMI Adopter and then sign an addendum to the HDMI Adopter Agreement which provides a license to the HDMI 2.0 Specification.

Q: Can non-HDMI Adopters license only the HDMI 2.1 Specification?
A: Companies wishing to use the HDMI 2.1 specification must become an HDMI Adopter and also sign the HDMI 2 Adopter Addendum. They will have access to HDMI 1.4b and HDMI 2.1 Specifications.

Q: If I am a current HDMI 1.4b Adopter, do I have to license HDMI 2.1 Specification?

For more information, please visit www.hdmiforum.org.
A: No, Adopters have the option to only license 1.x.

Q: Do HDMI 2.0 Adopters automatically get access to HDMI 2.1 Specification?
A: Yes it is licensed under the Version 2 addendum.

Q: Will current Adopters be required to pay an additional Annual Fee if they choose to adopt the HDMI 2.1 Specification?
A: No.

Q: Will there be any new royalty and/or increase in current royalties for products that implement HDMI 2.1 Specification features?
A: No there is no additional royalty for implementing the HDMI 2.1 Specification.

Q: Where can I download the HDMI 2.1 Specification?
A: HDMI 2.1 Specification can be downloaded from the Adopter Extranet.

Feature FAQS

High Video Resolutions

Q: Will 8K@60 or 4K@120 require a new cable or cable connector?
A: Yes a new cable is required

Q: What are the support resolutions and frame rates?
A:
- 4K50/60
- 4K100/120
- 5K50/60
- 5K100/120
- 8K50/60
- 8K100/120
- 10K50/60
- 10K100/120

Q: What colorimetry is supported?
A: HDMI 2.1 Specification supports the latest color spaces including BT.2020 with 10, 12, and 16 bits per color component.

48G Cable

Q: Is this cable required for delivering HDMI 2.1 Specification features?
A: The cable is the best way to ensure the high-bandwidth dependent features are delivered including the enhanced video and audio performance, and accounting for the new EMI characteristics.

Q: Will existing HDMI High Speed cables deliver the HDMI 2.1 features also?
A: While existing HDMI High Speed Cables with Ethernet can deliver some of the new features, the new cable is the best way to connect HDMI 2.1 enabled devices to ensure delivery of all the features.

Q: What connectors does this cable use?
A: It is compatible with HDMI Connectors Types A, C and D.

Q: Does the cable have an Ethernet channel?
A: Yes it supports the HDMI Ethernet Channel.

Q: Can this new cable work with existing HDMI devices?
A: The cable is backwards compatible and can be used with existing HDMI devices for the delivery of legacy HDMI features.

Dynamic HDR

Q: Does this Dynamic HDR require the new 48G Cable?
A: No, but it will be necessary to enable 8K video with HDR.

Q: Does the specification support the various HDR solutions?
A: Yes it supports various static and dynamic HDR solutions in the market.

Q: Is this accessible via a firmware upgrade?
A: Manufacturers will be implementing this in various ways.
eARC
Q: Will this work with any HDMI cable?
A: This works with HDMI High Speed Cables with Ethernet and the new 48G cable
Q: Is this available through a firmware upgrade?
A: Depends on manufacturer implementation

Game Mode VRR
Q: Does this require the new HDMI cable?
A: No
Q: Will this work with 8K@60 or 4K@120Hz?
A: Yes if those features are implemented along with Higher Video Resolution. That will require the new 48G cable
Q: Is this primarily for consoles or will PCs utilize this also?
A: It can be used for both.
Q: Will this result in more gaming PCs connecting to HDMI displays, either monitors or TVs?
A: The intent of the feature is to enable HDMI technology to be used in these applications. Given that HDMI connectivity already has a strong presence in this area, we expect that use of HDMI technology in gaming will continue to grow.

Want to contribute? JOIN THE HDMI FORUM
This is your chance to contribute to the world’s de facto connectivity standard for uncompressed HD and UHD video, multi-channel surround audio, and advanced control data. The HDMI Forum is looking for those companies who want to contribute to the next version of the HDMI specification.

Membership information can be found on the HDMI Forum website, www.hdmiforum.org
§ 430.3(p)
Standards

The IES is an accredited Standards Development Organization (SDO) under American National Standards Institute (ANSI) approved procedures. The Society publishes nearly 100 varied publications including recommended practices on a variety of applications, design guides, technical memoranda, and publications on energy management and lighting measurement.

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§ 430.3(r)
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- ENERGY STAR Incentivizes Efficiency in the Medical Industry with First-Ever Laboratory-Grade Refrigerator Specification
- ENERGY STAR Ends the Thermostat Wars by Introducing First-Ever Smart Thermostat Specification
ENERGY EFFICIENCY

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Heat and cool your home efficiently
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ASK THE EXPERT
Have questions about how best to save energy in your home? Well, Ask the Expert!

MY ENERGY STAR
Discover ways to save in your home and track progress in your "My ENERGY STAR" savings dashboard.

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Track and assess energy and water consumption across your entire portfolio of buildings.

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A home improvement expert takes you through a real home to learn energy-saving tips.

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SET YOUR PROGRAMMABLE THERMOSTAT
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Optica
Optical Materials Express
Optics and Photonics News
Optics Express
Optics Letters
Advances in Optics and Photonics

Govind Agrawal, Editor

Years of publication:
2009 - Present
Impact Factor: 17.833

eISSN: 1943-8206
CODEN: AOPAC7

Current Issue (/aop/issue.cfm) | All Issues (/aop/browse.cfm)

Frequency: Article-at-a-time publication; Quarterly issues

Articles: Invited, long review articles with internal navigational links and external reference linking, peer-reviewed tutorials with multimedia enhancements, and peer-reviewed letters to the editor and replies pertaining to published review articles or tutorials.

Topic Scope: Coverage encompasses comprehensive review articles and multimedia tutorials appropriate for students, researchers, faculty, business professionals and engineers. Authoritative content covers advances in all areas of optics and photonics from fundamental science to engineering applications, including materials, devices, and systems. Submissions of long reviews and tutorials are invited only. Tutorials feature interactive components such as animation and video to maximize their reach.
Applied Optics

Ronald Driggers, Editor

Years of publication:
1962 - Present
Impact Factor: 1.650

ISSN: 1559-128X (print)
eISSN: 2155-3165 (online)
CODEN: AOPOAI
h5 Index: 46

Current Issue (/ao/issue.cfm) | All Issues (/ao/browse.cfm)

Frequency: Article-at-a-time publication; 3 issues per month on the 1st, 10th, and 20th

Articles: Regular articles, feature issue contributions, comments/replies, errata

Topic Scope: A highly regarded, premium quality must read for everyone in the optics field that offers applications-centered research in optics, photonics, imaging, and sensing. Topics germane to the journal include optical technology, lasers, photonics, environmental optics, and information processing.
Biomedical Optics Express

Christoph Hitzenberger, Editor

Years of publication:
2010 - Present
Impact Factor: 3.337

eISSN: 2156-7085
CODEN: BOEICL
h5 Index: 51

Current Issue (/boe/issue.cfm) | All Issues (/boe/browse.cfm)
Frequency: Article-at-a-time publication; Monthly issues

Articles: Regular articles, Feature issue contributions, Interactive Science Publishing (ISP) articles, comments/replies, errata

Topic Scope: The journal scope encompasses fundamental research, technology development, biomedical studies and clinical applications related to optics, photonics and optical imaging in the life sciences.
Journal of the Optical Society of America A

P. Scott Carney, Editor

Years of publication:
1984 - Present
Impact Factor: 1.621

ISSN: 1084-7529 (print)
eISSN: 1520-8532 (online)
CODEN: JOAOD6
h5 Index: 31

Current Issue (/josaa/issue.cfm) | All Issues (/josaa/browse.cfm)

Frequency: Article-at-a-time publication; Monthly issues

Articles: Regular articles, feature issue contributions, communications, discussion papers, comments/replies, errata

Topic Scope: Topics representing classical optics, image science and vision, such as atmospheric optics, clinical vision, coherence and statistical optics, color, image processing, machine vision, scattering, and visual optics.
Journal of the Optical Society of America B

Grover Swartzlander, Editor

Years of publication:
1984 - Present

Impact Factor: 1.843

ISSN: 0740-3224 (print)
eISSN: 1520-8540 (online)
CODEN: JOBPDE
h5 Index: 38

Current Issue (/josab/issue.cfm) | All Issues (/josab/browse.cfm)

Frequency: Article-at-a-time publication; Monthly issues

Articles: Regular articles, feature issue contributions, communications, comments/replies, errata

Topic Scope: JOSA B emphasizes scientific research on the fundamentals of the interaction of light with matter such as quantum optics, nonlinear optics, and laser physics. Topics include atom optics and cold atoms, integrated and fiber optics, metamaterials, nanophotonics, photonic crystals, photorefractive optics and holography, physics of optical materials, spectroscopy, THz optics, ultrafast phenomena, and other related subjects.
Optica

Alex Gaeta, Editor

Years of publication:
2014 - Present

Impact Factor: 7.727

ISSN: 2334-2536
h5 Index: 22

Current Issue (/optica/issue.cfm) | All Issues (/optica/browse.cfm)

Frequency: Rapid article-at-a-time publication; Monthly issues

Articles: Research articles, letters, memoranda, and mini reviews.

Topic Scope: A new open-access journal that focuses on the rapid dissemination of high-impact results in all areas of optics and photonics. Optica is a dedicated venue for authors to publish high-profile research in both fundamental and applied optics and photonics.
Optical Materials Express

Alexandra Boltasseva, Editor

Years of publication:
2011 - Present

Impact Factor: 2.591

eISSN: 2159-3930
CODEN: OMEPAX
h5 Index: 38

Current Issue (/ome/issue.cfm) | All Issues (/ome/browse.cfm)

Frequency: Article-at-a-time publication; Monthly issues

Articles: Regular articles, Feature issue contributions, Interactive Science Publishing (ISP) articles, comments/replies, errata.

Topic Scope: The journal scope encompasses synthesis, processing and characterization of materials for applications in optics and photonics. Topics include: advances in novel optical materials; their properties, modeling, synthesis and fabrication for optics and photonics; how such materials contribute to novel optical behavior; and how they enable new or improved optical devices.
Optics and Photonics News

Stewart Wills, Editor

Years of publication:
1990 - Present

ISSN: 1047-6938 (print)
eISSN: 1541-3721 (online)
CODEN: OPPHEL

Current Issue (http://www.osa-opn.org/home/) | All Issues (http://www.osa-opn.org/home/archive/)

Frequency: Monthly issues

Topic Scope: OSA's premiere news magazine that provides in-depth coverage of recent developments in the field of optics and informative pieces on a variety of topics such as science and society, education, technology, business and professional development.
Optics Express

Andrew M. Weiner, Editor

Years of publication:
1997 - Present
Impact Factor: 3.307

eISSN: 1094-4087
CODEN: OPEXFF
h5 Index: 105

Current Issue (/oe/issue.cfm) | All Issues (/oe/browse.cfm)
Frequency: Article-at-a-time publication; Bi-weekly issues

Articles: Regular articles, focus issue contributions, Interactive Science Publishing (ISP) articles, comments/replies, errata.

Topic Scope: Peer-reviewed articles that emphasize scientific and technology innovations in all aspects of optics and photonics. The Energy Express (/oe/journal/oe/ee_about.cfm) dedicated section reports research on the science and engineering of light and its impact on sustainable energy development, the environment, and green technologies.
Optics Letters

Xi-Cheng Zhang, Editor

Years of publication:
1977 - Present
Impact Factor: 3.416

ISSN: 0146-9592 (print)
eISSN: 1539-4794 (online)
CODEN: OPLEDP
h5 Index: 80

Current Issue (/ol/issue.cfm) | All Issues (/ol/browse.cfm)
Frequency: Article-at-a-time publication; 2 issues per month on the 1st and 15th.

Articles: Short, original, peer-reviewed articles, comments/replies, errata.

Topic Scope: Latest research in all areas of optics and photonics.
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Proceedings (/conferences.cfm)

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Standards News

SMPTE Timed Text (ST 2052) documents available at no charge

- General overview of document structure OV 2052-0:2013
- Standard document (Definition of SMPTE-TT) ST 2052-1:2013
- Recommended Practice (Conversion from CEA 608 to SMPTE-TT) RP 2052-10:2013
- Recommended Practice (Conversion from CEA 708 to SMPTE-TT) RP 2052-11:2013
- FAQ
- Technical Report: TTML Features for IMF Data Essence

New numbering style

Digital Cinema Test Materials released for digital leader and DPROVE

Standards Meeting Reports

Meetings are held quarterly, usually in March, June, September and December. An Outcome Report that includes detail on a very large number of current projects is posted after each meeting on this page.

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- Patent Declaration Form
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