ATTACHMENT A

§ 430.3 Materials incorporated by reference.

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

(b) Air Movement and Control Association International, Inc. (AMCA), 30 West University Drive, Arlington Heights, IL 60004, (847) 394–0150, or by going to http://www.techstreet.com/amca.

(1) ANSI/ASHRAE 51–07/ANSI/AMCA 210–07 ("ANSI/AMCA 210"), Laboratory Methods of Testing Fans for Certified Aerodynamic Performance Rating, AMCA approved July 28, 2006; IBR approved for appendix X1 to subpart B.

(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.

(3) ANSI/AMCA Standard 230–15 ("AMCA 230–15"), "Laboratory Methods of Testing Air Circulating Fans for Rating and Certification," ANSI approved October 16, 2015, IBR approved for appendix U to this subpart, as follows:

(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).

(c) AHRI. Air–Conditioning, Heating, and Refrigeration Institute, 2111 Wilson Blvd, Suite 500, Arlington, VA 22201, 703–524–8800, or go to http://www.ahrinet.org/Standards.aspx.

(1) ANSI/AHRI 210/240–2008 with Addenda 1 and 2 ("AHRI 210/240–2008"), 2008 Standard for Performance Rating of Unitary Air–Conditioning & Air–Source Heat Pump Equipment, ANSI approved October 27, 2011 (Addendum 1 dated June 2011 and Addendum 2 dated March 2012), IBR approved for appendices M and M1 to subpart B, as follows:

(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.

(2) AHRI Standard 1160–2009 ("AHRI 1160"), Performance Rating of Heat Pump Pool Heaters, 2009, IBR approved for appendix P to subpart B.

(3) ANSI/AHRI 1230–2010 with Addendum 2 ("AHRI 1230–2010"), 2010 Standard for Performance Rating of Variable Refrigerant Flow (VRF) Multi–Split Air–Conditioning and Heat Pump Equipment (including Addendum 1 dated March 2011), ANSI approved August 2, 2010 (Addendum 2 dated June 2014), IBR approved for appendices M and M1 to subpart B, as follows:

(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) [1] Section 5—Test Requirements, Section 5.1 (untitled), 5.1.3–5.1.4;

(ii) [1] 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];

(iii) Section 6—Rating Requirements, Section 6.1—Standard Ratings, 6.1.6—Outdoor–Coil Airflow Rate (Applies to all Air-to–Air Systems);

(iv) Section 6—Rating Requirements, Section 6.2—Conditions for Standard Rating Test for Air-cooled Systems < 65,000 Btu/h [19,000W] (except Table 8); and

(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.

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

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

(e) ANSI. American National Standards Institute, 25 W. 43rd Street, 4th Floor, New York, NY 10036, 212–642–4900, or go to http://www.ansi.org. http://webstore.ansi.org/

(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.

(2) ANSI C78.20–2003, Revision of ANSI C78.20–1995 ("ANSI C78.20"), American National Standard for electric lamps—A, G, PS, and Similar Shapes with E26 Medium Screw Bases, approved October 30, 2003; IBR approved for § 430.2.

(3) ANSI C78.21–1989, American National Standard for Electric Lamps—PAR and R Shapes, approved March

3, 1989, IBR approved for § 430.2.

(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.

(5) ANSI—ANSLG C78.81–2010, ("ANSI C78.81"), American National Standard for Electric Lamps—Double–Capped Fluorescent Lamps— Dimensional and Electrical Characteristics, approved January 14, 2010, IBR approved for § 430.2, § 430.32, appendix Q, and appendix R to subpart B.

(6) ANSI C78.375–1997, Revision of ANSI C78.375–1991 ("ANSI C78.375"), American National Standard for Fluorescent Lamps—Guide for Electrical Measurements, first edition, approved September 25, 1997; IBR approved for appendix Q, and appendix R to subpart B.

(7) ANSI—IEC C78.901–2005, Revision of ANSI C78.901–2001 ("ANSI C78.901"), American National Standard for Electric Lamps—Single–Based Fluorescent Lamps—Dimensional and Electrical Characteristics, approved March 23, 2005; IBR approved for § 430.2, appendix Q, and appendix R to subpart B.

(8) ANSI C78.901–2014, American National Standard for Electric Lamps—Single–Based Fluorescent Lamps—Dimensional and Electrical Characteristics, ANSI approved July 2, 2014; IBR approved for appendix W to subpart B.

(9) ANSI C79.1–1994, American National Standard for Nomenclature for Glass Bulbs—Intended for Use with Electric Lamps, approved March 24, 1994, IBR approved for § 430.2.

(10) ANSI C79.1–2002, American National Standard for Electric Lamps—Nomenclature for Glass Bulbs Intended for Use with Electric Lamps, approved September 16, 2002, IBR approved for § 430.2.

(11) ANSI—ANSLG— C81.61–2006, Revision of ANSI C81.61–2005, ("ANSI C81.61"), American National Standard for electrical lamp bases—Specifications for Bases (Caps) for Electric Lamps, approved August 25, 2006, IBR approved for § 430.2.

(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.

(13) ANSI C82.2–2002, ("ANSI C82.2"), American National Standard for Lamp Ballasts—Method of Measurement of Fluorescent Ballasts, Approved June 6, 2002, IBR approved for appendix Q to subpart B.

(14) ANSI C82.3–2002, Revision of ANSI C82.3–1983 (R 1995) ("ANSI C82.3"), American National Standard for Reference Ballasts for Fluorescent Lamps, approved September 4, 2002; IBR approved for appendix Q, and appendix R to subpart B.

(15) ANSI C82.11 Consolidated–2002, ("ANSI C82.11"), American National Standard for Lamp Ballasts—High-frequency Fluorescent Lamp Ballasts—Supplements, approved March 11, 1999, August 5, 1999 and January 17, 2002; IBR approved for appendix Q to subpart B.

(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.

(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:

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

(ii) Figure 5–15—Plug and Receptacle.

(18) ANSI Z21.56–2006, section 2.10 ("ANSI Z21.56"), Standard for Gas–Fired Pool Heaters, approved

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

(19) ANSI Z21.50–2007 (CSA 2.22–2007), ("ANSI Z21.50"), Vented Gas Fireplaces, Fifth Edition, Approved February 22, 2007, IBR approved for § 430.2.

(20) ANSI Z21.86–2008, ("ANSI Z21.86"), Vented Gas–Fired Space Heating Appliances, Fifth Edition, approved March 28, 2008, IBR approved for appendix O to subpart B.

(21) ANSI Z21.88–2009 (CSA 2.33–2009), ("ANSI Z21.88"), Vented Gas Fireplace Heaters, Fifth Edition, Approved March 26, 2009, IBR approved for § 430.2.

(f) AS/NZS. Australian/New Zealand Standard, GPO Box 476, Sydney NSW 2001, (02) 9237–6000 or (12) 0065–4646, or go to www.standards.org.au/Standards New Zealand, Level 10 Radio New Zealand House 144 The Terrace Wellington 6001 (Private Bag 2439 Wellington 6020), (04) 498–5990 or (04) 498–5991, or go to https://shop.standards.govt.nz/catalog/ics/.

(1) AS/NZS 4474.1:2007, Performance of Household Electrical Appliances—Refrigerating Appliances; Part 1: Energy Consumption and Performance, Second edition, published August 15, 2007, IBR approved for appendix A to subpart B.

(g) ASHRAE. American Society of Heating, Refrigerating and Air–Conditioning Engineers, Inc., Publication Sales, 1791 Tullie Circle, NE., Atlanta, GA 30329, 800–527–4723 or 404–636–8400, or go to https://www.ashrae.org/standards-research--technology.

(1) ANSI/ASHRAE Standard 16–1983 ("ANSI/ASHRAE 16") (RA 2009), (Reaffirmation of ANSI/ASHRAE Standard 16–1983 [RA 1999]), Method of Testing for Rating Room Air Conditioners and Packaged Terminal Air Conditioners, ASHRAE approved October 18, 1988, and reaffirmed June 20, 2009. ANSI approved October 20, 1998 and reaffirmed June 25, 2009. IBR approved for appendix F to subpart B.

(2) ANSI/ASHRAE 23.1–2010, ("ASHRAE 23.1–2010"), Methods of Testing for Rating the Performance of Positive Displacement Refrigerant Compressors and Condensing Units that Operate at Subcritical Temperatures of the Refrigerant, ANSI approved January 28, 2010, IBR approved for appendices M and M1 to subpart B, as follows:

(i) Section 5—Requirements;

(ii) Section 6—Instruments;

(iii) Section 7—Methods of Testing; and

(iv) Section 8—Compressor Testing.

(3) ANSI/ASHRAE Standard 37–2009, ("ASHRAE 37–2009"), Methods of Testing for Rating Electrically Driven Unitary Air–Conditioning and Heat Pump Equipment, ANSI approved June 25, 2009, IBR approved for appendices AA and CC to subpart B.

(4) ANSI/ASHRAE Standard 37–2009, ("ANSI/ASHRAE 37–2009"), Methods of Testing for Rating Electrically Driven Unitary Air-Conditioning and Heat Pump Equipment, ANSI approved June 25, 2009, IBR approved for appendices M and M1 to subpart B, as follows:

(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;

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

(xviii) 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.

(5) ASHRAE 41.1–1986 (Reaffirmed 2006), Standard Method for Temperature Measurement, approved February 18, 1987, IBR approved for appendices E and AA to subpart B.

(6) ANSI/ASHRAE 41.1–2013 ("ANSI/ASHRAE 41.1"), Standard Method for Temperature Measurement, ANSI approved January 30, 2013; IBR approved for appendix X1 to subpart B.

(7) ANSI/ASHRAE Standard 41.1–2013, ("ANSI/ASHRAE 41.1–2013"), Standard Method for Temperature Measurement, ANSI approved January 30, 2013, IBR approved for appendices M and M1 to subpart B, as follows:

(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).

(8) ANSI/ASHRAE Standard 41.2–1987 (RA 1992), ("ASHRAE 41.2–1987 (RA 1992)"), Standard Methods for Laboratory Airflow Measurement, ANSI reaffirmed April 20, 1992, Section 5—Section of Airflow–Measuring Equipment and Systems, IBR approved for appendices M and M1 to subpart B, as follows:

(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.

(9) ANSI/ASHRAE Standard 41.6–2014, ("ASHRAE 41.6–2014"), Standard Method for Humidity Measurement, ANSI approved July 3, 2014, IBR approved for appendices M and M1 to subpart B, as follows:

(i) Section 4—Classifications;

(ii) Section 5—Requirements;

(iii) Section 6—Instruments and Calibration; and

(iv) Section 7—Humidity Measurement Methods.

(10) ANSI/ASHRAE 41.9–2011, ("ASHRAE 41.9–2011"), Standard Methods for Volatile–Refrigerant Mass Flow Measurements Using Calorimeters, ANSI approved February 3, 2011, IBR approved for appendices M and M1 to subpart B, as follows:

(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.

(12) ANSI/ASHRAE Standard 103–2007, ("ASHRAE 103–2007"), Method of Testing for Annual Fuel Utilization Efficiency of Residential Central Furnaces and Boilers, ANSI approved March 25, 2008, IBR approved for appendices O and AA to subpart B.

(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.

(14) ANSI/ASHRAE Standard 146–2011 ("ASHRAE 146"), Method of Testing and Rating Pool Heaters,

ASHRAE approved February 2, 2011, IBR approved for appendix P to subpart B.

(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.

(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.

(i)[3] AHAM. Association of Home Appliance Manufacturers, 1111 19th Street, NW., Suite 402, Washington, DC 20036, 202–872–5955, or go to http://www.aham.org. http://www.aham.org/AHAM/AuxStore

(1) ANSI/AHAM DH–1–2008 ("ANSI/AHAM DH–1"), Dehumidifiers, ANSI approved May 9, 2008, IBR approved for appendices X and X1 to subpart B.

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

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

(4) AHAM HRF–1–2008, ("HRF–1–2008"), Association of Home Appliance Manufacturers, Energy and Internal Volume of Refrigerating Appliances (2008), including Errata to Energy and Internal Volume of Refrigerating Appliances, Correction Sheet issued November 17, 2009, IBR approved for appendices A and B to subpart B.

(5) AHAM OV–1–2011, ("AHAM OV- 1"), Procedures for the Determination and Expression of the Volume of Household Microwave and Conventional Ovens, (2011), IBR approved for appendix I to subpart B.

(j) ASTM. American Society for Testing and Materials International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428–2959 (www.astm.org) https://www.astm.org/Standard/index.html

(1) ASTM D2156–09, ("ASTM D2156"), Standard Test Method for Smoke Density in Flue Gases from Burning Distillate Fuels, ASTM approved December 1, 2009, IBR approved for appendices E and O to subpart B.

(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.

(k) CEA. Consumer Electronics Association, Technology & Standards Department, 1919 S. Eads Street, Arlington, VA 22202, 703–907–7600, or go to www.CE.org. https://www.cta.tech/Research-Standards/Standards-Listing.aspx

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

(l) CENELEC. European Committee for Electrotechnical Standardization, 17, Avenue Marnix, B-1000 Brussels, phone: +32 2 519 68 71, available from the HIS Standards Store, https://www.ihs.com/products/cenelec-standards.html

(1) EN 60350-2:2013, ("EN 60350-2:2013"), Household electric cooking appliances Part 2: Hobs—Methods for 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.

(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.

(1) CIE 13.3–1995 ("CIE 13.3"), Technical Report: Method of Measuring and Specifying Colour Rendering Properties of Light Sources, 1995, ISBN 3 900 734 57 7; IBR approved for § 430.2 and appendices R and W to subpart B.

(2) CIE 15:2004 ("CIE 15"), Technical Report: Colorimetry, 3rd edition, 2004, ISBN 978 3 901906 33 6; IBR approved for appendices R and W to subpart B.

(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.

(1) ENERGY STAR Testing Facility Guidance Manual: Building a Testing Facility and Performing the Solid State Test Method for ENERGY STAR Qualified Ceiling Fans, Version 1.1, approved December 9, 2002, IBR approved for appendix U to subpart B.

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

(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.

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

(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.

(p) IESNA. Illuminating Engineering Society of North America, 120 Wall Street, Floor 17, New York, NY 10005–4001, 212–248–5000, or go to https://www.ies.org/standards/.

(1) The IESNA Lighting Handbook, Reference & Application, ("The IESNA Lighting Handbook"), 9th ed., Chapter 6, "Light Sources," July 2000, IBR approved for § 430.2.

(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.

(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:

(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.

(4) IESNA LM–16–1993 ("IESNA LM–16"), IESNA Practical Guide to Colorimetry of Light Sources, December 1993, IBR approved for § 430.2.

(5) IES LM–20–1994, IESNA Approved Method for Photometric Testing of Reflector–Type Lamps, approved December 3, 1994, IBR approved for appendix R to subpart B.

(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:

(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.

(7) IES LM–45–09, ("IES LM–45"), IES Approved Method for the Electrical and Photometric Measurement of General Service Incandescent Filament Lamps, approved December 14, 2009; IBR approved for appendix R to subpart B.

(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.

(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.

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

(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.

(11) IES LM–58–1994, IESNA Guide to Spectroradiometric Measurements, approved December 3, 1994, IBR approved for appendix R to subpart B.

(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:

(i) Section 4.0—Ambient and Physical Conditions;

(ii) Section 5.0—Electrical Conditions; and

(iii) Section 6.0—Lamp Test Procedures

(13) IES LM–66–14, ("IES LM–66–14"), IES Approved Method for the Electrical and Photometric Measurements of Single–Based Fluorescent Lamps, approved December 30, 2014; IBR approved for appendix V to subpart B.

(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:

(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.

(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:

(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).

(18) IES LM–84–14, ("IES LM–84"), Approved Method: Measuring Luminous Flux and Color Maintenance of LED Lamps, Light Engines, and Luminaires, approved March 31, 2014; IBR approved for appendix BB to subpart B.

(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.

(20) IES TM–28–14, ("IES TM–28"), Projecting Long–Term Luminous Flux Maintenance of LED Lamps and Luminaires, approved May 20, 2014; IBR approved for appendix BB to subpart B.

(q) IEC. International Electrotechnical Commission, available from the American National Standards Institute, 25 W. 43rd Street, 4th Floor, New York, NY 10036, (212) 642–4900, or go to http://webstore.ansi.org.

(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.)

(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.

(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:

(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 annexc.3; IBR approved for Appendix H to subpart B of this part.

(5) International Electrotechnical Commission (IEC) Standard 62301 ("IEC 62301"), Household electrical appliances—Measurement of standby power (first edition, June 2005), IBR approved for appendix F, and appendix I to subpart B.

(6) IEC 62301 ("IEC 62301"), Household electrical appliances—Measurement of standby power, (Edition 2.0, 2011–01), IBR approved for appendices C1, D1, D2, G, H, I, J2, N, O, P, X, X1, Y, Z, BB, and CC to subpart B.

(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).

(9) IEC 62301, ("IEC 62301–W"), Household electrical appliances—Measurement of standby power, (Edition 2.0, 2011–01), Section 5—Measurements, IBR approved for appendix W to subpart B.

(r) U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy. Resource Room of the Building Technologies Program, 950 L'Enfant Plaza SW., 6th Floor, Washington, DC 20024, 202–586–2945, (Energy Star materials are also found at http://www.energystar.gov.)

(1) ITU–R BT.470–6, Conventional Television Systems, published November 1998; IBR approved for § 430.2.

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

(s) NSF International. NSF International, P.O. Box 130140, 789 North Dixboro Road, Ann Arbor, MI 48113–0140, 1–800–673–6275, or go to http://www.nsf.org/services/by-type/standards-publications/buy-nsf-standards-publications.

(1) NSF/ANSI 51–2007 ("NSF/ANSI 51"), Food equipment materials, revised and adopted April 2007, IBR approved for § 430.2.

(t) Optical Society of America. Optical Society of America, 2010 Massachusetts Ave., NW., Washington, DC 20036–1012, 202–223–8130, or go to https://www.osapublishing.org/about.cfm.

(1) "Computation of Correlated Color Temperature and Distribution Temperature," A.R. Robertson, Journal of the Optical Society of America, Volume 58, Number 11, November 1968, pages 1528–1535, IBR approved for § 430.2.

(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.

(1) SMPTE 170M–2004, ("SMPTE 170M–2004"), SMPTE Standard for Television—Composite Analog Video Signal—NTSC for Studio Applications, approved November 30, 2004; IBR approved for § 430.2.

(v) UL. Underwriters Laboratories, Inc., 2600 NW. Lake Rd., Camas, WA 98607–8542 (www.UL.com) https://standardscatalog.ul.com/?_ga=2.213141524.1020773938.1499447546-1931259657.1499447546

(1) UL 729–2003 ("UL 729"), Standard for Safety for Oil–Fired Floor Furnaces, Sixth Edition, dated August 29, 2003, including revisions through April 22, 2010, IBR approved for appendix O to subpart B.

(2) UL 730–2003 ("UL 730"), Standard for Safety for Oil–Fired Wall Furnaces, Fifth Edition, dated August 29, 2003, including revisions through April 22, 2010, IBR approved for appendix O to subpart B.

(3) UL 896–1993 ("UL 896"), Standard for Safety for Oil–Burning Stoves, Fifth Edition, dated July 29, 1993, including revisions through May 7, 2010, IBR approved for appendix O to subpart B.

§ 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.

(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.

(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.

(3) IEC 60050–411, International Electrotechnical Vocabulary Chapter 411: Rotating machines, 1996, IBR approved as follows: sections 411–33–07 and 411–37–26, IBR approved for § 431.12.

(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.

(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.

(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:

(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:

(A) Paragraphs 12.35.1, 12.35.2, 12.38.1, 12.38.2, 12.39.1, 12.39.2, and 12.40.1, 12.40.2, and Tables 12–2, 12–3, and 12–10, IBR approved for § 431.12;

(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:

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

(ii) Part 13, Frame Assignments—A–C Integral–Horsepower Motors, 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

(1) NFPA 20, 2010 Edition, Standard for the Installation of Stationary Pumps for Fire Protection, section 9.5, IBR approved for § 431.12.

Federal Statutes and Regulations Incorporated by Reference

1 CFR Part 51

https://www.gpo.gov/fdsys/pkg/CFR-2015-title1-vol1/pdf/CFR-2015-title1-vol1-part51.pdf

10 CFR Part 429

https://www.gpo.gov/fdsys/granule/CFR-2014-title10-vol3/CFR-2014-title10-vol3-part429

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)

https://www.gpo.gov/fdsys/pkg/USCODE-2011-title5/pdf/USCODE-2011-title5-partI-chap5-subchapII-sec552.pdf

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

https://www.gpo.gov/fdsys/granule/USCODE-2010-title42/USCODE-2010-title42-chap77-subchapIII-partA-sec6291

https://www.gpo.gov/fdsys/pkg/USCODE-2010-title42/pdf/USCODE-2010-title42-chap77-subchapIII-partA-sec6292.pdf

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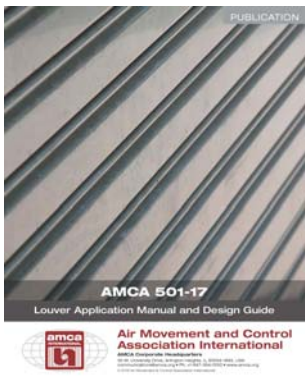


NEW! AMCA 501-17, Louver Application Manual and Design Guide
This publication outlines the application of louvers, including selection for pressure drop, air leakage, water penetration and sound reduction. Examples of louver selection are included. "System Effects," An important section in this publication, 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:

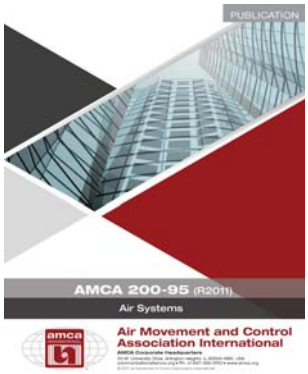
1. Fan airflow performance tested in accordance with ANSI/AMCA Standard

210 [1] ANSI/AMCA Standard 230 [2], ANSI/AMCA Standard 260 [3] or ISO Standard 5801 [4] or rated in accordance with AMCA Publication 211 [5].

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.

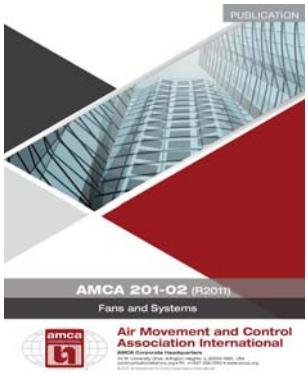
3. Pulse-width modulated variable frequency drives (VFDs).

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



NEW! AMCA 200-95 (R2011), Air Systems

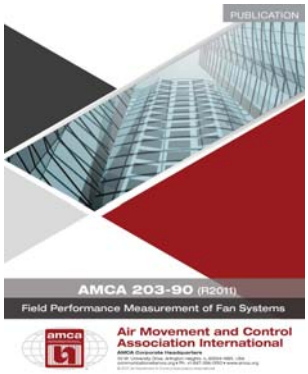
This publication is intended to provide basic information needed to design effective and energy efficient air systems.In those cases where the system handles a gas other than air, the design data must be modified to allow for the different physical properties of the gas being used.



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.

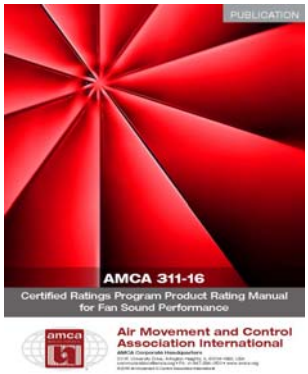


NEW! AMCA 203-90 (R2011), Field Performance Measurement of Fan Systems

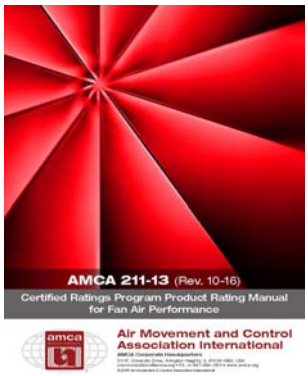
The recommendations and examples in this publication may be applied to all types of centrifugal, axial, and mixed flow fans in ducted or nonducted installations used for heating, ventilating, air conditioning, mechanical draft, industrial process, exhaust, conveying, drying, air cleaning, dust collection, 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.

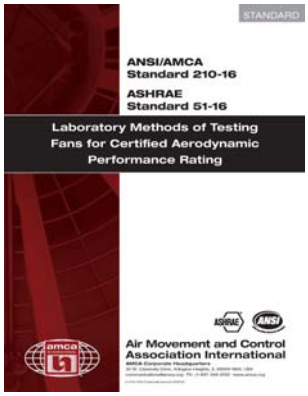
NEW! AMCA 202-17, Troubleshooting
AMCA 202-17 covers both new and existing fan installations. It covers aerodynamic performance as well as noise, vibration and mechanical issues.



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.

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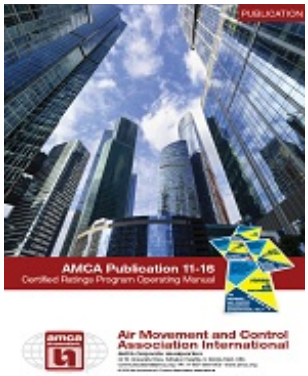

AMCA 11-16, Certified Ratings Program Operating Manual
The purpose of the AMCA International Certified Ratings Program (CRP) is to provide the buyer, user and specifier assurance that the manufacturer's published performance ratings of air system components are reliable, accurate and in compliance with 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(d)

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Test Methods

Numerical List of AATCC Standards

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Test Methods

Evaluation Procedures

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Updates

General Information

Method Development

Click standard number for purpose, scope, and ordering information.

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Colorfastness to Crocking. Crockmeter Method	Test Method 8
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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

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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You may preview the following Standards by clicking the links below.

Standard 62.1-2016

Standard 62.2-2016

Standard 90.1-2016 (I-P)

Standard 90.1-2013 (I-P)

Standard 90.2-2007

Standard 188-2015

Standard 189.1-2014

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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.

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	Product Link
(/ItemDetail?iProductCode=10001&Category=SUSSTD)	Sustainability Std.- Refrigeration Appliances (/ItemDetail?iProductCode=10001&Category=SUSSTD) 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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	Product Link
(/ItemDetail?iProductCode=10002&Category=SUSSTD)	Sustainability Std.- Portable & Floor Care Appliances (/ItemDetail?iProductCode=10002&Category=SUSSTD) Sustainability Standard for Household Portable and Floor Care Appliances - AHAM 7002-2014 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.
(/ItemDetail?iProductCode=10003&Category=SUSSTD)	Sustainability Std.- Clothes Washing Appliances (/ItemDetail?iProductCode=10003&Category=SUSSTD) Sustainability Standard for Household Clothes Washing Appliances - AHAM 7003-2016 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 six 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 home appliances.
(/ItemDetail?iProductCode=10004&Category=SUSSTD)	Sustainability Std.-Cooking Appliances - AHAM 7004-2017 (/ItemDetail?iProductCode=10004&Category=SUSSTD) Sustainability Standard for Household Cooking Appliances - AHAM 7004-2017 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.
(/ItemDetail?iProductCode=10005&Category=SUSSTD)	Sustainabilty Std. - Clothes Drying Appliances (/ItemDetail?iProductCode=10005&Category=SUSSTD) Sustainability Standard for Household Clothes Drying Appliances - AHAM 7005-2017 Second Edition/CSA R7005-17 First Edition/UL 7005 Second Edition 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 clothes dryer manufacturers in evaluating the environmental sustainability of household clothes drying appliances.
(/ItemDetail?iProductCode=10006&Category=SUSSTD)	

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	Product Link
(/ItemDetail?iProductCode=20001&Category=MADSTD)	ANSI/AHAM HLD-1-2010 (Household Tumble Type Clothes Dryers) (/ItemDetail?iProductCode=20001&Category=MADSTD) Household Tumble Type Clothes Dryers - ANSI/AHAM HLD-1-2010 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.
(/ItemDetail?iProductCode=20002&Category=MADSTD)	AHAM HLW-1-2013 (Household Clothes Washers) (/ItemDetail?iProductCode=20002&Category=MADSTD) Performance Evaluation Procedures for Household Clothes Washers - AHAM HLW-1-2013
(/ItemDetail?iProductCode=20003&Category=MADSTD)	ANSI/AHAM DH-1-2008 (Dehumifiers) (/ItemDetail?iProductCode=20003&Category=MADSTD) Dehumifiers - ANSI/AHAM DH-1-2008 Major Appliance Performance Standard for Residential Dehumidifiers
(/ItemDetail?iProductCode=20004&Category=MADSTD)	ANSI/AHAM DW-1-2010 (Household Electric Dishwashers) (/ItemDetail?iProductCode=20004&Category=MADSTD) Household Electric Dishwashers - ANSI/AHAM DW-1-2010
(/ItemDetail?iProductCode=20005&Category=MADSTD)	AHAM OV-1-2011 (R2016) (/ItemDetail?iProductCode=20005&Category=MADSTD) Procedures for the Determination and Expression of the Volume of Household Microwave and Coventional Ovens - AHAM OV-1-2011 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.
(/ItemDetail?iProductCode=20006&Category=MADSTD)	AHAM FWD-1-2016 (Food Waste Disposers) (/ItemDetail?iProductCode=20006&Category=MADSTD) Food Waste Disposers - AHAM FWD-1-2016
(/ItemDetail?iProductCode=20007&Category=MADSTD)	AHAM ER-1-2012 (Household Electric Ranges) (/ItemDetail?iProductCode=20007&Category=MADSTD) Household Electric Ranges Standard - AHAM ER-1-2012
(/ItemDetail?iProductCode=20008&Category=MADSTD)	ANSI/AHAM PAC-1-2015 (Portable Air Conditioners) (/ItemDetail?iProductCode=20008&Category=MADSTD) Portable Air Conditioners - ANSI/AHAM PAC-1-2015
(/ItemDetail?iProductCode=20009&Category=MADSTD)	AHAM HRF-1-2016 (Energy & Volume Refrigerating Appliances) (/ItemDetail?iProductCode=20009&Category=MADSTD) Energy and Internal Volume of Refrigerating Appliances - AHAM HRF-1-2016 This standard establishes a uniform, repeatable procedure and standard methods for measuring specified product characteristics of Refrigerators, Refrigerator-Freezers and Freezers.
(/ItemDetail?iProductCode=20010&Category=MADSTD)	AHAM-ANSI RAC-1-2015 (Room Air Conditioners) (/ItemDetail?iProductCode=20010&Category=MADSTD) Room Air Conditioners - ANSI-AHAM RAC-1-2015 This standard establishes a uniform, repeatable procedure or standard method for measuring specified product characteristics of household Room Air Conditioners.

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	Product Link
(/ItemDetail?iProductCode=20011&Category=MADSTD)	AHAM SA-1-2014 (Common Information Intelligent Appliances) (/ItemDetail?iProductCode=20011&Category=MADSTD) Common Information Necessary to Intelligent Appliances - AHAM SA-1-2014
(/ItemDetail?iProductCode=20012&Category=MADSTD)	AHAM TC-1-2012 (R201) (Household Trash Compactors) (/ItemDetail?iProductCode=20012&Category=MADSTD) Method for Measuring Performance of Household Trash Compactors - AHAM TC-1-2012 (R2016) The purpose of this standard is to establish a uniform and repeatable procedure or standard method for measuring specified product characteristics of household Trash Compactors.
(/ItemDetail?iProductCode=30001&Category=PADSTD)	AHAM AC-1-2013 Chinese (Portable Electric Room Air Cleaners) (/ItemDetail?iProductCode=30001&Category=PADSTD) Method for Measuring Performance of Portable Household Electric Room Air Cleaners - AHAM AC-1-2013 Chinese This standard establishes a uniform, repeatable procedure or standard method for measuring specified product characteristics of household portable air cleaners. The standard methods provide a means to compare and evaluate different brands and models of household portable air cleaners regarding characteristics significant to product use. Standard in Mandarin Chinese.
(/ItemDetail?iProductCode=30002&Category=PADSTD)	ANSI/AHAM AC-1-2015 (Portable Electric Room Air Cleaners) (/ItemDetail?iProductCode=30002&Category=PADSTD) Method for Measuring Performance of Portable Household Electric Room Air Cleaners - ANSI/AHAM AC-1-2015 This standard establishes a uniform, repeatable procedure or standard method for measuring specified product characteristics of household portable air cleaners. The standard methods provide a means to compare and evaluate different brands and models of household portable air cleaners regarding characteristics significant to product use.

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RESEARCH & STANDARDS

Standards

The Consumer Technology Association (CTA)™ Technology & Standards Program maintains an unmatched reputation as a credible and flexible standards-making body accredited by the American National Standards Institute.

Audio Systems Standards

NAME	DATE	DESCRIPTION	
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	

CTA-2010-B (ANSI)	Nov 2014	Defines a method for measuring the audio performance of powered subwoofers, both passive and powered.	

CTA-TR-11	Jul 2016	Addresses the study of audio loudness range for consumers in various listening modes and ambient noise levels.	
CTA-426-B S-2016	Jul 1998	Defines test methods and criteria of acceptability for testing the performance of a loudspeaker or loudspeaker system.	
CTA-490-A R-2008	Dec 2001	Intended to apply to defined devices intended for home audio and/or professional audio use.	

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Television Data Standards

NAME	DATE	DESCRIPTION	
CTA-CEB21-A	Jun 2011	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.	
CTA-516 S-2013	May 1988	Specifies the transmission technique, coding language and user interface for one-way broadcast teletext-service applications in North America.	
CTA-608-E R-2014	Apr 2008	Used for providing Closed Captioning services or other data services.	

CTA-708-E (ANSI)	Aug 2013	Defines DTV closed captioning (DTVCC) and provides specifications and guidelines for caption service providers, etc.

CTA-708.1 R-2017 (ANSI)	Oct 2012	Specifies signaling to allow CTA-708 [1] caption services to be rendered with stereoscopic 3D program content.

VIEW COMMITTEE INFO ›

Video Systems Standards

NAME	DATE	DESCRIPTION
CTA-CEB32.5	Jun 2017	This bulletin makes recommendations related to the audio capabilities of ATSC 3.0 Television Sets.
CTA-CEB3 R-2009 (Withdrawn)	Aug 1998	This bulletin includes essential information for the camcorder user and to standardize the format for the presentation of the information.
CTA-CEB4 S-2013	Aug 1998	Includes essential information for the VHS VCR user. Standardizes the format for the presentation of the information. NOTE: This bulletin has been stabilized.
CTA-CEB11-C	Jan 2015	Addresses the source levels, gain structure and output levels of any consumer digital television broadcast receiver, set top box.
CTA-CEB16-A	Jun 2013	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.

VIEW COMMITTEE INFO ›

DTV Interface Standards

NAME	DATE	DESCRIPTION	
CTA-679-C R-2013	Oct 2013	Two physical designs: Part A defines a removable and renewable security element form factor an Part B defines a removable and renewable security element form factor.	
CTA-761-B R-2012	May 2007	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.	
CTA-762-B (ANSI)	Jul 2009	Defines minimum specifications for a one-way data path utilizing an 8-VSB trellis remodulator in compliance with ATSC A/53.	
CTA-770.2-D R-2012	Apr 2007	Defines the physical characteristics of an interface and the parameters of the signals carried across that interface.	
CTA-770.3-E	Jun 2013	Defines two raster-scanning systems for the representation of stationary or moving two-dimensional images.	

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Portable Handheld and In-Vehicle

Electronics Standards

NAME	DATE	DESCRIPTION
CTA-2063 (ANSI)	May 2017	This standard outlines the elements and characteristics of a serial number to be used by small unmanned aerial systems.
CTA-2015 (R2017) (ANSI)	May 2007	Defines size and performance requirements for power and speaker cabling used in mobile electronics applications.
CTA-2051 (ANSI)	Jan 2017	This standard includes technical performance metrics and associated target values for consumer products which provide personal sound amplification.
CTA-803-B (ANSI)	Feb 2013	Defines the terms, abbreviations and definitions used in the sales and installation of vehicle aftermarket audio and security equipment.
CTA-885 R-2013 (ANSI)	Feb 2013	Addresses automotive accessories that allow the operator to start a vehicle while away from the vehicle and the safety of such devices.

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Health Fitness & Wellness Standards

NAME	DATE	DESCRIPTION
CTA/NSF-2052.1 (ANSI)	Jan 2016	This standards specifies terms and definitions for sleep wearable devices.

CTA-2056 (ANSI)	Oct 2016	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

NAME	DATE	DESCRIPTION
CTA-709.1-D (ANSI)	Apr 2014	Applies to a communication protocol for networked control systems. This specification applies to a communication protocol for networked control systems.
CTA-709.2-A R-2012	Jun 2000	Specifies the Control Network Power Line (PL) Channel and serves as a companion document to the CTA-709.1.This document specifies the Control Network Power Line (PL) Channel and serves as a companion document to the CTA-709.1 Control Network Protocol Specification [1].
CTA-709.3 R-2015 (ANSI)	Dec 1999	Specifies the CTA-709.3 free-topology twisted-pair channel and serves as a companion document to the CTA-709.1
CTA-709.4 (ANSI)	Feb 2013	Defines a complete 7-layer protocol stack for communications on a CTA-709.4 single-fiber (half-duplex) fiber-optic channel.
CTA-709.5 (ANSI)	Sep 2015	Specifies the Layered Implementation Guidelines (LIG) for the Control Network Protocol (CNP) Specification: ANSI/CTA-709.1-D.

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Modular Communication Interface for Energy Management Standards

NAME	DATE	DESCRIPTION
ANSI/CTA-2045	Jan 2013	Specifies a modular communications interface (MCI) to facilitate communications with residential devices for applications such as energy management.
ANSI/CTA-2045 Amendment 1	Jul 2014	This document amends ANSI/CTA-2045 Modular Communications Interface for Energy Management Standard.
ANSI/CTA-2045.1	Jul 2014	This specification is an extension of the ANSI/CTA-2045 Modular Communications Interface (MCI) for Energy Management standard.
ANSI/CTA-2045.2	Jul 2014	This specification is an extension of the ANSI/CTA-2045 Modular Communications Interface (MCI) for Energy Management Specification.
ANSI/CTA-2045.3	Aug 2014	This specification is an extension of the ANSI/CTA-2045 Modular Communications Interface (MCI) for Energy Management standard.

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Residential Systems Standards

NAME	DATE	DESCRIPTION
CTA/CEDIA-CEB24-A	Jun 2017	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.
CTA/CEDIA-CEB23-B	Mar 2017	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.
ANSI-J-STD-710 (CTA/CEDIA-2039)	Apr 2015	Provides a standardized set of architectural floor plan and reflected ceiling plan symbols for audio, video and control systems.
CTA/CEDIA-CEB17-A	Aug 2012	This recommended practice is an informative reference for the installation, application and placement of speakers in residential environments.
CTA/CEDIA-CEB29	Mar 2012	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.

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Alfa Laval Tank Cleaning Machines
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The company i work for we are distributor for the Alfa Laval GamaJet tank cleaning machines. I am trying to get a better understanding on

scam. 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 link: http

how to spec pumps for these machines and which is the best style of pump to go with. most of the time we are using a vertical centrifugal pumps. It seems it is ta

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§ 430.3(o)

home manufacturers

Overview

HDMI Specification 2.1 is the most recent update of the HDMI specification featuring advanced features for the HDMI eco-system. 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.

About HDMI Forum, Inc.

The HDMI Forum, Inc. is comprised of the world's leading manufacturers of consumer electronics, personal computers, mobile devices, cables and components. An open trade association, The HDMI Forum's mission is to foster broader industry participation in the development of future versions of the HDMI specification and to further expand the ecosystem of interoperable, HDMI-enabled products. The HDMI Forum currently has a membership of over 80 companies.

HDMI 2.1 Specification was developed by the HDMI Forum's Technical Working Group.

For more information, please visit www.hdmiforum.org.

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?

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

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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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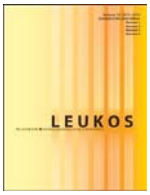

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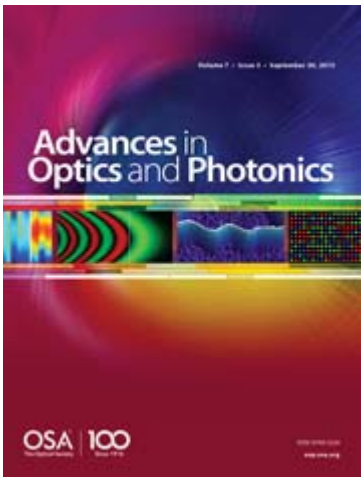

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Govind Agrawal, Editor

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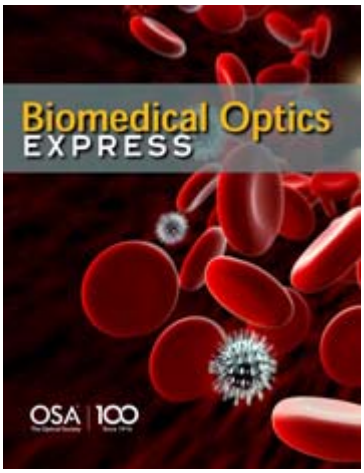
Ronald Driggers, Editor
Years of publication:
1962 - Present
Impact Factor: **1.650**

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.



(/boe)

Biomedical Optics Express

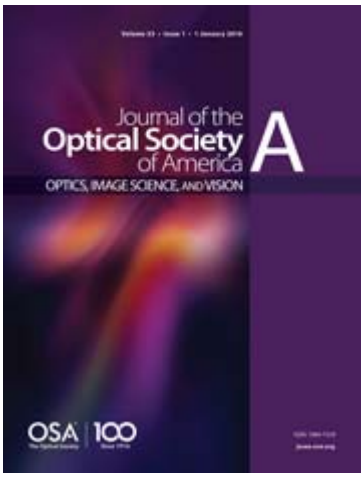
Christoph Hitzenberger, Editor
Years of publication:
2010 - Present
Impact Factor: **3.337**

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.



(/josaa)

Journal of the Optical Society of America A

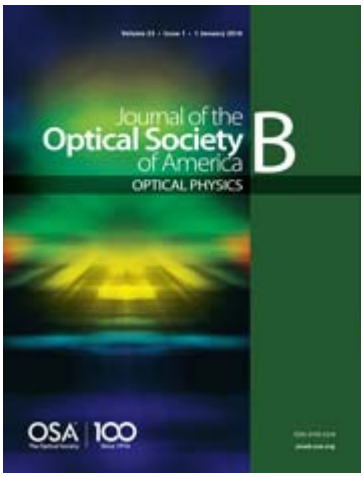
P. Scott Carney, Editor
Years of publication:
1984 - Present
Impact Factor: **1.621**

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.



(/josab)

Journal of the Optical Society of America B

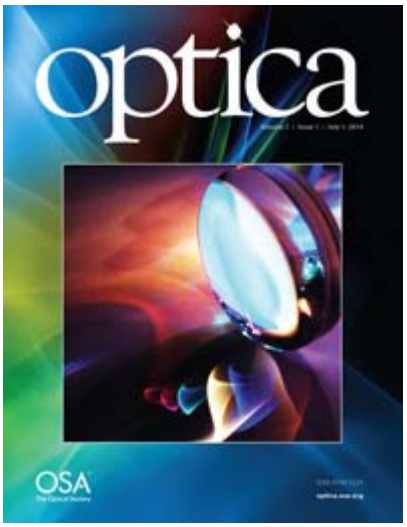
Grover Swartzlander, Editor
Years of publication:
1984 - Present
Impact Factor: **1.843**

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)

Optica

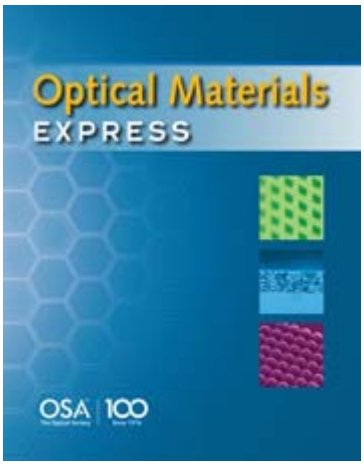
Alex Gaeta, Editor
Years of publication:
2014 - Present
Impact Factor: **7.727**

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.



(/ome)

Optical Materials Express

Alexandra Boltasseva, Editor

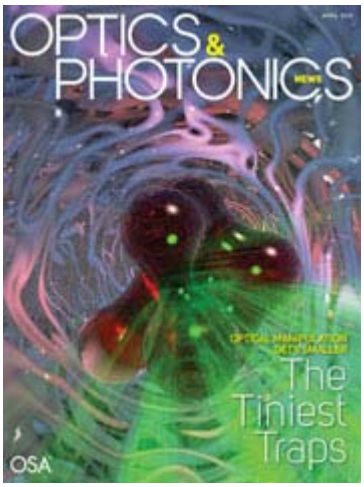
Years of publication:
2011 - Present
Impact Factor: **2.591**

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.



(http://www.osa-opn.org/home/)

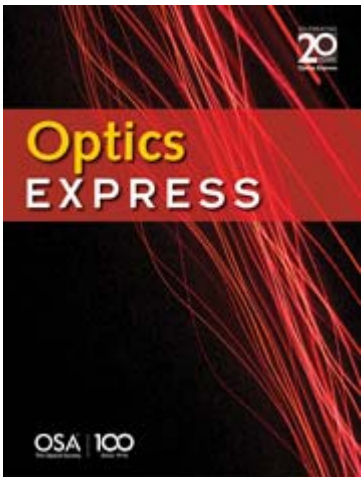
Optics and Photonics News

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.



(/oe)

Optics Express

Andrew M. Weiner, Editor

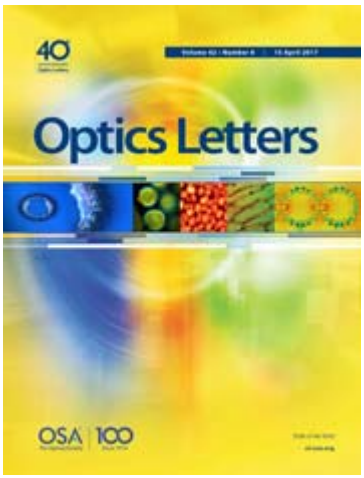
Years of publication:
1997 - Present
Impact Factor: **3.307**

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.



(/ol)

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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§ 430.3(u)

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SMPTE is an internationally recognized standards development body. As such we abide by the ANSI and ISO due process for initiating, approving, revising and removing standards. For nearly 100 years, SMPTE has been the leader in standards for the motion imaging industry, facilitating interoperability and therefore business.

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

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- 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: FCC Internet Caption Technical Requirements for SMPTE Timed Text
- Technical Report: TTML Features for IMF Data Essence

New numbering style

Digital Cinema Test Materials released for digital leader and DPROVE

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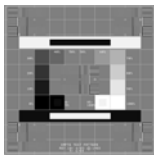

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- Standards Operations Manual (V3.0 - 24 October 2014, effective 31 January 2015))
- Intellectual Property Policy (Extracted from Standards Operations Manual V2.0)
- Patent Declaration Form

§ 430.3(v)

Showing 1 to 20 of 1,180 entries Previous 1 2 3 4 5 … 59 Next

Standard Number	Standard Title	Edition Number	Edition Date	Type
1	Standard for Flexible Metal Conduit	11	2005-02-16	ulstd
4	Standard for Armored Cable	15	2004-01-16	ulstd
5	Standard for Surface Metal Raceways and Fittings	15	2016-05-24	ulstd
5A	Nonmetallic Surface Raceways and Fittings	4	2015-06-26	ulcsa
5B	Standard for Strut-Type Channel Raceways and Fittings	2	2004-04-14	ulstd
5C	Standard for Surface Raceways and Fittings for Use with Data, Signal, and Control Circuits	3	2016-04-22	ulstd
6	Electrical Rigid Metal Conduit - Steel	14	2007-11-30	ulcsance
6A	Electrical Rigid Metal Conduit - Aluminum, Red Brass, and Stainless Steel	2	2008-10-31	ulcsance
8	Water Based Agent Fire Extinguishers	7	2016-11-25	ululc
9	Standard for Fire Tests of Window Assemblies	8	2009-07-02	ulstd
10A	Standard for Tin-Clad Fire Doors	21	2009-01-30	ulstd
10B	Standard for Fire Tests of Door Assemblies	10	2008-02-07	ulstd
10C	Standard for Positive Pressure Fire Tests of Door Assemblies	3	2016-06-09	ulstd
10D	Standard for Fire Tests of Fire Protective Curtain Assemblies	1	2014-01-23	ulstd
13	Standard for Power-Limited Circuit Cables	4	2015-03-18	ulstd
14B	Standard for Sliding Hardware for Standard, Horizontally Mounted Tin-Clad Fire Doors	9	2008-12-15	ulstd
14C	Standard for Swinging Hardware for Standard Tin-Clad Fire Doors Mounted Singly and in Pairs	8	2006-10-27	ulstd
17	Standard for Vent or Chimney Connector Dampers for Oil-Fired Appliances	4	2008-04-30	ulstd
19	Standard for Lined Fire Hose and Hose Assemblies	13	2013-10-25	ulstd
20	General-Use Snap Switches	13	2010-05-10	ulcsa

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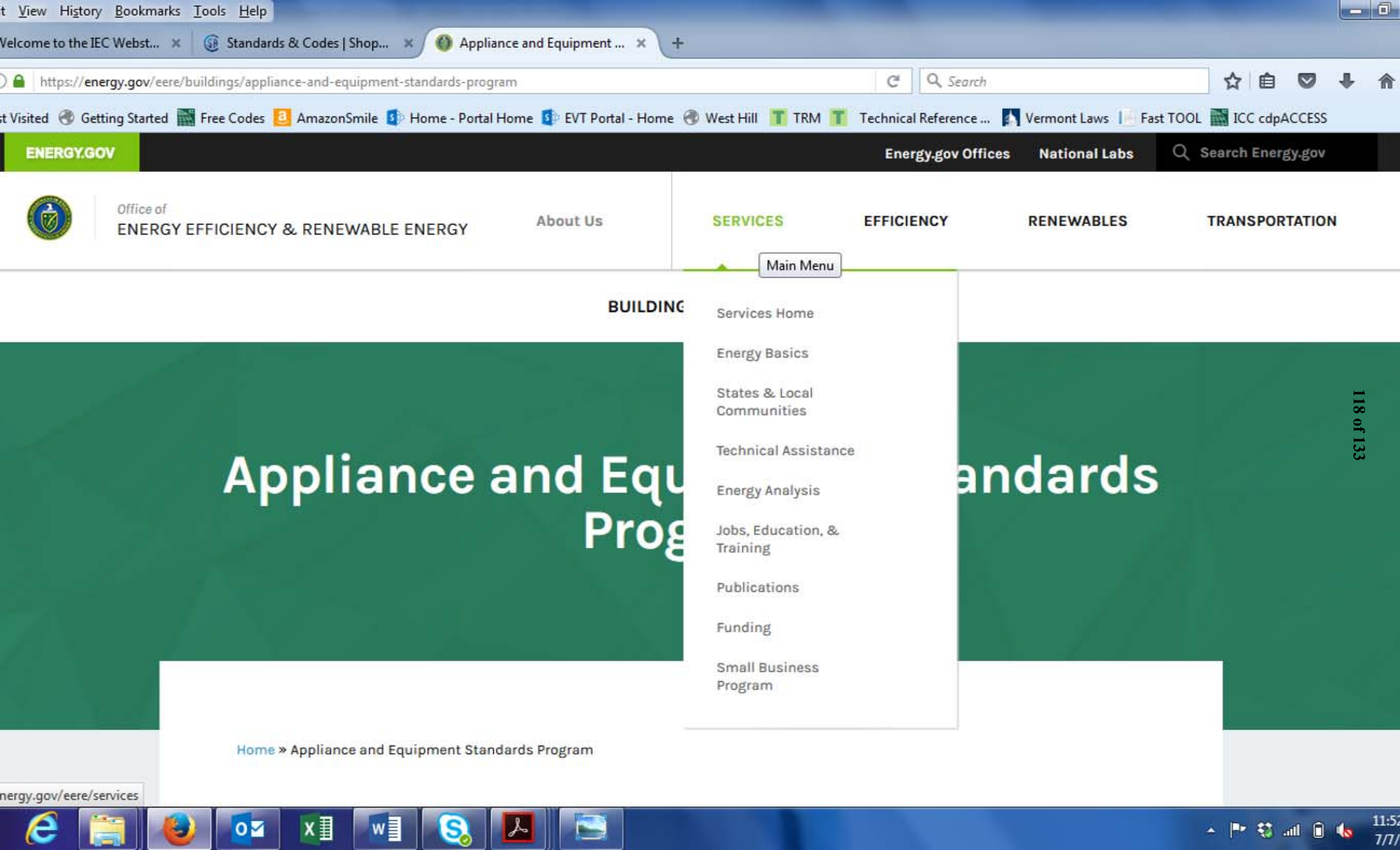
§ 431.15(a)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§ 431.15(b)

Standards & Codes

CSA Group Standards & Codes

§ 431.15(c)

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§ 431.15(d)

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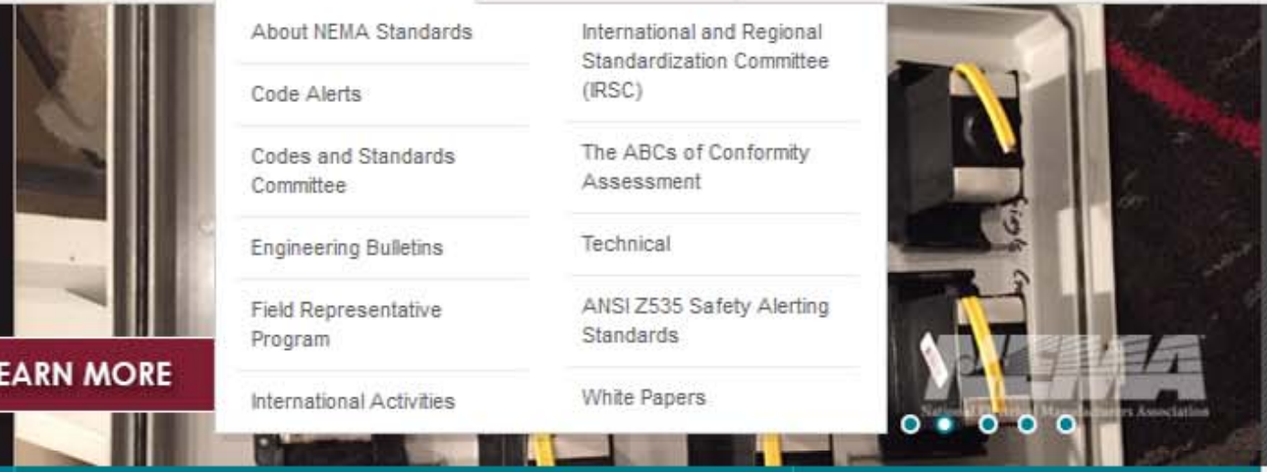

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§ 431.15(f)

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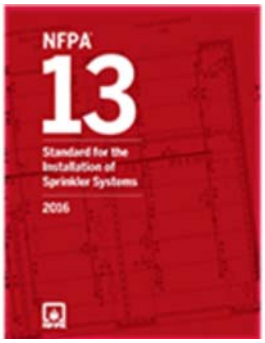

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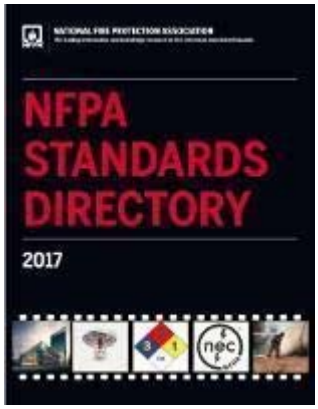

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