

ASHRAE Publishes 90.1-2016 Building Energy Standard

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#### Holiday Greetings to all:

Here is a quick update on events in the ASHRAE world.

#### Upcoming Events:

**December** – Join WV ASHRAE Chapter and Student Branch Members for a Holiday Social Gathering!

Expect networking, fun and games.

WHEN: December 18<sup>th</sup>, 2017 from 6:00 to 8:00 pm

WHERE: 222 Lee St., West Charleston, WV 25302 (Hosted by our WV ASHRAE Chapter President, Sam Butzer from ZMM and our Chapter Board Members.)

WHO: Members, non-members and spouses.

Light Refreshments and Appetizers to be provided.

No cost but donations are encouraged. All donations will go to support the Arthur D. Hallstrom Scholarship Fund and ASHRAE Research Promotion.

#### January 12th, 2017:

At the Charleston Civic Center

Tour of their new and remodeled facilities.

Presentation on the Civic Center Design-Build Process and Selection

Presentation on Variable Primary Chilled Water Systems

#### Jan 28-Feb 1, 2017

[ASHRAE Winter Meeting and AHRI SHOW in Las Vegas, Nev.](#)

Over 35,000 attend. Largest HVAC Show in North America. Major Conference with over 100 presentations/papers.

#### February 9th, 2017:

WV ASHRAE Meeting plus Marshall University Engineering and Business College Student Branch

Speaker: ASHRAE Distinguished Lecturer - Douglas Zentz, P.E.

His Topics:

1. How to Communicate in a Professional World with Technical Information
2. Applied Psychrometrics
3. Sustaining ASHRAE Through Leadership, Mentoring Our Future

#### March 22nd, 2017:

Charleston Building EXPO

Charleston Civic Center

ASHRAE Distinguished Lecturer – Dennis Knight

His topics:

1. Developing an Integrated Personal Management System.
2. Integrated Building Design and Building Information Modeling.
3. Building Performance Analysis for Building Performance Rating Systems.

Arty Hallstrom, P.E. ASHRAE Fellow

His Topics:

1. Advanced Residential Homes - Determining value

**April 20, 2017:**[ASHRAE Spring Webinar - 1- 4 pm EDT](#)

Using Analytics to Drive Building Performance

**May 11th, 2017:**

WV ASHRAE Chapter Annual Local Training and Trade Show

Days Inn in Flatwoods, WV.

**Are you involved?**

As the 2016 election draws closer, the ASHRAE Government Relations team is gearing up for the 115th Congress in January. As they do this, ASHRAE WV is assisting in connecting the team with members who have working relationships with sitting members of Congress or candidates that will be elected.

We would also like to know of any ASHRAE members who are running for any local offices. In addition, if you have a good relationship with a member of Congress and / or their challengers, or know of an engineer currently holding or running for a local office, please [email us](#) with details.

**ASHRAE SOCIETY NEWS****ASHRAE/IES Publish 2016 Energy Efficiency Standard**

ATLANTA - Numerous energy savings measures resulting from industry input are contained in the newly published energy efficiency standard ANSI/ASHRAE/IES Standard 90.1-2016, *Energy Efficiency Standard for Buildings Except Low-Rise Residential Buildings*, contains 125 addenda published since the 2013 standard. The 2013 standard currently serves as the commercial building reference standard for state building energy codes.

This 2016 version is the 10<sup>th</sup> edition published since the original standard was first published in 1975 during the energy crisis of the United States.

"It is the overall goal of each version to create a consensus standard that saves energy and is technically feasible and cost effective," Drake Erbe, chair of the Standard 90.1 committee, said. "In addition, as a result of a strategic initiative begun in the 2013 cycle, the 2016 version has a new format that we believe will be easier for users, a new way of incorporation of reference material from other standards starting with climate data, and a performance path for compliance that rewards designs for achieving energy cost levels above the standard minimum."

**Formatting**

The standard has made significant formatting changes to improve its use. These include a one-column format for easier reading; exceptions separated and indented, set apart with a smaller font size; all defined terms are italicized; and alternating coloring scheme for table rows.

The most significant technical changes included are as follows:

- **Building Envelope:**
  - The mandatory provisions include the addition of envelope verification in support of reduced air infiltration and increased requirements for air leakage to overhead coiling doors.
  - The prescriptive requirements include increased stringency requirements for metal building roofs and walls, fenestration, and opaque doors. Requirements for Climate Zone 0 have been added.
  - Improved clarity of the standard ranged from defining exterior walls to building orientation to clarity around the effective R-value of air spaces
- **Lighting:**
  - Modified control requirements that make the application of advanced lighting controls easier for increased energy savings

- Added minimum requirements for lighting in dwelling units to set limits on light source efficacy
- Added additional control for lighting in parking areas based on occupancy to reduce energy use
- **Mechanical:**
  - Chilled water plant metering - For the first time, the standard is requiring large electric driven chilled water plants to be monitored for electric energy use and efficiency.
  - DOAS requirements - Dedicated outdoor air systems were introduced over 25 years ago but there were no rating or efficiency requirements with which to comply. For the first time, this product class does have both efficiency and rating requirements with which they have to comply.
  - Elevator efficiency - Introduces requirements for designs to include both usage category and efficiency class. While a minimum threshold is not listed, it is the first step toward including minimum elevator efficiency requirement in a future standard. The standard referenced is an ISO standard since this the current industry standard for efficiency.
  - Economizer diagnostics - The standard is implementing requirements that air cooled DX cooling unit with economizers have a monitoring system to determine that the air economizer is properly working.
- **Energy Cost Budget (ECB) and Modeling.** A significant change to the application of Appendix G as follows:
  - Appendix G now can be used as a path for compliance with the standard. Previously Appendix G was used only to rate "beyond code" performance of buildings. This new version of Appendix G can show compliance with the 2016 version of the standard in the following manner:
    - The proposed building design requires a new metric the Performance Cost Index (PCI) and demonstration that it is less than that shown in Table 4.2.1.1 based on building type and climate zone.
    - Another change is that the baseline design is now fixed at a certain level of performance, the stringency or baseline of which is expected not to change with subsequent versions of the standard. By this, a building of any era can be rated using the same method.
  - Other modifications to Appendix G include: elevator, motor, and refrigeration baselines; changes to the baseline for existing building projects; as well as specific opaque assemblies for the baseline envelope model. Modeling rule changes were also made to heat pump auxiliary heat, economizer shutoff, lighting controls, humidification systems, cooling towers, and the simulation of preheat coils.

Additional **structural changes** include:

- Reference Standard Reproduction Annex 1 at the end of the document. This annex is designed to contain extracts from other references that are published with Standard 90.1 for the convenience of users. At present, the only standard this pertains to is ANSI/ASHRAE Standard 169, *Climatic Data for Building Design Standards*. Section 5.1.4 now cites this standard as the source for climatic data therefore extractions of tables and figures from Standard 169-2013 are included in Annex 1
- Addition of 2 weather zones 0 A/B in all prescriptive requirements tables to correspond with Standard 169.

The cost of is \$119, ASHRAE members (\$140, non-members). To order, visit [www.ashrae.org/bookstore](http://www.ashrae.org/bookstore) or contact ASHRAE Customer Contact Center at 1-800-527-4723 (United States and Canada) or 404-636-8400 (worldwide) or fax 678-539-2129.

**ASHRAE Publishes 2016 Edition of Standard 90.1, Starting DOE Review Clock Leading to State & Federal Update Requirements**

key countdown for States.

Under the Energy Conservation and Production Act, as amended, after ASHRAE publishes an update to Standard 90.1, the US Department of Energy (DOE) has 12 months to review the update and issue a preliminary determination in the *Federal Register* whether the new model standard will improve energy efficiency in commercial buildings. DOE is expected to issue their preliminary determination in about six months, around April 2017. After receiving public comment on their preliminary determination, the Department will issue a final determination on Standard 90.1-2016, after which States will have up to two years to certify to DOE that they have reviewed and updated the energy efficiency provisions of their building codes to meet or exceed Standard 90.1-2016.

Apart from the State requirements, DOE will also conduct a similar, but [separate process](#) for updating the minimum energy efficiency requirements for Federal buildings. In all likelihood, these new requirements will be 30% below the levels established in Standard 90.1-2016.

Those interested in viewing a summary of the changes in 90.1-2016 can do so [here](#).

A wide variety of high-level and in-depth information on State commercial and residential building energy code adoption and compliance activities can be found [here](#).

#### Online Thermal Comfort Compliance Tool Included in New ASHRAE User's Manual

ATLANTA – A new User's Manual for ASHRAE's thermal comfort standard provides an overview for new users while also including more detailed information for those more familiar with its requirements.

The User's Manual, based on ANSI/ASHRAE Standard 55-2013, *Thermal Environmental Conditions for Human Occupancy*, provides detailed information on the requirements of the standard. It includes tables, illustrations and examples to aid users in the design, commissioning, and measuring and rating of thermal comfort in buildings.

The manual includes a free online thermal comfort tool that can be used as the official tool for showing compliance with Standard 55-2013 along with all of the published addenda. This online tool is available only to those who purchase the User's Manual and can be accessed from any internet connected device. The web-based CBE/ASHRAE Thermal Comfort Tool was developed by the Center for the Built Environment at the University of California Berkeley.

"For a new user of Standard 55, the manual provides a great overview of what it takes to make a space thermally comfortable for the occupants," Abhijeet Pande, chair of the Standard 55 committee, said. "This includes descriptions of how to account for the environmental, occupant and local factors that impact comfort. For an experienced user of Standard 55, the manual provides insights into requirements that are sometimes hard to understand in the standard. The User's Manual provides examples of calculations that will help even the most experienced user who may struggle with figuring out where and how to get an input needed for thermal comfort calculations."

The manual also includes:

- Information on the intent and application of Standard 55
- Guidance on applying the principles of acceptable thermal comfort and effective thermal control
- Useful reference material to assist designers, owners and users in efficiently completing a successful and compliant design
- Guidance to building operation and maintenance personnel
- Descriptions of compliance options and tools

The cost of the ANSI/ASHRAE Standard 55 User's Manual is \$99, ASHRAE members (\$115, non-members). To order, visit [www.ashrae.org/bookstore](http://www.ashrae.org/bookstore) or contact ASHRAE Customer Contact Center at 1-800-527-4723 (United States and Canada) or 404-636-8400 (worldwide) or fax 678-539-2129. The

#### Impact of Building Energy Codes

Building energy codes represent a significant savings opportunity for U.S. home and business owners. Model energy codes for residential and commercial buildings are projected to save (cumulative 2010-

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- **\$126 billion** in energy cost savings
- **841 MMT** of avoided CO<sub>2</sub> emissions
- **12.82 quads** of primary energy

The U.S. Department of Energy (DOE) Building Energy Codes Program evaluates the impacts of model energy codes for residential and commercial buildings. The most recent assessment focuses on the current model codes, and their prospective national and state-level impacts. [Read the report.](#)

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WV ASHRAE Government Activities Chair



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