



Energy Policy Act 2005 and Tax Credits

The Energy Policy Act of 2005 provides a variety of tax credits for homeowners, businesses, and manufacturers for purchase of energy-efficient equipment, completion of new energy-efficient buildings, and improvements to existing buildings, which will be available after January 1, 2006, and before December 31, 2007. The Department of the Treasury will amend tax form 1040 to include a line for energy tax credits, in the tax credit section, and will issue regulations early in 2006 specifying what energy efficiency equipment and improvements to existing buildings or new building designs qualify for the credits. The Energy Efficiency and Renewable Energy Information Center hotline is collecting information and will be updating information on the tax credits as it becomes available. You can reach them at 1-877-337-3463. For specific tax advice, of course, please consult your tax preparer.

The U.S. Department of Energy's **REScheck**[™] and **COMcheck**[™] software tools cannot be used to determine percent savings to receive the tax credits described in the Energy Policy Act. These tools are designed solely for energy code compliance. The "percent improvement" provided for envelope (**COMcheck** and **REScheck**) and lighting (**COMcheck**) are not based on a whole building or performance-based approach.

Additional resources:

- Tax incentives for buildings and other efficiency improvements: www.energytaxincentives.org
- Commercial building provisions: www.efficientbuildings.org
- Residential building provisions: www.energystar.gov/index.cfm?c=products.pr_tax_credits

New Codes on Seasonal Energy Efficiency Ratio Impact Central Air Conditioners and Heat Pumps

In the 2003 and earlier editions of the International Energy Conservation Code (IECC), the International Residential Code (IRC), the Model Energy Code (MEC), and their supplements, the table addressing minimum heating and air conditioning equipment efficiency contains efficiency requirements for central air conditioners and heat pumps manufactured before January 23, 2006. More stringent requirements became effective on January 23, 2006, and by Federal law preempt state and local codes. The Subcategories and Minimum Performance numbers that changed on January 23, 2006, are highlighted in blue.

TABLE 503.2: MINIMUM EQUIPMENT PERFORMANCE

Equipment Category	Subcategory ^e	Referenced Standard	Minimum Performance
Air-cooled heat pumps, Heating mode < 65,000 Btu/h cooling capacity	<ul style="list-style-type: none"> • Split systems • Single package 	ARI 210/240	6.8 HSPF ^{a, b} 6.6 HSPF ^{a, b}
Gas-fired or oil-fired furnace < 225,000 Btu/h	—	DOE 10 CFR Part 430, Subpart B, Appendix N	AFUE 78% ^b E _t 80% ^c
Gas-fired or oil-fired steam and hot-water boilers < 300,000 Btu/h	—	DOE 10 CFR Part 430, Subpart B, Appendix N	AFUE 80% ^{b, d}
Air-cooled air conditioners and heat pumps. Cooling mode < 65,000 Btu/h cooling capacity	<ul style="list-style-type: none"> • Split systems • Single package 	ARI 210/240	10.0 SEER ^b 9.7 SEER ^b

Citations

- For multicapacity equipment, the minimum performance shall apply to each capacity step provided. Multicapacity refers to manufacturer published ratings for more than one capacity mode allowed by the product's controls.
- This is used to be consistent with the National Appliance Energy Conservation Act (NAECA) of 1987 (Public Law 100-12).
- These requirements apply to combination units not covered by NAECA (three-phase power or cooling capacity 65,000 Btu/h).
- Except for gas-fired steam boilers for which the minimum AFUE shall be 75 percent.
- Seasonal rating.

To make sure state and local laws and regulations are consistent with Federal law, a state or local jurisdiction that has adopted the IECC or IRC for their building energy code can use amending language similar to the following:

TABLE 503.2: MINIMUM EQUIPMENT PERFORMANCE

Equipment Category	Subcategory ^e	Referenced Standard	Minimum Performance
Air-cooled heat pumps, heating mode < 65,000 Btu/h cooling capacity	Split systems and single package Through-the-wall split systems Through-the-wall single package Space constrained products ^f	ARI 210/240	7.7 HSPF ^{a, b} 7.1 HSPF ^{a, b} 7.0 HSPF ^{a, b} 7.4 HSPF ^{a, b}
Gas-fired or oil-fired furnace < 225,000 Btu/h	—	DOE 10 CFR Part 430, Subpart B, Appendix N	AFUE 78% ^b E _t 80% ^c
Gas-fired or oil-fired steam and hot-water boilers < 300,000 Btu/h	—	DOE 10 CFR Part 430, Subpart B, Appendix N	AFUE 80% ^{b, d}
Air-cooled air conditioners and heat pumps. Cooling mode <65,000 Btu/h cooling capacity	Split systems and single package Through-the-wall split systems Through-the-wall single package Space constrained products ^f	ARI 210/240	13.0 SEER ^b 10.9 SEER ^b 10.6 SEER ^b 12.0 SEER ^b

Citations

For SI: 1 British thermal unit per hour = 0.2931 W.

- For multicapacity equipment, the minimum performance shall apply to each capacity step provided. Multicapacity refers to manufacturer-published ratings for more than one capacity mode allowed by the product's controls.
- This is used to be consistent with the National Appliance Energy Conservation Act (NAECA) of 1987 (Public Law 100-12).
- These requirements apply to combination units not covered by NAECA (three-phase power or cooling capacity 65,000 Btu/h).
- Except for gas-fired steam boilers for which the minimum AFUE shall be 75 percent.
- Seasonal rating.
- Space constrained product* means a central air conditioner or heat pump:
 - That has rated cooling capacities no greater than 30,000 BTU/hr
 - That has an outdoor or indoor unit having at least two overall exterior dimensions or an overall displacement that:
 - Is substantially smaller than those of other units that are:
 - Currently usually installed in site built single family homes; and
 - Of a similar cooling, and, if a heat pump, heating capacity; and
 - If increased, would certainly result in a considerable increase in the usual cost of installation or would certainly result in a significant loss in the utility of the product to the consumer; and
 - Of a product type that was available for purchase in the United States as of December 1, 2000.

Making these changes will ensure that the state or local code based on the IECC or IRC is consistent with Federal law and the minimum equipment efficiencies adopted by DOE pursuant to that law. As those minimum efficiencies apply uniformly throughout the United States and are enforced through point of manufacture regulations, non-complying equipment will not be made after January 24, 2006. Equipment made before that date will continue to be sold and installed until the distribution pipeline for this equipment has been exhausted.

The DOE has recommended to states that provisions be made to permit installation of the previously manufactured equipment, which can be legally sold subsequent to the effective date of the standard. However, some states and local jurisdictions may decide not to permit this. Requirements should be verified with the local building authority.

With respect to a building design that would be approved on the basis of performance, where one might "trade-off" higher efficiency equipment for less insulation, such trade-offs prior to January 23 were based on the current code and Federal regulations in effect at that time (e.g., the old equipment efficiencies). On or after January 23, the basis for any trade-off when applying a code based on the IECC or IRC would be the new equipment efficiencies, even if equipment manufactured prior to January 23 is available. For example, one cannot take trade-off credit for going from a 10 SEER to 13 SEER after January 22.

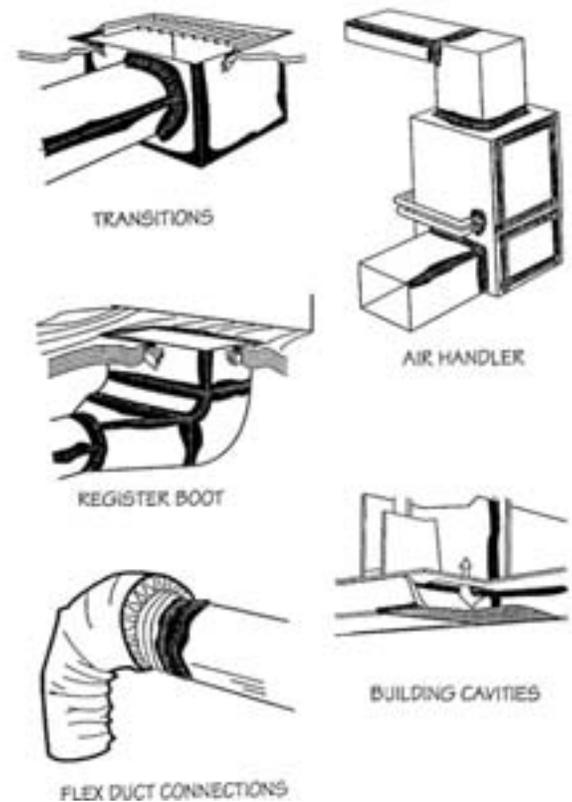
Are Duct Sealing Requirements in Codes Working?

It sounds simple, doesn't it? Constructing airtight conduits known as ducts through which air passes to be distributed to the different rooms within a house, apartment, or condo. However, study after study shows that ducts in new buildings are not only not airtight, but often have major leaks. For buildings with ducts passing through spaces outside the thermal envelope—like attics or garages—building scientists typically estimate average losses in the neighborhood of 25% of the total energy. Once new buildings are completed, air will be pumped through these ducts for many hours during most days of the year for decades. The total cost of energy passing through these ducts over their lifetimes will typically be in the tens of thousands of dollars. Clearly, improving the air-tightness of duct installations makes economic sense and has the potential to improve occupant comfort and air quality.

While the energy codes require that ducts be properly sealed, traditional visual inspections—looking for what are often tiny cracks and leaks—are time consuming and problematic. The ducts are often in difficult-to-access areas such as attics and crawlspaces, and leaks often are not obvious or not even visible at all. Most building scientists agree that the only sure way to check for duct leaks is to perform a pressurization test on the ducts.

Adding pressurization tests to code requirements would give teeth to the existing air-sealing requirements, guaranteeing homeowners the level of efficiency and comfort they expect from their code-compliant homes. The tests could be done in a matter of minutes using widely available “duct blaster” equipment. Is it time for energy codes to address this serious problem head on?

The DOE Building Energy Codes Program is interested in your thoughts on this topic. To let us know what you think, complete the survey at energycode.pnl.gov/EnergySurvey/entry.jsp?id=1135271249041



Proper duct sealing

Credit: Washington State Energy Office

Update on 2006 IECC

In September 2005, at the International Code Council final action hearings in Detroit, the 2006 International Energy Conservation Code (IECC) was finalized. The new energy code is based largely on the 2004 Supplement to the IECC, which included major changes to the residential portion of the code compared to the 2003 IECC. The 2006 IECC does differ from the 2004 version in several ways, including revised prescriptive wall R-values; a change to the trade-off limit on window U-factors; the addition of a vapor retarder requirement for coastal Oregon, Washington, and northern California; elimination of credit for low window area percentages in the performance path; and other small changes.

To purchase the 2006 IECC, visit

www.iccsafe.org/e/prodshow.html?prodid=3800S06&stateInfo=lacnacjalbpjij4053%7C2 (available in March)

Vestibules: Understanding Requirements for Air Locks in Commercial Settings for the IECC

Designers of commercial buildings are required, by the 2003 IECC, to install vestibules on the primary entrance doors leading from spaces equal to or greater than 3,000 ft² in all buildings. By creating an air lock, vestibules reduce infiltration into a space that includes doors with high volume of pedestrian traffic.

This requirement typically applies to large “box” stores where the building entrance is directly into the resale area or other buildings with large lobbies, such as hotels and office buildings. The only specific requirement in the 2003 IECC for vestibule design and operation is that the vestibule be designed so that the interior and exterior doors do not open at the same time. Some doors may be exempt from the requirement, such as revolving doors, mechanical room doors, or doors that open from spaces less than 3,000 ft² (for a full list of exempt doors, see IECC 2003, Section 802.3.6).

In reviewing commercial building plans,

1. Verify that doors separating conditioned space from the exterior leading to spaces 3,000 ft² or greater contain a vestibule.
2. Verify that doors separating conditioned space from the exterior that do not have vestibules are exempt from the requirement.
3. Verify that doors leaving into and out of the vestibule are designed so that in passing through the vestibule it is not necessary for the interior and exterior doors to open at the same time.
4. Verify that doors meet the requirement for means of egress doors as stated in 2003 IBC Section 1008.
5. Verify that building assemblies between the conditioned space and the vestibule meet the envelope requirements of Section 802 of the 2003 IECC.

For more information, see the Advanced Energy Design Guide implementation recommendations on air infiltration at resourcecenter.pnl.gov/cocoon/morf/ResourceCenter/article//1392. For more information on vestibules, see the Vestibule Requirements in Commercial Buildings Code Notes at resourcecenter.pnl.gov/cocoon/morf/ResourceCenter/article//1470. A 1-hour web-based training on vestibules is available at www.energycodes.gov/training/onlinetraining/vestibules_0905.stm.



Vestibules reduce infiltration and gain from stack and wind effects in buildings that experience a high volume of pedestrian traffic.

REScheck™ Updates

- **REScheck™** Version 3.7, Release 1b, reflects the increased efficiencies required by the appliance manufacturing standards that took effect on January 23, 2006. The minimum efficiencies have increased for air-conditioners (SEER 10 to SEER 13) and heat pumps (HSPF 6.8 to HSPF 7.7).

Trade-offs will not be allowed for equipment that does not exceed the new minimum efficiencies. This will avoid penalizing installation of equipment manufactured to the current standard, and sold after the effective date of the new standard. Otherwise, with the new higher baseline, use of equipment manufactured to the current standard in an envelope trade-off would result in requiring a better performing envelope to offset the lower performing equipment.

- Specification of project information has expanded and is now organized in a “Project Details” dialog. The additional inputs facilitate online permitting and provide more details about the location of the project.
- Compliance reports can now be sent via e-mail directly to the code official or code compliance office.
- Compliance reports are now generated and saved in PDF format, and a PDF Reader is required to view or print the reports. An RTF version of the reports will be available in a future software release.



- Log wall construction codes and energy efficiency calculations are enhanced. Log wall species have been added to the list of log wall component options.
- A new “Beyond the Code” feature provides links to pertinent and current information on different energy topics and building practices beyond the scope of simply complying with energy code requirements. Look for “Info” links in the component menus and hyperlinks in the project and mechanical tab of the software.

COMcheck™ Updates

- The software name changed from **COMcheck-EZ™** to **COMcheck™** in Version 3.1 Release 1.
- Compliance option for ASHRAE/IESNA Standard 90.1-2004 is now available.
- Compliance option for Alterations/Renovations in ASHRAE 90.1-1999/2000/2004 is supported in the desktop version.
- Based on a recent ASHRAE interpretation, below-grade wall areas are now included in the window-wall ratio calculation for ASHRAE 90.1-1999/2001/2004 Standards.
- Specification of project information has expanded and is now organized in a “Project Details” dialog. The additional inputs facilitate online permitting and provide more details about the location of the project.
- Compliance reports are now generated and saved in PDF format, and a PDF Reader is required to view or print the reports. An RTF version of the reports will be available in a future software release.
- Compliance reports can now be sent via e-mail directly to the code official or code compliance office.
- New codes are available for Georgia, Vermont, and the 2004 IECC.



Web Tools Update

The new **REScheck-Web™** and **COMcheck-Web™** online code compliance tools perform just like the desktop versions, but require no download and installation. While **COMcheck-Web** does not support “alterations” yet, all of the other features and compliance options are available with these online tools.

In the Field: Code Notes

Code Notes assist builders in obtaining code compliance of energy-efficient technologies. These information sheets, written to code officials, address a single above-code or otherwise obscure building feature. Check out the new Code Note on conditioned attics at resourcecenter.pnl.gov/cocoon/morf/ResourceCenter/article/1469.





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Building Energy Codes Training

Past Events

Eric Makela, Britt/Makela Group, was a guest speaker with Pam Cole, Pacific Northwest National Laboratory, for "Vestibules: Understanding the Commercial Energy Code Requirements" in September.

Michael Lane, Lighting Laboratory, and Eric Richman, PNNL, presented "Advanced Lighting Design and the Energy Code" in November.

"What's New in **COMcheck**[™]—Alterations" was presented in January.

Want to learn more? Check out the videos at www.energycodes.gov/training/onlinetraining/index.stm

Upcoming Events

Upcoming events include "Log Homes in **REScheck**[™]" in February and "2006 IECC Residential Code" in March. For a complete calendar of upcoming energy code-related training events, visit www.energycodes.gov/events/index.php.

Videos Online

Check out the following training videos online at www.energycodes.gov/training/onlinetraining/index.stm:

- **REScheck**[™]: How to Use **REScheck** for Residential Energy Code Compliance
- **COMcheck**[™]: How to Use **COMcheck-EZ**[™] for Commercial Energy Code Compliance
- Lighting: ASHRAE/IESNA 90.1 2004 Lighting Update
- ASHRAE Standard 90.1-1999