

1 Air Tightness. Air sealing a house stops cold air from leaking in during the winter, and hot air from leaking in during the summer. Making sure that your home is appropriately air sealed can not only save money, but helps to improve comfort and can help to improve air quality. Homes are tested for air tightness using a blower door. A flexible frame with a large fan is installed in one of the home's exterior doors. The fan is slowly turned on until a specific pressure difference is met between the inside and outside. A monometer, that measures the pressure difference, indicates the air tightness of the home.

- The 2009 IECC allows:

1. a visual inspection and documentation that all of the holes in the home are sealed, or
2. a blower door test verifying a maximum of 7 air changes per hour at 50 pascals (7 ACH50/50PA).

2 Basement/Foundation Insulation. Basement walls are generally made of concrete, which is not a good insulating material and transfers a lot of cold/heat. Although a good percentage of the wall may be buffered from the cold outside air with dirt, the temperature of the wall can still be as cold as the outside air temperature down to frost level – nearly 40" in some areas of the state.

- The 2009 IECC prescriptive requirement for basement wall insulation is: R-10 continuous insulation or R-13 cavity insulation.

3 Slab Insulation. Like basement walls, slabs are made of concrete which is not a good insulating material and transfers a lot of cold/heat. Insulating the edge of the slab and providing a complete thermal block stops the transfer of cold/heat through the floor.

- The 2009 IECC prescriptive requirement for slabs is: R-10 continuous insulation down a minimum of 2'-0". If the slab is heated the R-value increases to R-15.

4 Floor Insulation. In homes with floors over garages or crawlspaces or with floor overhangs, installing insulation in the floor helps to reduce energy costs and keep feet warm during the cold months.

- The 2009 IECC prescriptive requirement for floor insulation is R-30.

It is also important that the insulation be installed in direct contact with the floor above it and secured in place.

5 Box Sill/Rim Joist. The area of a home where the main level floor rests on the basement wall or the second level floor rests on the walls of the lower level is typically one of the leakiest and worst insulated areas of a new home. This "intersection", where the upper level walls rest on the floor structure, which then rests on the top of the foundation wall or lower level wall encompasses a large number of joints in the construction material, if not appropriately sealed and insulated, can easily leak air and moisture into the home.

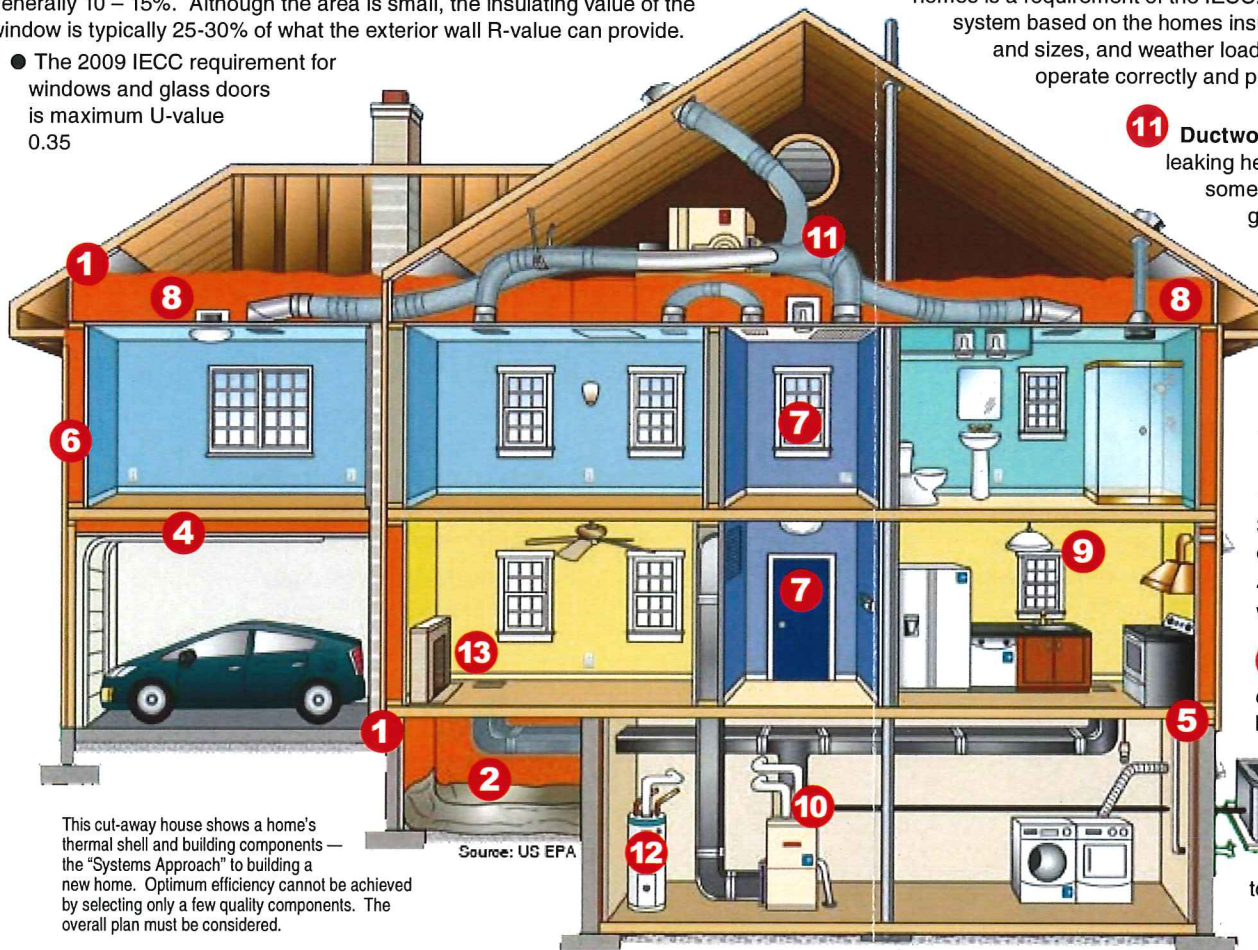
- The 2009 IECC prescriptive requirement for this area is the same as for exterior walls. R-20 cavity only insulation or a combined R-13 cavity insulation with R-5 continuous insulation.

6 Exterior Walls. The largest surface area of a home that is exposed to outside air temperatures is the exterior wall area. Meeting the minimum R-value requirements of the Energy Code in the exterior wall gives you the biggest opportunity to reduce the energy costs of your home, every year for the life of the home.

- The 2009 IECC prescriptive requirement for exterior walls is: R-20 cavity only insulation or a combined R-13 cavity insulation with R-5 continuous insulation.

7 Windows and Glass Doors. Unlike the exterior walls, windows and glass doors cover a fairly small percentage of surface area exposed to outside air temperatures, generally 10 – 15%. Although the area is small, the insulating value of the window is typically 25-30% of what the exterior wall R-value can provide.

- The 2009 IECC requirement for windows and glass doors is maximum U-value 0.35



This cut-away house shows a home's thermal shell and building components — the "Systems Approach" to building a new home. Optimum efficiency cannot be achieved by selecting only a few quality components. The overall plan must be considered.

8 Ceilings/Attics. Following exterior walls, ceilings are typically the second largest surface area of a home and are one of the most cost-effective areas of a home to insulate. Meeting the minimum R-value requirements of the Energy Codes in the ceilings and attics helps you to reduce the energy costs of your home, every year for the life of the home.

- The 2009 IECC prescriptive requirement for attic insulation is R-38.

The code does allow the R-value of ceilings with attics to be reduced (from R-38 to R-30 or R-49 to R-38) when the full height of the insulation completely extends over the top of the wall plate.

9 Lighting. Saving lighting energy is as easy as screwing in a high efficiency light bulb.

- The 2009 IECC requires a minimum of 50% of the lamps in permanently installed lighting fixtures have high-efficiency light bulbs.

10 HVAC. Properly sized heating, ventilating and air conditioning systems in new homes is a requirement of the IECC. Bigger is not better; appropriately sizing the system based on the homes insulation R-values and sizes, the window U-values and sizes, and weather loads is the only way to ensure that the system will operate correctly and provide you with year round comfort.

11 Ductwork. Sealing and insulating keeps ducts from leaking heated or cooled air into wall and floor areas, some of which may be in unheated areas, and gets the air to where it is needed in the home. Unsealed joints also "draw air" into the system causing your furnace and air conditioner to work harder to keep your house comfortable. See the IECC requirements regarding ductwork in the HVAC section (10) of this brochure.

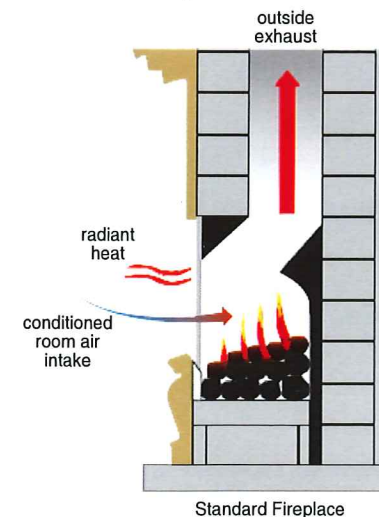
1. all ductwork to be sealed using mastic or tape, which is rated UL-181.
2. that building cavities not be used as supply ducts,
3. duct tightness testing for ductwork located outside of the conditioned space, and that
4. supply ducts in attics be insulated to an R-8 with all other ducts in attics insulated to an R-6.

12 Water Heating. Water heater minimum efficiency requirements are not established by the International Code Council, but the IECC does establish minimum requirements regarding various parts associated with plumbing systems.

- The 2009 IECC requires circulating systems to be insulated to an R-2. There are additional requirements for pools and snow melt systems.

13 Fireplaces. During cold winter weather cozying up to a fireplace with a cup of cocoa can provide a lot of warmth. But fireplaces can contribute substantially to heat loss in your living space. Standard fireplaces use large amounts of conditioned air from inside your home in the combustion process and send it out the chimney (see illustration).

- The 2009 IECC requires installed fireplaces to have tight fitting, gasketed doors and to be provided with outside combustion air. This combination of features helps to eliminate the loss of conditioned air from inside the home.

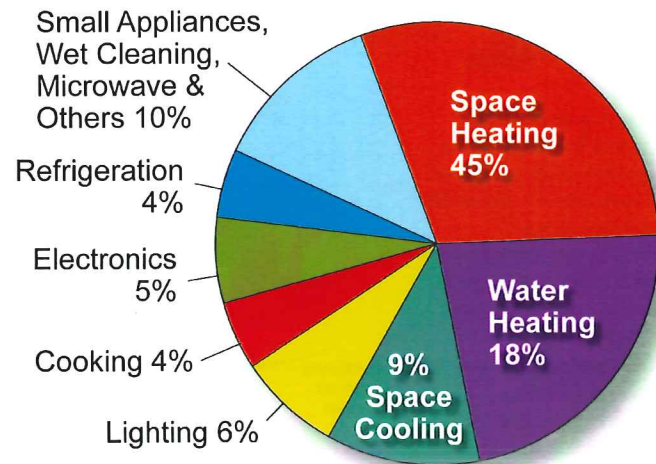


Energy Efficiency in Your New Home

You have much to consider when designing and building a new home, and it can be quite a challenge. One of those challenges is making choices during the process that will help to reduce the future operating costs of the home, to improve comfort in the home and to help to ensure the durability of the home. Recent technological improvements in building and construction techniques allow most energy saving elements to be seamlessly integrated into a home's design and construction while improving comfort, health, or aesthetics. Including energy efficient and air sealing features during the initial construction is the most cost effective way for you to ensure reduced future operating costs as well as the future durability of your home.

This brochure has been developed to provide you with information regarding the requirements of the latest Nebraska Energy Code; the 2009 International Energy Conservation Code (IECC) and to help you understand those requirements. It is also intended to provide you, as a future homeowner, with a guide to use during the design and construction of your home that will help to ensure that your home is well-built, will save you money and meets the minimum requirements of the Nebraska Energy Code. This document does not cover every aspect of the energy code, but it does provide information on numerous energy saving requirements of the Code. Please contact the Nebraska Energy Office at 402/471-2867 with any additional questions.

Residential Site Energy Consumption
by End Use



Source: 2011 Buildings Energy Data Book U.S. Dept. of Energy

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STATE OF NEBRASKA

The Energy Office logo is a floor mosaic located just inside the north entrance of the state capitol. The mosaic by Hildreth Meiere titled, "Genius of Creative Energy" represents various forms of energy.

Nebraska Energy Office
Box 95085
521 South 14th Street, Suite 300
Lincoln, NE 68509
Phone: 402-471-2867 Fax: 402-471-3064
Email: energy@nebraska.gov
Website: www.neo.ne.gov

Contact Your Local Jurisdiction

Nebraska Energy Code Requirements



A Guide to Energy Codes for Your New Home

Nebraska Energy Office
Email: energy@nebraska.gov
Website: www.neo.ne.gov