#1 PROPERTIES

ENERGY STAR

# ENERGY STAR Certified Home Features



# WOODS BROTHERS CONSTRUCTION

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# *Building the homes you love!*

# WOODS BROTHERS CONSTRUCTION

*Jim Woods*

*Josh Woods*

ENERGY STAR

# ENERGY STAR® Certified Home Features

Energy efficiency guidelines set by the U.S. Environmental Protection Agency (EPA)

# A COMPLETE HEATING AND COOLING SYSTEM

Heating and cooling can cost the average homeowner more than $1,000 a year—nearly half of the total energy bill. To help reduce these costs, ENERGY STAR certified homes come equipped with heating, ventilating, and cooling (HVAC) systems that are designed and installed to optimize performance, lower utility bills, keep you more comfortable, and provide better moisture control, better indoor air quality, and quieter operation. During design and construction, ENERGY STAR builder partners must meet all of the requirements of EPA's comprehensive HVAC Quality Installation inspections and work with trained and credentialed HVAC professionals to ensure that—

- Heating and cooling equipment and associated ductwork are sized and installed correctly to maximize comfort and performance.*
- Ducts are properly sealed to reduce air leakage, comfort problems, and expenses.
- Air is filtered and a mechanical ventilation system that draws in outside air is provided to reduce indoor air pollutants.

When builders meet these rigorous requirements, you get a home with a complete heating, ventilating, and cooling system—a better approach to building a better home.

## EFFICIENT EQUIPMENT

ENERGY STAR certified homes typically include high-efficiency HVAC equipment that uses less energy, operates at reduced noise levels, and often comes with extended warranty coverage, helping you save on utility bills and maintenance costs.

## PROPER SYSTEM DESIGN AND QUALITY INSTALLATION

Trained HVAC professionals design and install the heating and cooling systems in ENERGY STAR certified homes in accordance with best practices established by the leading industry association and equipment manufacturers.*

**System Design and Sizing –** Proper sizing of equipment and ductwork is essential to achieving optimum performance and comfort. Homes with oversized systems may not be as comfortable because of frequent on/off cycling, which can cause large temperature swings and lead to poor humidity control. Incorrect sizing can also put stress on system components and shorten the equipment's life. HVAC professionals are required in most cases to perform detailed calculations to determine the optimal heating and cooling system for your ENERGY STAR certified home based on factors such as home location and orientation, house size, window types and locations, and insulation levels.

**Duct Design and Installation –** In many homes, ductwork carries air from the central heater or air conditioner to each part of the home and back again. In ENERGY STAR certified homes where ducts are used, they are properly sized to ensure that the right amount of air gets to each room and has a path to get back to the central unit. HVAC professionals install ducts without kinks, sharp bends, or excessive coiling or looping to help air flow freely and efficiently throughout the house. In addition, they insulate ducts in unconditioned spaces, such as crawl spaces and attics, to minimize energy losses.

* Applies to installation of ventilating systems and the most common types of heating and cooling systems in new homes.

**Duct Sealing –** Sealing air ducts is an important step in the installation process. In a typical house, about 20 percent of the air moving through the duct system is lost due to leaks, holes, and poor connections. As the owner of an ENERGY STAR certified home, you can be sure you are paying less to heat or cool air because duct joints and seams are properly sealed with durable materials. HVAC professionals will also typically seal ducts at the connections to air inlets and registers to prevent conditioned air from seeping into the walls, ceilings, or floors, which could condense and lead to moisture problems.

**System Tests –** HVAC professionals work with trained Home Energy Raters to perform several system tests of your ENERGY STAR certified home, as applicable, to ensure that the HVAC systems are operating properly. For example, the HVAC professionals check the refrigerant charge in air conditioners and heat pumps—an important step because an improperly charged system can consume more energy and provide less dehumidification. The HVAC professionals also check the electrical connections of the equipment because if the voltage or current is too high or too low, it can shorten the life of the unit. Last, but not least, the HVAC contractors take measurements to make sure that the proper volume of air is flowing in the equipment and in each room—this helps to avoid comfort problems and high utility bills. Raters also test the duct system to verify that connections have been properly sealed for optimum performance.

## WHOLE-HOUSE MECHANICAL VENTILATION

Every ENERGY STAR certified home is built with a mechanical ventilation system to provide outside air and to reduce indoor air pollutants. These mechanical ventilation systems are designed to ensure that any outside air inlets are located away from known contamination sources, such as garages or exhaust fans, and include screens to keep pests out. Premium air filters (rated MERV-6 or higher) are used so you can breathe easier knowing that outside air and indoor return air are filtered to help reduce dust, allergens, and other airborne pollutants. These filters are located to allow for easy routine maintenance.

Exhaust fans are installed in bathrooms and kitchens to vent moisture and fumes directly to the outdoors (fans in many typical homes often vent to the inside of the home). Quieter fans are also used so you can run the fans when needed without being disturbed by noise.

**Improper Installation**

*Ducts are crammed into cavity, kinked and sharply bent.*

**Proper Installation**

*Ducts are run straight and supported properly.*

Combustion appliances, such as furnaces, boilers, and water heaters are directly vented to the outdoors; installed in lower-risk areas, such as garages or attics; and combustion tests are done to help ensure safe operation.

## BUILDING A BETTER FUTURE

An ENERGY STAR certified new home delivers better energy efficiency and so much more. An ENERGY STAR certified home is built better and built to last because the best, tried-and-true, integrated construction practices are used from the ground up. The result is better quality and durability, better comfort, better systems, a better value for today, and a better investment for tomorrow—plus a label backed by EPA. In short, better is better.

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### ENERGY STAR Certified Home Features

- A Complete Thermal Enclosure System
- A Complete Water Management System
- A Complete Heating, Ventilating, and Cooling System
- Efficient Lighting and Appliances
- Independent Inspections and Testing

**Ask your builder for more information.**

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ENERGY STAR

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# EFFICIENT LIGHTING AND APPLIANCES

The lighting and appliances in your home come with two price tags—the purchase price and the cost to operate and maintain them. ENERGY STAR qualified lighting and appliances meet strict energy efficiency guidelines that deliver better performance, provide better quality, and help reduce home operating costs through lower monthly utility bills, while creating the style you are looking for in a new home.

During construction, ENERGY STAR builder partners often select efficient lighting and appliances to create a complete energy-efficient package that meets EPA's rigorous guidelines—a better approach to building a better home.

## ADVANCED LIGHTING

ENERGY STAR builder partners offering advanced lighting options know that you expect high-quality design and functionality. ENERGY STAR qualified fixtures and bulbs are found in many shapes and sizes—giving you a wide range of lighting choices to match the atmosphere you want in your home. The attractive designs are complemented by features such as quick starts and no humming; some models include dimming or switching capabilities, automatic daylight shut-off, and motion sensors. ENERGY STAR qualified lighting also offers significant cost savings and longer lifetimes when compared to standard products.

**Cost Savings –** On average, ENERGY STAR qualified bulbs and fixtures use about 75 percent less energy than traditional models. An ENERGY STAR qualified compact fluorescent light bulb (CFL) that uses only 13 to15 watts can replace a 60-watt incandescent bulb and save more than $40 in electricity costs over the bulb's lifetime.

**Long Life –** Qualified bulbs and fixtures last 10 to 50 times longer than traditional incandescent light bulbs. This means you won't have to worry about regularly replacing bulbs—convenient for those hard-to-reach fixtures.

**High Quality –** ENERGY STAR qualified fixtures and bulbs offer the same amount of light, measured in lumens, as incandescent or halogen lighting, while providing a true and natural color without the flicker, hum, or buzz of their infamous fluorescent predecessors.

**Safety and Reliability –** ENERGY STAR qualified light bulbs must meet fire safety requirements, including UL standards (Underwriters Laboratories). When compared to incandescent lighting, ENERGY STAR qualified lighting produces about 75 percent less heat and is much cooler to the touch. All qualified lighting models are tested, must meet strict specifications for energy efficiency and quality, and come with at least a 2-year warranty.

## ENERGY STAR QUALIFIED APPLIANCES

Household appliances can account for nearly 20 percent of energy use in an average house. That is why many ENERGY STAR builder partners are helping buyers like you make smart choices about the models they choose for their new homes, which adds up to real savings in monthly utility bills. A comprehensive package of ENERGY STAR qualified appliances can reduce energy costs, but these models also offer premium features and improved performance over standard products.

**Refrigerators –** A new ENERGY STAR qualified refrigerator is 20 percent more energy efficient than the federal minimum energy efficiency standard. Along with greater efficiency, ENERGY STAR qualified models operate more quietly. Redesigned doors provide better insulation to keep food fresher and, often the doors are deeper, providing more space for commonly used items.

**Dishwashers –** ENERGY STAR qualified models are about 10 percent more energy efficient than conventional units. Their advanced technologies include more effective washing action to reduce pre-rinsing, energy-efficient motors for quieter operation, and sensors that determine the cycle length and water temperature necessary to clean the dishes. These "smart" features minimize water use, which helps reduce the cost of heating water each time you run a cycle.

**Clothes Washers –** ENERGY STAR qualified clothes washers come in front-loading and top-loading models. Both use over 50 percent less water and 30 percent less energy than standard clothes washers—saving a typical household about $50 per year in energy costs. ENERGY STAR qualified clothes washers incorporate high-quality features for improved performance. Gentler operation, more thorough rinsing, and the removal of more water in the spin cycle make washing clothes easier and help protect fabrics from fading and fraying.

**Ceiling Fans –** ENERGY STAR qualified ceiling fans move air 50 percent more efficiently than conventional fans. This means you'll use less energy to get the same amount of cooling. Qualified ceiling fans with lights can save you even more on energy bills over the life of the fan.

**Ventilation Fans –** ENERGY STAR qualified ventilation fans, like those used in bathrooms, utility rooms, and above cooking areas, use 70 percent less energy than standard models. They also employ high-performance motors and improved blade designs, so they make less noise when operating and provide better performance.

## BUILDING A BETTER FUTURE

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# A COMPLETE THERMAL ENCLOSURE SYSTEM

You want your home to be comfortable no matter what room you're in or what the weather is outside. Comprehensive air sealing, properly installed insulation, and high-performance windows work together in an ENERGY STAR certified home to deliver better comfort, better durability, reduced maintenance costs, and lower monthly utility bills. During construction, ENERGY STAR builder partners must meet all of the requirements of EPA's comprehensive thermal enclosure system inspection to ensure that—

- Your new home is tightly sealed to reduce leaks and drafts; and thermal bridging across walls is minimized.
- Correct levels of insulation are selected to provide whole-house comfort.
- Insulation is installed properly to deliver the best performance.

When builders meet these rigorous requirements, you get a home with a complete thermal enclosure system—a better approach to building a better home.

## AIR SEALING

A typical home contains a half-mile of cracks and gaps behind walls and around windows and doors, along with dozens of holes for pipes, vents, ducts, lighting, and wiring. Sealing these openings with a comprehensive air sealing package helps to significantly reduce drafts, moisture, dust, pollen, pests, and noise. The best time to seal these is during the construction process because access to critical areas can be limited once the house is completed.

ENERGY STAR builder partners seal the holes using caulks, foams, and other techniques—paying particular attention to those areas between the conditioned (heated or cooled) and unconditioned space of your home. One great example of this is found at the attic access panel, where ENERGY STAR certified homes feature a gasket to create a tight seal around the panel. This is a detail that is commonly missing in many other homes and can have a real impact on your comfort and utility bills.

The energy savings from comprehensive air sealing can quickly add up when you consider all the places hot or cool air can enter or escape from your home. Having a well-sealed home also means better air quality because dirt, pollen, pests, and moisture can't get in as easily. In addition, good sealing practices help protect your home against mold and moisture damage that can be caused by condensation.

## REDUCED THERMAL BRIDGING

Walls in homes are typically built with wood studs, which support the weight of the floors and roof above, help the home stand up to wind, and generally act as the structural "bones" of the home. While these components are critical to making a durable home, they often have a very low R-value (resistance to heat flow) and create thermal "bridges"—uninsulated pathways that compromise the comfort and efficiency of the home. ENERGY STAR builder partners select one of five strategies, such as adding a continuous layer of rigid foam or minimizing excess wood studs, to minimize thermal bridging in walls.

## PROPERLY INSTALLED INSULATION

While it's important to have the right amount of insulation in your home, it's the quality of the installation that makes all the difference in getting the best performance. ENERGY STAR builder partners can choose from many different types of insulation—including fiberglass batts, dense-packed cellulose, sprayed foam, and rigid foam sheets—to ensure that you get a blanket of comfort around your new home. Insulation levels are commonly rated by R-value, or resistance to heat flow; the higher the R-value, the more resistance. Insulation levels in ENERGY STAR certified homes are independently verified by Home Energy Raters to ensure that they match the levels selected during the design of the home.

For insulation to deliver its rated R-value, it has to be installed properly. ENERGY STAR builder partners install the insulation with minimal gaps or compressions and aligned with air barriers to improve performance. Imagine wearing a down jacket that's two sizes too big on a winter day—the cold air comes right up under the coat and chills your skin. ENERGY STAR builder partners also fit the insulation around wires, plumbing, and piping inside the walls to not leave empty, uninsulated spaces that could lead to hot or cold spots. These practices help maintain consistent temperatures throughout your house, reduce energy use, and improve comfort, especially on the hottest and coldest of days.

**Improper Installation**

*Insulation has misalignment, compression, and gaps.*

**Proper Installation**

*Insulation is fully aligned with air barrier with no major compressions or gaps.*

## HIGH-PERFORMANCE WINDOWS

ENERGY STAR certified homes feature windows that meet or exceed national performance standards. To satisfy this requirement, many builders choose to install ENERGY STAR qualified windows in their homes. These qualified windows use advanced technologies, such as protective coatings and improved frames, to help keep heat in during winter and out during summer—translating into real savings for you. They also often block damaging ultraviolet sunlight that can discolor photographs, carpets, and furnishings. Qualified windows can also help reduce the potential for condensation, which can damage window sills, cause paint to crack, and encourage mold growth.

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# A COMPLETE WATER MANAGEMENT SYSTEM

ENERGY STAR certified homes include a comprehensive package of water management practices and materials that help to protect your home from water damage and reduce the risk of indoor air quality problems. During construction, ENERGY STAR builder partners must meet EPA's comprehensive water management requirements to prevent rain and moisture from building up in living areas, attics, basements, crawlspaces, or behind walls. These water management requirements help ensure that—

- Water is directed off the roof, down the walls, and away from the foundation.
- Your home is built with moisture-resistant barriers to prevent water damage.
- Building materials are protected during construction to minimize the possibility of mold and rotting.

When builders meet these rigorous requirements, you get a home with a complete water management system—a better approach to building a better home.

## WATER-MANAGED CONSTRUCTION DETAILS

ENERGY STAR certified homes feature a comprehensive package of measures to ensure that water will be effectively drained away from your new home.

**Site and Foundation –** To help prevent damp foundations, ENERGY STAR builder partners install moisture-resistant barriers to protect the foundation from water in the ground. The area around the home is also graded so water flows away from the foundation, and is coupled with underground drains for some house types. These types of water management strategies help improve the durability of the foundation, reduce the potential for water damage, and even improve the comfort and indoor air quality in your home.

**Walls and Roofs –** ENERGY STAR certified homes are built with features designed to safely drain water off roofs, down walls, and away from the home. To help achieve this, ENERGY STAR builders wrap the walls of the home from top to bottom in a continuous layer of overlapping moisture-

*The final grade slopes away from the house. Neglecting to consider exterior water management could lead to water damage.*

resistant material to create a "drainage plane." In areas that are particularly susceptible to water problems, such as roof-wall intersections and openings around windows and doors, the drainage plane is supplemented with a second layer of protection, called flashing. Flashing consists of water-resistant material that directs water away from the areas of concern and onto the drainage plane, where it can be safely drained away.

**Building Materials –** Moisture problems in homes can start before the home is even built. Building materials that are improperly stored and exposed to the elements during construction can lead to rotting and mold growth. ENERGY STAR builder partners take steps to properly select and store building materials onsite so water-damaged materials are not used in the construction of your new home. In addition, they use moisture resistant materials in walls behind tubs and showers and avoid installing carpets in close proximity to wet areas of the home, such as in bathrooms.

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**Proper Installation**

*The below-grade concrete walls have damp-proof coating.*

**Proper Installation**

*The drain slopes away from the foundation and terminates at the proper distance.*

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