



# Reduce System Costs with Energy Efficient Combination Space/Water Heating Equipment

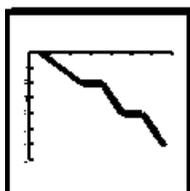
## Builder Guide



## DESCRIPTION

When homes are built with very efficient thermal envelopes, the heating and cooling requirements decrease. If the loads are small, more expensive high efficiency HVAC equipment may not be cost-effective. Combination space/water heating equipment can reduce the first cost of installing high efficiency equipment. Typically, space and water heating are provided with separate heating appliances (i.e. a hot water heater and a furnace, boiler, or heat pump.) With combination space/water heating equipment, only one heating appliance is required.

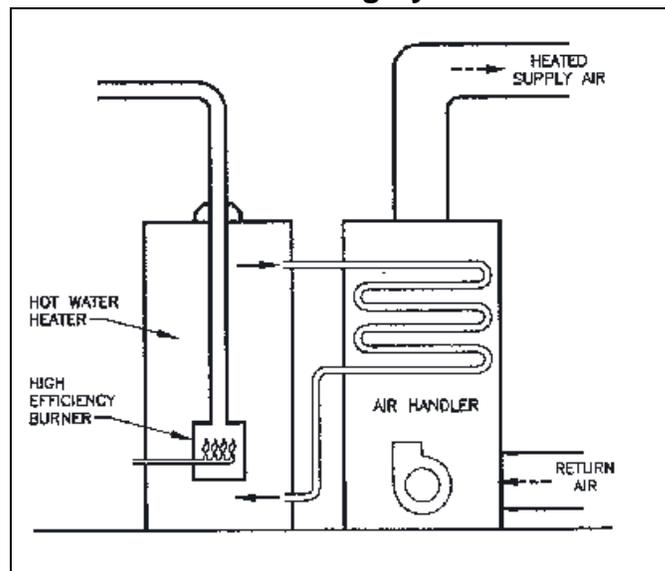
The efficiency of combination space heating/water heating equipment is measured by comparing the Annual Space Heating Efficiency (ASHE) to the AFUE of a stand alone furnace (ASHRAE Standard 124). High efficiency water heaters are available that match the performance of the highest efficiency boilers and furnaces. Domestic hot water is heated directly and space heating is accomplished with a hot water heat exchanger coil piped to the forced air heating system (see diagram). The space heating system integration enhances the efficiency of the hot water heater by reducing standby losses. Thus, a combination space/water heating system can provide high efficiency hot water heating and space heating for the cost of one high efficiency appliance. See the Builder Guide fact sheet on energy efficient Gas-fired Water Heaters for more information on the features of high efficiency hot water heaters.



## BENEFITS

Providing energy efficient houses with comfortable, high efficiency heating equipment can increase customer satisfaction and referrals. These benefits

## Combination Space Heating/ Water Heating Systems



can increase your business and profits.

- Energy efficient combination space/water heating equipment saves money.**

High efficiency combination space/water heating equipment can reduce heating bills by over 15% compared to separate minimum efficiency water heaters and furnaces. In addition, combination equipment can cost hundreds of dollars less to install than separate equipment.

- Direct vented combination space/water heating equipment does not require a chimney.**

Most high-efficiency combination space/water heating equipment vent combustion gases directly through the wall and do not require a chimney stack. This improves efficiency and can add 2 to 4 square feet of living space normally used for the chimney chase.

- Direct vented combination space/water heating equipment is safer.**

In less-efficient atmospheric-vented space and water heating equipment, combustion air is drawn from inside the house. However, houses can become depressurized due to exhaust fans, clothes dryers, fireplaces, duct leakage, and wind effects. When a house becomes depressurized, combustion gases in a low-efficiency water heater or furnace may be drawn back into the house. This is called "back-drafting" and can be a serious health hazard. Most high-efficiency combination space/water heating equipment (direct-vented) use a fan and vent pipes to control the flow of intake and exhaust gases, eliminating the risk of back-drafting.



## INTEGRATION

- Installation of high efficiency combination space/water heating equipment requires coordination with subcontractors.**

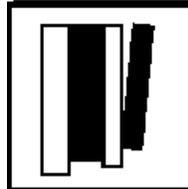
Direct-vented combustion appliances are vented directly through walls because they don't need a chimney stack. Both masonry and framing crews should be familiar with the installation requirements of direct-vented equipment. Additionally, plumbing and HVAC crews should be familiar with the installation requirements of space/water heating equipment.

- Using high-efficiency appliances can reduce the first cost of water heating equipment.**

Use of other energy efficiency features such as horizontal-axis clothes washers and low-flow faucets and showerheads can reduce hot water requirements, thereby allowing installation of smaller less-costly water heaters.

- Water piping systems should also be properly designed and insulated to minimize heat losses.**

Heat losses from piping systems can be responsible for degrading the efficiency of an integrated heating system by more than 10%. To get the most out of high efficiency heating systems, well-insulated piping systems with heat traps should be installed.



## RESOURCES

- For more information on ENERGY STAR HVAC Program and qualifying equipment, call 1-888-STAR YES.
- GAMA Directory of Certified Efficiency Ratings for Residential Heating and Water Heating Equipment*, Gas Appliance Manufacturers Association, 1996. Available at 703-525-9565.
- Retrofit Savings for Dual Integrated Appliances in Small Commercial and Multifamily Buildings: Final Report*, CEUE, December 1991. Available at (612) 348-6234.