



Jump Ducts Increase Energy Efficiency

By Dave Wolkowitz

Jump ducts are an increasingly popular method for improving the energy efficiency of homes with forced-air heating and cooling systems. They address the critical issues of equalizing air pressure in various parts of the home and of handling return air.

When managing the heating and cooling flow within any building, it is challenging to ensure that air moving into rooms equals the air moving out of rooms and back space-conditioning system. If more air enters than exits the room, the air pressure in the room increases and exceeds the pressure outside it. Without balanced air pressure, energy efficiency decreases as conditioned air escapes through the building envelope, through unplanned routes such as leaky windows or around electric outlets.

Houses have traditionally used a very distributed means of handling return air, according to Duncan Prah, an architect and research manager with architecture and engineering consulting firm IBACOS, which conducts research for the U.S. Department of Energy's "Building America" program.

"Historically contractors would try to take return air from every room," Duncan says. "They would use wall cavities or floor cavities and connect them in a convoluted way to the return air system of a building. Research has found that is a very inefficient way of handling return air. It's leaky, and it draws in outside air because cavities are typically connected to the outside."

Jump ducts are a way to avoid the highly distributed, leak-plagued traditional means of handling return air. Duncan explains that one central return in the main body of the house reduces the cost of HVAC and provides effective air flow. Jump ducts handle return air from rooms that can be isolated by closing doors; the jump ducts move air from the room to the hallway and ultimately to the central return air duct. "Jump ducts are a best practice," he adds.

Keeping it simple

With comparable initial costs, jump ducts are relatively simple and more efficient than the traditional method of using building cavities for return air. A grille on the ceiling of the room is connected through ductwork to a grill in the hallway's ceiling. Air exits the room through the jump duct into the hallway, and then moves through the hallway to the main return duct. The simplicity of the system makes leaks less likely.

But what about noise and light following the same pathway in and out of a room? Duncan recommends the use of insulated flexible duct, which muffles sound. And although a jump duct can be as short as three feet, Duncan recommends a length of six to eight feet to help prevent light pollution, as well as to further dampen noise moving between a room and the hallway. Low-cost stamped-metal grilles are typically used to provide a finished look on the ceiling. Duncan adds that those with a net free area of greater than 80% may increase the ease with which air passes through the jump duct.

Duncan says that while builders should use jump ducts in any new home with a forced-air HVAC system, retrofitting existing homes may not be cost-effective. However, if a home's occupants experience problems related to return air, such as extreme inefficiency, dampness or other comfort problems, jump ducts are worth considering. It is relatively straightforward to gain access to the space above the bedrooms and hall, and a central return can be accommodated in the main space of the house.

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Jump ducts allow air pressure between rooms to equalize through the ductwork.