

Fresh Air for Fuel-Burners

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How to keep your furnace happy in a tight house.

All combustion appliances require air to burn the fuel and to expel the combustion gases out the flue. In older homes, this air was generally drawn from the indoors. Indirectly, of course, all combustion air comes from the outdoors via infiltration. The standard formulas used to compute whether the indoor air supply was sufficient assumed a minimum rate of air infiltration of 0.5 air changes per hour.

In newer, tighter homes and in older retrofitted houses, air for combustion is not as readily available. If an appliance does not get enough air for complete combustion, its efficiency drops, soot can build up in and

enough to draw toxic flue gases back into the house. If the flue has insufficient stack height or is partially blocked, then tightening up the house might tip the air balance the wrong way. In a tight house, a combustion appliance will induce infiltration to feed its oxygen-starved flame, increasing the heating load of the house.

For both safety and energy reasons, then, more designers are deliberately supplying outside air to combustion appliances. Some solve the problem by avoiding the use of combustion devices altogether. In retrofits, though, this may not be feasible. And in new construction it may not be wise. The

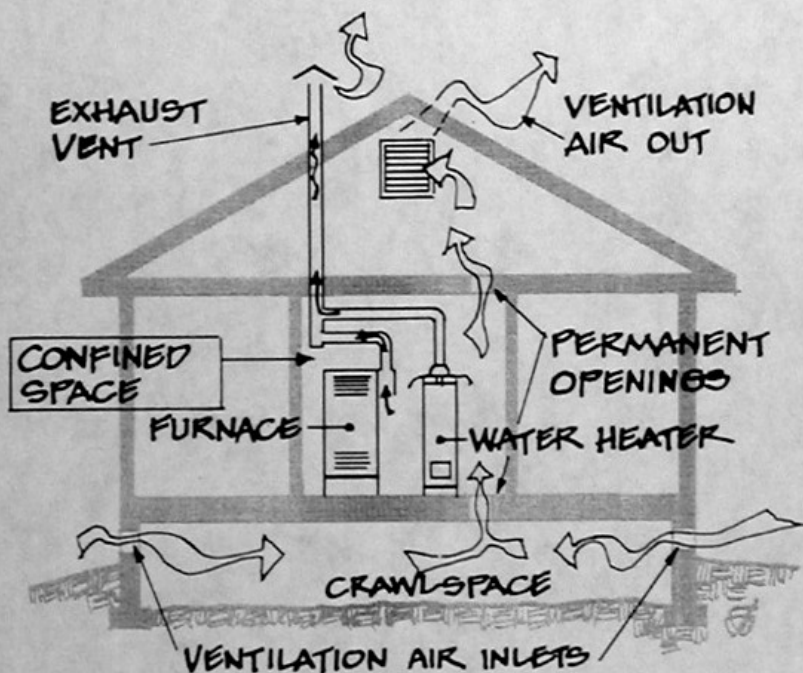


Figure 1. By confining the gas furnace in a separate room, adequate air for draft and combustion can be supplied without adding infiltration to the house.

around the burner, and condensed water (a by-product of combustion) can collect in and corrode the flue. Moreover, in a tight house, an exhaust fan—for example, in the kitchen, greenhouse, or clothes dryer—may create a negative air pressure strong

cost of competing fuels may be the driving force.

Diagnostics

An easy test of adequate draft in a gas appliance is to hold a blown-out match near the vent hood and see if the smoke is drawn up the flue. This should be done under worst conditions; that is, in warm weather when stack pressures will be reduced, with

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