

Ask Jon Eakes

DOES MY FURNACE GET ENOUGH AIR?

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A combustion furnace or boiler (gas, oil, coal or wood) requires air to burn and air to maintain a proper draft in the chimney. In a leaky old house with the furnace in an open basement this is never a problem. As the house becomes better sealed, several problems can arise:

-- An automatic ventilation system will supply ample air to the house but, if it fails or freezes up, the furnace could become starved for enough oxygen to burn cleanly or sufficient air to maintain a proper draft;

-- Every exhaust fan in the house is competing with the furnace for air, which could cause dangerous polluting chimney backdrafts. In fact, the building code requires special provision for combustion make-up air whenever you have exhaust fans that are larger than 75 liters/sec (150 cfm). Manufacturers of powerful indoor bar-b-que range top exhaust fans (often 300 to 600 cfm) do not acknowledge that installation of their fans without some significant work to provide failsafe air to the furnace when they are operating is in violation of the building code, and downright dangerous for the occupants of the house.

-- A hot fire in a fireplace which does not have its own fresh air supply will almost always outdraw a furnace if the two must compete for the same available air.

Here are two simple tests to evaluate if your furnace has a sufficient air supply.

First to test if you "might" have a problem. Close all the doors and windows in the house, as well as the fireplace damper and the cold-air intakes on any ventilating system. With the furnace off, watch the smoke from a cigarette or incense held near the barometric damper in the flue pipe of an oil furnace; below and near the backdraft hood above a gas furnace; or in front of the intake vents of a solid fuel furnace -- the smoke should go up the chimney. Now, have someone turn on all the exhaust fans in the house at the same time, including the clothes dryer if it exhausts outside. Continue observing the furnace for at least 15 minutes to allow the fans to exhaust the house. If the smoke noticeably stops going up the chimney and particularly if it obviously turns around and flows into the house, you should consider adding a combustion fresh air supply.

Now, open the fireplace damper and light your fireplace -- if the cigarette smoke turns around (which it most probably will do, whether or not it did before) you do need a fresh air supply specially for your fireplace whether or not you install one for the furnace.

The second test is to do the same things with the furnace operating. If the exhaust fans or fireplace can turn around the cigarette smoke while the chimney is full of hot gas -- you definitely need a combustion fresh air supply and probably a Hoyme Damper.

This test is not foolproof, but it includes a margin for error on the safe side. It can certainly indicate whether it is worth the trouble to professionally pressure test the house and/or consult a furnace expert.

The codes are constantly changing as we recognize the problems of competition for air in modern houses. Where the code requires combustion air for your furnace or boiler, don't sidestep the issue, even in renovation where codes are not as thoroughly enforced as in new construction.

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