Why Measure Draft?

This is important because draft measurement shows how rapidly the gases pass through the furnace or boiler. Draft measurements ensure that there is continuous negative pressure (systems without forced ventilation) in the combustion system. Excessive draft increases stack temperature and therefore decreases combustion efficiency.

Draft is critical. New furnaces use a pressure switch to test for correct draft, and if the draft is off, you will have a callback. A pressure switch will very rarely fail, so before replacing a pressure switch, check the draft.

It is important to measure draft on the chimney side, well downstream from a draft diverter. This measurement will inform you whether there is enough draft to move the flue gases up the chimney and vent them to the outside air.

Draft will be affected by a number of factors, including the outside air temperature. Normally, when a burner is running, there will be enough temperature difference to ensure that there is a measurable pressure difference capable of removing the waste gases safely, but there may be problems at start-up when the ambient temperature is high. Such factors should be borne in mind when designing a system, but the replacement of an older burner with a newer type may cause starting problems. Newer types have safety switches that demand a certain level of draught before they will start. This may make it necessary to add some form of forced draught system to solve the problem. some such systems can be organised to only work during the first part of operation, before working temperature has been reached. Adjustments to safety equipment to solve such problems should not even be considered. These burners require this level of draught and will not work properly without it.

The term draft was chosen instead of draught to show there is no national bias on this site. Draught seems to have gone out of usage, perhaps because it is the longer word. The dictionary still mentions draught.

The matter is slightly different when a forced draught system is used. You then expect a positive pressure in the stack, which will be higher just by the combustion chamber. All the items that obstruct the flow will cause a pressure drop. A differential pressure measurement can be carried out across these obstructions to see which item is causing the most pressure drop, possibly due to breakage or other defect.

Typical values for draft:

Burner with fan 0.12...0.20 hPa (mbar)

Oil burner and gas burner without fan - 0.04...- 0.10 hPa (mbar)

The typical problem that used to occur was bird nests being built in chimney that were

only used in winter. With central heating systems now being generally combined with hot water systems the chimneys are in use the whole year, reducing this standard hazard. Nevertheless it still occurs regularly in some countries. A sudden change in draught values will probably be caused by this type of problem. Naturally there are other factors that can cause a blockage and hence a dangerous change in draft values, it does not have to be our feathered friends! Again, modern chimneys tend to be lined, so the old problem of blockages caused by fallen bricks is no longer so likely to be the reason for a change in draft.

The old measurement methods of inclined manometers, whilst theoretically perfectly accurate have given way to electronic measurements in almost all cases. sometimes an old burner will have a permanent draft display in the form of a water column, but this is really an anachronism and has no real use for any purpose. It is a bit like the button in a lift that is supposed to close the doors. It is not connected to anything, but you feel better after pressing it! Burner draft should remain constant throughout the operating life of the system.