

HEATBASE FACTSHEET 9

System efficiency

This Factsheet can be read in association with FACTSHEET 10 Energy Saving Tips.

Climate change is a Global issue. 20% of all the Greenhouse gases produced in the UK come from homes and 70% of that from boilers. A coating of soot or scale the thickness of an eggshell can increase fuel consumption by 10%. An incorrectly adjusted burner could easily increase fuel consumption by another 10%. A fouled heating system also increases fuel consumption; 1mm of scale can increase fuel consumption by 7.5%, while a 12mm layer can raise this figure to 70%. It necessarily follows that a well Serviced boiler and clean heating system will work more efficiently and uses less fuel. Magnetic filters such as the Adey Magnaclean can be fitted to your system, which will help keep it clean and ensure maximum efficiency.

Most people know that if they drove their car over a specific distance, starting and stopping all the way, then they would use more fuel than if they drove there at a constant steady pace; oil boilers are the same when it comes to energy efficiency. Frequent starting and stopping of the burner, or short cycling as it is commonly known will waste fuel as well as making the boiler dirtier; at the point of ignition combustion is less efficient and is also dirtier. There are many reasons that cause short cycling, some can be rectified some can't.

Because oil boilers use "on-off" burners and can only produce heat at one rate, if a boiler is oversized or pipework is undersized, it will produce more heat than it can disperse and so it will quickly get itself up to temperature and shut down, it will then disperse this heat and then start up again and so will constantly short cycle.

Old fashioned "gravity hot water" as well as short cycling in the summer months due to its slow circulation ability, has no control other than the boiler thermostat. Even when you have a full tank of Hot water, the boiler thermostat will cool, and the burner will re-fire to keep the boiler up to temperature. When you use your Heating, this type of system means you still have to heat the hot water whether you want to or not. Modern "fully pumped" systems allow separate control over hot water and central heating times, gives a quicker recovery time to heat the hot water cylinder as well as providing an electrical interlock which prevents the burner from firing for hot water if the cylinder is up to temperature.

The design temperature of a heating system is usually between 75 and 82 Degrees Centigrade (approx. $\frac{3}{4}$ on the boiler thermostat). That is the temperature that heat should leave the boiler shell. When a system is used in this manner the radiators will be very hot; because of this rooms will heat up quicker and stay hot longer, which means you can shorten the times the boiler is programmed to be on; but it also makes the boiler run for longer periods and turn off for longer periods within this time scale, reducing short cycling. This will only help for efficiency if a system is controlled with thermostatic radiator valves and care should be taken if a gravity hot water system is used as it will increase the temperature of the water stored in the cylinder.

Thermostatic Radiator valves (TRV's) give the ability have different temperatures in different rooms; they are one of the best energy saving devices but it is seldom they are used correctly as people don't understand how to use them to their full potential, they obviously aren't fool proof and furniture or curtains placed in front of them or over them affect the operation of them to some degree. Each number on the valve gives an approximate room temperature and once the best temperature for each room is found it is best to leave them set there or at least keep a record of the different settings in each room. It is common to find the TRVs turned to maximum and the boiler thermostat turned low. It's worth spending time over a few days to get the correct setting as the fuel savings can be great.