



Refrigeration system maintenance

The basics

Contrary to popular belief, refrigeration system efficiency is highly variable from one installation to the next. It is also very dependent on the level of maintainance, location of the compressor set and the outside temperature.

In many instances it may be possible to make considerable savings on energy consumed by your refrigeration system, with little or no capital investment needed.

In practice

A refrigeration system has a number of major components, all of which must be working at their best for the whole system to be at its most efficient way.



Condensers recycling warm air

TOP TIPS

Refrigeration systems can often benefit from some additional cleaning and maintenance. Two examples of issues that can effect efficiency are blocked/damaged condenser coils and poor ventilation.

Refrigeration condenser coils can become blocked and damaged over the years. Coils in bad condition can increase refrigeration running costs by over 25%.



Poor ventilation means that it is difficult to get hot air away from the condensers which causes their efficiency to fall. Ideally, coils should be located in an area with good ventilation and away from direct sunlight – preferably North facing. If the area around the compressor set is being used to dry clothes it can show that the condenser isn't getting rid of the heat effectively, thus lowering the efficiency.



The above example shows how allowing free airflow through the condensers and keeping the units sheltered from the weather can improve efficiency.



The key components are:

Condenser Coil



Condenser Coil

This is the 'outside coil' which gets hot and is used to disperse the heat from the cooling process. It must be clean and in good condition and positioned in a cool place. Many coils end up being blocked with dust and some are located under direct sunlight or in hot lofts. Badly maintained and positioned coils are a major cause of low efficiency.



Shading for condenser coil

Refrigerant

This is the gas/fluid which transfers the heat around the refrigeration system. It can leak which leads to a depleted refrigeration charge which can cause the system efficiency to drop. To ensure optimum efficiency, have the refrigeration charge checked once per year.

Expansion Valve

This controls the amount of refrigerant which flows to the cooler and it must be set correctly for best operation – again this needs checking annually.

Condenser Fan

This passes air through the condenser coil. It's operated by a pressure switch in the refrigeration line and this must be set accurately. Too low a pressure and the fan will operate too long, too high and the refrigeration efficiency will drop. Check this during maintenance time.

Refrigerant Pipes

These need to be insulated to prevent energy loss prior to the refrigerant doing its work. Pipe insulation does degrade so it needs to be checked periodically.

Generally new refrigeration systems are more efficient than older designs. The use of scroll compressors, condensers and expansion valves has improved efficiency, in some cases, by more than 30%. Therefore an overall upgrade of the refrigeration unit is often a good investment.



Condenser fan and refrigeration pipes

Potential savings

The difference between an appropriately positioned, well maintained and ventilated refrigeration system and a system which has blocked coils, poor ventilation and inappropriately set controls can be as much as 40%. The relatively low cost of simple maintenance is therefore a particularly good investment. For a system cooling 1 million litres of milk per year, annual savings can be as high as £200 to £300.

For more information on refrigeration system maintenance please contact:

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