LEAVING CERTIFICATE ENGINEERING 2003.

Special Topic:- Basic principles of compressors as used in refrigeration.

Compression.

Air or gas can be compressed. This means that a large volume of air or gas can be pumped into a small container or tank. The pressure in the tank increases as more air or gas is pumped in. The pump used is called a compressor.
A compressor can be operated by:- hand, an electric motor, an oil or gas engine, wind, water, steam driven, etc.

Compressor.

The usual construction for a power driven compressor includes a crankshaft, a piston, a cylinder, an inlet valve, an outlet valve, a safety pressure release valve or bypass valve and a storage tank. Other structures also exist, eg centrifugal and helical spiral.
A gas under increasing pressure will turn into a liquid. A liquid is virtually incompressible.

Refrigeration.

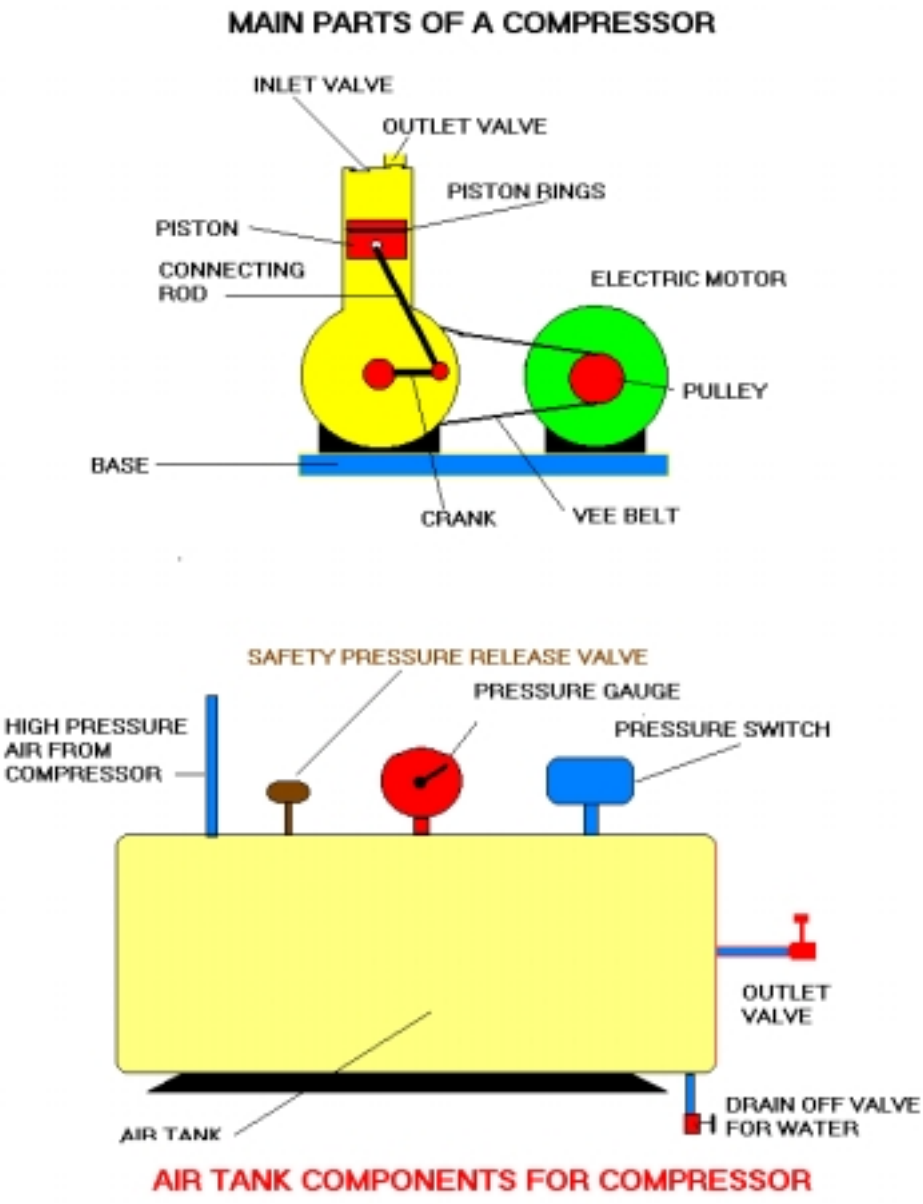
A compressed gas being released causes evaporation. Evaporation results in cooling.
It is this compression and evaporation process which makes refrigeration possible.
The process of refrigeration is used in domestic fridges, freezers and ice plants.
A fridge will have a small compressor driven by an electric motor. The compressor pumps a gas, such as ammonia, in a two stage circuit. The first part of the circuit allows the gas to be compressed, the next part of the circuit allows the gas to expand and evaporate through a restriction or jet in the circuit.
The cooling effect of evaporation absorbs heat from inside the fridge. A thermostat is used to maintain a steady temperature. The thermostat operates a switch that switches the motor on and off as required.

Compressor valves.

Flat spring loaded disk type non-return valves are used in most compressors.
These valves are opened and closed by the movement of the air or gas entering and leaving the cylinder. A closed compressor valve must be airtight.

Compressor Pistons.

The pistons in a compressor resemble engine pistons. They also have piston rings to prevent air from leaking between the piston and cylinder walls. A compressor may have one two or a number of pistons.



Some useful web pages.

http://www.members.aon.at/solarfrost/cooling.htm
http://www.dy_compressors.co.uk