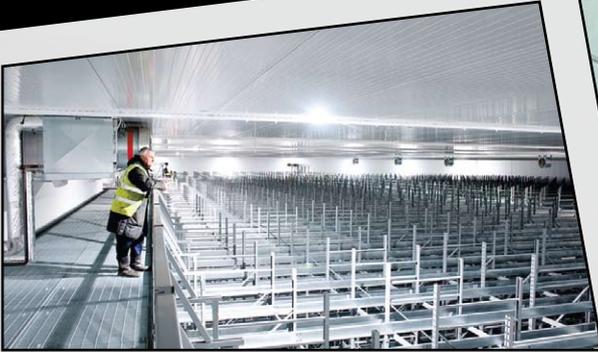




# Combined Cold Storage & LED Lighting Efficiency

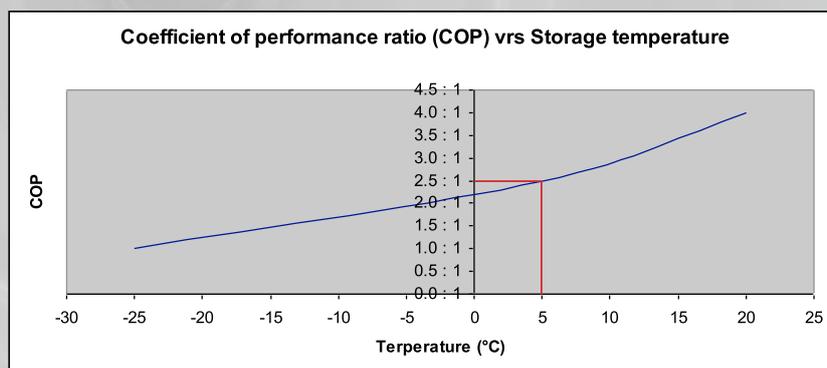


When LED lights are used to replace less efficient light sources, typically Metal Halide or SON Lighting, there is an additional saving gained when used in refrigerated environments.

In addition to the lighting circuit's reduced energy consumption, there will also be less power consumed by the cooling system to maintain the desired temperature. This is due to the higher efficiency of the LED light producing less waste heat that previously had to be removed by the refrigeration system.

The amount of energy required by the cooling system to remove an amount of heat within the cold store is described as the Coefficient of Performance (COP). COP is the ratio of cooling to energy consumption. A cold store with a COP of 1 moves 1 Watts of heat energy for every Watt of electricity consumed. A cold store with a COP of 3 would mean 3 Watts of heat energy is removed per 1 Watt of energy consumed.

However, the COP of a cold store is mainly dictated by the temperature needing to be reached by the system. From the graph below it can be seen that the COP for a 5°C fridge is approx 2.5 : 1. This means that 1 Watt of cooling energy consumption will remove 2.5 Watts of heat energy in this environment.



Generally a colder store will generate more savings.

The additional energy saved will depend on several factors dictated by the refrigeration system used in each specific case. Factors such as Refrigeration Pump Type/ Insulation / Outside temperature ect all effect an individual cold stores performance (COP).

### **Example**

5 degree cold store has 10 x 400w MH lights that are replaced by 10 x 120w LED light fittings.

**Saving** = 280w per fitting + 20w for control Gear = 300w x 10 = 3000w.

**Additional saving** = 3000w / 2.5 = 1200w total saving 3000+1200 = 4200w.

As can be seen this is a significant amount as it amounts to a 40% increase in savings and thus reduces any payback period.

The COP values above could vary by plus or minus 25% per specific store but give an indication that there is a significant extra reason to target LED fitment in refrigerated areas as a priority.