

# First Hotel to use CO2 refrigerant

CASE STUDY

**green**  
cooling

## The recently renovated Café Royal on London's Regent Street re-opened in December of 2012 as a luxury 5 star hotel.

This historic London landmark has seen a number of differing uses throughout its life over the past two centuries from iconic restaurant to sometime nightclub and has been frequented by the likes of Oscar Wilde, Bridget Bardot and Mick Jagger.



Image credit - Ewan Munro

Now the property has been transformed into a high specification hotel with cutting edge design in every area from front of house through to the buildings infrastructure and services.

An area of high priority throughout the design stage was to focus on minimising energy use and maximising efficiency with regard to the Café Royals refrigeration needs.

This design and specification process has now culminated in the latest tenant of the Café Royals upper basement being a CO2 refrigeration system.

This enables this iconic hotel to gain another accolade as being the first hotel to use the natural refrigerant CO2.

Providing sufficient capacity to meet the total demand for both coldrooms and kitchen refrigeration this system utilises the natural refrigerant CO2 which provides complete flexibility in terms of delivered temperature and is also highly efficient with the capability to provide 100% heat recovery.

Senior members of Green Cooling's design team worked alongside the consultant SHW and the kitchen contractor C & C Catering to provide a complete service from concept to design which ensured that the CO2 system was able to provide critical capacity to meet the total requirement for both kitchen and cold room refrigeration at a realistic project cost.

This service not only encompassed the design and selection of the main plant but also included the specification and installation of all chilled and frozen storage with bespoke under counter units and high performing cold rooms.

Green Cooling's Dave Blinkhorn who coordinated the refrigeration system design commented, "This project was extremely rewarding from a technical perspective and demonstrates that CO2 is perfectly practical to install and operate on any size of application", Blinkhorn continues, "CO2 packages are able to provide not only critical refrigeration but also recovered heat at temperatures over 80°C which is significantly more effective and usable than can be achieved by a comparable HFC system".

This "free high temperature heat" is making these systems very attractive for use on applications within the catering and hospitality market but importantly also in the food manufacturing and processing sector where a store of FREE high temperature heat energy can be used to provide both potable hot water and also to support a heating system and potentially displace a boiler with associated carbon savings.

It is clear that CO2 refrigeration is a specialist sector within the context of the UK refrigeration market, but that being said the operation and reliability of these systems is actually no different than would be expected from a comparable HFC system.

However the real benefits to the client of using CO2 are certainly attractive and cannot be delivered by a HFC system.

CO2 specification and use is becoming a BREEAM project necessity but the use of this high efficiency equipment also provides real financial benefits that should be equally considered alongside the accepted BREEAM benefits of utilising a natural refrigerant.

Primarily CO2 is able to deliver both flexible low temperature cooling plus an equally flexible supply of high temperature thermal energy that can achieve an 80°C flow temperature.

Green Cooling is a specialist in refrigeration based heat recovery and the use of CO2 enables them to achieve the most efficient performance of heat recovery with the highest delivery temperature.

The benefits of CO2 are not only a route to BREEAM excellence but importantly the message is also that CO2 can provide free recovered heat at over 80°C providing the user with a high degree of savings in terms of both fuel costs and carbon reduction.

It is good to see an industry development such as the increasing use of CO2, which is in essence being driven by environmental concerns, providing this financial benefit where high temperature 80°C "waste heat" energy can be used in a practical and cost effective manner, in fact it is effectively providing free energy whilst reducing the use of fossil fuels!

