

Hydrocarbons in refrigeration

What caterers need to know.



The Situation

The Climate Change Levy, announced by the Chancellor of the Exchequer in March 1999, came into force in April 2001. Under its terms, a tax has been imposed on the energy used by commercial premises. In essence, this Levy will increase the cost of energy by approximately 15%. The purpose of this Levy is to reduce greenhouse gas emissions by 12.5% by the year 2010, as committed to by the UK Government under the terms of the Kyoto Protocol.

The Issue

Minimising energy consumption will help to minimise the Levy's impact on your business and the damaging effects of gas emissions on the environment. Refrigeration equipment works hard- 24 hours a day- so an energy efficient refrigeration solution can reduce the potential financial impact of the Climate Change Levy.

Together with the ban on the use of CFCs/HCFCs, the Levy has caused the industry to search for an alternative refrigerant gas. There are a variety of alternative gases available, so how do they compare?

The Solution

Any solution to reduce energy consumed by refrigeration equipment is welcome but one that can also benefit the environment has a real advantage. Refrigerants- the cooling fluid used in refrigeration systems- can have a direct or indirect impact on the environment.

The TEWI (Total Equivalent Warming Impact) is a measure of the total impact of refrigeration in a system on global warming. Refrigeration systems can contribute twice to global warming:

- Directly through emissions of those refrigerants which are greenhouse gases
- Indirectly through the use of energy generated by burning fossil fuels-causing carbon dioxide emissions.

TEWI can be reduced by:

- Using a refrigerant which has a global warming potential as low as possible
- Reducing emissions of refrigerants (leaks etc.)
- Improving the energy efficiency of a system by using efficient refrigerants as well as implementing generic energy efficiency techniques and technologies.

Different refrigerants have different Global Warming Potentials (GWP). A refrigerant that can offer the least direct and indirect impact obviously offers the best solution. As demands for refrigerants to minimise their GWP and energy usage increase, more 'environmentally-friendly' alternatives have been introduced.

One such refrigerant type is Hydrocarbon, which virtually eliminates the direct effect because of its very low GWP and also reduces its indirect effect by improving energy efficiency. Hydrocarbon is increasingly becoming the acceptable standard in European domestic refrigeration for these reasons, with leading domestic brands Bosch, Whirlpool and Elstar having already made the change.

The Facts

Refrigerant	GWP (100 year basis)*	ODP**
R 12 CFC (Chlorofluorocarbon)	8500	1
R 134a HFC (Hydrofluorocarbon)	1300	0
R 22 HCFC (Hydrochlorofluorocarbon)	1700	0.05
R 404a HFC (Hydrofluorocarbon)	3800	0
R 290 HC (Hydrocarbon)	<3	0

*GWP is relative to Carbon Dioxide = 1

**ODP (Ozone Depletion Potential) is relative to R11 = 1

The Benefits of Hydrocarbons

Reducing your costs:

- Hydrocarbons can reduce energy consumption by up to 15%
- Hydrocarbons are a less 'aggressive' material- this extends the life span of your compressor, which in turn reduces servicing costs
- A quicker 'pull down time' when doors are closed means more efficient recovery

Reducing the cost to the environment:

- Hydrocarbons are more energy efficient than other HFC refrigerants reducing energy consumption, therefore helping to reduce the Total Global Warming Impact.
- A lower compressor operating temperature means less heat is emitted into the kitchen.
- A lower kitchen noise level is achieved due to less noise emanating from the compressor. This is excellent news in any kitchen, but combined with the reduced heat factor, really makes a difference in a large room with several cabinets.
- Hydrocarbons offer zero ozone depletion potential and very low global warming potential, unlike other standard refrigerants.

"Conservation and the environment has always been a major consideration for us at The National Trust. The replacement of all our old refrigerated cabinets with new Foster Hydrocarbon cabinets is a way of helping reduce environmental impacts at our sites throughout the UK."

Lynda Brewer, National Deputy Catering Manager for The National Trust

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