



# EFCTC NEWSLETTER

## An update on fluorocarbons and sulfur hexafluoride

**ISSUE 55 – March 2008**

### **FLUOROCARBONS HAVE BETTER LIFE CYCLE CLIMATE PERFORMANCE THAN CO<sub>2</sub> IN MOBILE AIR CONDITIONING**

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Fluorocarbons perform better in terms of [LCCP](#) (Life Cycle Climate Performance) than CO<sub>2</sub> in [Mobile Air Conditioning](#) systems, for compact and luxury cars and in all considered conditions, after a [study](#) presented at the [VDA Alternative Refrigerant Winter meeting](#) in February 2008. Such result was even more pronounced in warm climates.

The ranking between HFC-134a and recently announced new fluorinated refrigerants is influenced by [End-of-Life emissions](#), which are still under discussion.

The studied Fluorocarbons systems were standard existing systems, while the CO<sub>2</sub> systems were more costly, having additional controls and equipment – which gives room for further improvement for Fluorocarbons systems.

The compressor load was always the lowest with HFC-134a.

### **HELSINKI LARGEST DISTRICT COOLING PLANT WORLWIDE USES HFC**

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HFC-134a centrifugal [chillers](#) are commonly used as heat pumps operating in heating and cooling mode for large [district heating and cooling](#) systems.

District heating and cooling schemes provide the heat load required for high-efficiency Combined Heat and Power (CHP) plants and enable the recovery of energy resources that otherwise would be wasted.

The new Helsinki Energy Katri Vala heat pump plant is the largest in the world of its kind, producing simultaneously 60 MW cooling capacity and 90 MW heating capacity. The installation is composed of 5 HFC-134a chillers, using the heat energy of treated warm waste water as heat source for both districts heating and cooling, with an excellent COP of 5 for such conditions.

In a rock cavern excavated beneath the Katri Vala Park, the heat-pump plant is generating district heat of 88°C and simultaneously chilled water with a temperature of 4°C for district cooling purposes.

Compared to energy production for property-specific cooling, District Cooling produces considerably fewer emissions, and indeed Helsinki Energy's District Cooling carbon dioxide emissions are a low 70g/kWh, less than half of single property-specific cooling values.



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[http://www.friotherm.com/downloads/katri\\_vala\\_e012\\_uk.pdf](http://www.friotherm.com/downloads/katri_vala_e012_uk.pdf)

<http://www.euroheat.org/documents/PositionPapers/EHPCoolingMoreWithLess.pdf>

## HFC REFRIGERATION PRESERVING TUTANKHAMUN'S TREASURES IN LONDON

HFC-based [air-conditioning](#) systems are installed to protect Tutankhamun's treasures presented in London's O2 venue until August 2008.

In the 3,500m<sup>2</sup> exhibition space, temperature and humidity levels must be kept constant, which is ensured by tailored HFC air conditioners. The king's mummy has been placed in a climate-controlled display case, better protecting it from heat, humidity and dust as thousands of visitors will pass by the mummy.

King Tutankhamun's face is shown to the public for the first time since his tomb was discovered 85 years ago. The exhibition also features more than 130 artefacts from the tomb of the Pharaoh, notably the royal diadem, (the gold crown encircling the head of the king's mummified body) and the gold and precious stone inlaid that contained the king's mummified organs.

Source : <http://www.acr-news.com/news/news.asp?id=499>





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### **ENERGY EFFICIENT AIR CONDITIONING MAY LEAD TO A REDUCTION IN WORKERS' BUILDING SICKNESSES**

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An efficient, well-controlled and properly maintained [air-conditioning system](#) could lower staff sickness and improve worker's concentration levels.

High indoor CO<sub>2</sub> concentrations can cause headaches, eye problems, nasal symptoms, respiratory tract conditions and fatigue - so called Sick Building Syndrome.

According to a recent study by KPMG and Middlesex University, typical office CO<sub>2</sub> levels are in the range of 600-800 ppm, but at levels above 1500 ppm, 79% of people reported feeling tired and at levels above 2000 ppm, nearly 2 thirds reported being unable to concentrate.

In modern offices with sealed windows, draught exclusions and insulation, natural ventilation is minimal causing air to be used and breathed but not replaced.

This problem is resolved with an efficient and well-controlled air-conditioning system but becomes an issue if the system is not well maintained or is poorly designed in the first place.

Source: [Worker's health at risk from high CO<sub>2</sub> levels](#)