



# EFCTC NEWSLETTER

## An update on fluorocarbons and sulfur hexafluoride

**ISSUE n° 48 – July 2007**

### **EU HEAT PUMPS ECOLABEL: ECOLOGICAL CRITERIA INCLUDE THE USE OF HFCS**

The EU Ecolabel National [Competent Bodies](#) have adopted the ecological criteria for the EU Heat Pumps Ecolabel.

The criteria allow refrigerants with a global warming potential ([GWP](#)) lower than 2000, which includes [most HFC refrigerants](#).

The Ecolabel will cover all types of heat pumps, with a heat capacity up to 100 kW.

Energy efficiency requirements in terms of coefficient of performance ([COP](#)) in heating mode and energy efficiency ratio ([EER](#)) in cooling mode will be tested in accordance to the European Standard EN 14511:2004 which concerns [Air-conditioners, liquid chilling packages and heat pumps](#).

In the case of using a refrigerant with a GWP lower than 150, the required minimum energy efficiency (COP and EER) will be reduced by 15%.

This decision recognizes that [GWP only does not satisfactorily describe the climate impact](#) of a greenhouse gas.

Reference:

[http://ec.europa.eu/environment/ecolabel/pdf/heat\\_pumps/final\\_criteria.pdf](http://ec.europa.eu/environment/ecolabel/pdf/heat_pumps/final_criteria.pdf)

### **RESEARCH SHOWS THAT R410A HAS THE LOWEST ENVIRONMENTAL IMPACT IN SMALL CAPACITY REFRIGERATION SYSTEMS**

R410A has the lowest [environmental impact](#), evaluated as LCCP, as long as the annual emission of the refrigerant is lower than 10 %. This was the conclusion of the experimental evaluation of 3 [refrigerants](#) used in small capacity walk-in commercial coolers: R404A (near azeotropic refrigerant containing HFC-125, HFC-143a and HFC-134a), R410A (near azeotropic refrigerant containing HFC-32 and HFC-125) and R290 (propane).

The study was recently published in the International Journal of Refrigeration.



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Based on measured data and evaluated over the entire life cycle of the equipment, the environmental impact calculations showed that low-leaking R410A coolers have the best environmental impact when [safety](#) (toxicity and flammability), environmental impact ([LCCP](#)) and [cost and performance](#) (capacity and COP) are taken into account.

Such studies help to provide a clearer and more objective evaluation of the relative performances of HFC refrigeration blends, compared to alternative solutions.



Ref: International Journal of Refrigeration 30 (2007) pp. 633-641

### **ICE STORAGE TO IMPROVE THE PERFORMANCES OF HFC-134A BASED PARIS DISTRICT COOLING, ONE OF THE BIGGEST IN THE WORLD**

Integrating ice storage in a Paris cooling network, [one of the largest in the world](#), will improve its performance by reducing its electricity consumption and increasing its cooling capacity.





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The district cooling network (which serves buildings including the Louvre and Les Halles) was recently completed with 4 ice storage tanks of 200 m<sup>3</sup> with a total cooling capacity of 30 MWh.

Ice storage provides two advantages:

- decreasing the network temperature when necessary, achieving a higher cooling power with the same flow rate in the existing piping;
- buffering the cooling demand between peak hours (during the day, with higher electricity prices) and off-peak hours (at night, with lower electricity prices).

District cooling represents an [economical and energy efficient way](#) of providing the cooling demand of commercial buildings. HFC-134a is [the most efficient](#) fluid for large district cooling compression refrigeration systems.

District cooling is implemented in an increasing number of cities in Europe: Amsterdam, Barcelona, Berlin, Helsinki, Oslo, Paris, Stockholm, and more recently Linz, Vienna, Munich among others.

**Source:** <http://www.refripro.eu/fr/O1-froid-clim/O6-stockage-glace-vrf-fluides.html>

### **INNOVATIVE RESEARCH TO REDUCE THE REFRIGERANT CHARGE AND IMPROVE ENERGY EFFICIENCY**

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In a refrigeration system, the main part of the charge is found in the liquid phase. To reduce the refrigerant charge and the amount that could potentially leak, the best way is to reduce the size of the liquid phase components.

A French study has undertaken development of heat exchangers having a very small internal volume while keeping a high energy efficiency. Mini-channels heat exchangers have been designed which can procure a 10-fold reduction in refrigerant charge and reduce the overall [TEWI](#) by approximately 50%, as refrigerant losses can be reduced by 90% and energy efficiency improved by 10-20%.

The technology is applicable to small units with a power of less than 15 kW. In France there are 600,000 such units, containing 16,000 tons refrigerant, which represent 80% of all refrigeration systems and more than 40% of the total installed charge.

Fully implementing this technology, and thereby reducing small units total charge from 16,000 to 2,000 tonnes of refrigerant would eventually reduce their annual emissions by up to 1,200,000 tonnes CO<sub>2</sub>-equivalent, i.e. approximately 2% of the French energy sector's greenhouse gas emissions.



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Source:

<http://www.cemagref.fr/Informations/Presse/InfMedia/im68/im68recherche.htm>

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**Décret no 2007-737 du 7 mai 2007**

Concerns CFCs, HCFCs and HFCs used in refrigeration systems

**Arrêté du 7 mai 2007**

Leakage control ensuring containment of refrigeration fluids