EFCTC

EFCTC NEWSLETTER

An update on fluorocarbons and sulfur hexafluoride

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DISTRICT COOLING STUDY CONFIRMS HFC ENERGY EFFICIENCY

The Danish Board of District Heating (DBDH) is presenting a study concerning large central cooling plants, producing chilled water for district cooling, and using seawater for condensation.

Comparing different refrigerants, for both screw compressors and reciprocating compressors, the study concludes that HFC-134a is the most energy efficient with screw compressors in the range from 250 to 1000 kW, while, with reciprocating compressors, ammonia is more energy efficient up to a capacity of 750 kW.

The climate in Nordic countries allows seawater cooling, which contributes to saving 15-30% of the energy used for cooling plants.

ANTARCTIC 2004 OZONE HOLE PRESENTATIONS

Herewith two Ozone Hole presentations (scroll to the bottom of the web page), useful to explain the development of the Antarctic Ozone Hole in 2004.

The first one contains Ozone snapshots of the Antarctic Ozone Hole in 2004, showing its extent from August 12 to November 30 (Austral Spring).

The snapshots series shows that, at the start of August, the sun does not shine at all in the Antarctic, and the instrument on the satellite cannot make measurements. The areas that the instrument does not see appear on the pictures as the white circle around the pole and the white streaks towards the equator.
Later, the Sun shines on more of Antarctica, the vortex holding the stratospheric air round the South Pole gets stronger and the ozone in it starts to be depleted.
By September, the edge of the vortex is well defined and the stratospheric air within it becomes more and more depleted in ozone.
In the latter part of September, the Ozone Hole is at its deepest but the vortex is becoming less stable, as it is warmed by sunlight, and is no longer circular.
During October, the vortex shrinks and so the Ozone Hole becomes smaller and less intense, and, by the end of November, the Antarctic stratosphere is almost back to normal.

The second one presents historical snapshots of the Antarctic ozone, from 1996 to 2004, on the day that the Ozone Hole is at its deepest.

Each year the Ozone Hole reappears at roughly the same size, shape and depth.
However, 2002 was an exceptional year, the stratospheric vortex around the South Pole was very weak, and so the conditions that cause ozone depletion did not persist.

In 2003 and 2004 the vortex seemed to be behaving "normally", consequently the Ozone Hole was as extensive as normal.

All pictures are from the Total Ozone Mapping Spectrometer.

ULTRA-MODERN WIND TUNNEL USING HFC-134a IN SWITZERLAND

Sauber Petronas is a famous Formula One car company. It has recently put an ultra-modern wind tunnel into operation.

For the new facility, two refrigeration units, totalling 5150 kW and using 2,300 kg of HFC-134a, are installed, in order to provide a constant temperature of the Wind tunnel and adequate working conditions.

The impressive building (65-metre length, 50-metre width, 17-metre height, 63,000 cubic meters volume) has a glass façade, for esthetical and commercial reasons.

The wind tunnel is of a closed-circuit design. The total length of the steel tube is 141 meters, and the largest tube diameter is 9.4 meters. Wind speeds of up to 300 km/h can be reached in the test section.

Die Deutsche Kaelte und Klimatechnik No 11/2004 pp 28-34

See also "WORLD'S LARGEST CLIMATIC WIND TUNNEL USING HFC REFRIGERANT"

NORDIC COUNTRIES USING HFC-134a IN SUSTAINABLE REFRIGERATION PROJECTS

A number of remarkable projects have been implemented in Nordic Countries, backing on the sustainability of HFC-134a for reducing the energy consumption for heating or cooling in urban environments.

The advantages of Central District Cooling in large cities are, among others, the improvement of global energy efficiency (a large cooling unit offers significantly more opportunities to optimization than many small units; a single electricity supply is also better manageable) and the preserved esthetical of historical buildings.

Oslo – Fornebu (Norway) - District heating / cooling plant, using HFC-134a as refrigerant for a centralized refrigeration capacity, delivering air conditioning to commercial buildings.
Winter Heating Capacity: 5.4 MW - Summer Cooling Capacity: 4.1 MW.

Akalla-Kista (S) – Kista Science City (Sweden Science Centre District); and parts of Akalla, around 10 km north-west of central Stockholm, are supplied with chilled water through a district cooling system.
The heating/cooling plant consists in a number of HFC-134a Heat Pumps and

Chillers:

- 2 Heat pumps (Heating/Cooling) totalling 17.6 MW Heating Capacity
- 2 Chillers totalling 12 MW Capacity
- 1 Heat Pump / Chiller of 8.6 MW Capacity
- 1 Chiller of 13 MW Capacity

Additional information

Sysav Malmö (S) - Waste-to-Energy Plant enhancing the overall Energy Balance, thanks to HFC-134a Heat Pumps, totalling 19 MW Capacity.

Lund (S) - District heating /cooling plant using geothermal energy to feed HFC-134a Heat pumps and combined Heater/Chiller units. Geothermal energy replaces a large part of fossil fuels and saves CO_2 associated emissions.
This technique, supplying Lund with inexpensive and independently produced heat is called "the Lund Model" and is viewed as a good example by experts.
Heating Capacity: 9.3 MW
Additional information

Värtan Ropsten (S) – The largest sea water heat pump facility worldwide, with 3 HFC-134a Heat Pumps totalling 180 MW installed capacity.

Source: Equipment Manufacturer

NEW ON OUR SITE

Refrigeration Page

What is District Cooling?

District cooling means the centralized production and distribution of cooling energy. Chilled water is delivered via an underground pipeline to office, industrial and residential buildings to cool the indoor air of the buildings. The output of one cooling plant is enough to meet the cooling-energy demand of dozens of buildings.

Centralized production of cooling energy is more environmentally friendly and cost-effective than distributed building-specific cooling. In addition, centralization improves operational reliability

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