

**DuPont™ Opteon™ XP10:  
A new option for more environmentally sustainable  
commercial refrigeration**



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**FLCH-CHILLVENTA-2010-05**

Photo: ALDI Sued

As part of a pilot project, ALDI Süd has recently charged a R134a-based refrigeration system at one of its stores with the new DuPont refrigerant Opteon™ XP10 – a refrigerant characterised by its particularly low global warming potential. The system cools seven refrigerated shelves and three cold stores used to display and store dairy products, fresh meat, fruit and vegetables.

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Photo: DuPont/SPAR Österreich

As part of a field test started in July 2010, SPAR Österreichische Warenhandels-AG, of Salzburg, Austria, converted a medium-temperature compound refrigeration unit belonging to a R134a/CO<sub>2</sub> cascade system to the new DuPont refrigerant Opteon™ XP10, which provides a significantly lower global warming potential.

## **DuPont™ Opteon™ XP10: A new option for more environmentally sustainable commercial refrigeration**

**Nuremberg, Germany, October 2010. At Chillventa 2010, DuPont announced the development of a new, lower global warming potential (GWP) refrigerant for use in commercial refrigeration systems. DuPont™ Opteon™ XP10 is based on HFO-1234yf, which has recently received global acceptance for use in mobile air-conditioning. It is characterized by its lower GWP (close to 600) when compared to R134a, as well as its similarity to R134a in terms of its thermodynamic properties. Initial test results indicate that it is suitable for use as an alternative refrigerant for new, medium-temperature commercial refrigeration systems based on R134a technology, or as a cost-effective replacement for R134a in existing systems. First pilot projects with leading food retailers such as ALDI Süd, Penny (both Germany) and Spar (Austria) have been very encouraging in terms of operating performance and ease of use. DuPont is considering an initially limited commercial launch of Opteon™ XP10 in the EU between 2012 and 2013, and will monitor market interest to define the exact timing for its commercial introduction.**

The carbon emissions associated with the R&AC industry are not only a direct consequence of the refrigerants themselves, but are also produced indirectly as a result of the energy consumed by the refrigeration systems in which they are used. The food retail industry is one of the major operators of such equipment. This is one of the reasons why food retailers in many EU countries are being proactive in their quest to reduce the carbon footprint of their operations, including the adoption of refrigeration technologies and refrigerants that deliver reduced direct and indirect carbon emissions. The search for more sustainable refrigerants and energy efficient refrigeration systems are part of this effort, and DuPont is playing a leading role to help reduce the total carbon footprint of R&AC systems in preparation to meet current and future regulations.

### **Opteon™ XP10 – the promising, new lower GWP alternative to R134a**

DuPont has leveraged its science heritage to develop Opteon™ XP10, the lowest GWP, non-flammable refrigerant based on its new HFO-1234yf -technology. Opteon™ XP10 is a very close match in properties and performance to HFC-134a and is therefore highly compatible with current HFC-134a system technology, enabling the efficient transition in new equipment.

“As with our range of DuPont™ ISCEON® 9 Series refrigerants, which have since become almost an industry standard for the replacement of R-22, we are pleased to announce a further milestone in our quest to help reduce the environmental impact of R&AC systems with the development of a new lower GWP refrigerant technology for use in commercial refrigeration systems,” commented Thierry Vanlancker, global business director for DuPont Fluorochemicals.

DuPont development work has also revealed that Opteon™ XP10 offers the attractive opportunity to be used alongside CO<sub>2</sub> in hybrid systems – Opteon™ XP10 for medium temperatures and CO<sub>2</sub> for low temperatures. Studies show that such a solution would provide retailers with a 90 percent reduction in direct carbon emissions and a minimum 50 percent reduction in the total carbon impact of retail commercial refrigeration systems when compared to the current global industry standard direct expansion technology based on HFC-404A.

“We are already seeing retailers in some countries migrating from 404A DX technology to 134a/CO<sub>2</sub> hybrid systems in order to improve system energy efficiency and to reduce their overall carbon impact. Opteon™ XP10 is an efficient and logical choice in making a further step change reduction in carbon impact,” states Pascal Faigy, business and market manager, DuPont Fluorochemicals Europe, Middle East, Africa (EMEA).

Opteon™ XP10 can also be used in stand-alone systems for smaller applications where hybrid systems are not practical, such as in discounter applications. A further key benefit is that by adopting this new refrigerant technology in combination with systems using other low carbon refrigerants such as CO<sub>2</sub> or hydrocarbons, retailers can make a significant contribution to achieving the EU’s 20-20-20 targets (a 20% cut in emissions of greenhouse gases by 2020, compared with 1990 levels; a 20% increase in the share of renewables in the energy mix; and a 20% cut in energy consumption).

### **Positive results in first field trials**

With regard to the development and market testing of Opteon™ XP10, DuPont is conducting laboratory-based compressor and system tests in close cooperation with several leading equipment manufacturers. A series of field trials in food retail operations both within and outside Europe are also being conducted. For instance, SPAR Österreichische Warenhandels-AG of Salzburg, Austria, has been using Opteon™ XP10 for the medium-temperature section of a R134a/CO<sub>2</sub> cascade system at a supermarket in Kundl/Tyrol since July 2010. Apart from a replacement of the filter drier and a reprogramming of the Frigolink HKS regulator with the corresponding data for Opteon™ XP10, no further change of components, nor oil, was required. All work was carried out without a hitch. The refrigerant charge measured before and after the conversion came in at 83 kg. In line with DuPont recommendations, a minor adjustment to the expansion valve was made to ensure the correct superheat setting. The refrigeration system has shown no sign of leakages or other problems since recommencing operation.

In Germany, ALDI Süd GmbH & Co. K of Moenchengladbach, converted a R134a-based refrigeration system to Opteon™ XP10 as part of a second pilot project started in May 2010. Following removal of the original R134a refrigerant, the system was charged with the corresponding amount of Opteon™ XP10 and re-started. Neither an oil change nor a replacement of components was required. Service contractors solely carried out a minor adjustment of the expansion valve to ensure the correct superheat setting. Measurements taken before and after the conversion showed a slight fall in energy consumption (approximately 2 to 3%) with Opteon™ XP10 when compared to R134a at the same external temperatures.

DuPont is considering an initially limited commercial launch of Opteon™ XP10 in the EU between 2012 and 2013, and will monitor market interest to define the exact timing for its commercial introduction. “We believe that the extension of our field trials will prove that our new development has the potential to become a competitive and sustainable global technology standard that will enable the retail supermarket sector to meet their carbon footprint reduction goals,” concludes Pascal Faidy.

**DuPont Refrigerants** is a leading global supplier of refrigerants, using science and technology, market knowledge and global reach to provide sustainable materials and solutions to enhance personal comfort, enable food preservation, improve industrial processing and reduce environmental footprints. Further information can be found at: <http://refrigerants.dupont.com>.

**DuPont** is a science-based products and services company. Founded in 1802, DuPont puts science to work by creating sustainable solutions essential to a better, safer, healthier life for people everywhere. Operating in more than 70 countries, DuPont offers a wide range of innovative products and services for markets including agriculture and food; building and construction; communications; and transportation.

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Editorial contact:

Horst Ulrich Reimer

Public Relations Manager Europe, Middle East, Africa

DuPont Chemicals & Fluoroproducts

Du Pont de Nemours (Deutschland) GmbH

Telephone: +49 (0) 61 02/18-1297

Fax: +49 (0) 61 02/18-1318

E-Mail: [Horst-Ulrich.Reimer@dupont.com](mailto:Horst-Ulrich.Reimer@dupont.com)

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