

# DuPont™ ISCEON® MO99 refrigerant

## CASE HISTORY

### Replacement of R-22 in precision climate control systems

#### Switch to DuPont™ ISCEON® ensures environmental compliance at BT data centre

BT Group Plc is in the process of replacing R-22 with DuPont™ ISCEON® MO99 refrigerant (R-438A) as the refrigerant for precision climate control systems used to protect its data centre in West London, England. As well as offering a significantly lower global warming potential (GWP) than other refrigerant alternatives, ISCEON® MO99 has been designed to closely match the characteristics of R-22 for a quick and seamless replacement. This was also the experience of BT during a trial project to retrofit a GEA Denco close control system at the BT data centre ahead of the conversion of the remaining systems. The work was conducted by the air conditioning service contractor Temperature Control Ltd. (Manchester, England).

#### HCFC use ban

Since 1 January 2010, virgin HCFCs, predominantly in the form of R-22, have been banned from use in the maintenance or servicing of existing refrigeration and air conditioning (RAC) installations. From 2015 it will become illegal to use any HCFCs to service RAC equipment, making the service use of recycled or reclaimed HCFC illegal as of that date. It is with this next deadline in mind that companies such as BT, which use climate control systems to protect critical applications such as server rooms and data centres, are actively seeking a replacement for R-22 where changes in cooling performance and efficiency can be minimised.



*Temperature Control managed the conversion of the 17-year-old GEA Denco close control system to ISCEON® MO99 at the British Telecom data centre in West London. The DuPont refrigerant closely matches the characteristics of R-22 for a quick and seamless replacement.*

*Photo: DuPont*

#### ISCEON® MO99

ISCEON® MO99 is the most versatile R-22 replacement refrigerant in the ISCEON® product line. It has been designed to closely match the pressure, temperature, enthalpy, and mass flow properties of R-22 to provide an effective replacement over a wide range of evaporator temperatures. It has a 42% lower GWP than R-404A and is compatible with traditional and new lubricants, providing a quick, cost-effective R-22 replacement that requires minimal changes and adjustments to existing systems.



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## Temperature Control's Knowledge

It was Temperature Control's knowledge and experience of the ISCEON® 9-series of products that lead to its proposal of ISCEON® MO99 to BT as a solution for the conversion of the 17-year-old GEA Denco close control system at the West London data centre. The contractor was initially asked to carry out a trial on a 74KW Denco downflow CRAC (computer room air conditioning) system comprising of two circuits operating on R-22 refrigerant - one of eleven systems serving the data hall requiring approximately 700KW of cooling.

## Close Match to R-22

"The aim of the trial was to establish the performance of ISCEON® MO99 and whether there would be any loss in capacity or efficiency," recalls Wayne Buckley, business development director at Temperature Control Ltd. "This was critical to the data centre as there is only a 10 percent margin in spare capacity at the data centre to offer back up for failures and therefore the refrigerant must offer as close a match to R-22 as possible."

## Minimal Disruption

Based on a relatively simple method, tried and tested over the course of the last five years, Temperature Control carried out the retrofit in the course of just one day and with minimal disruption to operations at the data centre. Following satisfactory pre-commissioning checks the R-22 was removed and all critical seals were replaced to prevent future leakage when operating with the new refrigerant. The filter drier was also changed according to good engineering practice. The thermal expansion valve remained the same and was only minimally adjusted following the ISCEON® MO99-Retrofit Guidelines, available on the DuPont Homepage.

"Refrigerant capacity remained similar for the retrofit whilst evaporating temperatures were found to be slightly better than with R-22 in the system," recalls Wayne Buckley. "The efficiency of the equipment remained similar to when it was running with R-22 and tests showed a slight improvement in terms of its coefficient of performance."

## Positive Test Results

The success of the trial gave BT the confidence to continue with the conversion of its remaining 10 systems at the data centre. "The continued operation of the servers is critical and we need a safe method of cooling past the R22 phase-out date. ISCEON® MO99 provides this and allows business continuity as the retrofit works are carried out," confirms BT spokesperson Alan Tissington. The positive test results will also be used by Temperature Control in its promotion of ISCEON® MO99 as a simple and effective alternative to R-22 in critical air conditioning applications.

For further information:

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