

CABLE & WIRELESS CONVERTS TO NEW NON OZONE DEPLETING REFRIGERANT



The demise of Ozone Depleting Substances (ODS) is already well advanced with the phase out of CFCs in the European Union and the increasing restrictions that are being applied on the use of HCFCs, of which HCFC22 is by far the largest refrigerant in volume terms. HCFC22 will be restricted over the next few years with tighter controls, ban on use in new equipment and earlier and deeper cutbacks with eventual phase-out by 2010. During this period, this refrigerant is expected to become increasingly difficult to obtain as the tightening of the European Regulation has its effect, so that it makes practical sense to start now to move away to a more environmentally friendly and long term solution.

Wishing to be ahead of the game in replacing HCFC22, Cable and Wireless teamed up with Refrigerant Solutions Ltd (RSL), a company that specialises in processing and manufacturing refrigerants, to field trial a new refrigerant blend developed by RPL. The blend, called RS-44, is a non-ozone depleting refrigerant designed to replace HCFC22 in existing systems. Cable & Wireless currently run two specifications of air conditioning systems, using HCFC22 or HFC407C, and the field trial focussed on replacing the first of these two gases.

It was evident that both companies shared a commitment to take a pro-active approach to the upcoming phase-out of HCFC's and the eventual elimination of ozone depleting refrigerants. Estelle Hook, the Cable & Wireless Environment Manager, said: "We have been pursuing opportunities to eliminate Ozone Depleting Substances since the mid 1990s. The advent of this new refrigerant, RS-44, has provided us with a cost effective alternative to HCFC22 that is easy to install in our existing equipment. We believe that this has enabled us to make a significant improvement in our environmental performance. The trial has been a success and we were pleased to have the opportunity to be involved."



Estelle Hook: Cable & Wireless Environment Manager

Tony Moore, Senior Air Conditioning Engineer Mechanical & Electrical Operations, South, said: "Cable and Wireless's policy of installing state of the art air conditioning units provided an opportunity to convert from HCFC22 to a non ozone depleting alternative which would match the performance of HCFC22 and also be cost effective. The majority of our air conditioning systems have many years of life remaining so that it would not have been economic to buy new equipment to solve this problem.

After discussion with RSL we decided to convert two units, namely a 6 KW and a 12 KW DX free cool AHU units to RS-44, the new ozone friendly drop-in replacement for HCFC22. We selected our site at Bristol for the initial trials as it had a cross-section of commonly used air handling systems.



Cable and Wireless 30kW DX AHU unit being converted to RS-44 at Bristol.

Simple and straightforward. Lower discharge pressure and discharge temperature produced significant operating benefits.

Ran with no problems through hot summer with high ambient temperatures.

It was a very straightforward procedure. We recovered the HCFC22 charge and recharged the system with RS-44. Temperatures, pressures and running currents were recorded before and after conversion. The HCFC22 charge was removed and replaced with a similar amount of RS-44. There was no retrofitting required as RS-44 is compatible with all oils and system components, including thermostatic expansion valves and gasket materials. The only modification needed was an adjustment to the expansion valve superheat. It can't get any easier than that.

These units were monitored on a monthly basis throughout the summer months. With the hottest summer we have experienced for several years, the compressor ran with extra heat load and with no problems despite extreme ambient temperatures. We even noticed that units running on R407C tended to trip out on high pressure but this did not happen with RS-44, with its lower discharge pressure. RS-44 was also found to have a much lower discharge temperature than HCFC22, providing significant operating benefits.

Since these trials started, 72 air conditioning units have been changed from R22 to RS-44 with totally satisfactory results. It is our intention to convert all remaining R22 systems to this environmentally friendly refrigerant. I can declare that this process has been a complete success."

John Poole from RSL explained the purpose of the trial. "At that particular stage in the development of RS-44 we were looking for a typical air conditioning system that would challenge the oil return capabilities of our product while providing a good overall test of the physical properties and compatibility of the refrigerant in this type of application. We also wanted to illustrate to the service personnel and the equipment owner that no modifications or adjustments to the system would be necessary. It was simply a matter of removing the HCFC22 and recharging with RS-44. No change of lubricant or alterations to the equipment were made, and I am pleased to say that the system operated without any problems, and continues to do so today."

A number of other successful trials have since been carried out with RS-44 in commercial refrigeration systems and air conditioning systems in the UK, Canada, Asia and several European countries.