



# THE FINAL COUNTDOWN FOR R-22

Following on from last month's edition where we covered which refrigerants to use when replacing old R22 equipment with new, this month we will cover which refrigerants to use if you intend to convert rather than replace equipment.

In just under 11 months, it will be illegal to top up any refrigeration, air conditioning or heat pump equipment with HCFCs such as R-22. Whilst it will not be illegal to have equipment running on R-22, the down time and uncertainty of when a leak could render the equipment inoperable, could be extremely costly. Therefore, converting to another refrigerant now would be the sensible option, if the equipment is not to be replaced.

**The good news is that over the last 15 years a lot of R22 systems have been converted to alternative refrigerants with great success.**

There is no 'one size fits all solution' for R22 as it was used in such a diverse range of applications, therefore replacements have been spread across a number of different refrigerants, without one prevailing as the best across all applications as we try to achieve the best possible performance for the chosen operating conditions and temperatures.

## Conversion Choices

Logic would suggest that the same refrigerants that are used in new equipment could be used, however, in many cases that is not always possible, either due to differences in pressure, flammability, compatibility or componentry. Ammonia, Carbon dioxide and Hydrocarbons are not suitable for existing systems that were not designed for them, whilst the higher pressures of R404A, R410A, R422A and R507 are sometimes a problem for 15-30 year old equipment designed for the lower pressure of R22.

Although the term 'drop-in' was coined for CFC replacements, this was never the case for R22 replacements, as expansion valve sizing, heat transfer, mass flow, temperature glide, capacity, C.O.P and discharge temperatures are taken into consideration, not to mention oil return and compatibility. Nevertheless some refrigerants are easier to convert to than others, with the DuPont ISCEON® 9 Series being amongst the easiest. The age, condition and operational history of a system can also have a bearing on the conversion and with old equipment there may be other remedial work that may be needed at the same time.

In his second article for ACR Today, Peter Dinnage, Technical Director Climalife at IDS Refrigeration, discusses converting your existing R-22 based equipment.



For air conditioning systems, R417A, R422D, R407C and R438A have all proved very successful as R22 replacements, although the latter which is also known as ISCEON® MO99 is probably the most versatile across a range of applications, particularly where there is little room for adjustment of the expansion device. Sometimes choice is down to experience as familiarity is gained with the properties of a particular refrigerant. In all situations the supplier conversion guidelines should be consulted and followed to achieve the best results.

Throughout Europe R422D (ISCEON® MO29) has probably been the refrigerant most often chosen for conversion of direct expansion refrigeration systems, although R438A (ISCEON® MO99) is also growing in use not only because it has a GWP below 2500, but also because it is a closer match to R22 across a whole range of refrigeration and air conditioning applications. If multiple oil changes to a POE oil are considered acceptable, then R407F (Performax LT) and R407A for refrigeration applications can also be considered, even though both are more normally mooted as R404A replacements.



## A good time to convert

There is no need to go into a conversion blind or unprepared as there is already a lot of experience with refrigerant suppliers and fellow contractors on all the refrigerants that could be used successfully. It is sensible to ensure equipment doesn't have existing operational issues, before conversion as these invariably will still exist after conversion and have been known to be more pronounced. Frequently a conversion to a different refrigerant takes place after the R22 has been lost from a system, it is important to establish why and repair any leaks or other problems. It is also a good time to ensure that the correct grade and viscosity of oil is in the compressor.

Converted equipment if maintained properly can give extended life and a customer recently reported to me that a pumped circulation system converted back in 2009 to ISCEON® MO29 (R422D) had run leak free since conversion and the other system on site has also been converted.

End users are advised to use reputable contractors to carry out conversions, who can show experience of converting other equipment successfully and properly.

Once converted affix a label to the system stating which refrigerant has been used and complete the F-Gas log book.

For those unsure of what to use for their application there is plenty of good advice available from knowledgeable companies such as Climalife who can help with correct refrigerant choice for the operating conditions required and by drawing on the experiences of others.

With the end of R22 only a few months away, now is the time to act and replace it before it becomes a problem.

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