

DuPont™ ISCEON® REFRIGERANTS

CASE STUDY- ISCEON® MO29 (R422D)

Trane Water Chiller

Conversion of a Trane Dx water chiller from R22 to ISCEON® MO29.

Major companies set themselves Environmental objectives which include the elimination of ozone depleting substances on their sites and a reduction in CO₂ emissions by reducing energy consumption. Frequently the only way to achieve these objectives is by major capital expenditure on new equipment.

The British Energy site at Gloucester managed by ESS used to have a large range of R22 plant but back in 2002/3 they decided they wanted to replace R22 as soon as possible.

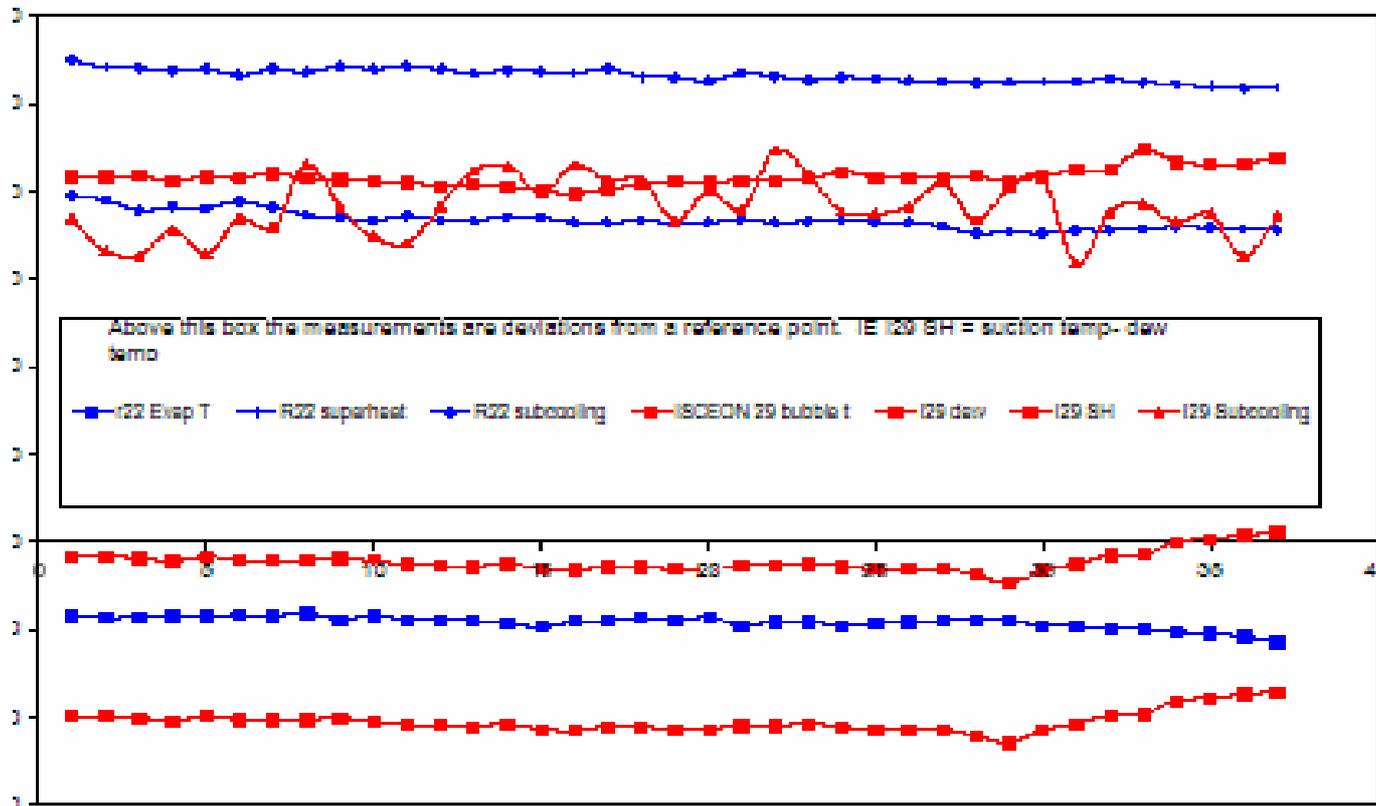
ISCEON® MO59 had already proven to be ideally suited for the range of Liebert close control Air Conditioning units on site. Conversion of these to the Zero ODP refrigerant ISCEON® MO59 was quick and effective and energy saving in the region of 10% was observed.

However, it was known that in certain circumstances, especially water chillers where they are running close to their design capacity, ISCEON® MO59 was not the most appropriate option.

Hence a Trane water chiller was identified for conversion to ISCEON® MO29.

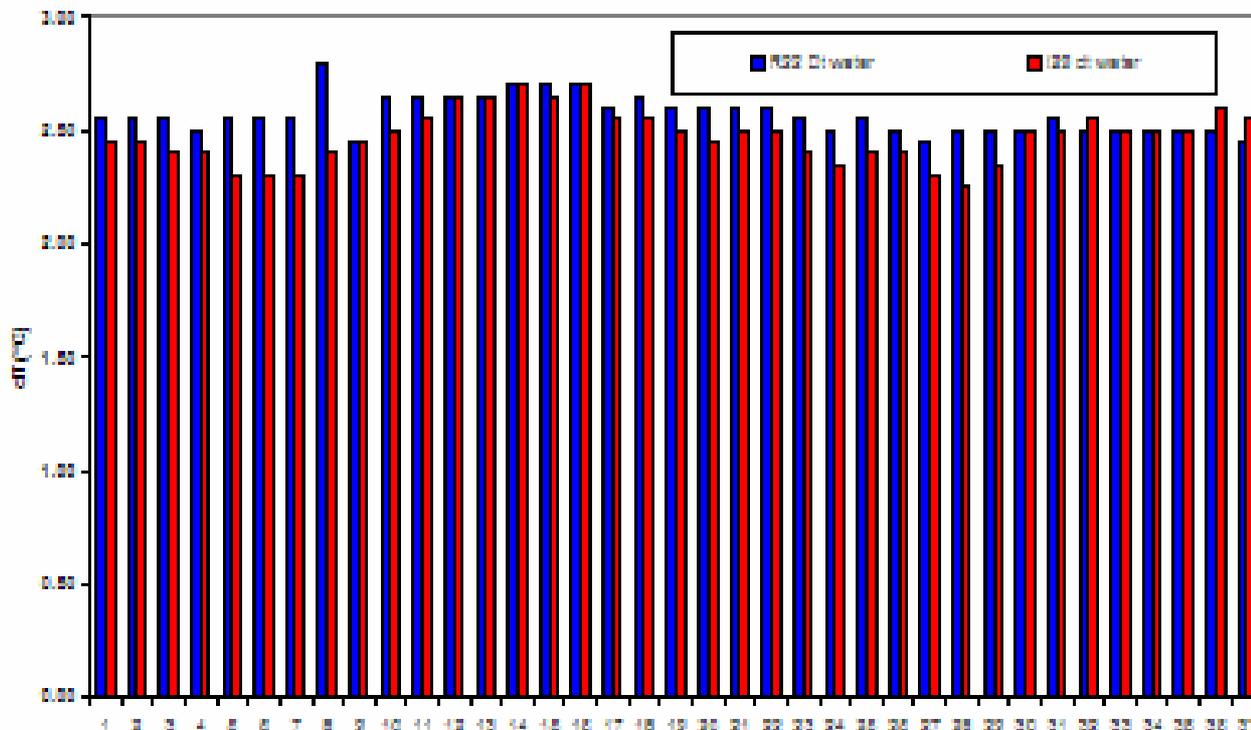
The conversion of this system demonstrated that ISCEON® MO29 was a close match to R-22 under the conditions of operation, meeting the cooling load, with the same operating conditions as when on R-22. The system conversion was performed with no system or lubricant changes, other than adjusting the Expansion Valve Superheat settings to optimise performance.

System Details
TRANE Water Chiller Model CGAB 027P
Twin circuit with total charge of 11.2kg of refrigerant R22
Air-cooled condenser. Shell and tube evaporator.

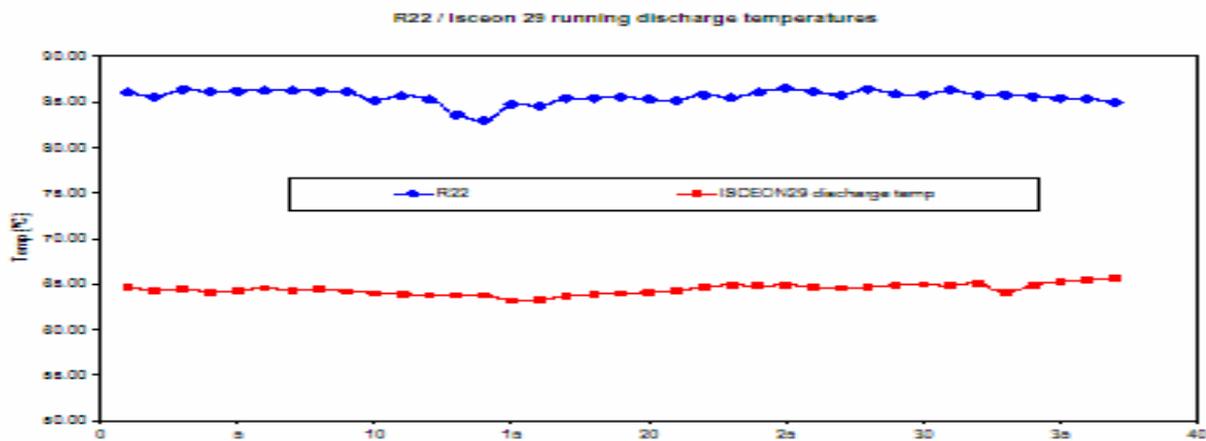


Typical operating conditions comparing R-22 and ISCEON® MO29

Comparison of the running ΔT of Water In and Water Out.



Comparison of running Compressor Discharge temperatures



NOTE: The water temperature and the ambient temperatures were slightly higher during the ISCEON[®] 29 test period.

ISCEON[®] MO29 Compared with R22

- The net Cooling Effect showed no significant difference between ISCEON[®] MO29 and R-22 .
- The Compressor Discharge Temperature was significantly lower by ~20° C
- The Bubble Point Suction Line pressure running on ISCEON[®] MO29 was higher by ~2-6%.
- The Superheat of the system as dew point was lower by 2° C.
- The Mean Evaporating Temperature is close to that of R-22 under similar operating conditions.
- The Superheat of the suction line is reduced but at 8.5° is above the critical 6°.

Conclusions:

The conversion to ISCEON[®] MO29 was straight forward and without problem. Optimisation of the system ensured that it was able to meet the cooling demand and offered the same level of cooling as R-22. In general terms, ISCEON[®] MO29 proved an extremely close match to R-22 and is operating within the parameters of the system and the system requirements.

ISCEON[®] MO29 provided the same cooling duty and was able to match the same ΔT Water Temperature In and Out as when on R-22.

ISCEON[®] MO29 has enabled the customer to eliminate an ozone depleting refrigerant ahead of legislation and without the need for major capital expenditure on new equipment.

Note; This case study was originally written in 2003 before ISCEON[®] MO29 became part of the DuPont™ ISCEON[®] 9 Series refrigerant family.

Please consult our website www.idsrefrigeration.co.uk for further product information and conversion guidelines.

The information contained in this document is given in good faith based on our current knowledge. We guarantee that our products comply with our sales specifications. This information must on no account be used as a substitute for necessary prior tests, which alone can ensure that a product is suitable for a given use.