

Conversion of Portuguese centrifugal chiller from R-12 to ISCEON® 39TC®

Application Profile



Application

Although the use of CFCs has been banned in the EU for several years now, there are many large chiller systems still operating with R-12. This is still legal until the chiller requires maintenance which would involve the handling of refrigerant: once removed from the system the CFC refrigerant cannot be replaced (neither can the charge be topped up after a leak). In such cases, owner of the chiller is faced with a dilemma: either replace the chiller, or convert it to operate with R-134a, requiring a substantial and costly mechanical upgrade. Now there is a third option: convert the chiller to use ISCEON® 39TC® a refrigerant which mimics the performance of R-12 very closely in centrifugal chillers.

Contractor

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Benefits gained

The conversion was easy, involving a change of lubricating oil from the existing mineral oil to a polyolester lubricant (in this case EMKARATE® RLH68 was chosen) and the change of refrigerant. A second, precautionary, oil change was carried out after 16 hours of operation.

The unit was started up and control adjustments made to account for slight differences in operating pressures between R-12 and ISCEON® 39TC®. The chiller operated well and has demonstrated capability to provide chilled water at the design temperatures (a slight reduction in cooling capacity – by around 5% – was observed). COP improved slightly. No surge problems were experienced.

Materials selected and why

Engineer Cesário Correia of ArClasse S.A., in Lisbon, was faced with such a situation with a Trane chiller (Model CVGA 015), which his company was responsible for, at the Lear Corporation in Lisbon. He decided to convert the chiller to ISCEON® 39TC®.

ISCEON® 39TC® is an easy-to-use, non-ozone-depleting HFC retrofit refrigerant for R-12 in centrifugal chillers. Its benefits include:

- the provision of an easy, quick, cost-effective retrofit, the retrofit typically requires a single lubricant change to polyol ester (POE) without additional flushing;
- it avoids expensive engineering changes to existing chiller equipment;
- it enables cost-effective continued use of existing chiller equipment.