

## FORANE<sup>®</sup> FX 100 (R-427A\*)

### THE CONVERSION FROM A COMPETITOR'S DROP-IN REFRIGERANT TO FORANE<sup>®</sup> FX 100 (R-427A\*) IN A BISCUIT FACTORY

The French company MULTI FROID SERVICES successfully carried out the replacement of a competitor's drop-in refrigerant by FORANE<sup>®</sup> FX 100 (R-427A\*) in a medium temperature refrigeration unit in a biscuit factory. The conversion took place in close cooperation with CLIMALIFE, Dehon Group, who distributes FORANE<sup>®</sup> refrigerants in France.

One year earlier, this unit supplying cold air to a refrigerated biscuit cooling tunnel was converted from R-22 to a competitor's drop-in with no oil change. Wishing to discontinue using any HCFCs, the customer decided to replace R-22 by this competitive product as it was a zero-ODP refrigerant. However, he very rapidly recognised important performance losses principally linked to the poor oil return of the drop-in. The evaporator had become clogged by mineral oil. He consequently asked CLIMALIFE for a better solution and decided to test FORANE<sup>®</sup> FX 100 (R-427A\*).

The conversion took place in the spring of 2006. Very satisfactory running conditions were rapidly reached and the customer is now highly satisfied with the performance of the installation particularly during the summer period.

#### **Unit description**

The main characteristics of the converted refrigeration unit are as follows:

- 1 reciprocating semi-hermetic BITZER compressor (BHS491)
- nominal refrigerating power: 2.2 kW
- water-cooled condenser
- bladed evaporator
- thermostatic expansion valve
- refrigerant charge: 5 kg
- air temperature set point: 3°C



#### **Retrofit procedure**

Non-toxic, non-flammable and zero ODP refrigerant, FORANE<sup>®</sup> FX 100 (R-427A\*) normally requires only that the original oil be drained once and replaced by a POE lubricant. Optimal performance close to R-22 can generally be achieved without a long and costly rinsing of the circuit thanks to a high tolerance of this new FORANE<sup>®</sup> grade to any residual original oil. However in view of the poor performance of the competitor's drop-in due to unsatisfactory oil return and hence fouling of the evaporator, it was decided in this case to rinse the circuit once.

After ensuring that the equipment was in a good state (a defective regulation valve had to be changed) and measuring the performance of the installation with the initial refrigerant charge, the competitor's product was replaced by FORANE<sup>®</sup> FX 100 (R-427A\*) and the mineral oil was replaced by a POE lubricant (Emkarate RL32H) with one rinsing step. The installation was then restarted and FORANE<sup>®</sup> FX 100 (R-427A\*) performance measured after running conditions had reached a steady state. Only a slight adjustment of the expansion valve was necessary.

Very satisfactory running conditions were rapidly reached. The temperature set point of 3°C was easily achieved with similar energy consumption despite 10% of residual mineral oil in the circuit.

\*R-427A : pending ASHRAE public review and approval

FORANE® FX 100 (R-427A\*) consequently fully satisfies the requirements of the European regulations while enabling existing equipment to continue to perform well without the need for any long and costly plant modifications.

The versatility of FORANE® FX 100 (R-427A\*) is also appreciated as it can be used to retrofit low temperature refrigeration equipment as well as air-conditioning installations, resulting in only one retrofit refrigerant for all R-22 units.

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