FORANE® REFRIGERANTS BY ARKEMA

FORANE® 427A

THE RETROFIT FROM R-22 TO FORANE® 427A IN A CONSERVATION CHAMBER AT A FISH FACTORY

ARKEMA INNOVATIVE CHEMISTRY

In September 2009, Solquimia operated a retrofit with Forane® 427A.in a cold chamber at a fish factory, BACALAOS PLEAMAR in Saragossa, Spain.

Unit description
The installation is equipped with two Copeland semi-hermetic compressors and two evaporators. The installation was made operational in 1989. Refrigerant charge of the installation is 16 kg.

Retrofit procedure: -

Arkema's Forane® 427A refrigerant has positioned itself as an excellent replacement candidate in low and - medium temperature refrigeration applications. Forane® 427A is an easy-to-use, non-toxic, non-flammable, and non-ozone depleting HFC refrigerant. In addition to having comparable performance to R-22, Forane® 427A has one of the lowest global warming potentials among all the R-22 replacements available on the market today. -

Retrofits to Forane® 427A require no change of any major component apart from the expansion valve. -

The retrofit was performed by Solquimia. An oil change and a leak detection were first operated. -

When changing the oil, it was found to be very acid; therefore, the replacement of the mineral oil with POE oil - avoided potential damage to the compressor. -

When pressurizing with dry nitrogen, a small leak was found close to the expansion valve in the low-pressure - section and the leak was repaired. -

The expansion valve was adjusted. -

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FORANE® 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® 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.

Combining environmental friendliness, high performance and simplicity is today a reality with FORANE® 427A !

Comparative Data

	Units	R22	Forane® 427A
Installation load	kg	16	16
Evaporation temperature/Boiling, dew points temperatures	℃	-10,3	-11,5/'-5,2
Condenstaion tenperature/boiling temperature	℃	34,9	4 0,1/35,3
Compressor entry temp	℃	13,4	9,7
Liquid sub cooling	℃	3,2	6,1
Condensation Pressure	Bar	13,5	14,6
Evaporation Pressure	Bar	3,5	3,6
Average amperage	A	7,7	7,7
condenser air change	℃	6	6
evaporator air change	℃	3	3
Discharge temperature	℃	80,8	65,8
Cooling capacity	KJ/m3	2449	2496
COP	-	4,77	4,75

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From these results we can tell that :

- The discharge temperature is lower with Forane® 427A ➔ protects and extents compressor's lifetime
- The cooling capacity is equivalent for both products ➔ performances are equivalent
- the electrical consumption is equivalent with Forane® 427A and R-22➔ the product is energy efficient

As a conclusion, installation runs with Forane® 427A and R-22 in the same conditions.

Forane® 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 unit modifications. The versatility of Forane® 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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