

ARKEMA'S FORANE® 427A CASE STUDY LES ALIMENTS LA MÈRE POULE, QUÉBEC, CANADA



BACKGROUND

As the HVACR industry continues to move away from R-22 due to regulatory pressures, Arkema's Forane® 427A refrigerant (R-427A) has proven itself as an excellent retrofit candidate for air conditioning and refrigeration applications. R-427A is an easy to use, non-ozone depleting HFC refrigerant, which, in addition to having comparable performance to R-22, has one of the lowest global warming potentials of any R-22 retrofit refrigerants available today.



R-427A's versatility was recently demonstrated in a critical, high-temperature refrigeration application at Les Aliments La Mère Poule, a baby food factory located in Saint-Léonard, Québec. A retrofit of a food preparation area was conducted by personnel from Réfrigération Supérieure Inc., a leading refrigeration service company based in the Montreal area. Claude De Carufel, owner of Réfrigération Supérieure Inc., learned about R-427A from Le Groupe Master S.E.C.'s refrigeration experts and Arkema's Forane® refrigerants team. Claude's interest in R-427A as a long-term retrofit solution was largely due to the fact that R-427A is one of the closest overall matches to R-22's performance and operating characteristics.

Project:

Les Aliments La Mère Poule

Location:

Saint-Léonard, Québec

Application:

High Temperature Refrigeration

RETROFIT APPLICATION

The baby food preparation room at La Mère Poule was cooled by an R-22 refrigeration system, utilizing a semi-hermetic, Copeland® reciprocating compressor, with a rooftop mounted condenser, and a ceiling mounted evaporator assembly. Total refrigerant charge weight for the system was 55 lbs of R-22. A room temperature of 55°F was maintained during food processing operations.

The retrofit was performed by Réfrigération Supérieure, with Arkema's engineers on site for support. Initial readings were taken to establish the system's performance with R-22. Recovery of the R-22 was followed by a quick change of the compressor oil to POE, replacement of the system filters, and deep evacuation. Optimization of the system charge produced the same charge weight (55 lbs) for R-427A as was used with R-22. No changes in settings were required for the expansion valves, pressure controls, or other system components.

RESULTS

Rapid pull-down of the room temperature was observed after the retrofit. Operating pressures with R-427A were close to those measured for R-22, while compressor discharge temperatures and amperage draw were both lower. Overall system performance after the retrofit was nearly indistinguishable from the system's previous performance with R-22.

This retrofit is a good example of the success Arkema's customers have with Forane® 427A refrigerant. If you have questions regarding your refrigerant plans, please contact Arkema to allow our technical service team the opportunity to assist with the R-22 transition.

Our technical service hotline is (800) 738-7695. More information can be found on our website, www.Forane427A.com.

FORANE® REFRIGERANT BASIC PROPERTY DATA		
	R-427A	R-22
Average Molecular Weight (g/mol)	90.4	86.5
Normal Boiling Point (NBP) (°F)	-44.8	-41.3
Latent Heat of Vaporization at NBP (BTU/lb)	102.0	100.5
Critical Temp (°F)	185.6	204.8
Critical Pressure (psia)	637.1	722.3
Density of Saturated Vapor @ NBP (lb/ft ³)	0.30	0.29
Density of Saturated Liquid at 77°F (lb/ft ³)	71.9	74.5
Specific Heat of Saturated Vapor at NBP (BTU/lb °R)	0.18	0.14
Specific Heat of Saturated Liquid at 77°F (BTU/lb °R)	0.38	0.30
Ozone Depletion Potential (ODP) (CFC-11=1.0)	0	0.055
ASHRAE Safety Group Classification	A1	A1
Occupational Exposure Limits (8 hr time/wt. Avg.) (ppm)	1,000	1,000
Global Warming Potential (GWP)	1,830	1,500

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