FORANE®427A

- **Non-ozone depleting refrigerant.**
- **R-22 retrofit refrigerant for air conditioning and low and medium temperature refrigeration systems.**

MAIN PROPERTIES

Composition	R-134a (50%) 	R-125 (25%) 	R-32 (15%) 	R-143a (10%) 
Type	HFC Zeotropic blend			
ASHRAE safety classification	A1 - non-toxic and non-flammable			
GWP*	2138			
Recommended lubricant	POE MO or AB (with oil separator)			

** GWP value for 100-year time horizons according to IPCC 2007 Fourth Assessment Report*

MAIN APPLICATIONS

Forane® 427A is a simplified and cost-effective retrofit solution for existing R-22 installations in a large range of applications:

- Commercial and domestic air conditioning: chillers, rooftop units, split systems, heat pumps, etc.
- Commercial refrigeration and food-processing sector : supermarkets, warehouses, cold rooms, etc.
- Industrial refrigeration.
- Transport refrigeration.

PERFORMANCES

- Forane® 427A is the **closest match to R-22** in terms of performances (**COP and cooling power**), **mass flow rates and operating pressures** over the whole range of temperatures.
- Discharge temperatures up to 10°C lower than those of R-22.
- Retrofits to Forane® 427A **do not require change-out** of the expansion valves, liquid lines, condensing units or any other costly parts of the installation. Expansion devices may only need to be adjusted to optimize system performance.
- One of the **lowest GWP** among R-22 retrofit solutions.

LUBRICATION

Mineral oil (MO) and alkylbenzene (AB) are often acceptable with Forane® 427A, if the system has an oil separator and reliable oil return with R-22. Otherwise, the oil must be changed to POE. If POE is required, usually only one drainage of the system's oil is needed, as Forane® 427A can tolerate high levels of residual MO or AB remaining in the system (up to 10-15%).

CHARGING

Due to the zeotropic nature of Forane® 427A, it should only be charged as liquid to prevent fractionation (changes in the designed refrigerant composition). In situations where vapor would normally be charged into a system, a valve should be installed in the charging line to flash liquid from the cylinder into vapor.

DELIVERIES

Forane® 427A can be delivered in various packaging:

- **bulk**: ISO container (18 tons) or ton-tank (800 kg).
- **other packaging available under requests.**

FORANE® REFRIGERANTS BY ARKEMA

FORANE®427A

THERMODYNAMIC PROPERTIES

This information is based on values calculated using the NIST REFPROP Database (NIST Standard Reference Database 23, Version 9.0, Lemmon, E. W., Huber, M. L.,and McLinden, M. O., Thermophysical Properties Division, 2010).

Critical temperature: **85°C**

Saturation points (bubble and dew points at same composition).

Temperature (°C)	Liquid Phase Pressure (bar)	Vapor Phase Pressure (bar)	Liquid Phase Density (kg/m³)	Vapor Phase Density (kg/m³)	Liquid Phase Enthalpy (kJ/kg)	Vapor Phase Enthalpy (kJ/kg)	Liquid Phase Entropy (kJ/(kg.K))	Vapor Phase Entropy (kJ/(kg.K))
-40	1,2	0,8	1360	4	146	377	0,79	1,79
-35	1,5	1,1	1344	5	153	380	0,82	1,78
-30	1,8	1,4	1329	6	159	382	0,84	1,77
-25	2,2	1,7	1313	8	166	385	0,87	1,77
-20	2,7	2,1	1296	10	173	388	0,90	1,76
-15	3,3	2,6	1280	12	179	391	0,92	1,75
-10	3,9	3,1	1263	14	186	394	0,95	1,75
-5	4,6	3,8	1245	17	193	396	0,97	1,74
0	5,5	4,5	1227	20	200	399	1,00	1,74
5	6,4	5,3	1209	24	207	401	1,03	1,73
10	7,5	6,3	1190	28	214	404	1,05	1,73
15	8,6	7,4	1170	33	221	406	1,08	1,72
20	10,0	8,6	1150	38	229	408	1,10	1,72
25	11,4	9,9	1129	45	236	410	1,13	1,71
30	13,0	11,4	1107	52	244	412	1,15	1,71
35	14,8	13,1	1084	60	252	414	1,18	1,71
40	16,8	15,0	1059	70	260	415	1,20	1,70
45	18,9	17,0	1033	81	268	416	1,23	1,70
50	21,3	19,3	1005	93	276	417	1,25	1,69
55	23,8	21,7	975	108	285	417	1,28	1,68
60	26,6	24,5	942	126	294	417	1,30	1,68
65	29,5	27,5	905	147	304	417	1,33	1,67

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