



Caratteristiche ed applicazioni dell'R-427A / sostituto dell'R-22

Si tratta di una miscela composta al 100% da refrigerante h.c. Non tossico, non infiammabile e il suo ODP (capacità di esaurimento dell'ozono) è pari a zero.

Sicurezza: la classificazione di sicurezza è A1/A1 (Gruppo L1)

L'R-427A è compatibile con oli POE (POE) con una tolleranza di tasso residuo compreso tra 2,1 e 15% di olio minerale o alchilbenzene, nella maggior parte dei casi. E' compatibile con elastomeri e materie plastiche utilizzate con R-407C e R-404A

L'R-427A **tecnicamente** può essere usato per convertire impianti di raffreddamento a bassa temperatura come impianti di condizionamento.

Consente di specificare lo svuotamento dell'olio originale del sistema (minerale o alchibenzenico) sostituendolo con un olio POE.

Non mescolarlo con l'R-22.

Deve sempre essere trasferito in fase liquida o a pieno carico se eseguito in fase gassosa.

Componenti:

Nome chimico	% in peso	N° . CE
1,1,1,2- Tetrafluoroetano (R-134a)	50	212-377-0
Pentafluoroetano (R-125)	25	206-557-8
1,1,1-Trifluoroetano (R-143a)	10	206-996-5
Difluorometano (R-32)	15	200-839-4

Proprietà fisiche:

PROPRIETA' FISICHE		R-427A	R22
Peso molecolare	(g/mol)	90,4	86,5
Temperatura di ebollizione a 1,013 bar	(°C)	-42,7	-40,8
Temperatura critica	(°C)	86,8	96
Pressione critica	(bar abs)	44,0	49,8
Pressione del vapore (25°C)	(bar abs)	11,2	10,4
Pressione del vapore (50°C)	(bar abs)	20,8	19,7
Densità liquido 25°C	(Kg/dm ³)	1,151	1,193
Densità del vapore saturato a 1,013 bar	(Kg/m ³)	4,78	4,70
Glide temp. a 1,013 bar	(K)	7,1	0
Conduttività termica del liquido a 25°C	(W/m.K)	0,081	0,083
Cond.Term. vapore a 25°C e 1,013 bar	(W/m.K)	0,014	0,012
Tensione superficiale a 25°C	(mN/m)	6,9	8,1
Viscosità del liquido a 25°C	(mPa.s)	0,15	0,17
Viscosità del vapore a 25°C e 1,013 bar	(mPa.s)	0,013	0,013
Calore specifico del liquido a 25°C	(kj/kg.K)	1,58	1,26
Calore spec. del vap. a 25°C e 1,013 bar	(kj/kg.K)	0,842	0,68
Infiammabilità		No	No
Tossicità	(ppm)	1000	1000
Classificazione di sicurezza (Gruppo L1)		A1/A1	A1
ODP		0	0,055
GWP		1830	1500

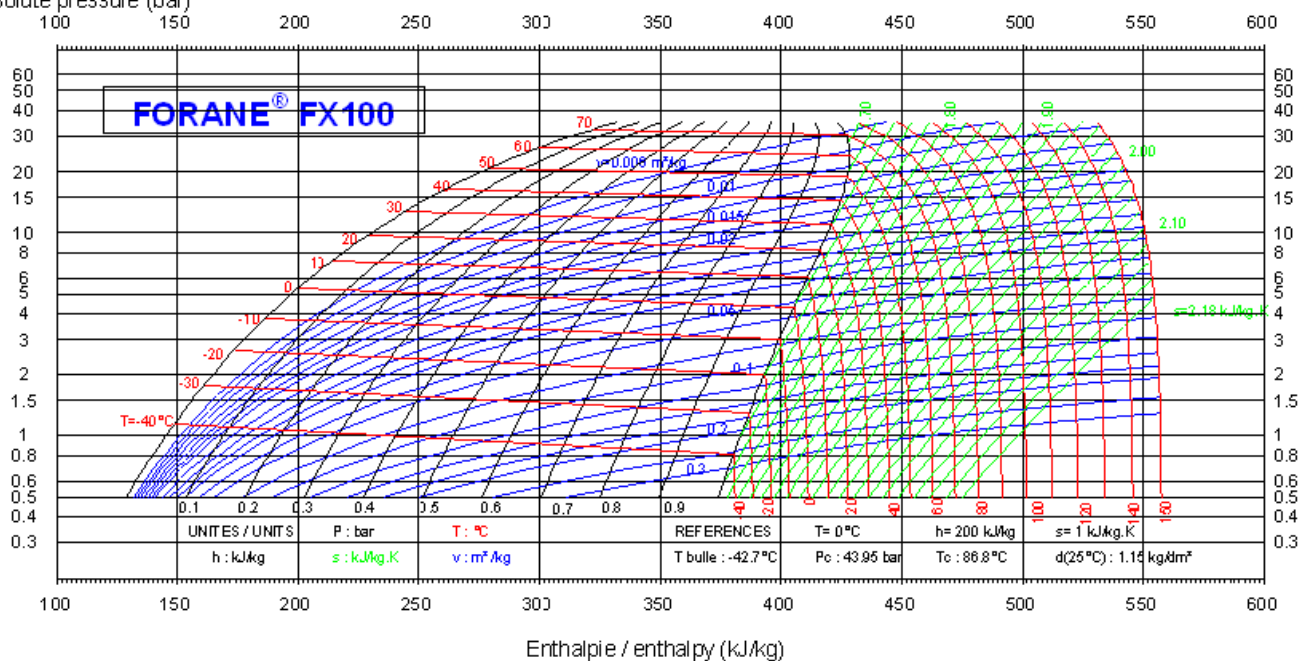


Confronto dei dati dei test condotti da Arkema:

	UNIDADES DE REFRIGERACIÓN MEDIA Y BAJA TEMPERATURA EN UN SUPERMERCADO		UNIDAD DE ENFRIAMIENTO DE AGUA	UNIDAD DE ENFRIAMIENTO DE LÍQUIDO CON DOBLE COMPRESIÓN
Potencia frigorífica nominal	9 kW	6 kW	400 kW	50 kW
Regulación de temperatura	0 à 8°C	- 20°C à - 23°C	6°C	- 20°C
Carga de FORANE® 427A	76 kg	36 kg	75 kg	20 kg
Retorno de aceite	OK con un 14,7 % de aceite mineral residual	OK con un 5,2 % de aceite mineral residual	OK con un 11,4 % de aceite mineral residual	OK con un 2,1 % de aceite alquibenceno residual
Consumo de energía respecto al R-22	Igual consumo de energía que con el R-22			

CENTRE DE RECHERCHE RHÔNE-ALPES

Pression absolue
Absolute pressure (bar)





FORANE® 427A											
Properties of saturated liquid and saturated vapor											
P (Abs) bar	Liquid					Vapor					Latent heat of vaporization Lv kJ/kg
	Bubble T' °C	Volume v' dm³/Kg	Density p' kg/m³	Enthalpy h' kJ/kg	Entropy s' kJ/(kg.K)	Dew T T'' °C	Volume v'' m³/Kg	Density p'' kg/m³	Enthalpy h'' kJ/kg	Entropy s'' kJ/(kg.K)	
0.0	-100.2	0.637	1570.97	81.30	0.466	-91.7	6.667	0.15	346.50	1.961	265.2
0.1	-79.6	0.661	1513.14	103.50	0.587	-71.6	1.475	0.68	359.30	1.881	255.8
0.2	-70.6	0.672	1487.06	113.40	0.637	-63.8	0.852	1.17	365.00	1.855	251.6
0.3	-64.5	0.681	1468.97	120.30	0.670	-56.8	0.605	1.65	368.90	1.840	248.6
0.4	-59.8	0.687	1454.78	125.70	0.696	-52.2	0.471	2.12	371.90	1.829	246.3
0.5	-55.9	0.693	1442.94	130.10	0.716	-48.4	0.387	2.59	374.40	1.821	244.3
0.6	-52.5	0.698	1432.70	134.00	0.734	-45.2	0.329	3.04	376.60	1.815	242.6
0.7	-49.6	0.702	1423.62	137.40	0.749	-42.3	0.286	3.50	378.40	1.810	241.0
0.8	-47.0	0.707	1415.42	140.50	0.763	-39.7	0.254	3.94	380.10	1.805	239.6
0.9	-44.6	0.710	1407.92	143.30	0.775	-37.4	0.228	4.39	381.60	1.801	238.3
1.0	-42.4	0.714	1401.00	145.90	0.787	-35.3	0.207	4.83	383.00	1.798	237.1
1.1	-40.4	0.717	1394.55	148.30	0.797	-33.3	0.190	5.27	384.20	1.795	236.0
1.2	-38.5	0.720	1388.49	150.50	0.806	-31.5	0.175	5.71	385.40	1.793	234.9
1.3	-36.8	0.723	1382.79	152.60	0.815	-29.8	0.163	6.14	386.50	1.790	233.9
1.4	-35.1	0.726	1377.38	154.70	0.824	-28.2	0.152	6.58	387.60	1.788	232.9
1.5	-33.5	0.729	1372.23	156.60	0.832	-26.6	0.143	7.01	388.50	1.786	232.0
1.6	-32.1	0.731	1367.32	158.40	0.839	-25.2	0.134	7.44	389.50	1.784	231.1
1.7	-30.6	0.734	1362.61	160.10	0.847	-23.8	0.127	7.87	390.40	1.782	230.2
1.8	-30.0	0.735	1360.55	160.90	0.850	-23.2	0.124	8.07	390.70	1.782	229.8
2.2	-25.0	0.744	1343.69	167.10	0.875	-18.3	0.102	9.78	393.80	1.776	226.7
2.6	-20.7	0.753	1328.84	172.60	0.897	-14.1	0.087	11.48	396.40	1.772	223.8
3.0	-16.8	0.760	1315.46	177.50	0.916	-10.3	0.076	13.17	398.70	1.768	221.2
3.4	-13.4	0.767	1303.23	182.00	0.933	-7.0	0.067	14.87	400.90	1.765	218.7
3.8	-10.2	0.774	1291.90	186.20	0.949	-3.9	0.060	16.56	402.60	1.762	216.4
4.2	-7.3	0.780	1281.31	190.00	0.963	-1.1	0.055	18.25	404.20	1.760	214.2
4.6	-4.6	0.787	1271.34	193.70	0.977	1.5	0.050	19.94	405.80	1.758	212.1
5.0	-2.1	0.792	1261.90	197.10	0.989	4.0	0.046	21.64	407.20	1.756	210.1
5.4	0.3	0.798	1252.90	200.40	1.001	6.3	0.043	23.34	408.40	1.754	208.1
5.8	2.5	0.804	1244.30	203.50	1.012	8.5	0.040	25.05	409.60	1.752	206.2
6.2	4.6	0.809	1236.04	206.40	1.023	10.5	0.037	26.76	410.80	1.751	204.3
6.2	4.8	0.809	1235.43	206.70	1.024	10.7	0.037	26.88	410.80	1.751	204.2
6.6	6.8	0.815	1227.50	209.50	1.034	12.6	0.035	28.60	411.90	1.749	202.4
7.0	8.7	0.820	1219.83	212.30	1.044	14.5	0.033	30.33	412.80	1.748	200.6
7.4	10.6	0.825	1212.41	214.90	1.053	16.3	0.031	32.06	413.80	1.747	198.9
7.8	12.3	0.830	1205.20	217.50	1.062	18.0	0.030	33.80	414.60	1.745	197.1
8.2	14.0	0.835	1198.19	220.00	1.070	19.6	0.028	35.55	415.40	1.744	195.5
8.6	15.7	0.839	1191.36	222.40	1.079	21.2	0.027	37.31	416.20	1.743	193.8
9.0	17.3	0.844	1184.69	224.70	1.087	22.8	0.026	39.08	416.90	1.742	192.2
9.4	18.8	0.849	1178.17	227.00	1.094	24.2	0.024	40.86	417.60	1.741	190.6
9.8	20.3	0.853	1171.79	229.30	1.102	25.7	0.023	42.64	418.30	1.740	189.0
10.0	21.0	0.856	1168.64	230.40	1.106	26.4	0.023	43.54	418.60	1.739	188.2
11.0	24.5	0.867	1153.35	235.70	1.123	29.7	0.021	48.08	420.00	1.737	184.3
13.0	30.7	0.889	1124.54	245.70	1.156	35.8	0.017	57.37	422.40	1.732	176.7
15.0	36.3	0.911	1097.47	254.90	1.185	41.1	0.015	67.01	424.20	1.728	169.3
17.0	41.4	0.933	1071.59	263.60	1.212	46.0	0.013	77.05	425.60	1.723	162.0
19.0	46.1	0.956	1046.51	271.90	1.237	50.4	0.011	87.54	426.50	1.719	154.7
21.0	50.4	0.979	1021.91	279.80	1.261	54.5	0.010	98.56	427.10	1.714	147.3
23.0	54.4	1.002	997.51	287.60	1.284	58.3	0.009	110.16	427.40	1.709	139.8
25.0	58.1	1.028	973.04	295.10	1.307	61.8	0.008	122.46	427.30	1.703	132.2
27.0	61.7	1.055	948.21	302.60	1.328	65.2	0.007	135.57	426.90	1.698	124.3
29.0	65.1	1.084	922.70	310.00	1.350	68.3	0.007	149.65	426.20	1.691	116.2
31.0	68.3	1.116	896.12	317.50	1.371	71.3	0.006	164.91	425.10	1.685	107.6
33.0	71.4	1.152	867.89	325.10	1.392	74.1	0.006	181.65	423.60	1.677	98.5
35.0	74.3	1.194	837.20	333.00	1.414	76.8	0.005	200.29	421.60	1.668	88.7
35.5	75.0	1.206	828.99	335.00	1.419	77.4	0.005	205.33	421.00	1.666	86.1

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