



## Characteristics and applications

The R-449A refrigerant gas is an HFC+HFO blend and a direct drop-in replacement for R-404A and R-507 in existing systems. As with all HFC+HFO refrigerants, it causes no damage to the ozone layer. Its safety classification is **A1** group **L1**, meaning that it has a low toxicity and is non-flammable.

Some of its main properties are:

- It is a good alternative to R-404A and R-507 for new medium and low temperature systems.
- It is a **direct drop-in** replacement for R-404A and R-507 in existing commercial and industrial medium and low temperature refrigeration equipment that uses positive displacement compressors and direct expansion systems (centralised systems, distributed systems, refrigerated production areas, chiller/freezer rooms, refrigerated warehouses, plug-in equipment, etc.).
- It is compatible with the equipment, components, lubricant and joints of an existing R-507 or R-404A system.
- It has a low global warming potential (GWP). A reduction of 64.38% in comparison to R-404A.
- It is compatible with POE synthetic oils.

## Toxicity and storage

R-449A is a substance with a very low toxicity. R-449A vapours are heavier than the air, so tend to accumulate near the floor. High atmospheric concentrations could cause anaesthetic effects and asphyxiation. Prolonged exposure may lead to heart arrhythmia and could cause sudden death.

R-449A cylinders should be stored in a cool and well-ventilated place, away from heat sources.

## Components

Chemical Name	% By weight	Nº CAS	Nº . CE
1,1,1,2-Tetrafluoroethane (R-134a)	25,5 - 26,7	811-97-2	212-377-0
2,3,3,3-Tetrafluoroprop-1-ene (R-1234yf)	24,3 - 25,5	754-12-1	468-710-7
Pentafluoroethane (R-125)	24,5 - 25,7	354-33-6	206-557-8
Difluoromethane (R-32)	23,3 - 24,5	75-10-5	200-839-4



## Physical properties

PHYSICAL PROPERTIES	UNITS	R-449A
Molecular weight	(g/mol)	87.2
Boiling point (at 1,013 bar)	(°C)	-46.0
Critical temperature	(°C)	81.5
Critical pressure	(bar)	44.5
Vapour pressure (25°C)	(bar)	12.75
Liquid density (21,1°C)	(Kg/m <sup>3</sup> )	1113.3
Sliding temperature or glide	(K)	~4
Flammability		No
ODP	-	0
GWP	-	1397 *

\* According to IPCC-AR4/CIE (Fourth Assessment Report of the Intergovernmental Panel of Experts on Climate Change)-2007.

## Pressure / temperature table

TEMP. (°C)	ABSOLUTE PRESSURE (bar)		DENSITY (Kg/m <sup>3</sup> )		ENTHALPY (kJ/Kg)		ENTROPY (kJ/Kg.K)	
	BUBBLE	DEW	BUBBLE	DEW	BUBBLE	DEW	BUBBLE	DEW
-50	0.83	0.60	1361.6	2.92	133.1	370.6	0.732	1.812
-45	1.06	0.79	1346.5	3.75	139.5	373.5	0.760	1.801
-40	1.34	1.01	1331.2	4.74	146.0	376.5	0.788	1.791
-35	1.68	1.28	1315.6	5.94	152.5	379.4	0.815	1.782
-30	2.07	1.61	1299.7	7.35	159.1	382.3	0.843	1.773
-25	2.53	1.99	1283.6	9.03	165.7	385.1	0.870	1.765
-20	3.07	2.45	1267.1	10.99	172.4	387.9	0.896	1.758
-15	3.70	2.98	1250.2	13.27	179.2	390.6	0.922	1.751
-10	4.42	3.60	1233.0	15.92	186.0	393.2	0.948	1.745
-5	5.23	4.31	1215.3	18.97	193.0	395.8	0.974	1.739
0	6.16	5.13	1197.1	22.48	200.0	398.2	1.000	1.734
5	7.20	6.06	1178.3	26.51	207.1	400.6	1.026	1.729
10	8.38	7.11	1159.0	31.11	214.4	402.8	1.051	1.724
15	9.68	8.29	1138.9	36.37	221.7	405.0	1.076	1.719
20	11.14	9.62	1118.0	42.37	229.2	406.9	1.102	1.714
25	12.75	11.10	1096.2	49.23	236.8	408.7	1.127	1.709
30	14.52	12.74	1073.3	57.08	244.6	410.3	1.152	1.704
35	16.47	14.57	1049.3	66.09	252.5	411.7	1.178	1.699
40	18.61	16.59	1023.7	76.46	260.7	412.8	1.203	1.693
45	20.95	18.82	996.5	88.49	269.1	413.6	1.229	1.687
50	23.49	21.28	967.0	102.54	277.7	414.0	1.255	1.681

Mollier Diagram

