



Characteristics and applications

The R-450A refrigerant gas is an azeotropic HFC+HFO blend and a direct drop-in replacement for R-134a 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-134a for new medium and high temperature systems.
- It is a **direct drop-in** replacement for R-134a in existing commercial and industrial medium and high temperature refrigeration equipment that uses positive displacement compressors and direct expansion systems. It is also suitable for heat pumps, vending machines, drink dispensers, centrifugal air and water chillers and for replacing R-134a in medium-temperature circuits of two-stage hybrid cascade systems with CO₂.
- It is compatible with the equipment, components, lubricant and joints of an existing R-134a system.
- It has a low global warming potential (GWP). A reduction of 57.76% in comparison to R-134a.
- It is compatible with POE synthetic oils.

Toxicity and storage

R-450A is a substance with a very low toxicity. R-450A 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-450A cylinders should be stored in a cool and well-ventilated place, away from heat sources.

Components

Chemical Name	% By weight	N° CAS	N° . CE
trans-1,3,3,3-Tetrafluoroprop-1-ene (R-1234ze)	58	29118-24-9	471-480-0
1,1,1,2- Tetrafluoroethane (R-134a)	42	811-97-2	212-377-0



Physical properties

PROPIEDADES FÍSICAS	UNIDADES	R-450A
Molecular weight	(g/mol)	108.6
Boiling point (at 1,013 bar)	(°C)	-23.1
Critical temperature	(°C)	104.4
Critical pressure	(bar)	38.2
Critical density	(Kg/m ³)	492.2
Liquid density (0°C)	(Kg/m ³)	1257.7
Vapour density (25°C)	(Kg/m ³)	29.6
Vapour pressure (20°C)	(bar)	5.54
Vapour pressure (54,4°C)	(bar)	13.89
Sliding temperature or glide	(K)	0.4
Flammability		No
ODP	-	0
GWP	-	604 *

* According to IPPCC-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 ³)		ENTHALPY (kJ/Kg)		ENTROPY (kJ/Kg.K)	
	BUBBLE	DEW	BUBBLE	DEW	BUBBLE	DEW	BUBBLE	DEW
-50	0.27	0.26	1397.2	1.61	136.01	352.98	0.742	1.717
-46	0.34	0.33	1386.3	1.99	140.98	355.69	0.764	1.711
-42	0.43	0.41	1375.3	2.45	145.96	358.40	0.786	1.707
-38	0.53	0.51	1364.3	2.98	150.97	361.10	0.808	1.703
-34	0.65	0.62	1353.1	3.59	156.00	363.81	0.829	1.699
-30	0.79	0.76	1341.9	4.31	161.06	366.51	0.850	1.696
-26	0.95	0.92	1330.5	5.13	166.15	369.19	0.870	1.693
-22	1.14	1.10	1319.0	6.08	171.26	371.87	0.891	1.691
-18	1.36	1.31	1307.3	7.15	176.41	374.53	0.911	1.689
-14	1.60	1.55	1295.5	8.37	181.59	377.17	0.931	1.687
-10	1.88	1.82	1283.5	9.75	186.80	379.79	0.951	1.686
-6	2.20	2.13	1271.3	11.30	192.05	382.39	0.971	1.684
-2	2.55	2.48	1259.0	13.05	197.34	384.96	0.990	1.683
2	2.95	2.87	1246.2	14.99	202.67	387.50	1.010	1.683
6	3.39	3.30	1233.6	17.17	208.04	390.01	1.029	1.682
10	3.88	3.78	1220.6	19.59	213.45	392.48	1.048	1.681
14	4.42	4.31	1207.2	22.28	218.91	394.91	1.067	1.681
18	5.02	4.90	1193.6	25.26	224.42	397.30	1.086	1.681
22	5.68	5.55	1179.7	28.56	229.98	399.63	1.105	1.680
26	6.40	6.25	1165.4	32.21	235.60	401.91	1.123	1.680
30	7.19	7.03	1150.8	36.25	241.29	404.13	1.142	1.680
34	8.04	7.87	1135.7	40.71	247.03	406.28	1.161	1.680
38	8.98	8.79	1120.2	45.64	252.85	408.36	1.179	1.680
42	9.99	9.79	1104.1	51.09	258.74	410.36	1.198	1.679
46	11.08	10.87	1087.4	57.12	264.71	412.26	1.216	1.679
50	12.26	12.04	1070.1	63.80	270.77	414.05	1.235	1.679



Mollier Diagram

