



R-1234yf

Characteristics and applications

The R-1234yf refrigerant gas is an HFO that replaces R-134a in the air conditioning systems of new automobile models. As with all HFO refrigerants, it causes no damage to the ozone layer. It has great thermal and chemical stability, low toxicity and it is only slightly flammable. It is also highly compatible with the majority of materials. Its safety classification is **A2L** group **L2**.

It is miscible with polyolester synthetic oils (POE) and polyalkylene glycols (PAG), so it should always be used with these kinds of oils.

It is used in the air conditioning systems of new automobile models. It is also used in chillers in industrial and commercial industries.

Toxicity and storage

R-1234yf is a substance with a very low toxicity. R-1234yf cylinders should be stored in a cool and well-ventilated place, away from heat sources. The vapours from R-1234yf are heavier than air and may cause asphyxiation by reducing the oxygen in the air being breathed. Protect it from solar rays and avoid exposing it to temperatures over 50 °C.

Components

Chemical Name	% By weight	CAS No.	EC No.
2,3,3,3-Tetrafluoropropene (R-1234yf)	100	754-12-1	468-710-7



Physical properties

PHYSICAL PROPERTIES	UNITS	R-1234yf
Molecular weight	(g/mol)	114,0
Boiling point	(°C)	-29,4
Critical temperature	(°C)	94,7
Critical pressure	(bar)	33,81
Critical density	(Kg/m ³)	475,55
Vapour pressure (21,1°C)	(bar)	6,07
Vapour pressure (54,4°C)	(bar)	14,2
Density	(Kg/m ³)	1100
Solubility in water (24°C)	(mg/l)	198,2
Sliding temperature or glide	(K)	0
Safety classification		A2L
Lower flammability limit	(Kg/m ³)	0,289
Auto-ignition temperature	(°C)	405
ODP	-	0
GWP	-	4 *

* 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	0,37	0,37	1318,4	2,35	139,6	329,9	0,757	1,610
-46	0,46	0,46	1307,9	2,87	144,2	332,5	0,777	1,607
-42	0,57	0,57	1297,2	3,46	148,8	335,2	0,797	1,604
-38	0,68	0,68	1286,5	4,15	153,4	337,9	0,817	1,602
-34	0,83	0,83	1275,6	4,95	158,1	340,6	0,837	1,600
-30	0,99	0,99	1264,5	5,86	162,8	343,3	0,857	1,599
-26	1,18	1,18	1253,4	6,89	167,6	346,0	0,876	1,598
-22	1,39	1,39	1242,0	8,07	172,4	348,7	0,895	1,597
-18	1,63	1,63	1230,5	9,39	177,3	351,4	0,915	1,597
-14	1,91	1,91	1218,8	10,89	182,3	354,1	0,934	1,597
-10	2,22	2,22	1207,0	12,56	187,3	356,7	0,953	1,597
-6	2,56	2,56	1194,9	14,43	192,3	359,4	0,972	1,597
-2	2,95	2,95	1182,5	16,52	197,4	362,0	0,991	1,598
2	3,38	3,38	1170,0	18,84	202,6	364,6	1,009	1,598
6	3,85	3,85	1157,2	21,41	207,8	367,2	1,028	1,599
10	4,38	4,38	1144,0	24,27	213,1	369,7	1,047	1,600
14	4,95	4,95	1130,6	27,43	218,5	372,2	1,065	1,601
18	5,58	5,58	1116,9	30,92	223,9	374,7	1,084	1,602
22	6,27	6,27	1102,8	34,77	229,3	377,1	1,102	1,603
26	7,02	7,02	1088,2	39,03	234,9	379,5	1,121	1,604
30	7,84	7,84	1073,3	43,73	240,5	381,8	1,139	1,605
34	8,72	8,72	1057,9	48,92	246,2	384,0	1,158	1,606
38	9,68	9,68	1042,0	54,66	252,0	386,1	1,176	1,607
42	10,71	10,71	1025,5	61,01	257,8	388,2	1,194	1,608
46	11,82	11,82	1008,3	68,05	263,8	390,1	1,213	1,609
50	13,02	13,02	990,4	75,88	269,9	392,0	1,231	1,609

Mollier Diagram

