



Characteristics and applications

The R-452A 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 an alternative to R-404A and R-507 for new medium and low temperature refrigerated transport systems with positive displacement compressors and direct expansion systems, and also for new commercial and industrial refrigerated systems.
- It is a **direct drop-in** replacement for R-404A and R-507 in existing refrigerated transport and commercial and industrial refrigeration equipment.
- Refrigerated transport applications: refrigerated lorries, refrigerated vans, refrigerated containers (reefers).
- It is compatible with the equipment, components, lubricant and joints of an existing R-507 or R-404A system,
- The global warming potential (GWP) is 45.41% less than that of R-404A.
- It is compatible with POE synthetic oils.

Toxicity and storage

R-452A is a substance with a very low toxicity. R-452A 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-452A cylinders should be stored in a cool and well-ventilated place, away from heat sources.

Components

Chemical Name	% By weight	N° CAS	N° . CE
Pentafluoroethane (R-125)	59,0	354-33-6	206-557-8
2,3,3,3-Tetrafluoroprop-1-ene (R-1234yf)	30,0	754-12-1	468-710-7
Difluoromethane (R-32)	11,0	75-10-5	200-839-4



Physical properties

PHYSICAL PROPERTIES	UNITS	R-452A
Molecular weight	(g/mol)	103.5
Boiling point (at 1,013 bar)	(°C)	-47.0
Critical temperature	(°C)	74.9
Critical pressure	(bar)	40.02
Vapour pressure (25°C)	(bar)	13.16
Liquid density (21,1°C)	(Kg/m ³)	1148.8
Sliding temperature or glide	(K)	~3
Flammability		No
ODP	-	0
GWP	-	2140 *

* 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	0.87	0.72	1419.6	4.17	137.7	332.7	0.750	1.632
-45	1.17	0.93	1403.4	5.28	143.6	335.6	0.776	1.626
-40	1.41	1.18	1387.0	6.61	149.6	338.6	0.802	1.621
-35	1.76	1.48	1370.2	8.20	155.6	341.5	0.828	1.616
-30	2.17	1.84	1353.2	10.07	161.7	344.4	0.853	1.611
-25	2.65	2.26	1335.7	12.26	167.9	347.3	0.878	1.607
-20	3.21	2.76	1317.9	14.81	174.2	350.1	0.903	1.604
-15	3.86	3.33	1299.6	17.76	180.5	352.9	0.927	1.601
-10	4.60	3.99	1280.9	21.17	186.9	355.6	0.952	1.598
-5	5.45	4.75	1261.6	25.09	193.4	358.2	0.976	1.596
0	6.40	5.61	1241.6	29.59	200.0	360.8	1.000	1.594
5	7.48	6.59	1221.0	34.74	206.7	363.3	1.024	1.592
10	8.68	7.69	1199.6	40.62	213.5	365.7	1.048	1.590
15	10.02	8.93	1177.3	47.35	220.4	367.9	1.072	1.588
20	11.51	10.31	1154.1	55.04	227.5	370.0	1.096	1.586
25	13.16	11.85	1129.6	63.86	234.7	372.0	1.119	1.584
30	14.97	13.55	1103.9	73.98	242.0	373.7	1.143	1.581
35	16.96	15.44	1076.5	85.67	249.6	375.2	1.167	1.578
40	19.14	17.53	1047.1	99.25	257.4	376.4	1.192	1.575
45	21.51	19.82	1015.3	115.18	265.4	377.3	1.217	1.571
50	24.10	22.35	980.2	134.11	273.7	377.8	1.242	1.566

Mollier Diagram

