



Features and uses of Isceon R-422D

R-422D is a non-azeotropic mixture consisting of R-125, R-134a and R-600, which replaces R-22, no effects against ozone. It is compatible with mineral oil installation, so it is a direct replacement for R-22.

The main application of this refrigerant is the replacement of R-22 in those applications that are working in average temperatures or positive evaporation: it is recommended especially where water cooler performance and yields practically coincide with those of R-22. In most of the conversions, energy savings have been also obtained, reducing operating equipment costs and reducing the total greenhouse effect. In general it can be used in direct expansion systems, and in the temperature range indicated above. In any case we recommend contacting us before making any type of conversion.

R-422D has always to be transferred in liquid phase from the bottle. In case of partial leak, the system can be refilled with R-422D without significantly affecting the performance thereof.

R-422D is non-flammable and has a toxicity profile similar to R-134a. Its security classification is **A1 group L1**.

Security

R-422D is not toxic, not flammable, high security.
It has been classified as **A1 / group L1**.

Applications

Average temperatures in commercial refrigeration systems and industrial direct expansion. It can also be used in some low temperature applications (In this case, we advise you to consult our Technical Services).

- Supermarkets.
- Cooling chambers and working average temperatures.
- Ice Machines.

Residential and commercial air conditioning:

The best alternative for water coolers working with R-22



Advantages

- Conversions to this refrigerant are simpler, faster and less expensive than those made to R-404A, R-507 and R-407C.
- It is a coolant that does not damage the ozone layer.
- It is compatible with mineral oils, alkyl benzene and polyolesters. The conversion does not require the change of lubricant in most cases. The oil return is determined by various design and operating conditions (on some systems with complicated pipes configuration it could be specified to add POE). In some applications it may be necessary to modify slightly the team. (Replacement of gaskets) and adjust the expansion devices.
- It has a 30% less GWP (Greenhouse effect) than R-404A and R-507.
- No decomposition in case of leakage.

Behavior in the refrigeration system

- In most systems, their behavior and results are similar to R-22.
- The discharge temperature is lower than R-22, this provides longer life for the compressor and oil.

Components

Chemical Name	% By weight	CAS N °	EC N °
1,1,1,2- Tetrafluoroethane (R-134a)	31,5	811-97-2	212-377-0
Pentafluoroethane (R-125)	65,1	354-33-6	206-557-8
Isobutene	3,4	75-28-5	200-857-2

Physical Properties

PHYSICAL PROPERTIES	UNITS	R-422D	R-22
Molecular weight	(Kg/Kmol)	109.94	86.5
Boiling point (at 1,013 bar)	(°C)	-43.20	-40,8
Vapor pressure (25°C)	(bar abs)	11.3	10.4
Critical temperature	(°C)	79.56	96.2
Critical pressure	(bar abs)	39.03	49.8
Liquid Density at 25 ° C	(Kg/m³)	1143	1193
Saturated vapor density (at 1,013 bar)	(Kg/m³)	5.9	4.7
Slip temp.	(°C)	4.5	0
Specific heat of liquid at 25 ° C	(KJ/Kg.K)	1,44	1.26
Specific heat of vapor at 25°C and 1 atm	(KJ/Kg.K)	0.84	0.68
Flammability		None	None
Toxicity	(ppm)	1000	1000
ODP	-	0	0.05
GWP	-	2729*	1810

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



Thermodynamic properties

TEMP. (°C)	ABSOLUTE PRESSURE (bar)		DENSITY (Kg/m ³)		ENTHALPY (kJ/Kg)		ENTROPY (kJ/Kg.K)	
	BUBBLE	DEW	BUBBLE	DEW	BUBBLE	DEW	BUBBLE	BUBBLE
-50	0.73	0.55	1423.40	3.37	137.45	328.50	0.7489	1.6165
-45	0.93	0.72	1407.50	4.34	143.45	331.58	0.7754	1.6105
-40	1.18	0.93	1391.40	5.15	149.50	334.65	0.8016	1.6052
-35	1.47	1.19	1375.00	6.93	155.60	337.70	0.8274	1.6007
-30	1.82	1.50	1358.40	8.61	161.74	340.73	0.8528	1.5968
-25	2.22	1.86	1341.50	10.60	167.95	343.72	0.8780	1.5934
-20	2.70	2.29	1324.20	12.93	174.22	346.68	0.9028	1.5906
-15	3.26	2.80	1306.40	15.64	180.55	349.59	0.9274	1.5881
-10	3.89	3.38	1288.30	18.79	186.96	352.45	0.9518	1.5861
-5	4.61	4.05	1269.70	22.43	193.44	355.25	0.9760	1.5843
0	5.43	4.82	1250.50	26.61	200.00	358.00	1.0000	1.5828
5	6.35	5.69	1230.70	31.41	206.65	360.63	1.0239	1.5814
10	7.39	6.68	1210.20	36.90	213.40	363.20	1.0476	1.5802
15	8.55	7.79	1188.90	43.18	220.25	365.65	1.0713	1.5791
20	9.84	9.04	1166.70	50.36	227.23	367.98	1.0949	1.5779
25	11.28	10.42	1143.40	58.58	234.33	370.16	1.1185	1.5767
30	12.86	11.96	1119.00	68.00	241.57	372.17	1.1421	1.5753
35	14.60	13.67	1093.00	78.84	249.00	374.00	1.1658	1.5736
40	16.51	15.55	1065.30	91.38	256.60	375.60	1.1898	1.5715
45	18.60	17.62	1035.50	105.98	264.40	376.90	1.2139	1.5689
50	20.89	19.89	1003.00	123.18	272.50	377.80	1.2385	1.5656

Mollier Diagram

