

## R-22 basic physical properties

Item	R-22	R-134a	R-502
Component	-	-	R-22/R-115 48.8/51.2wt%
Chemical Formula	CHClF <sub>2</sub>	CF <sub>3</sub> CH <sub>2</sub> F	CHF <sub>2</sub> /CF <sub>3</sub> CClF <sub>2</sub>
Molecular weight [kg/kmol]	86.5	102	111.6
Critical Temperature [°C]	96.1	101.1	82.2
Critical Pressure [MPa]	4.9	4.059	4.065
Freezing Point [°C]	-160	-101	-160
Boiling Temperature (101.325kPa) [°C]	-40.8	-26.1	-45.3
Dew Point Temperature (101.325kPa) [°C]	-40.8	-26.1	-45
Boiling Point Pressure (25°C) [kPa]	1044	665	1159
Dew Point Pressure (25°C) [kPa]	1044	665	1158
Density (25°C, saturated liquid) [kg/m <sup>3</sup> ]	1191	1207	1213
Density (25°C, saturated gas) [kg/m <sup>3</sup> ]	44.2	32.4	66.6
Latent heat of evaporation (25°C) [kJ/kg]	182.7	177.8	127.6
Specific heat ratio (25°C, 101.325kPa) [-]	1.185	1.119	1.131
Thermal conductivity (25°C, saturated liquid)[mW/(m · K)]	83.7	81.1	62.9
Thermal conductivity (25°C, saturated gas)[mW/(m · K)]	11.4	13.8	12
Viscosity (25°C, saturated liquid) [μPa · s]	165.8	197.9	142.5
Viscosity (25°C, saturated gas) [μPa · s]	12.7	11.8	13
Surface tension (25°C) [mN/m]	8.1	8.1	5.5
Solubility in water (25°C,101.325kPa) [%]	0.3	0.15	
Solubility with water refrigerant (25°C) [%]	0.13	0.1	0.056
Dielectric strength (N2=1) (25°C,101.325kPa) [-]	1.27	0.8	2.34
Dielectric constant (saturated liquid)	6.11	9.24	3.863
Dielectric constant (40°C,0.1MPa) [-]	1.0045	1.0113	1.009 (20°C, 50kPa)
Ozone Depletion Potential (CFC-11=1) [-]	0.055	0	0.334
Global Warming Potential* (CO <sub>2</sub> =1) [-]	1810	1430	4660
Atmospheric lifetime [years]	13.3	14.6	-
Ignition range [vol%]	None	None	None
ASHRAE SSSPC34 Safety Classification	A1	A1	A1
Allowable concentration**[ppm]	1000(1)	1000(3)	1000(2)
Azeotropic point [°C]	-	-	18.9
Existing chemical substance number	2-93	2-3585	2-93 2-87
CAS NO	75-45-6	811-97-2	75-45-6 76-15-3
TSCA	Finished input	Finished input	Finished input
EINECS NO	2008719	2123770	2008719 2009382

\* IPCC4 Assessment Report 2007

\*\* Allowable concentration: (1) Japan Society for Occupational Health recommended value, (2) ACGIH's TLV-TWA value, (3) AIHA's WEEL-TWA value