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R32

REFRIGERANTS

R32

Instructions for Use and Handling

Contents

Foreword

R32 is a chlorine-free, ozone-safe fluorocarbon whose boiling point is -52°C.
R32 is a component of R410A, a blend refrigerant widely used in developed countries as a main alternative to HCFC-22, an ozone depleting refrigerant. But R410A has a high Global Warming Potential (hereafter, GWP) of 2088, so a new refrigerant with lower GWP is needed to mitigate climate change.

R32 has a GWP about one third that of R410A, and it has excellent properties as a refrigerant. Therefore, the technology has been developed to use it by itself as an alternative refrigerant to replace R410A.

Especially in the air conditioning sector, it is difficult to select an alternative refrigerant – although low-GWP substances such as natural refrigerants have been proposed, various problems have to be solved before they can be put into practical use. On the other hand, R32 is an almost non-toxic, chemically stable substance and is readily available because it is a commercially manufactured product. R32 can be used with extension of existing technology because its pressure is similar to that of R410A, and it can provide excellent energy efficiency of the equipment.
All these properties make R32 a promising choice for the present.

R32 as a single component refrigerant is attracting attention not only as an alternative to R410A in developed countries but also as an alternative to HCFC-22 in developing countries.

When using R32, however, applicable regulations and standards must be observed and results of risk assessment must be considered because it has slight flammability (Class 2L under refrigerant standards ISO/FDIS 817 and ASHRAE 34).

1 Characteristics

1.1 General Characteristics

Product		R32	R410A	HCFC-22
Component		HFC-32	HFC-32/ HFC-125	HCFC-22
Chemical formula		CH_2F_2	CH_2F_2/ CHF_2CF_3	$CHClF_2$
Composition	mass%	100	50/50	100
Molar mass		52.0	72.6	86.5
Boiling point		-51.7	-51.4	-40.8
Freezing point		-136	-	-160
Critical temperature		78.1	72.0	96.2
Critical pressure	MPa	5.78	4.95	4.99
Critical density	kg/m^3	424	486	515
Density Saturated liquid	kg/m^3	961	1059	1191
Density Saturated vapor	kg/m^3	47.34	64.87	44.23
Viscosity Saturated liquid	mPa·s	0.116	0.121	0.178
Viscosity Normal pressure vapor	mPa·s	0.0126	0.0129	0.0128
Isobaric specific heat Saturated liquid	kJ/kg·K	1.937	1.711	1.256
Isobaric specific heat Normal pressure vapor	kJ/kg·K	0.848	0.818	0.662
Latent heat of vaporization (Boiling Point)	kJ/kg	382	275	233
Thermal conductivity Saturated liquid	mW/m·K	125	87	87
Thermal conductivity Normal pressure vapor	mW/m·K	13	13	11
Breakdown voltage Normal pressure vapor	kV	2.8	4.8	7.2
Dielectric constant Saturated liquid		14.27	7.88	6.35
Acceptable concentration limit	ppm	1000*2	1000*3	1000*4
Ozone depletion potential ODP	CFC11=1	0	0	0.055
Global warming potential GWP *1	CO_2=1	675	2088	1810
Solubility of water	massppm	3400	1600	1300

Unless otherwise specified, the values in the above table are at 25°C.

*1 Global Warming Potential: Based on IPCC 4th Assessment Report 2007, integration time horizon 100 years. For blends, figures calculated on its basis.
*2 WEEL-TWA value of AIHA (Workplace Environmental Exposure Level; Time-Weighted Average; American Industrial Hygiene Association)
*3 Calculated value based on the WEEL-TWA value of AIHA of each component.
*4 TLV-TWA value of ACGIH (Threshold limit value; Association Advancing Occupational and Environmental Health).

1.2 Flammability

R32 is flammable, but its flammability is extremely low compared with that of hydrocarbon refrigerants such as propane. Therefore, R32 is positioned as a slightly flammable refrigerant. When using R32, applicable regulations and standards must be observed and results of risk assessment must be considered.

Flammability properties and Flammability classification by the applicable laws, regulations and standards

		R32	R410A	HCFC-22	Ammonia	Propane
Flammability range (in Air)	Lower flammability limit (LFL) vol.%	13.6	non	non	15	2.2
	Upper flammability limit (UFL) vol.%	28.4			28	9.5
Minimum ignition energy (MIE)	mJ	30 ~ 100	-	-	Not fixed	0.25
Maximum burning velocity (BV)	cm/s	6.7	-	-	7.2	38.7
Heat of combustion (HOC)	kJ/kg	9,400	-	-	18,600	45,700
ASHRAE standard 34		Class 2L (Slightly flammable)	Class 1 (Non-flammable)	Class 1 (Non-flammable)	Class 2L (Slightly flammable)	Class 3 (Highly flammable)
ISO international standard 817		Class 2L (Slightly flammable)	Class 1 (Non-flammable)	Class 1 (Non-flammable)	Class 2L (Slightly flammable)	Class 3 (Highly flammable)
GHS (Globally Harmonized System of Classification and Labelling of Chemicals)	MPa	Category 1 (Extremely flammable gas)	Not Classified	Not Classified	Category 1 (Extremely flammable gas)	Category 1 (Extremely flammable gas)

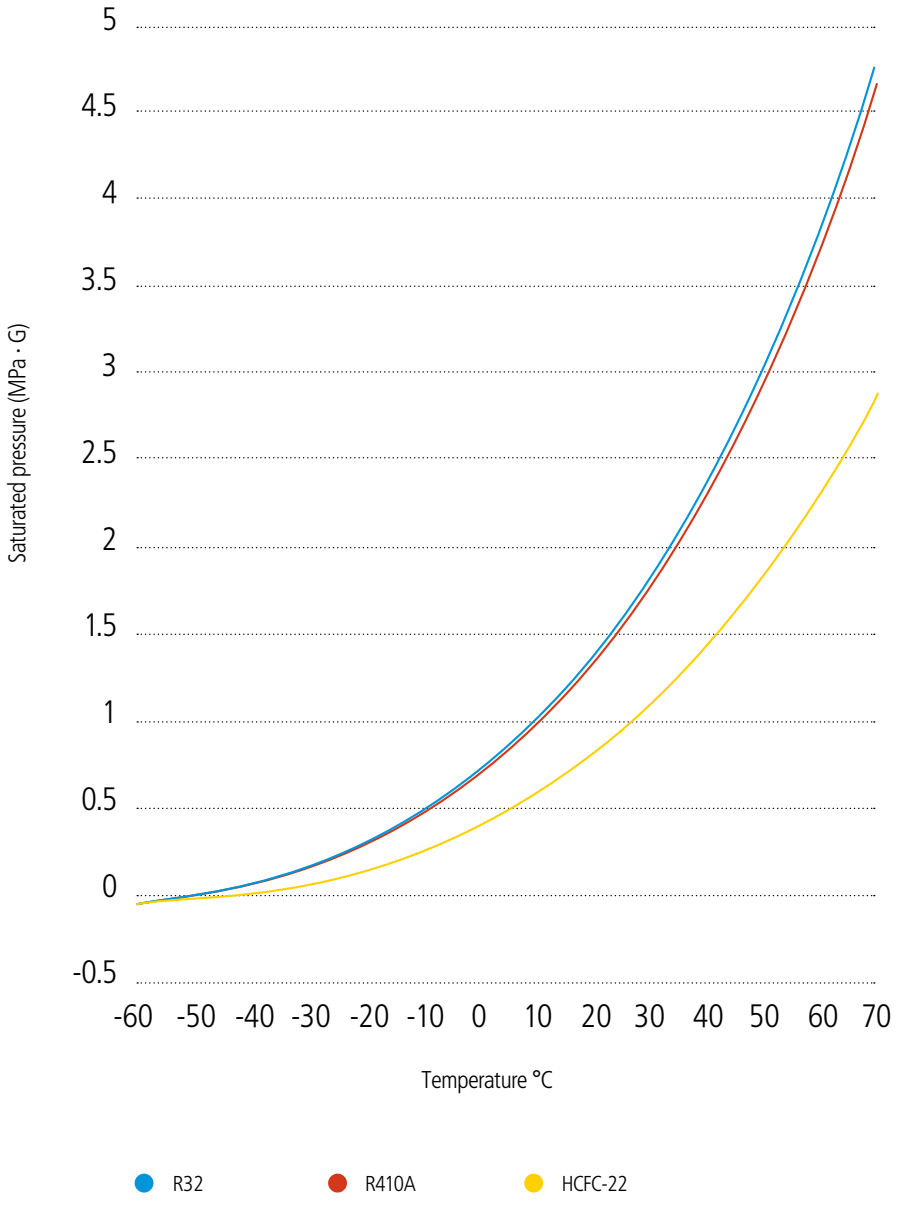
(Reference) Classification criteria for flammable gases on the applicable laws, regulations and standards

Organization	American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ASHRAE)	International Organization for Standardization (ISO)	United Nations (UN)
Standard	ASHRAE 34 - 2010	ISO/FDIS 817 2012	GHS Third Revised Edition 2009
Classification criteria	Class 3 Highly flammable LFL 0.10 kg / m^3 or HOC 19,000 kJ / kg	Class 3 Highly flammable LFL 3.5 vol. % or HOC 19,000 kJ / kg	Category 1; Extremely flammable gas LFL 13 vol. % or UFL – LFL 12 %
	Class 2 Low flammable LFL 0.10 kg / m^3 and HOC 19,000 kJ / kg	Class 2 Low flammable LFL 3.5 vol. % and HOC 19,000kJ / kg	Category 2; Flammable gas Other than those of Category 1, have a flammable range
	Class 2L Slightly flammable BV 10 cm / sec	Class 2L Slightly flammable BV 10 cm / sec	
	Class 1 Non-flammable No flame propagation	Class 1 Non-flammable No flame propagation	Not Classified No-range of flammability

1.3 Saturated Vapor Pressure / Temperature Curves

The graph below shows the relationship between temperature and saturated vapor pressure of R32, in comparison with that of R410A and HCFC-22.
As shown on the graph, R32 has similar vapor pressure to that of R410A.

Saturated Vapor Pressure Curve



1.4 Theoretical Characteristics of Refrigeration Cycle

R32 delivers superior performance in both cooling / heating capacity and energy efficiency – compared with R410A, volumetric capacity of R32 is about 15% higher and its COP is about 6% higher (therefore, concerning the climate change issue, it can contribute to reduce the equipment's indirect impact on CO_2 emission). But the discharge gas temperature of R32 is about 20°C higher, so this feature must be taken into consideration in equipment design.

			R32	R410A	HCFC-22
Evaporator Pressure		MPa	0.81	0.80	0.50
Condenser Pressure		MPa	3.14	3.07	1.94
Glide in evaporator		°C	-	0.11	-
Discharge Temperature		°C	106	83	88
Cooling	COP *1		2.75	2.57	2.90
	Capacity	kJ / m³	4812	4150	3010
Heating	COP *1		3.75	3.57	3.90
	Capacity	kJ / m³	6562	5764	4049

Evaporator Temperature	0°C
Condenser Temperature	50°C
Superheat	0K
Subcool	0K
Compressor efficiency	70%

*1 Coefficient of Performance (Index of the energy efficiency).

1.5 Chemical Stability

Substances which affect the chemical stability of HFC refrigerants include refrigerant oils, coexistent metals, desiccants and contaminating air and moisture. The data below were observed from sealed tube tests on R32 / polyol ester oil.
Stability of R32 has almost the same tendency as that of R410A.

Sealed Tube Test Result

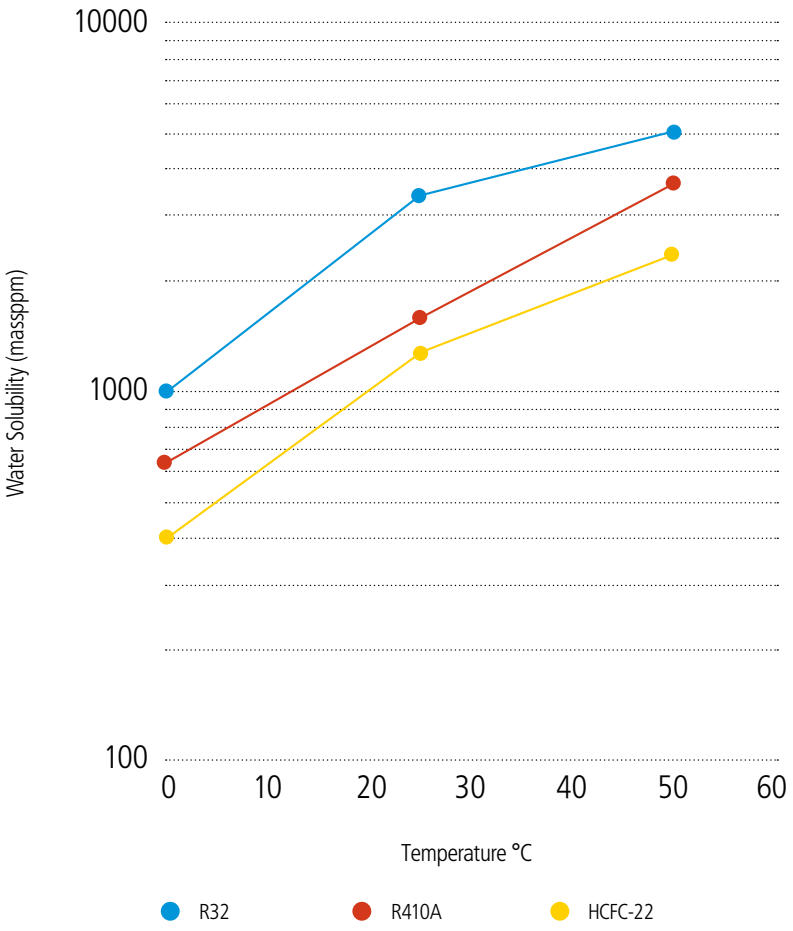
Refrigerant	Test Condition		Acid Concentration* HCl, HF
	days	°C	massppm
R32	30	175	1
	60	175	4
R410A	30	175	2
	60	175	3
HCFC-22	30	175	9
	60	175	35

* Acidic compounds are generated as a result of refrigerant decomposition.

Refrigerant Oil ratio =1/1(weight ratio)
Coexisting metal rods (copper, iron and aluminum)
R32, R410A/Ester Oil, HCFC-22/Mineral Oil

1.6 Water Solubility

Saturated solubility of water to fluorocarbons is generally low, but R32 has higher solubility of water than existing refrigerants (HCFC, blend HFC refrigerants).



1.7 Desiccants

Desiccants may be used to remove moisture from the refrigeration system in order to prevent capillary blockages due to freezing, and also to prevent polyol ester oils from thermal deterioration. Synthetic zeolite (Molecular Sieve®, etc.) is an effective desiccant to use for eliminating water from refrigerant. Molecular sieves that have smaller pore diameters than the size of the refrigerant molecule are preferable so that they remove only the water selectively. The table shows the molecular sizes of the various refrigerants and the relative applicability of different molecular sieves.

Refrigerant / Molecular size (Å)	Molecular sieve* Pore size (Å)	4A-NRG* 4	XH-9* 3	XH-10* 3
R32	3.3	×	△ ~ ×	○
R410A	3.3, 4.2	×	○	○
HCFC-22	3.8	×	△ ~ ×	○

* Manufactured by Union Showa

○ Appropriate △ Care required × Not appropriate

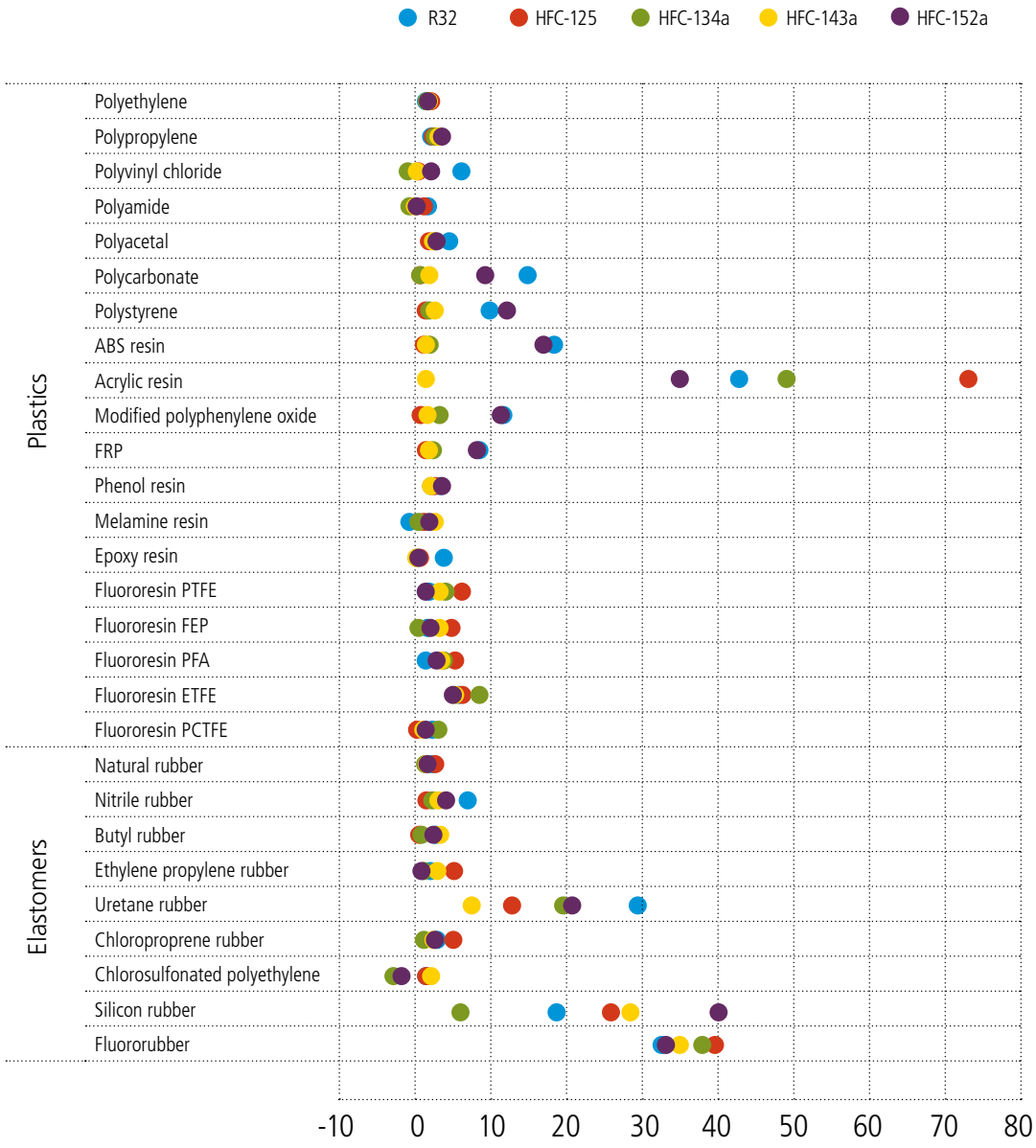
Note: Molecular size of water is 2.8Å

Desiccant can be a cause of deterioration of the refrigerant, so that care should be exercised when selecting the desiccant to use.

1.8 Effect on Polymeric Materials

The test results below show the effects of R32 and existing HFCs on polymeric materials.

Plastics or elastomers, even consisting of the same polymeric ingredients, can have different natures depending on the processing method and the type and amount of filler, plasticizer, cross-linker, etc. It may also undergo an unexpected change when existing with refrigerant oil. Therefore, each material must be tested individually to determine reliability under actual conditions of use.



Measurement conditions: Immersed in refrigerant at 50°C for 2 weeks.
Measured immediately after taking out.
Change in weight (%)

1.9 Miscibility with Refrigeration Oils

Generally, HFCs are not miscible with mineral refrigerant oils and tend to separate from these oils.
Synthetic oils such as polyol ester (POE), polyvinyl ether (PVE) and polyalkylene glycol (PAG) are the recommended types of refrigerant oils to use for HFC refrigeration systems.

Miscibility with refrigerant oils (low-temperature region)

	R32	R410A
Mineral oil	Immiscible	Immiscible
POE oil for R410A	Separate at 20°C	Separate at -10°C
PVE oil for R410A	Separate at 20°C	Separate at -47°C

Compared with R410A, R32 is less miscible with oils, so use of the refrigeration oils for R410A may lead to inadequate lubrication due to insufficient oil return. Lubricating oil manufacturers have developed lubricating oils for R32 with improved compatibility. When using R32 as a single refrigerant, please inquire with lubricating oil manufacturers.

2 Safety

R32 has already been registered at TSCA in the United States and REACH for the import into the EU through Daikin's subsidiary in Europe. It was also examined and passed in Japan under the "Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc." In addition, exhaustive toxicity tests under Program for Alternative Fluorocarbon Toxicity Testing (PAFT) set up by the world's major fluorocarbon manufacturers have been completed. Since no practical problem was reported from any of the tests, the safety of the substance is considered to be equal to or better than that of R410A and HCFC-22.

	CAS	TSCA (USA)	REACH registration No. (EU)	EC No. (EU)	Class Reference No. in The Gazette List (Japan)	KE No. (Korea)	WEEL* (Workplace environmental exposure level)
R32	75-10-5	Listed	01-2119471312-47	200-839-4	2-3705	97-3-4	1000 ppm

* 8-hrs TWA (Time Weighted Average) by the American Industrial Hygiene Association (AIHA)

3 Handling Precautions

For details, please refer to MSDS.

(1) Laws and regulations

R32 is a high-pressure liquefied gas. As mentioned in 1-2, R32 is classified as flammable under international standards (but under Japan's High Pressure Gas Safety Act, it is not classified as a flammable gas). To handle R32 safely, please observe applicable laws and regulations.

(2) Handling of containers

R32 is a high-pressure gas and is kept in high-pressure containers. Although these containers are of safe design, they may crack when handled roughly, and this can cause accidents. Be very careful not to drop, hit or roll the containers or to let them fall over.

(3) Storage

Like all other high-pressure gases, store R32 in a cool, dark and well-ventilated place. If R32 gas is leaked or discharged into the air, it tends to sink to a lower level and remain there because R32 gas is heavier than air. If R32 gas accumulates to high concentrations in some area, symptoms of oxygen deficiency may occur to the person who gets into the area, or accidental combustion of the gas may result. All containers for high-pressure gases including R32 have a safety device fitted. If the storage temperature (when the device is a fusible plug) or pressure (when the device is a spring safety valve) rises above a certain level, the plug may melt or the safety valve may work so that the gas escapes.

(4) Precautions about decomposed gas

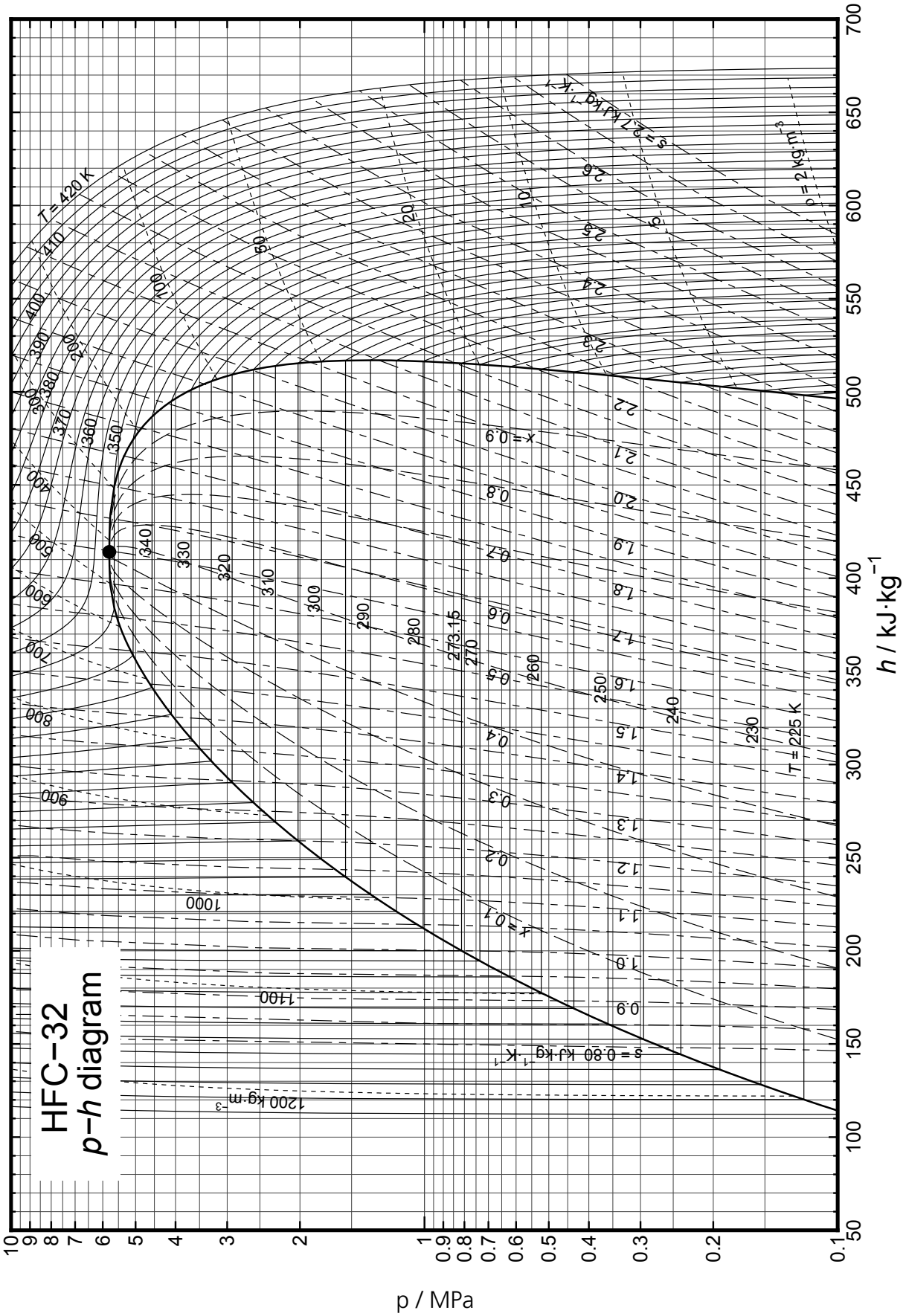
Keep R32 away from heat or open flame. If R32 is combusted or thermally decomposed as a result of exposure to flame or heat source like overheated metal, hazardous gas will be generated.

(5) Health precautions

Like other liquefied high-pressure gases, R32 should be prevented from coming into direct contact with the skin or eyes and from being inhaled.
Emergency treatment methods are shown below.

- If the gas is inhaled
  - Move the person to an airy place to rest in a relaxed position.
  - Keep the person warm with a blanket, etc.
  - If breathing is weak or has stopped, loosen the clothing, secure a respiratory airway and give artificial respiration.
  - Seek medical assistance when needed.
- If liquefied gas gets into the eye
  - Wash the eyes out with water for 15 minutes or more. Try to avoid rubbing your eyes and blinking.
  - When needed, seek medical assistance immediately.
  - To prevent such accidents, always wear protective goggles when handling R32.
- If liquefied gas comes into direct contact with the skin
  - When liquid R32 evaporates into the air, its temperature drops dramatically.
  - Direct contact with the skin in this state may cause frostbite.
  - If a large quantity of evaporating liquid R32 comes into direct contact with the skin, it will cause frostbite, so seek medical assistance immediately.

Appendix 1, P-h Diagramm



Appendix 2, Thermodynamic Properties (Saturation Table)

Refprop Ver.9.0

	Pressure	Density		Isobaric specific heat		Specific Enthalpy			Specific Entropy	
Temp.	kPa	kg/m		kJ/kgK		kJ/kg			kJ/kgK	
°C		Liquid	Vapor	Liquid	Vapor	Liquid	Vapor	Latent	Liquid	Vapor
-60	64.96	1236	1.969	1.576	0.833	101.38	492.11	390.73	0.596	2.429
-59	68.65	1233	2.074	1.577	0.838	102.95	492.64	389.69	0.603	2.423
-58	72.52	1230	2.183	1.578	0.843	104.53	493.17	388.64	0.611	2.417
-57	76.56	1228	2.297	1.579	0.848	106.11	493.70	387.59	0.618	2.411
-56	80.77	1225	2.415	1.581	0.853	107.70	494.22	386.53	0.625	2.405
-55	85.17	1222	2.538	1.582	0.858	109.28	494.74	385.46	0.632	2.399
-54	89.76	1219	2.667	1.584	0.863	110.86	495.26	384.39	0.640	2.394
-53	94.55	1217	2.800	1.585	0.868	112.45	495.77	383.32	0.647	2.388
-52	99.54	1214	2.938	1.586	0.873	114.04	496.27	382.24	0.654	2.382
-51.7	101.3	1213	2.988	1.587	0.875	114.59	496.45	381.86	0.656	2.380
-51	104.7	1211	3.082	1.588	0.878	115.63	496.78	381.15	0.661	2.377
-50	110.1	1208	3.232	1.589	0.883	117.22	497.27	380.06	0.668	2.371
-49	115.8	1206	3.387	1.591	0.889	118.81	497.77	378.96	0.675	2.366
-48	121.6	1203	3.548	1.593	0.894	120.40	498.26	377.85	0.682	2.361
-47	127.7	1200	3.715	1.594	0.900	122.00	498.74	376.74	0.689	2.355
-46	134.0	1197	3.888	1.596	0.905	123.60	499.23	375.63	0.697	2.350
-45	140.6	1194	4.067	1.598	0.911	125.20	499.70	374.50	0.704	2.345
-44	147.4	1192	4.253	1.600	0.917	126.80	500.17	373.38	0.711	2.340
-43	154.5	1189	4.446	1.602	0.922	128.40	500.64	372.24	0.717	2.335
-42	161.9	1186	4.645	1.604	0.928	130.01	501.11	371.10	0.724	2.330
-41	169.5	1183	4.851	1.606	0.934	131.62	501.56	369.95	0.731	2.325
-40	177.4	1180	5.065	1.608	0.940	133.23	502.02	368.79	0.738	2.320
-39	185.6	1177	5.286	1.610	0.946	134.84	502.47	367.63	0.745	2.315
-38	194.1	1174	5.515	1.612	0.952	136.45	502.91	366.46	0.752	2.310
-37	202.9	1172	5.751	1.614	0.958	138.07	503.35	365.28	0.759	2.306
-36	212.0	1169	5.995	1.616	0.965	139.69	503.78	364.10	0.766	2.301
-35	221.4	1166	6.248	1.619	0.971	141.31	504.21	362.90	0.772	2.296
-34	231.1	1163	6.508	1.621	0.977	142.93	504.63	361.70	0.779	2.292
-33	241.2	1160	6.778	1.624	0.984	144.56	505.05	360.50	0.786	2.287
-32	251.6	1157	7.056	1.626	0.990	146.18	505.47	359.28	0.793	2.282
-31	262.3	1154	7.343	1.629	0.997	147.81	505.87	358.06	0.799	2.278
-30	273.4	1151	7.639	1.631	1.004	149.45	506.27	356.83	0.806	2.273
-29	284.9	1148	7.945	1.634	1.010	151.08	506.67	355.59	0.813	2.269
-28	296.7	1145	8.260	1.637	1.017	152.72	507.06	354.34	0.819	2.265
-27	309.0	1142	8.585	1.639	1.024	154.36	507.45	353.08	0.826	2.260
-26	321.6	1139	8.920	1.642	1.031	156.01	507.83	351.82	0.833	2.256
-25	334.6	1136	9.266	1.645	1.038	157.66	508.20	350.54	0.839	2.252
-24	348.0	1133	9.622	1.648	1.045	159.31	508.57	349.26	0.846	2.248
-23	361.8	1130	9.989	1.651	1.052	160.96	508.93	347.97	0.852	2.243
-22	376.0	1127	10.37	1.654	1.060	162.62	509.28	346.66	0.859	2.239
-21	390.7	1124	10.76	1.657	1.067	164.28	509.63	345.35	0.865	2.235
-20	405.8	1121	11.16	1.661	1.075	165.94	509.97	344.03	0.872	2.231
-19	421.3	1117	11.57	1.664	1.082	167.61	510.31	342.70	0.878	2.227
-18	437.3	1114	12.00	1.668	1.090	169.28	510.64	341.36	0.885	2.223
-17	453.7	1111	12.43	1.671	1.098	170.95	510.96	340.01	0.891	2.219
-16	470.7	1108	12.88	1.675	1.106	172.63	511.28	338.65	0.898	2.215
-15	488.1	1105	13.35	1.678	1.114	174.31	511.58	337.28	0.904	2.211
-14	506.0	1102	13.82	1.682	1.122	175.99	511.89	335.90	0.911	2.207
-13	524.4	1098	14.31	1.686	1.130	177.68	512.18	334.50	0.917	2.203
-12	543.3	1095	14.82	1.690	1.139	179.37	512.47	333.10	0.924	2.199
-11	562.7	1092	15.34	1.694	1.147	181.07	512.75	331.68	0.930	2.195
-10	582.6	1089	15.87	1.698	1.156	182.76	513.02	330.25	0.937	2.192
-9	603.1	1085	16.42	1.702	1.165	184.47	513.28	328.82	0.943	2.188
-8	624.1	1082	16.98	1.706	1.174	186.18	513.54	327.37	0.949	2.184
-7	645.7	1079	17.56	1.711	1.183	187.89	513.79	325.90	0.956	2.180
-6	667.9	1076	18.16	1.715	1.192	189.60	514.03	324.43	0.962	2.176
-5	690.6	1072	18.77	1.720	1.201	191.33	514.26	322.94	0.968	2.173
-4	713.9	1069	19.40	1.725	1.211	193.05	514.49	321.44	0.975	2.169
-3	737.8	1066	20.04	1.730	1.221	194.78	514.70	319.92	0.981	2.165
-2	762.3	1062	20.71	1.735	1.231	196.52	514.91	318.40	0.987	2.162
-1	787.4	1059	21.39	1.740	1.241	198.26	515.11	316.85	0.994	2.158
0	813.1	1055	22.09	1.745	1.251	200.00	515.30	315.30	1.000	2.154

	Pressure	Density		Isobaric specific heat		Specific Enthalpy			Specific Entropy	
Temp.	kPa	kg/m		kJ/kgK		kJ/kg			kJ/kgK	
°C		Liquid	Vapor	Liquid	Vapor	Liquid	Vapor	Latent	Liquid	Vapor
1	839.5	1052	22.81	1.750	1.262	201.75	515.48	313.73	1.006	2.151
2	866.5	1048	23.55	1.756	1.272	203.50	515.65	312.15	1.013	2.147
3	894.1	1045	24.31	1.762	1.283	205.26	515.81	310.55	1.019	2.143
4	922.5	1041	25.09	1.767	1.294	207.03	515.96	308.93	1.025	2.140
5	951.4	1038	25.89	1.773	1.306	208.80	516.11	307.31	1.031	2.136
6	981.1	1034	26.71	1.779	1.317	210.58	516.24	305.66	1.038	2.133
7	1012	1031	27.56	1.786	1.329	212.36	516.36	304.00	1.044	2.129
8	1043	1027	28.43	1.792	1.341	214.15	516.47	302.32	1.050	2.126
9	1074	1023	29.32	1.799	1.354	215.94	516.57	300.63	1.057	2.122
10	1107	1020	30.23	1.806	1.367	217.74	516.66	298.92	1.063	2.118
11	1140	1016	31.17	1.813	1.380	219.55	516.74	297.19	1.069	2.115
12	1174	1012	32.14	1.820	1.393	221.36	516.80	295.44	1.075	2.111
13	1209	1008	33.13	1.827	1.407	223.18	516.86	293.68	1.082	2.108
14	1244	1005	34.15	1.835	1.421	225.01	516.90	291.89	1.088	2.104
15	1281	1001	35.19	1.843	1.435	226.84	516.93	290.09	1.094	2.101
16	1318	997.1	36.26	1.851	1.450	228.68	516.95	288.27	1.100	2.097
17	1356	993.2	37.37	1.859	1.465	230.53	516.96	286.43	1.107	2.094
18	1395	989.3	38.50	1.868	1.481	232.39	516.95	284.57	1.113	2.090
19	1434	985.4	39.66	1.877	1.497	234.25	516.93	282.68	1.119	2.087
20	1475	981.4	40.86	1.886	1.514	236.12	516.90	280.78	1.125	2.083
21	1516	977.4	42.08	1.895	1.531	238.00	516.85	278.85	1.132	2.080
22	1558	973.3	43.34	1.905	1.548	239.89	516.79	276.90	1.138	2.076
23	1601	969.3	44.64	1.915	1.566	241.78	516.71	274.93	1.144	2.072
24	1645	965.2	45.97	1.926	1.585	243.69	516.62	272.93	1.150	2.069
25	1690	961.0	47.34	1.937	1.604	245.60	516.51	270.91	1.157	2.065
26	1735	956.8	48.74	1.948	1.624	247.53	516.39	268.86	1.163	2.062
27	1782	952.6	50.19	1.960	1.645	249.46	516.25	266.79	1.169	2.058
28	1830	948.3	51.68	1.972	1.667	251.40	516.09	264.69	1.175	2.054
29	1878	944.0	53.20	1.984	1.689	253.35	515.92	262.56	1.182	2.051
30	1928	939.6	54.78	1.997	1.712	255.32	515.72	260.41	1.188	2.047
31	1978	935.2	56.39	2.011	1.736	257.29	515.51	258.22	1.194	2.043
32	2029	930.7	58.06	2.025	1.760	259.28	515.29	256.01	1.201	2.040
33	2082	926.2	59.77	2.040	1.786	261.27	515.04	253.77	1.207	2.036
34	2135	921.7	61.53	2.055	1.813	263.28	514.77	251.49	1.213	2.032
35	2190	917.0	63.34	2.071	1.841	265.30	514.48	249.18	1.220	2.028
36	2245	912.4	65.21	2.088	1.870	267.34	514.17	246.83	1.226	2.025
37	2302	907.6	67.14	2.105	1.901	269.38	513.84	244.46	1.233	2.021
38	2360	902.8	69.12	2.124	1.933	271.45	513.49	242.04	1.239	2.017
39	2418	898.0	71.16	2.143	1.966	273.52	513.11	239.59	1.246	2.013
40	2478	893.0	73.27	2.163	2.001	275.61	512.71	237.09	1.252	2.009
41	2539	888.0	75.44	2.184	2.038	277.72	512.28	234.56	1.258	2.005
42	2601	883.0	77.68	2.206	2.077	279.84	511.82	231.99	1.265	2.001
43	2665	877.8	80.00	2.230	2.117	281.98	511.34	229.37	1.272	1.997
44	2729	872.6	82.39	2.255	2.160	284.13	510.83	226.70	1.278	1.993
45	2795	867.3	84.86	2.281	2.206	286.31	510.29	223.99	1.285	1.989
46	2862	861.9	87.41	2.309	2.254	288.50	509.72	221.22	1.291	1.985
47	2930	856.4	90.05	2.338	2.304	290.71	509.12	218.41	1.298	1.980
48	2999	850.8	92.79	2.369	2.358	292.95	508.48	215.54	1.305	1.976
49	3069	845.1	95.62	2.403	2.416	295.21	507.81	212.61	1.312	1.971
50	3141	839.3	98.55	2.439	2.477	297.49	507.10	209.62	1.318	1.967
51	3214	833.3	101.6	2.477	2.543	299.79	506.36	206.57	1.325	1.962
52	3289	827.3	104.7	2.518	2.613	302.12	505.57	203.45	1.332	1.958
53	3364	821.1	108.0	2.562	2.689	304.48	504.74	200.26	1.339	1.953
54	3441	814.8	111.4	2.609	2.771	306.87	503.86	196.99	1.346	1.948
55	3520	808.3	115.0	2.661	2.859	309.29	502.93	193.64	1.353	1.943
56	3600	801.7	118.7	2.717	2.956	311.74	501.95	190.21	1.360	1.938
57	3681	794.9	122.5	2.778	3.060	314.22	500.92	186.69	1.368	1.933
58	3764	787.9	126.6	2.845	3.175	316.75	499.82	183.07	1.375	1.928
59	3848	780.7	130.8	2.919	3.301	319.32	498.67	179.35	1.382	1.922
60	3933	773.3	135.2	3.001	3.441	321.93	497.44	175.51	1.390	1.917
61	4020	765.7	139.9	3.092	3.597	324.59	496.14	171.56	1.397	1.911
62	4109	757.8	144.7	3.193	3.771	327.30	494.76	167.46	1.405	1.905
63	4199	749.6	149.9	3.308	3.967	330.07	493.29	163.23	1.413	1.899
64	4291	741.1	155.3	3.438	4.190	332.90	491.73	158.83	1.421	1.892
65	4384	732.3	161.1	3.588	4.446	335.80	490.05	154.25	1.429	1.885
66	4479	723.0	167.2	3.761	4.743	338.78	488.26	149.48	1.438	1.878
67	4576	713.3	173.8	3.965	5.092	341.85	486.33	144.48	1.446	1.871
68	4675	703.2	180.8	4.207	5.508	345.02	484.25	139.23	1.455	1.863
69	4775	692.4	188.4	4.501	6.013	348.31	481.99	133.68	1.464	1.855
70	4877	680.9	196.7	4.865	6.639	351.73	479.52	127.78	1.474	1.846

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Instructions for Use and Handling

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