

REFRIGERANT FACT SHEET

R744 CO₂



CHARACTERISTICS

R744 (Carbon Dioxide) is refrigerant grade CO₂. It is environmentally friendly, having zero ODP and an ultra-low GWP.

Subject to high operating pressures and low critical temperature.

R744 can be used alongside other refrigerants in cascade systems.

PERFORMANCE

- R744 is only suitable for new specifically designed systems
- The system must be designed to handle high pressure and low temperatures, therefore retrofitting is not suitable.
- Operating pressures up to 10 times higher than R134a
- R744 is a suitable alternative for R134a and R404A applications
- Refrigeration systems that contain R744 require strict controls on contaminants such as moisture and oil. Moisture content must be less than 5ppm.
- Due to extremely high operating pressures, there is risk associated with handling R744.

APPLICATIONS



Low Temperature Refrigeration

- Industrial
- Commercial



Medium Temperature Refrigeration

- Cascade systems



Water Chillers

PHYSICAL ATTRIBUTES



- **ODP:** 0
- **GWP:** 1
- **Class/ Type:** Inorganic Compound (A1)
- **Refrigerant Kind:** Natural refrigerant
- **Oil Type:** CO₂ specific Polyolester Oil (POE)
- **Glide:** N/A

FEATURES

- Non-flammable
- Low energy usage
- Compressors must be charged with POE (check OEM guidelines)
- R744 is odourless, heavier than air and is an asphyxiant, a leak could lead to concentration exceeding safe limits
- Risk minimisation steps must be taken

THERMODYNAMIC PERFORMANCE

- Excellent thermodynamic properties
- High pressure
- Low critical temperature
- When systems are turned off the static pressure of R744 is still very high and requires management.

PRODUCT PART NUMBERS

- **R744014** 13.5kg Cylinder
- **R744030** 30kg Cylinder
- **R744384** 384kg Cylinder

For safety, handling and storage information please refer to the MSDS (available on Chemwatch)

This information is believed to be accurate and reliable, but is provided as a guide only. Beijer Ref Holdings Australia Pty Ltd (T/A Beijer Ref Support) accepts no responsibility and the end user assumes all risks and liability for the use of this information.

PRESSURE TEMPERATURE CHART

Temp C°	Pressure (kPa)
-44	764
-42	832
-40	904
-38	980
-36	1060
-34	1145
-32	1234
-30	1327
-28	1426
-26	1529
-24	1637
-22	1750
-20	1869
-18	1993
-16	2123
-14	2259
-12	2401
-10	2548
-8	2702
-6	2862
-4	3029
-2	3203
0	3384
2	3572
4	3767
6	3970
8	4181
10	4399
12	4627
14	4863
16	5107
18	5361
20	5625
22	5899
24	6184
26	6479
28	6787
30	7106

PHYSICAL PROPERTIES

Class/ Type	Inorganic Compound
Formula	100% R744
Kind	Natural Refrigerant
Appearance	Colourless
ODP	0
GWP	1
Ashrae Std. 34 Safety Class	A1

Units	AHRI Specification
Molecular weight	44.01 g/mol
Boiling Point	- 78°C
Critical Temperature	31°C
Critical Pressure	7281 kPa gauge
Saturated Pressure at 25°C	6370 kPa gauge
Triple Point	-56.6°C
Critical Density	468 kg/m ³
Vapour Density at 21°C	1.833kg/m ³
Vapour Pressure at 21°C	5,774 kPa gauge

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