

Carbon Dioxide

Colorless, odorless, nonflammable slightly acidic, refrigerated liquid.

CAS Number	124 - 38 - 9
UN Number	2187
Shipping Name	Carbon Dioxide, Refrigerated Liquid
Hazard Class	2.2
Label	Nonflammable Gas

Applications

Liquid carbon dioxide is used widely in the food industry for freezing meats, poultry, vegetables, and fruits. Solid carbon dioxide (dry ice) is used to cool meats prior to grinding and also to refrigerate meat and poultry during transit.

Soft drinks, wines, and beers are produced using gaseous carbon dioxide for carbonation. Carbon dioxide is used in water treatment to neutralize alkaline water. Liquid carbon dioxide is also used to increase recovery from oil and gas wells. Other industrial uses include the production of chemicals, plastics, rubber, metals, and electronic components.

Physical Properties

Chemical formula	CO ₂	Heat vaporization, BTU/lb	
Molecular weight	44.01	Solid: -109.25°F	246.6
Color - vapor & gas	none	Liquid: +1.7°F 300 psig gauge	119.2
solid	translucent white	Liquid: +70.0°F 839 psig gauge	63.9
Specific gravity (air - 1.0)		Specific heat, BTU/lb	
Gas at 70°F 1 atm	1.53	At constant pressure (1 atm), 70°F	0.20
Specific volume, cu ft/lb		At constant volume (1 atm), 70°F	0.15
Gas 60°F 1 atm, lb/cu ft	8.57	Viscosity, centipoise	
Gas 70°F 1 atm, lb/cu ft	8.74	Gas, 70°F, 1 atm	0.015
Temperature of solid, 1 atm	-109.25°F	Liquid (SAT. at 0°F)	0.14
Density, lb/cu ft		Critical temperature	
Solid: -109.25°F	97.6	Highest as liquid	87.82°F
Liquid: +1.7°F 300 psig gauge	63.36	Triple point	
Liquid: +70.0°F 839 psig gauge	47.35	Temperature-pressure combination for	
Liquid: -69.8°F	73.5	simultaneous existence as solid,	
		liquid or gas	-69.83° F, 60.4 psig



MATHESON

ask. . .The Gas Professionals™

www.mathesongas.com

Carbon Dioxide *(continued)*

Carbon Dioxide Specifications (Units in ppm [v/v] unless shown otherwise)

Limiting Characteristics	CGA G-6.2 Grade H	MTG Typical
Carbon Dioxide Min. % (mole/mole)	99.8	99.9
Water (vapor)	32	32
Dewpoint, °F	-60	-60
Total Hydrocarbons (as methane)	50	50
Oxygen	30	30
Carbon Monoxide	10	10
Hydrogen Sulfide	0.5*	0.5
Nitric Oxide	2.5	5

Limiting Characteristics	CGA G-6.2 Grade H	MTG Typical
Nitrogen Dioxide	2.5	5
Sulfur Dioxide	5	5
Carbonyl Sulfide	0.5*	0.5
Nonvolatile Residues, ppm (wt/wt)	10	10
Odor	Free of Foreign Odor**	
Inerts	-	1000
Ammonia	-	25
Foreign taste	-	None detected

*Total sulfides in QVLH shall not exceed 0.5 ppm as hydrogen sulfide

**In gas phase or water solution

Conversion Data

	WEIGHT			GAS		LIQUID		SOLID
	POUNDS Lb.	TONS T	KILOGRAMS Kg	CUBIC FEET SCF	CUBIC METERS Nm ³	GALLONS Gal	LITERS L	CUBIC FEET Cu Ft
1 Pound	1.0	0.0005	0.4536	8.741	0.2294	0.11806	0.4469	0.010246
1 Ton	2000.0	1.000	907.2	17,483	458.8	236.1	893.9	20.49
1 Kilogram	2.205	0.0011023	1.0	19.253	0.5058	0.2603	0.9860	0.2260
1 SCF Gas	0.1144	-	0.05189	1.0	0.02628	0.013506	0.05113	0.0011723
1 Nm ³ Gas	4.359	0.002180	1.9772	38.04	1.0	0.515	1.9480	0.04468
1 Gal Liquid	8.470	0.004235	3.842	74.04	1.9431	1.0	3.785	0.08678
1 L Liquid	2.238	0.0011185	1.0151	19.562	0.5134	0.2642	1.0	0.02293
1 Cu Ft Solid	97.56	0.04880	44.25	852.8	22.38	11.518	43.60	1.0

SCF (standard cubic feet) gas measured at 1 atmosphere and 70°F.
Liquid measured at 21.42 atmosphere and 1.7°F.
All values rounded to nearest 4/5 significant numbers.

Nm³ (normal cubic meter) gas measured at 1 atmosphere and 0°C.
Solid measured at -109.25° F.



MATHESON

ask...The Gas Professionals™

www.mathesongas.com