

**Marking**

CAS

Characterization acc. ADR

Cylinder Marking

124-38-9  
UN 1013 CARBON DIOXIDE,  
2.2, (C/E)

Shoulder color: grey

**Essential properties**

liquified gas, heavier than air, colorless, odorless

**Symbols of risks****Physical Properties**

molecular weight	44,0098 kg/kmol
gas density at 0°C and 1,013 bar	1,9767 kg/m <sup>3</sup>
density ratio to air	1,5289
vapour pressure at 20°C	57,258 bar

For additional safety information see safety data sheet \*-CO2-018A

**Valves / Manifolds**

Valve connection

acc. to national standards  
liquid withdrawal trough dip tube for any SFC/SFE-products

Recommended Manifolds

Spectrolab FM 51 / FM 52exact  
Spectrochem FE 51 / FE 52exact  
For SFC/SFE-products: withdrawal fittings (without pressure reduction)

Specification / receptacles					
		Carbon dioxide 4.5	Carbon dioxide 4.8	Carbon dioxide 5.5	
<b>Composition</b>					
CO <sub>2</sub>	≥	99.995	99.998	99.9995	Vol.-%
<b>Impurities</b>					
CO	≤	1	1	0.5	ppmv
O <sub>2</sub>	≤	10	2	1	ppmv
N <sub>2</sub>	≤	25	8	2	ppmv
HC (as CH <sub>4</sub> )	≤	1	1	0.5	ppmv
H <sub>2</sub> O	≤	5	3	-	ppmv
<b>Cylinder / Contents</b>					
F 10 7,5kg		7.5	7.5	-	kg
F 40 30kg		30.0	-	30.0	kg
F 50 37,5kg		37.5	37.5	37.5	kg
F 50*12 450kg		450.0	-	-	kg

**Remarks**

Applications:

Active gas in CO<sub>2</sub>-lasers

Component in artificial biological atmospheres

Solvent for supercritical extraction and chromatography (SFE / SFC)

Analysis from vapourized liquid phase

**MESSER**   
Gases for Life

Messer Group GmbH

Messer-Platz 1

65812 Bad Soden

<https://www.messergroup.com>

**Marking****CAS**

Characterization acc. ADR

**Cylinder Marking**124-38-9  
UN 1013 CARBON DIOXIDE,  
2.2, (C/E)

Shoulder color: grey

**Essential properties**

liquified gas, heavier than air, colorless, odorless

**Symbols of risks**

For additional safety information see safety data sheet \*-CO2-018A

**Description**Colourless, liquified gas with slightly sourish smelling resp. taste. During expansion the carbondioxide can be cooled down below sublimation temperature. This results in CO<sub>2</sub>-snow (dry ice).**Materials**Cylinders and Valves: any usual materials  
In the presence of humidity danger of corrosion of steel  
Seals: PTFE, PCTFE, PVDF, PA, PP

Physical Properties			
<b>molecular weight</b>	44,0098 kg/kmol	<b>vapour pressure at 20°C</b>	
<b>critical point</b>		<b>gas density at 0°C and 1,013 bar</b>	1,9767 kg/m <sup>3</sup>
temperature	304,21 K	<b>density ratio to air</b>	1,5289
Pressure	73,825 bar	<b>gas density at 15°C and 1 bar</b>	1,8474 kg/m <sup>3</sup>
density	0,466 kg/l	<b>conversion factor</b>	
<b>triple point</b>		liquid at Ts to m <sup>3</sup> gas (15°C, 1 bar)	
temperature	216,58 K	<b>virial coefficient</b>	
Pressure	5,185 bar	Bn at 0°C	-6,64*10 <sup>-3</sup> bar <sup>-1</sup>
<b>boiling point</b>		B30 at 30°C	-4,78*10 <sup>-3</sup> bar <sup>-1</sup>
temperature	194,674 K; -78,5 °C	<b>gaseous state at 25°C and 1 bar</b>	
liquid density	(Sublimationspunkt)	specific heat capacity cp	0,8504 kJ/kg K
evaporation heat	573,02 kJ/kg	thermal conductivity	164*10 <sup>-4</sup> W/m K
		dynam. viscosity	14,833*10 <sup>-6</sup> Ns/m <sup>2</sup>