

JIS

JAPANESE INDUSTRIAL STANDARD

Liquid Carbon Dioxide

 JIS K 1106—1990

Translated and Published

by

Japanese Standards Association

In the event of any doubt arising,
the original Standard in Japanese is to be final authority.



JAPANESE INDUSTRIAL STANDARD

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Liquid Carbon Dioxide
 CO_2 FW: 44.01

K 1106-1990

1. Scope

This Japanese Industrial Standard specifies the liquid carbon dioxide for industrial use which has been filled in a cylindrical vessel for compressed gas.

2. Classification

Liquid carbon dioxide shall be classified into three classes of Class 1, Class 2, and Class 3, according to its quality.

3. Quality

The quality of liquid carbon dioxide shall be as shown in Table 1 when tested by the procedures in 4.

Table 1. Quality

Item \ Class	Quality		
	Class 1	Class 2	Class 3
Carbon dioxide vol % (in dry gas)	99.5 min.	99.5 min.	99.9 min.
Water content vol %	0.12 max.	0.012 max.	0.005 max.
Odor	No foreign odor	No foreign odor	No foreign odor

4. Testing Method

4.1 General Matters The general matters in common to every test shall conform to the description in JIS K 0050.

Applicable Standards and Reference Standard: See page 9.

4.2 Sampling Take the sample from liquid phase part kept in the container, and use it after making it room temperature under an atmospheric pressure.

In the case of the container with a syphon tube, generally attach a pressure reducing valve (regulator) with a heater to the container that has been standing condition, and in the case of without a syphone tube, attach it to the container that has been upside down, then gasify the sample owing to pressure-reducing, and make it room temperature under an atmospheric pressure. In order to connect the pressure-reducing valve to the tester, use a metal tube or plastic hose of low permeability.

4.3 Carbon Dioxide Adopt either one of the following two methods for the test of carbon dioxide.

- (1) Gas chromatography
- (2) Alkali-absorption method

4.3.1 Gas Chromatography

- (1) Summary Employ synthetic zeolite with uniform fine pores for the filter in a column; separate oxygen and nitrogen kept in the carbon dioxide by means of a molecular sieve effect; determine quantitatively the oxygen and the nitrogen making use of the peak area shown on the chromatogram; and calculate the vol % of the carbon dioxide content.
- (2) Analysis Components and Its Range of Concentration The analysis components and the range of concentration shall be as follows.
 - (a) Analysis Components Oxygen and nitrogen
 - (b) Range of Concentration Oxygen: 0.01 to 0.1 vol %
Nitrogen: 0.03 to 0.5 vol %
- (3) Calculation The content of carbon dioxide shall be calculated according to the following formula.

$$\text{CO}_2 = 100 - (A_O + A_N)$$

where, CO_2 : carbon dioxide (vol %)
 A_O : oxygen (vol %)
 A_N : nitrogen (vol %)
- (4) Apparatus The apparatus shall conform to the description in JIS K 0114.
- (5) Calibration Gas The kind, concentration, and preparation of the calibration gas shall be as follows.
 - (a) Kind Oxygen and nitrogen are needed for component gas and helium for dilution gas.
 - (b) Concentration 0.02 vol % and 0.1 vol % in the case of oxygen, and 0.1 vol % and 0.5 vol % in the case of nitrogen.