

ICS 75.060
CCS E 24



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 20603-2023

Replacing GB/T 20603-2006

**Refrigerated light hydrocarbon fluids - Sampling for liquefied
natural gas**

冷冻轻烃流体 液化天然气的取样

(English Translation)

Issued on: December 28, 2023

Implemented on: April 1, 2024

**Issued by: State Administration for Market Regulation, China National
Standardization Administration**

Table of Contents

Preface	
1 Scope	
2 Normative references	
3 Terms and Definitions	
4 Sampling method	
4.1 Continuous sampling	
4.2 Intermittent sampling	
4.3 Spot sampling	
5 General requirements	
5.1 General	
5.2 Continuous sampling	
5.3 Intermittent sampling	
5.4 Spot sampling	
6 Devices	
6.1 Materials	
6.2 Sampling probe	
6.3 LNG sample vaporizer	
6.4 Gas sample container	
6.5 Continuous sampling back-end device	
6.6 Intermittent sampling back-end device	
6.7 Sampling back-end device	
7 Sampling Step	
7.1 Continuous sampling	
7.2 Intermittent sampling	
7.3 Spot sampling	
8 Sampling report	
8.1 General requirements	
8.2 Continuous sampling	
8.3 Intermittent sampling	
8.4 Spot sampling	
Appendix A (informative) Calculation example of subcooling	
A:1 Original parameters	

A:2 Calculation method

Appendix B (informative) Calculation method for gas phase container and dosing device volumes

B:1 Calculation method of gas phase container volume

B:2 Calculation method of volume of dosing device

Appendix C (informative) LNG sample status determination

Reference

Figure A:1 Enthalpy of saturated liquid

Figure C:1 LNG gas-liquid phase diagram

Table C:1 Bubble point and dew point temperatures of typical LNG lean and rich liquids under different pressures

Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents" Drafting:

This document replaces GB/T 20603-2006 "Continuous Sampling Method for Refrigerated Light Hydrocarbon Fluid Liquefied Natural Gas" and is consistent with GB/T 20603-Compared with:2006, in addition to structural adjustments and editorial changes, the main technical changes are as follows:

- a) Added requirements for back-end devices for intermittent sampling and spot sampling (see 6.6 and 6:7);
- b) Added sampling step requirements for intermittent sampling and spot sampling (see 7.2 and 7:3);
- c) Added sampling reporting requirements for intermittent sampling and spot sampling (see 8.3 and 8:4):

Please note that some content in this document may be subject to patents: The publisher of this document assumes no responsibility for identifying patents:

1 Scope

This document specifies the sampling methods when liquefied natural gas (LNG) is transported through pipelines, including continuous sampling, intermittent sampling and spot sampling method:

This document is applicable to liquefied natural gas sampling at small LNG stations such as large LNG receiving stations, LNG factories, filling stations, and gas filling stations:

2 Normative reference documents

The contents of the following documents constitute essential provisions of this document through normative references in the text: Among them, the dated quotations for undated referenced documents, only the version corresponding to that date applies to this document; for undated referenced documents, the latest version (including all amendments) applies to this document:

GB/T 13609 Guidelines for natural gas sampling

3 Terms and definitions

The following terms and definitions apply to this document:

liquefied natural gas an inert gas consisting primarily of methane and may contain small amounts of ethane, propane, butane, nitrogen, or other components commonly found in natural gas:

Color cryogenic liquid fluid:

[Source: GB/T 8423.3-2018,2:1:14] 3.2 continuous samplingcontinuoussampling A sampling method that continuously removes samples from the sample source during the entire period of stable transportation:

intermittent samplingintermittentsampling A sampling method that draws gasified LNG at predetermined intervals or at predetermined flow intervals:

spotsampling

A sample of a specified volume is collected from the LNG flow path at a specified time and place:

subcooling

Lowers the temperature of LNG below its boiling point at a given pressure:

degreeofsubcooling

The enthalpy change of LNG from the boiling point to the subcooling point at a given pressure: