# Manual of Petroleum Measurement Standards Chapter 8.6

## Refrigerated Light Hydrocarbon Fluids—Sampling of Liquified Natural Gas—Continuous and Intermittent Methods

ANSI/API *MPMS* CHAPTER 8.6
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## ISO 8943 (Modified), Refrigerated light hydrocarbon fluids – Sampling of liquified natural gas – Continuous and intermittent methods

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The API Committee on Measurement Quality (COMQ) voted to adopt a modified version of ISO 8943-2007 as American National Standard ANSI/API MPMS Chapter 8.6. These modifications from the ISO standard have been incorporated directly into the text and are highlighted. See the highlighted text in the Introduction for an explanation of the modifications.

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## ISO Foreword

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The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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ISO 8943 was prepared by Technical Committee ISO/TC 28, Petroleum products and lubricants, Subcommittee SC 5, Measurement of refrigerated hydrocarbon and non-petroleum based liquefied gaseous fuels.

This second edition cancels and replaces the first edition (ISO 8943:1991), which has been technically revised.

## Introduction

In the custody transfer of liquefied natural gas, hereinafter referred to as LNG, it is common practice to determine the quantity transferred on a calorific-content basis. The total calorific content of quantities of LNG quoted in the custody transfer is determined by the liquid volume, liquid density and gross calorific value of the LNG delivered.

At the time of publication, this standard discusses current technology proven to minimize sampling uncertainty, as indicated by the highlighted modifications. Future technology has to be performance-based and meet the requirement of providing an accurate sample of the LNG transfer. The LNG sampling devices have to ensure the total and continuous vaporization of a quantity of LNG. This quantity has to be sufficient for taking gaseous samples representative of the LNG being (un)loaded.

A knowledge of the composition of the LNG is required in order to calculate the density and the calorific content of quantities of LNG. Therefore, precise sampling is a prerequisite for precise analysis.

LNG is a complex mixture of low-molecular-weight hydrocarbons with nitrogen as a principal inert impurity. Typically, methane is the major component. Minor-component concentrations vary with the source of the raw gas, the liquefaction pre-treatment, the liquefaction process and the storage conditions.

# Refrigerated Light Hydrocarbon Fluids — Sampling of Liquefied Natural Gas — Continuous and Intermittent Methods

## 1 Scope

This International Standard specifies methods for the continuous and the intermittent sampling of LNG while it is being transferred through an LNG transfer line.

## 2 Normative References

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 10715:1997, *Natural gas — Sampling guidelines*

API *MPMS* Chapter 14.1, *Collecting and Handling of Natural Gas Samples for Custody Transfer*

## 3 Terms and Definitions

For the purposes of this document, the following terms and definitions apply.

**3.1**
**accumulator**
Storage vessel provided to absorb pressure pulsations of gasified LNG and to homogenize the same.

**3.2**
**bubbling**
Procedure, in the case of a water-seal-type gas sample holder, to saturate the seal water in a gas sample holder with gasified LNG in order to suppress the effect of the seal water on the gas sample.

**3.3**
**compressor for transferring gasified LNG**
Compressor used for boosting the pressure of gasified LNG when gasified LNG in the LNG sample vaporizer cannot be transferred to the gas sample holder by its inherent pressure.

**3.4**
**constant pressure/floating piston sample container**
**CP/FP sample container**
Sample container, abbreviated as CP/FP sample container and usually used for intermittent sampling, capable of maintaining constant pressure during the sampling of gas from the process line into the gas cylinder.

**3.5**
**continuous sampling**
Continuous collection of LNG from the main line during loading/unloading operations.

NOTE The fully vaporized LNG from the vaporizer is thereafter continuously fed into the gas sample holder. Gas sample containers are filled with the mixed gas from this gas holder after completion of the sampling process for offline analysis.

**3.6**
**gas sample container**
Sample container, usually used for continuous sampling, used for the retention of the gas sample and for its transfer to an analyzing instrument.

**3.7**
**gas sample compressor**
Compressor used for charging the gas sample collected in a gas sample holder into a gas sample container.