

Manual of Petroleum Measurement Standards Chapter 8.6

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

ANSI/API *MPMS* CHAPTER 8.6
FIRST EDITION, MAY 2020

ISO 8943 (Modified), Refrigerated light hydrocarbon fluids
– Sampling of liquefied 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

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

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.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

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 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/floatation 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.