Date of Errata Issue: March 2017
Affected Publication: API *MPMS* Chapter 17.11, *Measurement and Sampling of Cargoes On Board Tank Vessels Using Closed and Restricted Equipment*, Second Edition, August 2016

ERRATA

This errata corrects an editorial error in the second edition of API MPMS Chapter 17.11.

Section 7.1.3, page 13, note at the end of section, change:

> NOTE Alternate methods of water determination may be used. Refer to API MPMS Chapter 3.1A/EI HM 4.

to

> NOTE Alternate methods of water determination may be used; such as the clip rod/water gauge bar (see Figure 5.5), which, when used in conjunction with water-indicating paste, can be used for determination of free water. Refer to API MPMS Chapter 3.1A/EI HM 4.

energy API
AMERICAN PETROLEUM INSTITUTE

energy institute

Manual of Petroleum Measurement Standards Chapter 17.11

Measurement and Sampling of Cargoes On Board Tank Vessels Using Closed and Restricted Equipment

EI Hydrocarbon Management HM 52

SECOND EDITION, AUGUST 2016

ERRATA: MARCH 2017

API *MPMS* Chapter 17.11/EI HM 52

Measurement and Sampling of Cargoes On Board Tank Vessels Using Closed and Restricted Equipment

Second Edition

August 2016

Published jointly by

API
and
ENERGY INSTITUTE LONDON
The Energy Institute is a professional membership body incorporated by Royal Charter 2003
Registered charity number 1097899

Special Notes and Disclaimers

API and EI publications are recommended for general adoption but should be read and interpreted in conjunction with Weights and Measures, Safety, Customs and Excise and other regulations in force in the country in which they are to be applied. With respect to particular circumstances, local, state, and federal laws and regulations should be reviewed. Such regulatory requirements have precedence over corresponding clauses in API/EI publications. However, where requirements of API/EI publications are more rigorous, then their use is recommended.

The information contained in this publication is provided as guidance only. Neither API and EI nor any of API/EI's employees, subcontractors, consultants, committees, or other assignees make any warranty or representation, either express or implied, with respect to the accuracy, completeness, or usefulness of the information contained herein, or assume any liability or responsibility for any use, or the results of such use, of any information or process disclosed in this publication. Neither API and EI nor any of API/EI's employees, subcontractors, consultants, or other assignees represent that use of this publication would not infringe upon privately owned rights.

Users of this publication should not rely exclusively on the information contained in this document. Sound business, scientific, engineering, and safety judgment should be used in employing the information contained herein.

API/EI joint publications may be used by anyone desiring to do so. Every effort has been made by the Institutes to ensure the accuracy and reliability of the data contained in them; however, the Institutes make no representation, warranty, or guarantee in connection with this publication and hereby expressly disclaim any liability or responsibility for loss or damage resulting from its use or for the violation of any authorities having jurisdiction with which this publication may conflict.

API/EI joint publications are published to facilitate the broad availability of proven, sound engineering and operating practices. These publications are not intended to obviate the need for applying sound engineering judgment regarding when and where these publications should be utilised. The development and publication of API/EI joint publications is not intended in any way to inhibit anyone from using any other practices.

Nothing contained in any API/EI joint publication is to be construed as granting any right, by implication or otherwise, for the manufacture, sale, or use of any method, apparatus, or product covered by letters patent. Neither should anything contained in the publication be construed as insuring anyone against liability for infringement of letters patent.

API/EI are not undertaking to meet the duties of employers, manufacturers, or suppliers to warn and properly train and equip their employees, and others exposed, concerning health and safety risks and precautions, nor undertaking their obligations to comply with authorities having jurisdiction.

The above disclaimer is not intended to restrict or exclude liability for death or personal injury caused by own negligence.

The Energy Institute is a professional membership body incorporated by Royal Charter 2003.

Registered charity number 1097899, England

Foreword

This publication was prepared jointly by the API Committee on Petroleum Measurement (COPM) and the EI Hydrocarbon Management Committee (HMC).

The COPM and HMC are responsible for the production and maintenance of standards and guides covering various aspects of static and dynamic measurement of petroleum. The API/EI Joint Committee on Hydrocarbon Management (JCHM), its subcommittees, and work groups consist of technical specialists representing oil companies, equipment manufacturers, service companies, terminal and shipowners and operators. The API/EI JCHM encourages international participation, and when producing publications, its aim is to represent the best consensus of international technical expertise and good practice. This is the main reason behind the production of joint publications involving cooperation with experts from both the API and EI.

This standard is intended to provide guidelines for measurement and sampling of cargoes on board tank vessels using closed and restricted equipment. However, it is not intended to preclude the use or development of any other technologies or methods. To gain a better understanding of the methods described in this standard, the reader should review in detail the latest editions of the publications, standards, and documents referenced herein.

SI units are used throughout this publication as the primary units of measure because this system is commonly used in measurement and sampling. However, US Customary (USC) units continue to be used in some applications. Therefore, both SI and USC units are shown (with USC in parentheses).

This standard is not intended to supersede any safety or operating practices recommended by organizations such as the International Maritime Organization (IMO), International Chamber of Shipping (ICS), and Oil Companies International Marine Forum (OCIMF), or individual operating companies, nor is the publication intended to supersede any other safety or environmental considerations, local regulations, or the specific provisions of any contract.

All shipboard procedures described in this standard should be performed by or in the presence of the ship's master or the designated representatives. For reasons of safety, only approved equipment certified intrinsically safe or otherwise approved suitable for its intended use shall be used.

API/EI standards are published as an aid to procurement of standardized equipment and materials and/or as good practice procedures. These standards are not intended to inhibit purchasers or producers from purchasing or producing products made to specifications other than those of API or EI.

Classified areas may vary depending on the location, conditions, equipment, and substances involved in any given situation. Users of this standard should consult with the appropriate authorities having jurisdiction. Users of this standard should not rely exclusively on the information contained in this publication. Sound business, scientific, engineering, and safety judgment should be used in employing the information contained herein.

Shall: As used in a standard, "shall" denotes a minimum requirement in order to conform to the requirement.

Should: As used in a standard, "should" denotes a recommendation or that which is advised but not required in order to conform to the requirement.

May: As used in a standard, "may" denotes a course of action permissible within the limits of a standard.

Can: As used in a standard, "can" denotes a statement of possibility or capability.

This publication was produced following API/EI standardization procedures that ensure appropriate notification and participation in the developmental process and is designated as an API/EI standard.

Questions concerning the interpretation of the content of this publication or comments and questions concerning the procedures under which this publication was developed should be directed in writing to the Director of Standards, American Petroleum Institute, 1220 L Street, NW, Washington, DC 20005, USA, or the Technical Department, Energy Institute, 61 New Cavendish Street, London, W1G 7AR, UK.

Requests for permission to reproduce or translate all or any part of the material published herein should also be addressed to the Director of Standards (API) or the Technical Department (EI). Generally, API/EI standards are reviewed and revised, reaffirmed, or withdrawn at least every five years. A one-time extension of up to two years may be added to this review cycle. Status of the publication can be ascertained from the API Standards Department, 1220 L Street, NW, Washington, DC 20005, USA, or the EI Technical Department, Energy Institute, 61 New Cavendish Street, London, W1G 7AR, UK.

A catalogue of API publications can be found at www.api.org/publications.

A catalogue of EI publications can be found at https://publishing.energyinst.org.

Suggested revisions are invited and should be submitted to the Standards Department, API, 1220 L Street, NW, Washington, DC 20005, USA, standards@api.org, or to the Technical Department, Energy Institute, 61 New Cavendish Street, London, W1G 7AR, UK.

Contents

Contents

Introduction

Measurement accuracy and representative sampling are essential to the sale, purchase, and handling of bulk liquids. Accurate measurements and representative sampling require the use of standardized equipment and procedures.

Government and regulatory agencies worldwide are imposing safety and environmental regulations that prohibit tank vessel operations from releasing hydrocarbons into the atmosphere. This has resulted in the restriction and, in some cases, the prohibition of traditional methods of obtaining cargo measurements and samples. Consequently, methods and technologies are now being developed and used that allow cargo measurements and samples to be taken with no vapor release (closed) or with very limited vapor release (restricted).

Shipboard sampling at the load or discharge port is frequently required to test the quality of the cargo against contract and also to determine if any cargo quality degradation has occurred during the shipping process. Shipboard sampling may also be required prior to cargo acceptance and custody transfer, particularly where shipboard blending has taken place.

It should be noted that when taking vessel samples, it may not be possible to obtain representative samples of nonhomogeneous cargoes due to the inherent nature of the cargo and the sampling restrictions.

Measurement and Sampling of Cargoes On Board Tank Vessels Using Closed and Restricted Equipment

1 Scope

This document provides guidance on the use, maintenance, and calibration of restricted and closed measurement and sampling equipment. It also provides guidance on preferred size and positioning for gauging and sampling fittings on vessels.

2 Normative References

This document should be used in conjunction with the following referenced documents. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

API *Manual of Petroleum Measurement Standards (MPMS)* Chapter 1, *Vocabulary*

API *MPMS* Chapter 2*, Tank Calibration*

API *MPMS* Chapter 3.1A-2005, *Manual Gauging of Petroleum and Petroleum Products*

API *MPMS* Chapter 7, *Temperature Determination*

API *MPMS* Chapter 8.1, *Manual Sampling of Petroleum and Petroleum Products*

API *MPMS* Chapter 17.4, *Method of Quantification of Small Volumes on Marine Vessels (OBQ/ROB)*

API Recommended Practice 2003, *Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents*

EI HM 4*, Manual Level Measurement for Petroleum Liquids*

ISO 3170:2004 [1], *Petroleum Liquids—Manual Sampling*

3 Terms and Definitions

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

3.1
air-saturated vapor pressure
ASVP
The observed pressure exerted in vacuo by air-saturated petroleum products, components, and feedstocks, in the absence of undissolved water.

3.2
assay
The procedure to determine the presence, absence, or quantity of one or more components.

3.3
dead bottom sample
A sample obtained from the lowest accessible point in a tank.

[1] International Organization for Standardization, 1, ch. de la Voie-Creuse, Case postale 56, CH-1211, Geneva, Switzerland, www.iso.org.