



# **API Manual of Petroleum Measurement Standards Chapter 17.11**

## **EI Hydrocarbon Management HM 52**

### **Measurement and Sampling of Cargoes Using Closed and Restricted Equipment**

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Measurement and Sampling of Cargoes Using Closed and  
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## **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 available and used that allow cargo measurements and samples to be taken with no vapor release (closed) or with very limited vapor release (restricted).

There are a number of potential issues that can affect the reliability of samples obtained using restricted and closed sampling equipment, including equipment (both sampling devices and tank fittings) cleanliness and the requirement to transfer the sample into a secondary container. Furthermore, it should be noted that 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 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.

## 2 Normative References

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any addenda) applies.

API *Manual of Petroleum Measurement Standards (MPMS) Chapter 3.1A, Manual Gauging of Petroleum and Petroleum Products*

API MPMS Chapter 7 (all sections), *Temperature Determination*

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

EI HM 4<sup>1</sup>, *Manual level measurement for hydrocarbon liquids*

## 3 Terms and Definitions

For the purposes of this document, the following definitions apply. Terms of more general use may be found in API MPMS Chapter 1, *Online Terms and Definitions Database*.

### 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.

### 3.4

#### **decanting**

To pour (a liquid) from one container to another.

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<sup>1</sup> Energy Institute, 61 New Cavendish Street, London W1G 7AR, United Kingdom, [www.energyinst.org](http://www.energyinst.org).