

Manual of Petroleum Measurement Standards Chapter 2.4

Measurement and Calibration of Tank Cars

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Introduction

The purposes of tank cars are to provide secure and safe transportation of petroleum and petrochemical materials and as measurement devices for those contents. This document addresses the development and standardization of the capacity tables used for these measurements. The actual determination of volume of material contained in a tank car is addressed in *API Manual of Petroleum Measurement Standards* Chapter 3.2.

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Measurement and Calibration of Tank Cars

1 Scope

This standard describes the procedures required to produce a capacity table for a tank car. Calibration procedures for pressure and non-pressure tank cars are addressed within this document.

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 MPMS Chapter 2.2A *Measurement and Calibration of Upright Cylindrical Tanks by the Manual Strapping Method*

API MPMS Chapter 2.2D/ISO 7507-4 *Tank Calibration by Internal Electro-Optical Distance-Ranging Method*

API MPMS Chapter 2.2E/ISO 12917-1: 2002 *Petroleum and Liquid Petroleum Products—Calibration of Horizontal Cylindrical Tanks—Part 1: Manual Methods (ANSI/API MPMS Ch. 2.2E)*

API MPMS Chapter 2.2F/ISO 12917-2: 2002, *Petroleum and Liquid petroleum products—Calibration of Horizontal Cylindrical Tanks—Part 2: Internal Electro-Optical Distance-Ranging Method (ANSI/API MPMS Ch. 2.2F)*

API MPMS Chapter 2.2G *Calibration of Upright Cylindrical Tanks Using the Total Station Reference Line Method*

API MPMS Chapter 3.2, *Gauging Petroleum and Petroleum Products in Tank Cars*

API MPMS Chapter 4 (all sections), *Proving Systems*

API MPMS Chapter 5 (all sections), *Metering*

API MPMS Chapter 21 (all sections), *Electronics Measurement*

3 Terms, Definitions, Abbreviations, and Symbols

3.1 Terms and Definitions

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

3.1.1

tank car calibration

The method used to determine the volume capacity of a tank car. Each tank car is calibrated to accurately measure its shell-full capacity.

3.1.2

capacity

The volume of a container or tank filled to a specified level.

3.1.3

tank car capacity table

Table showing the liquid volume capacities, on an innage or ullage (outage) basis, and the corresponding vapor space capacities, in a tank, tank car or vessel compartment, at various liquid levels, which are measured at the