
**Petroleum and liquid petroleum
products — Calibration of vertical
cylindrical tanks —**

**Part 2:
Optical-reference-line method**

*Pétrole et produits pétroliers liquides — Jaugeage des réservoirs
cylindriques verticaux —*

Partie 2: Méthode par ligne de référence optique



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Contents

Page

Foreword.....	iv
Introduction.....	v
1 Scope.....	1
2 Normative references.....	1
3 Terms and definitions.....	1
4 Precautions.....	2
5 Equipment.....	2
6 Procedure.....	3
6.1 Principle.....	3
6.2 Preparation of the tank.....	3
6.3 Reference circumference.....	3
6.4 Offset readings.....	4
6.5 Tank bottom calibration.....	8
6.6 Other measurements and data.....	8
7 Tolerances.....	9
8 Tank capacity calculation procedure.....	9
8.1 Outside circumference.....	9
8.2 Corrections.....	10
8.3 Tank capacity table.....	10
Annex A (informative) Tank calibration uncertainties.....	11
Bibliography.....	26

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 7507-2 was prepared by Technical Committee ISO/TC 28, *Petroleum products and lubricants*, Subcommittee SC 3, *Static petroleum measurement*.

This second edition cancels and replaces the first edition (ISO 7507-2:1993), which has been technically revised.

ISO 7507 consists of the following parts, under the general title *Petroleum and liquid petroleum products — Calibration of vertical cylindrical tanks*:

- *Part 1: Strapping method*
- *Part 2: Optical-reference-line method*
- *Part 3: Optical-triangulation method*
- *Part 4: Internal electro-optical distance-ranging method*
- *Part 5: External electro-optical distance-ranging method*

Introduction

This part of ISO 7507 forms part of a series on tank calibration, including the following:

ISO 4269:2001, *Petroleum and liquid petroleum products — Tank calibration by liquid measurement — Incremental method using volumetric meters*

ISO 7507-1:2003, *Petroleum and liquid petroleum products — Calibration of vertical cylindrical tanks — Part 1: Strapping method*

ISO 7507-3:1993, *Petroleum and liquid petroleum products — Calibration of vertical cylindrical tanks — Part 3: Optical-triangulation method*

ISO 7507-4:1995, *Petroleum and liquid petroleum products — Calibration of vertical cylindrical tanks — Part 4: Internal electro-optical distance-ranging method*

ISO 7507-5:2000, *Petroleum and liquid petroleum products — Calibration of vertical cylindrical tanks — Part 5: External electro-optical distance-ranging method*

ISO 8311:1989, *Refrigerated light hydrocarbon fluids — Calibration of membrane tanks and independent prismatic tanks in ships — Physical measurement*

ISO 9091-1:1991, *Refrigerated light hydrocarbon fluids — Calibration of spherical tanks in ships — Part 1: Stereo-photogrammetry*

ISO 9091-2:1992, *Refrigerated light hydrocarbon fluids — Calibration of spherical tanks in ships — Part 2: Triangulation measurement*

ISO 12917-1:2002, *Petroleum and liquid petroleum products — Calibration of horizontal cylindrical tanks — Part 1: Manual methods*

ISO 12917-2: 2002, *Petroleum and liquid petroleum products — Calibration of horizontal cylindrical tanks — Part 2: Internal electro-optical distance-ranging method*

This part of ISO 7507 describes a method for the calibration of vertical cylindrical tanks by measurement of one reference circumference by strapping and then determining the remaining circumferences at different levels from measurements of radial offsets from vertical optical-reference lines. These circumferences are corrected to give the true internal circumferences.

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Petroleum and liquid petroleum products — Calibration of vertical cylindrical tanks —

Part 2: Optical-reference-line method

1 Scope

This part of ISO 7507 specifies a method for the calibration of tanks above eight metres in diameter with cylindrical courses that are substantially vertical. It provides a method for determining the volumetric quantity contained within a tank at gauged liquid levels.

NOTE The optical (offset) measurements required to determine the circumferences can be taken internally or externally.

The method specified in this part of ISO 7507 is suitable for tilted tanks with up to 3 % deviation from the vertical provided that a correction is applied for the measurement tilt, as described in ISO 7507-1.

This method is an alternative to other methods such as strapping (ISO 7507-1) and the optical-triangulation method (ISO 7507-3).

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 4269:2001, *Petroleum and liquid petroleum products — Tank calibration by liquid measurement — Incremental method using volumetric meters*

ISO 7507-1:2003, *Petroleum and liquid petroleum products — Calibration of vertical cylindrical tanks — Part 1: Strapping method*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 7507-1 and the following apply.

3.1

optical-reference-line

vertical optical ray (virtual) that is established using the optical device at a given location

3.2

magnetic trolley

mechanical device that can be traversed up or down the tank shell wall to measure deviations in the tank shell relative to the optical-reference-line using a horizontal scale that is mounted on the trolley