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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 13235.1-2016

Replacing GB/T 13235.1-1991

**Petroleum and liquid petroleum products -- Volumetric
calibration of vertical cylindrical metal tanks -- Strapping
method**

(English Translation)

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Foreword

GB/T 13235 "Petroleum and liquid petroleum products vertical cylindrical tank volume calibration" is expected to be divided into the following parts.

Part 1. Enclosing method;

- Part 2. Optical reference line method;

Part 3. Optical triangulation;

- Part 4. Photoelectric distance measurement method;

Part 5. Optoelectronic distance measurement method.

This part is part 1 of GB/T 13235.

This part is drafted in accordance with the rules given in GB/T 1.1-2009.

This part of the replacement GB/T 13235.1-1991 "Petroleum and liquid petroleum products Vertical cylindrical metal tank volume calibration method (fence Law) ", compared with GB/T 13235.1-1991 main technical changes are as follows.

- the standard name is changed to "oil and liquid petroleum products vertical cylindrical tank volume calibration Part 1. foot method";
- modify the technical content of the supplemental "scope", add this section to include other measurements and compute the schedules and the inclination of the tank (See Chapter 1);
- a normative reference document has been added (see Chapter 2);
- add and remove parts of the terms and definitions, and rewrite some of the terms (see Chapter 3);
- the deletion of the "method summary" (see chapter 4 of the 1991 edition);
- the technical requirements for modifying part of the enclosure equipment in accordance with Appendix C (see Chapter 5, Chapter 6 of 1991);
- to modify the general requirements of the calibration, to increase the liquid calibration, check points, reference points, the relative position of the two and the height of the relevant reference Contents (see Chapter 6, 1991, Edition 5.1);
- to modify the technical content of the foot method, the deletion of the specific method of foot, emphasizing the application of the fence with the test force consistent with the pull, and (See Chapter 7, Chapter 7 of the 1991 edition), as far as possible, to the full length, - modify the technical content of the floating roof measurement and no longer be included as an appendix (see Chapter 12, 1991, Chapter 12 and Appendix B);
- increase the re-calibration chapter (see Chapter 13);
- modify the relevant content of data processing (see Chapter 16, 1991, Chapter 14,15,16,17);
- a method of increasing the tank volume table (see Chapter 17);
- the contents of the tank volume table are removed and the relevant contents are placed in the appendix (see Appendix G, Appendix H, Appendix I, Appendix J, 1991 edition of chapter 18);
- delete the calibration report (see 1991 edition 19);
- the total uncertainty in the removal of the tank volume calibration (see chapter 20 of 1991);
- an increase of six appendices, which are "technical requirements for the equipment used in the fence (Appendix C)", "tank calibration and volume table monitoring and (Appendix D) "" Uncertainty in tank calibration (Appendix F) "" Determination of tank wall temperature (Appendix G) "" Level gauge temperature (Appendix H) "and" Temperature-induced expansion (Appendix I) ";
- In Appendix J, two additional algorithms for calculating the static pressure volume

correction are added.

This part uses the re-drafting method to modify ISO 1507-1.:2003 "Petroleum and liquid petroleum products Vertical cylindrical tank standard Part 1. Enclosure Method ".

This section has a greater structural adjustment compared to ISO 7507-1.:2003, which is listed in Appendix A and ISO 7507-1.:2003 of the chapter number of the control list.

This section has technical differences with ISO 7507-1.:2003, and these differences relate to the terms that have been passed through its outer margins Vertical line (|), Appendix B gives a list of the corresponding technical differences and their causes.

This section makes the following editorial changes.

--- canceled the introduction;

- Note 2 in Chapter 1, "Scope" to illustrate the extent to which the deformation of the tank affects the nominal volume;

- In the 3.2 "calibration" terminology, add a note indicating the relationship between calibration and calibration and calibration;

- Note 1, note 2 and note 3 in 14.4;

- In Table E, add table E.1 "Vertical cylindrical tank calibration record table", combined with our customary algorithm, rewritten " Type cylindrical tank calibration data calculation table "as table E.2;

--- combined with the actual situation of China's calibration tank, modify the Appendix F "tank calibration uncertainty", the uncertainty of the tank calibration Evaluation method to rewrite.

This part of the National Petroleum Products and Lubricants Standardization Technical Committee (SAC/TC280) proposed.

This part of the National Petroleum Products and Lubricants Standardization Technical Committee of Petroleum Static and Light Hydrocarbon Metering Subcommittee (SAC/TC 280/SC2).

1 Scope

This part of GB/T 13235 specifies the method of measuring the volume of vertical cylindrical tanks by measuring the oil tank circumference with a steel ruler.

This method is referred to as the "ruler method" and is suitable for use as a working method, a reference method or an arbitration method.

Note 1: The relevant content used by this method as a baseline method is specified in the reference to this part of the standard.

This part also gives the vertical cylindrical tank plate height, thickness, tank bottom, accessories, floating roof and tilt and other data measurement and calculation of the table Methods.

This method does not apply to tanks that are severely deformed (such as recessed or not rounded).

Note 2: The effect of the calibration volume on the circumference of the parcel is not greater than $(3/20) R$ when the ratio of the depression depth to the radius does not exceed $2/1000$ Negligible.

This method is applicable to oil tanks with an inclination of not more than 3%, but the calculation should be corrected according to the tilt measurement.

2 Normative reference documents

The following documents are indispensable for the application of this document. For dated references, only the dated edition applies to this article Pieces. For undated references, the latest edition (including all modifications) applies to this document.

GB/T 1884 Determination of density of crude oil and liquid petroleum products - Laboratory method (density meter method) (GB/T 1884-2000, eqv ISO 3675.:1998) GB/T 1885 oil gauge (GB/T 1885-1998, eqvISO 91-2.:1991, Petroleum measurement tables-Part 2. Tables based on reference temperatures of 20 degree C) GB/T 4756 Petroleum liquid manual sampling method (GB/T 4756-1998, eqvISO 3170. 1988) GB/T 8927 Petroleum and liquid petroleum products - Temperature measurement manual method (GB/T 8927-2008, ISO 4268.:2000, MOD) GB/T 13236 Petroleum and liquid petroleum products - Tank level manual measurement equipment (GB/T 13236-2011, ISO 4512.

2000, MOD)

GB/T 13894 Petroleum and liquid petroleum products Level measurement method (manual method) ISO 4269.:2001 Petroleum and Liquid Petroleum Products Tank Liquid Calibration Volumetric Flowmeter Incremental Method (Petroleum and liquid petroleum products-Tank calibration by liquid measurement-Incremental method using volumetric meters

3 Terms and definitions

The following terms and definitions apply to this document and to other parts of GB/T 13235.

Bottom calibrated bottom calibration the measurement of the amount of liquid contained in the tank at the lowest point at the bottom of the tank or at the lowest level of elimination of tank bottom deformation and/or below the calibration reference point.