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

GB/T 25964-2010

**Petroleum and liquid petroleum products -- Determination of
volume, density and mass of the hydrocarbon content of
vertical cylindrical tanks by hybrid tank measurement systems**

石油和液体石油产品 采用混合式油罐测量系统测量立式圆筒形油罐内油品体积、
密度和质量的方法

(English Translation)

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Table of Contents

- Preface
- 1 Scope
- 2 Normative references
- 3 Terms and definitions
- 4 General Precautions
 - 4.1 Safety precautions
 - 4.2 Equipment preventive measures

Foreword

This revised standard adopts ISO 15169:2003 "Petroleum and liquid petroleum products using a hybrid tank measurement system vertical cylinder the volume of liquid in the tank shape, the method "density and quality.

This standard is based on ISO 15169:2003 redrafted the standard clauses structure with international standards.

In the use of ISO 15169:2003, the standard of the present situation of China the following technical corrections.

--- In view of the tank wall temperature using GB/T 19779 algorithm, thus increasing the GB/T 19779 "Petroleum and liquid petroleum products, fuel gauge Operators static measurement "as normative references;

--- Because the field component calibration using the inconvenience, so the inherent accuracy of the system table 3 automatic tank custody transfer measurement of volume-based thermometer Replaced by a system calibration inherent accuracy;

--- For the 6.2 paragraph 4 "If HTMS is mainly used for mass or density measurements.", Removing "or density" the reason is to reduce the density measurement ALG accuracy will result greater impact;

--- To avoid misunderstanding, "1) For zero adjustments, disconnect the transmitter to the atmosphere in the pressure port 8.5.2.1.

"To" 1) For zero adjustments, disconnect the pressure transmitter is connected with the tank line and make it the impulse towards big mouth gas. ";

--- Suitable for our habits, supplemented by oil meter standard-density (Dref) and volume correction factor in Table 5 (VCF) content;

--- Table 6 formula $D_{obs} = D_{ref}/VCF$ there is an error, it should be replaced $D_{obs} = D_{ref} \times VCF$;

--- Suitable for our habits, added in Table 6 to determine the volume correction factor (VCF) with oil content meter.

This standard also made the following editorial changes.

--- 5.2.1 Pressure Sensor will involve the naming convention Description Note into 5.3.1;

--- Finally, the increase in the 6.3 "Note. The maximum error of the pressure sensor should contain additional temperature error.";

--- The data in Appendix A metered volume of gross A.2 formula for calculating the amount of the adjustment of the floating roof (FRA) to discharge liquid floating roof Product (FRV), while additional calculations floating roof drainage volume formulas;

--- Informative revised Table B.3 in Appendix B, Table B.4, B.5 and B.6 of the table part of the calculation data;

--- Will B.2 Informative Appendix B in the B value formula "UP1-zero" to "UP3-zero".

Appendix A of this standard and Appendix B is an informative annex.

This standard by the National Standardization Technical Committee on products and lubricant oil (SAC/TC280) proposed.

This standard by the National Petroleum products Petroleum measurement of static and light hydrocarbons and lubricants Technical Committee of Standardization Technical Committee (SAC/TC280/SC2) centralized.

1 Scope

This standard gives the hybrid tank measurement systems (HTMS) the selection, installation, commissioning, calibration and inspection guidelines, through the system can Liquid petroleum and petroleum products storage tank to measure the static quality, measurement volume and standard volume and density measurement and standard density, to meet the needs Custody transfer measurement. In the custody transfer measurement, the volume or mass number using the number of oil determined by the user, but are still included in this standard Analysis and examples related uncertainty, the purpose is to help you choose the right HTMS component configuration to achieve the desired measurable indicators.

This standard applies to stationary vertical cylindrical tanks, which store oil Reid Vapor Pressure (RVP) of less than 103.42kPa.

This standard does not apply to cabin pressure tank or for metering.

Note 1: The term "quality" is used to indicate vacuum quality (true quality). In the oil industry, the

apparent mass (air) commonly used in the business transfer. therefore, Standard calculation method is also provided on the air quality and the apparent quality (see Appendix A).

Note 2: The standard calculation method can also be used for other shapes tanks, these tanks have been calibrated by national standard methods. Ball given in Appendix B Calculation example shaped horizontal cylindrical tanks and uncertainty analysis.

2 Normative references

The following documents contain provisions which, through reference in this standard and become the standard terms. For dated references, subsequent Amendments (not including errata content) or revisions do not apply to this standard, however, encourage the parties to the agreement are based on research Whether the latest versions of these documents. For undated reference documents, the latest versions apply to this standard.

GB/T 1884 crude oil and liquid petroleum products - Laboratory determination of density (density meter method) (GB/T 1884-2000, eqv ISO 3675:1998) GB/T 1885 Petroleum Measurement Tables (GB/T 1885-1998, eqv ISO 91-2:1991) GB/T 4756 petroleum liquids hand sampling method (GB/T 4756-1998, eqv ISO 3170. 1988) GB/T 18273 Petroleum and liquid petroleum products - Direct static vertical fuel tank measurements (HTG quality measurement) (GB/T 18273-2000, eqv ISO 11223-1:1995) GB/T 19779 Petroleum and liquid petroleum products - Calculation of oil static measurement GB/T 21451.4 Petroleum and liquid petroleum product storage tank level and temperature automatic measurement - Part 4. temperature and atmospheric tanks Measurement (GB/T 21451.4-2008, ISO 4266-4:2002, MOD) 1)

1) GB/T 21451 comprises six parts, currently only promulgated GB/T 21451.4, other parts are being developed.

SH/T 0604 crude oil and petroleum products densitometry (U-type vibration tube method) (SH/T 0604-2000, eqv ISO 12185:1996) ISO 91-1:1992 Petroleum Measurement Tables - Part 1. 60 °F to 15 °C and the temperature of the standard table ISO 1998 (all parts), petroleum industry terminology ISO 4266-1 Petroleum and liquid petroleum product storage tank liquid level and temperature Automatic measurements - Part 1. atmospheric tanks of liquid Level Measurement

3 Terms and Definitions

ISO 1998 (all parts), and established the following terms and definitions apply to this standard.