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Liquid hydrocarbons — Volumetric measurement by displacement meter

Hydrocarbures liquides — Mesurage volumétrique au moyen de compteurs à chambre mesureuse

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 28, *Petroleum and related products, fuels and lubricants from natural or synthetic sources*, Subcommittee SC 2, *Measurement of petroleum and related products*, in collaboration with Technical Committee ISO/TC 30, *Measurement of fluid flow in closed conduits*.

This second edition cancels and replaces the first edition (ISO 2714:1980), which has been technically revised.

Introduction

This document gives recommendations on the design, installation, operation and maintenance of positive displacement meter systems used for liquid measurement. This widens the application scope from the previous document, which was primarily aimed at hydrocarbon custody transfer applications. The guidance now applies to all suitable liquids measured across different applications and industry sectors.

Displacement meters are extensively used in general fluid measurement in addition to fiscal, custody transfer and legal metrology applications involving hydrocarbon and non-hydrocarbon products. These can range from the light products such as gasoline, through to higher viscosity fluids.

The document has an extended scope from the first edition to cover applications for a wider range of liquids and duties and to remove restriction to hydrocarbon liquids. It now provides guidance, rather than mandatory requirements, on performance to allow meters to be specified and verified to meet relevant regulatory, fiscal and custody transfer specifications. The document also now includes additional meter designs. This revision has been achieved through the participation of ISO/TC 30 in the preparation, hence, providing a single standard for the measurement of flowing liquids using positive displacement flowmeters.

Liquid hydrocarbons — Volumetric measurement by displacement meter

WARNING — The use of this document might involve hazardous materials, operations and equipment. This document does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of this document to establish appropriate safety and health practices.

1 Scope

This document describes and discusses the characteristics of displacement flowmeters. Attention is given to the factors to be considered in the application of positive displacement meters to liquid metering. These include the properties and nature of the liquid to be metered, the correct installation and operation of the meter, environmental effects, and the wide choice of secondary and ancillary equipment. Aspects of meter proving and maintenance are also discussed.

This document is applicable to the metering of any appropriate liquid. Guidance is given on the use of positive displacement meters in the metering of two-component mixtures of the same phase such as water and oil.

It is not applicable to two-phase flow when gases or solids are present under metering conditions (i.e. two-phase flow). It can be applied to the many and varied liquids encountered in industry for liquid metering only. It is not restricted to hydrocarbons.

Guidance on the performance expected for fiscal/custody transfer applications for hydrocarbons is outlined.

This document is not applicable to cryogenic liquids such as liquefied natural gas (LNG) and refrigerated petroleum gas. It does not cover potable water and fuel dispenser applications.

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 amendments) applies.

ISO/IEC Guide 99, *International vocabulary of basic and general terms in metrology (VIM)*

ISO 4006, *Measurement of fluid flow in closed conduits — Vocabulary and symbols*

3 Terms, definitions, symbols and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/