TECHNICAL REPORT

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Petroleum products — Equivalency of test method determining the same property —

Part 100: Background and principle of the comparison and the evaluation of equivalency

Produits pétroliers — Équivalence des méthodes d'essai déterminant la même propriété —

Partie 100: Fondement et principe de la comparaison et de l'évaluation de l'équivalence

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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.

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).

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For an explanation on 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.

The committee responsible for this document is ISO/TC 28, *Petroleum products and related products of synthetic or biological origin.*

A list of the parts of ISO/TR 19686 can be found on the ISO website.

Introduction

In 2010 ISO/TC 28 established a working group to investigate the development of test method equivalency tables. This proposal resulted from the discussion about identities, equivalences or differences in test methods related to fuels. It was concluded that a more structured approach would be useful.

The task of determining equivalency appeared to be a difficult and complex one; it was therefore decided that each property would be taken into account in turn and addressed in separate Technical Reports. In 2014 ISO/TC 28 agreed that a base document would be developed to show how the experts effectively compared the test method standards and evaluated their equivalency. This document gives that guidance.

Petroleum products — Equivalency of test method determining the same property —

Part 100: Background and principle of the comparison and the evaluation of equivalency

1 Scope

This document describes the procedure for evaluation in order to determine the equivalency of test methods used on a global scale in quality specifications of petroleum products, lubricants, liquid fuels and gaseous fuels for transportation purposes. The result of the assessment on each property is presented in a separate part of ISO/TR 19686. This document is intended to guide laboratories that use one part of ISO/TR 19686 and wish to know if they can also use other parts.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

No terms and definitions are listed in this document.

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

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

4 Comparison

4.1 Reasons for divergence

When compared test methods are originally based on the same document(s), then at the time of first publication these methods may be designated “identical”. However, if the derived methods are used in different regional, legislative and/or technical environments, they will diverge over time due to independent revision; therefore the designation “identical” will slowly move towards “equivalent” or even to “different”.

4.2 Equivalency

The designations “identical”, “equivalent” or “different” can be factored into a set of important analytical parameters which do affect applicability, results and precision as follows:

a) test method scope;

   1) applicability to specific product groups,

   2) measurement ranges;

b) interferences (matrix effects/disturbances);

c) test equipment/apparatus;

d) procedural items (internal/external standard, calibration, sample preparation, etc.);

e) precision, ILS (Interlaboratory Study) information.

Any comparison of test methods should give comprehensive answers to the above mentioned issues. Several approaches to these "identity questions" sometimes reduce the above findings to categories such as:

— **Identical**: same technical scope, procedures, results, and precision, only editorial differences due to different editorial styles;

— **Equivalent**: some differences introduced in technical aspects such as updated precision, extension of scope or range, etc.;

— **Different**: introduction of significant technical changes such as different equipment, different calibration or calculation has changed the test result or the way the test result may be or is used.

5 Questionnaire for checking similarities of test methods

The questionnaire presented in Table 1 should serve as a starting point for a more structured approach for a test method comparison. When more than one precision statement is available it is prudent to also assess the significance of any difference for $r = f(x)$ and $R = f(x)$ after collection of the details from the round robin data of the test methods.

The following main issues should be compared:

A. measured property;

B. instrumentation used;

C. calibration;

D. sampling and sample handling;

E. test method procedure as such;

F. precision information and the data on which it has been determined;

G. any other relevant information.

After the requested details have been compiled, a consensus opinion on the extent to which the compared test methods are identical/equivalent/different and which steps would be necessary to increase test similarities has been developed.

Each part of ISO/TR 19686 gives a conclusion of the assessment, i.e. whether the methods under review can be considered identical or not.

Table 1 — Test method comparison matrix

		Method A	Method B	Comparison (Identical/equivalent/different)
A	**Issues concerning measured properties**			
A.1	Which properties are determined (also which units)?			
A.2	What exactly is the principle of measurement?			

Table 1 *(continued)*

		Method A	Method B	Comparison (Identical/equivalent/different)
A.3	Which products can the test method be applied to?			
A.4	What is the measurement range (per property)?			
A.5	Which components can interfere with the determination?			
A.6	Are there any matrix effects to consider?			
B	**Issues concerning instrumentation**			
B.1	List all required equipment including specific manufacturers if any are mentioned			
C	**Issues concerning calibration**			
C.1	What procedure is used to prepare calibration standards? If calibration standards are purchased, what requirements are placed on those standards?			
C.2	Are the standards Internal or external to the measurement of the tested property in the test sample?			
C.3	What is the calibration procedure? Which calculations are done to complete the calibration?			
D	**Sample handling and preparation**			
D.1	Sample handling details?			
D.2	Sample preparation procedure?			
E	**Procedural test method details**			
E.1	What are the test method procedures?			
E.2	Which measurement is made?			
E.3	Requirements for reporting/rounding of results?			