
Petroleum products and other liquids — Guidance for flash point testing

*Produits pétroliers et autres liquides — Lignes directrices pour la
détermination du point d'éclair*



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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.

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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.

In exceptional circumstances, when a technical committee has collected data of a different kind from that which is normally published as an International Standard ("state of the art", for example), it may decide by a simple majority vote of its participating members to publish a Technical Report. A Technical Report is entirely informative in nature and does not have to be reviewed until the data it provides are considered to be no longer valid or useful.

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/TR 29662 was prepared by Technical Committee ISO/TC 28, *Petroleum products and lubricants*.

Introduction

This Technical Report was written under the guidance and with the assistance of the ISO/TC 28/TC 35 (CEN/TC 19/TC 139) joint working group for flash point methods and the Energy Institute flammability panel ST B 4 with the aim of assisting laboratory managers and technicians, regulators, specification writers and industry in the use, specification and application of flash-point tests for liquids and semi-solids. It is technically identical to CEN/TR 15138:2005, prepared by Technical Committee CEN/TC 19.

The work is based on standards produced by the following organizations:

- ISO/TC 28, *Petroleum products and lubricants*;
- ISO/TC 35, *Paints and varnishes*;
- CEN/TC 19, *Gaseous and liquid fuels, lubricants and related products of petroleum, synthetic and biological origin*;
- CEN/TC 139, *Paints and varnishes*;
- ASTM D01.22, *Health and Safety*;
- ASTM D02.08 B, *Flammability Section*;
- DIN, *Deutsches Institut für Normung*;
- EI ST B 4, *Flammability Panel*.

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WARNING — The use of this International Standard can involve hazardous materials, operations and equipment. This International Standard does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of this International Standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

1 Scope

This Technical Report is not intended to be a comprehensive manual on flash point tests and the interpretation of test results; nevertheless, it covers the key aspects of these subjects.

The flash point test can be summarized as a procedure where a test portion is introduced into a temperature-controlled test cup and an ignition source is applied to the vapours produced by the test portion to determine if the vapour/air mixture is flammable and, if so, at what temperature.

2 Outline

There are many, slightly different definitions of flash point, however the following definition is widely used in standard test methods:

The lowest temperature of the test portion, corrected to a barometric pressure of 101,3 kPa, at which the application of an ignition source causes the vapour of the test portion to ignite momentarily and the flame to propagate across the surface of the liquid under the specified conditions of test.

It is important to realize that the value of the flash point is not a physical constant but it is the result of a flash-point test and is dependent on the apparatus and procedure used. This fact is so important that a general statement similar to the following is incorporated into all the main flash-point methods:

Flash-point values are not a constant physical-chemical property of the materials tested. They are a function of the apparatus design, the condition of the apparatus used and the operational procedure carried out. Flash point can, therefore, be defined only in terms of a standard test method, and no general valid correlation or lack of a fixed bias can be guaranteed between results obtained by different test methods or with test apparatus different from that specified.

Due to the importance of flash-point test results for both safety and regulatory purposes, an identification of the test method should always be included with the test result.

In general, specific products specifications indicate which standard test method should be employed.

3 Brief history

The discovery of petroleum and the increased use of flammable distillates in the 19th century for lighting and heating in place of animal and vegetable oils led to a large number of explosions and other fire-related accidents.