Gaaside ja aurude plahvatuspiiride määramine

Determination of explosion limits of gases and vapours

EESTI STANDARDIKESKUS
ESTONIAN CENTRE FOR STANDARDISATION

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 1839:2012 sisaldab Euroopa standardi EN 1839:2012 ingliskeelset teksti.	This Estonian standard EVS-EN 1839:2012 consists of the English text of the European standard EN 1839:2012.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 19.09.2012.	Date of Availability of the European standard is 19.09.2012.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

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Võtmesõnad: conglomerates, definition, definitions, explosion limits, explosion protection, explosions, gas explosion, gases, petroleum products, steam, vapours,

EUROPEAN STANDARD

NORME EUROPÉENNE

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English Version

Determination of explosion limits of gases and vapours

Détermination des limites d'exposivité des gaz et vapeurs

Bestimmung der Explosionsgrenzen von Gasen und Dämpfen

This European Standard was approved by CEN on 27 July 2012.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: Avenue Marnix 17, B-1000 Brussels

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Foreword

This document (EN 1839:2012) has been prepared by Technical Committee CEN/TC 305 “Potentially explosive atmospheres — Explosion prevention and protection”, the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by March 2013, and conflicting national standards shall be withdrawn at the latest by March 2013.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 1839:2003.

The significant changes between this European Standard and EN 1839:2003 are given in Table H.1.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive 94/9/EC.

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

According to the CEN/CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

The hazard of an explosion can be avoided by preventing the formation of explosive mixtures of gases and/or vapours. To do so, the explosion limits (also known as “flammability limits") of the flammable substance need to be known. These limits depend mainly on:

— the properties of the flammable substance;

— temperature and pressure;

— size and shape of the test vessel;

— ignition source (type, energy);

— the criterion for self-propagating combustion.

To obtain reliable and comparable results it is necessary to standardise the conditions for determining the explosion limits (i.e. apparatus and procedure). However, it is not possible to provide one single method that is suitable for all types of substances. For practical reasons, it is preferable to use apparatus that can also be used for the determination of other explosion characteristics. This European Standard, therefore, details two methods, namely, the tube method (method T) and the bomb method (method B). In general, the tube method gives a wider explosion range. Differences in the explosion limits determined by the two methods can vary by up to 10 % relative.

For substances which are difficult to ignite with large quenching distances, only a modified tube method is suitable. This is described in Annex A.

1 Scope

This European Standard specifies two test methods (method T and method B) to determine the explosion limits of gases, vapours and their mixtures, mixed with air. An air/inert gas mixture (volume fraction of the oxygen < 21 %) can be used as the oxidizer instead of air. In this European Standard, the term “air” includes such air/inert mixtures.

This European Standard applies to gases, vapours and their mixtures at atmospheric pressure for temperatures up to 200 °C.

2 Normative references

Not applicable.

3 Terms and definitions

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

3.1
explosion range
range of the concentration of a flammable substance or mixture of substances in air, within which an explosion can occur, respectively range of the concentration of a flammable substance or mixture of substances in mixture with air/inert gas, within which an explosion can occur, determined under specified test conditions

[SOURCE: EN 13237:2012, 3.22]

3.2
lower explosion limit
LEL
lowest concentration of the explosion range at which an explosion can occur

Note 1 to entry: Those concentrations are given at which an explosion just fails during the tests.

[SOURCE: EN 13237:2012, 3.19.1]

3.3
upper explosion limit
UEL
highest concentration of the explosion range at which an explosion can occur

Note 1 to entry: Those concentrations are given at which an explosion just fails during the tests.

[SOURCE: EN 13237:2012, 3.19.2]

3.4
explosion criterion — flame detachment
in method T, the criterion for an explosion (self-propagating combustion) is the upward movement of the flame from the spark gap for at least 100 mm or the formation of a halo which either reaches the top of the tube or reaches a minimum height of 240 mm

Note 1 to entry: Throughout the duration of the ignition, spark test mixtures, whose test substance content lies just outside the explosion range, may exhibit a luminous phenomenon (referred to as a “halo”) above the spark gap which does not detach from the latter (see Annex B). For some test substances (e.g. halogenated hydrocarbons), this luminous phenomenon can occupy a large portion of the test vessel. The formation of a halo alone is not considered to count as an ignition of the test mixture unless it reaches the top of the tube or a minimum height of 240 mm.