

**Tolmupilvede plahvatusomaduste
kindlaksmääramine. Osa 1:
Tolmupilvede maksimaalse
plahvatusrõhu (p_{max})
kindlaksmääramine**

Determination of explosion characteristics of dust
clouds - Part 1: Determination of the maximum
explosion pressure p_{max} of dust clouds

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN 14034-1:2004 sisaldab Euroopa standardi EN 14034-1:2004 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 23.11.2004 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN 14034-1:2004 consists of the English text of the European standard EN 14034-1:2004.</p> <p>This document is endorsed on 23.11.2004 with the notification being published in the official publication of the Estonian national standardisation organisation.</p> <p>The standard is available from Estonian standardisation organisation.</p>
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<p>Käsitlusala:</p> <p>This standard describes a test method for the determination of the maximum explosion pressure of dust clouds in a closed vessel under defined initial conditions of pressure and temperature. This method is not suitable for use with recognised explosives, like gunpowder and dynamite, substances which do not require oxygen for combustion, pyrophoric substances, or substances or mixtures of substances which may under some circumstances behave in a similar manner. Where any doubt exists about the existence of hazard due to explosive properties, expert advice should be sought.</p>	<p>Scope:</p> <p>This standard describes a test method for the determination of the maximum explosion pressure of dust clouds in a closed vessel under defined initial conditions of pressure and temperature. This method is not suitable for use with recognised explosives, like gunpowder and dynamite, substances which do not require oxygen for combustion, pyrophoric substances, or substances or mixtures of substances which may under some circumstances behave in a similar manner. Where any doubt exists about the existence of hazard due to explosive properties, expert advice should be sought.</p>
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ICS 13.230

Võtmesõnad: experimentation, explosion index, explosion pressure, explosion protection, explosions, explosive atmospheres, fire safety, gas mixtures, limits (mathematics), mathematics, parameters, potentially explosive materials, pressure, properties, test equipment, testing

ICS 13.230

English version

Determination of explosion characteristics of dust clouds - Part
1: Determination of the maximum explosion pressure p_{\max} of
dust clouds

Détermination des caractéristiques d'explosion des nuages
de poussière - Partie 1 : Détermination de la pression
maximale d'explosion p_{\max} des nuages de poussière

Bestimmung der Explosionskenngrößen von Staub/Luft-
Gemischen - Teil 1: Bestimmung des maximalen
Explosionsdruckes p_{\max} von Staub/Luft-Gemischen

This European Standard was approved by CEN on 9 July 2004.

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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

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Foreword

This document (EN 14034-1:2004) 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 2005, and conflicting national standards shall be withdrawn at the latest by March 2005.

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(s).

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

This document includes a Bibliography.

This document is one of a series of standards as listed below:

- EN 14034-1, Determination of explosion characteristics of dust clouds - Part 1: Determination of the maximum explosion pressure p_{\max} of dust clouds;
- prEN 14034-2, Determination of explosion characteristics of dust clouds - Part 2: Determination of the maximum rate of explosion pressure rise $(dp/dt)_{\max}$ of dust clouds;
- prEN 14034-3, Determination of explosion characteristics of dust clouds - Part 3: Determination of the lower explosion limit LEL of dust clouds;
- EN 14034-4, Determination of explosion characteristics of dust clouds - Part 4: Determination of the limiting oxygen concentration LOC of dust clouds.

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

Introduction

This document specifies a method for experimental determination of the maximum explosion pressure of dust clouds. The maximum explosion pressure is the maximum value of the overpressure during explosions of explosive atmospheres in the explosion range of a combustible dust in a closed vessel. The measurement of the maximum explosion pressure forms the basis for explosion protection by design and construction of equipment, protective systems and components to reduce the explosion effects.

This maximum explosion pressure is a safety characteristic used for hazard identification and designing safety measures for the mitigation of destructive effects of dust explosions.

Therefore this document gives added values to the following clauses of the EU directives:

- Directive 98/37/EC of the European Parliament and the Council of June 22, 1998 on the approximation of the laws of the member states relating to machinery

Annex I, Clause 1.5.7

- Directive 94/9/EC of the European Parliament and the Council of March 23, 1994 on the approximation of the laws of the member states concerning equipment and protective systems intended for use in potentially explosive atmospheres.

Annex II, Clause 1.0.1

1 Scope

This document describes a test method for the determination of the maximum explosion pressure of dust clouds in a closed vessel under defined initial conditions of pressure and temperature.

This method is not suitable for use with recognised explosives, like gunpowder and dynamite, substances which do not require oxygen for combustion, pyrophoric substances, or substances or mixtures of substances which may under some circumstances behave in a similar manner. Where any doubt exists about the existence of hazard due to explosive properties, expert advice should be sought.

2 Normative references

The following referenced documents are indispensable for the application 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.

prEN 14460, *Explosion resistant equipment*.

3 Terms and definitions

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

3.1

dust

small solid particles in the atmosphere which settle out under their own weight, but which may remain suspended in air for some time (includes dust and grit, as defined in ISO 4225)

NOTE Generally maximum particle size will not exceed 500 μm .

3.2

combustible dust

dust able to undergo an exothermic reaction with air when ignited

NOTE The terms “flammable” and “combustible” are used synonymously.

3.3

explosion pressure

p_{ex}

the highest overpressure occurring during an explosion of a dust cloud in a closed vessel

3.4

explosive atmosphere

mixture with air, under atmospheric conditions, of flammable (combustible) substances in the form of gases, vapours, mists or dusts, in which, after ignition has occurred, combustion spreads to the entire unburned mixture

3.5

ignition delay

t_v

time between the initiation of the dust dispersion and the activation of the ignition source

3.6

initial pressure

p_i

the pressure in the explosion vessel at the moment of ignition