



# SLOVENSKI STANDARD

## SIST EN 14756:2007

01-april-2007

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### Ugotavljanje mejne koncentracije kisika (LOC) za vnetljive pline in hlape

Determination of the limiting oxygen concentration (LOC) for flammable gases and vapours

Bestimmung der Sauerstoffgrenzkonzentration (SGK) für brennbare Gase und Dämpfe

Détermination de la concentration limite en oxygène (CLO) des gaz et des vapeurs inflammable

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Ta slovenski standard je istoveten z: **EN 14756:2006**

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#### **ICS:**

13.230

Varstvo pred eksplozijo

Explosion protection

**SIST EN 14756:2007**

**en**

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 14756**

November 2006

ICS 13.230

English Version

## Determination of the limiting oxygen concentration (LOC) for flammable gases and vapours

Détermination de la concentration limite en oxygène (CLO) des gaz et des vapeurs inflammable

Bestimmung der Sauerstoffgrenzkonzentration (SGK) für brennbare Gase und Dämpfe

This European Standard was approved by CEN on 2 October 2006.

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.

CEN members are the national standards bodies of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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## Foreword

This document (EN 14756:2006) 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 May 2007, and conflicting national standards shall be withdrawn at the latest by May 2007.

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.

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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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## Introduction

This European Standard describes a method for the experimental determination of the limiting oxygen concentration (*LOC*) of mixtures consisting of flammable gas or vapour, air and inert gas. The *LOC* is the maximum concentration of oxygen in a mixture at which an explosion cannot occur at any fuel concentration. Explosion protection by "inerting" is based on the *LOC*.

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## 1 Scope

This European Standard specifies the method for determining the *LOC* of mixtures consisting of flammable gas or vapour, air and inert gas at atmospheric pressure and temperatures from ambient temperature to 200 °C.

## 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.

EN 1839:2003, *Determination of explosion limits of gases and vapours*

## 3 Terms and definitions

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

### 3.1

#### **limiting air concentration** **LAC**

maximum air concentration in a mixture of a flammable substance, air and an inert gas, in which an explosion will not occur, determined under specified test conditions

NOTE 1 LAC is usually expressed as molar fraction in % or volume fraction in % (for conversion of units see EN 1839:2003, Annex F).

NOTE 2 The LAC does not depend only on the flammable gas or vapour, but also on the inert gas used.

### 3.2

#### **limiting oxygen concentration** **LOC**

maximum oxygen concentration in a mixture of a flammable substance, air and an inert gas, in which an explosion will not occur

NOTE 1 LOC is usually expressed as molar fraction in % or volume fraction in % (for conversion of units see EN 1839:2003, Annex F)

NOTE 2 The LOC does not depend only on the flammable gas or vapour, but also on the inert gas used.

### 3.3

#### **test substance**

substance or mixture of substances for which the *LOC* is to be determined

NOTE The test substance is usually a flammable gas or the vapour generated by the complete evaporation of a flammable liquid.

### 3.4

#### **test mixture**

mixture of test substance, air and inert gas

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- 3.5  
inert gas**  
gas that does not react with the test substance or oxygen
- 3.6  
explosion range**  
range of concentration of a flammable substance or mixture of substances in air within which an explosion can occur
- 3.7  
explosion limit**  
limit of the explosion range or of the explosion area

NOTE 1 Explosion limits (lower explosion limits, *LEL*, and upper explosion limits, *UEL*) are determined according to EN 1839. At the explosion limits flame propagation does not occur. The explosion limits are not part of the explosion range or explosion area.

NOTE 2 Explosion limits means also the limits where the test mixture contains additional fractions of inert gas.

- 3.8  
explosion area**  
area inside the boundary curve formed by the explosion limits of a flammable substance in various mixtures with air and inert gas

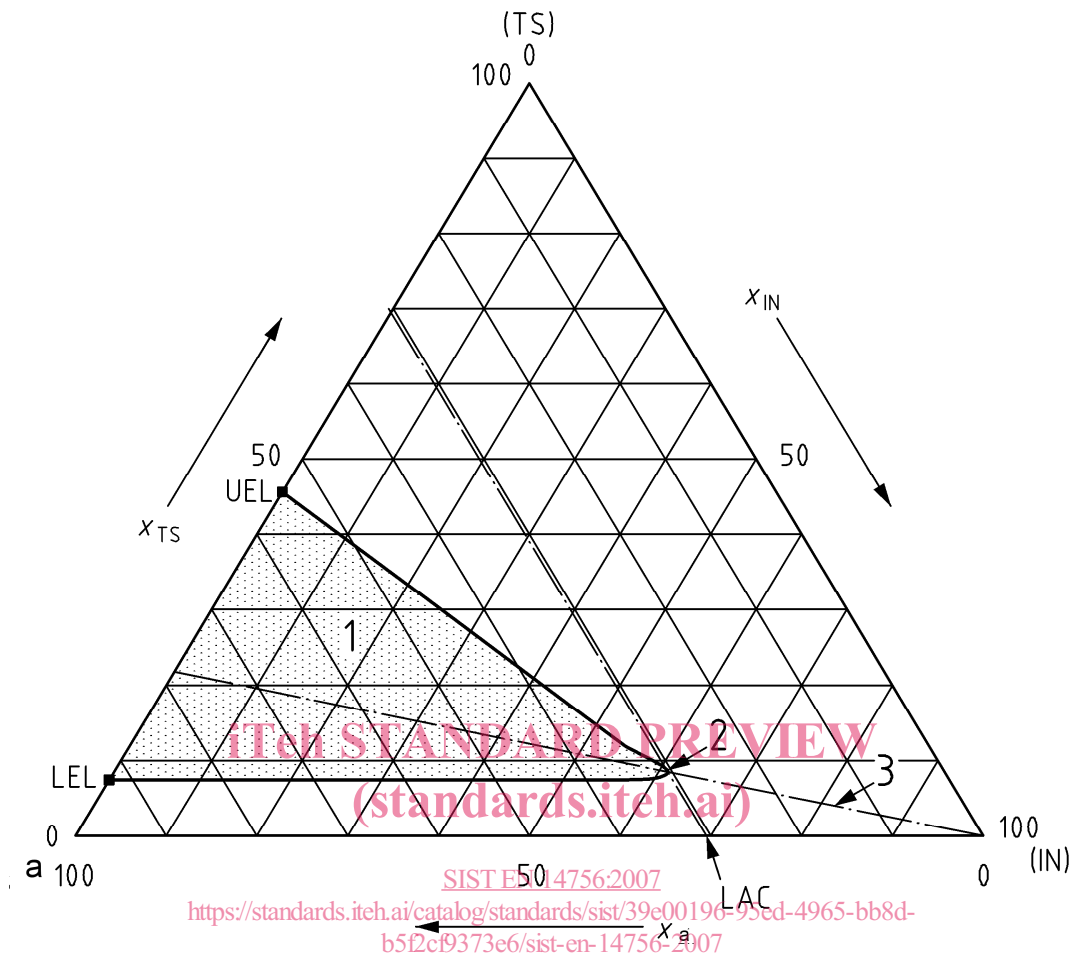
NOTE 1 See Figure 1.

NOTE 2 In many cases the boundary curve has an apex, which corresponds to the limiting air concentration, LAC.

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#### Key

- 1 explosion area
- 2 apex
- 3 stoichiometric line
- x molar fraction in %
- IN inert gas
- TS test substance
- a air

Figure 1 — Explosion area for a ternary system of test substance, air and inert gas

## 4 Test apparatus

The standard test apparatuses for determination of the *LOC* are described in EN 1839. For practical reasons there are two methods for the determination of the explosion limits, a tube method (T) and a bomb method (B). A specific apparatus is specified for each method, both of which are suitable for the determination of the *LOC*. It shall be clearly stated which of the two methods was used, as the apparatus and test procedure may influence the *LOC* value.

For the purposes of this European Standard the oxygen concentration shall be measured by means of a calibrated oxygen analyser with a precision of a molar fraction of 0,1 % oxygen (e.g. paramagnetic analyser, gas chromatography etc.).