



SLOVENSKI STANDARD

SIST EN 720-1:2000

01-januar-2000

Premične plinske jeklenke - Plini in zmesi plinov - 1. del: Lastnosti čistih plinov

Transportable gas cylinders - Gases and gas mixtures - Part 1: Properties of pure gases

Ortsbewegliche Gasflaschen - Gase und Gasgemische - Teil 1: Eigenschaften von Einzel - Gasen

Bouteilles a gaz transportables - Gaz et mélanges de gaz - Partie 1: Propriétés des gaz purs

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Ta slovenski standard je istoveten z: ^{SIST EN 720-1:2000} EN 720-1:1999

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ICS:

23.020.30	Tlačne posode, plinske jeklenke	Pressure vessels, gas cylinders
71.100.20	Industrijski plini	Gases for industrial application

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en

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 720-1

April 1999

ICS 23.020.30; 71.100.20; 75.160.30

English version

Transportable gas cylinders - Gases and gas mixtures - Part 1:
Properties of pure gases

Bouteilles à gaz transportables - Gaz et mélanges de gaz -
Partie 1: Propriétés des gaz purs

Ortsbewegliche Gasflaschen - Gase und Gasgemische -
Teil 1: Eigenschaften von Einzel - Gasen

This European Standard was approved by CEN on 20 December 1998.

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, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

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Foreword

This European Standard has been prepared by Technical Committee CEN/TC 23 "Transportable gas cylinders", the secretariat of which is held by BSI.

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 October 1999, and conflicting national standards shall be withdrawn at the latest by October 1999.

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

This European Standard has been submitted for reference into the RID and/or in the technical annexes of the ADR. Therefore in this context the standards listed in the normative references and covering basic requirements of the RID/ADR not addressed within the present standard are normative only when the standards themselves are

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Introduction

In Europe there are 2 existing Directives which deal with the classification of gases. One relates to Dangerous Substances and Preparations, the other to the Transport of Dangerous Goods (ADR). These Directives have several conflicting classifications e.g. Toxicity is expressed in volume parts per million (p.p.m.V) in the ADR Directive and in milligrams per litre (mg/l) in the Substances and Preparations Directive.

The purpose of this standard is to list the properties of individual gases to facilitate the selection of valve outlets.

This is different from the scope of the two Directives mentioned above which are concerned with hazard identification and transport matters respectively.

Consequently this standard is not in conflict with either of the two above Directives as it specifically addresses the risks of mis-connection of equipment eg. Chlorine is not an oxidant according to Transport Regulations, but the risk of mixing this gas with flammable gas is well known and is addressed in this standard.

1 Scope

The purpose of this part of EN 720 is to define the properties of gases on the basis of four main physical-chemical criteria i.e. fire potential, toxicity, state of gas and corrosiveness (see clause 3) for the purpose of the selection of suitable valve outlets.

NOTE : See 3.4 for the definition of corrosiveness.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 720-2	Classification of gases and gas mixtures - Part 2 : Gases and gas mixtures - Determination of fire potential and oxidizing ability
EN ISO 11114-1	Transportable gas cylinders - Compatibility of cylinder and valve materials with gas contents - Part 1 : Metallic materials

3 Definitions

For the purpose of this European Standard, the following definitions apply :

3.1 fire potential

A gas or gas mixture is said to be flammable in air if it will ignite in air at atmospheric pressure and at a temperature of 20 °C. The minimum content of gas or gas mixture at which it ignites is called the lower flammability limit in air. This limit is determined at atmospheric pressure and at a temperature of 20 °C.

A gas or a gas mixture which is less oxidizing than air is not able at atmospheric pressure, to support the combustion of substances, which are flammable in air.

3.2 toxicity

Toxicity is characterized by the 50 % lethal concentration. In this standard the 50 % lethal concentration (LC₅₀) is the concentration of a gas in air, expressed in p.p.m.V., administered in a single exposure during a short period of time (24 hours or less) to a group of young adult albino rats (males and females) which results in the death of half of the animals in a period of at least 14 days (see 5.2).

3.3 state of gas

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The physical state in which gases may be stored and transported in cylinders. Four categories are adopted :

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- deeply refrigerated liquefied ;
- liquefied ;
- compressed ;
- dissolved.

3.4 corrosiveness

Ability of the gas to damage or to destroy external living tissues (eyes and skin). Gases are assigned a corrosiveness category. This is not to be confused with corrosivity of gases with metallic materials (see EN ISO 11114-1).

4 Properties of gas mixtures

From the properties of the various components given in clause 6, the properties of the gas mixtures may be determined by using the appropriate standard on gas mixtures concerning each of the physico-chemical criteria indicated in clause 1 (see EN 720-2 for the fire potential).

5 Code number

To be able to recognize the properties of a gas, a code number (FTSC) is given. This code number assigned to each gas is based on the following four physico-chemical criteria :

Category I : fire potential, defining the gas behaviour with respect to flammability (see 3.1) ;

Category II : toxicity determined by the 50 % lethal concentration (see 3.2) ;

Category III : gas state, defining the physical state of the contents in the cylinder at 15 °C within a given pressure range (see 3.3) ;

Category IV : corrosiveness (see 3.4).

Each category is composed of different sub-divisions, each identified by a different digit. In this way a gas, in a given state, is characterized by a series of four digits (one digit per category) as shown in 5.1 to 5.5.

5.1 Fire potential (category I)

For fire potential, gases are divided in 6 subdivisions :

Subdivision 0 : inert (any gas not classified under subdivisions 1 to 5 below) ;

Subdivision 1 : supports combustion (oxidizing gas having an oxidant potential equal to or less than that of air) ;

Subdivision 2 : flammable (gas having flammable limits in air) (see 3.1) ;

Subdivision 3 : spontaneously flammable ;

Subdivision 4 : highly oxidizing (see 3.1) (oxidizing gas having an oxidant potential greater than that of air) ;

Subdivision 5 : flammable and subject to decomposition or polymerization.

5.2 Toxicity (category II)

For toxicity, gases are divided into five subdivisions :

Subdivision 0 : life supporting ;

Subdivision 1 : asphyxiant (when LC_{50} is greater than 15 000 p.p.m.V) ;

Subdivision 2 : toxic and asphyxiant (when $200 \text{ p.p.m.V} \leq LC_{50} \leq 5\,000 \text{ p.p.m.V}$) ;

Subdivision 3 : very toxic and asphyxiant (when $LC_{50} \leq 200 \text{ p.p.m.V}$) ;

Subdivision 9 : harmful and asphyxiant (when $5\,000 \text{ p.p.m.V} \leq LC_{50} \leq 15\,000 \text{ p.p.m.V}$).

where LC_{50} values correspond to one hour exposure and mortality in 14 days and with p.p.m.V corresponding to the parts per million by volume.

5.3 State of the gas in the cylinder at 15 °C (category III)

For state of the gas, gases are divided into 8 subdivisions :

Subdivision 0 : liquefied gas at 35 bar or less ;

Subdivision 1 : liquefied gas at over 35 bar ;

Subdivision 2 : liquid withdrawal - liquefied gas (optional) ;

Subdivision 3 : dissolved gas ;

Subdivision 4 : 35 bar or less - gas only (including cryogenic gas withdrawal) ;

Subdivision 5 : medium pressure range, compressed gases from 35 bar up to and including 250 bar ;

Subdivision 7 : high pressure range, above 250 bar and up to and including 400 bar ;

Subdivision 8 : very high pressure, above 400 bar.

NOTE : Subdivision 6 is not used here because it is used by the U.S..

5.4 Corrosiveness (category IV)

For corrosiveness, gases are divided into 4 subdivisions :

Subdivision 0 : non-corrosive ;

Subdivision 1 : non-halogen acid forming ;

Subdivision 2 : basic ;

Subdivision 3 : halogen acid forming.

5.5 Designation of the code

This code is called FTSC code :

F : for fire potential, defining the gas behaviour with respect to flammability ;

T : for toxicity ;

S : for gas state, defining the physical state of the contents in the cylinder at 15 °C within a given pressure range ;

C : for corrosiveness.