SLOVENSKI STANDARD
SIST EN 15004-9:2008

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Vgrajeni gasilni sistemi - Sistemi za gaġenje s plinom - 9. del: Fizikalne lastnosti in naļ rtovanje sistema za gaġenje s plinom za gasilo IG-55 (ISO 14520-14:2005, spremenjen)

Fixed firefighting systems - Gas extinguishing systems - Part 9: Physical properties and system design of gas extinguishing systems for IG-55 extinguishant (ISO 14520-14:2005, modified)

Ortsfeste Brandbekämpfungsanlagen - Löschanlagen mit gasförmigen Löschmitteln - Teil 9: Physikalische Eigenschaften und Anlagenauslegung für Feuerlöschmittel IG-55 (ISO 14520-14:2005, modifiziert)

Installations fixes de lutte contre l'incendie - Installations d'extinction à gaz - Partie 9 : Propriétés physiques et conception des systèmes pour agent extincteur IG-55 (ISO 14520-14:2005, modifiée)

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This European Standard was approved by CEN on 26 April 2008.

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 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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, 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.

EUROPEAN COMMITTEE FOR STANDARDIZATION
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Foreword

This document (EN 15004-9:2008) has been prepared by Technical Committee CEN/TC 191 “Fixed firefighting systems”, 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of an identical text or by endorsement, at the latest by December 2008, and conflicting national standards shall be withdrawn at the latest by December 2008.

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.

The text of the International Standard ISO 14520-14:2005 from Technical Committee ISO/TC 21 "Equipment for fire protection and fire fighting" of the International Organization for Standardization (ISO) has been taken over as a European Standard by Technical Committee CEN/TC 191 "Fixed firefighting systems", the secretariat of which is held by BSI, with common modifications which are indicated by a straight line in the margin of the text.

This European Standard will consist of the following parts, under the general title *Fixed firefighting systems – Gas extinguishing systems:*

— *Part 1: Design, installation and maintenance (ISO 14520-1, modified)*

— *Part 2: Physical properties and system design of gas extinguishing systems for FK-5-1-12 extinguishant (ISO 14520-5, modified)*

— *Part 3: Physical properties and system design of gas extinguishing systems for HCFC Blend A extinguishant (ISO 14520-6, modified)*

— *Part 4: Physical properties and system design of gas extinguishing systems for HFC 125 extinguishant (ISO 14520-8, modified)*

— *Part 5: Physical properties and system design of gas extinguishing systems for HFC 227ea extinguishant (ISO 14520-9, modified)*

— *Part 6: Physical properties and system design of gas extinguishing systems for HFC 23 extinguishant (ISO 14520-10, modified)*

— *Part 7: Physical properties and system design of gas extinguishing systems for IG-01 extinguishant (ISO 14520-12, modified)*

— *Part 8: Physical properties and system design of gas extinguishing systems for IG-100 extinguishant (ISO 14520-13, modified)*

— *Part 9: Physical properties and system design of gas extinguishing systems for IG-55 extinguishant (ISO 14520-14, modified)*

— *Part 10: Physical properties and system design of gas extinguishing systems for IG-541 extinguishant (ISO 14520-15, modified)*

The International Standards ISO 14520-2 and ISO 14520-11, which dealt with CF_3I and HFC 236fa extinguishants, respectively, have not been implemented by CEN, as CF_3I extinguishant is only valid for local

application and HFC 236fa extinguishant is only applicable for portable fire extinguishers and local application, respectively, which is not covered by the scope.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, 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 the United Kingdom.

Foreword of ISO 14520-14:2005

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

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.

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 14520-14 was prepared by Technical Committee ISO/TC 21, *Equipment for fire protection and fire fighting*, Subcommittee SC 8, *Gaseous media and firefighting systems using gas*.

This second edition cancels and replaces the first edition (ISO 14520-14:2000), which has been technically revised.

ISO 14520 consists of the following parts, under the general title *Gaseous media fire extinguishing systems — Physical properties and system design*:

— *Part 1: General requirements*

— *Part 2: CF_3I extinguishant*

— *Part 5: FK-5-1-12 extinguishant*

— *Part 6: HCFC Blend A extinguishant*

— *Part 8: HFC 125 extinguishant*

— *Part 9: HFC 227ea extinguishant*

— *Part 10: HFC 23 extinguishant*

— *Part 11: HFC 236fa extinguishant*

— *Part 12: IG-01 extinguishant*

— *Part 13: IG-100 extinguishant*

— *Part 14: IG-55 extinguishant*

— *Part 15: IG-541 extinguishant*

Parts 3, 4 and 7, which dealt with FC-2-1-8, FC-3-1-10 and HCFC 124 extinguishants, respectively, have been withdrawn, as these types are no longer manufactured.

1 Scope

This document gives specific requirements for gaseous fire-extinguishing systems, with respect to the IG-55 extinguishant. It includes details of physical properties, specification, usage and safety aspects and is applicable to systems operating at nominal pressure of 150 bar, 200 bar and 300 bar at 15 °C. This does not preclude the use of other systems; however, design data for other pressures were not available at time of publication.

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 15004-1:2008, Fixed firefighting systems – Gas extinguishing systems - *Design installation and maintenance (ISO 14520-1, modified)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 15004-1:2008 apply.

4 Characteristics and uses

4.1 General

Extinguishant IG-55 shall comply with the specification according to Table 1.

IG-55 is a colourless, odourless, electrically non-conductive gas with a density approximately the same as that of air. It is an inert gas mixture consisting nominally of 50 % argon and 50 % nitrogen with the following mixture specification:

a) Argon: range of (50 ± 5) %;

b) Nitrogen: range of (50 ± 5) %.

The physical properties are given in Table 2.

IG-55 extinguishes fires by a reduction of the oxygen concentration in the atmosphere of the hazard enclosure.

Table 1 — Specification for IG-55

Property	Requirement	
	Argon	Nitrogen
Purity	> 99,9 %	> 99,9 %
Water content	$< 15 \times 10^{-6}$	$< 10 \times 10^{-6}$
Only principal contaminants are shown. Other measurements may include hydrocarbons, CO, NO, NO^2, CO^2, etc. Most are $< 20 \times 10^{-6}$.		

Table 2 — Physical properties of IG-55

Property	Unit	Value
Molecular mass	—	33,98
Boiling point at 1,013 bar (absolute) [a]	°C	—
Freezing point	°C	—
Critical temperature	°C	—
Critical pressure	bar abs [a]	—
Critical volume	cm^3/mol	—
Critical density	kg/m^3	—
Vapour pressure 20 °C	bar abs [a]	—
Liquid density 20 °C	kg/m^3	—
Saturated vapour density 20 °C	kg/m^3	—
Specific volume of superheated vapour at 1,013 bar and 20 °C	m^3/kg	0,708
Chemical formulas	N_2 50 % by volume Ar 50 % by volume	
Chemical names	Nitrogen Argon	

[a] 1 bar = 0,1 MPa = 10^5 Pa; 1 MPa = 1 N/mm^2.

4.2 Use of IG-55 systems

IG-55 total flooding systems may be used for extinguishing fires of all classes within the limits specified in EN 15004-1:2008, Clause 4.

The specific vapour volumes are shown in Table 3. The quantity, Q, of agent required per volume of protected space is determined using the equation in Table 3.

The extinguishing concentrations and design concentrations for n-heptane and Surface Class A hazards are given in Table 4.