TECHNICAL SPECIFICATION

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Gaseous media fire-extinguishing systems — Physical properties and system design — Scaling factors for Class B fuels other than heptane

Matériel à gaz extincteurs — Propriétés physiques pour Classe B carburantes autrement que heptane

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Foreword

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ISO/TS 12854 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*.

Introduction

ISO 14520-1:2006, 7.5.1.2 and 7.5.1.3 set out requirements for determining gaseous extinguishant design concentrations for Class A and Class B (heptane) fuels. For Class B fuels other than heptane, fuel-specific cup burner and pan fire (room) tests are required. This Technical Specification details an alternative scaling factor method for determining design concentrations for Class B fuels other than heptane.

The purpose of this Technical Specification is to provide the user with a procedure for determining scaling factors, so that information and experience of its use in practice may be gathered and its requirements included in a future revision of ISO 14520-1.

Gaseous media fire-extinguishing systems — Physical properties and system design — Scaling factors for Class B fuels other than heptane

1 Scope

This Technical Specification establishes an alternative method to ISO 14520-1:2006, 7.5.1.2 for determining design concentrations applicable to various gaseous extinguishants for Class B fuels other than heptane.

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.

ISO 14520-1:2006, *Gaseous fire-extinguishing systems — Physical properties and system design — Part 1: General requirements*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 14520-1 apply.

NOTE For the purposes of this Technical Specification, the term “bar” is taken to mean “gauge”, unless otherwise indicated. Concentrations or quantities expressed as a percentage (%) are by volume, unless otherwise indicated.

4 Requirements in accordance with ISO 14520-1

The minimum Class B design concentration for each extinguishant shall be a demonstrated extinguishing concentration for each Class B fuel plus a safety factor of 1,3. The extinguishing concentration used shall be that demonstrated by the cup burner test, carried out in accordance with the method set out in Annex B, that has been verified with the heptane pan tests detailed in ISO 14520-1:2006, C.6.2. For hazards involving multiple fuels, the value for the fuel requiring the greatest design concentration shall be used. The extinguishing concentration shall be taken as the cup burner value or the heptane pan test value (see ISO 14520-1:2006, Annex C), whichever is greater.

5 Proposed scaling factor method

As an alternative to Clause 4, the design concentration for Class B fuels other than heptane may be established using the extinguishing concentration determined in accordance with ISO 14520-1:2006, Annex B, multiplied by the scaling factor specific for the extinguishant and then multiplied by a safety factor of 1.3.

6 Procedure

The scaling factor, f_{SF}, for each extinguishant may be determined using the following procedure.

For the extinguishant, tests in accordance with ISO 14520-1:2006, Annex C (0,25 m^2 pan with flammable liquid, 100 m^3 room) and ISO 14520-1:2006, Annex B, shall be carried out with heptane and at least two other Class B fuels (methyl alcohol and acetone). For each fuel of interest, the relation of the extinguishing concentrations from the two test methods shall be calculated as given by Equation (1):

$$f_{SF} = \frac{c_{E1}}{c_{E2}} \tag{1}$$

where

c_{E1} is the extinguishing concentration in accordance with ISO 14520-1:2006, Annex C;

c_{E2} is the extinguishing concentration in accordance with ISO 14520-1:2006, Annex B.

The scaling factor, f_{SF}, for the extinguishant shall be the highest figure of these relations, but not less than 1.

For each extinguishant, the scaling factor can be included in ISO 14520-2, ISO 14520-3, ISO 14520-4, ISO 14520-5, ISO 14520-6, ISO 14520-8, ISO 14520-9, ISO 14520-10, ISO 14520-11, ISO 14520-12, ISO 14520-13, ISO 14520-14 and ISO 14520-15.

If a scaling factor is not available, a preliminary scaling factor of 1,15 shall be used.

Bibliography

[1] ISO 14520-2, *Gaseous fire-extinguishing systems — Physical properties and system design — Part 2: CF3I extinguishant*

[2] ISO 14520-3, *Gaseous fire-extinguishing systems — Physical properties and system design — Part 3: FC-2-1-8 extinguishant*

[3] ISO 14520-4, *Gaseous fire-extinguishing systems — Physical properties and system design — Part 4: FC-3-1-10 extinguishant*

[4] ISO 14520-5, *Gaseous fire-extinguishing systems — Physical properties and system design — Part 5: FK-5-1-12 extinguishant*

[5] ISO 14520-6, *Gaseous fire-extinguishing systems — Physical properties and system design — Part 6: HCFC Blend A extinguishant*

[6] ISO 14520-8, *Gaseous fire-extinguishing systems — Physical properties and system design — Part 8: HFC 125 extinguishant*

[7] ISO 14520-9, *Gaseous fire-extinguishing systems — Physical properties and system design — Part 9: HFC 227ea extinguishant*

[8] ISO 14520-10, *Gaseous fire-extinguishing systems — Physical properties and system design — Part 10: HFC 23 extinguishant*

[9] ISO 14520-11, *Gaseous fire-extinguishing systems — Physical properties and system design — Part 11: HFC 236fa extinguishant*

[10] ISO 14520-12, *Gaseous fire-extinguishing systems — Physical properties and system design — Part 12: IG-01 extinguishant*

[11] ISO 14520-13, *Gaseous fire-extinguishing systems — Physical properties and system design — Part 13: IG-100 extinguishant*

[12] ISO 14520-14 *Gaseous fire-extinguishing systems — Physical properties and system design — Part 14: IG-55 extinguishant*

[13] ISO 14520-15, *Gaseous fire-extinguishing systems — Physical properties and system design — Part 15: IG-541 extinguishant*

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