SLOVENSKI STANDARD
SIST EN 4649:2009

01-maj-2009

Aeronavtika - Roļ ni gasilniki s sintetiļ nimi plini za uporabo v aeronavtiki - Tehniļ na specifikacija in kvalifikacijski pogoji

Aerospace series - Handheld fire extinguishers with synthesis gases, for aircraft use - Technical specification and qualification conditions

Luft- und Raumfahrt - An Bord Handfeuerlöscher - Lieferbedingungen und Qualifikationsbedingungen

iTeh STANDARD PREVIEW
(standards.iteh.ai)

Série aérospatiale - Extincteurs portatifs pour aéronefs aux agents gazeux de synthèse - Spécification technique et conditions de qualification

SIST EN 4649:2009
https://standards.iteh.ai/catalog/standards/sist/1eb4eee0-6eb3-4487-af4c-4e51694b01d3/sist-en-4649-2009

Ta slovenski standard je istoveten z: **EN 4649:2009**

ICS:

13.220.10	Gašenje požara	Fire-fighting
49.095	Oprema za potnike in oprema kabin	Passenger and cabin equipment

SIST EN 4649:2009 **en**

2003-01.Slovenski inštitut za standardizacijo. Razmnoževanje celote ali delov tega standarda ni dovoljeno.

SIST EN 4649:2009

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 4649:2009
https://standards.iteh.ai/catalog/standards/sist/1eb4eee0-6eb3-4487-af4c-4e51694b01d3/sist-en-4649-2009

SIST EN 4649:2009

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 4649

February 2009

ICS 13.220.10; 49.095

English Version

Aerospace series - Handheld fire extinguishers with synthesis gases, for aircraft use - Technical specification and qualification conditions

Série aérospatiale - Extincteurs portatifs pour aéronefs aux agents gazeux de synthèse - Spécification technique et conditions de qualification

Luft- und Raumfahrt - An Bord Handfeuerlöscher - Lieferbedingungen und Qualifikationsbedingungen

This European Standard was approved by CEN on 5 October 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.

iTeh STANDARD PREVIEW

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.

(standards.iteh.ai)

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.

SIST EN 4649:2009
https://standards.iteh.ai/catalog/standards/sist/1eb4ece0-6eb3-4487-af4c-4e51694b01d3/sist-en-4649-2009

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

Management Centre: Avenue Marnix 17, B-1000 Brussels

© 2009 CEN All rights of exploitation in any form and by any means reserved worldwide for CEN national Members.

SIST EN 4649:2009

Contents

Page

iTeh STANDARD PREVIEW
(standards.iteh.ai)
SIST EN 4649:2009
https://standards.iteh.ai/catalog/standards/sist/1eb4eee0-6eb3-4487-af4c-4c51694b01d3/sist-en-4649-2009

SIST EN 4649:2009

Foreword

This document (EN 4649:2009) has been prepared by the Aerospace and Defence Industries Association of Europe - Standardization (ASD-STAN).

After enquiries and votes carried out in accordance with the rules of this Association, this Standard has received the approval of the National Associations and the Official Services of the member countries of ASD, prior to its presentation to CEN.

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 August 2009, and conflicting national standards shall be withdrawn at the latest by August 2009.

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.

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.

iTeh STANDARD PREVIEW
(standards.iteh.ai)
SIST EN 4649:2009
https://standards.iteh.ai/catalog/standards/sist/1eb4eee0-6eb3-4487-af4c-4e51694b01d3/sist-en-4649-2009

SIST EN 4649:2009

Introduction

This standard is implemented to define aeronautical requirements regarding the following:

— all handheld fire extinguishers using synthesis gases;

— all aircraft;

— the need to protect persons, equipment and the environment (in particular the provisions concerning implementation of the Montreal protocol).

If the extinguisher uses a synthesis gas under the terms of a waiver to current legislation, all the tests except the extinguishing efficiency tests, shall be run using an authorised equivalent substitute agent.

This standard is intended for fire extinguishers with a maximum operating pressure up to 25 bars.

iTeh STANDARD PREVIEW
(standards.iteh.ai)
SIST EN 4649:2009
https://standards.iteh.ai/catalog/standards/sist/1eb4eee0-6eb3-4487-af4c-4e51694b01d3/sist-en-4649-2009

SIST EN 4649:2009

1 Scope

This standard specifies the technical requirements and qualification conditions for handheld fire extinguishers made with metal vessels and using synthesis gases for aircraft use, designed for use in the cockpit, in the passenger cabin and to protect areas accessible to the crew.

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 9100, *Aerospace series — Quality management systems — Requirements (based on ISO 9001:2000) and Quality systems — Model for quality assurance in design, development, production, installation and servicing (based on ISO 9001:1994)*

EN 9103, *Aerospace series — Quality management systems — Variation management of key characteristics*

EN 9133, *Aerospace series — Quality management systems — Qualification procedure for aerospace standard parts*

EN 10002-1, *Metallic materials — Tensile testing — Part 1: Method of test at ambient temperature*

EN 10204, *Metallic products —Types of inspection documents*

ISO 3941, *Classification of fires*

iTeh STANDARD PREVIEW
(standards.iteh.ai)

ISO 7165, *Fire fighting — Portable fire extinguishers — Performance and construction*

DOT/FAA/AR-01-37, *Development of a minimum performance standard for hand-held fire extinguishers as a replacement for Hamon 1211 on Civilian Transport Category Aircraft* [1]

https://standards.iteh.ai/catalog/standards/sist/1eb4eee0-6eb3-4487-af4c-4e51694b01d3/sist-en-4649-2009

ED-14D/RTCA/DO-160, *Environmental conditions and test procedures for airborne equipment* [2]

EASA – Part 145, *Maintenance Organisation Approvals* [3]

3 Terms and definitions

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

3.1
pressure-relief safety device
device which releases the pressure inside the vessel in the event of over-pressure

3.2
handheld fire extinguisher
extinguisher designed to be carried and used by hand, weighing 20 kg or less

3.3
bracket
element used to hold the extinguisher on board

---

1 Published by: Office of Aviation Research – Washington, D.C. 20591.

2 Published by: EUROCAE, 102 rue Etienne Dolet – 92240 Malakoff.

3 Published by: European Aviation Safety Agency – Postfach 10 12 53 – D-50452 Koeln, Germany.

SIST EN 4649:2009

3.4
survival temperature
temperature to which the extinguisher may be exposed without compromising subsequent use in the operating temperature range

3.5
fire classes
according to ISO 3941, the following fire classes may be identified:

— class A: these are fires of solid materials, generally organic in nature, the combustion of which normally leads to the formation of embers

— class B: these are fires involving liquids or liquefiable solids

According to this standard the following fire class is added:

— class H: these are fires in indirectly accessible spaces (hidden fires)

4 Symbols and abbreviations

bar	Unit of pressure, 1 bar is equal to 0,1 MPa
IF	Inspection File
DF	Definition File
MF	Manufacturing File
P (T max.)	Pressure at maximum operating temperature
P (T min.)	Pressure at minimum operating temperature
TP	Test Pressure
TS	Technical Specification
T max.	Maximum operating temperature
T min.	Minimum operating temperature
V	Internal volume of the vessel

iTeh STANDARD PREVIEW
(standards.iteh.ai)
SIST EN 4649:2009
https://standards.iteh.ai/catalog/standards/sist/1eb4eee0-6eb3-4487-af4c-4e51694b01d3/sist-en-4649-2009

5 Description

A handheld fire extinguisher consists of, but is not limited to:

— a vessel;

— an extinguishing agent;

— a pressurisation agent if necessary (acting as the propellant);

— a pressure indicating device;

— a pick-up device;

— a controlling device;

— a projection device;

— a discharge hose if necessary;

— a pressure-relief safety device;

— a controlling device locking system;

— an indicator of not used.

NOTE The bracket is independent of the extinguisher, but shall be qualified jointly with it.

SIST EN 4649:2009

6 Design

6.1 General

The fire extinguisher shall operate in vertical position with the actuating device on the top.

No part shall easily be removable from the fire extinguisher and its bracket except the controlling device locking system.

The design of handheld fire extinguishers shall enable them to withstand the environmental conditions specific to the aeronautical field, as defined in Clause 8:

— mechanical (vibrations, crash resistance, operational shocks);

— climatic (temperature, altitude, humidity, salt mist);

— electromagnetic, if applicable.

6.2 Materials

The materials used to manufacture the fire extinguisher shall comply with the standards in force, shall be resistant to the extinguishing and pressurising agents and shall withstand the environmental and operating conditions.

For this purpose, the designer shall determine the appropriate materials, heat treatments and protections.

Magnesium alloys are prohibited.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

6.3 Vessel

SIST EN 4649:2009
https://standards.iteh.ai/catalog/standards/sist/1eb4eee0-6ef3-4487-af4c-4e51694b01d3/sist-en-4649-2009

The manufacturer shall obtain and record the analysis and testing certificates for the materials used to manufacture the vessels. The inspection documents shall provide the composition of the material and results of the chemical analysis and the results of the mechanical tests in accordance with EN 10204.

The vessel shall be made of metal and its design shall comply with the requirements of 7.2. If a material other than metal is used, the manufacturer must show evidence that this material is compliant to the requirements set forth in this standard. Dedicated test procedures for this material must be developed by the supplier.

6.4 Extinguishing and pressurising agents

The products used shall comply with the applicable standards and regulations in force.

6.5 Pressure-relief safety device

The fire extinguisher may be equipped with a pressure-relief safety device designed to protect the pressurised elements against over-pressure.

The operation of this device shall be based on the pressure rise principle.

The design of this device shall comply with the requirements of 7.3.1.

This device may also be used as a filling device.

If not fitted with a pressure-relief safety device, the fire extinguisher shall be designed to automatically evacuate its entire contents safely, in case of over pressure. In this case, the provisions of 7.3.2 shall apply.

SIST EN 4649:2009

6.6 Pressure indicating device

The handheld fire extinguisher shall be equipped with a device indicating that the pressure of the fire extinguisher is within operating limits.

6.7 Pick-up device

This device shall allow an efficient pick-up of the extinguishing agent.

6.8 Projection device

This device shall allow efficient and easy projection of the extinguishing agent onto the fire.

6.9 Controlling device

This device shall be used to start and stop the flow of extinguishing agent.

6.10 Discharge hose

The fire extinguishers with more than 2 kg of agent(s) shall be equipped with a hose.

6.11 Controlling-device locking system

This device is designed to prevent inadvertent actuation.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

6.12 Indicator of not used

This device shall show whether the fire extinguisher has been operated.

SIST EN 4649:2009
https://standards.iteh.ai/catalog/standards/sist/1eb4eee0-6eb3-4487-af4c-4e518948bfd3/sist-en-4649-2009

This may be in the form of a wire and seal or a mechanism that prevents re-insertion of the safety device.

6.13 Bracket

This device is used to hold the fire extinguisher on board.

The fire extinguisher shall be easily removable from its bracket and the related operating method shall be obvious and non-ambiguous.

7 Characteristics

7.1 General

All pressure shall be in accordance with Annex A.

The pressure levels reached in the vessel shall be determined according to the agent(s) used, the filling coefficient, the pressurisation pressure, the maximum survival temperature.

The minimum range of operating temperature is – 40 °C to 70 °C.

The minimum range of survival temperature is – 55 °C to 85 °C.

An attachment of elements on the vessel shall not weaken its mechanical strength.

SIST EN 4649:2009

7.2 Vessel

7.2.1 Thickness of the wall

The thickness of the wall shall be such that regardless of the extinguishing agent used and its vapour pressure, the 0,2 % offset yield strength of the material chosen shall never be exceeded at the vessel test pressure.

If markings are etched, these shall be done in a dedicated area.

7.2.2 Mechanical properties

The ratio shall be:

$$\frac{R_{p0.2}}{R_m} \leq 0{,}90$$

where

$R_{p0.2}$ is the yield strength, see EN 10002-1;

R_m is the tensile strength, see EN 10002-1.

7.2.3 Test pressure

iTeh STANDARD PREVIEW

The test pressure shall be minimum equal to 125 % of the pressure corresponding to the maximum survival temperature.

(standards.iteh.ai)

7.2.4 Burst pressure

SIST EN 4649:2009
https://standards.iteh.ai/catalog/standards/sist/1eb4eee0-6eb3-4487-af4c-

The burst pressure shall be minimum equal to 270 % of the pressure corresponding to the maximum survival temperature.

7.3 Safety in case of over-pressure

7.3.1 Pressure-relief safety device

Pressure levels for activation of the pressure relief safety device shall be:

— minimum: pressure equivalent to 105 % of the pressure at maximum survival temperature,

— maximum: pressure equivalent to the test pressure (7.2.3).

7.3.2 Fire extinguisher without a pressure-relief safety device

In case of over pressure, no mechanical element shall be ejected from the fire extinguisher and the fire extinguisher shall remain in its bracket.

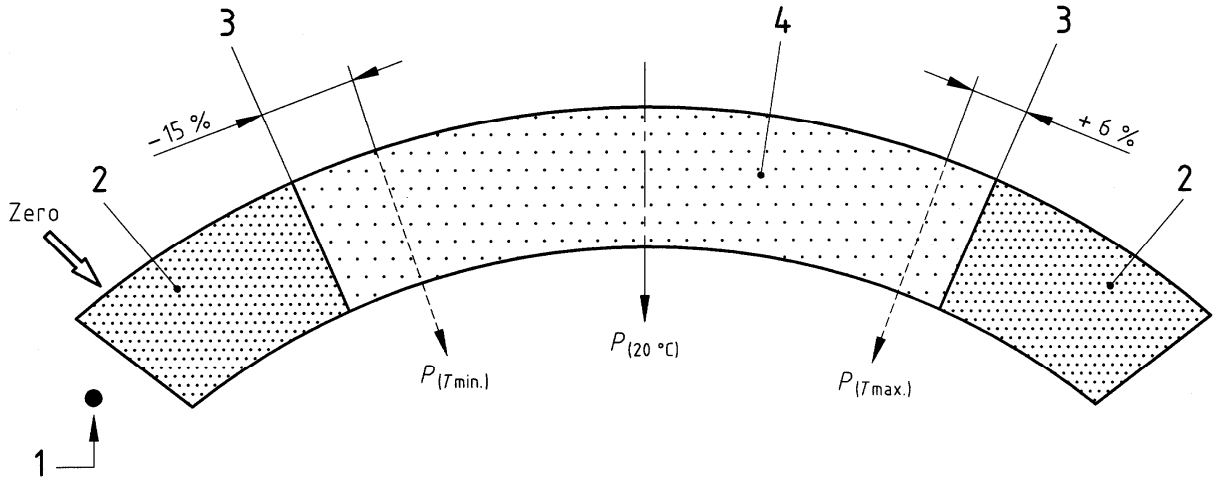
7.4 Pressure indicating device

The reading range of the pressure indicating device shall comprise (see Figure 1):

— a zero reference (to indicate zero pressure). If there is a needle stop, it shall be below the zero reference.

— a green zone (4) corresponding to the pressures of the whole operating temperature range in accordance with Figure 1.

SIST EN 4649:2009



Key

1 Stop
2 Red
3 Rounded-off to 0,5 bar
4 Green

$P_{(T\,min.)}$ Pressure at minimum operating temperature

$P_{(T\,max.)}$ Pressure at maximum operating temperature

iTeh STANDARD PREVIEW
(standards.iteh.ai)

Figure 1

The pressures are rounded off to the nearest half-bar or bar.

SIST EN 4649:2009
https://standards.iteh.ai/catalog/standards/sist/1eb4eee0-6eb3-4487-af4c-4e51694b01d3/sist-en-4649-2009

The zones located on either side of the green zone are red.

To ensure that the pressure indication is readable, the characteristics shall be as follows:

— the needle movement across the pressure zone shall allow a clear reading;

— a mark shall show the pressure at the temperature of 20 °C.

NOTE An indicating device giving the same indications as mentioned above is also acceptable.

7.5 Pick-up device

The pick-up device (e.g. plunger tube) shall allow drainage of at least 90 % of the extinguishing agent during the test defined in 8.4.1.

7.6 Controlling device

The characteristics of the controlling device are as follows:

— actuation of the controlling device shall, within 2 s, start emission of the extinguishing agent stream and shall stop it as soon as the controlling device is released;

— tightness shall be ensured between two emissions to comply with 8.4.4;

— it shall be actuated with one hand only applying a maximum strength of 10 daN.

7.7 Controlling-device locking system

The characteristics of the controlling-device locking system are as follows: