PAS 2013-1:2013

Incorporating Corrigendum No. 1

Liquid fire-extinguishing media –

Part 1: Hand-applied units for use on Class F fires (up to 3 L or up to 5 L cooking media) – Specification

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30 September 2014	Corrigendum No. 1 to make changes to **6.1**, **E.5.8** and **E.5.13**. See also foreword.

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Foreword

This PAS was sponsored by Fire Out. Its development was facilitated by BSI Standards Limited and published under licence from The British Standards Institution. It came into effect on 31 August 2013.

Acknowledgement is given to Tim Russell, as the technical author, and the following organizations that were involved in the development of this PAS as members of the steering group.

- Association of British Certification Bodies (ABCB)
- Building Research Establishment (BRE)
- Callaways and Sons Insurance Consultants Limited
- Chief Fire Officer's Association (CFOA)
- Fire Brigades Union (FBU)
- Fire Industry Association (FIA)
- Fire Out
- HouseMark Limited
- Institute of Fire Prevention Officers (IFPO)
- University of Central Lancashire (UCLAN)

Acknowledgement is also given to the members of a wider review panel who were consulted in the development of this PAS.

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The PAS process enables a specification to be rapidly developed in order to fulfil an immediate need in industry. A PAS can be considered for further development as a British Standard, or constitute part of the UK input into the development of a European or International Standard.

Relationship with other publications

It is envisaged that a further part to PAS 2013 to cover hand-applied units for quantities of cooking media fires greater than 5 L is likely to be developed.

Product certification and testing. Users of this PAS are advised to consider the desirability of third-party certification and testing of product conformity with this PAS. Users seeking assistance in identifying appropriate conformity assessment bodies or schemes may ask BSI to forward their enquiries to the relevant association.

Assessed capability. Users of this PAS are advised to consider the desirability of quality system assessment and registration against the appropriate standard in the BS EN ISO 9000 series by an accredited third-party certification body.

Test laboratory accreditation. Users of this PAS are advised to consider the desirability of selecting test laboratories that are accredited to BS EN ISO/IEC 17025 by a national or international accreditation body.

Information about this document

Text introduced by or altered by Corrigendum No. 1 is indicated in the text by tags ⟦C1⟩ and ⟨C1⟧. Minor editorial corrections are not tagged.

The figure ≤200 °C has been corrected to ≤300 °C as the piloted ignition temperature of oil is above 300 °C. It is the "fire point" and not the "flashpoint" from *Kirk's fire investigation* [9] that should have originally been referenced.

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Hazard warnings

WARNING. This PAS calls for the use of substances and/or procedures that can be injurious to health if adequate precautions are not taken. It refers only to technical suitability and does not absolve the user from legal obligations relating to health and safety at any stage.

Use of this document

It has been assumed in the preparation of this PAS that the execution of its provisions will be entrusted to appropriately qualified and experienced people, for whose use it has been produced.

Presentational conventions

The provisions of this standard are presented in roman (i.e. upright) type. Its requirements are expressed in sentences in which the principal auxiliary verb is "shall".

Commentary, explanation and general informative material is presented in italic type, and does not constitute a normative element.

Requirements in this standard are drafted in accordance with *The BSI guide to standardization – Section 2: Rules for the structure, drafting and presentation of British Standards*, subclause **11.3.1**, which states, "Requirements should be expressed using wording such as: 'When tested as described in Annex A, the product shall ...'". This means that only those products that are capable of passing the specified test will be deemed to conform to this standard.

Contractual and legal considerations

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a PAS cannot confer immunity from legal obligations.

Particular attention is drawn to the following specific regulations:

- The Regulatory Reform (Fire Safety) Order 2005 [1];
- The Control of Substances Hazardous to Health (Amendment) Regulations 2004 [2];
- The Control of Substances Hazardous to Health (Amendment) Regulations (Northern Ireland) 2005 [3];
- The REACH Enforcement Regulations 2008 [4];
- The Personal Protective Equipment Regulations 2002 [5].

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Introduction

This specification has been sponsored by Fire Out and developed in conjunction with BSI to cover a new type of lightweight fire-extinguishing unit which can be used by a single person to extinguish and cool Class F (cooking media) fires of up to 3 L or of up to 5 L rapidly and simply by placing it in the burning cooking media. Quick application of such a hand-applied unit could help to prevent the escalation of a small fire into a more serious fire. It might also prevent the burns that can result from handling a kitchen pan which has been subjected to fire. The aim of the PAS is to help this area of the fire prevention industry to grow with a series of established benchmarks promoting good practice for manufacturers and for the production of hand-applied units of a consistent and industry-accepted quality. Hand-applied units can be used as part of a wider fire-prevention system. British Standards such as BS EN 1869, BS 7944 and the BS EN 3 series were used to inform the development of PAS 2013-1.

Cooking-related fires are responsible for a high number of casualties and deaths. In Great Britain in 2011 to 2012 alone, there were 2 600 chip or fat pan fires reported.[1)] These fires caused 1 230 casualties and 12 fatalities. Having a readily accessible method for extinguishing a fire that is appropriate for the type of fire, its location and its severity could significantly reduce the fire risks to occupants as well as reducing fire damage to a property. A publication by the Fire Extinguishing Trades Association (FETA) and the Independent Fire Engineering and Distributors Association (IFEDA), called *Report on a survey into portable fire extinguishers and their use in the United Kingdom and other member countries of Eurofeu* [7], states that the Fire and Rescue Service were not called to 75% of fires in the UK. This could indicate that such fires were successfully tackled by those within its proximity. In instances where people attempt to extinguish a fire themselves, it is safer for them to use an appropriate method.

However, it is important to stress that it is not advisable for someone to attempt to approach a fire to apply a hand-applied unit in situations in which it would be considered unsafe to do so (i.e. in situations in which it would be considered too unsafe to approach the fire to turn off the heat).[2)]

NOTE *Attention is drawn to the Regulatory Reform (Fire Safety) Order 2005 [1] for hand-applied units intended for use in non-domestic premises.*

[1)] DCLG report, *Fire Statistics – Great Britain: 2011 to 2012* [6].

[2)] Further information and guidance specifically regarding household fire safety can be found in the DCLG publication, *Fire safety in the home* [8].

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1 Scope

This PAS specifies requirements and test methods for hand-applied units containing a non-toxic liquid medium for use to extinguish and cool Class F fires in open-top cooking appliances (e.g. chip pans, deep fat fryers) that involve cooking media (vegetable or animal oils and fats) up to a volume of 3 L or up to a volume of 5 L. It is for use by manufacturers of such hand-applied units.

This PAS covers non-pressurized hand-applied units that are not reusable and that are intended for use by one person. It covers testing for electric shock, durability and inappropriate use.

This PAS does not cover any fire-fighting apparatus that uses a jet-discharge (e.g. fire extinguishers).

***NOTE** For information and requirements for portable fire extinguishers, see BS EN 3 (all parts).*

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensible for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

BS EN 60068-2-78, *Environmental testing – Part 2-78: Tests – Test cab: Damp heat, steady state*

BS EN 60584-1 (IEC 60584-1), *Thermocouples – Part 1: Reference tables*

BS EN ISO 13943 (ISO 13943), *Fire safety – Vocabulary*

BS ISO 24153, *Random sampling and randomization procedures*

3 Terms and definitions

For the purposes of this PAS, the terms and definitions given in BS EN ISO 13943 and the following apply.

3.1 Class F fire

fire involving cooking media in cooking appliances

***NOTE** See also BS EN 2:1992, Clause **2**.*

3.2 cooking media

vegetable or animal oils and fats

3.3 hand-applied unit

product that can be held in one hand and applied to a fire to extinguish it by a single person

4 Testing (type tests)

***NOTE 1** Type tests are tests made before supplying a particular type of item on a general commercial basis, to determine whether the item has satisfactory performance characteristics to be suitable for the intended application.*

***NOTE 2** Users might find it desirable to implement a quality control system such as BS EN ISO 9001, or equivalent.*

4.1 General

Type tests shall be carried out on eight hand-applied unit test specimens. These test specimens shall be selected in accordance with BS ISO 24153 and labelled Specimen 1 to Specimen 8.

Specimen 1 to Specimen 8 shall conform to the relevant clauses in accordance with Table 1.

Where a specimen does not conform to the relevant clauses in accordance with Table 1, the hand-applied unit shall be recorded as a failure.

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4.2 Repetition of type tests

Type tests shall be repeated when changes are made to the hand-applied unit's:

a) materials;

b) design; or

c) manufacturing process.

Table 1 – Test schedule

Specimen	Test	Clause
	Construction and design tests	
1	Drop test	**5.2**
2	Electrical resistance test	**5.3**
3	Humidity test	**5.4**
4	Nominal volume test	**5.6**
	Performance tests	
5	Fire extinguishing and cooling test (conditioning at 0 °C to 30 °C)	**6**
6	Fire extinguishing and cooling test (conditioning at approximately 0 °C)	**6**
7	Fire extinguishing and cooling test (conditioning at approximately 60 °C)	**6**
8	Inappropriate use test (conditioning at 0 °C to 30 °C)	**6**

5 Construction, design and disposal of the hand-applied unit

5.1 Flammability

The hand-applied unit shall conform to Clause **6**. The outer material of the hand-applied unit may degrade or even burn on contact with flame.

5.2 Drop test

When tested in accordance with Annex A and Annex B, the hand-applied unit shall not leak, break, swell or distort.

5.3 Electrical resistance

When tested in accordance with Annex A and Annex C, the electrical resistance of the hand-applied unit shall not be less than 1 MΩ across 100 mm, as measured across the surface of the hand-applied unit from the body to the handle.

NOTE 1 *See BS EN 62631-1 for further information regarding electrical resistance.*

NOTE 2 *The "handle" of the test specimen is considered to be the part of the hand-applied unit that is held by the user on application. The "body" of the hand-applied unit is considered to be the part that contains the liquid fire-extinguishing media.*

5.4 Humidity (test for damp heat, steady state)

5.4.1 General

The test specimen shall be tested for its influence by the absorption and diffusion of moisture and moisture vapour in accordance with BS EN 60068-2-78, using the parameters and requirements given in **5.4.2** to **5.4.5**.

The test specimen shall be tested for a duration of 21 days (504 h).

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