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Ognjemet – 6. del: Bengalski ognji – Specifikacija in preskusne metode

Fireworks - Part 6: Bengal flames - Specification and test methods

Feuerwerkskörper - Teil 6: Bengalf Feuer - Anforderungen und Prüfverfahren

Artifices de divertissement - Partie 6: Feux de Bengale - Spécifications et méthodes d'essai

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und Prüfverfahren

This European Standard was approved by CEN on 14 June 2004.

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Foreword

This document (EN 14035-6:2004) has been prepared by Technical Committee CEN/TC 212 "Fireworks", the secretariat of which is held by NEN.

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of an identical text or by endorsement, at the latest by February 2005, and conflicting national standards shall be withdrawn at the latest by February 2005.

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

This European Standard is one of a series of standards as listed below.

EN 14035-1, *Fireworks - Part 1: Terminology.*

EN 14035-2, *Fireworks - Part 2: Categorisation.*

EN 14035-3, *Fireworks - Part 3: Aerial wheels - Specification and test methods.*

EN 14035-4, *Fireworks - Part 4: Bangers and banger batteries - Specification and test methods.*

prEN 14035-5, *Fireworks - Part 5: Batteries or combinations - Specification and test methods.*

EN 14035-6, *Fireworks - Part 6: Bengal flames - Specification and test methods.*

EN 14035-7, *Fireworks - Part 7: Bengal matches - Specification and test methods.*

EN 14035-8, *Fireworks - Part 8: Bengal sticks - Specification and test methods.*

EN 14035-9, *Fireworks - Part 9: Crackling granules - Specification and test methods.*

EN 14035-10, *Fireworks - Part 10: Double bangers - Specification and test methods.*

EN 14035-12, *Fireworks - Part 12: Flash bangers and flash banger batteries - Specification and test methods.*

EN 14035-13, *Fireworks - Part 13: Flash pellets - Specification and test methods.*

EN 14035-15, *Fireworks - Part 15: Fountains - Specification and test methods.*

EN 14035-17, *Fireworks - Part 17: Ground spinners - Specification and test methods.*

prEN 14035-18, *Fireworks - Part 18: Hand-held fountains - Specification and test methods.*

EN 14035-19, *Fireworks - Part 19: Hand-held sparklers - Specification and test methods.*

prEN 14035-20, *Fireworks - Part 20: Jumping crackers - Specification and test methods.*

prEN 14035-21, *Fireworks - Part 21: Jumping ground spinners - Specification and test methods.*

EN 14035-22, *Fireworks - Part 22: Mines - Specification and test methods.*

EN 14035-23, *Fireworks - Part 23: Non-hand-held sparklers - Specification and test methods.*

EN 14035-24, *Fireworks - Part 24: Novelty matches - Specification and test methods.*

prEN 14035-25, *Fireworks - Part 25: Party poppers - Specification and test methods.*

EN 14035-27, *Fireworks - Part 27: Rockets - Specification and test methods.*

EN 14035-28, *Fireworks - Part 28: Roman candles - Specification and test methods.*

EN 14035-29, *Fireworks - Part 29: Serpents - Specification and test methods.*

prEN 14035-31, *Fireworks - Part 31: Shell-in-mortars - Specification and test methods.*

prEN 14035-32, *Fireworks - Part 32: Snaps - Specification and test methods.*

prEN 14035-33, *Fireworks - Part 33: Spinners - Specification and test methods.*

EN 14035-34, *Fireworks - Part 34: Table bombs - Specification and test methods.*

prEN 14035-35, *Fireworks - Part 35: Throwdowns - Specification and test methods.*

EN 14035-36, *Fireworks - Part 36: Wheels - Specification and test methods.*

prEN 14035-37, *Fireworks - Part 37: Whistlers - Specification and test methods.*

prEN1035-38, *Fireworks - Part 38: Shot tubes - Specification and test methods.*

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1 Scope

This document specifies requirements for the construction, performance, primary packaging and labelling of Bengal flames and the corresponding test methods. It is applicable to fireworks which are classified as Bengal flames in categories 1, 2 and 3 in EN 14035-2.

It is not applicable to Bengal flames containing pyrotechnic composition that includes any of the following substances:

- arsenic or arsenic compounds;
- mixtures containing a mass fraction of chlorates greater than 80 %;
- mixtures of chlorates with metals;
- mixtures of chlorates with red phosphorus;
- mixtures of chlorates with potassium hexacyanoferrate(II);
- mixtures of chlorates with sulfur;
- mixtures of chlorates with sulfides;
- lead or lead compounds;
- mercury compounds;
- white phosphorus;
- picrates or picric acid;
- potassium chlorate with a mass fraction of bromates greater than 0,15 %;
- sulfur with an acidity, expressed in mass fraction of sulphuric acid, greater than 0,002 %;
- zirconium with a particle size of less than 40 µm.

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NOTE In EN 14035-2, Bengal flames are classified as follows:

- brief description: tube containing slow burning pyrotechnic composition;
- principal effect: emission of coloured flames.

Schemes for type testing of Bengal flames and batch testing of Bengal flames are specified in annex A and annex B respectively.

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 14035-1:2003, *Fireworks — Part 1: Terminology*.

EN 14035-2, *Fireworks — Part 2: Categorisation*.

EN ISO 845, *Cellular plastics and rubbers — Determination of apparent (bulk) density (ISO 845:1988)*.

EN ISO 868, *Plastics and ebonite - Determination of indentation hardness by means of a durometer (Shore hardness) (ISO 868:2003)*.

EN ISO 2439, *Flexible cellular polymeric materials - Determination of hardness (indentation technique) (ISO 2439:1997, including Technical Corrigendum 1:1998)*.

ISO 2859-1, *Sampling procedures for inspection by attributes — Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection*.

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 14035-1:2003 apply.

4 Construction

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4.1 Means of ignition

The means of ignition shall be identified by a protruding fuse, an ignition head, or, for a category 1 Bengal flame only, a sealing paper.

Conformity to this requirement shall be verified by visual examination.

4.2 Attachment of initial fuse

For Bengal flames with protruding fuse, the attachment of the protruding fuse to the Bengal flame shall be secure when tested in accordance with 8.1.

For Bengal flames with sealing paper or ignition head, the attachment of the sealing paper or ignition head to the Bengal flame shall be secure when tested in accordance with 8.2.

4.3 Protection of initial fuse

4.3.1 General

4.3.2 The initial fuse shall be protected in one of the ways specified in 4.3.2, 4.3.3 or 4.3.4. Initial fuse protected by fuse cover

An orange fuse cover shall be in place over the initial fuse.

Conformity to this requirement shall be verified by visual examination.

4.3.3 Initial fuse protected by primary pack or selection pack

The Bengal flames shall be contained in a primary pack or selection pack conforming to 6.

Conformity to this requirement shall be verified by visual examination.

4.3.4 Protruding fuse designed to resist side ignition

When tested in accordance with 8.6, the protruding fuse shall not ignite.

4.4 Materials of firework case

The body of the firework case shall be made of paper or cardboard. If the end closure is a separate component, it shall be made of non-metallic material.

Conformity to these requirements shall be verified by visual examination.

4.5 Integrity

There shall be no holes, splits, dents or bulges in the body of the firework case. There shall be no holes or splits in the end closure, except if they are intended for the fixing of the Bengal flame. If the end closure is a separate component, it shall be securely in place.

Conformity to these requirements shall be verified by visual examination.

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4.6 Net explosive content

When determined in accordance with 8.5, a category 1 Bengal flame shall have a net explosive content of not more than 20,0 g.

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When determined in accordance with 8.5, a category 2 Bengal flame shall have a net explosive content of not more than 200,0 g.

When determined in accordance with 8.5, a category 3 Bengal flame shall have a net explosive content of not more than 500,0 g.

4.7 Vertical stability

For Bengal flames designed to be placed vertically on the ground, the Bengal flame shall not fall over when tested in accordance with 8.3.

5 Performance

5.1 Initial fuse

NOTE Category 1 Bengal flames with sealing paper do not usually have an initial fuse (producing the principal effect immediately after ignition).

When tested in accordance with 8.4, the initial fuse of a Bengal flame shall ignite within 10 s and the ignition shall be visible.

For category 1 Bengal flames and category 2 Bengal flames the duration of the initial fuse burning shall be 3,0 s to 8,0 s, when tested in accordance with 8.4.

For category 3 Bengal flames, the duration of the initial fuse burning shall be 5,0 s to 13,0 s, when tested in accordance with 8.4.

5.2 Principal effect

When tested in accordance with 8.4, the principal effect of the Bengal flame, as given in EN 14035-2, shall be the emission of coloured flames.

5.3 Functioning

When tested in accordance with 8.4, all the pyrotechnic composition shall burn off.

5.4 Explosion

When tested in accordance with 8.4, the Bengal flame shall not produce an explosion.

5.5 Burning matter

When tested in accordance with 8.4, no burning or incandescent matter from a category 1 Bengal flame shall fall to the ground at a distance of more than 1,0 m from the testing point.

When tested in accordance with 8.4, no burning or incandescent matter from a category 2 Bengal flame shall fall to the ground at a distance of more than 6,0 m from the testing point.

When tested in accordance with 8.4, no burning or incandescent matter from a category 3 Bengal flame shall fall to the ground at a distance of more than 15,0 m from the testing point.

When tested in accordance with 8.4, any flames caused by the functioning of the Bengal flame shall be extinguished within 60,0 s of the Bengal flame ceasing to function.

5.6 Burning rate of pyrotechnic composition

When tested in accordance with 8.4 the pyrotechnic composition of a Bengal flame shall have a burning rate of more than 60,0 s for 100,0 g of pyrotechnic composition.

5.7 Stability

When tested in accordance with 8.4, the Bengal flame designed to be placed vertically or fixed, shall remain upright or fixed whilst functioning.

6 Primary pack or selection pack

If a primary pack or selection pack is required to protect the initial fuse(s) of the Bengal flame(s) (see 4.3.3), the pack shall completely enclose the Bengal flame(s). There shall be no holes or splits in the pack, except those which are intended to enable the packaging to be opened and those which are otherwise technically necessary.

Conformity to these requirements shall be verified by visual examination.

7 Minimum labelling requirements

7.1 General

Bengal flames and their primary packs, if any, shall be marked with the information specified in 7.2 to 7.5 and, if relevant, 7.7 and/or 7.8.

The specified information shall be given in the language(s) of the country in which the Bengal flames or primary packs are offered for retail sale. For each language, it shall be presented as a whole and shall not be interrupted by other text. Additional text given in another language shall not conflict with the specified information.

Conformity to the requirements specified in 7.1 to 7.5, 7.6.1, 7.7.2 and 7.8 shall be verified by visual examination.

NOTE Examples of typical labels for bangers, for which many of the marking requirements are similar to those specified for Bengal flames in this standard, are given in EN 14035-4.

7.2 Type name and category

The type name shall be marked, in upper case, as 'BENGAL FLAME'. If a trade name is used in addition to the type name, it shall not conflict with the principal effect of a Bengal flame or with the name of another type of firework.

The appropriate category shall be marked, in upper case, as 'CATEGORY 2' or 'CAT 2' for example.

7.3 Safety information

7.3.1 General

Safety information shall be emphasized by use of a heading, or bold type, or similar. If necessary, instructions in addition to those specified in 7.3.2 to 7.3.5 may be given.

7.3.2 Category 1 Bengal flames

Labelling shall include at least the following safety information in the order as given:

- 'For outdoor use only';
- 'Remove orange fuse cover'¹⁾;
- 'Do not inhale smoke';

Specific placing instructions for different types of Bengal flames, inserted as appropriate (see 7.3.5);

- 'Standing sideways, light fuse at its outermost end and retire immediately at least 1 m²⁾'; or
- 'Standing sideways, light ignition head and retire immediately at least 1 m²⁾'; or
- 'Standing sideways, light sealing paper and retire immediately at least 1 m²⁾'.

¹⁾ If applicable.

²⁾ Whichever is appropriate