



SLOVENSKI STANDARD

SIST EN 14035-5:2006

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Ognjemet - 5. del: Baterije in sestave - Specifikacija in preskusne metode

Fireworks - Part 5: Batteries and combinations - Specification and test methods

Feuerwerkskörper - Teil 5: Batterien und Kombinationen - Anforderungen und Prüfverfahren

Artifices de divertissement - Partie 5: Batteries et combinaisons - Spécifications et méthodes d'essai

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English Version

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combinaisons - Spécifications et méthodes d'essai

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Anforderungen und Prüfverfahren

This European Standard was approved by CEN on 30 December 2005.

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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

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

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Contents

Page

Foreword.....	3
1 Scope	5
2 Normative references	6
3 Terms and definitions	6
4 Elements in the battery or combination	7
5 Construction.....	8
6 Performance	10
7 Primary pack or selection pack.....	11
8 Minimum labelling requirements.....	11
9 Methods of test	14
Annex A (normative) Type testing	24
Annex B (normative) Batch testing.....	34
Annex C (normative) Method for determination of smouldering rate of cigarette.....	38
Annex D (informative) A-Deviations	39

SIST EN 14035-5:2006
<https://standards.itech.ai/catalog/standards/sist/70e01c21-8820-4bcb-a6a0-635daa78aacb/sist-en-14035-5-2006>

Foreword

This European Standard (EN 14035-5:2006) 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 August 2006, and conflicting national standards shall be withdrawn at the latest by August 2006.

This 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*

EN 14035-5, *Fireworks - Part 5: Batteries and 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*

EN 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*

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

EN 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*

EN 14035-5:2006 (E)

EN 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*

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

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

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

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

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

EN 14035-38, *Fireworks - Part 38: Shot tubes - Specification and test methods*

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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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1 Scope

This European Standard specifies requirements for the construction, performance, primary packaging and labelling of batteries and combinations and the corresponding test methods. It is applicable to fireworks which are classified as batteries and combinations in categories 2 and 3 according to EN 14035-2.

It is applicable to category 2 batteries and combinations containing elements, each corresponding to a type of firework listed in EN 14035-2 and which conform to the relevant requirements of categories 1 and 2.

It is applicable to category 3 batteries and combinations containing elements, each corresponding to a type of firework listed in EN 14035-2 and which conform to the relevant requirements of categories 1, 2 and 3.

It is not applicable to banger batteries and flash banger batteries, which are specified in EN 14035-4 and EN 14035-12 respectively.

NOTE 1 The elements (types of firework) that can be included in a battery or combination are specified in Clause 4.

It is not applicable to batteries and combinations 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 as mass fraction of sulfuric acid, greater than 0,002 %;
- zirconium with a particle size of less than 40 μm .

NOTE 2 In EN 14035-2, batteries and combinations are classified as follows:

— brief description:

— battery: assembly including several elements, each of the same type and corresponding to one of the types of firework listed in EN 14035-2, with one point of ignition;

— combination: assembly including several elements, not all of the same type, each corresponding to one of the types of firework listed in EN 14035-2, with one point of ignition;

— principal effects: as for the individual elements.

Schemes for type testing of batteries and combinations and batch testing of batteries and combinations are specified in Annex A and Annex B respectively.

2 Normative references

The following referenced documents are indispensable for the application of this European Standard. 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 61672-1, *Electroacoustics — Sound level meters — Part 1: Specifications (IEC 61672-1:2002)*

EN 61672-2, *Electroacoustics — Sound level meters — Part 2: Pattern evaluation tests (IEC 61672-2:2003)*

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 European Standard, the terms and definitions given in EN 14035-1:2003 apply.

4 Elements in the battery or combination

4.1 Battery

A battery shall comprise elements corresponding to one of the following types of firework (as classified in EN 14035-2):

- Bengal flames;
- crackling granules;
- fountains;
- ground spinners;
- mines;
- rockets, assembled in a launcher;
- Roman candles;
- spinners;
- shell-in-mortars;
- shot tubes;
- wheels.

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Conformity to this requirement shall be verified by visual examination.

4.2 Combination

A combination shall comprise elements corresponding to two or more of the following types of firework (as classified in EN 14035-2):

- bangers;
- Bengal flames;
- fountains;
- mines;
- Roman candles;
- shell-in-mortars;
- shot tubes;
- wheels.

Conformity to this requirement shall be verified by visual examination.

5 Construction

5.1 General requirements

5.1.1 Means of ignition

The means of ignition shall be identified by a protruding fuse.

Conformity to this requirement shall be verified by visual examination.

5.1.2 Attachment of initial fuse

The attachment of the protruding fuse to the battery or combination shall be secure when tested in accordance with 9.1.

5.1.3 Protection of initial fuse

5.1.3.1 General

The initial fuse shall be protected in one of the ways specified in 5.1.3.2, 5.1.3.3 or 5.1.3.4.

5.1.3.2 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.

5.1.3.3 Initial fuse protected by primary pack or selection pack

The battery or combination shall be contained in a primary pack or selection pack conforming to Clause 7.

Conformity to this requirement shall be verified by visual examination.

5.1.3.4 Protruding fuse designed to resist side ignition

When tested in accordance with 9.5, the protruding fuse shall not ignite.

5.1.4 Materials

5.1.4.1 Individual elements

The materials of the individual elements shall conform to the requirements given in the relevant parts of EN 14035.

Conformity to these requirements shall be verified by visual examination.

5.1.4.2 Pyrotechnic units

The materials of the pyrotechnic units shall conform to the requirements, if any, given in the relevant parts of EN 14035.

Conformity to these requirements shall be verified by visual examination.

5.1.4.3 Outer case (if any)

The body of the outer firework case shall be made of paper, cardboard or plastics. If the end closure is a separate component, it shall be made of non-metallic material. The base and/or means of fixing shall be made of non-metallic material.

Conformity to these requirements shall be verified by visual examination.

5.1.4.4 Framework (if any)

With the exception of staples, nails and binding wires, the other parts of the assembly shall be made of non-metallic material.

Conformity to these requirements shall be verified by visual examination.

5.1.5 Integrity

If the battery or combination has an outer case, there shall be no holes, splits, dents or bulges in the body of the outer case, except those technically necessary for the correct functioning of the battery or combination. There shall be no holes or splits in the end closure, if any. If the end closure is a separate component, it shall be securely in place. If the base is a separate component, it shall be securely in place.

If the battery or combination has no outer case, there shall be no holes, splits, dents or bulges in the bodies of the individual elements, except those technically necessary for the correct functioning of the element. There shall be no holes or splits in the end closures, if any. If the end closures are separate components, they shall be securely in place.

Each individual element shall be securely attached, other than by the transmitting fuse(s) alone, to the other elements or to the framework of the battery or combination. For a battery of rockets this requirement shall apply to the rocket launchers, not to the rockets.

Conformity to these requirements shall be verified by visual examination.

5.1.6 Net explosive content

5.1.6.1 Net explosive content of the individual elements

When determined in accordance with 9.4, the net explosive content of each individual element shall conform to the requirements given in the relevant parts of EN 14035. If the battery or combination includes one or more shell-in-mortar(s), the net explosive content of each shell-in-mortar(s) shall be not more than 200,0 g.

5.1.6.2 Mass of report and/or bursting charges

When determined in accordance with 9.4, the mass of each report and/or bursting charge, if any, shall conform to the requirements given in the relevant parts of EN 14035.

5.1.6.3 Net explosive content of category 2 batteries and combinations

When determined in accordance with 9.4, a category 2 battery or combination, except a combination containing fountains, shall have a net explosive content of not more than 200,0 g.

When determined in accordance with 9.4, the net explosive content of a category 2 combination containing fountains shall have a net explosive content of not more than 600,0 g, of which not more than 200,0 g shall be contained in elements other than fountains.

When determined in accordance with 9.4, the net explosive content of a category 2 battery containing fountains shall have a net explosive content of not more than 600,0 g.

5.1.6.4 Net explosive content of category 3 batteries and combinations

When determined in accordance with 9.4, a category 3 battery or combination, except a combination containing fountains, shall have a net explosive content of not more than 1 000,0 g.

When determined in accordance with 9.4, a category 3 combination containing fountains shall have a net explosive content of not more than 3 000,0 g, of which not more than 1 000,0 g shall be contained in elements other than fountains.

When determined in accordance with 9.4, a category 3 battery containing fountains shall have a net explosive content of not more than 3 000,0 g.

5.1.7 Vertical stability

Batteries and combinations designed to be placed on the ground, shall not fall over when tested in accordance with 9.2.

6 Performance

6.1 Initial fuse

When tested in accordance with 9.3, the initial fuse shall ignite within 10 s and the ignition shall be visible.

For category 2 batteries and combinations the duration of the initial fuse burning shall be 3,0 s to 8,0 s, when tested in accordance with 9.3.

For category 3 batteries and combinations, the duration of the initial fuse burning shall be 5,0 s to 13,0 s, when tested in accordance with 9.3.

6.2 Other performance characteristics of the battery or combination as a whole

6.2.1 Explosions

When tested in accordance with 9.3, the battery or combination shall not produce an explosion damaging the integrity of the firework other than those which are principal effects (for one or more of the elements).

6.2.2 Sound pressure level

The requirements for sound pressure level apply to all batteries and combinations, except for:

- batteries of Bengal flames, fountains or rockets;
- combinations of Bengal flames and fountains.

When tested in accordance with 9.3, a category 2 battery or combination shall produce a maximum A-weighted impulse sound pressure level (L_{Amax}) of not higher than 120 dB(AI) at a horizontal distance of 8,0 m from the testing point and at a height of 1,0 m above the ground.

When tested in accordance with 9.3, a category 3 battery or combination shall produce a maximum A-weighted impulse sound pressure level (L_{Amax}) of not higher than 120 dB(AI) at a horizontal distance of 15,0 m from the testing point and at a height of 1,0 m above the ground.

6.2.3 Burning matter

When tested in accordance with 9.3, no burning or incandescent matter from a category 2 battery or combination shall fall to the ground more than 6,0 m from the testing point, except for batteries of rockets.

When tested in accordance with 9.3, no burning or incandescent matter from a category 3 battery or combination shall fall to the ground more than 15,0 m from the testing point, except for batteries of rockets.

When tested in accordance with 9.3, any flames caused by the functioning of the battery or combination shall be extinguished within 60,0 s of the battery or combination ceasing to function, except for batteries and combinations containing fountains.

6.2.4 Projected debris

When tested in accordance with 9.3, no debris from a category 2 battery or combination, except for a battery of rockets, shall be projected laterally more than 8,0 m from the testing point and any particle of debris which is projected laterally more than 6,0 m from the testing point shall not exceed a mass of 1,0 g.

When tested in accordance with 9.3, no debris from a category 3 battery or combination shall be projected laterally more than 15,0 m from the testing point.

6.2.5 Stability

When tested in accordance with 9.3, a battery or combination shall remain upright or in its original position whilst functioning.

When tested in accordance with 9.3, the launcher of the battery of rockets shall remain upright in its original position whilst functioning.

6.3 Performance characteristics of each individual element and pyrotechnic unit

When tested in accordance with 9.3, each element and pyrotechnic unit of a battery or combination shall function according to the requirements given in the relevant parts of EN 14035, except where already covered by the requirements of the battery or combination as a whole (6.2).

7 Primary pack or selection pack

If a primary pack or selection pack is required to protect the initial fuse(s) of the battery (batteries) or combination(s) (see 5.1.3.3), the pack shall completely enclose the battery (batteries) or combination(s) and there shall be no holes or splits in the pack, except those which are intended to open the packaging or otherwise technically necessary.

Conformity to these requirements shall be verified by visual examination.

8 Minimum labelling requirements

8.1 General

Batteries or combinations and their primary packs, if any, shall be marked with the information specified in 8.2 to 8.5 and 8.7.

The specified information shall be given in the language(s) of the country in which the batteries or combinations or primary packs are offered for retail sale. For each language, it shall be presented as a whole