



SLOVENSKI STANDARD

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Pirotehnični izdelki - Ognjemet, kategorija 4 - 2. del: Zahteve

Pyrotechnic articles - Fireworks, Category 4 - Part 2: Requirements

Pyrotechnische Gegenstände - Feuerwerkskörper, Kategorie 4 - Teil 2: Anforderungen

Articles pyrotechniques - Artifices de divertissement, Catégorie 4 - Partie 2: Exigences

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EUROPEAN STANDARD
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EN 16261-2

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English Version

Pyrotechnic articles - Fireworks, Category 4 - Part 2: Requirements

Articles pyrotechniques - Artifices de divertissement,
Catégorie 4 - Partie 2: Exigences

Pyrotechnische Gegenstände - Feuerwerkskörper,
Kategorie 4 - Teil 2: Anforderungen

This European Standard was approved by CEN on 24 November 2012.

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-CENELEC Management Centre or to any CEN member.

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EN 16261-2:2013 (E)**Foreword**

This document (EN 16261-2:2013) has been prepared by Technical Committee CEN/TC 212 "Pyrotechnic articles", 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of an identical text or by endorsement, at the latest by July 2013, and conflicting national standards shall be withdrawn at the latest by July 2013.

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.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

This European Standard is one of the series of standards as listed below:

- EN 16261-1, *Pyrotechnic articles — Fireworks, Category 4 — Part 1 Terminology*;
- EN 16261-3, *Pyrotechnic articles — Fireworks, Category 4 — Part 3 Test methods*;
- EN 16261-4, *Pyrotechnic articles — Fireworks, Category 4 — Part 4 Minimum labelling requirements and instructions for use*.

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CEN/TC 212 has also developed European Standards for:

- Pyrotechnic articles — Fireworks Categories 1, 2 and 3;
- Pyrotechnic articles — Theatrical pyrotechnic articles;
- Pyrotechnic articles — Pyrotechnic articles for vehicles;
- Pyrotechnic articles — Other pyrotechnic articles;
- Pyrotechnic articles — Ignition devices.

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

1 Scope

This European Standard specifies requirements for the construction, performance and protective packaging of Category 4 fireworks, as listed in EN 16261-1.

This European Standard does not apply for articles containing pyrotechnic compositions that include any of the following substances:

- arsenic or arsenic compounds;
- polychlorobenzenes;
- lead or lead compounds;
- mercury compounds;
- white phosphorus;
- picrates or picric acid.

This European Standard does not apply for articles containing military explosives or commercial blasting agents except for black powder or flash composition.

In addition, any European regulation regarding forbidden substances should be taken into account.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable 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.

EN 16261-1:2012, *Pyrotechnic articles — Fireworks, Category 4 — Part 1: Terminology*

EN 16261-3:2012, *Pyrotechnic articles — Fireworks, Category 4 — Part 3: Test methods*

EN 16261-4:2012, *Pyrotechnic articles — Fireworks, Category 4 — Part 4: Minimum labelling requirements and instructions for use*

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 16261-1:2012 apply.

EN 16261-2:2013 (E)**4 Pyrotechnic composition**

No limits are given for the net explosive content (NEC)¹⁾ of Category 4 articles in this standard.

5 Construction (type test and batch test)

When tested in accordance with 6.1 and 6.2 of EN 16261-3:2012, the article dimensions and gross mass shall be in accordance with the manufacturer's declaration (including tolerances).

The orientation of mortars shall be verified by inspection according to 6.3 of EN 16261-3:2012, during type test.

When the orientation of mortars in combinations is not visible, the maximum firing angle shall be displayed on the label and verified by visual inspection according to 6.7 of EN 16261-3:2012.

6 Means of ignition**6.1 Identification (type test and batch test)**

The means of ignition shall be clearly visible or shall be indicated by labelling or instructions where applicable.

Conformity to this requirement shall be verified by visual examination according to 6.7 of EN 16261-3:2012.

6.2 Protection (type test and batch test) SIST EN 16261-2:2013

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Where appropriate, the means of ignition shall be protected to avoid accidental ignition of the fireworks.

Conformity to this requirement shall be verified by visual examination according to 6.7 of EN 16261-3:2012.

7 Performance**7.1 Properties to be checked before functioning tests****7.1.1 Loose pyrotechnic composition after mechanical conditioning (type test)**

When tested in accordance with 6.8 of EN 16261-3:2012, the loose pyrotechnic composition found outside the article after mechanical conditioning shall be weighed. The mass of the whole loose material shall comply with manufacturer's specifications (if any) and the mass of loose pyrotechnic composition shall not exceed 3 % of the NEC and not more than 1 g for each item tested. If the pyrotechnic composition cannot be separated from the loose material, the same limits shall apply to the whole loose material.

1) The NEC has an influence (directly or indirectly) on the safety distances. For Category 4 fireworks, it is agreed that no fixed minimum safety distances are defined, contrary to Category 1, 2 and 3 fireworks. The safe use of Category 4 fireworks is one of the major responsibilities of the person with specialist knowledge who should determine the minimum safety distance by using the information given in prEN 16261-4:2011, Clause 4.

7.1.2 Integrity (type test and batch test)

7.1.2.1 General requirements

There shall be no holes, splits, dents or bulges either in the body of the firework case or in the end closures, except those technically necessary for the correct functioning of the firework. If the end closures are separate components, they shall be in place. There shall be no pyrotechnic leakage of the article to be tested when it is received for testing.

Conformity to these requirements shall be verified by visual examination according to 6.7 of EN 16261-3:2012.

7.1.2.2 Specific requirements

For combinations: each individual element shall be securely attached to the other elements or to the framework. Attachment by the transmitting fuse(s) alone shall be allowed if it is sufficient to keep the elements joined together during normal handling.

Conformity to above requirements shall be checked by visual examination according to 6.7 of EN 16261-3:2012.

7.2 Properties to be checked during functioning tests

7.2.1 Principal effects (type test and batch test)

When tested in accordance with 6.10 of EN 16261-3:2012, the principal effects of each firework shall conform to those specified by the manufacturer or importer as described in EN 16261-1.

7.2.2 Functioning (type test and batch test)

For type test only, functioning test in accordance with 6.10 of EN 16261-3:2012, shall be performed in as received conditions and, after mechanical and thermal conditions in accordance with 6.8 and 6.9 of EN 16261-3:2012.

For type test and batch test, when tested in accordance with 6.10 of EN 16261-3:2012, the article shall function as intended and shall not function in an erratic and unforeseeable manner.

7.2.3 Stability during functioning (type test and batch test)

When used according to the instructions for use, the article shall remain in its initial position and maintain its integrity whilst functioning, if applicable. Conformity to these requirements shall be checked by the method described in 6.10 of EN 16261-3:2012.

7.2.4 Performance parameters (type test and batch test)

The mandatory parameters listed in Annex A shall be measured and recorded according to 6.4, 6.5, 6.10.3 and 6.10.4 of EN 16261-3:2012 (if applicable).

During type tests, all test results shall be within a tolerance of $\pm 20\%$ of the measured average, except as otherwise justified by the manufacturers. The measured average value shall be displayed on the label. This value may be rounded. Tolerances regarding performance parameters are only applicable to articles in as received condition. During batch tests, all test results shall be within a tolerance of $\pm 30\%$ from the value which is displayed on the label.

These tolerances are not applicable for sound pressure.

EN 16261-2:2013 (E)**7.2.5 Sound pressure level (type test and batch test)**

For articles which have report, explosion, and/or whistling effects as part of their performance, the sound pressure level shall be measured and recorded at a predefined distance from the firing point according to 6.5 of EN 16261-3:2012.

The maximum measured value or a higher value if specified by the manufacturer shall be displayed on label.

During batch test, the measured value shall not exceed the displayed value.

7.2.6 Extinguishing of flames (type test)

When tested in accordance with 6.6 of EN 16261-3:2012, the existence of flames observed more than 2 min after the end of functioning of the article shall be displayed on the label or in the instructions for use.

Conformity to this requirement shall be tested by visual examination according to 6.7 of EN 16261-3:2012.

7.2.7 Projected debris (type test and batch test)

If the type test has shown projection of debris, the design of the firework shall be examined in accordance with 6.2 of EN 16261-3:2012 to establish whether the debris is a result of the design or malfunction of the article.

If the debris is the result of design, the instructions for use shall be checked according to 6.7 of EN 16261-3:2012, to establish whether the projection of debris has been addressed (including expected distance according to 6.10.2 of EN 16261-3:2012).

When tested in accordance with 6.7 of EN 16261-3:2012, the maximum debris distance found during batch tests shall not exceed the distance displayed on the label.

7.2.8 Burning or incandescent matter (type test and batch test)

The fall of burning or incandescent matter to the ground shall be checked during the functioning test (see 6.10 of EN 16261-3:2012).

7.3 Requirements for components (type test and batch test)

The following requirements shall apply on components:

- construction (see Clause 5);
- thermal conditioning (type test only: see 6.9 of EN 16261-3:2012);
- loose composition after mechanical conditioning (type test only: see 7.1.1).

8 Protective pack (type test and batch test)

Protective packs (if any) shall provide on their label the necessary information as required by 4.11 of EN 16261-4:2012. This shall be verified according to 6.7 of EN 16261-3:2012, by visual examination.

The means of ignition of pyrotechnic articles within protective pack shall be protected according to 6.2. This shall be verified by visual examination according to 6.7 of EN 16261-3:2012.

9 Type testing

9.1 General

Each firework to be type tested shall meet the following requirements:

- Clause 5: Construction;
- Clause 6: Means of ignition;
- Clause 7: Performance;
- Clause 8: Protective pack;
- EN 16261-4 "Pyrotechnic articles – Fireworks, Category 4 – Part 4: Minimum labelling requirements and instructions for use".

9.2 Number of items to be tested

In accordance with Table 1, a total number of nine pyrotechnic articles shall be tested.

Table 1 — Number of items to be tested

Number of fireworks to be tested	Condition	Tests in accordance with
3	As received	<ul style="list-style-type: none"> — Clause 5 — Clause 6 — Clause 7 — EN 16261-4 — Clause 8
3	After thermal conditioning (see 6.9 of EN 16261-3:2012)	<ul style="list-style-type: none"> — Clause 6 — Clause 7
3	After mechanical conditioning (see 6.8 of EN 16261-3:2012)	<ul style="list-style-type: none"> — Clause 6 — Clause 7

For aquatic fireworks and for each condition presented in Table 1, two items shall be tested to determine the effect range and to check the waterproofness in accordance with 6.1.4 of EN 16261-3:2012.

9.3 Fireworks supplied in protective packs

Fireworks that are supplied in protective packs shall be tested for thermal and mechanical conditioning within the protective pack.