

| | | |
|------------|---|--|
| STN | Pyrotechnické výrobky Zábavná pyrotechnika kategórií F1, F2 a F3 Časť 4: Skúšobné metódy | STN EN 15947-4 66 8301 |
|------------|---|--|

Pyrotechnic articles - Fireworks, Categories F1, F2 and F3 - Part 4: Test methods

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 12/22

Obsahuje: EN 15947-4:2022

Oznámením tejto normy sa od 31.12.2023 ruší
STN EN 15947-4 (66 8301) z marca 2017

136021

EUROPEAN STANDARD

EN 15947-4

NORME EUROPÉENNE

EUROPÄISCHE NORM

October 2022

ICS 71.100.30

Supersedes EN 15947-4:2015

English Version

Pyrotechnic articles - Fireworks, Categories F1, F2 and F3 - Part 4: Test methods

Articles pyrotechniques - Artifices de divertissement,
Catégories F1, F2 et F3 - Partie 4 : Méthodes d'essai

Pyrotechnische Gegenstände - Feuerwerkskörper,
Kategorien F1, F2 und F3 - Teil 4: Prüfverfahren

This European Standard was approved by CEN on 8 August 2022.

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.

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-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and United Kingdom.



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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

EN 15947-4:2022 (E)

| Contents | Page |
|---|-------------|
| European foreword | 4 |
| 1 Scope | 6 |
| 2 Normative references | 6 |
| 3 Terms and definitions | 6 |
| 4 Test environment | 6 |
| 4.1 General..... | 6 |
| 4.2 Indoor..... | 6 |
| 4.3 Outdoor..... | 7 |
| 4.3.1 General..... | 7 |
| 4.3.2 Category F1..... | 7 |
| 4.3.3 Category F2..... | 7 |
| 4.3.4 Category F3..... | 7 |
| 4.4 Monitoring height..... | 7 |
| 5 Apparatus | 7 |
| 6 Methods of tests | 12 |
| 6.1 Construction and stability | 12 |
| 6.1.1 Length of handle..... | 12 |
| 6.1.2 Attachment of separate handle or separate base..... | 13 |
| 6.1.3 Length of item..... | 13 |
| 6.1.4 Length of pull-string or pull-strip | 14 |
| 6.1.5 Determination of diameter | 14 |
| 6.1.6 Attachment of initial fuse..... | 14 |
| 6.1.7 Resistance to ignition by an abrasive surface | 14 |
| 6.1.8 Breakability of end closures | 15 |
| 6.2 Design - Verification..... | 15 |
| 6.2.1 General..... | 15 |
| 6.2.2 Conformity to drawings and part lists..... | 15 |
| 6.2.3 Determination of net explosive content..... | 16 |
| 6.3 Paper tests..... | 17 |
| 6.3.1 Test for burning or incandescent matter | 17 |
| 6.3.2 Test for horizontally projected debris | 18 |
| 6.3.3 Test for vertically projected debris..... | 20 |
| 6.4 Angle of ascent and height of explosion..... | 21 |
| 6.4.1 Apparatus | 21 |
| 6.4.2 Procedure for double banger | 22 |
| 6.4.3 Procedure for items other than double banger | 22 |
| 6.5 Measurement of sound pressure level | 22 |
| 6.5.1 General measurement for outdoors..... | 22 |
| 6.5.2 Party popper..... | 23 |
| 6.5.3 Christmas cracker and snap for indoors | 24 |
| 6.6 Time measurement..... | 25 |
| 6.6.1 Apparatus | 25 |
| 6.6.2 Procedure | 25 |
| 6.7 Measuring of labelling..... | 25 |

| | | |
|--|--------------------------------------|----|
| 6.7.1 | Apparatus | 25 |
| 6.7.2 | Procedure | 25 |
| 6.8 | Extinguishing of flames | 26 |
| 6.8.1 | Apparatus | 26 |
| 6.8.2 | Procedure | 26 |
| 6.9 | Burning rate of composition..... | 26 |
| 6.9.1 | Apparatus | 26 |
| 6.9.2 | Procedure | 26 |
| 6.10 | Droop test..... | 26 |
| 6.10.1 | Apparatus | 26 |
| 6.10.2 | Procedure | 26 |
| 6.11 | Projected debris (outdoor) | 26 |
| 6.11.1 | Apparatus | 26 |
| 6.11.2 | Procedure | 26 |
| 6.12 | Incandescent matter..... | 27 |
| 6.13 | Visual and audible examinations..... | 27 |
| 6.14 | Mechanical conditioning..... | 27 |
| 6.14.1 | Apparatus | 27 |
| 6.14.2 | Procedure | 27 |
| 6.15 | Thermal conditioning | 28 |
| 6.15.1 | Apparatus | 28 |
| 6.15.2 | Procedure | 28 |
| 6.16 | Striking surface test..... | 28 |
| 6.16.1 | Apparatus | 28 |
| 6.16.2 | Procedure | 28 |
| 6.17 | Function test..... | 28 |
| 6.17.1 | Apparatus | 28 |
| 6.17.2 | Procedure | 28 |
| 6.18 | Determination of tube angle..... | 29 |
| 6.18.1 | Apparatus | 29 |
| 6.18.2 | Procedure | 29 |
| Annex A (informative) Mechanical conditioning (shock apparatus)..... | | 30 |
| Annex B (normative) Determination of silver fulminate | | 33 |
| B.1 | Reagents..... | 33 |
| B.2 | Apparatus | 33 |
| B.3 | Procedure | 33 |
| Annex ZA (informative) Relationship between this European Standard and the essential safety requirements of Directive 2013/29/EU aimed to be covered | | 35 |
| Bibliography | | 36 |

EN 15947-4:2022 (E)**European foreword**

This document (EN 15947-4:2022) 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 April 2023, and conflicting national standards shall be withdrawn at the latest by December 2023.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 15947-4:2015.

In comparison with the previous edition EN 15947-4:2015, the following technical modifications have been made:

- as a result of the inclusion of a new test method (6.1.8) two new apparatuses 5.28 “Dropping Tube” and 5.29 “Mass cylindrical in shape” were added;
- as a consequence of the inclusion of hand-held bengal flame (category F1) into the standard the titles for subclauses 6.1.1.2.1, 6.1.1.2.2 and 6.1.1.2.3 are changed into “6.1.1.2.1 Hand-held fireworks with uncoated ends as handles”, “6.1.1.2.2 Hand-held fireworks where the handle is an integral part of the body and not filled with pyrotechnic composition” and “6.1.1.2.3 Hand-held fireworks where the handle is a separate component and not filled with pyrotechnic composition”;
- a sentence to cover the testing of fuses fixed with adhesive tape for certain articles is added into subclause 6.1.6.2;
- a new test method under subclause 6.1.8 “Breakability of end closures” was added;
- Table 2 and Table 3 into subclause 6.3.1.2.2 are updated including all possible types;
- Figure 9 into subclause 6.5.2 has been revised, considering a new positioning of the sound meter with regards to the party popper;
- bullet point in subclause 6.14.1 has been removed and changes have been done into the whole subclause proposing an appropriate balance (5.7.3) fitting with the accuracy needed;
- “height of initial fuse for mounted wheels in category F3” has been removed.

This document has been prepared under a Standardization Request (M/583) concerning pyrotechnic articles given to CEN by the European Commission and the European Free Trade Association, and supports Essential Safety requirements of Directive 2013/29/EU.

For relationship with Directive 2013/29/EU, see informative Annex ZA, which is an integral part of this document.

This document is one of the series of standards as listed below:

- EN 15947-1, *Pyrotechnic articles — Fireworks, Categories F1, F2 and F3 — Part 1: Terminology*

- EN 15947-2, *Pyrotechnic articles — Fireworks, Categories F1, F2 and F3 — Part 2: Categories and types of firework*
- EN 15947-3, *Pyrotechnic articles — Fireworks, Categories F1, F2 and F3 — Part 3: Minimum labelling requirements*
- EN 15947-4, *Pyrotechnic articles — Fireworks, Categories F1, F2 and F3 — Part 4: Test methods*
- EN 15947-5, *Pyrotechnic articles — Fireworks, Categories F1, F2 and F3 — Part 5: Requirements for construction and performance*

Any feedback and questions on this document should be directed to the users' national standards body. A complete listing of these bodies can be found on the CEN website.

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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

EN 15947-4:2022 (E)**1 Scope**

This document specifies test methods. It is applicable to fireworks of the categories F1, F2 and F3 as defined by Article 6 Paragraph (1) clause (a) subclause (i) to (iii) of Directive 2013/29/EU.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 15947-1:2022, *Pyrotechnic articles — Fireworks, Categories F1, F2 and F3 — Part 1: Terminology*

EN 15947-3:2022, *Pyrotechnic articles — Fireworks, Categories F1, F2 and F3 — Part 3: Minimum labelling requirements*

EN 15947-5:2022, *Pyrotechnic articles — Fireworks, Categories F1, F2 and F3 — Part 5: Requirements for construction and performance*

EN 61672-1:2013, *Electroacoustics — Sound level meters — Part 1: Specifications*

EN ISO 3696:1995, *Water for analytical laboratory use — Specification and test methods (ISO 3696:1987)*

ISO 4793:1980, *Laboratory sintered (fritted) filters — Porosity grading, classification and designation*

ISO 6344-3:2013, *Coated abrasives — Grain size analysis — Part 3: Determination of grain size distribution of microgrits P240 to P2500*

ISO 21948:2001, *Coated abrasives — Plain sheets*

koniec náhľadu – text ďalej pokračuje v platenej verzii STN