



**SLOVENSKI STANDARD**  
**SIST EN 14035-22:2004**  
**01-november-2004**

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Fireworks - - Part 22: Mines - Specification and test methods

Feuerwerkskörper - Teil 22: Feuertöpfe - Anforderungen und Prüfverfahren

Artifices de divertissement - Partie 22: Pots a feu en mortier - Spécifications et méthodes d'essai

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English version

## Fireworks - - Part 22: Mines - Specification and test methods

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mortier - Spécifications et méthodes d'essai

Feuerwerkskörper - Feuertöpfe - Teil 22: Anforderungen  
und Prüfverfahren

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

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

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EUROPEAN COMMITTEE FOR STANDARDIZATION  
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## Foreword

This document (EN 14035-22:2004) 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of an identical text or by endorsement, at the latest by February 2005, and conflicting national standards shall be withdrawn at the latest by February 2005.

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 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.*

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.*

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

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## 1 Scope

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

It is not applicable to mines containing pyrotechnic composition which 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.

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

- brief description: mortar containing propellant charge and pyrotechnic units, and designed to be placed on the ground or to be fixed in the ground;
- principal effects: ejection of all the pyrotechnic units in a single burst producing a widely dispersed visual and/or aural effect in the air.

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

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## 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 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*.

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## 3 Terms and definitions

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

## 4 Construction

### 4.1 Means of ignition

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

Conformity to this requirement shall be verified by visual examination.

### 4.2 Attachment of initial fuse

For mines with protruding fuse, the attachment of the protruding fuses to the mine shall be secure when tested in accordance with 8.1.

For mines with ignition head, the attachment of the ignition head to the mine shall be secure when tested in accordance with 8.2.

### 4.3 Protection of initial fuse

#### 4.3.1 General

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

#### 4.3.2 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.

#### 4.3.3 Initial fuse protected by primary pack or selection pack

The mine 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 tube shall be made of paper, cardboard or plastics. The base shall be made of non-metallic material.

Conformity to these requirements shall be verified by visual examination.

### 4.5 Integrity

#### 4.5.1 Firework case

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. If the end closures are separate components they shall be securely in place. If the base is a separate component, it shall be securely in place.

Conformity to these requirements shall be verified by visual examination.

#### 4.5.2 Mine

When tested in accordance with A.5, the mass of loose pyrotechnic composition shall not exceed 0,1% of the pyrotechnic composition with a maximum of 500 mg.

### 4.6 Net explosive content

When determined in accordance with 8.5, a category 2 mine shall have a net explosive content of not more than 50,0 g.

When determined in accordance with 8.5, a category 3 mine shall have a net explosive content of not more than 300,0 g.

### 4.7 Mass of report charge

When determined in accordance with 8.5, a category 2 mine shall not contain more than 5 pyrotechnic units containing report composition and each of these pyrotechnic units shall not contain more than 5,0 g of black powder or 2,0 g of nitrate/metal-based report composition or 1,0 g of perchlorate/metal-based report composition.

When determined in accordance with 8.5, a category 3 mine shall not contain more than 25 pyrotechnic units containing report composition and each of these pyrotechnic units shall not contain more than 5,0 g of black powder or 2,0 g of nitrate/metal-based report composition or 1,0 g of perchlorate/metal-based report composition.

## 4.8 Vertical stability

For mines designed to be placed on the ground, the mine shall not fall over when tested in accordance with 8.3.

## 5 Performance

### 5.1 Initial fuse

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

For category 2 mines, 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 mines, 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 Invisible burning

When tested in accordance with 8.4, any period of invisible burning occurring after the preliminary effect shall not exceed 5,0 s.

### 5.3 Principal effects

When tested in accordance with 8.4, the principal effects of the mine, as given in EN 14035-2, shall be the ejection of all the pyrotechnic units in a single burst producing a widely dispersed visual and/or aural effect in the air.

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### 5.4 Functioning

When tested in accordance with 8.4, the mine shall function completely.

### 5.5 Sound pressure level (if applicable)

When tested in accordance with 8.4, a category 2 mine with aural effect shall produce a maximum A-weighted impulse sound pressure level ( $L_{AImax}$ ) 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 8.4, a category 3 mine with aural effect shall produce a maximum A-weighted impulse sound pressure level ( $L_{AImax}$ ) 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.

## 5.6 Burning matter

When tested in accordance with 8.4, no burning or incandescent matter from a category 2 mine shall fall to the ground 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 mine shall fall to the ground more than 15,0 m from the testing point.

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

## 5.7 Stability

When tested in accordance with 8.4, the mine shall remain upright whilst functioning.

## 5.8 Integrity of the firework case after functioning

When tested in accordance with 8.4, there shall be no additional holes or splits in the firework case.

## 6 Primary pack or selection pack

If a primary pack or selection pack is required to protect the initial fuse(s) of the mine(s) (see 4.3.3), the pack shall completely enclose the mine(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.

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## 7 Minimum labelling requirements

### 7.1 General

Mines 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 mines 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 mines 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 'MINE'. If a trade name is used in addition to the type name, it shall not conflict with the effect of a mine 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.