SLOVENSKI STANDARD
oSIST prEN 13630-10:2021

01-april-2021

Eksplozivi za civilno uporabo - Detonacijske in počasi goreče vžigalne vrvice - 10. del: Ugotavljanje sposobnosti detonacijskih vrvic za prenos vžiga

Explosives for civil uses - Detonating cords and safety fuses - Part 10: Determination of initiating capability of detonating cords

Explosivstoffe für zivile Zwecke - Sprengschnüre und Sicherheitsanzündschnüre - Teil 10: Bestimmung der Zündfähigkeit von Sprengschnüren

Explosifs à usage civil - Cordeaux détonants et mèches de sûreté - Partie 10: Détermination de la capacité d'allumage des cordeaux détonants

Ta slovenski standard je istoveten z: **prEN 13630-10**

ICS:

71.100.30	Eksplozivi. Pirotehnika in ognjemeti	Explosives. Pyrotechnics and fireworks

oSIST prEN 13630-10:2021 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

DRAFT
prEN 13630-10

April 2021

ICS 71.100.30

Will supersede EN 13630-10:2005

English Version

Explosives for civil uses - Detonating cords and safety fuses - Part 10: Determination of initiating capability of detonating cords

Explosifs à usage civil - Cordeaux détonants et mèches de sûreté - Partie 10: Détermination de la capacité d'allumage des cordeaux détonants

Explosivstoffe für zivile Zwecke - Sprengschnüre und Sicherheitsanzündschnüre - Teil 10: Bestimmung der Zündfähigkeit von Sprengschnüren

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 321.

If this draft becomes a European Standard, 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.

This draft European Standard was established by CEN 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, Turkey and United Kingdom.

Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Warning : This document is not a European Standard. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a European Standard.

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

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

Contents

European foreword

This document (prEN 13630-10:2021) has been prepared by Technical Committee CEN/TC 321 "Explosives for civil uses", the secretariat of which is held by UNE.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 13630-10:2005.

In comparison with the previous edition, the following technical modifications have been made:

a) the normative references have been updated;

b) in Clause 3, *Terms and definitions*, term 3.1 has been added;

c) Annex A, *Range of applicability of the test method*, has been removed;

d) Annex B, *Restriction of the test method*, has been removed and its content has been moved to 7.3;

e) Annex ZA has been updated.

This document has been prepared under a Standardization Request (M/562) annexed to the Commission Implementing Decision C(2019)6634 final as regards Explosives for civil uses given to CEN by the European Commission and the European Free Trade Association, and supports Essential Safety requirements of Directive 2014/28/EU.

For relationship with Directive 2014/28/EU, see informative Annex ZA, which is an integral part of this document.

EN 13630, *Explosives for civil uses — Detonating cords and safety fuses*, is currently composed of the following parts:

— *Part 1: Requirements*

— *Part 2: Determination of thermal stability of detonating cords and safety fuses*

— *Part 3: Determination of sensitiveness to friction of the core of detonating cords*

— *Part 4: Determination of sensitiveness to impact of detonating cords*

— *Part 5: Determination of resistance to abrasion of detonating cords*

— *Part 6: Measurement of resistance to tension of detonating cords*

— *Part 7: Determination of reliability of initiation of detonating cords*

— *Part 8: Determination of resistance to water of detonating cords and safety fuses*

— *Part 9: Determination of transmission of detonation from detonating cord to detonating cord*

— *Part 10: Determination of initiating capability of detonating cords*

— *Part 11: Determination of velocity of detonation of detonating cords*

— *Part 12: Determination of burning duration of safety fuses*

1 Scope

This document specifies a method of determining an initiation capability for detonating cords.

NOTE The limitations of this method are described in 7.3.

The test method described in this document is intended to assess the initiation capability of detonating cords only. The reliability of initiation is assessed in prEN 13630-7:2021.

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.

prEN 13763-15:2021, *Explosives for civil uses — Detonators and relays — Part 15: Determination of equivalent initiating capability*

prEN 13857-1:2021, *Explosives for civil uses — Part 1: Terminology*

EN ISO 536:2020, *Paper and board - Determination of grammage (ISO 536:2019)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in prEN 13857-1:2021 and the following apply.

3.1
initiation capability
capability of a detonating cord to cut a number of paper cards of a given grammage

Note 1 to entry: The grammage is determined in 7.2.

4 Principle

An initiation capability of a detonation cord is determined by counting the number of paper cards of a given grammage which are cut when a test sample is detonated across.

5 Apparatus

5.1 Detonator

A detonator of equivalent initiating capability, determined in accordance with prEN 13763-15:2021, as specified by the manufacturer of the detonating cord.

5.2 Paper cards

Cards cut from plain non-coated paper of a grammage (g_c) between 240 g/m^2 and 260 g/m^2 as determined according to EN ISO 536:2020. The dimensions of the paper cards shall be (100 ± 5) mm long and (50 ± 5) mm wide.

5.3 Support plate

Steel or aluminium plate (200 ± 20) mm long and (60 ± 5) mm wide. The thickness shall be at least 4,0 mm.

5.4 Tape

Sticky tape, width (20 ± 2) mm.

6 Preparation of test sample

Select five pieces of detonating cords to be tested, each with a length of at least (500 ± 50) mm.

Seal both ends of all the test samples with the means of sealing compatible with the explosive under test (e.g. adhesive tape) to avoid leakage of explosive during testing.

NOTE The number of test samples to be tested is based on the current sampling practice which is in place for decades and for which there is no evidence supporting a change for more or less samples.

7 Procedure

7.1 General

This test method is applied at ambient conditions, when it is known that within the given temperature range for use, the explosive in the detonating cord does not undergo any change of physical state.

If a change of physical state occurs within the given temperature range for use, the test shall be in addition applied at the lowest and highest use temperatures.

7.2 Testing

Select such a number of paper cards (5.2) that after the test at least five paper cards are completely uncut.

NOTE Depending on the grammage of the paper, the number of cards likely to be required is 24 to 33 for 12 g/m detonating cords and 35 to 45 for 24 g/m detonating cords.

Place the paper cards on top of the support plate (5.3). Tightly connect one end of the detonating cord with three equally spaced pieces of tape (5.4) to the paper cards and the support plate. Provide an excess end of (50 ± 10) mm of detonating cord (see Figure 1).

At the other end of the detonating cord tape the detonator (5.1) to the detonating cord over a distance of (25 ± 5) mm or in a manner specified by the manufacturer.

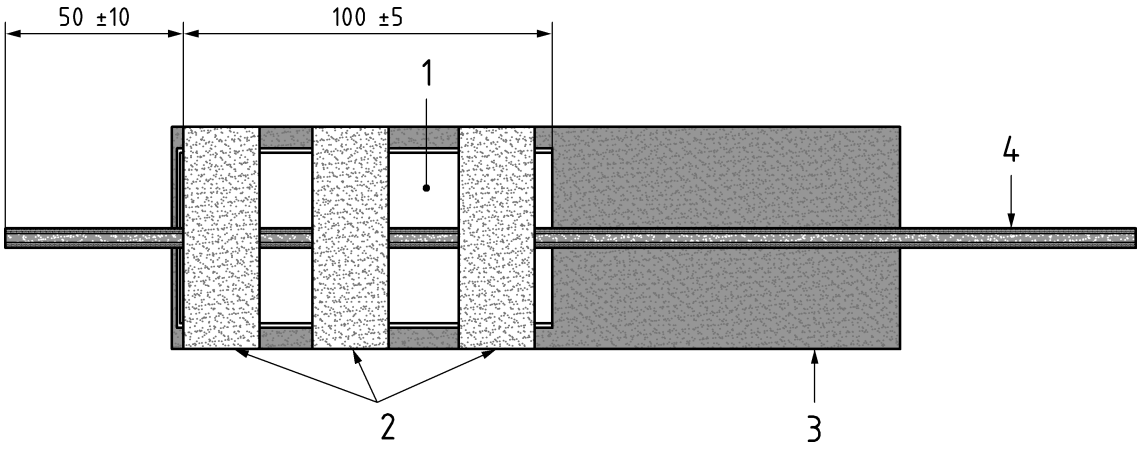
Place the assembly on a solid base of steel or concrete.

Fire the detonator.

Collect the paper cards. Count the number of paper cards that are cut completely. Add the total number of partially cut cards using the percentage (with an accuracy of 5 %) of each paper card that has been cut (i.e. if the paper card is cut for 30 mm add 0,3 to the number of cut cards). The number of cut paper cards (X) is the sum of the total and partial cut cards.

Perform the test with each test piece.

Dimensions in millimetres



Key

1	paper cards
2	tape
3	support plate
4	detonating cord

Figure 1 — Detonating cord connected to the paper cards and support plate

7.3 Calculation of results

The initiating capability (IC_n) of each detonating cord is calculated using the formula:

$$IC_n = \frac{\left(X_n \times g_c\right)}{1000}$$

where

n is the number of the test

IC_n is the initiating capability of the detonating cord in the n^{th} test

X_n is the number of paper cards cut in the n^{th} test

g_c is the grammage of the paper cards, given in g/m^2

NOTE Although the unit of IC is g/m^2, *IC* will be used without units when expressing the results.

Report the result as the arithmetic mean of the five individual values, rounded down to the nearest whole number.

When developing this test method, it was concluded that the reproducibility of the test was good, but the repeatability was not. It should be noted that difficulty may be experienced in obtaining consistent results between different laboratories, as a consequence of variations in age or quality of the paper used. To compare IC values of detonating cords obtained using two different types of paper, one will need a correction factor. Furthermore, IC values obtained for mild detonating cords manufactured with low explosive concentrations (in terms of grammage per metre) have not been evaluated thoroughly and should therefore be reviewed critically.

8 Test report

The test report should conform to EN ISO/IEC 17025:2017, 7.8.2 and 7.8.3. In addition, the following information shall be given:

a) reference to this document (i.e. EN 13630-10:202X);

b) initiating capability claimed by the manufacturer;

c) type and grammage of paper card used in the test (g_c);

d) individual results of all five tests in the form of the total number of paper cards cut (X_n) and the calculated initiating capability (IC_n);

e) mean value of the initiating capability (IC) of the detonating cord;

f) type of detonator used.