



SLOVENSKI STANDARD

SIST EN 13630-11:2002

01-december-2002

Eksplzivni za civilno uporabo – Detonacijske in počasi goreče vžigalne vrvice – 11. del: Ugotavljanje detonacijske hitrosti detonacijskih vrvic

Explosives for civil uses - Detonating cords and safety fuses - Part 11: Determination of velocity of detonation of detonating cords

Explosivstoffe für zivile Zwecke - Sprengschnüre und Sicherheitsanzündschnüre - Teil 11: Bestimmung der Detonationsgeschwindigkeit von Sprengschnüren

Explosifs a usage civil - Cordeaux détonants et meches de sureté - Partie 11: Détermination de la vitesse de détonation des cordeaux détonants

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ICS:

71.100.30 Eksplozivi. Pirotehnika Explosives. Pyrotechnics

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ICS 71.100.30

English version

**Explosives for civil uses - Detonating cords and safety fuses -
Part 11: Determination of velocity of detonation of detonating
cords**

Explosifs à usage civil - Cordeaux détonants et mèches de
sûreté - Partie 11: Détermination de la vitesse de
détonation des cordeaux détonants

Explosivstoffe für zivile Zwecke - Sprengschnüre und
Sicherheitsanzündschnüre - Teil 11: Bestimmung der
Detonationsgeschwindigkeit von Sprengschnüren

This European Standard was approved by CEN on 11 July 2002.

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 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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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

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Foreword

This document (EN 13630-11:2002) has been prepared by Technical Committee CEN/TC 321 "Explosives for civil uses", the secretariat of which is held by AENOR.

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 March 2003, and conflicting national standards shall be withdrawn at the latest by March 2003.

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 a series of standards on *Explosives for civil uses – Detonating cords and safety fuses*. The other parts of this series are:

- prEN 13630-1 *Part 1: Requirements.*
- EN 13630-2 *Part 2: Determination of thermal stability of detonating cords and safety fuses.*
- EN 13630-3 *Part 3: Determination of sensitiveness to friction of the core of detonating cords.*
- EN 13630-4 *Part 4: Determination of sensitiveness to impact of detonating cords.*
- prEN 13630-5 *Part 5: Determination of resistance to abrasion of detonating cords.*
- EN 13630-6 *Part 6: Determination of the resistance to tension of detonating cords.*
- EN 13630-7 *Part 7: Determination of reliability of initiation of detonating cords.*
- EN 13630-8 *Part 8: Determination of resistance to water of detonating cords and safety fuses.*
- prEN 13630-9 *Part 9: Determination of transmission of detonation from detonating cord to detonating cord.*
- WI 00321088 *Part 10: Determination of initiating capability of detonating cords.*
- EN 13630-12 *Part 12: Determination of burning duration of safety fuses.*

Annex A of this document is informative.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This European Standard specifies a method for determining the velocity of detonation of detonating cords.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text, and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

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

prEN 13857-1:2001, *Explosives for civil uses — Part 1: Terminology*.

EN ISO/IEC 17025, *General requirements for the competence of testing and calibration laboratories (ISO/IEC 17025:1999)*.

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3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in prEN 13857-1:2001 apply.

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4 Apparatus

4.1 Sensors

Two sensors, for detecting the detonation wave: for example, two enamel insulated twisted copper wires or an optical system.

4.2 Time-measuring equipment

Time-measuring equipment, capable of measuring time to an accuracy of $\pm 1 \mu\text{s}$.

4.3 Detonator

A detonator of equivalent initiating capability as specified by the manufacturer of the detonating cord, in accordance with prEN 13763-15, shall be used to initiate the detonating cord.

5 Test pieces

Select eight test pieces of $(1\,500 \pm 50)$ mm length.

6 Procedure

Tape the detonator to the detonating cord at a distance of (25 ± 5) mm from one end of the detonating cord (see Figure 1), or in a manner specified by the manufacturer.

Clamp the detonating cord and the detonator horizontally between two supports at a height of at least 200 mm above the ground.

Position the first sensor at a distance of (225 ± 15) mm from the end of the detonating cord to which the detonator is attached.

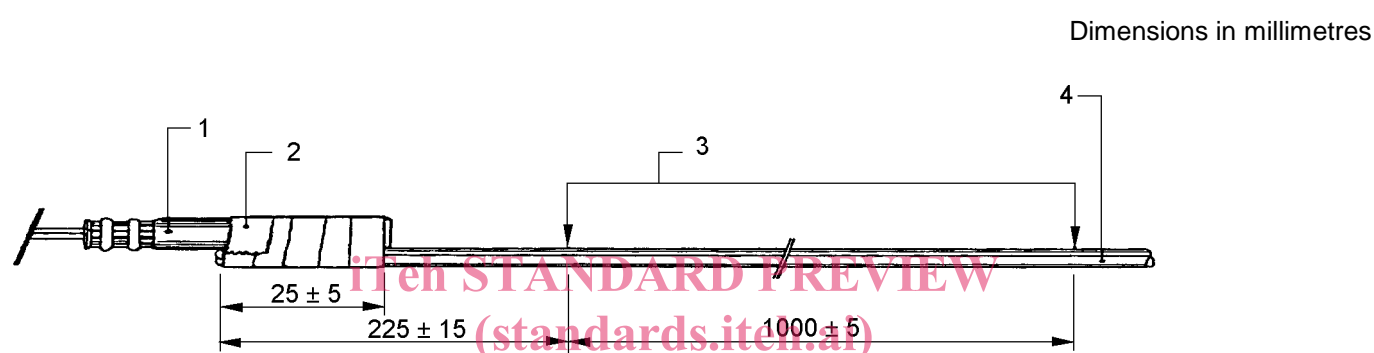
Position the second sensor at a distance of $(1\ 000 \pm 5)$ mm from the first sensor.

Connect the sensors to the time-measuring equipment.

Connect the detonator to the firing system and carry out the firing.

Record the time taken for the detonation wave to traverse the distance between the two sensors. If the detonation is stopped, record the result as "failed".

Perform the test three times. If any result differs by more than 5 % from the velocity of detonation claimed by the manufacturer, repeat the test a further five times.



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Key

- 1 Detonator
- 2 Adhesive tape
- 3 Sensors
- 4 Detonating cord

Figure 1 – Example of test arrangement

7 Calculation of results

The velocity of detonation is given by the equation:

$$v = \frac{10^6}{t}$$

where

v is the velocity of detonation, expressed in meter per second $(\text{m/s})^{-1}$

t is the recorded time, expressed in microseconds (μs) , for the detonation wave to travel between the two sensors.

8 Test report

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

- a) the velocity of detonation claimed by the manufacturer;
- b) the results of all three or eight tests in the form of each velocity of detonation (v) and deviation from the velocity of detonation claimed by the manufacturer.

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Annex A
(informative)

Range of applicability of the test method

Range of applicability of the test method: - 30 °C to + 80 °C.

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