



SLOVENSKI STANDARD

SIST EN 13763-7:2004

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Eksplozivi za civilno uporabo – Detonatorji in zakasnilniki – 7. del: Ugotavljanje mehanske trdnosti vodnikov, detonacijskih cevk, konektorjev, stisnjenih spojev in stisnitev

Explosives for civil uses - Detonators and relays - Part 7: Determination of the mechanical strength of leading wires, shock tubes, connections, crimps and closures

Explosivstoffe für zivile Zwecke - Zünder und Verzögerungselemente - Teil 7: Bestimmung der mechanischen Festigkeit von Zünderdrähten, Zündschläuchen, Verbindungen, Anwürgung und Verschluss

Explosifs a usage civil - Détonateurs et relais - Partie 7: Détermination de la force mécanique des fils d'amorçage, tubes a transmission d'onde de choc, liaisons, sertissages et fermetures

Ta slovenski standard je istoveten z: EN 13763-7:2003

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ICS 71.100.30

English version

Explosives for civil uses - Detonators and relays - Part 7:
Determination of the mechanical strength of leading wires,
shock tubes, connections, crimps and closures

Explosifs à usage civil - Détonateurs et relais - Partie 7:
Détermination de la force mécanique des fils d'amorçage,
tubes à transmission d'onde de choc, liaisons, sertissages et
fermetures

Explosivstoffe für zivile Zwecke - Zünder und
Verzögerungselemente - Teil 7: Bestimmung der
mechanischen Festigkeit von Zünderdrähten,
Zündschläuchen, Verbindungen, Anwürgung und
Verschluss

This European Standard was approved by CEN on 1 September 2003.

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, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and United Kingdom.



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Foreword

This document (EN 13763-7:2003) 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 May 2004, and conflicting national standards shall be withdrawn at the latest by May 2004.

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 the relationship with EU Directive(s), see informative annex ZA, which is an integral part of this standard.

This European Standard is one of a series of standards with the generic title *Explosives for civil uses – Detonators and relays*. The other parts of this series are listed below:

prEN 13763-1	Part 1: Requirements
EN 13763-2	Part 2: Determination of thermal stability
EN 13763-3	Part 3: Determination of sensitiveness to impact
EN 13763-4	Part 4: Determination of resistance to abrasion of leading wires and shock tubes
EN 13763-5	Part 5: Determination of resistance to cutting damage of leading wires and shock tubes
EN 13763-6	Part 6: Determination of resistance to cracking at low temperatures of leading wires
EN 13763-8	Part 8: Determination of resistance to vibration of plain detonators
EN 13763-9	Part 9: Determination of resistance to bending of detonators
EN 13763-11	Part 11: Determination of resistance to damage by dropping of detonators and relays
EN 13763-12	Part 12: Determination of resistance to hydrostatic pressure
prEN 13763-13	Part 13: Determination of resistance of electric detonators against electrostatic discharge
prEN 13763-15	Part 15: Determination of equivalent initiating capability
prEN 13763-16	Part 16: Determination of delay accuracy
prEN 13763-17	Part 17: Determination of no-fire current of electric detonators
prEN 13763-18	Part 18: Determination of series firing current of electric detonators
prEN 13763-19	Part 19: Determination of firing impulse of electric detonators
EN 13763-20	Part 20: Determination of total electrical resistance of electric detonators
prEN 13763-21	Part 21: Determination of flash-over voltage of electric detonators
prEN 13763-22	Part 22: Determination of capacitance, insulation resistance and insulation breakdown of leading wires

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EN 13763-23 Part 23: Determination of the shockwave velocity of shock tubes

EN 13763-24 Part 24: Determination of the electrical non-conductivity of shock tubes

prEN 13763-25 Part 25: Determination of transfer capability of surface connectors and coupling accessories

prEN 13763-26 Part 26: Definitions, methods and requirements for devices and accessories for reliable and safe function of detonators and relays

CEN/TS 13763-27 Part 27: Definitions, methods and requirements for electronic initiation systems

Annex A 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, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and the United Kingdom.

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Introduction

During normal use on site, the crimps/closures of detonators and their leading wires or shock tubes can be subjected to pulling forces. Such forces can cause a pullout of internal components of the detonator. For example:

- the shock tube can be pulled out of the detonator through the sealing plug;
- the leading wires, fusehead and sealing plug can be pulled out of the shell as one unit;
- the leading wires with fusehead connected to them can pull out through the sealing plug;
- the leading wires can break, or the joint between fusehead and wires break inside the sealing plug, so that the wires pull out leaving the fusehead loose inside the shell.

A pullout would either cause the detonator to explode, or would render it incapable of functioning.

1 Scope

This European Standard specifies a method for determining the ability of detonator leading wires/shock tubes, and their connections into the crimp/closure or sealing arrangement, to withstand a pullout when subjected to a pulling force.

2 Normative references

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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).

EN 13857-1:2003; *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).*

3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN 13857-1:2003 apply.

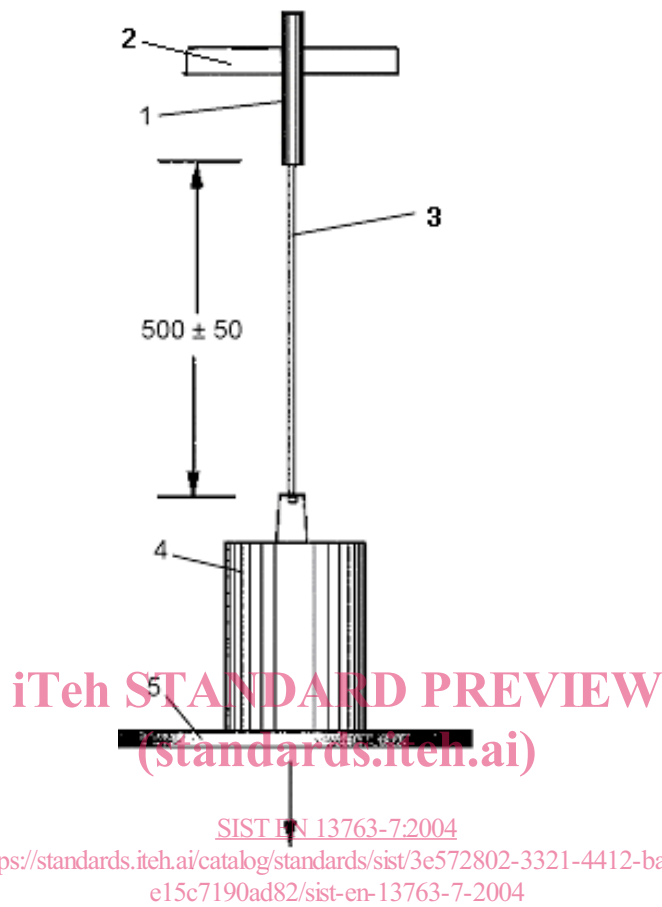
4 Apparatus

The apparatus comprises the following components as shown in Figure 1:

4.1 Fixing point for the detonator.

4.2 Weight(s) to be attached to the leading wires or shock tubes, suitable for applying forces of 40 or 100 N.

4.3 Moveable support table.



Key

- 1 Detonator
- 2 Fixing point for detonator
- 3 Leading wires or shock tube
- 4 Weight(s)
- 5 Movable support table

Figure 1 – Test apparatus

5 Test pieces

5.1 Electric detonators

Select 40 assemblies of each specific type, whose dimensions, shell material, leading wires, construction and crimp/closure are of the same design, but primary charge/base charge, delay compositions and fuseheads may vary.

5.2 Non electric detonators

Select 20 assemblies of each specific type, whose dimensions, shell material, shock tube, construction and crimp/closure are of the same design, but primary charge/base charge and delay composition may vary.

6 Procedure

6.1 General

The tests shall be carried out at the highest operating temperature claimed by the manufacturer.

6.2 Sudden release test

6.2.1 Electric detonators

Test 20 assemblies. Attach the detonator shell to the fixing point and attach the leading wires to weights of total mass corresponding to a force of $(40 \pm 0,1)$ N. Let the weights rest on the supporting table, in such a manner that a slight tension, of about 5 N, is applied and so that the distance between the detonator and the attachment to the weights is (500 ± 50) mm.

Ensure that the leading wires are attached to the weights in such a manner that the force will be evenly distributed between them. Release the weights so that the full load is applied instantly and maintain the load for (120 ± 5) s.

Record whether or not the detonator fires during the test. Record whether or not the leading wires break and/or whether a pullout has occurred.

6.2.2 Non electric detonators

Test 20 assemblies. Attach the detonator shell to the fixing point and attach the shock tube to weights of total mass corresponding to a force of $(40 \pm 0,1)$ N. Let the weights rest on the supporting table, in such a manner that a slight tension, of about 5 N, is applied and so that the distance between the detonator and the attachment to the weights is (500 ± 50) mm. Release the weights so that the full load is applied instantly and maintain the load for (120 ± 5) s.

Record whether or not the detonator fires during the test. Record whether or not the shock tube breaks and/or whether a pullout has occurred.

6.3 Slow release test (electric detonators only)

Test 20 assemblies. Attach the detonator shell to the fixing point and attach the leading wires to weights of total mass corresponding to a force of (100 ± 1) N. Let the weights rest on the supporting table, in such a manner that a slight tension of about 5 N is applied, and so that the distance between the detonator and the attachment to the weights is (500 ± 50) mm. Ensure that the leading wires are attached to the weights in such a manner that the force will be evenly distributed between them. Release the weights slowly until the full load is applied and maintain that load for 10 s. Record whether or not the detonator fires during the test. Record whether or not the leading wires break or whether a pullout has occurred.

6.4 Functioning test after sudden release test

After tests carried out as specified in 6.2.1 and 6.2.2, fire each remaining detonator of which the leading wires or shock tube are intact and no pullout has occurred, in accordance with the manufacturer's instructions. Record whether the detonators fire or not.