

**Tsiviilkäibes olevad lõhkeained.
Detonaatorid ja releed. Osa 4: Juhtmete
ja šokitorude hõõrdekindluse
määramine**

Explosives for civil uses - Detonators and relays -
Part 4: Determination of resistance to abrasion of
leading wires and shock tubes

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN 13763-4:2004 sisaldab Euroopa standardi EN 13763-4:2003 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 28.01.2004 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN 13763-4:2004 consists of the English text of the European standard EN 13763-4:2003.</p> <p>This document is endorsed on 28.01.2004 with the notification being published in the official publication of the Estonian national standardisation organisation.</p> <p>The standard is available from Estonian standardisation organisation.</p>
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<p>Käsitlusala:</p> <p>This standard specifies a method for determining the resistance to abrasion of plastics used as insulating material of leading wires of electric detonators, or used as base material for the tubing of shock tube non-electric detonators.</p>	<p>Scope:</p> <p>This standard specifies a method for determining the resistance to abrasion of plastics used as insulating material of leading wires of electric detonators, or used as base material for the tubing of shock tube non-electric detonators.</p>
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ICS 71.100.30

Võtmesõnad: abrasion resistance, blasting, blasting charges, definitions, determination, detonator, detonators, electric fuse, electrical engineering, explosion proofness, explosives, explosives storage, igniters, retardants, sensitivity, testing

ICS 71.100.30

English version

**Explosives for civil uses - Detonators and relays - Part 4:
Determination of resistance to abrasion of leading wires and
shock tubes**

Explosifs à usage civil - Détonateurs et relais - Partie 4:
Détermination de la résistance à l'abrasion des fils
d'amorce et des tubes à transmission d'ondes de choc

Explosivstoffe für zivile Zwecke - Zünder und
Verzögerungselemente - Teil 4: Bestimmung der
Widerstandsfähigkeit von Zünderdrähten und
Zündschläuchen gegenüber Abrieb

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

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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.

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Foreword

This document (EN 13763-4:2003) 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 document.

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: <i>Requirements</i> .
EN 13763-2	Part 2: <i>Determination of thermal stability</i> .
EN 13763-3	Part 3: <i>Determination of sensitiveness to impact</i> .
EN 13763-5	Part 5: <i>Determination of resistance to cutting damage of leading wires and shock tubes</i> .
EN 13763-6	Part 6: <i>Determination of resistance to cracking at low temperatures of leading wires</i> .
EN 13763-7	Part 7: <i>Determination of the mechanical strength of leading wires, shock tubes, connections, crimps and closures</i> .
EN 13763-8	Part 8: <i>Determination of resistance to vibration of plain detonators</i> .
EN 13763-9	Part 9: <i>Determination of resistance to bending of detonators</i> .
EN 13763-11	Part 11: <i>Determination of resistance to damage by dropping of detonators and relays</i> .
EN 13763-12	Part 12: <i>Determination of resistance to hydrostatic pressure</i> .
prEN 13763-13	Part 13: <i>Determination of resistance of electric detonators against electrostatic discharge</i> .
prEN 13763-15	Part 15: <i>Determination of equivalent initiating capability</i> .
prEN 13763-16	Part 16: <i>Determination of delay accuracy</i> .
prEN 13763-17	Part 17: <i>Determination of no-fire current of electric detonators</i> .
prEN 13763-18	Part 18: <i>Determination of series firing current of electric detonators</i> .
prEN 13763-19	Part 19: <i>Determination of firing impulse of electric detonators</i> .
EN 13763-20	Part 20: <i>Determination of total electrical resistance of electric detonators</i> .
prEN 13763-21	Part 21: <i>Determination of flash-over voltage of electric detonators</i> .

- prEN 13763-22 Part 22: *Determination of capacitance, insulation resistance and insulation breakdown of leading wires.*
- EN 13763-23 Part 23: *Determination of the shock-wave velocity of shock tube.*
- 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 system.*

The annexes A and C are informative, annex B is normative.

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.

Introduction

During usage on site, the insulation on the leading wires of electric detonators and the plastics tubing of shock tube non-electric detonators can be subjected to many forces, including abrasive forces when drawn over rough surfaces and/or cutting forces when drawn over a sharp edge. In the former, the plastics material is worn away gradually by abrasion. In the latter, the sharp edge cuts directly into the material. This standard deals with the former case by determining the ability of leading wire insulation/shock tube to resist the abrasive forces likely to be experienced in normal use.

1 Scope

This European Standard specifies a method for determining the resistance to abrasion of plastics used as insulating material for leading wires of electric detonators, or used as base material for the tubing of shock tube non-electric detonators.

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).

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 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 Principle

The test piece is subjected to abrasion by an abrasive surface, moving at a specified speed, while a specified load is applied. For leading wires the time taken for the insulation to be penetrated is determined. For shock tubes the functioning of the shock tube after immersion in water is tested.

5 Apparatus

5.1 Abrasion test apparatus, as shown in Figure 1, comprising the following main components.