

TSIVIILKÄIBES OLEVAD LÕHKEAINED. DETONAATORID
JA DETONEERNÖÖRIDE RELEED. OSA 22: JUHTMETE
MAHTUVUSE, ISOLATSIOONITAKISTUSE JA
ELEKTRILISE LÄBILÖÖGIKINDLUSE MÄÄRAMINE

Explosives for civil uses - Detonators and detonating
cord relays - Part 22: Verification of capacitance,
insulation resistance and insulation breakdown of
leading wires

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 13763-22:2025 sisaldab Euroopa standardi EN 13763-22:2025 ingliskeelset teksti. Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas. Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 01.10.2025. Standard on kättesaadav Eesti Standardimis-ja Akrediteerimiskeskusest.	This Estonian standard EVS-EN 13763-22:2025 consists of the English text of the European standard EN 13763-22:2025. This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation and Accreditation. Date of Availability of the European standard is 01.10.2025. The standard is available from the Estonian Centre for Standardisation and Accreditation.
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English Version

**Explosives for civil uses - Detonators and detonating cord
relays - Part 22: Verification of capacitance, insulation
resistance and insulation breakdown of leading wires**

Explosifs à usage civil - Détonateurs et relais pour
cordeau détonant - Partie 22 : Vérification de la
capacité, de la résistance d'isolement et de la rupture
d'isolement des fils d'amorce

Explosivstoffe für zivile Zwecke - Zünder und
Sprengschnurverbinder - Teil 22: Überprüfung der
Kapazität, des Isolationswiderstandes und der
Durchschlagsspannung der Zünderdrahtisolierung

This European Standard was approved by CEN on 29 September 2025.

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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 CEN-CENELEC Management Centre has the same status as the official versions.

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COMITÉ EUROPÉEN DE NORMALISATION
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European foreword

This document (EN 13763-22:2025) has been prepared by Technical Committee CEN/TC 321 “Explosives for civil uses”, the secretariat of which is held by UNE.

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 April 2026, and conflicting national standards shall be withdrawn at the latest by April 2026.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 13763-22:2003.

EN 13763-22:2025 includes the following significant technical changes with respect to EN 13763-22:2003:

- a) the document title has been changed from “Detonators and relays — Part 22: Determination of capacitance, insulation resistance and insulation breakdown of leading wires” to “Detonators and detonating cord relays — Part 22: Verification of capacitance, insulation resistance and insulation breakdown of leading wires”;
- b) the Introduction has been removed;
- c) the Scope has been revised to clarify the covered and not covered explosives;
- d) the normative references have been updated;
- e) the Clause 4 “Principle” has been added;
- f) the Clause “Apparatus” has been updated and completed;
- g) the Clause “Test pieces” is now called “Preparation of test sample” and has been revised to include the specifications of the test sample preparation from the former Subclause 7.1;
- h) the Clause “Procedure” has been revised and the new Subclauses 8.1 and 8.2 have been added;
- i) the former Clause 8 has been integrated into the new Subclause 8.3;
- j) the Clause 9 “Expression of results” has been added;
- k) the Clause “Test report” does no longer require conformity with EN ISO/IEC 17025 and the information to be provided has been revised and extended;
- l) the former Annex A “Range of applicability of the test method” has been removed;
- m) the Annex ZA has been updated;
- n) the Bibliography has been added and lists EN ISO/IEC 17025:2017.

This document has been prepared under a standardization request addressed to CEN by the European Commission. The Standing Committee of the EFTA States subsequently approves these requests for its Member States.

For the relationship with EU Legislation, see informative Annex ZA, which is an integral part of this document.

A list of all parts in the EN 13763 series, published under the general title *Explosives for civil uses — Detonators and detonating cord relays*, can be found on the CEN website.

Any feedback and questions on this document should be directed to the users' national standards body. A complete listing of these bodies can be found on the CEN website.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: 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, Türkiye and the United Kingdom.

1 Scope

This document specifies a test method for the verification of the capacitance, insulation resistance and insulation breakdown of leading wires of electric detonators and electronic detonators.

This document does not apply to non-electric detonators, surface connectors, detonating cord relays, shock tubes and electronic initiation systems.

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.

EN 13763-1:2025, *Explosives for civil uses — Detonators and detonating cord relays — Part 1: Requirements*

EN 13857-1:2025, *Explosives for civil uses — Part 1: Vocabulary*

EN ISO 3696:1995, *Water for analytical laboratory use — Specification and test methods (ISO 3696:1987)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 13857-1:2025 apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

4 Principle

During blasting, electric detonators are usually connected in series and, in contrast to electronic detonators, often require high voltages to ensure correct initiation. In order to withstand these high voltages without causing misfire or premature initiation of the electric detonators, several conditions have to be met. The capacitance of the leading wires has to be limited so that charging to a dangerous level is prevented. At the same time, the capacitance shall not be too high, in order to ensure that the firing impulse reaches the electric detonators. A minimum insulation resistance of the leading wires is necessary and there shall not be a leading wire insulation breakdown when subjected to high voltage.

For the verification of the capacitance, the insulation resistance and the insulation breakdown of leading wires, a test piece together with a copper electrode are submerged into a conductive solution. The correlating values are measured and compared with pre-specified values.

5 Reagents

5.1 Conductive solution, consisting of water, conforming to grade 3 of EN ISO 3696:1995, and 3 % sodium chloride with a purity > 99 %.

6 Apparatus

6.1 Beaker, made of a non-conductive material and with a nominal volume of ≥ 5 l.