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TSIVIILKÄIBES OLEVAD LÕHKEAINED. DETONAATORID JA DETONEERNÖÖRIDE RELEED. OSA 23: IMPULSI SIIRDETORU DETONATSIOONIIMPULSI KIIRUSE MÄÄRAMINE

Explosives for civil uses - Detonators and detonating cord relays - Part 23: Verification of the shock wave velocity of shock tubes

EESTI STANDARDIMIS- JA AKREDITEERIMISKESKUS
ESTONIAN CENTRE FOR STANDARDISATION AND ACCREDITATION

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 13763-23:2025 sisaldab Euroopa standardi EN 13763-23:2025 ingliskeelset teksti.	This Estonian standard EVS-EN 13763-23:2025 consists of the English text of the European standard EN 13763-23:2025.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation and Accreditation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 01.10.2025.	Date of Availability of the European standard is 01.10.2025.
Standard on kättesaadav Eesti Standardimis-ja Akrediteerimiskeskusest.	The standard is available from the Estonian Centre for Standardisation and Accreditation.

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ICS 71.100.30

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 13763-23

October 2025

ICS 71.100.30

Supersedes EN 13763-23:2002

English Version

Explosives for civil uses - Detonators and detonating cord relays - Part 23: Verification of the shock wave velocity of shock tubes

Explosifs à usage civil - Détonateurs et relais pour cordeau détonant - Partie 23 : Vérification de la vitesse d'onde de choc des tubes à transmission d'ondes de choc

Explosivstoffe für zivile Zwecke - Zünder und Sprengschnurverzögerer - Teil 23: Überprüfung der Stoßwellengeschwindigkeit in Zündschläuchen

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

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Ref. No. EN 13763-23:2025 E

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Contents

Page

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European foreword

This document (EN 13763-23:2025) 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 13763-23:2002.

EN 13763-23:2025 includes the following significant technical changes with respect to EN 13763-23:2002:

a) the document title has been changed from “Detonators and relays — Part 23: Determination of the shock-wave velocity of shock tube” to “Detonators and detonating cord relays — Part 23: Verification of the shock wave velocity of shock tubes”;

b) the Scope has been revised to clarify the covered and not covered explosives;

c) the normative references have been updated;

d) the Clause 4 “Principle” has been added;

e) the Clause “Apparatus” has been revised and completed;

f) the Clause “Test pieces” is now called “Preparation of test sample” and the conditioning step has been moved there from the Clause “Procedure”;

g) the Clause “Procedure” has been revised for clarification purposes and Figure 1 has been editorially revised;

h) the Clause 8 “Expression of results” has been added;

i) 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;

j) the former Annex A “Range of applicability of the test method” has been removed;

k) the Annex ZA has been updated;

l) 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.

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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.

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1 Scope

This document specifies a method for the verification of the shock wave velocity of shock tubes.

This document is applicable to shock tubes of non-electric detonators, surface connectors and electronic detonators, and on shock tube as bulk product.

This document does not apply to electric detonators, plain detonators, semi-finished detonators, detonating cord relays 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*

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

The shock wave velocity of a shock tube is an important performance characteristic. A shock wave velocity lower than specified for a given shock tube can result in a failure to reliably initiate a non-electric or an electronic detonator. A shock wave velocity significantly different from the specified value can also influence the planned delays of a blast.

For the verification of the shock wave velocity of a shock tube, a test piece is initiated, and the time is measured for the shock wave to pass a defined shock tube length. The measured value is then compared to the value specified for the tested shock tube.

5 Apparatus

5.1 Means of initiation, as specified in accordance with EN 13763-1:2025, 4.9.1.4.

5.2 Shock wave velocity measuring equipment, equipped with two identical photodiodes each of which is connected to an optical fibre. The shock wave velocity measuring equipment shall be capable of measuring the time taken for the shock wave to travel between the two measuring points, A and B, to a maximum permissible uncertainty of ±1 µs. The start and the stop of the time measurement shall be triggered by the rising edge using the same trigger level.

5.3 Conditioning chamber, capable of maintaining a temperature of (20 ± 2) °C.

5.4 Adhesive tape, made from plastic, paper or natural fibre.

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