

SLOVENSKI STANDARD oSIST prEN 13631-6:2021

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Eksplozivi za civilno uporabo – Razstreliva – 6. del: Ugotavljanje odpornosti proti hidrostatičnemu tlaku

Explosives for civil uses - High explosives - Part 6: Determination of resistance to hydrostatic pressure

Explosivstoffe für industrielle Zwecke - Sprengstoffe - Teil 6: Bestimmung der Widerstandsfähigkeit gegen hydrostatischen Druck PREVIEW

Explosifs à usage civil - Explosifs brisants - Partie 6. Détermination de la résistance à la pression hydrostatique

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Ta slovenski standard je istoveten z:0ee/osisprEN136312621

ICS:

71.100.30 Eksplozivi. Pirotehnika in ognjemeti

Explosives. Pyrotechnics and fireworks

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EUROPEAN STANDARD NORME EUROPÉENNE EUROPÄISCHE NORM

DRAFT prEN 13631-6

ICS 71.100.30

April 2021

Will supersede EN 13631-6:2002

English Version

Explosives for civil uses - Explosives - Part 6: Determination of the resistance to hydrostatic pressure of explosives

Explosifs à usage civil - Explosifs - Partie 6: Détermination de la résistance à la pression hydrostatique Explosivstoffe für zivile Zwecke - Explosivstoffe - Teil 6: Bestimmung der Widerstandsfähigkeit gegen hydrostatischen Druck von Explosivstoffen

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 321.

If this draft becomes a European Standard, 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.

This draft European Standard was established by CEN 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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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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

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prEN 13631-6:2021 (E)

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European foreword

This document (prEN 13631-6:2021) has been prepared by Technical Committee CEN/TC 321 "Explosives for civil uses", the secretariat of which is held by UNE.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 13631-6:2002.

In comparison with the previous edition, the following technical modifications have been made:

- a) the main element of the document's title has been changed from "High explosives" to "Explosives";
- b) the normative references have been updated;
- c) Clause 4, *Principle*, has been added;
- d) the description of the preparatory steps and for performing the test have been clearly separated;
- e) Annex A, *Range of applicability of the test method*, has been removed;
- f) Annex ZA has been updated.

This document has been prepared under a Standardization Request (M/562) annexed to the Commission Implementing Decision C(2019)6634 final as regards Explosives for civil uses given to CEN by the European Commission and the European Free Trade Association, and supports Essential Safety requirements of Directive 2014/28/EU.

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For relationship with Directive 2014/28/EU, see informative Annex ZA, which is an integral part of this b412644710ee/osist-pren-13631-6-2021

EN 13631, *Explosives for civil uses — Explosives*, is currently composed with the following parts:

- Part 1: Requirements
- Part 2: Determination of thermal stability of explosives
- Part 3: Determination of sensitiveness to friction of explosives
- Part 4: Determination of sensitiveness to impact of explosives
- Part 5: Determination of the resistance to water of explosives
- Part 6: Determination of the resistance to hydrostatic pressure of explosives
- Part 7: Determination of safety and reliability at extreme temperatures
- Part 10: Method for the verification of the means of initiation of explosives
- Part 11: Determination of the transmission of detonation of explosives
- Part 13: Determination of density

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- Part 14: Determination of the velocity of detonation of explosives

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1 Scope

This document specifies a test method for determining the ability of boosters and explosives to detonate while under hydrostatic pressure. This test method does not apply to black powder.

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.

prEN 13630-7:2021, *Explosives for civil uses* — *Detonating cords and safety fuses* — *Part 7: Determination of reliability of initiation of detonating cords*

prEN 13631-14:2021, Explosives for civil uses — Explosives — Part 14: Determination of the velocity of detonation of explosives

prEN 13857-1:2021, Explosives for civil uses — Part 1: Terminology

3 Terms and definitions

For the purposes of this document, the terms and definitions given in prEN 13857-1:2021 apply.

4 Principle iTeh STANDARD PREVIEW

Hydrostatic pressure may adversely affect the safety and reliability of explosives in that the explosive may not be initiated or not completely detonate. The test applies the hydrostatic pressure to that level as foreseen by the manufacturer and requires firing of the explosive while the pressure is still applied.

NOTE This method is applicable to boosters and explosives in cartridges and as bulk products intended for use under conditions where hydrostatic pressure may adversely affect their safety and reliability. The method is limited to explosives that are able to detonate without confinement at normal atmospheric pressure.

5 Apparatus

5.1 Firing tube (see Figure 1), made of a material which is able to withstand the maximum hydrostatic pressure applied during the test. The length and the diameter of this tube shall be such that the cartridge and the witness system can be loaded easily. A system for bleeding air shall be provided in the tube or in one of the seals.

5.2 Watertight seal, provided at each end of the firing tube and incorporating watertight openings for the water inlet pipe and the firing line (electrical leads, or shock tube) of the initiating system. When assembled the firing tube and the seals shall be able to withstand the maximum hydrostatic pressure applied during the test.

5.3 Pressure system, to produce the required hydrostatic pressure in the firing tube. An example of such a system is shown in Figure 2.

5.4 Means of initiation, as specified by the explosives' manufacturer.

5.5 Witness system, to confirm the detonation of the cartridge, e.g. equipment for measuring velocity of detonation as specified in prEN 13631-14:2021, or detonating cord or witness plate as specified in prEN 13630-7:2021, 5.3.

5.6 Means of measuring of temperature, with an accuracy of 1 °C.

5.7 Plastic liner (for bulk explosives only), made of a thin plastic film. The liner shall have the smallest diameter intended for use of the explosive as stated by the manufacturer.



Key

- 1 seal
- 2 firing tube
- 3 electrical leads
- 4 seal
- 5 witness
- 6 water inlet pipe

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Key

1 relief valve

2 compressed air **iTeh STANDARD PREVIEW**

- detonator with shock/electrical tube standards.iteh.ai) 3
- 4 firing tube
- explosive Cartridge 5

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- 6 seal
- 7 water under pressure
- 8 water inlet
- 9 manometer
- 10 valve A

Figure 2 — Example for a pressure system

6 Test pieces

6.1 General

This test method is applied at ambient laboratory conditions, when it is known that within the given temperature range for use the explosive (or parts of it) does not undergo any change of physical state. If a change of physical state occurs within the given temperature range for use, the test shall be in addition applied at the lowest and highest use temperatures.

6.2 Preparation for testing

The preparation for testing according to 7.1, 7.2 or 7.3 shall be done as follows:

- for cartridged explosives, prepare three cartridges of the minimum diameter placed on the market for use under hydrostatic pressure.
- for bulk explosives, prepare three test pieces of a representative sample of the explosive, which shall be loaded into a plastic liner. The length of the test pieces shall be at least five times its diameter.

6.3 Preparation for testing in a field test

The field test is defined in 7.4.

For cartridged explosives, prepare a sufficient number of cartridges of the minimum diameter placed on the market for use under hydrostatic pressure to load at least three boreholes with a diameter corresponding to the diameter of the explosive.

For bulk explosives, prepare an amount of a representative sample of the explosive which is necessary to load at least three boreholes.

7 Procedure

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7.1 Testing with a firing tube

Attach the test piece to the witness system and insert the assembly, together with the initiator, into the firing tube. Close the firing tube at both ends, with the water inlet pipe and the electrical leads in place. Fill the firing tube completely with water. Measure the temperature of the water using the means according 5.6. Apply at least the maximum pressure specified by the manufacturer of the explosive, but no more than 5 % above this value. Maintain this pressure for 2 h. After that time disconnect or isolate the pressure system (e.g. by closing valve A in Figure 2) while maintaining the hydrostatic pressure in the firing tube.

Connect the electrical leads and initiate the explosive.

The test is performed three times unless a failure occurs, in which case the test is discontinued.

7.2 Alternative test method

If the firing tube method described in 6.1 to 6.3 is not suitable, alternative test methods can be used. Apparatus in 5.1 to 5.3 are replaced by the alternative test set-up. Apparatus in 5.4 to 5.7 shall be used correspondingly. Use a correspondent procedure as described in 7.1.

The test is performed three times unless a failure occurs, in which case the test is discontinued.