



# SLOVENSKI STANDARD

## SIST EN 13631-6:2002

01-december-2002

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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

Explosifs a usage civil - Explosifs brisants - Partie 6: Détermination de la résistance a la pression hydrostatique

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**Ta slovenski standard je istoveten z: EN 13631-6:2002**

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#### **ICS:**

71.100.30      Eksplozivi. Pirotehnika      Explosives. Pyrotechnics

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**en**

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ICS 71.100.30

English version

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

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

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

This European Standard was approved by CEN on 1 August 2002.

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

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## Foreword

This document (EN 13631-6:2002) has been prepared by the 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 March 2003, and conflicting national standards shall be withdrawn at the latest by March 2003.

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of the EU Directive(s).

For 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 on *Explosives for civil uses– High explosives*. The other parts of this series are:

- prEN 13631-1 *Part 1: Requirements.*
- EN 13631-2 *Part 2: Determination of thermal stability of explosives.*
- prEN 13631-3 *Part 3: Determination of sensitiveness to friction of explosives.*
- EN 13631-4 *Part 4: Determination of sensitiveness to impact of explosives.*
- EN 13631-5 *Part 5: Determination of resistance to water.*
- prEN 13631-7 *Part 7: Determination of safety and reliability at extreme temperatures.*
- prEN 13631-10 *Part 10: Method for the verification of the means of initiation.*
- prEN 13631-11 *Part 11: Method for the determination of transmission of detonation.*
- prEN 13631-12 *Part 12: Determination of the initiating capability of boosters.*
- prEN 13631-13 *Part 13: Method for the determination of density.*
- prEN 13631-14 *Part 14: Method for the determination of velocity of detonation.*
- prEN 13631-15 *Part 15: Calculation of thermodynamic properties.*
- prEN 13631-16 *Part 16: Detection and measurement of toxic gases.*

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

## 1 Scope

This European Standard specifies a method for determining the ability of high explosives for civil uses to detonate while under applied hydrostatic pressure.

This method is applicable to high 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.

## 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).

prEN 13631-10; *Explosives for civil uses - High explosives - Part 10: Method for the verification of the means of initiation.*

prEN 13857-1:2001; *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).*

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## 3 Terms and definitions

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For the purposes of this European Standard, the terms and definitions given in prEN 13857-1:2001 apply.

## 4 Apparatus

**4.1 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.

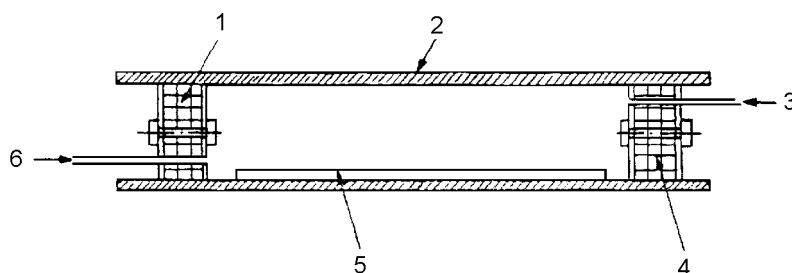
**4.2 Watertight seal**, provided at each end of the firing tube and incorporating watertight openings for the water inlet pipe and the electrical leads of the initiating system. When assembled the firing tube and the seals shall be able to withstand the maximum hydrostatic pressure applied during the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

**4.3 Witness system**, to confirm the detonation of the cartridge.

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

**4.5 Means of initiation**, as specified by the explosive manufacturer in accordance with prEN 13631-10. The means of initiation should be able to operate at the hydrostatic pressure to be applied.

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

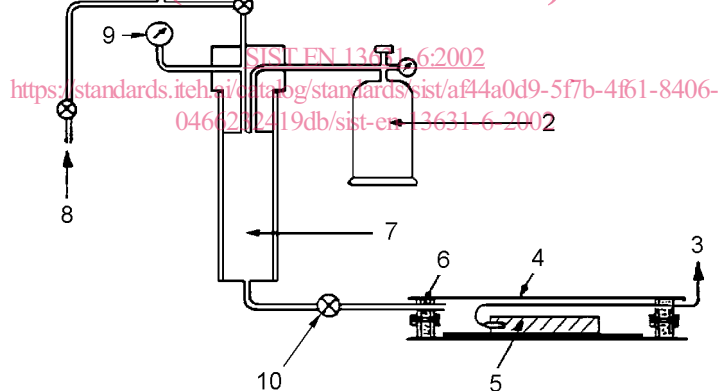


**Key**

- 1 Seal
- 2 Firing tube
- 3 Electrical leads
- 4 Seal
- 5 Witness
- 6 Water inlet pipe

Figure 1 - Firing tube

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**Key**

- 1 Relief valve
- 2 Compressed air
- 3 Electrical leads
- 4 Firing tube
- 5 Explosive Cartridge
- 6 Seal
- 7 Water under pressure
- 8 Water inlet
- 9 Manometer
- 10 Valve A

Figure 2 – Example for a pressure system

## 5 Test pieces

For cartridge explosives, test three cartridges of the minimum diameter placed on the market for use under hydrostatic pressure.

For bulk explosives, prepare and test three cartridges of diameter equal to the minimum borehole diameter specified by the manufacturer for the product. The length shall be at least five times this diameter.

## 6 Procedure

Attach the cartridge 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. Apply at least the maximum pressure specified by the manufacturer of the high 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 fire the initiator. If the cartridge fails to detonate record the result of the test as "Failure".

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

## 7 Test report

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The test report shall conform to EN ISO/IEC 17025. In addition the following information shall be given:

- a) a reference to this standard;
- b) the temperature of the water immediately before each test;
- c) the diameter of the cartridges;
- d) the pressure applied;
- e) the witness system used;
- f) the means of initiation;
- g) the results, as "Pass" (if all three cartridges detonate) or "failure" (if one of the cartridges fails to detonate).



**Annex A**  
(informative)

**Range of applicability of the test method**

Range of applicability of the test method:

Temperature: 0 °C to 80 °C

Pressure: up to 60 MPa depending on the test equipment.

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