



# SLOVENSKI STANDARD

## SIST EN 13631-5:2002

01-december-2002

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**Eksplzivni za civilno uporabo – Razstreliva – 5. del: Ugotavljanje odpornosti proti vodi**

Explosives for civil uses - High explosives - Part 5: Determination of resistance to water

Explosivstoffe für zivile Zwecke - Sprengstoffe - Teil 5: Bestimmung der Wasserfestigkeit

Installation solaires thermiques et leur composants - Installations préfabriquées en usine  
- Partie 1 : Exigence générale (standards.iteh.ai)

Ta slovenski standard je istoveten z: **EN 13631-5:2002**

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**ICS:**

71.100.30      Eksplozivi. Pirotehnika      Explosives. Pyrotechnics

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ICS 71.100.30

English version

## Explosives for civil uses - High explosives - Part 5: Determination of resistance to water

Explosifs à usage civil - Explosifs - Partie 5: Détermination  
de la résistance à l'eau

Explosivstoffe für zivile Zwecke - Sprengstoffe - Teil 5:  
Bestimmung der Wasserfestigkeit

This European Standard was approved by CEN on 11 July 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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EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

**Management Centre: rue de Stassart, 36 B-1050 Brussels**

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## Foreword

This document (EN 13631-5:2002) 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 March 2003, and conflicting national standards shall be withdrawn at the latest by March 2003.

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 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 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 13631-6 *Part 6: Determination of resistance to hydrostatic pressure.*
- 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: 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 of this document 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 of determining the resistance to water of cartridge or bulk high explosives for civil uses, which are designed to be used for blasting operations in wet conditions.

## 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 13631-10:2000, *Explosives for civil uses – High explosives – Part 10: Method for the verification of the means of initiation.*

prEN 13631-14, *Explosives for civil uses – High explosives – Part 14: Method for the determination of velocity of detonation.*

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

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

## 4 Preliminary test for cartridge explosives

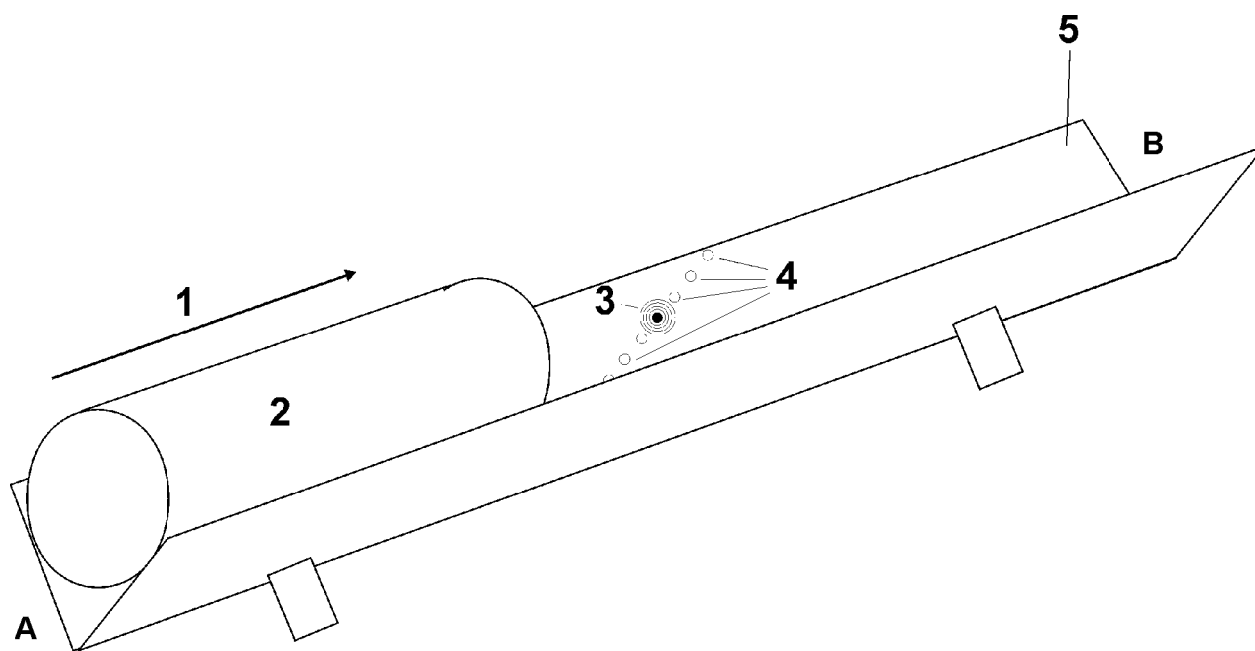
### 4.1 General

Unless the manufacturer claims that the explosive composition is inherently water resistant, the cover material shall be subjected to this preliminary test.

### 4.2 Apparatus

**4.2.1 V-shaped guide**, made from aluminium or similar material, of length at least 500 mm longer than the length of the cartridge under test (see Figure 1). The guide shall have a series of holes, spaced 2 mm apart in the direction at right angles to the axis of the guide, for the pin (see 4.2.2). The holes shall be located approximately 500 mm from end 'B' of the guide and at least the length of the cartridge from end 'A'.

**4.2.2 Pin**, made of stainless steel with a cone angle of 45° and a height of 5 mm (see Figure 2).



**Key**

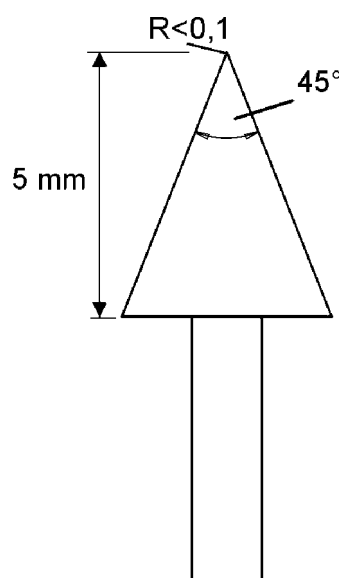
- 1 Direction of pushing
- 2 Explosive cartridge
- 3 Pin in position
- 4 Holes for the pin
- 5 Guide

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**Figure 1 - V-shaped guide and cartridge**



**Figure 2 - Steel pin**

### 4.3 Procedure

Place the guide horizontally on a table.

Place a cartridge in the guide so that one end is in line with end 'A' of the guide.

According to the diameter of the cartridge place the pin in one of the holes so that it is in line with the area of the cartridge touching the guide.

Push the cartridge through the guide to end 'B'. Do not apply any vertical force.

Rotate the cartridge 90° and repeat the test until there are four traces of the pin.

Do this with a total of three cartridges.

Inspect the traces very carefully and determine whether any perforation is visible. If there is no perforation of the cover it is assumed to be an integral part of the water resistance of the product. In this case the water resistance of the explosive shall be determined using the cartridges as supplied.

If there is, on the other hand, any perforation of the cover it is not assumed to be an integral part of the water resistance of the explosive. In this case the water resistance of the explosive shall be determined using test pieces comprising cartridges modified by cutting notches as described in 5.2.

Do not use cartridges subjected to this preliminary test for further testing.

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## 5 Preparation of notched test pieces

[SIST EN 13631-5:2002](https://standards.iteh.ai/catalog/standards/sist/en-13631-5-2002)

### 5.1 General

<https://standards.iteh.ai/catalog/standards/sist/409e391b-057b-46c5-bb42-980fce89b92e/sist-en-13631-5-2002>

If the manufacturer of cartridge explosives claims that the explosive composition is inherently water resistant, then notches shall be cut into all cartridges of the test piece.

### 5.2 Cutting notches

Each notch shall be approximately 20 mm long, 0,5 mm wide and 5 mm deep. The number of notches shall be such that there is one notch per 30 cm<sup>2</sup> of surface. The notches shall be uniformly distributed over the circumference.

## 6 Test for water resistance

### 6.1 Apparatus

**6.1.1 Means of initiation**, as specified by the explosives manufacturer in terms of initiating capability according to prEN 13631-10:2000, subclause 5.1.

**6.1.2 Water tank**, which allows easy and complete immersion of the test pieces in water. The height of the water tank shall be sufficient to hold water to a depth of at least 200 mm plus the diameter of the test piece. In the case of a tubular water tank its diameter shall be at least twice the diameter of the test piece.

**6.1.3 Means of assessing** complete detonation, (e.g. equipment for measuring velocity of detonation as specified in prEN 13631-14, or witness plates).



## 6.2 Procedure

### 6.2.1 Cartridged explosives

The test piece consists of a number of cartridges with a total length of at least 0,5 m. The diameter and length of the cartridges shall be the minimum dimensions of products placed on the market.

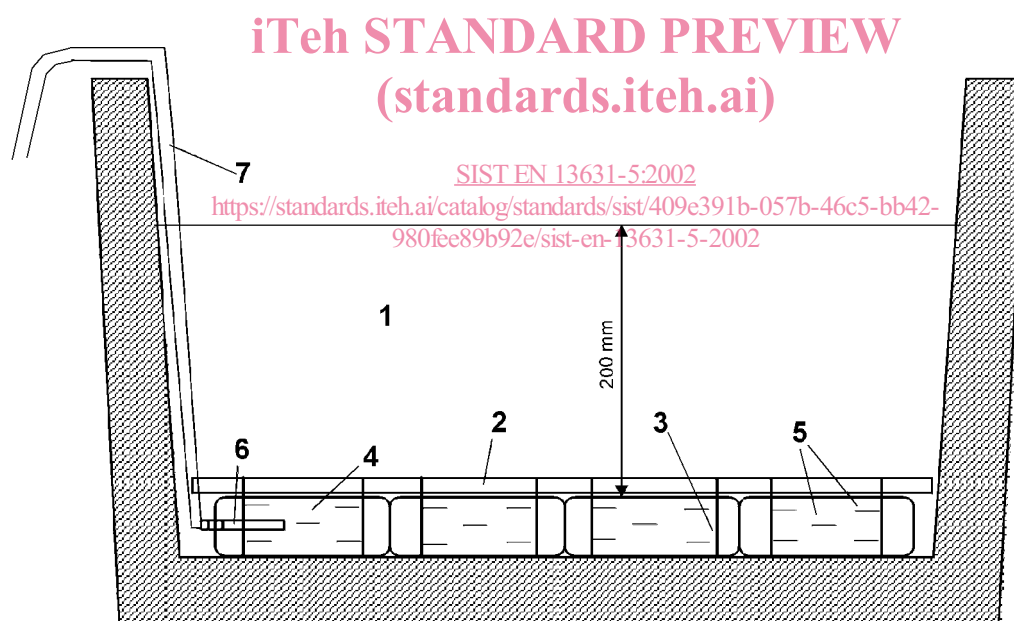
Fix the test piece along a wooden stick or metal rod. If the test piece consists of two or more cartridges, there shall be no visible gap between them.

Prepare the test piece for initiation with the means of initiation as described in 6.1.1.

Immerse the test piece in water at 20 °C to 30 °C to a water depth of 200 mm (see Figure 3). Fire the test piece after 5 h.

If the cartridges are too big for the test method described, a plastic tubular tank of suitable length can be used as container. In that case the test piece shall have a length of ten times its diameter. Insert the test piece into the vertically oriented tube, prepare it for initiation with the means of initiation as described in 6.1.1 and fill the tube with water at 20 °C to 30 °C until the uppermost cartridge is covered by at least 200 mm of water. Fire the test piece after 5 h.

In either case, assess whether complete detonation has taken place.



#### Key

- 1 Water
- 2 Wooden rod
- 3 Wire
- 4 Cartridge
- 5 Notches
- 6 Detonator
- 7 Leading wires

Figure 3 - Test assembly for cartridged explosives