# SLOVENSKI STANDARD

**SIST EN 13631-1:2005**

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**Eksplozivi za civilno uporabo - Razstreliva - 1. del: Zahteve**

Explosives for civil uses - High explosives - Part 1: Requirements

Explosivstoffe für zivile Zwecke - Sprengstoffe - Teil 1: Anforderungen

Explosifs a usage civil - Explosifs - Partie 1 : Exigences



**Ta slovenski standard je istoveten z: EN 13631-1:2005**

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# EN 13631-1

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English version

# Explosives for civil uses - High explosives - Part 1: Requirements

Explosifs à usage civil - Explosifs - Partie 1 : Exigences

Explosivstoffe für zivile Zwecke - Sprengstoffe - Teil 1: Anforderungen

This European Standard was approved by CEN on 21 March 2005.

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 Central Secretariat 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 Central Secretariat has the same status as the official versions.



CEN members are the national standards bodies of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.



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# Foreword

This document (EN 13631-1:2005) 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of an identical text or by endorsement, at the latest by November 2005, and conflicting national standards shall be withdrawn at the latest by November 2005.

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:

*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 resistance to water*

*Part 6: Determination of resistance to hydrostatic pressure*

*Part 7: Determination of safety and reliability at extreme temperatures*

*Part 10: Method for the verification of the means of initiation*

*Part 11: Determination of transmission of detonation*

*Part 12: Specifications of boosters with different initiating capability*

*Part 13: Determination of density*

*Part 14: Determination of velocity of detonation*

*Part 15: Calculation of thermodynamic properties*

*Part 16: Detection and measurement of toxic gases*

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

## 1 Scope

This European Standard specifies the requirements for high explosives for civil uses when subjected to test methods defined in the standards referred herein.

## 2 Normative references

The following referenced documents are indispensable for the application 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 13631-2, *Explosives for civil uses - High explosives - Part 2: Determination of thermal stability of explosives*

EN 13631-3, *Explosives for civil uses - High explosives - Part 3: Determination of sensitiveness to friction of explosives*

EN 13631-4, *Explosives for civil uses - High explosives - Part 4: Determination of sensitiveness to impact of explosives*

EN 13631-5, *Explosives for civil uses - High explosives - Part 5: Determination of resistance to water*

EN 13631-6, *Explosives for civil uses - High explosives - Part 6: Determination of resistance to hydrostatic pressure*



EN 13631-7, *Explosives for civil uses - High explosives - Part 7: Determination of safety and reliability at extreme temperatures*



EN 13631-10, *Explosives for civil uses - High explosives - Part 10: Method of the verification of the means of initiation*

EN 13631-11, *Explosives for civil uses - High explosives - Part 11: Determination of transmission of detonation*

EN 13631-13, *Explosives for civil uses - High explosives. Part 13: Determination of density*

EN 13631-14, *Explosives for civil uses - High explosives. Part 14: Determination of velocity of detonation*

EN 13631-15, *Explosives for civil uses - High explosives. Part 15: Calculation of thermodynamic properties*

EN 13631-16, *Explosives for civil uses - High explosives - Part 16: Detection and measurement of toxic gases*

EN 13857-1:2003, *Explosives for civil uses - Part 1:Terminology*

## 3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN 13857-1:2003 apply.

# 4 Requirements

## 4.1 Thermal stability

When tested in accordance with EN 13631-2, the result shall be “no reaction”.

## 4.2 Sensitiveness to friction

When tested in accordance with EN 13631-3, the sensitiveness to friction shall be not less than 80 N.

NOTE The range of validity of the results is considered to be from 10 °C to 40 °C.

## 4.3 Sensitiveness to impact

When tested in accordance with EN 13631-4 the sensitiveness to impact shall be greater than 2 J.

NOTE The range of validity of the results is considered to be from 10 °C to 40 °C.

## 4.4 Resistance to water

If it is claimed that the explosive is water-resistant, it shall be tested three times in accordance with EN 13631-5. Detonation shall be observed in all three shots.



NOTE The range of validity of the results is considered to be:



- Temperature: from 0 °C to 40 °C.
- Pressure: from 0 MPa to 0,3 MPa above atmospheric.

## 4.5 Resistance to hydrostatic pressure

If it is claimed that the explosive can be used under a hydrostatic pressure of up to 0,3 MPa, it shall conform to 4.4.

If it is claimed that the explosive can be used under a hydrostatic pressure greater than 0,3 MPa, it shall be tested according to EN 13631-6 under the maximum pressure stated by the manufacturer. Detonation shall be observed in all three shots.

NOTE The range of validity of the results is considered to be:

- Temperature: from 0 °C to 40 °C.
- Pressure: up to the pressure tested.

## 4.6 Safety at extreme temperatures

All tests referred to in this standard, where applicable, shall be performed at ambient temperature and pressure. Results of the tests shall be considered valid within the ranges defined, for each test method, in this standard.

If one or both temperature (and, where applicable, pressure) limits of use claimed by the manufacturer lie outside the ranges of validity of test results for some test, those tests shall also be carried out at the extremes of the range of use claimed. The requirements given for each particular test shall also be met in such conditions.

If a test method is not applicable under the extreme conditions of use claimed by the manufacturer, the procedure described in EN 13631-7 shall be followed.

### 4.7 Safety at loading

If the explosive is claimed to be suitable for loading by mechanical means, it shall meet the following values of sensitiveness, when tested in accordance with EN 13631-3 and EN 13631-4:

– Friction: Greater than 160 N.

– Impact: Greater than 30 J.

The actual means of loading should be individually assessed given the specific conditions and the actual equipment to be used.

NOTE National regulations for use of explosives might also apply.

### 4.8 Verification of the means of initiation



The explosive shall be tested according to EN 13631-10. When several means of initiation are claimed by the manufacturer (e.g. detonator and detonating cord), each of them shall be tested.



The velocity of detonation in all three shots shall be at least 90 % of the value claimed by the manufacturer for each type of initiation claimed.

NOTE The range of validity of the results is considered to be from 5 °C to 50 °C.

### 4.9 Transmission of detonation

When tested in accordance with EN 13631-11, $D_{max}$ shall be not less than 20 mm.

NOTE The range of validity of the results is considered to be from 5 °C to 50 °C.

### 4.10 Density

Explosive density shall be determined according to EN 13631-13. The test shall be performed three times on three separate test pieces. All the density values shall be within the limits claimed by the manufacturer.

### 4.11 Velocity of detonation

Velocity of detonation shall be determined according to EN 13631-14 at the minimum diameter placed on the market, or the minimum borehole diameter recommended by the manufacturer. The test shall be performed three times on three separate test samples. All the velocity values shall be at least 90 % the value claimed by the manufacturer.

### 4.12 Thermodynamic properties

Thermodynamic calculations shall be carried out according to EN 13631-15. Calculated heat of explosion, gas volume and specific force shall be within ± 3 % of the values claimed by the manufacturer.

# 5 Other tests

## 5.1 Toxic gases

Contents of carbon monoxide and nitrogen oxides in the detonation products shall be determined according to EN 13631-16.

NOTE The amounts of those gases might be used for reasons of health protection by national authorities to control the use of the explosive in the various conditions of underground works.

## 5.2 Explosives for use in hazardous environments

If the explosive is claimed to be suitable for use in coal mines, or under conditions where flammable gases or flammable dust may exist, the explosive's ability to ignite firedamp and coal dust shall be assessed by means of laboratory tests simulating the practical firing conditions at the mine.

NOTE National authorities might use the results of those tests in order to classify the explosive into categories in such way that its use in the various working conditions of coal mining is either permitted or prohibited.