SLOVENSKI STANDARD
SIST EN 13631-4:2002

01-december-2002

Eksplozivi za civilno uporabo – Razstreliva – 4. del: Ugotavljanje občutljivosti razstreliv na udar

Explosives for civil uses - High explosives - Part 4: Determination of sensitiveness to impact of explosives

Explosivstoffe für zivile Zwecke - Sprengstoffe - Teil 4: Bestimmung der Schagempfindlichkeit von Explosivstoffen

Explosifs a usage civil - Explosifs - Partie 4: Détermination de la sensibilité au choc des explosifs

Ta slovenski standard je istoveten z: **EN 13631-4:2002**

ICS:

71.100.30	Eksplozivi. Pirotehnika	Explosives. Pyrotechnics

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EUROPEAN STANDARD

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English version

Explosives for civil uses - High explosives - Part 4: Determination of sensitiveness to impact of explosives

Explosifs à usage civil - Explosifs - Partie 4: Détermination de la sensibilité à l'impact des explosifs

Explosivstoffe für zivile Zwecke - Sprengstoffe - Teil 4: Bestimmung der Schagempfindlichkeit von Explosivstoffen

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.

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

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Contents

Foreword

This document (EN 13631-4:2002) 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 13631-5 *Part 5: Determination of resistance to water.*

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 for determining the sensitiveness to impact of explosives.

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 13857-1:2001, *Explosives for civil uses – Part 1: Terminology.*

EN ISO 683-17:1999, *Heat-treated steels, alloy steels and free-cutting steels – Part 17: Ball and roller bearing steels (ISO 683-17:1999).*

EN ISO 4957, *Tool steels (ISO 4957:1999).*

EN ISO/IEC 17025, *General requirements for the competence of testing and calibration laboratories (ISO/IEC 17025:1999).*

3 Terms and definitions

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

3.1
reaction
occurrence of report or flame

3.2
drop height
distance between the uppermost part of the impact device and the lower face of the striking head immediately before the drop

3.3
impact energy
energy of the drop weight immediately before impact, calculated by multiplying the mass of the drop weight by the drop height and by the acceleration due to gravity

NOTE For practical purposes, the acceleration due to gravity is rounded to 10 m/s² so that, for example, with a drop weight of mass 1 kg and a drop height of 500 mm the impact energy is assumed to be 5 J.

3.4
sensitiveness to impact
lowest impact energy at which a reaction is obtained from at least one out of six tests

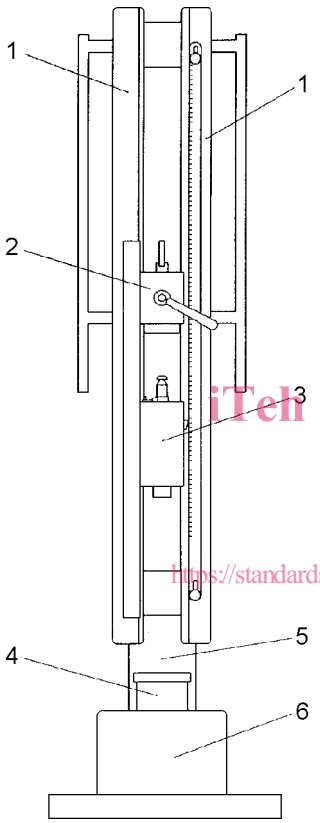
4 Principle

A weight of known mass is dropped onto a sample of the explosive which is confined in a way that during the impact of the weight no significant friction is applied to the explosive.

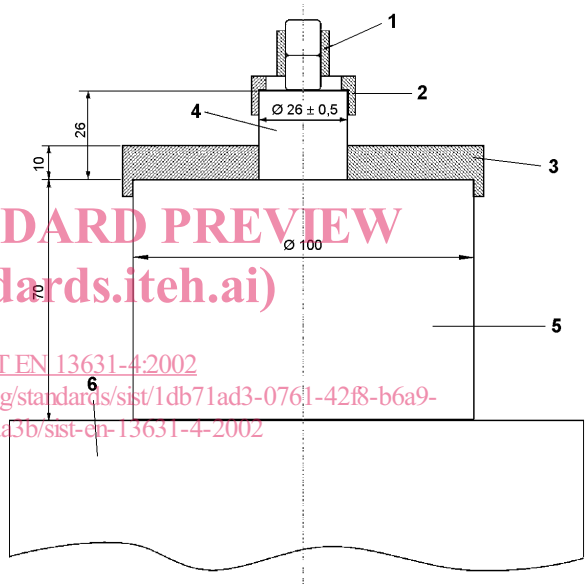
5 Apparatus

5.1 Drop Hammer, (see Figure 1) consisting of a cast steel block with base, an anvil, a column, guides, drop weights with release device, and an impact device. The column is made from a seamless drawn steel tube. The support into which the column is fixed is bolted to the back of the steel block. The dimensions of the anvil (see 5.2) and the intermediate anvil are given in Figure 2, which shows the arrangement of the lower parts. The two guides which are fixed to the column by means of three cross-pieces are fitted with a toothed rack to limit the re-bound of the drop weight (see 5.3) and a moveable graduated scale for adjusting the drop height.

NOTE An example of drop hammer is the BAM fall-hammer.



Dimensions in millimetres



Key

1 Guides
2 Release device
3 Drop weight
4 Anvil
5 Column
6 Steel block

Figure 1 General arrangement of the BAM fall-hammer(scheme of BAM[1] apparatus)

Key

1 Impact device
2 Locating ring
3 Locating plate
4 Intermediate anvil
5 Anvil
6 Steel block

Figure 2 – Lower part of the BAM fall-hammer

The drop height shall be accurate to within ± 0,5 cm. The drop weight release mechanism is adjustable between the guides and is clamped to them by the operation of a lever nut on two jaws. The apparatus shall be firmly

[1] BAM: Bundesanstalt für Materialforschung und -prüfung.

secured to a concrete block, with minimum dimensions of 0,6 m × 0,6 m × 0,6 m, by means of four anchoring bolts. The guides shall be vertical. A wooden protective box with inner protective lining and a window for observation surrounds the apparatus up to the level of the bottom crossbar.

5.2 Steel anvil, screwed onto the steel block and cast base. The steel used for the anvil is of type 90 MnCrV 8 (EN ISO 4957, HRC hardness of 60).

5.3 Three drop weights of mass 1 kg, 5 kg and 10 kg. Each drop weight is provided with two locating grooves to hold it between the guides as it drops. A suspension spigot, a removable cylindrical striking head and a rebound catch are screwed onto the drop weight. The striking head is made from hardened steel of the same type as the anvil (see 5.2) with a minimum diameter of 25 mm. It has a shoulder to prevent it from being forced into the drop weight by the impact. The drop weights are used in conjunction with particular drop heights to produce the impact energies as given in Table 1. The mass of each drop weight shall be within ± 0,1% of its specified mass.

Table 1 - Combinations of drop height, mass of drop weight and the resulting impact energies

Drop height cm	Mass of drop weight kg	Impact energy J
10	1	1
20	1	2
30	1	3
40	1	4
50	1	5
15	5	7,5
20	5	10
30	5	15
40	5	20
50	5	25
60	5	30
35	10	35
40	10	40
50	10	50

5.4 Impact device, consisting of two coaxial steel cylinders, one above the other in a hollow cylindrical steel guide ring. The cylinders are steel rollers from roller bearings with polished surfaces and rounded edges. Both the ring and the steel rollers are made of steel 100Cr6 as specified in EN ISO 683-17:1997 (HRC-Hardness 58 to 65). The dimensions of the cylinders and the ring are given in Figure 3. The impact device is placed on an intermediate anvil and centred by a locating ring with a ring of vent-holes to permit the escape of gases.

Dimensions in millimetres

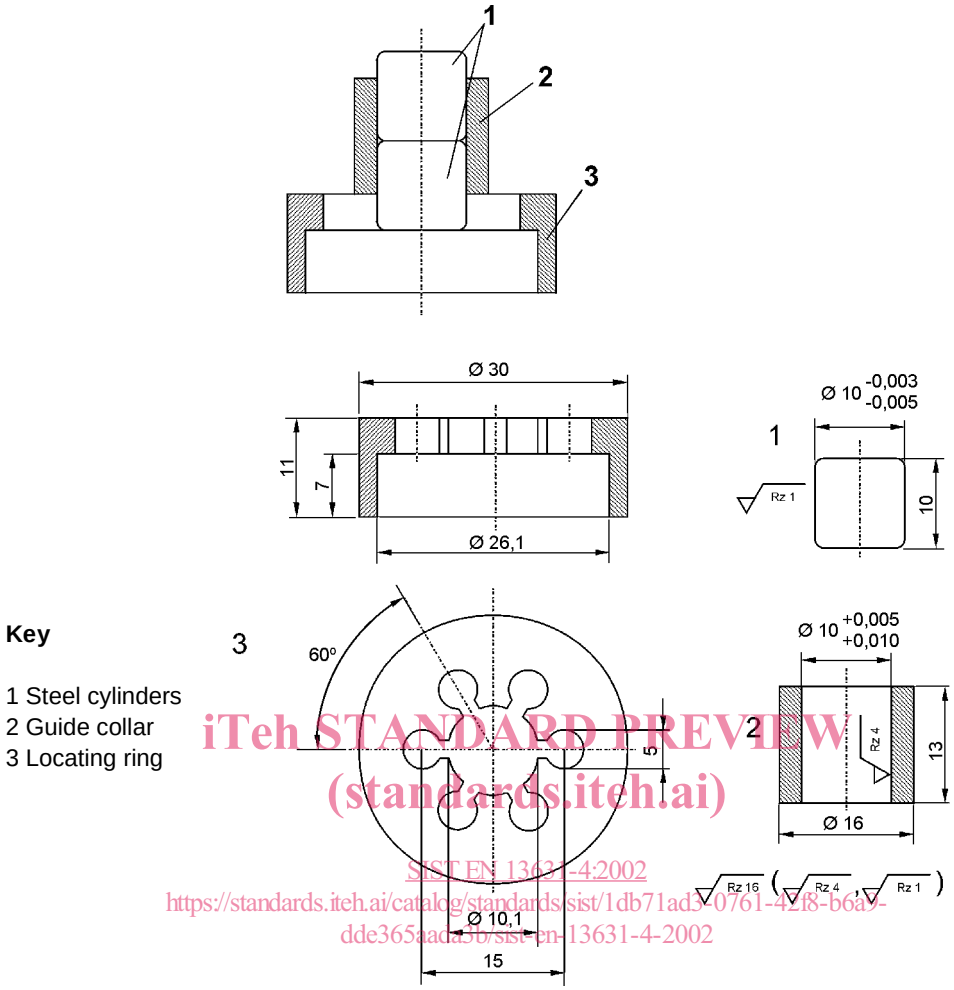


Figure 3 – Parts of the impact device and their dimensions

6 Test pieces

6.1 Solid substances which are easily broken up or in powdered form

Granular substances shall be passed through a sieve with an aperture size of 0,5 mm. The fraction which passes through the sieve shall be used for the test.

Substances which have been compressed, cast or otherwise consolidated shall be broken into small pieces and sieved. The fraction which passes through a 1 mm sieve and is retained on a 0,5 mm sieve is used for the test.

For substances which contain more than one constituent, the sieve fraction used for the test shall be representative of the original sample.

A sample of the substance prepared as described above shall be taken with a cylindrical measure of 40 mm^3 capacity (3,7 mm diameter by 3,7 mm length) for each test.

6.2 Plastic bonded substances and other solids which are not easily broken up

These substances shall be tested in the form of discs of about 4 mm in diameter and about 3 mm in thickness (volume 40 mm^3).