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Explosiva varor för civilt bruk – Sprängämnen –
Del 3: Bestämning av friktionskänslighet för explosiva
varor

Explosives for civil uses – High explosives –
Part 3: Determination of sensitiveness to friction of
explosives

ICS 71.100.30

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English version

Explosives for civil uses - High explosives - Part 3: Determination of sensitiveness to friction of explosives

Explosifs à usage civil - Explosifs - Partie 3 : Détermination
de la sensibilité au frottement des explosifs

Explosivstoffe für zivile Zwecke - Sprengstoffe - Teil 3:
Bestimmung der Reibempfindlichkeit von Explosivstoffen

This European Standard was approved by CEN on 21 June 2004.

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.

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Foreword

This document (EN 13631-3:2004) 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of an identical text or by endorsement, at the latest by February 2005, and conflicting national standards shall be withdrawn at the latest by February 2005.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 document 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
- EN 13631-4 Part 4: Determination of sensitiveness to impact of explosives
- EN 13631-5 Part 5: Determination of resistance to water
- EN 13631-6 Part 6: Determination of resistance to hydrostatic pressure
- EN 13631-7 Part 7: Determination of safety and reliability at extreme temperatures
- EN 13631-10 Part 10: Verification of the means of initiation
- EN 13631-11 Part 11: Determination of transmission of detonation
- prEN 13631-12 Part 12: Specification of boosters with different initiating capability
- EN 13631-13 Part 13: Determination of density
- EN 13631-14 Part 14: Determination of velocity of detonation
- prEN 13631-15 Part 15: Calculation of thermodynamic properties
- EN 13631-16 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.

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1 Scope

This document specifies a method for determining the sensitiveness to friction of explosives. This method is not applicable to liquid products.

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

EN 60672-3:1997, *Ceramic and glass insulating materials — Part 3: Specifications for individual materials (IEC 60672-3:1997)*

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 document, the terms and definitions given in EN 13857-1:2003 and the following apply.

3.1

reaction

occurrence of report, crackling, sparking and/or flame

3.2

sensitiveness to friction

lowest load at which a reaction is obtained from at least one out of six trials

4 Principle

A small amount of the explosive is placed on a porcelain plate and a porcelain peg is pressed onto the sample under a specified load. The plate is moved to apply a friction stimulus to the sample. The load is reduced for subsequent trials until the lowest load at which a reaction is obtained from at least one out of six trials is reached.

5 Preparation of test samples

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

Granular substances shall be passed through a sieve with a nominal aperture size of 0,5 mm.

Substances which have been compressed, cast or otherwise consolidated shall be broken into small pieces before sieving. The fraction which passes through the sieve shall be 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.

Take a sample of the prepared substance with a cylindrical measure of 10 mm³ capacity (2,3 mm diameter by 2,4 mm length) and place it in the friction apparatus.

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

These substances shall be tested in the form of discs or chips of 10 mm³ and a minimum diameter of 4 mm.

5.3 Paste-like and gel-type substances

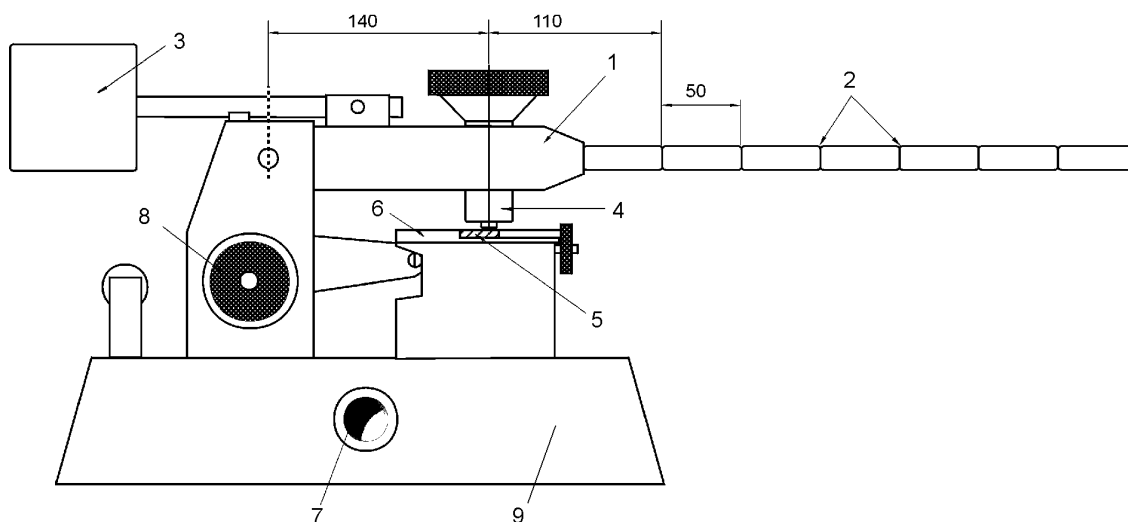
For these substances fill a rectangular 0,5 mm thick gauge with a 2 mm x 10 mm window with the substance, place it the apparatus and remove the gauge carefully.

6 Apparatus

6.1 General

The friction apparatus consists of a cast steel base on which the friction device is securely mounted, as shown in Figure 1.

Dimensions in millimetres



Key

- 1 Pivoted lever
- 2 Notches
- 3 Counterweight
- 4 Holder for porcelain peg
- 5 Porcelain plate
- 6 Movable carriage for porcelain plate
- 7 Operating switch
- 8 Wheel for manual adjustment
- 9 Cast steel base

Figure 1 — Friction apparatus

6.2 Loading device

The loading device consists of a pivoted lever with six notches on one side, a counterweight on the other side and a holder for a porcelain peg.

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By adjusting the counterweight at one end of the lever the zero load condition is set. When the loading device is lowered onto the porcelain plate the longitudinal axis of the porcelain peg is perpendicular to the plate. The notches on the loading device are located at distances of (110 ± 2) mm, (160 ± 2) mm, (210 ± 2) mm, (260 ± 2) mm, (310 ± 2) mm, and (360 ± 2) mm from the axis of the porcelain peg and are numbered from 1 (110 mm) to 6 (360 mm). A weight is hung from a notch by means of a ring and hook. The same ring and hook are used for all weights. There are nine different weights of 0,28 kg, 0,56 kg, 1,12 kg, 1,68 kg, 2,24 kg, 3,36 kg, 4,48 kg, 6,72 kg, and 10,08 kg, numbered from 1 to 9. All specified masses include the weight of the ring and hook.

A range of applied loads, as listed in Table 1, is achieved by the use of different weights in different notches. Loads are given in Newtons [N].

NOTE The listed values are approximate because some basic values for the calculation are rounded to obtain integer numbers as results. The actual loads do not differ by more than 2 %.

The cylindrical porcelain pegs are made from technical white porcelain and their roughened ends are rounded. The dimensions are given in Figure 2.

Dimensions in millimetres

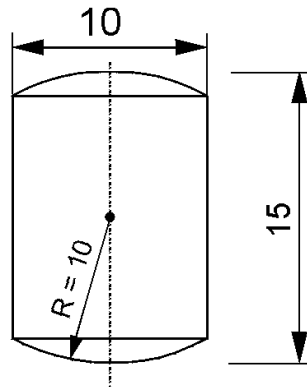


Figure 2 — Porcelain peg