
Eksplozivi za civilno uporabo - Smodniki in raketna goriva - 1. del: Zahteve

Explosives for civil uses - Propellants and rocket propellants - Part 1: Requirements

Explosivstoffe für zivile Zwecke - Treibladungspulver und Raketentreibstoffe - Teil 1: Anforderungen

Explosif à usage civil - Poudres propulsives et propergols pour fusées - Partie 1 : Exigences

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English Version

Explosives for civil uses - Propellants and rocket propellants - Part 1: Requirements

Explosif à usage civil - Poudres propulsives et
propergols pour fusées - Partie 1 : Exigences

Explosivstoffe für zivile Zwecke - Treibladungspulver
und Raketentreibstoffe - Teil 1: Merkmale

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 321.

If this draft becomes a European Standard, 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.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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

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European foreword

This document (prEN 13938-1:2021) has been prepared by Technical Committee CEN/TC 321 “Explosives for civil uses”, the secretariat of which is held by UNE.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 13938-1:2004.

In comparison with the previous edition, the following technical modifications have been made:

- a) Clause 1, *Scope*, has been updated;
- b) the normative references have been updated;
- c) in Clause 3, Terms and definitions, the terms 3.2, 3.3 and 3.4 have been added;
- d) in 4.6, the requirements for properties of black powders for blasting have been removed and requirements regarding bulk density and density of compressed pellets for black powders used as propellant, pyrotechnic or in safety fuses have been added;
- e) 4.10, *Environmentally friendly disposal*, 4.11, *Suitable instructions*, and 4.12, *Use by date*, have been added;
- f) Annex ZA has been updated.

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This document has been prepared under a Standardization Request (M/562) annexed to the Commission Implementing Decision C(2019)6634 final as regards Explosives for civil uses given to CEN by the European Commission and the European Free Trade Association, and supports Essential Safety requirements of Directive 2014/28/EU.

For relationship with Directive 2014/28/EU, see informative Annex ZA, which is an integral part of this document.

EN 13938, *Explosives for civil uses — Propellants and rocket propellants*, is currently composed of the following parts:

- *Part 1: Requirements*
- *Part 2: Determination of resistance to electrostatic discharge*
- *Part 3: Determination of deflagration to detonation transition*
- *Part 4: Determination of burning rate under ambient conditions*
- *Part 5: Determination of voids and fissures*
- *Part 6: Solid rocket propellants — Guide for the determination of integrity of inhibitor coatings*
- *Part 7: Determination of safe and reliable ignition and complete deflagration of black powder*

prEN 13938-1:2021 (E)**1 Scope**

This document specifies the requirements for solid propellants, solid rocket propellants, powder cakes and black powders for pyrotechnics and safety fuses, when subjected to the test methods defined in the standards referenced to in Clause 2.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

prEN 13631-2:2021, *Explosives for civil uses — Explosives — Part 2: Determination of thermal stability of explosives*

prEN 13631-3:2021, *Explosives for civil uses — Explosives — Part 3: Determination of sensitiveness to friction of explosives*

prEN 13631-4:2021, *Explosives for civil uses — Explosives — Part 4: Determination of sensitiveness to impact of explosives*

prEN 13631-13:2021, *Explosives for civil uses — Explosives — Part 13: Determination of density*

prEN 13857-1:2021, *Explosives for civil uses — Part 1: Terminology*

EN 13857-3:2002, *Explosives for civil uses — Part 3: Information to be provided by the manufacturer or his authorised representative to the user*

prEN 13938-2:2021, *Explosives for civil uses — Propellants and rocket propellants — Part 2: Determination of resistance to electrostatic discharge*

prEN 13938-3:2021, *Explosives for civil uses — Propellants and rocket propellants — Part 3: Determination of deflagration to detonation transition*

prEN 13938-4:2021, *Explosives for civil uses — Propellants and rocket propellants — Part 4: Determination of burning rate under ambient conditions*

prEN 13938-5:2021, *Explosives for civil uses — Propellants and rocket propellants — Part 5: Determination of voids and fissures*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in prEN 13857-1:2021 and the following apply.

3.1**powder cake**

substance consisting of nitro-cellulose impregnated with not more than 60 %, by mass, of nitro-glycerine or other liquid organic nitrates or a mixture of these

3.2**large rocket motor**

rocket motor which contains more than 100 g of solid rocket propellant(s)

3.3**solid gun propellant**

solid propellant used for conversion of its energy into kinetic energy of the projectile

3.4**rocket propellant**

propellants used in propulsion devices

4 Requirements**4.1 Resistance to electrostatic discharge - Solid gun propellants**

When tested in accordance with prEN 13938-2:2021, Clause 7, the sensitiveness to electrostatic discharge shall not be less than 0,5 J.

4.2 Deflagration to detonation transition - Solid gun propellants

When tested in accordance with prEN 13938-3:2021, Clause 7, the length before detonation (LBD) shall not be less than 0,05 m.

4.3 Burning rate under ambient conditions

— *Solid gun propellants:*

When tested in accordance with prEN 13938-4:2021, 7.1, the burning rate shall be less than 400 mm/s.

— *Black powders used as propellants, pyrotechnic or in safety fuses:*

When tested in accordance with prEN 13938-4:2021, 7.1, each determination of the burning rate shall be within ± 20 % of that claimed by the manufacturer.

4.4 Voids and fissures - Solid rocket propellants

— *Small rocket motors:*

When tested in accordance with prEN 13938-5:2021, Clause 6, the difference between any partial average thrust and the overall average thrust shall not be greater than 10 %.

— *Large rocket motors:*

When determined by the method specified by the manufacturer listed in prEN 13938-5:2021, Clause 5, the maximum size and number of voids and fissures shall meet the requirements of the manufacturer's specification.

4.5 Integrity of inhibitor coatings - Solid rocket propellants

When determined by the method specified by the manufacturer, the integrity of the inhibitor coating shall meet the requirements of the manufacturer's specification.

NOTE Guidance on the determination of integrity of inhibitor coatings is given in EN 13938-6:2004.

4.6 Bulk density and density of compressed pellets - Black powders used as propellant, pyrotechnic or in safety fuses

When tested in accordance with prEN 13631-13:2021, 6.2.2 and 7.2, the bulk density and density values shall be within the limits given in the specification of the manufacturer.

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4.7 Thermal stability - Solid gun propellants, solid rocket propellants and black powder used as propellants, pyrotechnic or in safety fuses

When tested in accordance with prEN 13631-2:2021, Clause 7, the result shall be 'no reaction' according to prEN 13631-2:2021, 7.2.

4.8 Sensitiveness to friction

— *Solid gun propellants and solid rocket propellants:*

When tested in accordance with prEN 13631-3:2021, Clause 7, the sensitiveness to friction shall not be less than 50 N.

— *Powder cakes and black powders used as propellants, pyrotechnic or in safety fuses:*

When tested in accordance with prEN 13631-3:2021, Clause 7, the sensitiveness to friction shall not be less than 80 N.

4.9 Sensitiveness to impact

— *Solid gun propellants and solid rocket propellants:*

When tested in accordance with prEN 13631-4:2021, Clause 7, the sensitiveness to impact shall not be less than 1 J.

— *Powder cakes and black powders used as propellants, pyrotechnic or in safety fuses:*

When tested in accordance with prEN 13631-4:2021, Clause 7, the sensitiveness to impact shall not be less than 2 J.

4.10 Environmental-friendly disposal

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The explosive shall be accompanied by information about the manufacturer detailing:

- the selection of the explosive substances for the foreseen purpose;
- the selection of the material to ensure the correct functioning.

For each of the materials and explosives addressed in the above paragraph the manufacturer shall draw up information on how to dispose of these in a manner that minimize effects on the environment, taking into account the relevant economic and technical viable conditions.

This information shall be assessed in relation to state-of-the-art knowledge for explosives of the same kind. Suitable references to scientific work can be given to support the explanations provided.

4.11 Suitable instructions

The instructions for use, given by the manufacturer to the user, shall conform to EN 13857-3:2002, Clause 5.

4.12 Use by date

The "use by" date shall be provided by the manufacturer in accordance with EN 13857-3:2002, Clause 4.

Annex ZA (informative)

Relationship between this European Standard and the essential safety requirements of Directive 2014/28/EU relating to the making available on the market and supervision of explosives for civil uses aimed to be covered

This European Standard has been prepared under a standardization request M/562 annexed to Commission Implementing Decision C(2019)6634 final as regards explosives for civil uses to provide one voluntary means of conforming to essential safety requirements of Directive 2014/28/EU relating to the making available on the market and supervision of explosives for civil uses.

Once this standard is cited in the Official Journal of the European Union (OJEU), under Directive 2014/28/EU, compliance with the normative clauses of this standard given in Table ZA.1 confers, within the limits of the scope of this standard, a presumption of conformity with the corresponding essential safety requirements of that Directive 2014/28/EU, and associated EFTA regulations.

Table ZA.1 — Correspondence between this European Standard and Directive 2014/28/EU

Essential Safety Requirements of Directive 2014/28/EU Annex II	Clause(s)/sub-clause(s) of this EN (standards.iteh.ai)	Remarks/ Notes
I.1.	4.1, 4.2, 4.3, 4.4, 4.6, 4.7, 4.8 and 4.9	
I.2.	4.1, 4.2, 4.3, 4.4, 4.6, 4.7, 4.8 and 4.9	
I.3.	4.10	
II.1.(a)	4.1, 4.3, 4.4, 4.6, 4.7, 4.8 and 4.9	
II.1.(b)	4.6 and 4.7	
II.1.(c)	4.8 and 4.9	
II.1.(d)	4.7	
II.1.(e)	-	
II.1.(f)	-	
II.1.(g)	-	
II.1.(h)	-	
II.1.(i)	4.1, 4.7, 4.8 and 4.9	
II.1.(j)	4.2, 4.8 and 4.9	
II.1.(k)	4.11	
II.1.(l)	4.11 and 4.12	
II.1.(m)	4.11	

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Essential Safety Requirements of Directive 2014/28/EU Annex II	Clause(s)/sub-clause(s) of this EN	Remarks/ Notes
II.2.	4.1, 4.2, 4.3, 4.6, 4.7, 4.8 and 4.9	All tests have been designed to match as closely as possible the conditions of use.
II.3.4.(a)	4.2, 4.3	
II.3.4.(b)	-	
II.3.4.(c)	4.4	

WARNING 1 — Presumption of conformity stays valid only as long as a reference to this European Standard is maintained in the list published in the Official Journal of the European Union. Users of this standard should consult frequently the latest list published in the Official Journal of the European Union.

WARNING 2 — Other Union legislation may be applicable to the product(s) falling within the scope of this standard.

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