



SLOVENSKI STANDARD

SIST EN 13124-2:2004

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Okna, vrata in polkna – Odpornost proti eksplozijam – Preskusna metoda – 2. del: Preskus na prostem

Windows, doors and shutters - Explosion resistance - Test method - Part 2: Range test

Fenster, Türen und Abschlüsse - Sprengwirkungshemmung - Prüfverfahren - Teil 2:
Freilandversuch

Portes, fenetres et fermetures - Résistance à l'explosion - Méthode d'essai - Partie 2:
Essai en plein air

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Ta slovenski standard je istoveten z: EN 13124-2:2004

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ICS:

13.230	Varstvo pred eksplozijo	Explosion protection
91.060.50	Vrata in okna	Doors and windows

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 13124-2

February 2004

ICS 13.230; 91.060.50

English version

Windows, doors and shutters - Explosion resistance - Test method - Part 2: Range test

Portes, fenêtres et fermetures - Résistance à l'explosion -
Méthode d'essai - Partie 2: Essai en plein air

Fenster, Türen und Abschlüsse - Sprengwirkungshemmung
- Prüfverfahren - Teil 2: Freilandversuch

This European Standard was approved by CEN on 2 January 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.

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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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 13124-2:2004) has been prepared by Technical Committee CEN/TC 33 "Doors, windows, shutters, building hardware and curtain walling", the secretariat of which is held by AFNOR.

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 August 2004, and conflicting national standards shall be withdrawn at the latest by August 2004.

This European Standard is one of a series of standards for windows, doors and shutters.

No existing European Standard is superseded.

Annexes A and B are normative.

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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EN 13124-2:2004 (E)

1 Scope

This European Standard specifies a test procedure to permit classification of the explosion resistance of windows, doors and shutters together with their infills.

This European Standard concerns a test method against blast waves in open air resulting from high explosives that can be carried by hand and placed a few metres from a target. At such close distances blast values vary across an attack face. Controlled measurement of the actual blast on the face of the test specimen being difficult, costly and subject to inaccuracy, consistency of the blast forces is therefore controlled in this European Standard by the characteristics of the explosive charge and its location (see annex A and annex B).

This European Standard covers only the behaviour of the complete unit including infill, frame and fixings as tested. It gives no information on the ability of the surrounding wall or building structure to resist the direct or transmitted forces.

If the windows, doors and shutters are intended for specific conditions of climate, specific test conditions can be required.

This European Standard gives no information on the behaviour of the units subjected to other types of loading.

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).

EN 13123-2: 2004, *Windows, doors and shutters – Explosion resistance – Requirements and classification – Part 2: Range test.*

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3 Terms and definitions

For the purposes of this European Standard, the following terms and definitions apply.

3.1

test specimen

sample prepared and submitted for testing

3.2

attack face

face of the test specimen designed to face the explosion

3.3

rear face

opposite side of the test specimen to the attack face

3.4

breach

opening created by distortion in the test specimen during the test and evident after the test exceeding that specified in clause 9. Any opening created by a fragment of the specimen passing through or ejected from the test specimen

3.5

pressure wave

pressure wave generated by the detonation of a high explosive charge, creating an instantaneous rise in pressure which then decays with time (see Figure B.1)

3.6**explosive pressure resistance – Range test (EXR)**

resistance offered against a blast created by a defined charge and stand-off distance

3.7**charge**

explosive charge as specified in EN 13123-2

NOTE Details of the charge are given in annex A.

3.8**stand-off**

perpendicular distance between the centre point of the charge and the attack face of the test specimen

NOTE As indicated in annex B, Figure B.2.

3.9**charge support**

apparatus used to support the explosive charge in the required position

NOTE As described in annex B, Figures B.2 to B.5.

3.10**ambient condition**

measurement and recording of the ambient climatic test conditions, such as temperature, barometric air pressure and relative humidity, to be undertaken to attain comparable values

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4 Requirements

Performance requirements relating to the explosion resistance of windows, doors and shutters, tested under range conditions, are given in EN 13123-2.

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5 Apparatus**5.1 Test specimen support**

Test specimen support shall comprise a rigid frame or construction to which the test specimen may be securely attached.

It shall

- a) be sufficiently strong to resist the blast forces without deformation and without imparting deformations to the test specimen,
- b) allow the test specimen to be fixed in a manner representative of its as built condition without imposing abnormal stresses,
- c) prevent passage of blast pressure to the rear face of the test specimen other than through deformation or by design intention,
- d) accept mounting of pressure gauges where required,
- e) provide a minimum of 200 mm perimeter structure at the sides and top of the test specimen, as indicated in annex B, Figures B.3 to B.5,
- f) have a rear face, the inside surface of which shall be set back a minimum of 800 mm from the rear face of the test specimen,
- g) be a minimum size of 2,40 m wide by 2,40 m high by 0,80 m deep.

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5.2 Measuring conditions

The following characteristics shall be measured:

- a) ambient air temperature;
- b) ambient air pressure;
- c) surface temperature of the test specimen;
- d) relative humidity;
- e) peak pressure and duration if requested.

6 Test specimen

The test specimen shall be representative of the relevant window, door or shutter (see clause 11). The applicant shall supply drawings showing all details of the test specimen to scale together with description and composition of all materials including infills, fixings etc.

The test specimen size and method of fixing to the test specimen support shall be agreed between the test laboratory and the applicant. The attack face shall be clearly marked. The method of fixing used to connect the test specimen to the test specimen support shall be representative of the actual method of fixing employed in the course of installing the window, door or shutter (see 7.1 e)).

After the test, at the request of the applicant, the test laboratory shall return the test specimen, adequately and indelibly marked for retention.

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7 Procedure

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7.1 Installation

Install the test specimen in the test specimen support at a sill height of not more than 800 mm ensuring that

- a) the alignment/relationship between all components is correct,
- b) the fixings do not create abnormal stresses in the test specimen,
- c) no opening exists between/around the test specimen support,
- d) the hardware, mechanisms, movable sashes and door leaves are operable,
- e) the method of fixing and type/quantity of fixings used are identical in all respects to the intended application,
- f) all measurement devices are checked so as to verify their correct calibration.

7.2 Explosion pressure resistance – Range test (EXR)

The test shall generate a blast wave striking the attack face of the test specimen. The blast wave is generated from the detonation of a specified high explosive charge at a specified stand-off from the test specimen. The explosive charge is described in annex A.

The quantity and stand-off distance shall be in accordance with EN 13123-2.

8 Sequence of test

The following steps shall be taken:

- a) take measurements to verify that the test specimen dimensions, including infills, are in accordance with the drawings supplied by the applicant;
- b) install the test specimen in accordance with 7.1;
- c) check that the fixings are correct and that the infills are correctly installed;
- d) create a photographic record of the test specimen as installed in the test specimen support. Where desired set up high speed motion cameras;
- e) record the ambient conditions within 30 min of the test;
- f) position the required charge at the stand-off distance according to the resistance class;
- g) detonate the explosive charge;
- h) the test laboratory shall verify that full high order detonation has taken place;
- i) examine the test specimen and record the level of physical damage, including presence or absence of splinters, visible on the test specimen by photograph or film. A written record shall be created which specifies the level of distortion, deflection etc. evident on the test specimen. This information will form an integral part of the test report.

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9 Evaluation of results

9.1 The following criteria shall be used in evaluating the results of the test.

9.2 Evaluate the test in accordance with the requirements and classification in EN 13123-2 ensuring that the following test criteria are fulfilled:

- a) no perforation or opening through the test specimen is evident after the test through which a blunt 10 mm diameter rigid bar can be gently passed;
- b) no opening between the test specimen frame and the test specimen support is evident after the test through which a blunt 10 mm diameter rigid bar can be gently passed;
- c) no perforation or opening through the test specimen is evident after the test created by detachment or ejection of material from the test specimen;
- d) no part of the frame or hardware shall be ejected from the rear face;
- e) security closures or locking mechanisms previously secure from the attack face shall remain secure. If access through the test specimen can be gained this shall be noted in the test report;
- f) the absence or presence of splinters ejected from the rear face of the test specimen is fully described. The results shall be fully recorded in the test report and noted in the test certificate with suffix S or NS in accordance with EN 13123-2:2004, Table 1.

9.3 The test is considered successful even if after the test the opening mechanisms are no longer operable, or if the other performances (such as air permeability, water tightness, wind resistance etc.) except those concerning security, cannot be maintained.

If the results are ambiguous, the test shall be repeated on a new test specimen.

If these criteria are fulfilled, the window, door or shutter can be classified in accordance with EN 13123-2.