

Windows, doors, shutters and blinds — Bullet resistance — Requirements and classification

The European Standard EN 1522:1998 has the status of a
British Standard

ICS 91.060.50

National foreword

This British Standard is the English language version of EN 1522:1998.

The UK participation in its preparation was entrusted to Technical Committee B/538, Doors, windows, shutters, hardware and curtain walling, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

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Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 5 and a back cover.

Amendments issued since publication

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Descriptors: windows, doors, closures, mechanical strength, shock resistance, fire arms, tests, specifications, classifications, testing conditions, accident prevention

English version

Windows, doors, shutters and blinds — Bullet resistance — Requirements and classification

Fenêtres, portes, fermetures et stores — Résistance
aux balles — Prescriptions et classification

Fenster, Türen, Abschlüsse —
Durchschußhemmung — Anforderungen und
Klassifizierung

This European Standard was approved by CEN on 4 September 1998.

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CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart 36, B-1050 Brussels

Foreword

This European Standard has been prepared by Technical Committee CEN/TC 33, Doors, windows, shutters and building hardware, 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of an identical text or by endorsement, at the latest by April 1999, and conflicting national standards shall be withdrawn at the latest by April 1999.

This standard includes an informative annex giving criteria for testing the bullet resistance of windows, doors, shutters and blinds with some calibres of ammunition other than those shown in Tables 1 and 2 of this standard.

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, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

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1 Scope

This standard defines the requirements and classification that windows, doors, shutters and blinds must satisfy when tested in accordance with EN 1523.

This standard is applicable to attacks by hand guns, rifles and shotguns on windows, doors, shutters and blinds complete with their frames and infills, for use in both internal and external locations in buildings. Shutters and blinds must be tested separately and not in conjunction with a window or door, in order to achieve classification in terms of bullet resistance.

This standard gives no information on the behaviour of the test item when subjected to other types of stresses. It gives no information on the bullet resistance of the junction between the frame and the wall or other surrounding structure.¹⁾

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.

EN 1523:1998, *Windows, doors, shutters and blinds — Bullet resistance — Test method.*

prEN 1063, *Specification for security glazing — Bullet resistant glazing — Classification and test methods.*

prEN 12216, *Blind and shutters — Terminology.*

prEN 12519, *Doors and windows — Terminology.*

3 Definitions

For the purposes of this European Standard, the definitions given in prEN 12519 and prEN 12216 apply.

4 Requirements

Any glass infill in the test specimen shall be of bullet resisting glass conforming to the appropriate class of prEN 1063 in accordance with Tables 1 and 2. If the test specimen contains a higher class level of glass, this must be stated in the test report and test report summary.

After the test in accordance with EN 1523 the door leaf and/or any opening window casement, sash or curtain of a shutter or blind shall remain retained in the closed position, whether or not the opening mechanisms are still operable, and it shall not be possible to gain access from the attack face to any operating mechanism which remains in operable condition. It is not a requirement of the test that performance in other respects such as air permeability, watertightness, wind resistance etc. be maintained.

Resistance to perforation by weapons and ammunition listed in Tables 1 and 2 shall be classified in accordance with clause 5. To achieve a particular class of bullet resistance, the test specimen shall show no perforation when tested in accordance with EN 1523 using the ammunition appropriate to that class as shown in Table 1 or 2.

To obtain classes FB4 or FB6 the test specimen shall be tested with ammunition of both calibres indicated.

5 Classification

The classes FB1 to FB7 given in Table 1 are in order of increasing resistance to perforation. Class FB1 represents the lowest bullet resistance, and class FB7 the highest e.g. FB4 includes FB3, FB2, FB1 and where necessary the testing institute shall conduct additional tests in the lower classes to confirm this.

Test specimens which fail to meet class FB1 cannot be described as offering bullet resistance.

Results of the tests shall be qualified by the addition of an "S" or "NS" suffix according to the presence or absence of splinters.

EXAMPLE

FB1(S), FB1(NS), etc.

¹⁾ Care should be taken to ensure that all joints between the wall and the door, window, shutter or blind have bullet protection which is at least equal to that of the door, window, shutter or blind.

Table 1 — Classification and requirements for testing with hand guns and rifles

Class	Type of weapon	Calibre	Bullet		Test condition	
			Type	Mass g	Test range m	Bullet velocity m/s
FB1	rifle	22 LR	L/RN	$2,6 \pm 0,1$	$10 \pm 0,5$	360 ± 10
FB2	hand gun	9 mm Luger	FJ ¹ /RN/SC	$8,0 \pm 0,1$	$5 \pm 0,5$	400 ± 10
FB3	hand gun	357 Mag.	FJ ¹ /CB/SC	$10,2 \pm 0,1$	$5 \pm 0,5$	430 ± 10
FB4	hand gun	357 Mag.	FJ ¹ /CB/SC	$10,2 \pm 0,1$	$5 \pm 0,5$	430 ± 10
	hand gun (see note)	44 Rem. Mag.	FJ ² /FN/SC	$15,6 \pm 0,1$	$5 \pm 0,5$	440 ± 10
FB5	rifle	$5,56 \times 45^*$	FJ ² /PB/SCP1	$4,0 \pm 0,1$	$10 \pm 0,5$	950 ± 10
FB6	rifle	$5,56 \times 45^*$	FJ ² /PB/SCP1	$4,0 \pm 0,1$	$10 \pm 0,5$	950 ± 10
	rifle (see note)	$7,62 \times 51$	FJ ¹ /PB/SC	$9,5 \pm 0,1$	$10 \pm 0,5$	830 ± 10
FB7	rifle	$7,62 \times 51^{**}$	FJ ² /PB/HC1	$9,8 \pm 0,1$	$10 \pm 0,5$	820 ± 10
<p>L lead</p> <p>CB coned bullet</p> <p>FJ full metal jacket bullet</p> <p>FN flat nose bullet</p> <p>HC1 steel hard core, mass $(3,7 \pm 0,1)$ g hardness more than 63 HRC</p> <p>PB pointed bullet</p> <p>RN round nose bullet</p> <p>SC soft core (lead)</p> <p>SCP1 soft core (lead) with steel penetrator (type SS109)</p> <p>* To achieve the stated values for $[5,56 \times 45]$, the recommended barrel twist length = (178 ± 10) mm.</p> <p>** To achieve the stated values for class FB7, the recommended barrel twist length = (254 ± 10) mm.</p> <p>FJ¹ = full steel jacket (plated)</p> <p>FJ² = full copper alloy jacket</p>						
<p>NOTE 1 When a shot is to be fired at a single point the test range may be reduced to achieve the firing accuracy as defined in Section 6 of EN 1523:1998. In this case it may not be possible to measure the velocity of the bullet.</p> <p>NOTE 2 To be classified FB4 or FB6 the specimen shall be tested with both calibres listed.</p>						

Table 2 — Classification and requirements for testing with shotguns

Class	Type of weapon	Calibre	Bullet		Test condition	
			Type	Mass g	Test range m	Bullet velocity m/s
FSG	shotgun	12/70	Solid lead slug ³⁾	$31 \pm 0,5$	$10 \pm 0,5$	420 ± 20
³⁾ = Brenneke.						

Table 3 — Class for use in test

Class	Minimum class of glass to be used in test (in accordance with prEN 1063)
FB1	BR1
FB2	BR2
FB3	BR3
FB4	BR4
FB5	BR5
FB6	BR6
FB7	BR7
FSG	SG2

Annex A (informative)

Some types and calibres of ammunition other than those shown in Tables 1 and 2

Tables 1 and 2 indicate the most common ammunition available in the European market. For this reason, these types and calibres have been chosen for the tests which form the basis for this European Standard for the classification of bullet resistance.

Countries may have threats from ammunition of other types and calibres and may require tests to be carried out with these. Table A.1 indicates some of these types and calibres of ammunition, together with criteria for interpreting the test results.

Any such test should be conducted in accordance with EN 1523 but classification in accordance with this European Standard is not permitted.

The results of such tests should not be compared with classes FB1 to FB7 and FSG.

Table A.1 — Criteria for testing with ammunition of some types and calibres other than those shown in Tables 1 and 2

Type of weapon	Calibre	Bullet		Test condition	
		Type	Mass g	Test range m	Bullet velocity m/s
shotgun	12/70	SP ⁴ /FS	17,9 ± 0,1	10 ± 0,5	605 ± 30
rifle	5,56 × 45	FJ ² /PB/HC2	3,45 ± 0,1	10 ± 0,5	980 ± 10
rifle	8 × 68 S	FJ ¹ /RN/SC	12,7 ± 0,1	10 ± 0,5	880 ± 10
rifle	5,56 × 45	FJ ¹ /PB/SC	4,1 ± 0,1	10 ± 0,5	905 ± 10
rifle	7,5 × 55	FJ ¹ /PB/SC	11,3 ± 0,1	10 ± 0,5	760 ± 10
rifle	7,62 × 39	FJ ¹ /PB/SC	8,0 ± 0,1	10 ± 0,5	700 ± 10
rifle	5,45 × 39	FJ ¹ /PB/SCP2	3,45 ± 0,1	10 ± 0,5	910 ± 10
rifle	7,62 × 51	FJ ¹ /PB/HC3	8,45 ± 0,1	10 ± 0,5	960 ± 20
rifle	7,62 × 51	FJ ² /PB/HC4	9,5 ± 0,1	10 ± 0,5	870 ± 10
rifle	5,56 × 45	FJ ² /PB/HC5	4,0 ± 0,1	10 ± 0,5	970 ± 10
<div style="display: flex; justify-content: space-between;"> <div> <p>FJ full metal jacket bullet</p> <p>FS full steel</p> <p>HC2 steel hard core, mass (1,17 ± 0,1) g hardness more than 63 HRC</p> <p>HC3 steel hard core, mass (6,0 ± 0,1) g hardness more than 63 HRC</p> <p>HC4 steel hard core, mass (4,3 ± 0,04) g hardness more than 63 HRC</p> <p>HC5 steel hard core, mass (0,61 ± 0,02) g hardness more than 63 HRC</p> <p>PB pointed bullet</p> <p>RN round nose</p> <p>SC soft core (lead)</p> <p>SCP2 soft core (lead) with steel penetrator</p> </div> <div> <p>FJ¹ = full steel jacket (plated)</p> <p>FJ² = full copper alloy jacket</p> <p>SP⁴ = spherical ball</p> </div> </div>					

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