BULLET-PROOF

EN 1522-1523
EN 1063

A brief explanation

There are currently two European reference standards for ballistics, which cover the testing and classification of resistance to attack by bullets:

- on glass in the construction (security glazing) **EN 1063;**
- on windows, doors, shutters and blinds **EN 1522-1523.**

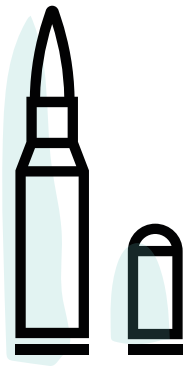
These standards include:

- the elements of construction subjected to tests;
- a different classification illustrated by the letters "**BR**" for classes of glazing and "**FB**" for classes of windows, doors, shutters and blinds;
- tests which are only carried out for the core of the element for standard EN 1063, additional tests that also test the **joints and structures** for standard EN 1522-1523.

The standard regulates a series of parameters to provide a framework for the laboratory tests in order to obtain comparable test results.

In fact, under “real” shooting conditions, the parameters below influence the trajectory of a bullet:

- the temperature of the ammunition;
- the ballistic coefficient;
- the upward or downward trajectory of the bullet compared with the horizontal;
- the rotation of the planet earth;
- the wind;
- the drift of the bullet;
- the dispersion elements the barometric pressure;
- the temperature of the air;
- the relative humidity (rhesus).



Test circumstances

The ballistic tests require the following obligation to be met: preventing anything from perforating the wall.

What is meant by perforating?

This means the wall is pierced by a projectile or a part of it and/or an opening is created between the side under attack and the rear side.

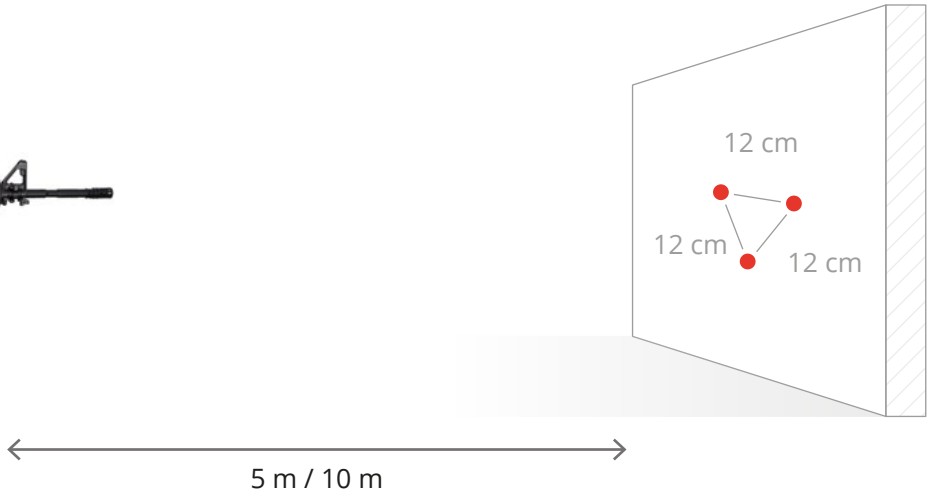
The following cases are considered to be perforation:

- **a projectile or a part of it passes** through the test body;
- **the rear side of the test body is splintered** by the bullet or a part of it, even if it is visibly stopped at the rear side of the test body;
- **a passage is created through** the test body, even if the passage subsequently closes up.

Ballistic tests have to be conducted following the procedure laid down in standard EN 1522-1523 and by approved official laboratories. We carry out our bulletproof tests in two of those official laboratories:

- the Banc National d’Epreuve of Saint Etienne (France);
- the Laboratory of the Department of Weapons Systems and Ballistics at the Royal Military Academy in Brussels (Belgium).

Banc National d'Epreuve
Saint-Etienne

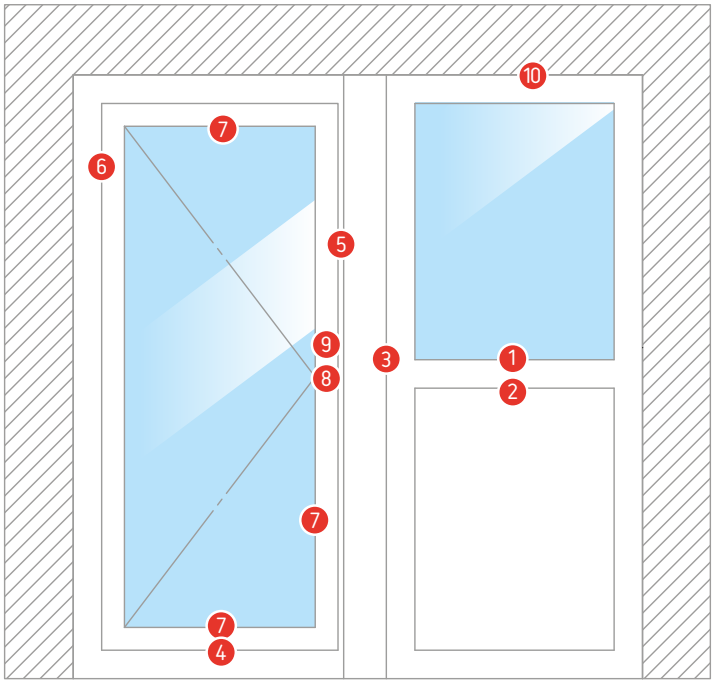


During EN 1063 tests, the impacts, of which there are three, are directed at the centre of the tested glazing, in such a way as to check **the resistance of the element's intrinsic composition.**

This test is also conducted for doors and frames (EN 1522-1523).

In addition to this first test, standard EN 1522-1523 checks the joints between the various elements as a second step. An example of completed tests with the various impact points over a sample of frames in a fixed glazed version, a fixed solid version and a hung version follows below.

Each joint will be tested by 3 shots at different points (apart from the lock test and cylinder which are unique).



1. Junction between glazing and crossbeam.
2. Junction between full infilling and crossbeam.
3. Junction between fixed frame and block frame.
4. Junction between leaf and doorsill.
5. Junction between leaf frame and block frame, lock side.
6. Junction between leaf frame and block frame, hinge side.
7. Junction between glazing and leaf profile.
8. Lock.
9. Cylinder.
10. Junction between block frame and brickwork (N.B.: this is not imposed in the standard but for the sake of consistency and rigour, we require this test to ensure a total solution, guaranteed to be bulletproof).

Official reports and documents

We would like to draw attention to the reports provided by the manufacturers of bulletproof joinery for their customers. Three types of “test reports” and certifications can be supplied:

BALLISTIC STEEL CERTIFICATION

This certification proves that the steel used has bulletproof properties but does not in any way measure the bulletproof properties of the construction of the joinery (profiles, junctions etc.).

ORIENTATION TEST REPORT

This test report may only concern one of the points of the joinery. In this case, the test is not official but is intended to guide manufacturers who are engaged in a product development process.

A frame may have satisfied an orientation test conducted on an opening/block joint, without having passed the complete test covering all the joints.

APPROVAL TEST REPORT

This test report provides assurance of the success of official trials that validate the element tested as a whole (see diagram above).

The concept of splitting and non-splitting

The test report indicates whether **splitting occurred (S) or not (NS)** within the secured zone. During the tests, an aluminium control sheet (0.02 mm thick) is placed on the protected side to detect any splinters which may have come from the element tested itself.

Any splinters are then analysed to determine where they come from and their composition.

The concept of **non-splitting** may be important in cases where the joinery elements protect staff who are constantly stationed behind them, for example a counter.

Classification

Standard EN 1522-1523 comprises **7 "closed" classes** covering the munitions most commonly available on the European market. Classes FB1 to FB7 and BR1 to BR7 (EN1063) are rated by increasing level of the protection provided.

For classes FB4 (44 Rem. Magnum) and FB6 (7.62 x 51), the test always starts with a preliminary trial that validates the performance of the element tested in accordance with the class below, that is respectively FB3 (357 Magnum) and FB5 (5.56 x 45).

During the tests, the laboratory reserves the right to test the element with ammunition from a lower class if this is deemed necessary.

*There are also other so-called "**open**" classes. These classes cover munitions and calibres less commonly found in Europe. The class with the worst reputation is **AK47 or Kalashnikov**, from the name of this weapon considered to be uncommon as it is not often officially sold in Europe, but which is in fact frequently used in armed and terrorist attacks. In terms of perforation strength, this is one of the level FB4 and FB5 closed classes.

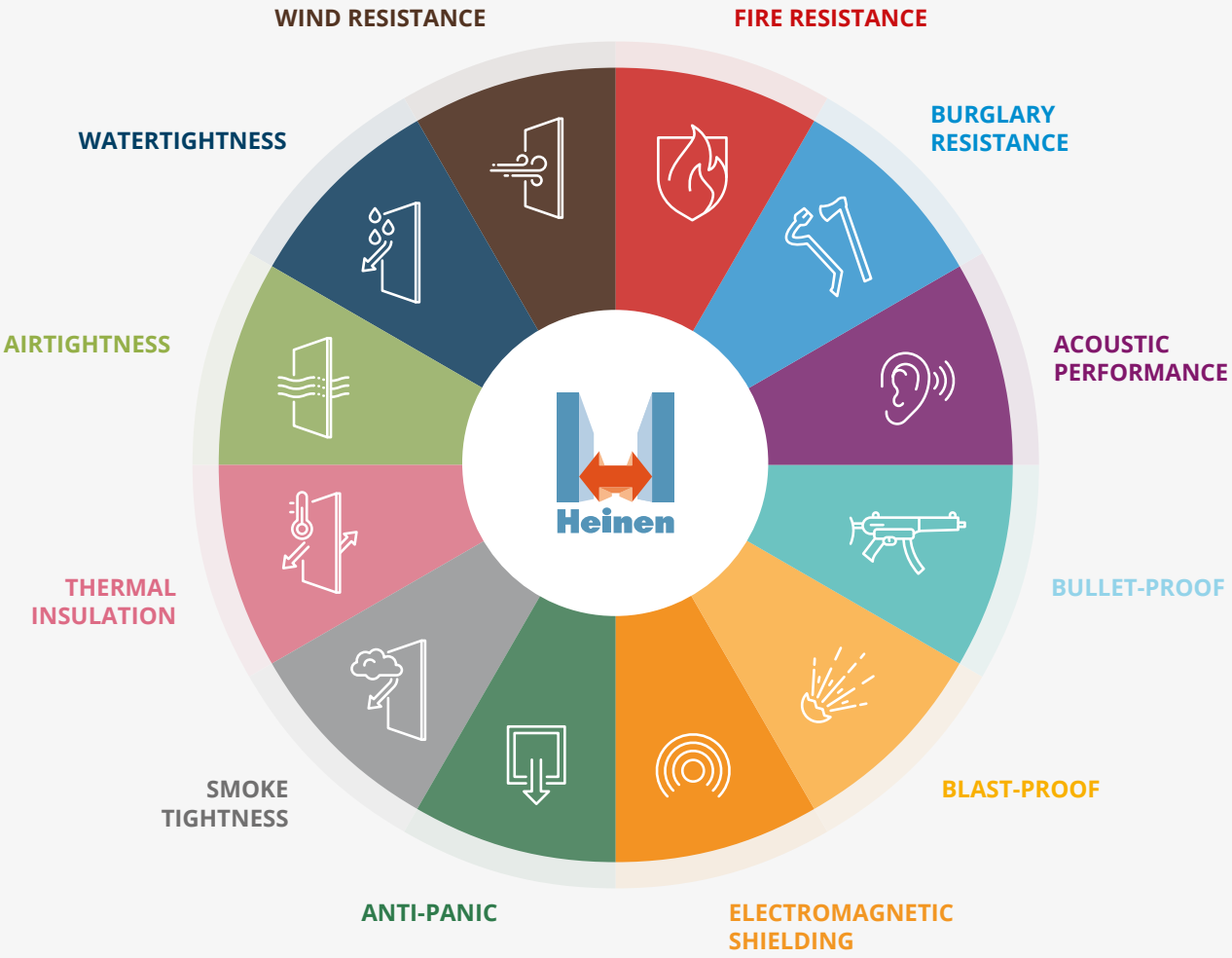
There is also an "**SG**" table giving the classifications and test conditions for resistance to bullets shot from hunting rifles.

Classes and values

Class EN 1522-1523	Class EN 1063	Weapon type		BULLET				Test conditions	
				Caliber	Shape	Structure	Weight (g)	Shooting dist. (m)	Velocity (m/s)
FB1	**BR1**	Rifle		22 LR		Round nose	• lead	2.6	10	360
FB2	**BR2**	Automatic pistol		9 mm Luger		Round nose	• full steel jacket • soft core (lead)	8	5	400
FB3	**BR3**	Hand gun		357 Magnum		Coned bullet	• full steel jacket • soft core (lead)	10.2	5	430
FB4	**BR4**	Hand gun		44 Rem. Magnum		flat nose	• full steel jacket • soft core (lead)	15.6	5	440
***AK47**	***AK47**	Kalach-nikov		7.62 x 39		pointed	• full steel jacket • soft core (steel) (niv. 2)	8	10	700/720
FB5	**BR5**	Assault rifle		5.56 x 45		pointed	• copper jacket • steel core • steel penetrator	4	10	950
FB6	**BR6**	Rifle		7.62 x 51		pointed	• full metal jacket • soft core (lead)	9.5	10	830
FB7	**BR7**	Rifle		7.62 x 51		pointed	• copper jacket • steel hard core	9.8	10	820
FSG	**SG1** **SG2**	Hunting rifle		12/70			• brenneke	31	10	420

*VPAM

Combining bespoke performance features



Heinen doors can combine performance features on a bespoke basis. Depending on your needs, one or more performance features are added to the basic, robust METAL+ door.