

sapa:

A92 BR

Bullet resistant windows and doors





Architect: KBC, Belgium

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Bullet resistant windows and doors

A92 BR is a thermally insulated, bullet resistant system for fixed vent, windows, inward and outward opening doors. The hollow front chamber offers the possibility to insert steel reinforcements. The system obtains the FB6(NS) classification in accordance with EN1522 standard.



Enhanced Safety

- The A92 BR is developed to add increased security to buildings such as banks, embassies and government buildings, police stations and firing ranges, courts and prisons, airports and congress centers, nightclubs, ...
- A92 BR is a robust system that will discourage even the most determined intruder.
- Bullet resistant threshold against deflection shots under the door leaf (option).
- The system contains special bullet proof steel to stop the round or to deflect the path of the round to avoid perforation of the rear face of the profile by the bullet or part of the bullet.
- The combination of multipoint locking, bullet proof safety glass and special hardware ensures a high resistance against forced entry. Internal tubular glazing beads prevent unclipping from the outside.
- Safety hardware: solid turning hardware for big vent weights (300 kg for doors).

A92 BR

Safety and security



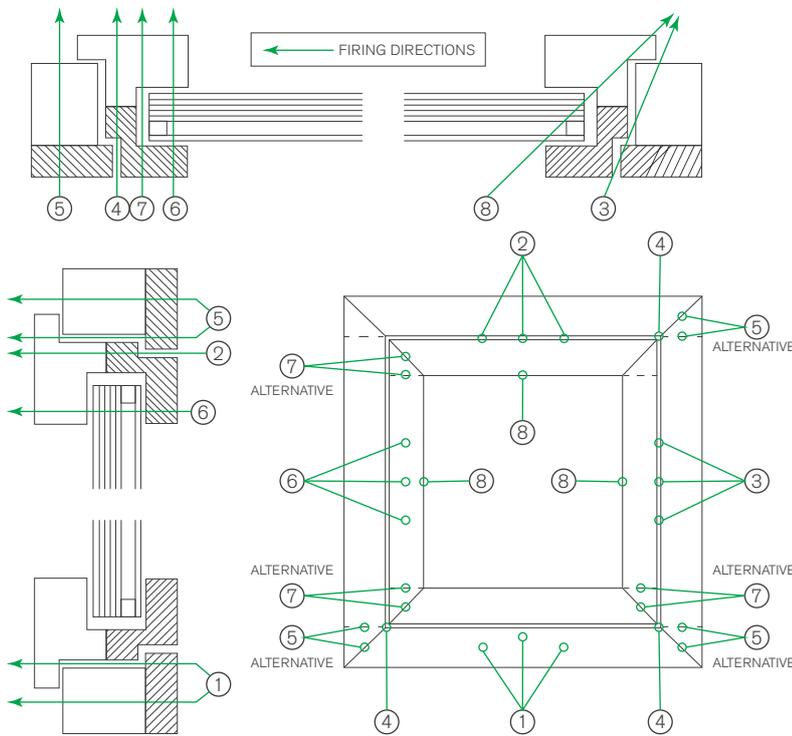
Besides steel armour inserts, the system also accommodates for tubular glazing beads, special locks, unique corner cleats, safety hardware and door sills to provide an effective protection against ballistic attack.

System Features

- A92 BR is the perfect solution for all bullet resistant applications for windows and doors with building depth of frame of 92 mm. The building depth of vent is 102 mm.
- The system accommodates glazing of 28 - 56 mm for frame and 40 - 67 mm for vent.
- The additional strength of a 3-chamber system with a building depth of 92 mm for the frame makes it possible to construct complex structures and large surfaces with a maximum of light penetration.
- Corner connection by specially designed solid adjustable corner cleats with fixing screws gives the construction greater strength, rigidity and stability.
- Different tubular glazing beads of 22 mm height and steps of 2,5 mm. Types: Classic (straight), Rustic (decorative) or Futuro (rounded).
- Acoustic gasket

A92 BR

Fully tested for angled shots



Angled shots

- A92 BR was tested officially, according to EN1523. These tests included both direct bullet impact (90 degree) and angled shots, in accordance with the test method in accredited test laboratories. Especially the successful test with angled shots are very important because of the weak points at the different seams between profile and glass.
- Aluminium extrusion profiles with two armour steel inserts designed to be bullet resistant to EN 1522: FB6(NS) classification

Class EN1522	Glass EN1063	Type of weapon	Calibre	Bullet type	Bullet mass (g)	Test range (m)	Bullet velocity (m/s)
FB1	BR1	Rifle	.22 LR	L/RN	2.6 +/- 0,1	10 +/- 0,5	360 +/- 10
FB2	BR2	Hand gun	9 mm Luger	FJ(1)/RN/SC	8.0 +/- 0,1	5 +/- 0,5	400 +/- 10
FB3	BR3	Hand gun	0.357 Magnum	FJ(1)/CB/SC	10.2 +/- 0,1	5 +/- 0,5	430 +/- 10
FB4	BR4	Hand gun	.357 Magnum	FJ(1)/CB/SC	10.2 +/- 0,1	5 +/- 0,5	430 +/- 10
			.44 Magnum	FJ(2)/FN/SC	15.6 +/- 0,1	5 +/- 0,5	440 +/- 10
FB5	BR5	Rifle	5.56 x 45*	FJ(2)/PB/SCP1	4.0 +/- 0,1	10 +/- 0,5	950 +/- 10
FB6	BR6	Rifle	5.56 x 45*	FJ(2)/PB/SCP1	4.0 +/- 0,1	10 +/- 0,5	950 +/- 10
			7.62 x 51	FJ(1)/PB/SC	9.5 +/- 0,1	10 +/- 0,5	830 +/- 10
FB7	BR7	Rifle	7,62 x 51**	FJ(2)/PB/HC1	9,8 +/- 0,1	10 +/- 0,5	820 +/- 10

L: lead
 FJ: full metal jacket bullet
 PB: pointed bullet
 SC: soft core (lead)
 SCP1: soft core (lead) and steel penetrating (type SS109)
 HC1: steel hard core, mass (3.7 +/- 0.1) g, hardness more than 63 HRC

CB: coned bullet
 FN: flat nose
 RN: round nose

* To achieve the stated values for (5.56 x 45), the recommended barrel twist length equals (178 +/- 10) mm.

** To achieve the stated values for Class FB7, the recommended barrel twist length equals (254 +/- 10) mm.

note 1: When a shot is to be fired from a single point, the test range may be reduced to achieve the firing accuracy as defined in section 6 of EN 1523:1988. In this case it may not be possible to measure the velocity of the bullet.

note 2: To be classified FB4 or FB6, the specimen shall be tested with both calibers listed.

A92 BR



Architect: Jean Van Meerbeeck, Aarschot

Project support & service

- Sapa Building System's experienced Project Team will advise you on the best product solutions.
- We can help you with pricing, strength calculations, thermal simulations, etc..
- Specific project solutions can be developed.
- Samples, catalogues, technical specifications and digital drawings are available.

SapaLogic is a user-friendly calculation program for fast, efficient and complete calculation of windows, doors, structures, curtain walls and conservatories. SapaLogic is very much complete but modular still: the different versions can be adapted to your company's needs.

SapaThermic is detailed thermal simulation software for doors, windows, sliding systems and curtain walls. It can either be linked to SapaLogic or act as a stand-alone version.

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Configurations and performances

Dimensions

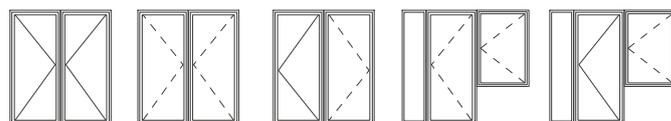
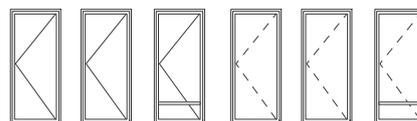
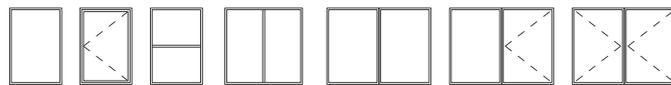
Min. sightline fixed frame	63 mm
Min. sightline window with inward opening vent	122 mm
Min. sightline inward opening door	154 mm
Min. sightline outward opening door	154 mm
Min. sightline transom	98 mm
Profile depth frame / Building depth	92 mm
Profile depth vent	102 mm
Max. window (width x height)	1400 x 1800 mm
Max. door (width x height)	1200 x 2440 mm

Glazing

Rebate height	22 mm
Infill thickness fixed frame	28 - 56 mm
Infill thickness vent frame (window)	40 - 67 mm
Infill thickness vent frame (door)	24 - 56 mm
Glazing method	dry glazed with EPDM gaskets

Performances

Thermal insulation	$U_i = 2,49 \text{ W/m}^2\text{K}$ (EN ISO 10077-2)
Forced entry resistance	class 4 (EN 1627 - 1630)



Bullet Resistance Performance

Tested element:

- fixed window
- connection between 2 frames
- turn window
- fixed window with T-connector
- inward opening door
- outward opening door

Used armour:

- Bullet resistant steel 2 x 4 mm

Achieved class for all:

FB6 NS

and all preceding classes*



* see table page 5

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