CPNI
Centre for the Protection of National Infrastructure

GUIDANCE NOTE: BULLET RESISTANT WINDOWS, DOORS, BLINDS AND SHUTTERS

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Introduction

The use of guns by both terrorists and criminals may be considered a threat for some locations. If this is the case bullet resistance may need to be provided for parts of the building. Guidance to assist the building owner in selecting a design threat is contained in EBP Note 13/14.

The aim of this guidance note is to assist the building owner, security managers and facility managers to ensure that suitable bullet resistant windows, doors, blinds and shutters are selected to mitigate the threat and that they have been certified as meeting the correct standards.

If in doubt, technical advice should be sought from specialist engineers with experience and training in designing and implementing bullet resistant measures. These may be Members of the Register of Security Engineers and Specialists (RSES) www.rses.org.uk or will be able to demonstrate that they have similar levels of competence to those required for membership.

Test standards[1]

There are European test standards for complete windows, doors, shutters and blinds (BS EN 1522 and BS EN 1523). However there is a separate, complementary standard for bullet resistant glass (BS EN 1063).The standard for windows etc. does not provide a method for testing the interface between the frame of the product and the wall in which it is mounted.

The test standard uses the same threat requirements as the standard for bullet resistant glass but prefixes the test level with FB rather than BR as shown in Table 1 which is a simplified version of the table in BS EN 1522.

Table 1 – FB threat summary

Threat	Weapon	Calibre	Bullet Type	Mass (g)	Velocity (m/s)	Remarks
FB 1	Rifle	0.22 in long rifle	Lead	2.6	360	
FB 2	Hand gun	9 mm Luger	Ball	8.0	400	
FB 3	Hand gun	0.357 in Magnum	Ball	10.2	430	
FB 4	Hand gun	0.44 in Magnum	Ball	15.6	440	
FB 5	Rifle	5.56 mm x 45	Ball with steel penetrator	4.0	950	NATO bullet
FB 6	Rifle	7.62 mm x 51	Ball	9.5	830	NATO bullet
FB 7	Rifle	7.62 mm x 51	Armour piercing	9.8	820	NATO bullet
FSG	Shot gun	12 bore x 70	Solid lead slug	31.0	420	

The standard focuses on weaknesses in the whole system, which is likely to be at the interfaces around the glass, corner joints, at hinges and locks and round the edges of opening lights.

The standard requires the testing organisation to analyse the window etc. being tested, identify potentially vulnerable areas and develop a test plan to assess these areas. It suggests the vulnerable areas to be considered and indicates them on diagrams. It generally requires each area to be tested with three shots. The angle of attack should be adjusted to produce the worst potential damage.

Different parts of the window etc. may be vulnerable to different types of bullet. The hardened steel core of an armour piercing round may penetrate thinner parts of the assembly whilst molten lead from a ball round may squeeze through narrow gaps.

The manufacturer should be able to produce evidence of its product having been tested by an accredited test organisation.

[1] BS EN 1522:1999 Windows, doors, shutters and blinds – Bullet resistance – Requirements and classification
BS EN 1523:1999 Windows, doors, shutters and blinds – Bullet resistance – Test method
BS EN 1063:2000 Glass in building – Security Glazing – Testing and classification against bullet attack

The standard for windows etc. does not provide a method for testing the interface between the frame of the product and the wall in which it is mounted. This is a potential vulnerability that should be examined by a specialist.

Further guidance

Further guidance is contained in:

EBP Note 13/14 – Protection against bullets

EBP Note 14/14 – Bullet resistant glass