

Glazing protection

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Modern buildings make much greater use of glass than older buildings, which means that most bomb casualties nowadays are caused by flying glass.

This page provides information, primarily aimed at architects and structural engineers, on the best glazing solutions available to protect against flying glass.

There are three main methods of protection against flying glass:

- applying transparent polyester anti-shatter film (ASF) to the glass and providing bomb blast net curtains (BBNC). This is a retro-fit upgrade to existing glass in order to reduce fragments and splinters. In timber-framed Georgian-style windows bomb blast net curtains should be used in conjunction with the ASF.
- installing blast resistant glass (i.e. laminated glass) in new buildings or refurbished windows.
- installing blast resistant secondary glazing inside exterior glazing.

Guidance notes on how to enhance glazing to resist blast and how to install ASF and BBNC have been produced for CPNI by HOSDB. There are also guidance notes detailing how to assess and test the adhesion of ASF and for government departments the contracts that are in place for installing ASF and BBNC.

Anti-shatter film

Use polyester film 175 microns thick (including adhesive layers of multi-ply) or film with equivalent properties. Consider using 300 micron film for panes over 6 square metres area, or over 8mm thick, or for ground floor windows of over 3 square metres. The specification can be lowered to at least 100 microns if bomb blast net curtains are also used.

The film must be fixed in clean and dust-free conditions. On new windows or areas being re-glazed, apply film to the glass to its extreme edges before fixing the frames. If, however, there is to be extensive building work after installation - in which case dust and debris may cause unacceptable scratching - it may be better to postpone fixing the film until work is complete. In this case the film should be applied as close as possible to the putty of glazing bars with an edge gap of less than 3mm. 5mm can be tolerated along particularly irregular putty edges.

Butt joints are acceptable if the film is insufficiently wide to cover the glass in one piece.

The film cannot be applied to the patterned side of frosted, figured or reeded glass.

With double glazed windows consisting of two separate frames, in which the inner frame can be opened independently of the other, treat both panes. If the inner pane cannot be opened independently, or a "sealed unit" is fitted, applying film to the inner panel is sufficient. Sometimes inner frames are only lightly fitted; if so, they should be fully secured.

Bomb blast net curtains

Use bomb blast net curtains only in combination with anti-shatter film. If the film is of sufficient thickness they may not be needed, but they are vital with single glazed, small paned windows in Georgian frames.

Curtains should be of 90 or 100 denier polyester terylene curtain material and be made twice the width and 1.5 times the length of the window. The bottom hem must incorporate flexible weights at the rate of 400 grammes per metre. The excess length should be folded concertina-wise and placed in shallow troughs at window sill level.

Curtains should normally be installed 50 to 100 mm from the glass, but can be farther back if it is impossible to hang them closer.