

Quick facts

- Standard glass – both float and toughened – can be broken with a garden rock.
- Toughened glass shatters when it breaks and will mostly fall out of the frame.
- Standard window frames can be bent and broken with a crowbar.
- Keyed internal locks do little from a security perspective.
- Most add-on/retro fitted security products compromise the look and/or function of windows.
- There is no Australian Standard that covers the security of windows and doors.

Security solutions

- Risk assess the project and identify where security may be an issue.
- Use a laminated glass with a thicker vinyl interlayer.
- Use compression operating window frames – awning and casement.

Glass basics

The minimum thickness and type (float or toughened) of glass that is used in windows is determined by the Australian Standard (AS1288) for using glass safely in a home. This “human impact” section is meant to ensure that if you run into a window that the risk of injury is minimised. Today most glass used in windows will be between 4mm and 6mm thick, and depending on its location it may also be toughened.

Float glass between 3mm and 8mm can be broken with a single blow from a hammer. The glass will break into large and small shards with sharp edges. Depending on the window size some pieces may stay in the frame, held in by the glazing bead/wedge. But it is likely that around the impact point most of the glass will fall out.

Toughened glass between 3mm and 8mm can be broken with a single blow from a pointed object like a centre punch. The glass will shatter into small fragments and most of it will fall out of the frame.

Neither float or toughened glass are good security solutions.

Laminated glass – the security solution

Laminated glass is safety glass that has been manufactured by adhering two or more sheets of glass with a flexible interlayer. The interlayer is made from polyvinyl butyral (PVB) and prevents the glass from disintegrating when broken. The interlayer does not impact the transparency of the glass.

Standard laminated glass 6.38mm thick can be broken with 2 blows from a hammer. However the clear vinyl interlayer between the two pieces of glass will hold the broken glass in place. It will then take several more blows to create a wider hole in the glass sufficient to gain entry.

Security laminated glass is 6.52mm thick and requires 20 blows from a hammer to break. This however only breaks the glass and does not create an opening for an intruder. It then takes repeated blows to create even a small hole in the glass. The strength of the security glass comes from its vinyl interlayer. In standard laminated glass the vinyl is 0.38mm thick; in security glass it is 4 times thicker at 1.52mm.

The additional benefits of laminated glass are:

- The PVB interlayer reduces fading
- The greater thickness improves acoustic performance

Beyond clear laminated glass consider:

- Using a toned glass instead of clear to reduce glare
- Using laminated glass in an IGU to achieve security and insulation

Also remember, if it is more difficult to gain entry through security glass it is also more difficult to achieve a rapid exit by smashing the glass in the event of a fire. It is critical that windows are not locked with a key lock while the house is occupied.

Window frames

Different window fenestration types will determine how easy it is for an intruder to try and force the complete sash out of the frame instead of breaking the glass.

Compression sealing windows lock the operating sash against the frame providing a robust system which will have resistance to forced entry. Awning and casement style windows can have multi-point or additional locks added to further improve the resistance.

Most sliding systems, including double hung, provide an easier target for intruders. In most cases the operating sash locks against the fixed sash and even when locked they can move within the frame. The fixed sash in a Stegbar window is "sash glazed" – this system does have marginally more resistance as it can be mechanically fixed to the outer frame. In many other manufacturers products the fixed sash is "direct glazed." Such systems are compromised even further as the vertical mullion's strength comes only from the fixing points to the outer frame.

From a material perspective, there is little difference between aluminium, cedar and A.T. 2000 with regards to their strength in preventing forced entry.

Keyed locks

In most cases keyed window locks or door deadlocks provide no extra strength or resistance to forced entry. Keyed window locks and door deadlocks are only required by insurance companies to prevent intruders from easily removing household items through readily operable windows and doors. However if an emergency exit is required, for example in the case of a fire, keyed locks and deadlocks without a key can be a death trap. And leaving the key in the lock will compromise the whole point of having them and may also impact on insurance claims.

Stegbar security solution range

Glass

Glass thickness	Interlayer thickness	Glass finish	Blows to create hole
6.38mm	0.38mm	Clear, Tone, Low-E	2
6.52mm	1.52mm	Clear, Tone	20
7.52mm	1.52mm	Clear, Tone	20

Window style

Awning and casement are the most secure fenestration options.

Pricing

Windows featuring a Stegbar security solution will cost more than a basic window glazed with 4mm clear glass. The percentage below should only be used as a rough guide to the likely premium. This is based on a 1m x 1m single lite window, and will vary depending on size and mandatory glass requirements designated by Australian Standards.

- 6.38mm laminated glass – 15%
- 6.52mm laminated security glass – 19%
- 7.52mm laminated security glass – 50%



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