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Security glazing: is it all that it's cracked up to be?

A guide to the selection of effective security glazing

Craig Devine and Richard Flint

IHS

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Executive summary

The BRE Trust-funded research project 'Security glazing: is it all that it's cracked up to be?' followed a spate of burglaries in the West End of London in 2008. The burglaries in London used 'smash-and-grab' attacks to steal expensive goods such as jewellery and designer clothing from window displays. This showed that of all building elements, glazing offers the least resistance to impact and explosive loading. This was further demonstrated in the 2011 series of riots in UK major cities. Additionally, the majority of injuries from explosive events, including terrorist attack, invariably result from flying glass particles. As such, improvements in the design of glazing to resist attack are required.

Standards are critical to the selection of an appropriate product. However, in the case of glazing a number of different standards have been developed based upon arbitrary methods. For example, glazing may be subjected to a simulated manual attack or impacted by a known mass at a known velocity. The results from such tests are not typically comparable with each other, and so it is not immediately obvious which standard is best suited to a particular application.

This publication has been produced from a BRE Trust-funded research project to investigate the performance of glazing in security applications. It outlines the different types of glazing, guides the reader through the maze of applicable standards and offers advice on selecting glazing systems appropriate to their intended use.

1 Introduction

Naturally occurring glass, such as obsidian, has been used since the Stone Age for the production of sharp cutting tools, and the first evidence of man-made glass can be traced back to 3500 BC in Mesopotamia. Glassmaking manuals can be dated back to 650 BC, where instructions on how to make glass are contained in cuneiform tablets.

Early glass was a luxury item and considered as precious as gold. Egyptians created glass using a method called 'core-forming', whereby molten glass was wrapped around a core (made of clay and dung) and then shaped by rolling the glass on a smooth surface. Glass-blowing was discovered by AD 14; this process of making glass has changed very little since then.

The material began to be used for architectural purposes by the Romans, following the discovery of how to make clear glass around AD 100. Cast glass windows then began to appear in the most important buildings in Rome. Glassmaking subsequently spread across Europe and beyond.

The techniques used to produce glass continue to advance even today, resulting in clearer glass with less impurities and imperfections. Glass has been used for a variety of applications, from jewellery to mosaic tiles, from storage containers to stained-glass windows.

Probably the most common type of glass we see today is that used to form the glazing of windows in the buildings we live and work in. Glazing not only allows natural light to permeate into buildings, it must also keep the elements out and help to maintain a comfortable environment within the building. Glazing also needs to provide a host of other performance attributes, including acoustics, fire resistance and security.

This guide was primarily developed to aid the selection of effective security glazing. It will help architects, consultants, police officers and others who advise people on the selection of effective security to determine whether the glazing provides an equivalent level of resistance to forced entry by criminals as that provided by the building elements into which the glazing is fitted.

Whilst the focus of this guide is physical security and, in particular, the resistance to manual attack of different generic types of glazing, the guide also contains advice relating to those other performance attributes.

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