WHITEPAPER

The seven tests that prove your front entrance door is up to scratch

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The front entrance door is a vital element of any building. If not built to a high standard, it represents a point of weakness where fire, smoke or unwanted intruders can enter. But how do you know if it has been built to a high standard?

There are seven key tests, conducted or scrutinised by independent examiners, that provide evidence that a door is fit for purpose.

Test 1
Security

Although entrance doors do not by law have to be tested under PAS 24, many landlords, councils and architects will specify that the doors used in their buildings must have passed this standard. Doors tested under PAS 24 (PAS stands for 'Product Assessment Specification') either pass or fail – there are no grades of success or failure. During the test, doors are subjected to attacks that simulate those most often associated with opportunistic burglary. PAS 24 provides an independent assurance of quality, and its credibility is reinforced through PAS24 testing being valid only when conducted by test centres that are UKAS (United Kingdom Accreditation Service) approved.

Test 2
Fire

Fire safety obligations are set by the Regulatory Reform (Fire Safety) Order 2005. They apply to public buildings, places of employment, entertainment and leisure, and the communal areas of buildings that contain separate flats (including individual flat entrance doors). The regulations require that fire doors must be effective at preventing fire, and this is demonstrated by them having been tested under BS 476 (the relevant British standard) or EN 1634 (its European equivalent).

Such testing must be carried out by UKAS-approved body and since 2019 must usually be conducted on both sides of the door to demonstrate that the door will contain the spread of fire whichever side of the door the fire is on.

During fire testing, a door will be exposed to high temperatures for the duration of protection required – Building Regulations require different duration times of 30, 60, 90, 120 minutes, etc, according to the door's siting and purpose – or until the door fails. The point at which a door is considered to have failed is defined within the testing standards and relates to, among other things, when flames have been present on the non-fire side for ten seconds or the temperature on the non-fire side of the door exceeds certain levels.

Test 3
Smoke

During smoke testing, a doorset will be placed in a sealed pressurised chamber with smoke on one side of it. The amount of smoke that leaks through to the other side of the door is then measured. The door passes if the leakage is less than the permitted 3m3/h/m (three cubic metres per hour for each linear metre of door edge). There are no distinctive grades of effectiveness at controlling smoke: the doorset either passes or fails.

Test 4
Endurance

Fire doors need to retain their ability to protect against fire and unauthorised intruders over long periods of time. To test their enduring integrity, doorsets are set up in rigs that repeatedly open and close them to prove their durability. It can then be certified as good for the relevant number of cycles – this aspect of door performance is measured under BS6375-2.

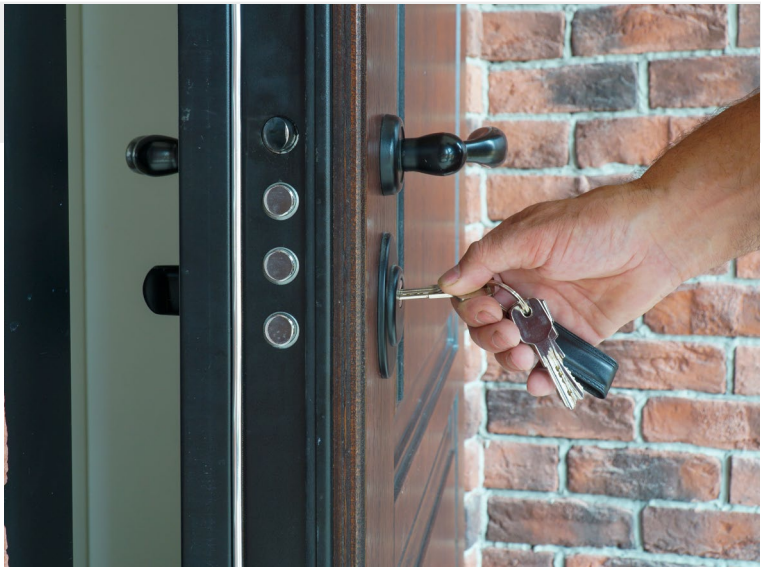
Test 5
Thermal

While fire doors have to be effective at resisting the extreme heat of fires, they also need to provide effective insulation from the cold. Their ability to retain internal warmth is expressed as a U-value. This shows how much heat (in Watts) flows through each square metre of doorset, for every degree Kelvin of difference between inside and outside temperatures (or, in mathematical terms, W/m2K). The lower the U-Value the better, as it means more heat is retained within the building – good for the environment and good for energy bills! Thermal testing must be done by a UKAS approved laboratory in accordance with BS EN 10077-1.

Test 6
Weather

Fire doors also have to be able to withstand the elements, especially when opening directly on to the exterior of buildings. Rain and wind should not affect their performance, nor should they allow draughts. These facets of performance are tested, by UKAS approved labs, under BS6375-1 or BS EN 14351-1 and some other standards. For example, a door's watertightness is measured under BS EN 1027, which involves spraying a door using gradually increasing volumes of water and air pressure until the designated failure point – basically any water other than caused by condensation being found on the reverse side – is reached.

Test 7
SBD



Secured by Design (SBD) was set up by the UK Police Service in 1989, initially to reduce crime by improving the physical security of buildings. Since then, its remit has extended so that the SBD scheme now looks at a broad range of factors relating to public safety and security. Products – such as fire doors – that reach the required standards are accredited by SBD, and companies making these products can become members of the SBD scheme (Solidcor is a member company).

Although not part of the regulatory testing regime, SBD provides an independent mark of quality, and bases many of its requirements for products on specific legal standards having been achieved.

The testing process

With each of the different tests described, it is important to remember that what is being tested is a doorset, not just a door panel. Building Regulations define a fire doorset as 'a complete door assembly, assembled on site or delivered as a completed assembly, consisting of the door frame, leaf or leaves, essential hardware, edge seals and glazing, and any integral side panels or fanlight panels in an associated door screen.'

Fire doorsets are tested by first defining the doorset – its complete specification – then conducting the tests described above. This produces primary test evidence from which approved uses (or Direct Applications) are derived. However, the almost infinite variations in doorsets make it impossible for certification to be based solely on direct test results. Instead, UKAS-approved certification companies examine the specification and test results and assess what variations on the specification of the tested doorset – for example, an increase in the amount of glazing, or a change in the fittings – are permissible for the test results to retain validity. These variations are known as Extended Applications (EXAPs) and the resulting range of approved variations from the original doorset specification is known as a Field of Application.

Note that the integrity of the overall testing regime is protected not only through just UKAS-approved laboratories being allowed to determine the Extended Applications, but also by them being allowed to extend them only within ranges set by the relevant testing standards.

Reassurance

Although we have only scratched the surface of how doors are tested to destruction – literally in many cases – we hope we have demonstrated how these seven areas of testing combine to provide reassurance that doors are fit to meet all of the challenges thrown at them. The tests are conducted to vigorous standards, and carried out or assessed by independent experts who themselves are under the oversight of a body, UKAS, that exists solely to ensure the continuing integrity of the testing system. Architects, building owners and occupants can all be confident that front entrance doors meeting the test standards deliver safety and security.