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Product testing and best practice

By Kevin Towler, Managing Director of Chiltern International Fire.

Obtaining test evidence against the required performance criteria is one way to demonstrate that a product will perform in a building – yet it might still fail when installed.

This can be because:

- The product was tested to an inappropriate standard
- The product failed the test but was supplied regardless
- The product supplied was not the same as that tested.
- The manufacturer falsely claimed a test had taken place
- The product had passed the test but was wrongly installed
- The product installed was composed of components tested to different international standards.

Any test method aims to simulate as closely as possible what happens in practice. There will be occasions, of course, when the test method will not simulate actual fire conditions – but a product which has been fire tested will have a greater chance of containing the fire than one which has not.

Test methods do change with time and vary to some extent around the world. Most countries now accept, however, that the only way to demonstrate the performance of a fire-rated product is to undertake a full-scale fire test.

International fire resistance test methods are generally based on the same time temperature curve specified in the International Standard ISO 834, with generally the same pressure regime within the furnace and the same failure criteria.

A notable exception to this is the American test method because until very recently, the previous standard ASTM E 152 stipulated that all fire doors be tested to a negative pressure in the furnace. This in our view is a less onerous pressure regime for timber fire doors, so can give a very different performance outcome to British and other international test methods, undertaken to positive pressure.

It must be recognised that ASTM E 2074-00, which superseded ASTM E 152, now gives the option to test to either positive or negative pressure. It is therefore suggested that the specifier or the approving body checks how the door was tested.

The net effect is that it can prove difficult to put together a fire doorset using products tested to different standards, unless the test evidence is considered very carefully. A good example of this is when a timber door tested to a British or European standard is fitted with hardware tested or certified to American standards. Hardware tested to American standards has generally been designed and tested on steel or composite doors. When fitted to a timber door, however, it may prove totally unsuitable.

By the same token, a timber door leaf installed in a timber frame might achieve 60 minutes' fire resistance, yet the same door leaf will not achieve 60 minutes if installed in a steel frame, even if that steel frame has independently achieved 60 minutes' fire resistance. The performance will be reduced by up to 50%. It is possible to purchase timber door leaves which have been successfully tested in steel frames, but generally the intumescent detailing around the door will be different to that which is used in a timber frame. Specifiers should take great care, therefore, when specifying components to ensure that they are compatible.

Poor site practice is another major reason for poor performance. Fire doors could fail to meet their performance expectations for several reasons, including:

- Incorrect filling (or not filling at all) of the gap between the back of the frame and the wall
- Unsuitable method for fixing the door to the wall
- Planing the door to make it fit into the installed frame
- Fitting the door with too large gaps between the leaf and the frame.

There is no easy solution. These are all issues which have developed over many years, where bad practice has become the norm - 'we always do it like this' – not helped by the very tight timescales for construction projects in the region. Yet the fact that timescales are so short means that there is no room for mistakes in the specification, supply or fixing of the different products.

There are three key steps to improve performance:

1. The product must be tested to demonstrate that it can achieve the required performance rating.
2. Ideally the specifier should choose a third-party certified product, which ensures that the product has a defined scope of approval and that it is manufactured consistently to a certain standard.
3. The product needs to be installed correctly.

To achieve membership of the Q-Mark third-party certification scheme, it is a requirement for the manufacture to use tested products which are compatible with each other, to ensure that the complete doorset will achieve the required rating. The manufacturing process is regularly audited to ensure that that the products are made in accordance with the specification. Audit testing is then undertaken to further demonstrate the performance of the product or to identify areas where improvements in the manufacturing process need to be undertaken. The Q-mark installer scheme is available to ensure the installer has been correctly trained to make sure the doorset is installed correctly.

- For further information on: Chiltern International Fire visit www.chilternfire.co.uk; the Q-Mark fire door scheme or for a list of certified manufacturers visit www.bmtrada.com.

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