WHITEPAPER

A look beneath the surface of different fire door types

SOLIDCOR

SAFE TODAY SAFE TOMORROW

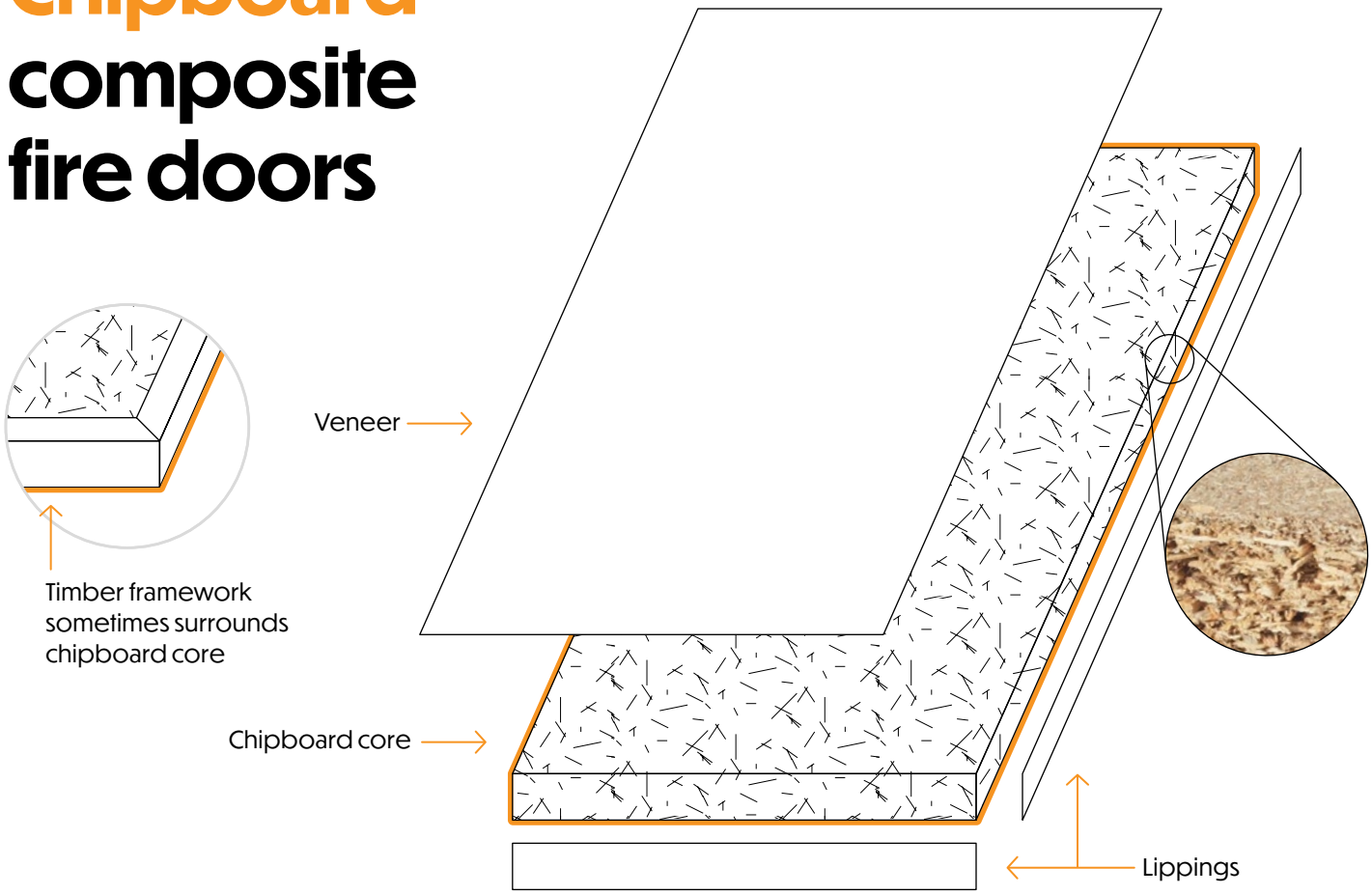
Understanding the different types of fire doors

Fire-rated doors are an integral part of modern building codes and safety standards, performing a vital life-saving role in the event of a fire. There are many fire door options on the market, featuring different styles and materials, all of which have undergone rigorous testing to meet specific fire-resistance standards.

However, this does not mean that all fire doors are the same. While all will have achieved a 'pass' in ideal test circumstances, they can perform very differently in the event of a fire, once the door has been in use for a few years.

The difference in performance largely comes down to the construction type of any given door. In this piece, we peel back the surface of the common construction types and highlight the critical areas to be aware of when specifying fire doors.

Chipboard composite fire doors

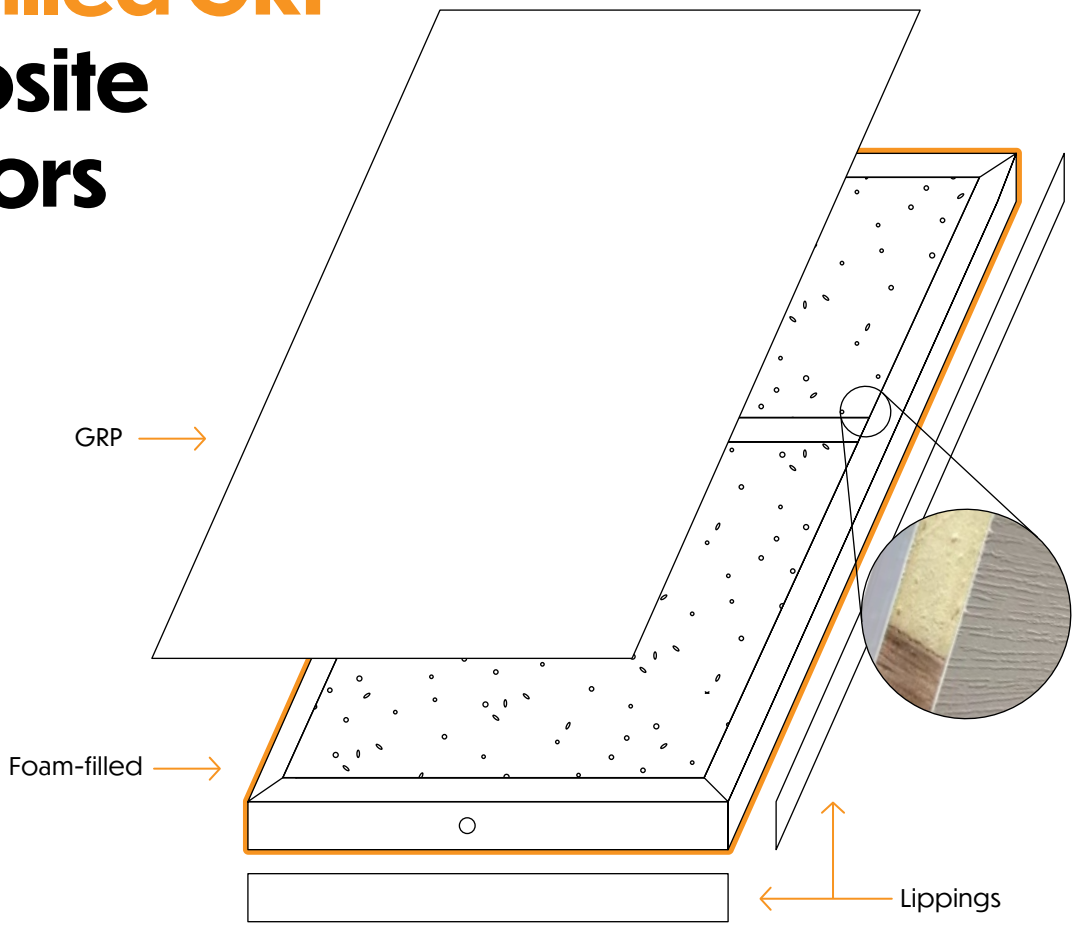


Chipboard fire doors are constructed using a core of high-density chipboard which is made from compressed wood particles and resin. The core may be an edge-to-edge panel, or the chipboard may be set within a timber framework. This core is then faced with a veneer and lipping/edging to enhance its finish and fire resistance. In its original manufactured state, this door construction can achieve a clear pass in a fire test.

The downside to this style of door is that chipboard, due to its composition, is susceptible to crumbling away from fixings. It typically begins to fail in areas where repeated use means that screws embedded within the chipboard are put under strain – for example those holding hinges and door handles.

As chipboard doors are heavy, there typically is extra strain on screws holding the hinges. If ironmongery comes loose, the integrity of the door is seriously compromised and it will no longer perform in the event of a fire as it did when tested. Chipboard can also be more susceptible to moisture damage over time, particularly where loose ironmongery creates a point of ingress for any water, and this creates areas of weakness.

Foam-filled GRP composite fire doors

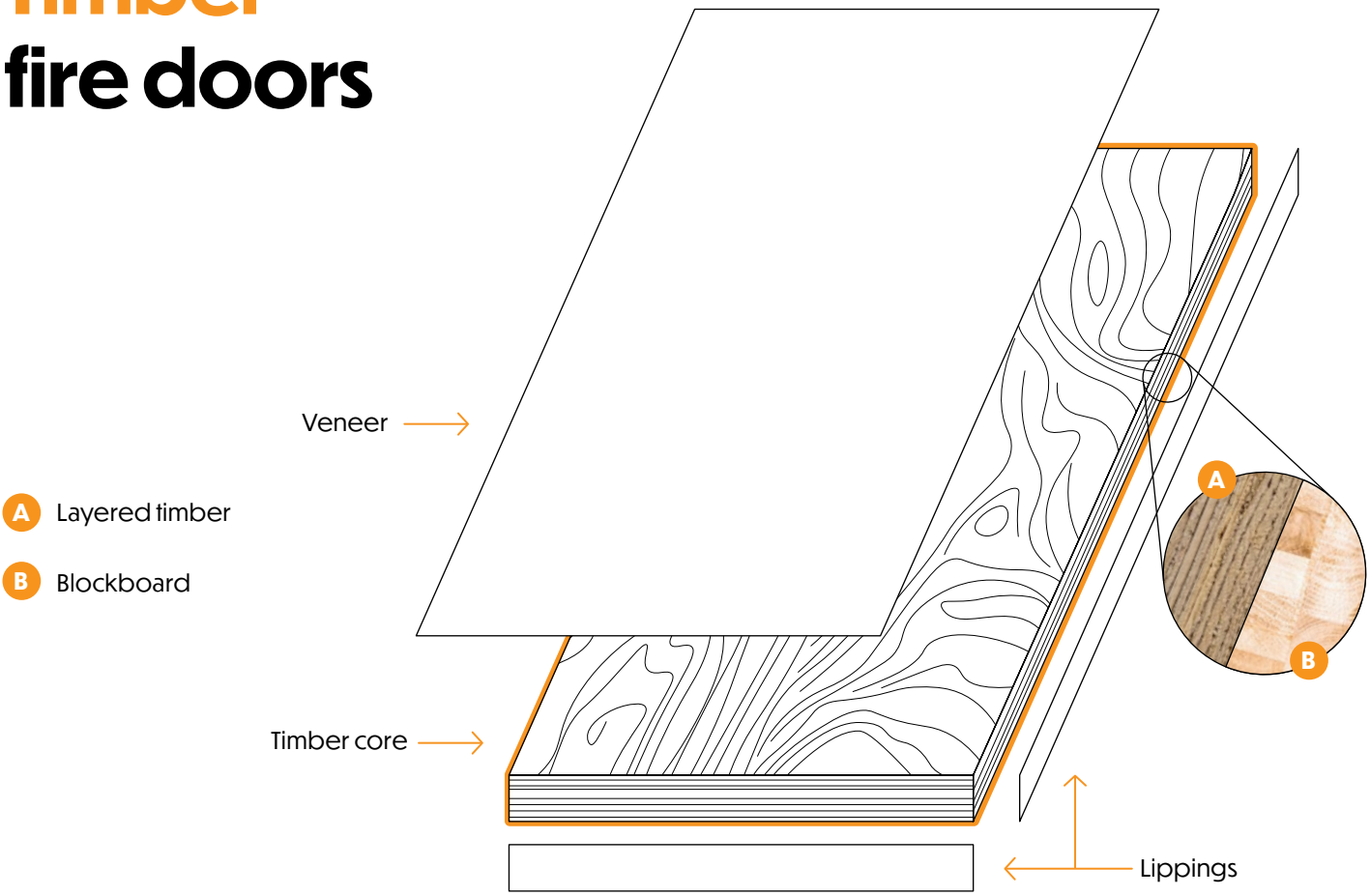


Foam-filled GRP doors are made using a multi-step process. A frame is constructed in 30mm timber to form the door panels, with holes drilled through the framework to allow insertion of the foam. The frame is then faced with glass-reinforced plastic (GRP), creating a sealed but hollow door panel. This is then filled with a high-density polyurethane foam, injected into the entrance hole within the framework and flowing throughout the door panel. The GRP facing has high fire resistance, providing it remains an unbroken surface.

There are several weaknesses to this door type, to the extent that many feel they should no longer classify as fire doors. The Grenfell tragedy brought them into the spotlight as they were implicated in the report. The first issue is that the GRP face material is very easily compromised – intruders have even been known to cut the material simply with a knife, in order to gain entrance.

As soon as the surface is broken, fire will get inside to the highly flammable polyurethane foam core, and the door will burn from the inside out much quicker than the time achieved during a fire test. The second significant weakness is that the foam may not successfully migrate to all parts of the cavity during the filling process. This creates weak spots which will compromise more easily.

Timber fire doors



The term 'timber doorset' is applied to any doorset that is substantially constructed in wood. Timber is recognised as one of the most fire-resistant materials and is therefore the preferred core option to achieve a dependably fire-resistant door. The exact nature of a timber door core can vary between a blockboard construction or a layered timber and plywood construction. Both types are faced with veneer on each side and lipping around the edge.

While any solid timber door offers much more dependable performance in the event of a fire than the traditional composite doors, there is one thing to be aware of. Most timber doorsets are made from components that have been fire tested, but the complete doorset has not been subjected to rigorous testing.

This presents the distinct weakness that the doorset as assembled may present vulnerabilities that haven't been exposed by testing. The Solidcor T-Series is the only comprehensive range of timber doorsets that have been fully fire tested to achieve multiple certifications, and also have the benefit of a hardwearing pre-decorated surface in a range of colours.

Put simply, there is always more margin for error when fire-tested components are purchased separately and then assembled in an unregulated environment, as it relies entirely on the competency and diligence of the individual tradesmen doing the installation. When selecting timber fire doors, therefore, it is very important to choose ones that have been tested as complete doorsets.

Solidcor doors – achieving the best of all worlds

Solidcor's door ranges were developed to provide the best-possible performance in the event of fire combined with installation ease and exceptional everyday durability.

At the heart of both the R-Series and T-Series ranges, is the essential Solidcor door construction. Every door is comprised of a substantial solid timber core faced with a hardwearing, maintenance-free PVC surface. The timber core is made of several layers of natural timber and plywood, laid in alternating directions for structural strength and exceptional fire performance. The PVC surface provides a ready-decorated surface, and thanks to its through-colour, hides surface scratches very well.

All Solidcor doors are rigorously tested as complete doorsets to multiple standards and certifications for fire, smoke and security, and are supplied to site in just the same state as in the test conditions. All testing is dual-oriented, meaning that they can withstand fire for the specified time on either side of the door.

Solidcor R-Series

The flagship R30 and R60 doorsets combine the high-performance Solidcor door construction with a timber-insert PVC frame. The PVC outer of the frame provides the same maintenance-free durability as the door itself, while the timber insert ensures the exceptional fire performance – in fact the R30 door regularly lasts 47 minutes in a 30-minute test.

Solidcor T-Series

The T30 front entrance and communal doorsets provide an all-timber construction where required, enabling installation in more restricted apertures. They combine the same high-performance Solidcor door construction within a pre-painted hardwood door frame. Fully tested in multiple glazing styles, they provide dependable performance at all times.

In conclusion...

We hope this paper has highlighted the importance of a doorset being able to withstand fire after several years of heavy use in the same way as it did in the fire test straight off the production line. If it won't reliably do so, it could be the cause of fire spreading fast and compromising exit routes, resulting in tragic injury or loss of life.

Specifying materials that perform a life-preserving function in the event of a fire is a task that comes with a great deal of responsibility. Our aim is provide the specifier with enough information so that he or she can examine the hard facts and make an informed choice that keeps residents safe at all times.