Fireshield® applications in timber frame during the construction process

INTRODUCTION: In the design process of any building, project professionals will consult Building Regulations, Standards and Codes for information on fire safety and compliance. This process usually focuses on the level of life safety related to fire of occupants in and around a *completed* building only. This is due to an absence of technical guidance in Building Regulations and Standards for fire safety during construction, specifically the determination of the safe fire space separation between buildings under construction and existing buildings outside the site boundary.

To address fire prevention while construction is happening, designers can consult the Construction (Design and Management) Regulations (2015) and, if it is a timber frame structure being built, extensive guidance published by the Structural Timber Association (STA). We will look at the STA's guidance in greater detail in this document.

STA Guidance:
The STA's during construction guidance relates to safe separating distances of timber frame buildings with a total floor area >600m². The purpose of the guidance is to reduce radiant heat emissions to acceptable levels by the selection of appropriate timber frame material specifications.

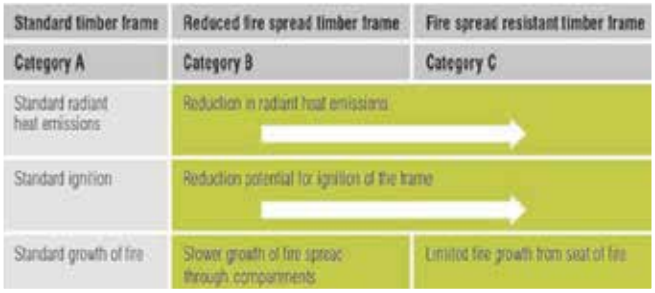
The STA organises timber frame types into 3 categories, with each type categorised by the materials used:
Category A
Standard timber frame

Category B
Key Changes from Category A:
- *Flame retardant materials & insulation materials*
- *Three subdivisions by performance: B1 (lowest), B2, B3 (highest)*

Category C
Key Changes from Category A:
- *Limited or non-combustible sheathing*

The STA guidance then calculates the safe separation distance for each category of timber frame, with the distance decreasing as the specification becomes more fire resistant.

The difference in separation distance, as known as the emitter length (eL), between timber frame category types can be significant. An example taken from the STA's Structural Timber Engineering Bulletin No. 6 demonstrates how simply changing the specification of a 4-storey timber building from the Category A standard timber frame to a Category C timber frame would decrease the safe separating distance by 11.5 metres!




Category A


Category B


Category C

Fireshield Testing
The A. Proctor Group worked with Edinburgh University to carry out a test which shows the performance of Fireshield with a timber frame as shown below. The results showed how the intumescent nature of the coating on the Class B vapour permeable membrane complies with the STA requirements for what is part of a Category C compliant wall assembly.

Proctor Group

How does reaction to fire and fire resistance testing apply to building membranes?

The testing at Edinburgh University resulted in the STA approving the following text:

"Fireshield can also be used on the external cavity face to improve the fire robustness of closed panel assemblies when installed to the external sheathing alongside suitable non-combustible internal linings.

Fireshield is the ***first fire resistant vapour permeable membrane*** approved for inclusion in the Structural Timber Association tested product listing for fire robustness during construction. As part of such a construction, Fireshield will be part of a system to limit the spread of fire to adjacent properties, which can allow for reduced spacing to adjacent properties."

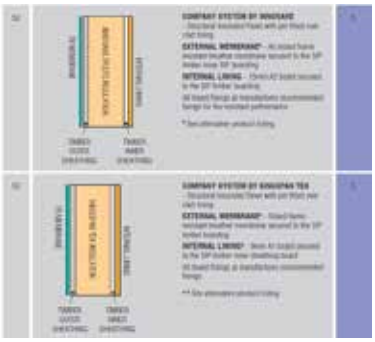
The STA document 'Design Guide to Separating Distances During Construction for Timber Frame Buildings' (Oct 2019) categorises Fireshield as follows:

FR Build Membrane
(in accordance with Technical Papers 2 and 3)

FR Build - External Membranes

Manufacturer / Product	Application
Proctor Fireshield©	For the external face of a wall, facing the cavity

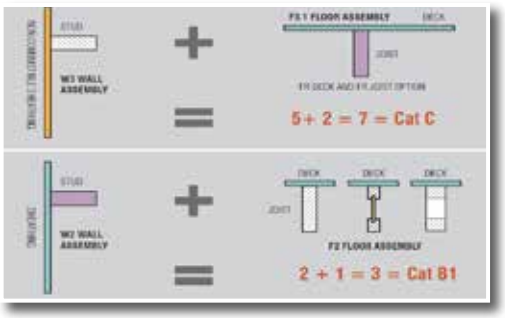
The categorisation of Fireshield as a **'FR Build – External Membrane'** allows the membrane to be used in Closed panel systems like the ones below and gain the maximum 5 points for wall assembly assuming the constructions are similar to these below with suitable internal linings applied.



Timber frame manufacturers, and STA Members, that utilise closed panel solutions to gain 5 points, as shown above, for assessing separating distances of their buildings, can consider Fireshield as a suitable solution when using an appropriate internal lining.

STA Scoring System

The STA have developed a range of documents to guide designers on which systems would be appropriate for different situations. Similar to the Acoustic Robust Details, the timber frame category is decided by use of a numbering system depending on the wall and floor build ups chosen as shown below:



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