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Report Revision 0:

ASSESSMENT REPORT

Title

The fire resistance performance of
Fire resisting timber door assemblies,
when installed with Nullifire FF197 fire foam,
in accordance with EN1634-1: 2014.

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Contents

1. Scope

This report presents an assessment of the expected fire resistance performance of Nullifire FF197 expanding fire foam, when tested as part of a timber based door assembly in accordance with EN 1634-1: 2014. The timber based door assembly, when installed with the Nullifire FF197 expanding fire foam at the interface between the door frame and wall, as discussed in this report, would be expected to achieve a fire resistance performance of up to 30, 60 or 120 minutes integrity and insulation (depending on the doorset), when tested in accordance with EN 1634-1: 2014.

2. Assumptions

It is assumed that the doorsets which will be installed with Nullifire FF197 expanding fire foam shall be previously tested and proven in the required configuration and for the required period of fire resistance performance, having demonstrated their capability of providing either 30, 60 or 120 minutes integrity and, where applicable, insulation.

In all cases, the doorsets shall in all other aspects and specification be as previously tested and proven in terms of the required level of fire resistance performance and installed within the walls of the same specification, fixed in an identical manner. Additionally the doorsets shall meet the minimum specifications given in section 4 of this report.

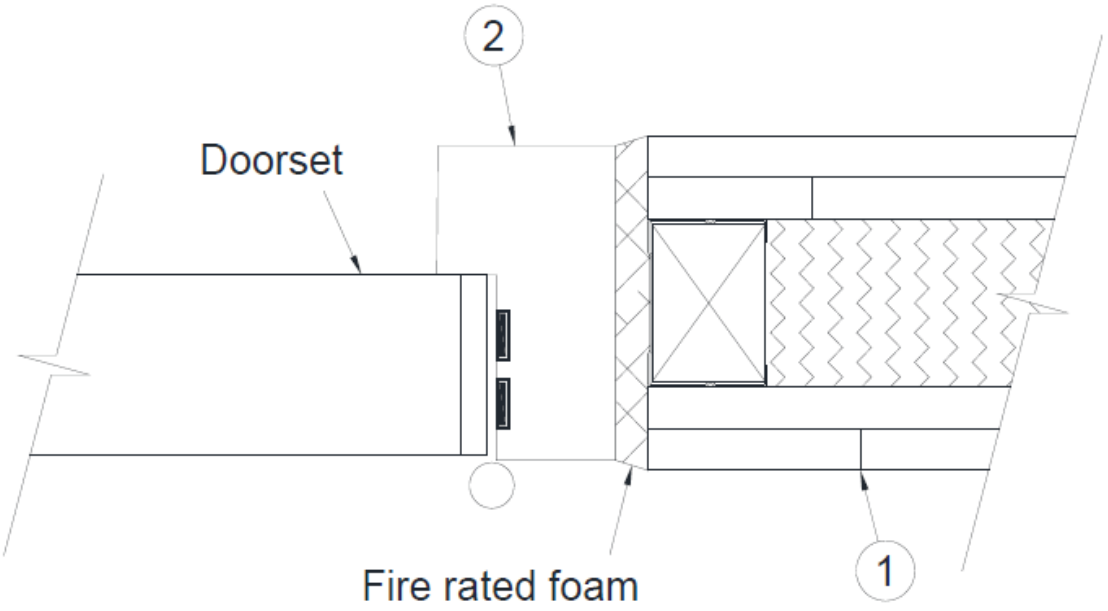
The purpose of this assessment is to consider the use of the Nullifire FF197 expanding fire foam in terms of its suitability for use in substitution of previously included frame to wall interface seal, therefore the scope of this report is limited only to doorsets satisfying the above criteria.

Doorset constructions will be installed in a similar manner to that detailed in the relevant test reports, and by competent installers. Door leaf to frame and frame to wall clearance gaps can have a significant effect on the overall fire performance of a doorset, it is therefore assumed that these clearance gaps will not exceed those measured for the relevant fire tested doorset. In addition it is assumed that the door leaves will be in the closed and where required latched position. The Nullifire FF197 expanding fire foam shall be fitted in accordance with the manufacturer's instructions.

The proposed doorsets will include a surface mounted overhead door closer capable of returning the door leaf to the fully closed position and overcoming any resistance from the latch mechanism.

3. Proposals

Nullifire FF197 is an expanding foam designed to be gunned into the gap between the outer edge of the frame of timber based doorsets and the reveal of the opening within the wall, as illustrated below:



1. Gypsum/stud wall
2. Door frame

It is proposed that previously fire tested timber based doorsets which have achieved 30, 60 or 120 minutes integrity and, where applicable, insulation performance, as discussed in this report, may be installed using the Nullifire FF197 to seal between the door frame and wall, in accordance with the recommendations given in this report without detracting from the overall performance of the doorset in terms of the requirements of EN 1634-1: 2014

It is also proposed that timber packers may be used around the door frame and architrave may be optionally added.

4. Assessment

4.1 60 minute timber doorsets

The test report WF No. 394353A details a test conducted in accordance with EN 1634-1 on a specimen of timber based, 60 minute fire resisting doorset which was installed using Nullifire FF197 fire foam around the entire frame to wall interface. The gap between frame and wall was measured as 35 mm at the head and leading edge and 10 mm at the trailing edge and the Nullifire FF197 fire foam was installed to full depth, 94-100 mm (frame-wall).

The test demonstrated the ability of the doorset to provide 68 minutes integrity and insulation performance and therefore there is no doubt in the ability of the Nullifire FF197 fire foam seal to positively contribute to the 60 minutes performance of such a door.

Based upon the tested specification and specifications that empirical evidence and test experience have shown to be equivalent to or less critical than those tested, the following critical specifications may therefore be positively appraised for 60 minutes performance of the Nullifire FF197 seal:

Component	Tested Specification	Minimum assessed requirement
Wall	100 mm thick Gyspum/timber stud	100 mm thick masonry/concrete/timber or steel stud – min. EI 60 classified (EN 13501-2)
Aperture lining	None	None, gypsum or other non-combustible board
Door frame	94 mm deep hardwood – 620 kg/m^3	Hardwood
		Min. 94 mm deep
		Min. 620 kg/m^3 density
Packers	Plastic	Plastic or timber
Fixings	Steel screws	Steel screws
Doorset	Timber leaf/timber frame EI 60 classified (EN 13501-2)	Timber leaf/timber frame– min. E 60 or EI 60 classified (EN 13501-2)
Depth of Nullifire FF197	94 mm (min.) full depth of frame	Full depth of frame and min. 94 mm
Frame to wall gap	10-35 mm	10-35 mm
Configuration	Single-action, single-leaf	Single/double-action, single/double-leaf/leaf and half*
Architrave	None	Any, no restriction

* Leaf configuration is not considered critical to the frame to wall seal provided the door has the required classification.

4.2 30 minute timber doorsets

Further to the above, it is also considered that the same method of sealing may be utilised for timber doors classified as E 30 or EI 30. Typically such doors will be of a reduced specification, due to the significantly reduced performance requirement and this is therefore reflected in the appraised table of critical specifications given below:

Component	**Minimum assessed requirement**
Wall	100 mm thick masonry/concrete/timber or steel stud – min. EI 30 classified (EN 13501-2)
Aperture lining	None, gypsum or other non-combustible board (must be lined in the case of frames less than 70 mm deep)
Door frame	Softwood or hardwood
	Min. 94 mm deep without aperture lining/ Min. 70 mm deep with aperture framed and lined
	Min. 450 kg/m^3 density
Packers	Plastic or timber
Fixings	Steel screws
Doorset	Timber leaf/timber frame– min. E 30 or EI 30 classified (EN 13501-2)
Depth of Nullifire FF197	Full depth of frame and min. 70 mm
Frame to wall gap	10-35 mm
Configuration	Single/double-action, single/double-leaf/leaf and half*
Architrave	Any, no restriction

While the proposed reduction in material specification for the frame will almost certainly lead to a reduction from the achieved 68 minutes performance, it is not considered that it will reduce the performance such that the required 30 minutes integrity/insulation performance would be achieved.

4.4 120 minute timber (mineral composite) doorsets

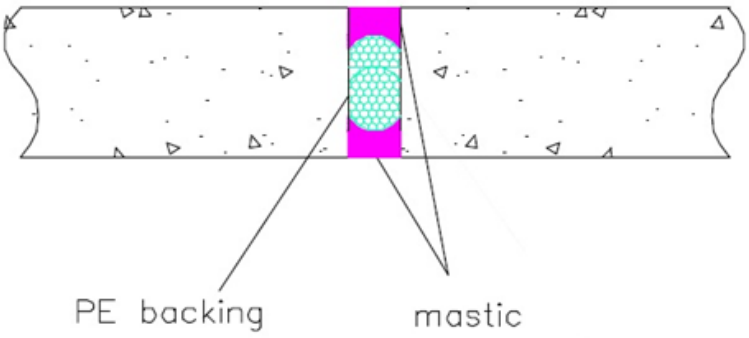
Further to the above, it is also considered that a seal comprising Nullifire FF197 fire foam faced with Nullifire FS702 sealant may be utilised for timber/mineral composite doors classified as E 120 or EI 120.

This is supported by European Technical Approval ETA-17/0390 and the specification given in A.3.1, as illustrated below:

A.3.1 Vertical linear joint or gap seal between rigid walls

Joint Seal: Nullifire FS702 to the both faces of the wall, joint widths up to 35 mm

Construction details:



A.3.1.1

Substrate	Depth (mm)	Backing	Classification
masonry/ concrete	17.5	PE rod	EI 240 – V – X – F – W35
	35		
masonry/ concrete / Steel	17.5		EI 240 – V – X – F – W35 EI 120 – V – X – F – W35
	35		E 240 – V – X – F – W35 EI 90 – V – X – F – W35
masonry/ concrete / Timber	17.5		EI 120 – V – X – F – W35
	35		EI 180 – V – X – F – W35

It can be seen that gaps up to 35 mm wide are classified EI 120 when utilising 17.5 mm of Nullifire FS702 to both faces of a 150 mm wall faced on one side with a timber sheet. In this case the sealant is back only with PE rod, which contributes nothing to performance and therefore on the basis of the proven capability of the Nullifire FF197 fire foam with a 60 minute doorset and the capability of the Nullifire FS702 alone to provide 120 minutes performance in this similar configuration, it can confidently be predicted that in combination, these materials are capable of positively contributing to the performance of a 120 minute fire resisting timber/mineral composite doorset.

Doors, other than metallic, for such periods are not common and are typically only partially of a timber construction in addition to mineral composite materials or will be of significantly increased overall thickness and this is therefore reflected in the appraised table of critical specifications given below:

Component	**Minimum assessed requirement**
Wall	150 mm thick masonry/concrete – min. EI 120 classified (EN 13501-2)
Aperture lining	None
Door frame	Hardwood
	Min. 150 mm deep
	Min. 620 kg/m^3 density
Packers	Plastic or timber
Fixings	Steel screws
Doorset	Timber/composite leaf/timber frame– min. E 120 or EI 120 classified (EN 13501-2)
Depth of Nullifire FF197	Min. 115 mm
Depth of Nullifire FS702	Min. 17.5 mm to both faces
Frame to wall gap	10-35 mm
Configuration	Single/double-action, single/double-leaf/leaf and half*
Architrave	Any, no restriction

5. Limits of Applicability

This assessment does not constitute product certification by UL.

6. Conclusions

Nullifire FF197 expanding fire foam, as detailed in this report would be expected to contribute positively towards the overall fire resistance performance of previously proven timber based doorsets required to provide performances of up to 30, 60 or 120 minutes, subject to satisfaction of the assumptions and requirements for suitable doorsets detailed, if tested in accordance with EN1634-1: 2014.

7. Validity

This assessment is issued on the basis of test data and information available at the time of issue.

If contradictory evidence becomes available to UL International (UK) Ltd. the assessment will be unconditionally withdrawn and Tremco Illbruck Limited will be notified in writing. Similarly the assessment is invalidated if the assessed construction is subsequently tested because actual test data is deemed to take precedence over an expressed opinion.

The assessment is valid initially for a period of five years from the issue date, after which time it is recommended that it be returned for re-appraisal.

The appraisal is only valid provided that no other modifications are made to the tested construction other than those described in this report.

8. Declaration by Tremco Illbruck Limited

We the undersigned confirm that we have read and complied with the obligations placed on us by the UK Fire Test Study Group Resolution No. 82: 2001.

We confirm that the component or element of structure, which is the subject of this assessment, has not to our knowledge been subjected to a fire test to the Standard against which the assessment is being made.

We agree to withdraw this assessment from circulation should the component or element of structure be the subject of a fire test to the Standard against which this assessment is being made.

We are not aware of any information that could adversely affect the conclusions of this assessment.

If we subsequently become aware of any such information we agree to cease using the assessment and ask UL International (UK) Ltd. to withdraw the assessment.

Signed:

For and on behalf of:

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9. Signatories

Report by:

Chris Johnson*
Staff Engineer
Building and Life Safety Technologies

Reviewed by:

Steven Harms*
Engineering Leader
Building and Life Safety Technologies

For and on behalf of UL International (UK) Ltd.

The assessment report is not valid unless it incorporates the declaration duly signed by the applicant. This is included in Section 8 to this report.

REPORT ISSUED: 28th January 2019

Appendix 1: Summary of Supporting Evidence

Primary Evidence:

Lab: **Exova Warringtonfire**
Report Number: 394353A Issue 2

Fire resistance test in accordance with EN 1634-1: 2014 on a single-acting, single-leaf timber based doorset. The doorset had nominal overall dimensions of 2084 mm high by 922 mm wide and comprised a 54 mm thick timber based door leaf with hardwood lippings to its vertical edges mounted within a hardwood door frame. The doorset was installed within a 100 mm gypsum board and timber stud wall and was sealed around its perimeter using Nullifire FF 197 fire foam, 35 mm wide at the head and leading edge and 10 mm at the hanging edge.

The doorset was mounted such that it opened away from the heating conditions of the test.

Integrity:
Sustained flaming: 68 minutes
Gap Gauge: 68 minutes
Cotton pad: 68 minutes
Insulation (I_2): 81 minutes

Test Date: 9th February 2018
Report Date: 2nd August 2018
Test Sponsor: Nullifire and Firetherm, divisions of Tremco illbruck UK Limited

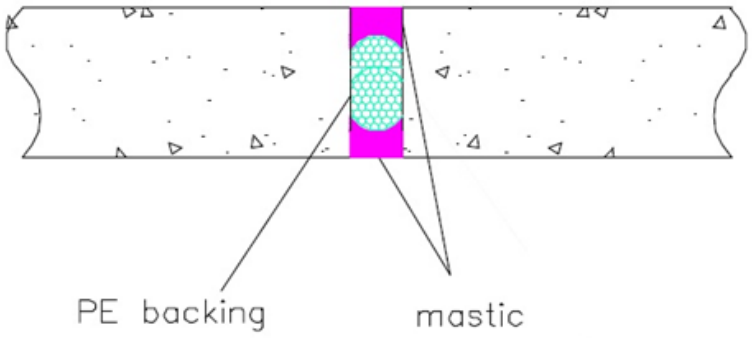
Technical Assessment Body : **UL International (UK) Ltd**
ETA Number : **ETA-17/0390**

A European Technical Assessment of Nullifire FS702 Sealant. Clause A.3.1 provide the following classifications:

A.3.1 Vertical linear joint or gap seal between rigid walls

Joint Seal: Nullifire FS702 to the both faces of the wall, joint widths up to 35 mm

Construction details:



A.3.1.1

Substrate	Depth (mm)	Backing	Classification
masonry/ concrete	17.5	PE rod	EI 240 – V – X – F – W35
	35		
masonry/ concrete / Steel	17.5		EI 240 – V – X – F – W35 EI 120 – V – X – F – W35
	35		E 240 – V – X – F – W35 EI 90 – V – X – F – W35
masonry/ concrete / Timber	17.5		EI 120 – V – X – F – W35
	35		EI 180 – V – X – F – W35

Issue Date: 14th July 2017
Test Sponsor: tremco-illbruck Ltd