

Exova Warringtonfire
Holmesfield Road
Warrington
WA1 2DS
United Kingdom

T : +44 (0) 1925 655 116
F : +44 (0) 1925 655 419
E : warrington@exova.com
W: www.exova.com



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Title:

The Fire Resistance Performance of
a Sliding Doorset Referenced
'Essential REI30' if Tested
in Accordance with BS 476: Part 22:
1987

WF Assessment Report No.

355943

Prepared for:

Scrigno SpA Unipersonale

Via Casale Sant'Ermete n. 975
47822 Santarcangelo di Romagna
(RN), Italy

Date:

14th September 2015

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Executive Summary

Objective	This report presents an appraisal of the fire resistance performance of a timber based, single-leaf, sliding doorset, if subjected to a fire resistance test in accordance with Clause 8 of BS 476: Part 22: 1987.
Sponsor	Scigno SpA Unipersonale
Address	Via Casale Sant'Ermete n. 975 47822 Santarcangelo di Romagna (RN), Italy
Summary of Conclusions	It can be concluded that the proposed doorset should be capable of providing at least 30 minutes integrity and insulation performance, if subjected to a fire resistance test in accordance with Clause 6 of BS 476: Part 22: 1987, from each direction separately.
Valid until	1 st October 2020

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Introduction

This report presents an appraisal of the fire resistance performance of a single-leaf, sliding doorset.

The doorset is required to provide at least 30 minutes integrity and insulation performance, if subjected to a fire resistance test in accordance with Clause 6 of BS 476: Part 22: 1987, from each direction separately.

FTSG

The data referred to in the supporting data section has been considered for the purpose of this appraisal which has been prepared in accordance with the Fire Test Study Group Resolution No. 82: 2001.

Assumptions

General Construction

It is assumed that the general construction of the doorset and the materials used in the construction will, unless specifically detailed in this report, be identical to those of the tested assembly. The doorset shall also be constructed in a similar manner, with regards to the attachment of various parts.

Supporting Construction

It is assumed that the doorset shall be fixed to a supporting construction of similar specification to that tested which is capable of maintaining adequate support for the required period of 30 minutes.

Door Gaps

It is assumed that the door leaf to frame clearance gaps shall not exceed those of the previously fire tested assembly.

Installation

It is assumed that the doorset will be installed by competent installers in a similar manner to that used when installing the fire tested assembly.

Proposals

The test referenced EFR-13-J-131476 was performed in accordance with EN 1634-1: 2014, on a specimen of the proposed single-leaf, sliding doorset.

It is proposed that the same doorset will satisfy the integrity and insulation performance criteria of Clause 6 of BS 476: Part 22: 1987 for a period of 30 minutes, when tested from each direction separately.

Based upon the achieved period of overrun during the test, it is also proposed that consideration be provided to an increase in door leaf dimensions over and above those tested.

Basic Test Evidence

EFR-13-J-131476 A fire resistance test in accordance with EN 1634-1: 2014 on a specimen of symmetrical, single-leaf, sliding, timber based doorset, referenced 'Essential REI30', mounted within a standard flexible supporting construction.

The doorset had overall nominal dimensions of 2134 mm high by 2331 mm wide, and included a door leaf with dimensions of 2040 mm high by 1130 mm by 40 mm thick.

The doorset satisfied the integrity and insulation (I₁) performance criteria for a period of 36 minutes.

Assessed Performance

The previous fire test was performed in accordance with EN 1634-1. Testing experience has demonstrated that this represents a more arduous test compared with BS 476: Part 22: 1987.

Heating Conditions

Although the two test methods specify a near identical temperature/time heating curve, the furnace thermocouples specified by the EN test method are less responsive to temperature rise compared with those specified for a test to BS 476: Part 22: 1987. The consequence of this is that it is necessary for the furnace to be worked harder for a test to EN 1634-1 in order to maintain the specified furnace temperature, particularly during the early stages of the test due to the required rapid temperature increase.

Furnace Pressure

EN 1634-1 requires the neutral pressure axis within the furnace to be maintained at a height of 500 mm above the threshold of the doorset. For a test in accordance with BS 476 the neutral pressure axis is specified at a height of 1000 mm. Based a furnace pressure gradient of 8.5 Pa per metre height (as assumed by both test methods), the pressure across the upper edge of a doorset for a test in accordance with EN 1634-1 would therefore be nominally 4.25 Pa greater than for the same test performed in accordance with BS 476: Part 22: 1987.

Performance Criteria

The integrity performance criteria of both test methods are near identical, both requiring the specimen to be evaluated for sustained flaming and for impermeability using the 'cotton pad' and the 6 mm and 25 mm gap gauges.

The insulation performance criteria specified for I₁ within EN 1634-1 imposes a limitation on the mean temperature rise of the door leaf of 140°C. Any individual temperature rise recorded on the door leaf or frame must not exceed 180°C. The same temperature rise limitations are imposed by BS 476: Part 22: 1987. For the proposed door leaf specification, the frame components are concealed within the supporting wall construction and the frame temperature is therefore not a consideration.

For the I₁ performance criteria specified within EN 1634-1, the thermocouples shall be placed no closer than 25 mm to the edge of the door leaf. Under BS 476: Part 22: 1987, this distance is increased to 50 mm.

Although the temperature rise requirements of the two standards are therefore identical, the requirement for the thermocouples to be positioned in closer to proximity to the edge of the door leaf results in a potential reduction in the period of insulation performance under EN 1634-1, compared with BS 476: Part 22: 1987.

Summary of Comparison

The two test methods are very similar in most respects but differences in the furnace instrumentation, the specified furnace pressure and different surface thermocouple positioning requirements result in a more onerous testing regime under EN 1634-1.

The previously tested doorset would therefore be expected to provide at least 30 minutes integrity and insulation performance if subjected to a fire test in accordance with Clause 6 of BS 476: Part 22: 1987. Since the tested door construction was symmetrical, it would be expected to achieve the indicated performance regardless of the direction of fire exposure.

Door Leaf Dimensions

The previously fire tested doorset has demonstrated its ability to satisfy the performance criteria for a period of 36 minutes, which represents a 'Category B' overrun as defined within EN 1634-1. This automatically permits an increase in leaf size by up to 50% in height or 50% in width, subject to a maximum increase in area by 50%.

Although no such rule exists within BS 476: Part 22: 1987, it would seem appropriate to use the same methodology when considering the maximum permitted size under BS 476: Part 22: 1987, particularly considering that it has already been established that this represents a less onerous testing procedure.

The vertical and upper edges of the door leaf are concealed within the wall construction and are therefore well restrained under fire test conditions and should not therefore be susceptible to deformation regardless of the proposed size increase. The base of the door leaf is fitted with a 30 mm by 2 mm intumescent seal which provides a considerable obstruction to gap formation across the lower edge.

In addition, integrity failure of the doorset after 36 minutes was due to cotton pad failure at a position where the leaf had started to burn through at the junction between the bottom rail and the door core. No size/distortion related failure occurred during the test duration of 38 minutes.

Although the proposed size increase is therefore significant, this is considered to be justifiable based upon the restraint provided to the door leaf edges by the supporting construction and the proven 27% period of overrun without any distortion related failure.

The maximum permissible door leaf area is therefore 3.46 m², subject to a maximum leaf height of 3060 mm or a maximum leaf width of 1695 mm wide. This is based upon the assumption that the door leaf can be fabricated in exactly the same manner as tested and that the any size increase does not require untested jointing techniques to be introduced for any of the components.

Conclusion

It can be concluded that the proposed doorset should be capable of providing at least 30 minutes integrity and insulation performance, if subjected to a fire resistance test in accordance with Clause 6 of BS 476: Part 22: 1987, from each direction separately.

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 Exova Warringtonfire the assessment will be unconditionally withdrawn and Scigno SpA Unipersonale 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 i.e. until 1st October 2020, 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.

Summary of Primary Supporting Data

EFR-13-J-131476 A fire resistance test in accordance with EN 1634-1: 2014 on a specimen of symmetrical, single-leaf, sliding, timber based doorset, referenced 'Essential REI30', mounted within a standard flexible supporting construction.

The doorset had overall nominal dimensions of 2134 mm high by 2331 mm wide, and included a door leaf with dimensions of 2040 mm high by 1130 mm by 40 mm thick.

The doorset briefly comprised a door leaf fabricated from 35 mm by 32 mm softwood stiles and rails with a 32 mm thick flaxboard core of 400 kg/m³ density, both of which were faced on each side with 4 mm thick MDF. An aluminium box frame was fitted inside the plasterboard supporting construction to enable the door leaf to slide inside the wall. A full specification of the door construction is provided within the test report.

Test Results:

Integrity	Sustained flaming	37 minutes
	Gap gauge	38 minutes
	Cotton Pad	36 minutes
Insulation	(I ₁)	36 minutes
	(I ₂)	36 minutes

Test date : 22nd April 2015

Test sponsor : Scrigno SpA Unipersonale

Declaration by Scrigno SpA Unipersonale

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 Exova Warringtonfire to withdraw the assessment.

Signed:

For and on behalf of:

Signatories


Responsible Officer
D Hankinson* - Principal Certification Engineer


Approved
A Kearns * - Technical Manager

* For and on behalf of Exova Warringtonfire.

Report Issued: 14 th September 2015

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