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Title:

The Fire Resistance
Performance of a Single-
Acting, Single-Leaf Doorset
Referenced X355, if Tested
in Accordance with BS 476:
Part 22: 1987

**WF Assessment Report
No.**

380574

Prepared for:

**CHEMOLLI S.A.S. di Eros
Chemolli & C.**

Via Fitta, 1 - 38062 – Arco
(TN), Italy

Date: 19th April 2017

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Executive Summary

Objective	This report presents an appraisal of the fire resistance performance of a single-acting, single-leaf doorset, if subjected to a fire resistance test in accordance with Clause 6 of BS 476: Part 22: 1987.
Sponsor	CHEMOLLI S.A.S. di Eros Chemolli & C.
Address	Via Fitta, 1 - 38062 – Arco (TN), 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 May 2022

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Introduction

This report presents an appraisal of the fire resistance performance of a single-acting, single-leaf 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 masonry or reinforced concrete supporting construction 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 RINA0133FR was performed in accordance with UNI EN 1634-1: 2014, on a specimen of the proposed single-acting, single-leaf doorset, opening towards the heating conditions of the test.

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.

Basic Test Evidence

RINA0133FR

A fire resistance test in accordance with UNI EN 1634-1: 2009 on a specimen of an inward opening, single-acting, single-leaf doorset.

The doorset had overall nominal dimensions of 2140 mm high by 980 mm wide, with a door leaf having dimensions of 2103 mm high by 915 mm by 44 mm thick.

The doorset satisfied the integrity and insulation (I_1) performance criteria for a period of 37 minutes after which time the test was discontinued without failure.

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 I_1 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 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 option 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, from each direction separately.

Direction of Fire Exposure

EN 1634-1: 2014 specifies that the most onerous direction of fire exposure for a timber based doorset is where the door leaf opens towards the heating conditions of the test. This tested direction of exposure is therefore deemed to provide coverage for both directions of fire exposure.

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 CHEMOLLI S.A.S. di Eros Chemolli & C. 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 May 2022, 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

RINA0133FR

A fire resistance test in accordance with UNI EN 1634-1: 2014 on a specimen of an inward opening, single-acting, single-leaf doorset referenced X355.

The doorset had overall nominal dimensions of 2140 mm high by 980 mm wide, with a door leaf having dimensions of 2103 mm high by 915 mm by 44 mm thick.

The door leaf briefly comprised a 36 mm thick flaxboard board core of 350 kg/m³ nominal density surrounded by softwood stiles and rails of 450 kg/m³ nominal density with 4 mm thick MDF facings to both sides. The door leaf was hung within a door frame comprising softwood sections. Intumescent seals referenced Promaseal LFCSK 15 x 1.8 mm were included within the reveal edge of the frame. The door leaf included three Chemolli Firebolt A1 and two Chemolli Firebolt A2 thermally activated bolts.

Test Results:

Integrity	Sustained flaming	37 minutes (no failure)
	Gap gauge	37 minutes (no failure)
	Cotton Pad	37 minutes (no failure)
Insulation	(I ₁)	37 minutes (no failure)
	(I ₂)	37 minutes (no failure)

Test date : 15th July 2016

Test sponsor : CHEMOLLI S.A.S.

Declaration by CHEMOLLI S.A.S. di Eros Chemolli & C.

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
C Abbott * - Principal Certification Engineer

* For and on behalf of Exova Warringtonfire.

Report Issued: 19 th April 2017
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