

Title:

The Fire Resistance
Performance Of Single-Acting
Doorsets When Fitted With
DFA 127 Surface Mounted
Automatic Swing Door
Operator

Report No:

335458 Issue 3

Prepared for:

Record UK Limited

Unit D
Watt Place
Hamilton International Park
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Date:

02 December 2013

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Executive Summary

Objective This report presents an appraisal of the fire resistance performance of single-acting timber based, and single-acting predominantly steel based doorsets when fitted with DFA 127 surface mounted automatic swing door operators.

Report Sponsor **Record UK Limited**

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Summary of Conclusions Should the recommendations given in this report be followed, it can be concluded that timber and steel doorsets, which have previously been successfully fire tested to BS 476: Part 22 or EN 1634-1 by a laboratory accredited to IS/IEC 17025 (under International Laboratory Accreditation Cooperation (ILAC) membership), and achieved the required integrity performance as discussed in this report, may be fitted with DFA 127 surface mounted automatic swing door operators, as follows:

Fully insulated timber-based doorsets	Up to 120 minutes
Uninsulated predominantly steel-based doorsets (Exposed face only)	Up to 240 minutes
Fully insulated predominantly steel-based doorsets	Up to 120 minutes

This assessment represents our opinion as to the performance likely to be demonstrated on a test in accordance with BS 476: Part 22: 1987 or EN 1634-1:2014+A1:2018, on the basis of the evidence referred to evidence referred to herein. We express no opinion as to whether that evidence, and/or this assessment, would be regarded by any Building Control authority as sufficient for that or any other purpose. This assessment is provided to the client for its own purposes, and we cannot opine on whether it will be accepted by Building Control authorities or any other third parties for any purpose.

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Introduction

This report presents an appraisal of the fire resistance performance of previously tested fully insulated, single-acting, timber doorsets, and insulated and uninsulated predominantly steel based doorsets, in single or double leaf configurations when fitted with 'DFA 127' surface mounted automatic swing door operators.

The doorsets onto which the door operators are to be fitted shall be latched or unlatched and may be of single-leaf or double-leaf configurations.

The proposed doorsets are required to provide a fire resistance performance of up to 120 minutes for fully insulated timber or fully insulated predominantly steel doorsets, or 240 minutes for uninsulated predominantly steel doorsets with regards integrity and insulation with respect to BS 476: Part 22: 1987 or EN 1634-1:2014+A1:2018.

FTSG/PFPF

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 and the Passive Fire Protection Federation (PFPF) Guide to Undertaking Technical Assessments of Fire Performance of Construction Products Based on Fire Test Evidence - 2021.

Assumptions

It is assumed that any doorset used has been proven by test to BS 476: Part 22 or EN 1634-1 as capable of providing the required period of fire resistance in the configurations provided i.e. single-action single-leaf or double-leaf.

Supporting wall

It is also assumed that the construction of the wall, which supports the proposed doorsets, will have been the subject of a separate test and the performance of the wall is such that it will not influence the performance of the doorset for the required period.

Clearance gaps

Door leaf to frame clearance gaps can have a significant effect on the overall fire performance of a doorset. It is therefore assumed that the leaf to leaf and leaf to frame 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 position.

Closer Installation

The units shall be fixed with screws supplied by the manufacturer. Bolt-through fixings shall not be used.

Where the units are fitted to door leaves or frames that are manufactured from mineral-based materials, or low-density cellulosic-based material, the door assembly shall have previously been shown capable of accommodating the installation of units at the head of the doorset, without detriment to the door assembly's performance.

Uninsulated steel doorsets

Where the DFA 127 surface mounted automatic swing door operator is fitted to uninsulated steel based doorsets for fire resistance periods of up to 240 minutes, the unit will be fitted to the exposed face only

IMPORTANT - Where the unit is fitted on the unexposed face, or where the direction of the fire hazard is not known, the fire performance of uninsulated steel based doorsets for fire resistance is restricted to 30 minutes.

Hardware Approval

All door hardware is subject to the acceptance by the chosen door assembly supplier's tested, assessed or certificated scope, which generally identifies the types of hardware approved, the required specification/design based on the key materials/ maximum size, and the application of any additional intumescent protection.

On this basis approval should be sought from the specific door assembly supplier to ensure compliance based on this assessed/certificated scope.

EN1634-1

EN1634-1 was issued originally in 2000, with amended versions issued in 2008, 2014 and 2018. The differences between each version are mainly procedural and are not considered to have a practical impact on the performance of the samples under test. On this basis this evaluation is considered applicable to all versions of EN1634-1 issued prior to the issue of this assessment.

Proposals

It is proposed that the DFA 127 surface mounted automatic swing door operators may be fitted onto a previously tested (in accordance with BS EN 1634-1 or BS 476: 22) insulated timber or mineral composite doorset and insulated and uninsulated steel doorsets in the same configuration as that proposed i.e. single-leaf or double-leaf.

The proposed doorsets are required to provide a fire resistance performance as follows with respect to BS 476: Part 22: 1987 or EN 1634-1:2014+A1:2018:

Fully insulated timber-based doorsets	Up to 120 minutes
Uninsulated predominantly steel-based doorsets (Exposed face only)	Up to 240 minutes
Fully insulated predominantly steel-based doorsets	Up to 120 minutes

Basic Test Evidence

WF No. 330936

A report detailing a test conducted tested in accordance with BS EN 1634-1: 2008 to determine the fire resistance performance of a single-acting, single-leaf steel based doorset (B) and a single-acting, single-leaf timber based doorset (A).

Test report review

The original test reports used in support of this assessment have been reviewed and it has been concluded that the test data remains acceptable, and the final result would be unchanged on the following basis:

- A comparison of the test procedures and performance criteria with the current standard has identified that any variations would have no detrimental impact on the performance of the doorset and hardware under test.
- The client has confirmed that there has been no change to the design or material specification of the hardware tested originally.
- The reports are available in their entirety, the products are adequately referenced and linked to the products being considered for assessment, and the ownership of the test data has been confirmed as the assessment report holder.

Assessed Performance

Hardware Variant Specifications

An appraisal of the hardware variants detailed in this report is based upon product information supplied by the hardware manufacturer, which is retained in the confidential file relating to this report. Warringtonfire have not inspected the devices being appraised and cannot be held responsible for the accuracy of the information provided.

General

The main function of an automatic swing door operator, when used on unlatched timber based doorsets subjected to fire resistance testing is as a door closing device, i.e. to maintain the door in the fully closed position up until the intumescent in the leaf to frame clearance gaps has been given sufficient time to react. The door closer is not intended to remain in position for the test duration.

After a period between 10 and 15 minutes of the test, the intumescent seals will have reacted, thereby providing friction between the leaf and frame and inhibiting the tendency of the door leaf to swing open. It is therefore essential that the closer remains in position and operable up until this point.

In the case of an unlatched steel based doorset, the operator must maintain the door in the fully closed position until such time as the door expands sufficiently to jam within its door frame. Where a closer is fitted to the non-fire exposed face of an uninsulated doorset it must additionally prove that it does not present an additional risk to the integrity performance of the doorset whereby the closer's components and hydraulic fluid must demonstrate that they are not ignited by the high levels of heat transfer through the metal doorset.

Timber Doorset performance

Test report WF No. 330936 identifies that continuous flaming occurred at 47 minutes on Doorset A. However, this failure occurred at mid height on the leading edge and therefore was not co-incident to or, associated with the use of the DFA 127 surface mounted automatic swing door operator, and therefore this door related failure can be disregarded when considering the performance of the DFA 127 units.

Observations contained within the test report WF No. 330936 indicate that the closer to Doorset A remained in position for a period of 35 minutes. During this period there was no visible tendency of the door leaf to open. It is therefore considered that the device performed effectively during the test and positively contributed to the 62 minutes performance achieved.

It is also considered that should the proposed operator be fitted to timber or mineral composite based doorsets designed to provide up to 120 minutes fire resistance, they would remain in place for a similar period, enabling the intumescent seals to effectively react.

Glazing in Timber Doorsets

Test report WF No. 330936 identifies that on the DFA 127 unit fitted to the unexposed face of the uninsulated steel door, plastic elements flamed continuously at 43 minutes. This suggests that where timber doors incorporate large areas of uninsulated glass a similar failure is likely to occur.

As a consequence of this failure, where timber based doors incorporate uninsulated glazed panels in excess of 20% of the leaf area, the maximum permitted fire resistance performance will be restricted to 30 minutes.

Uninsulated Steel Based Doorsets

The performance of the DFA 127 surface mounted automatic swing door operator fitted to Doorset B in the test referenced WF No. 330936 is cited to suitably demonstrate the ability of the closer model to be fitted to uninsulated steel based doorsets required to provide a fire resistance performance of up to 240 minutes on the exposed, and 30 minutes on the unexposed face if tested in accordance with BS 476: Part 22: 1987 or EN 1634-1:2014+A1:2018.

Reviewing the observations taken from the test report, it is known that the active door closer fitted to the exposed side of the doorset remained in place after 30 minutes of testing and that the inactive closer body mounted to the unexposed face flamed continuously at 43 minutes due to the radiant heat through the uninsulated door construction.

It is therefore reasonable to conclude that the tested DFA 127 surface mounted automatic swing door operator has positively demonstrated its ability to contribute toward the fire performance of uninsulated steel based doorsets for fire resistance periods of up to 240 minutes when fitted on the exposed face only.

IMPORTANT - Where the tested DFA 127 surface mounted automatic swing door operator is fitted on the unexposed face, or where the direction of the fire hazard is not known, the fire performance of uninsulated steel based doorsets for fire resistance is restricted to 30 minutes.

Insulated Steel based doorsets

The performance of the DFA 127 surface mounted automatic swing door operator fitted to Doorset B in the test referenced WF No. 330936 is cited to suitably demonstrate the ability of the closer model to be fitted to uninsulated steel based doorsets required to provide a fire resistance performance of up to 120 minutes if tested in accordance with BS 476: Part 22: 1987 or EN 1634-1:2014+A1:2018.

It is reasonable to conclude that the tested DFA 127 surface mounted automatic swing door operator can be accommodated on a fully insulated steel doorset doorsets for fire resistance periods of up to 120 minutes on both the exposed and unexposed face of the door.

The same limitations for glazed timber based doorsets shall apply with this configuration; therefore, where insulated steel doors incorporate uninsulated glazed panels in excess of 20% of the leaf area the maximum permitted fire resistance performance will be 30 minutes.

Glazing in Uninsulated Steel Based Doorsets

Alternative Doorsets

To enable the use of the DFA 127 surface mounted automatic swing door operator on a range of doorsets, it is necessary to address the available information on the proposed doorset. As this appraisal is intended to be used on a general basis and not restricted to any particular manufacturer of fire resisting doorsets, the following points are given to enable the DFA 127 to be used safely:

- a) For timber doorsets applications, the doorset, including the door frame and associated ironmongery should have achieved the required performance level, up to 120 minutes integrity and insulation performance, when tested by an accredited laboratory to BS 476: Part 22 or EN 1634-1. The Doors shall not incorporate uninsulated glazed panels in excess of 20% of the leaf area. Where doors incorporate uninsulated glazed panels in excess of 20% of the leaf area the maximum permitted fire resistance performance will be restricted to 30 minutes.
- b) For uninsulated steel doorsets applications (operator to exposed face only), the doorset, including the door frame and associated ironmongery should have achieved up to 240 minutes integrity performance, when tested by an accredited laboratory to BS 476: Part 22 or EN 1634-1.
- c) For insulated steel doorsets applications, the doorset, including the door frame and associated ironmongery should have achieved up to 120 minutes integrity and insulation performance, when tested by an accredited laboratory to BS 476: Part 22 or EN 1634-1. The Doors shall not incorporate uninsulated glazed panels in excess of 20% of the leaf area. Where doors incorporate uninsulated glazed panels in excess of 20% of the leaf area the maximum permitted fire resistance performance will be restricted to 30 minutes
- d) If the proposed doorset is to be used in double-leaf configurations, the test or assessment evidence should be applicable to double-leaf configurations.
- e) Likewise, if the proposed doorset is to be used in unlatched configurations then the available test evidence should be applicable to unlatched doorsets.

- f) The size and weight of the door leaf of the proposed doorset should be compatible with the power rating of the operator.

The fitting of the DFA 127 surface mounted automatic swing door operators onto alternative doorsets, on the basis of compliance with the conditions given above, is therefore considered to be acceptable.

Conclusions

Should the recommendations given in this report be followed, it can be concluded that timber and steel doorsets, which have previously been successfully fire tested to BS 476: Part 22 or EN 1634-1 by a laboratory accredited to IS/IEC 17025 (under International Laboratory Accreditation Cooperation (ILAC) membership), and achieved the required integrity performance as discussed in this report, may be fitted with DFA 127 surface mounted automatic swing door operators, as follows:

Fully insulated timber-based doorsets	Up to 120 minutes
Uninsulated predominantly steel-based doorsets	Up to 240 minutes
Fully insulated predominantly steel-based doorsets	Up to 120 minutes

This assessment represents our opinion as to the performance likely to be demonstrated on a test in accordance with BS 476: Part 22: 1987 or EN 1634-1:2014+A1:2018, on the basis of the evidence referred to evidence referred to herein. We express no opinion as to whether that evidence, and/or this assessment, would be regarded by any Building Control authority as sufficient for that or any other purpose. This assessment is provided to the client for its own purposes, and we cannot opine on whether it will be accepted by Building Control authorities or any other third parties for any purpose.

Review

It has been confirmed by Record UK Limited that there have been no changes to the specification, materials or manufacturing location of the door operators considered in the original appraisal referenced WF Assessment Report No. 335458 issue 2 issued 29/10/2018.

The original assessment has been written using appropriate test evidence generated at accredited test laboratories. The supporting test evidence has been deemed appropriate to support the manufacturers stated design.

The defined scope presented in the original assessment report relates to the behaviour of the proposed design under the particular conditions of the test; they are not intended to be the sole criterion for assessing the potential fire hazard of the operators in use.

This revalidation has been prepared and checked by product assessors with the necessary competence, who subscribe to the principles outlined in the PFPF guidelines to undertaking assessments in lieu of fire tests. The aim of the PFPF guidelines is to give confidence to end-users that assessments that exist in the UK are of a satisfactory standard to be used in lieu of fire tests for building control and other purposes.

The PFPF guidelines are produced by the UK Fire Test Study Group (FTSG) an association of the major fire testing laboratories in the UK and are published by the PFPF, the representative body for the passive fire protection industry in the UK.

The data used for the original appraisal has been re-examined and found to be satisfactory. The procedures adopted for the original assessment have also been re-examined and are similar to those currently in use.

Therefore, with respect to the assessment of performance given in WF Assessment Report No. 335458 issue 3, the contents should remain valid for a further 5 years.

This review is based on information used to formulate the original assessment. No other information or data has been provided by Record UK Limited which could affect this review.

The original appraisal report was performed in accordance with the principles of the UK Fire Test Study Group Resolution 82: 2001. This review has therefore also been conducted using the principles of Resolution 82: 2001.

Validity

The assessment is initially valid for five years after which time it is recommended to be submitted to Warringtonfire for re-appraisal.

This assessment report is not valid unless it incorporates the declaration given below duly signed by the applicant.

Summary of Primary Supporting Data

WF No. 330936

Details a test conducted to determine the fire resistance performance of a single-acting, single-leaf steel based doorset and a single-acting, single-leaf timber based doorset, incorporating DFA 127 surface mounted automatic swing door operators mounted within a high-density rigid supporting construction, when tested in accordance with BS EN 1634-1: 2008.

Doorset A had overall dimensions of 2150 mm high by 1006 mm wide and incorporated a door leaf of overall dimensions 2040 mm high by 930 mm wide by 54mm thick. The door leaf was hung within a hardwood door frame on three stainless steel hinges. The door leaf was formed from a graduated density chipboard core with hardwood lippings to the vertical edges. An Automatic swing door operator referenced 'DFA 127' was fitted to the exposed surface of the doorset. Doorset A was installed such that it would open towards the heating conditions.

Doorset B was of overall dimensions 2160 mm high by 1000 mm wide and included a steel based door leaf of overall dimensions 2050 mm high by 941 mm wide by 45 mm thick. The door leaf incorporated a cardboard honeycomb core sandwiched by 1.2 mm thick Zintec steel door skins. The door leaf was hung within a steel frame on four stainless steel hinges. An Automatic swing door operator referenced 'DFA 127' was fitted to the unexposed surface of the doorset. Doorset B was installed such that it would open away from the heating conditions

The doorset achieved the following results:

Test Results:		Doorset A	Doorset B
Integrity performance	Sustained flaming	47 minutes	43 minutes
	Gap gauge	62 minutes	132 minutes*
	Cotton Pad	47 minutes	43 minutes
Insulation performance		47 minutes	8 minutes

Test date : 09 July 2013.

*The test duration. The test was discontinued after a period of 132 minutes.

Test Sponsor : Record UK Limited

Declaration by Record UK Limited

We the undersigned confirm that we have read and comply with obligations placed on us by the Passive Fire Protection Forum (PFPF) Guide to undertaking technical assessments and engineering evaluations based on fire test evidence 2021 Industry Standard Procedure

We confirm that any changes to a component or element of structure, which are the subject of this assessment, have not to our knowledge been tested to the standard against which this assessment has been made.

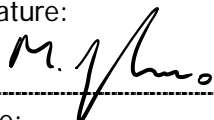
We agree to withdraw this assessment from circulation should the component or element of structure, or any of its component parts be the subject of a failed fire resistance test to the standard against which this assessment is being made.

We understand that this assessment is based on test evidence and will be withdrawn should evidence become available that causes the conclusion to be questioned. In that case, we accept that new test evidence may be required.

We are not aware of any information that could affect the conclusions of this assessment. If we subsequently become aware of any such information, we agree to ask the assessing authority to withdraw the assessment.

(In accordance with the principles of FTSG Resolution 82:2001)

Signature:



Name:

Mark Ayton

Position:

Managing Director

Date:

04/12/2023

For and on behalf of:

Record UK Ltd

Limitations

The following limitations apply to this assessment:

We confirm that any changes to a component or element of structure which are the subject of this assessment have not to our knowledge been tested to the standard against which this assessment has been made.

We agree to withdraw this assessment from circulation should the component or element of structure, or any of its component parts be the subject of a failed fire resistance test to the standard against which this assessment is being made.

1. This report addresses itself solely to the elements and subjects discussed and do not cover any other criteria or modifications. All other details not specifically referred to should remain as tested or assessed.
2. This report is issued on the basis of test data and information to hand at the time of issue. If contradictory evidence becomes available to Warringtonfire, the assessment will be unconditionally withdrawn, and the applicant will be notified in writing. Similarly, the assessment evaluation is invalidated if the assessed construction is subsequently tested since actual test data is deemed to take precedence.
3. This field of application has been carried out in accordance with Fire Test Study Group Resolution No. 82: 2001.
4. Opinions and interpretation expressed herein are outside the scope of UKAS accreditation.
5. This field of application relates only to those aspects of design, materials and construction that influence the performance of the element(s) under fire resistance test conditions against the ISO 834 time/temperature curve that is stipulated in the standard this assessment concludes to. It does not purport to be a complete specification ensuring fitness for purpose and long-term serviceability. It is the responsibility of the client to ensure that the element conforms to recognised good practice in all other respects and that, with the incorporation of the guidance given in this field of application, the element is suitable for its intended purpose.
6. This report represents our opinion as to the performance likely to be demonstrated on a test in accordance with EN1634-1, on the basis of the test evidence referred to in this report. We express no opinion as to whether that evidence, and/or this report would be regarded by any Building Control authorities or any other third parties as sufficient for that or any other purpose.

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Signatories



Responsible Officer

R. Anning* - Principal Product Assessor



Approved

M Tolan* - Senior Product Assessor

* For and on behalf of Warringtonfire.

Report Issued: 02 December 2013

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Revision History

Issue No: 1	Issue Date: 02 December 2013
Written By: R Anning	Approved By: D Forshaw

Issue No: 2	Re-issue Date: 29 October 2018
Revised By: R Anning	Approved By: M Tolan
Reason for Revision: Review and revalidation	

Issue No: 3	Re-issue Date: 28 November 2023
Revised By: R Anning	Approved By: M Tolan
Reason for Revision: Review and revalidation + address change	