

Title:

The Fire Resistance Performance
Of Timber Based Insulated
Doorsets When Fitted With D &
E Architectural Hardware Double
Action Spring Hinges

Report No:

331560/C Issue 4

Prepared for:

**D&E Architectural Hardware
Limited**

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Foreword

This assessment report has been commissioned by D&E Architectural Hardware Limited and relates to the fire resistance of various door hardware.

The report is for National Application and has been written in accordance with the general principles outlined in BS EN 15725: 2010; *Extended application reports on the fire performance of construction products and building elements*.

This report uses established empirical methods of extrapolation and experience of fire testing similar door hardware, in order to extend the scope of application by determining the limits for the designs based on the tested constructions and performances obtained. The scope is an evaluation of the potential fire resistance performance, if the variations specified herein were to be tested in accordance with BS 476: Part 22: 1987 or EN 1634-1:2014+A1:2018.

This scope document cannot be used as supporting documentation for either a CE marking application for doorsets, nor can the conclusion be used to establish a formal classification against EN13501-2.

The scope presented in this report relates to the behaviour of the door hardware under the particular conditions of the test; they are not intended to be the sole criterion for considering the potential fire hazard of the door hardware in use.

This report has been prepared and checked by product assessors with the necessary competence, who subscribe to the principles outlined in the Passive Fire Protection Forum (PFPF) 'Guide to Undertaking Technical Assessments of the Fire Performance of Construction Products Based on Fire Test Evidence - 2021'. 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 for building control and other purposes.

Executive Summary

Objective This report presents an appraisal of the fire resistance performance of timber based doorsets when fitted with the referenced double action spring hinges, if tested in accordance with BS EN 1634-1 or BS 476: Part 22: 1987.

Report Sponsor **D&E Architectural Hardware Limited**

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Summary of Conclusions Should the recommendations given in this report be followed, it can be concluded that the double action spring hinges listed within the tables included in Annex A of this report may be fitted to timber based insulated 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 have achieved up to 60 minutes, as discussed in this report, without detracting from the overall integrity performance (and insulation where relevant) of the doorset.

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, based on the 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 double-acting insulated doorsets when fitted with the referenced double action spring hinges and single or double action insulated doorsets when fitted with the referenced door viewers. The doorset, onto which the proposed hardware is to be fitted, may be of single-leaf or double-leaf configuration, on the basis the scope is supported by the test data/Field of Application for the doorset proposed.

The proposed doorsets are required to provide a fire resistance performance of 60 minutes integrity, as indicated for the specific hinge models, with respect to EN 1634-1:2014+A1:2018 or BS 476: Part 22: 1987

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

Doorset details

It is assumed that the hardware will be fitted to an insulated timber based doorset which has also been previously shown to be capable of providing the required fire resistance performance when tested in accordance with BS EN 1634-1 or BS 476: Part 22: 1987 in the proposed configuration i.e. single-leaf or double-leaf. Additionally the spring hinges shall only be fitted to doorsets that have been previously proven in double-action configuration. The critical aspects of the door construction are detailed later in this report.

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 and, where appropriate, latched position.

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 double action spring hinges may be fitted into a previously tested (in accordance with BS EN 1634-1 or BS 476: Part 22: 1987) insulated timber based doorset which has been shown to be capable of providing 60 minutes integrity and insulation in the same configuration as that proposed i.e. single-leaf or double-leaf.

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

It is proposed that previously fire tested timber based insulated doorsets may be fitted with the double action spring hinges without detracting from the performance of the doorset.

The performances of the respective doorsets during the test referenced WF No. 324188 are cited to display the ability of the hardware to contribute towards the required fire resistance performances.

The test included insulated timber based door leaves and upon examination of the test report it can be seen that there were no modes of integrity failure, which were either attributable to or co-incident with the performance or presence of the proposed items within the respective 60 minute target performances.

Double Action Spring Hinges

DELDA08 Hinges – 60 minute performance

The hinges referenced 'DELDA08 EI60' fitted to the 60 minute doorset construction of Doorset B were a double-action spring hinge of mild steel construction. Review of the observations contained in the test report show that the hinges contributed positively to the performance of the doorset for far in excess of the 60 minute performance required from the doorset.

Initial integrity failure of the doorset occurred after 61 minutes, but this mode of failure was not associated with the performance or presence of the hinges.

The observations shown that the test continued beyond the initial failure of the doorset until 66 minutes at which time the test was terminated without any instance of integrity failure attributable to the performance of the hinges.

It is therefore reasonable to consider that, based on the performance of the DELDA08 EI60 hinges during the test, a high level of confidence can be taken in

the proposal that the hinges may be fitted to other, previously proven, timber based insulated doorsets whilst continuing to positively contribute to the performance of the doorset for the required 60 minute performance.

The tested doorset assembly included two hinges and each hinge was provided with intumescent protection kit in the form of a 2 mm thickness of sheet material fitted behind each blade for the full length of the hinge blade in contact with the door leaf and door frame.

It is therefore a requirement of this appraisal that a minimum of two hinges be fitted to a door leaf and that the same intumescent protection kit is provided as part of their installation.

Alternative hinge references

The tested hinges are marketed under various different references as are their associated intumescent protection kits. In all instances both the hinges and the intumescent kit are identical to those included in the test. Details of the various alternative references and approved finishes for the hinges are given in the tables in Annex A at the end of this report.

Intumescent Protection

It is a requirement of this report that **all hinges** are fitted with the 2 mm intumescent protection behind each blade as supplied by D&E; **failure to fit the supplied intumescent protection will invalidate this assessment.**

Proposed Doorsets

As stated in this report, the doorset, in the required configuration, will be previously successfully tested to BS 476: Part 22: 1987 or EN 1634-1:2014+A1:2018 and its performance is therefore not in doubt.

To enable the use of the hardware 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 manufacture of fire resisting doorset, the following points are given to enable the hardware to be used safely:

The critical aspects of the doorset construction in terms of the performance of the proposed hinges are considered to be the material of the door frame, the leaf to frame clearance gaps and the lipping material to the door leaf. Attention should be paid to these details, and these should not be amended from that previously fire tested. Where this information is not known the following minimum specification will be followed:

- a) The doorset shall carry valid certification or the doorset, including the door frame and associated hardware should have achieved 60 minutes integrity (as appropriate), when tested to BS 476: Part 22: 1987 or EN 1634-1 by a laboratory accredited to IS/IEC 17025 (under International Laboratory accreditation Cooperation (ILAC) membership).
- b) The doorset, onto which the proposed hardware is to be fitted, may be of single-leaf or double-leaf configuration, on the basis the scope is supported by the test data/Field of Application for the doorset proposed.
- c) Door leaves for 60 minute applications shall have minimum thicknesses of 54 mm respectively and shall be fitted with hardwood timber lippings having a minimum thickness of 8 mm and a minimum density of 640 kg/m³.

- d) Door frames for 60 minute doorsets shall be hardwood timber with a minimum density of 640 kg/m^3 .
- e) Where the proposed double-action hinges are to be installed, the test or assessment evidence for the proposed doorset should be applicable to double-action configurations.

Conclusions

Should the recommendations given in this report be followed, it can be concluded that the double action spring hinges listed within the tables included in Annex A of this report may be fitted to timber based insulated 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 have achieved up to 60 minutes, as discussed in this report, without detracting from the overall integrity performance (and insulation where relevant) of the doorset.

Review

It has been confirmed by D&E Architectural Hardware Limited that there have been no changes to the specification, materials or manufacturing location of the products considered in the original appraisal referenced WF Assessment Report No. 331560/C Issue 2 issued 13th December 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 door hardware 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. 331560/C, 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 D&E Architectural Hardware 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 Test Report No. 324188

Test report relating to the performance of two fully insulated, double-acting, single-leaf, timber doorsets incorporating various items of building hardware, when subjected to a test in accordance with BS EN 1634-1: 2008 to determine their fire resistance performance.

For the purposes of the test, the doorsets were referenced Doorset A and Doorset B.

Doorset A had overall dimensions of 2020 mm high by 1025 mm wide and incorporated a door leaf of overall dimensions 1975 mm high by 932 mm wide by 44 mm thick. The door leaf was hung within a softwood door frame on three Double Action Spring Hinges referenced 'LIOBEX – DELDA06 / No.36 / 126101'. The door leaf comprised a three layer particle board Halspan core, timber stiles and rails and hardwood lippings to the vertical edges. The doorset incorporated three door viewers referenced 'DE3850 EI30 SI', 'DESWLAF EI30 NP' and 'DEC2AF EI30 NP'.

Doorset B had overall dimensions of 2018 mm high by 1032 mm wide and incorporated a door leaf of overall dimensions 1975 mm high by 930 mm wide by 54 mm thick. The door leaf was hung within a hardwood door frame on two Double Action Spring Hinges referenced 'LIOBEX – DELDA08 / No.42 / 128101'. The door leaf comprised a three layer particle board Halspan core, timber stiles and rails and hardwood lippings to the vertical edges. The doorset incorporated two door viewers referenced 'DE3850 EI60 GD' and 'DESWLAF EI60 NP'.

Warringtonfire was not involved in any selection or sampling procedures of the specimen or any of the components.

The specimens satisfied the test requirements for the following periods:

		Doorset A	Doorset B
Integrity	Sustained Flames	36 minutes	61 minutes
	Gap Gauge	36 minutes	66 minutes*
	Cotton Pad	36 minutes	61 minutes
Insulation		36 minutes	61 minutes

* The test duration. The test was discontinued after a period of 66 minutes.

Test date : 09 January 2013

Test sponsor : D & E Architectural Hardware Limited

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.

Declaration by D & E Architectural Hardware 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:

DAVID SAMLER

Position:

DIRECTOR

Date:

25/4/2024

For and on behalf of:

D&E ARCHITECTURAL
HARDWARE 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 or BS476: Part 22, 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: 24 January 2014

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Revision History

Issue No: 1	Issue Date: 24 January 2014
Written By: D Forshaw	Approved By: A Kearns

Issue No: 2	Re-issue Date: 13 December 2018
Revised By: R Anning	Approved By: M Tolan
Reason for Revision: 5-year review/revalidation	

Issue No: 3	Re-issue Date: -
Revised By: R Anning	Approved By: M Tolan
Reason for Revision: Not issued	

Issue No: 4	Re-issue Date: 26 April 2024
Revised By: R Anning	Approved By: M Tolan
Reason for Revision: 5-year review/revalidation	

Annex A – Approved Hardware

Alternative References for Spring Hinges for 60 minute applications			
DELDA08	LDA08	No. 42	128101
DEGRDA08	GRDA08		GR128101

Alternative References for Intumescent Kit for Spring Hinges for 60 minute applications					
DEIKLDA08/FD60	DEIKLDA08/FD60 KIT	DEIKLDA08/EI60	DEIKLDA08/EI60 KIT	DELDA08/FD60 KIT	DELDA08/EI60 KIT
IKLDA08/FD60	IKLDA08/FD60 KIT	IKLDA08/EI60	IKLDA08/EI60 KIT	LDA08/FD60 KIT	LDA08/EI60 KIT
DEIKGRDA08/FD60	DEIKGRDA08/FD60 KIT	DEIKGRDA08/EI60	DEIKGRDA08/EI60 KIT	DEGRDA08/FD60 KIT	DEGRDA08/EI60 KIT
IKGRDA08/FD60	IKGRDA08/FD60 KIT	IKGRDA08/EI60	IKGRDA08/EI60 KIT	GRDA08/FD60 KIT	GRDA08/EI60 KIT
DEIK128101 FD60	DEIK128101 FD60 KIT	DEIK128101 EI60	DEIK128101 EI60 KIT	DE128101 FD60 KIT	DE128101 EI60 KIT
IK128101 FD60	IK128101 FD60 KIT	IK128101 EI60	IK128101 EI60 KIT	128101 FD60 KIT	128101 EI60 KIT
DEIKGR128101/FD60	DEIKGR128101/FD60 KIT	DEIKGR128101/EI60	DEIKGR128101/EI60 KIT	DEGR128101/FD60 KIT	DEGR128101/EI60 KIT
IKGR128101/FD60	IKGR128101/FD60 KIT	IKGR128101/EI60	IKGR128101/EI60 KIT	GR128101/FD60 KIT	GR128101/EI60 KIT
DEIK42/FD60	DEIK42/FD60 KIT	DEIK42/EI60	DEIK42/EI60 KIT	DE42/FD60 KIT	DE42/EI60 KIT
IK42/FD60	IK42/FD60 KIT	IK42/EI60	IK42/EI60 KIT	42/FD60 KIT	42/EI60 KIT

Alternative References for Combined Spring Hinges/Intumescent Kit for 60 minute applications			
DELDA08 FD60	LDA08 FD60	No. 42 FD60	128101 FD60
DELDA08 EI60	LDA08 EI60	No. 42 EI60	128101 EI60
DEGRDA08 FD60	GRDA08 FD60		GR128101 FD60
DEGRDA08 EI60	GRDA08 EI60		GR128101 EI60

All part numbers listed above refer solely to the silver finish.

Finishes Available:

Black
Brown
Gold
RAL colour
Silver
White
Stainless steel
Bronze
Brass plated
Chrome plated
Galvanised
Zinc plated
Natural steel