

**Title:**

The Fire Resistance  
Performance Of Timber Or  
Mineral Composite Based  
Insulated Doorsets When  
Fitted With D & E Architectural  
Hardware Spring Hinges

**Report No:**

331560/B

**Prepared for:**

**D&E Architectural Hardware  
Limited**

17 Royce Road,  
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Peterborough,  
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PE1 5YB

**Date:**

**24<sup>th</sup> January 2014**

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## Executive Summary

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<b>Objective</b>	This report presents an appraisal of the fire resistance performance of timber or mineral composite based doorsets when fitted with the referenced spring hinges, if tested in accordance with BS EN 1634-1 or BS 476: Part 22: 1987.
<b>Report Sponsor</b>	<b>D&amp;E Architectural Hardware Limited</b>
<b>Address</b>	17 Royce Road, Carr Road Industrial Estate, Peterborough, Cambridgeshire, PE1 5YB.
<b>Summary of Conclusions</b>	Should the recommendations given in this report be followed, it can be concluded that the spring hinges listed within the tables included in Annex A of this report may be fitted to previously tested or assessed (by Exova Warringtonfire) insulated doorsets, to provide 30 minutes integrity performance, if tested in accordance with BS EN 1634-1 or BS 476: Part 22: 1987.
<b>Valid until</b>	1 <sup>st</sup> February 2019

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## Introduction

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This report presents an appraisal of the fire resistance performance of double-acting insulated doorsets when fitted with the referenced double action spring hinges. The doorset, onto which the proposed hardware is to be fitted, may be of single-leaf or double-leaf configuration.

The proposed doorsets are required to provide a fire resistance performance of 30 minutes integrity, with respect to BS EN 1634-1 or BS 476: Part 22: 1987

### 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

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### Doorset details

It is assumed that the hardware will be fitted to an insulated doorset (timber or mineral composite based) 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. 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.

## Proposals

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It is proposed that the spring hinges may be fitted into a previously tested (in accordance with BS EN 1634-1 or BS 476: Part 22: 1987) insulated (timber or mineral composite) doorset which has been shown to be capable of providing 30 minutes integrity and insulation in the same configuration as that proposed i.e. single-leaf or double-leaf.

## Basic Test Evidence

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### WF Test Report No. 324188

The test referenced WF Test Report No. 324188 included two double-acting, single-leaf timber based doorsets referenced as Doorset A and Doorset B. Only the information relating to Doorset A is relevant to this appraisal.

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 'DELDA06 EI30'. The doorset incorporated three door viewers.

The doorset achieved an integrity performance of 36 minutes.

## Assessed Performance

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### General

It is proposed that previously fire tested (or assessed by Exova Warringtonfire) timber or mineral composite based insulated doorsets may be fitted with the hardware items without detracting from the performance of the doorset.

The performance of Doorset A during the test referenced WF No. 324188 is cited to display the ability of the spring hinges to contribute towards the required fire resistance performance.

The tested doorset included an insulated (timber based) door leaf 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 hinges within the 30 minute target performance.

The proposed hinges referenced DELDA06 EI30 fitted to the 30 minute doorset construction of Doorset A 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 30 minute performance required from the doorset.

Initial integrity failure of the doorset occurred after 36 minutes, but this mode of failure was not associated with the performance or presence of the hinges.

As the test continued beyond the initial failure of the doorset, this allowed the evaluation of the hinges to continue and the observations also show that no direct instance of failure associated with the hinges occurred until after 44 minutes of testing.

Based on the performance of the DELDA06 EI30 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 or mineral composite based insulated doorsets whilst continuing to positively contribute to the performance of the doorset for the required 30 minute performance.

The tested doorset assembly included three 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 three 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.

#### **Proposed Doorsets**

As stated in this report, the doorset, in the required configuration, will be previously tested (or assessed by Exova Warringtonfire) 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 30 minutes integrity, when tested by a UKAS approved laboratory (or assessed by Exova Warringtonfire) to BS EN 1634-1 or BS 476: Part 22: 1987.
- b) If the proposed doorset is to be used in double-leaf configuration the test or assessment evidence should be applicable to double-leaf configurations.
- c) Door leaves for 30 minute applications shall have minimum thicknesses of 44 mm and shall be fitted with hardwood timber lippings having a minimum thickness of 8 mm and a minimum density of 650 kg/m<sup>3</sup>.
- d) Door frames for 30 minute doorsets shall be timber with a minimum density of 510 kg/m<sup>3</sup>.
- 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

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Timber or mineral composite based doorsets that have previously been successfully fire tested by a UKAS accredited laboratory (or assessed by Exova Warringtonfire) which have achieved 30 minutes integrity as discussed in this report, may be fitted with the double action spring hinges detailed in Annex A, without detracting from the overall performance of the doorset.

## Validity

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This assessment is issued on the basis of test data and information available at the time of issue. If contradictory evidence becomes available to warringtonfire the assessment will be unconditionally withdrawn and D & E Architectural Hardware 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 i.e. until 1st February 2019, 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

### 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. Only details of the relevant doorset, Doorset A are included.

**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 'DELDA06 EI30'. The door leaf comprised a three layer particle board Halspan core, timber stiles and rails and hardwood lippings to the vertical edges. The doorset also incorporated three door viewers.

The specimen satisfied the test requirements for the following periods:

		Doorset A
<b>Integrity</b>	Sustained Flames	36 minutes
	Gap Gauge	36 minutes
	Cotton Pad	36 minutes
<b>Insulation</b>		36 minutes

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

Test date : 9<sup>th</sup> January 2013

Test sponsor : D & E Architectural Hardware Limited



## Declaration by D & E Architectural Hardware Limited

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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:


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For and on behalf of:

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## Signatories

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Responsible Officer
D. Forshaw* - Principal Certification Engineer


Approved
A. Kearns* - Technical Manager

\* For and on behalf of Exova Warringtonfire.

Report Issued: 24 <sup>th</sup> January 2014
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The assessment report is not valid unless it incorporates the declaration duly signed by the applicant.

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## Annex A – Approved Hardware

Alternative References for Spring Hinges for 30 minute applications			
DELDA06	LDA06	No. 36	126101
DEGRDA06	GRDA06		GR126101

Alternative References for Intumescent Kit for Spring Hinges for 30 minute applications					
DEIKLDA06/FD30	DEIKLDA06/FD30 KIT	DEIKLDA06/EI30	DEIKLDA06/EI30 KIT	DELDA06/FD30 KIT	DELDA06/EI30 KIT
IKLDA06/FD30	IKLDA06/FD30 KIT	IKLDA06/EI30	IKLDA06/EI30 KIT	LDA06/FD30 KIT	LDA06/EI30 KIT
DEIKGRDA06/FD30	DEIKGRDA06/FD30 KIT	DEIKGRDA06/EI30	DEIKGRDA06/EI30 KIT	DEGRDA06/FD30 KIT	DEGRDA06/EI30 KIT
IKGRDA06/FD30	IKGRDA06/FD30 KIT	IKGRDA06/EI30	IKGRDA06/EI30 KIT	GRDA06/FD30 KIT	GRDA06/EI30 KIT
DEIK126101 FD30	DEIK126101 FD30 KIT	DEIK126101 EI30	DEIK126101 EI30 KIT	DE126101 FD30 KIT	DE126101 EI30 KIT
IK126101 FD30	IK126101 FD30 KIT	IK126101 EI30	IK126101 EI30 KIT	126101 FD30 KIT	126101 EI30 KIT
DEIKGR126101/FD30	DEIKGR126101/FD30 KIT	DEIKGR126101/EI30	DEIKGR126101/EI30 KIT	DEGR126101/FD30 KIT	DEGR126101/EI30 KIT
IKGR126101/FD30	IKGR126101/FD30 KIT	IKGR126101/EI30	IKGR126101/EI30 KIT	GR126101/FD30 KIT	GR126101/EI30 KIT
DEIK36/FD30	DEIK36/FD30 KIT	DEIK36/EI30	DEIK36/EI30 KIT	DE36/FD30 KIT	DE36/EI30 KIT
IK36/FD30	IK36/FD30 KIT	IK36/EI30	IK36/EI30 KIT	36/FD30 KIT	36/EI30 KIT

Alternative References for Combined Spring Hinges/Intumescent Kit for 30 minute applications			
DELDA06 FD30	LDA06 FD30	No. 36 FD30	126101 FD30
DELDA06 EI30	LDA06 EI30	No. 36 EI30	126101 EI30
DEGRDA06 FD30	GRDA06 FD30		GR126101 FD30
DEGRDA06 EI30	GRDA06 EI30		GR126101 EI30

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