

# assessment report

**Title:**

The Fire Resistance  
Performance Of Previously  
Fire Tested Insulated  
Timber/  
Mineral Composite Doorsets  
Incorporating Simonswerk  
'TECTUS' Series Hinges

**WF Assessment Report  
No:**

181761

**Prepared for:**

**Simonswerk UK Ltd**

Burcot Works  
Spring Street  
Tipton  
West Midlands  
DY4 8TF

**Date:**

**30<sup>th</sup> April 2009**

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## Executive Summary

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<b>Objective</b>	This report presents an appraisal of the fire resistance performance of previously tested (or assessed by <b>warringtonfire</b> ) fully insulated, single-acting, timber or mineral composite based doorsets in single or double leaf configurations, when fitted with Simonswerk 'Tectus' 'TE340-3D', 'TE540-3D' and 'TE540-3D A8' concealed hinges.
<b>Report Sponsor</b>	<b>Simonswerk UK Ltd</b>
<b>Address</b>	Burcot Works Spring Street Tipton West Midlands DY4 8TF
<b>Summary of Conclusions</b>	Should the recommendations given in this report be followed, it can be concluded that timber or mineral composite based doorsets, which have achieved 30 minutes integrity and insulation performance may be fitted with 'Tectus' 'TE340-3D', 'TE540-3D' and 'TE540-3D A8' concealed hinges, without detracting from the overall achieved performance of the doorset in accordance with BS 476: Part 22: 1987 or BS EN 1634-1: 2000.
<b>Valid until</b>	1 <sup>st</sup> May 2014

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## Introduction

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This report presents an appraisal of the fire resistance performance of previously tested (or assessed by **warringtonfire**) fully insulated, single-acting, timber or mineral composite based doorsets in single or double leaf configurations, when fitted with Simonswerk 'Tectus' 'TE340-3D', 'TE540-3D' and 'TE540-3D A8' concealed hinges.

The doorsets to which the hinges 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 30 minutes integrity and insulation when fitted with 'Tectus' 'TE340-3D', 'TE540-3D' or 'TE540-3D A8' concealed hinges, with respect to BS 476: Part 22: 1987 or BS EN 1634-1: 2000.

### 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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### Supporting construction

It is assumed that the construction, which supports the proposed doorset assembly, will have been the subject of a separate test and its performance 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 and in any case shall not exceed 3.0 mm.

### Doorset details

It is assumed that the proposed hinges will be fitted to timber or mineral composite based door leaves which have previously been shown to be capable of providing 30 minutes integrity and insulation performance in the same configuration as that proposed, with regard to:

- a) Single-acting, single or double-leaf
- b) Latched or unlatched

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## Proposals

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It is proposed that the concealed hinges referenced 'Tectus' 'TE340-3D', 'TE540-3D' and 'TE540-3D A8' are fitted to fully insulated doorsets, the specification of which has previously been successfully fire tested by a laboratory appropriately accredited by UKAS (or previously assessed by Bodycote **warringtonfire**), for periods of integrity and insulation performance of 30 minutes.

It is proposed that the doorsets may be of single or double-leaf, single-acting configurations.

Doorsets, which are suitable for use with the proposed hinges, are detailed later in this report.

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## Basic Test Evidence

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**WFRC No. 133469** The test referenced WFRC No. 133469 and described briefly in the supporting data section of this report describes a fire resistance test in accordance with BS EN 1634-1: 2000 on two specimens of single-leaf, timber based doorset assembly.

The test assembly comprised two specimens of single-acting, single-leaf doorsets. Doorset B had overall dimensions of 2085 mm high by 1005 mm wide. The doorset was of a '30 minute' construction, 44 mm thick and was hung upon 'Tectus 510' concealed hinges.

The test demonstrated the ability of the doorsets to provide 63 minutes and 33 minutes integrity and insulation performance respectively.

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## Assessed Performance

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It is proposed that previously fire tested (or assessed by **warringtonfire**) timber or mineral composite based insulated doorsets may be fitted with 'Tectus' 'TE340-3D', 'TE540-3D' and 'TE540-3D A8' concealed hinges in order to provide 30 minutes integrity and insulation without detracting from the performance of the doorset.

The tested doorset construction in WF No. 133469 referenced Doorset B included a timber based door leaf, hung within a softwood frame and upon examination of the test report, it can be seen that there were no modes of integrity failure for a period of 33 minutes.

### 'TE340-3D'

The proposed 'TE340-3D' hinge is similar in construction to the tested 'Tectus 510' in terms of materials of construction, but is of slightly smaller overall dimensions.

The 'TE 340-3D' is 20 mm shorter at 160 mm high, 2 mm narrower at 28 mm wide and requires a 2 mm shallower mortice into the door leaf and frame projecting a maximum of 32 mm into each. The reduction in hinge size would be expected to have no affect upon the ability of the hinge to provide the required support to the door leaf and a slightly positive affect in terms of burn through at the hinge position.

Based upon the 'TE 340-3D' hinge being marginally smaller than the hinge already proven by test, i.e. requiring less material to be removed from the leaf and frame, it is therefore considered that the 'TE 340-3D' may also be positively appraised.

#### **'TE540-3D'**

The 'TE 540-3D' is slightly larger than the tested hinge, at 200 mm high it is 20 mm taller, 2 mm wider at 32 mm wide and requires a 1 mm deeper mortice into the door leaf and frame, projecting 35 mm into each. The larger hinge would be expected to be capable of supporting the door leaf at least as well as the tested model and so does not provide any concerns in that respect. The increased to the mortice width and depth required to install the hinge are considered as minor modifications which would have a negligible affect in terms of burn through at the hinge position.

The height of the hinge is recognised to be a more onerous situation, however, the increase of 20 mm is not thought to present significantly more risk in terms of the hinge's required performance of 30 minutes. It is particularly significant to recognise that the tested doorset fitted with the 'Tectus 510' hinge achieved an integrity and insulation performance of 33 minutes with no indication of any imminent failure at that time, the doorset being sealed off to allow the continuation of the test for the other 60 minute doorset.

#### **'TE540-3D A8'**

The 'TE 540-3D A8' is of the same construction and has the same overall blade height and width as the 'TE540-3D' but is slightly deeper and requires a 6 mm deeper mortice into the door leaf and frame, projecting 41 mm into each. Whilst the larger unit is of a greater thermal mass, its interruption in the door leaf to doorframe junction is no greater than that of the previously discussed 'TE540-3D' and the added depth of projection of 6 mm into the door leaf and frame are not considered to present more than a negligible increase in the risk of burn through at the hinge position.

When taking into account that the same level of intumescent protection around the hinge body will be used, and that the tested hinge achieved an overrun of performance of 10% before to doorset was sealed off, a high level of confidence can be taken in the ability of the proposed hinge to be capable of achieving the required 30 minutes performance.

The above discussion provides confidence that should a doorset of similar specification to that tested, which has been separately proven to be capable of providing at least 30 minutes integrity performance (the critical specifications of which are detailed later in this section), be hung upon the 'Tectus' 'TE340-3D', 'TE540-3D' or 'TE540-3D A8' hinges, then this would not be expected to have any deleterious effects on the performance of the doorset for the required period.

### Suitable doorsets

To enable the use of the hinges with 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 hinges to be used safely:

- The doorset, including the door frame and associated ironmongery should have achieved 30 minutes integrity and insulation performance, when tested by a UKAS approved laboratory (or assessed by **warringtonfire**) in accordance with BS 476: Part 22: 1987 or BS EN 1634-1:2000.
- If the proposed doorset is to be used in double-leaf configurations, the test or assessment evidence should be applicable to double-leaf configurations.
- Likewise, if the proposed doorset is to be used in unlatched configurations then the available test evidence should be applicable to unlatched doorsets.
- The door leaf will be of a timber based or mineral composite construction with hardwood lippings with a minimum density of 640 kg/m<sup>3</sup>.
- The door frame will be of a timber based or mineral composite construction with a minimum density of 510 kg/m<sup>3</sup>.
- The hinges must be fully encased in 2 mm thick mono-ammonium phosphate intumescent sheet material, as per the tested assembly.

The fitting of the hinges onto alternative doorsets, on the basis of compliance with the conditions given above, is therefore considered to be acceptable.

## Conclusions

Timber or mineral composite based doorsets, which have achieved 30 minutes integrity and insulation performance may be fitted with 'Tectus' 'TE340-3D', 'TE540-3D' and 'TE540-3D A8' concealed hinges, without detracting from the overall achieved performance of the doorset in accordance with BS 476: Part 22: 1987 or BS EN 1634-1: 2000.

## 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 **Simonswerk UK Ltd** 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 1<sup>st</sup> May 2014, 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

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**WFRC No. 133469** The test report referenced WFRC No. 133469 describes a fire resistance test in accordance with BS EN 1634-1: 2000 on two specimens of single-leaf, timber based doorset assembly.

For the purpose of the test the specimens were referenced Doorset A and Doorset B.

Doorset A had overall nominal dimensions of 2082 mm high by 1011 mm wide and incorporated a door leaf of overall nominal dimensions 2040 mm high by 927 mm wide by 53 mm thick hung on three '1880 Samson' brass butt hinges.

Doorset B had overall nominal dimensions of 2085 mm high by 1005 mm wide and incorporated a door leaf of overall nominal dimensions 2040 mm high by 925 mm wide by 44 mm thick hung on three 'Tectus 510' recessed hinges.

Both door leaves were orientated such that they opened towards the heating conditions of the test. Both doorsets incorporated a latch and handles at approximately mid-height and were latched for the duration of the test.

The hinges for both doorsets were protected via nominally 2 mm thick Interdens intumescent sheet.

The doorsets were not fitted with latches, closing being effected via a surface mounted overhead door closer fixed to the exposed surface of the specimen.



The specimens achieved the following results:

<b>Performance Criteria</b>		<b>Doorset A</b>	<b>Doorset B</b>
<b>Integrity</b>	Cotton Pad	63 minutes	33 minutes
	Sustained flames	63 minutes	33 minutes
	Gap gauges	63 minutes	33 minutes
<b>Insulation</b>		63 minutes	33 minutes

Test date : 29<sup>th</sup> July 2003

Test sponsor : Hinges and Things (Now Simonswerk UK Limited)

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## Declaration by Simonswerk UK Ltd

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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 **warringtonfire** to withdraw the assessment.

Signed:

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For and on behalf of:

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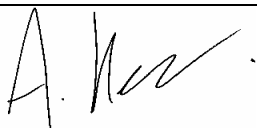
## Signatories

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Responsible Officer

D Forshaw\* - Certification Engineer



Approved

A Kearns\* - Technical Manager

\* For and on behalf of **warringtonfire**.

Report Issued: 30<sup>th</sup> April 2009

The assessment report is not valid unless it incorporates the declaration duly signed by the applicant.

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