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Testing. Advising. Assuring.

**Title:**

# The Fire Resistance Performance of Single-Acting, Single-Leaf, Timber Doorsets

**WF Report No:**

304730 Issue 2

**Prepared for:**

**Corinthian Industries (Asia) Sdn Bhd**

Lot 37217, Jalan Genting
Off 4th Mile
Jalan Kapar
42100 Rantau Panjang
Klang
Selangor Darul Ehsan
Malaysia

**Date: 14th March 2011**

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# Executive Summary

**Objective**

This report presents an appraisal of the fire resistance performance of single-acting, single-leaf, timber doorsets similar to that referenced Doorset A in the test referenced WF No. 303282, when modified to include 4 or 6 panels.

**Report Sponsor**

**Corinthian Industries (Asia) Sdn Bhd**

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**Summary of Conclusions**

Should the recommendations given in this report be followed, it can be concluded that the proposed timber doorsets should provide 30 minutes integrity and insulation performance, if tested in accordance with Clause 6 of BS 476: Part 22: 1987.

**Valid until**

1st March 2016

# Introduction

This report presents an appraisal of the fire resistance performance of single-acting, single-leaf, timber doorsets similar to that referenced Doorset A in the test referenced WF No. 303282, when modified to include 4 or 6 panels.

The proposed doorsets are required to provide a fire resistance performance of 30 minutes integrity and insulation, if subjected to a fire resistance test in accordance with Clause 6 of 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

**General Construction**

It is assumed that the doorsets shall be constructed and installed in an identical manner to the previously fire tested doorsets described in this report, unless otherwise specified.

**Supporting construction**

It is assumed that the doorsets shall be installed within a fire rated supporting construction, which has separately proven to be capable of supporting the doorsets for the required period of 30 minutes

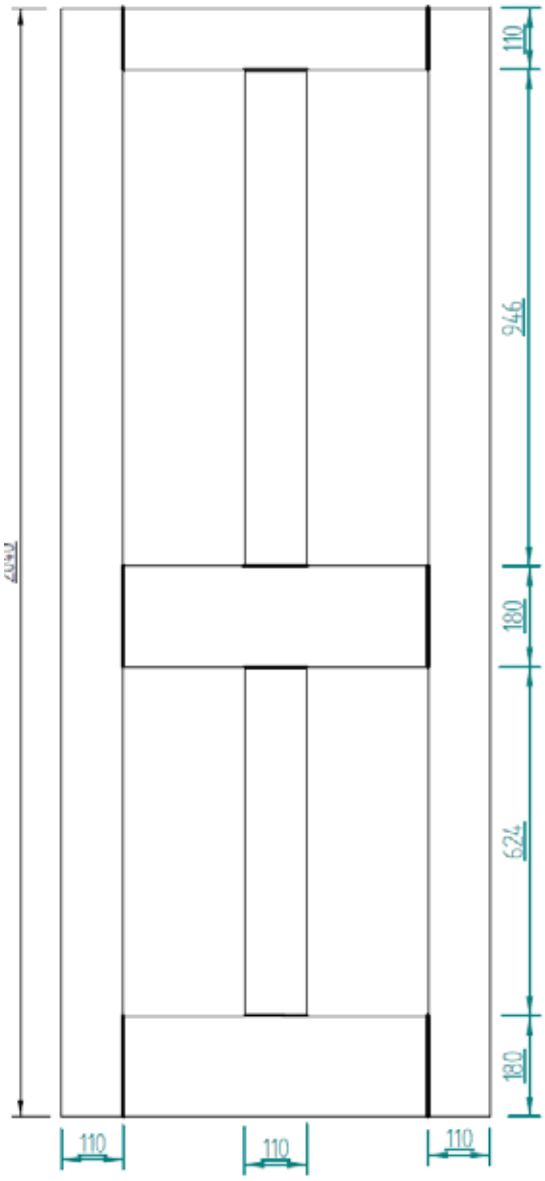
**Clearance gaps**

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 of the fire tested assemblies, and in no case shall exceed 3 mm.

# Proposals

It is proposed that timber based doorsets, similar to that previously fire tested under the reference WF No. 303282 – Doorset A, will provide 30 minutes integrity and insulation when incorporating 4 or 6 panels, as detailed in Figures 1-3 below

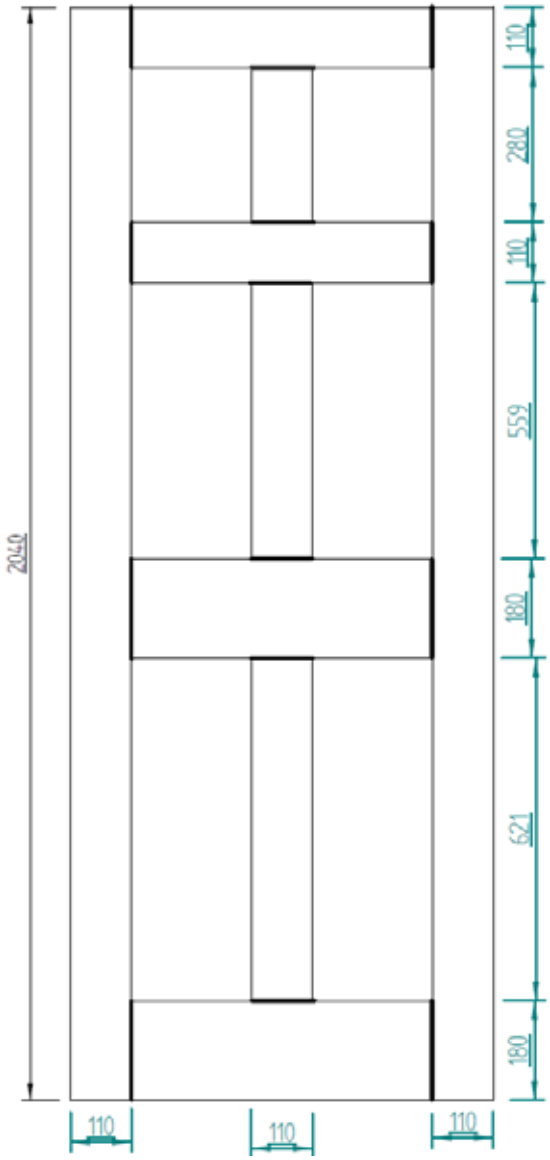
**Figure 1 – 4 panel**




Note :

- Flush Shaker Construction, Unprofile
- Half V-Joint on all sticking
- Panel (flat): 9mm Standard Particle Board sandwich with 5mm MgO board, veneers
- Stile/mullion : Clear unprofile KSK sticking, Edgebend 16mm clear KSK outer, Standard Particle board core, veneers
- Top/Bottom Rails : Clear unprofile KSK sticking, edgeband 10mm minimum paint grade FJ outer, Particle Board core, veneers
- With Pyromas A Intumescent mastic at all sticking parts, 2x2mm U-channel

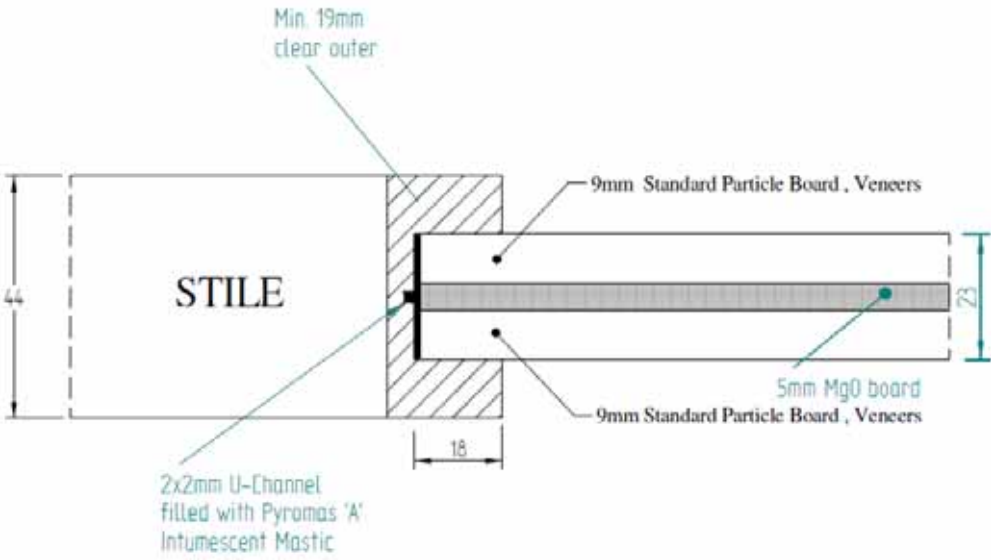
**Figure 2 – 6 panel**




Note :

- Flush Shaker Construction, Unprofile
- Half V-Joint on all sticking
- Panel (flat): 9mm Standard Particle Board sandwich with 5mm MgO board, veneers
- Stile/mullion : Clear unprofile KSK sticking, Edgebend 16mm clear KSK outer, Standard Particle board core, veneers
- Top/Bottom Rails : Clear unprofile KSK sticking, edgeband 10mm minimum paint grade FJ outer, Particle Board core, veneers
- With Pyromas A Intumescent mastic at all sticking parts, 2x2mm U-channel

**Figure 3 – Panel edge detail**



# Basic Test Evidence

**WF No. 303282**

A fire resistance test in accordance with BS 476: Part 22: 1987, Clause 6, on two fully insulated single-acting, single-leaf doorsets.

For the purpose of the test the doorsets were referenced Doorset A and Doorset B, both were installed such that their leaves opened towards the heating conditions of the test. This assessment only considers the specimen referenced Doorset A.

The doorset included a door leaf of overall dimensions 2040 mm high by 926 mm wide by 44 mm thick and was of a 1 panel 'Shaker' panelled design with particleboard framework and composite panel in fills. The door leaf was hung within a softwood door frame on three steel hinges. The results of the test were as follows:

Test Results:

| | |
|---|---|
| Integrity | 34 minutes |
| Insulation | 34 minutes |

The test was discontinued after a period of 34 minutes.

# Assessed Performance

The specimen referenced Doorset A in the test referenced WF No. 303282 was of a timber based construction, briefly comprising a softwood door frame and a 44 mm thick, panelled door leaf with particleboard stiles and rails and single, large panel.

The panel had dimensions of 1750 x 706 mm and comprised a 5 mm MgO core board faced with 9 mm particle board and were retained within a groove in a hardwood Channel, as illustrated in Figure 3.

The stiles and rails of a timber based doorset are typically the most influential components in terms of maintaining stability/resisting distortion and therefore the larger these components are, the more likely the door is to remain flat under fire test conditions.

Similarly, the addition of further rails and mullions, subject to section size would also be expected to result in a more stable door.

The proposed 4 panel and 6 panel doors incorporate additional rails and mullions of equal dimensions to the tested perimeter stiles and rails, which would therefore only be expected to have a positive affect upon leaf stability and therefore doorset performance. The corresponding reduction in panel dimensions would also be expected to be beneficial in terms of the MgO panel core, which is less likely to crack and form large fissures at reduced overall dimensions.

Based upon the above it is therefore considered that the proposal to modify the doorset to 4 or 6 panel designs, as illustrated in Figures 1-3, would be likely to have a positive or neutral affect upon performance and the required 30 minutes integrity and insulation performance would therefore be expected to be maintained.

## Conclusions

Should the recommendations given in this report be followed, it can be concluded that the proposed timber doorsets should provide 30 minutes integrity and insulation performance, if tested in accordance with Clause 6 of BS 476: Part 22: 1987.

## 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 **Corinthian Industries (Asia) Sdn Bhd** 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 March 2016, 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 Supporting Data

**WF No. 303282** A fire resistance test in accordance with BS 476: Part 22: 1987, Clause 6, on two fully insulated single-acting, single-leaf doorsets.

For the purpose of the test the doorsets were referenced Doorset A and Doorset B, both were installed such that their leaves opened towards the heating conditions of the test. This assessment only considers the specimen referenced Doorset A.

The doorset had overall dimensions of 2080 mm high by 993 mm wide and incorporated a door leaf of overall dimensions of 2040 mm high by 926 mm wide by 44 mm thick. The door leaf was hung within a softwood frame on three mild steel hinges. The door leaf referenced '1 Panel Shaker FD30' incorporated a particle board perimeter framework, with additional secondary Kembang Semangkok (KSK) timber stiles and rails, inside of the perimeter framework. The core was of a sandwich panel construction, which comprised 1 no. layer of 5 mm thick Magnesium Oxide board, 9 mm thick standard particle board inner facings and 0.45 mm to 0.55 mm thick oak veneer outer skins. The vertical edges of the door leaf were lipped with Kembang Semangkok (KSK) timber, and the top and bottom edges of the door leaf were lipped with Paint grade timber.. The results of the test were as follows:

Test Results:

| | |
|---|---|
| Integrity | 34 minutes |
| Insulation | 34 minutes |

The test was discontinued after a period of 34 minutes.

Test Date : 12th January 2011

Test Sponsor : Corinthian Industries (Asia) Sdn Bhd

# Declaration by Corinthian Industries (Asia) Sdn Bhd

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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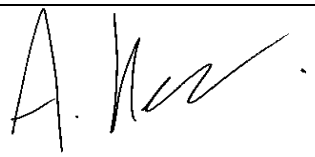
For and on behalf of:

# Signatories

Responsible Officer

C Johnson* - Principal Certification Engineer



Approved

A Kearns* - Technical Manager

* For and on behalf of **Exova Warringtonfire**

Report Issued: 14th March 2011

Issue 2 – Correction of typographical errors (21st March 2011)

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