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Title:

The Fire Resistance
Performance of a Hinged,
Two-Panel, Semi-Automatic
Lift Landing Doorset

WF Assessment Report

No:

306474 (Issue 2)

Prepared for:

Klefer SA

Kilkis Industrial Area
Stavroxiri
Greece

Date:

28th April 2011

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Executive Summary

Objective	This report provides an appraisal of the fire resistance performance of a hinged, two-panel, semi-automatic, lift landing doorset.
Report Sponsor	Klefer SA
Address	Kilkis Industrial Area Stavroxiri Greece
Summary of Conclusions	It can be concluded that the proposed doorset would be expected to provide 120 minutes integrity performance and 60 minutes radiation performance, if subjected to a fire resistance test in accordance with BS EN 81-58: 2003.
Valid until	1 st May 2016

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Introduction

This report provides an appraisal of the fire resistance performance of a hinged, two-panel, semi-automatic lift landing doorset.

The doorset discussed within this report is required to provide 120 minutes integrity performance and 60 minutes radiation performance, if subjected to a fire resistance test in accordance with BS EN 81-58: 2003.

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

It is assumed that the wall constructions to which the doorset will be mounted will be of reinforced concrete or masonry, capable of providing effective structural support for the required period.

It is also assumed that the general construction of the doorset and the materials used in the construction will, unless specifically detailed in this report, be identical to that of the tested assembly.

It is further assumed that the doorset will be required to provide fire resistance when the landing side only is exposed to the heating conditions of a fire resistance test.

It is assumed that the doorset will be installed by competent installers in a similar manner to that used when installing the fire tested assembly.

Proposals

A specimen of the proposed doorset has been previously fire tested under the reference FIRES-FR-226-10-AUNE. It is proposed that the dimensions of this tested doorset may be increased to between 1700 and 2400 mm high by between 910 and 1700 mm wide.

It is proposed that the aforementioned change in size will not detract from the previously achieved fire performance of 120 minutes integrity and 60 minutes radiation.

Basic Test Evidence

FIRES-FR-226-10-AUNE A fire resistance test conducted in accordance with EN 81-58: 2003, on a specimen of a hinged, two-panel, semi-automatic, lift landing doorset.

The doorset had clear opening dimensions of 2100 mm high by 1300 mm wide and comprised door leaves having a thickness of 50 mm. The door leaves were constructed from 1.25 mm thick folded mild steel sheet with upper and lower capping channels. Each door leaf included a vision panel having pane dimensions of 1060 mm high by 140 mm wide which comprised 6 mm thick Koulinas and Motsis wired glass.

The specimen satisfied the integrity performance requirements of the Standard for the test duration of 126 minutes and the radiation criteria for a period of 123 minutes.

Assessed Performance

Integrity Performance

The previous fire test referenced FIRES-FR-226-10-AUNE has demonstrated the ability of the proposed doorset to satisfy the integrity performance requirements of EN 81-58: 2003 for a period of 126 minutes.

Throughout the test, the maximum recorded CO₂ leakage was 0.5 m³/(min.m), considerably less than the maximum permissible of 3 m³/(min.m).

The Direct Field of Application within BS EN 81-58: 2003 permits a 15% increase in height and a 30% increase or reduction in width based upon a successful test, for doorsets which are required to satisfy the integrity performance criteria only. When the leakage is adjusted to account for the increased furnace overpressure to which the doorset would be subjected at its maximum proposed height, this still falls well within the limit imposed by the test standard.

Under the Direct Field of Application, the acceptable range of clear opening sizes is up to 2415 mm high by between 910 and 1690 mm wide. The maximum proposed clear opening height shall be reduced by 15 mm to 2400 mm which is deemed to adequately offset the proposed slight increase in the maximum width by 10 mm to 1700 mm.

The proposed range of door sizes may therefore be positively appraised for 120 minutes integrity performance.

Radiation Performance

The Direct Field of Application relates to the integrity performance only. No field of application is provided with respect to radiation performance.

It is, however, possible to calculate the radiation intensity for doorsets having larger wall opening sizes using the following formula:

$$W_{\text{ext}} = W_0 \times [\varphi_{\text{ext}}/\varphi_0] \leq W_{\text{max}}$$

with:

$$\varphi_0 = \frac{2}{\pi} \left[\frac{w_0}{\sqrt{w_0^2 + 4d^2}} \times \arctan\left(\frac{h_0}{\sqrt{w_0^2 + 4d^2}}\right) + \frac{h_0}{\sqrt{h_0^2 + 4d^2}} \times \arctan\left(\frac{w_0}{\sqrt{h_0^2 + 4d^2}}\right) \right]$$

$$\varphi_{\text{ext}} = \frac{2}{\pi} \left[\frac{w_{\text{ext}}}{\sqrt{w_{\text{ext}}^2 + 4d^2}} \times \arctan\left(\frac{h_{\text{ext}}}{\sqrt{w_{\text{ext}}^2 + 4d^2}}\right) + \frac{h_{\text{ext}}}{\sqrt{h_{\text{ext}}^2 + 4d^2}} \times \arctan\left(\frac{w_{\text{ext}}}{\sqrt{h_{\text{ext}}^2 + 4d^2}}\right) \right]$$

where:

- W_{ext} = radiation of the test specimen after extension
- W_0 = measured radiation from the test specimen at the time of classification
- φ_0 = configuration factor for tested test specimen
- φ_{ext} = configuration factor of the test specimen after extension
- d = distance between test specimen and sensor (1 m as required by EN 1364 - 2)
- w_0, h_0 = width and height of the test specimen
- $w_{\text{ext}}, h_{\text{ext}}$ = extended width and height of the test specimen
- $w_{\text{max}}, h_{\text{max}}$ = maximum extended width and height of the test specimen

A reduction in clear opening size compared with that tested is expected to reduce the radiation intensity. Consideration to the radiation intensity at the maximum proposed dimensions of 2400 mm high by 1700 mm wide is therefore only considered to be required, this representing the worst case.

The doorset previously fire tested under the reference FIRES-FR-226-10-AUNE had clear opening dimensions of 2100 mm high by 1300 mm wide. After the required 60 minute period, the recorded radiation intensity was 9.7 kW/m².

Using this data, the radiation for the maximum proposed clear opening size may be calculated as follows:

$$\varphi_0 = 2/\pi (0.54 \times \tan^{-1}0.88 + 0.72 \times \tan^{-1}0.45) = 25.48$$

$$\varphi_{\text{ext}} = 2/\pi (0.65 \times \tan^{-1}0.91 + 0.77 \times \tan^{-1}0.54) = 31.46$$

$$W_{\text{ext}} = (31.46/25.48) \times 9.7 = 11.98 \text{ kW/m}^2$$

Since the predicted radiation intensity for the maximum proposed wall opening size of 2400 mm high by 1700 mm wide is therefore still less than the maximum permitted of 15 kW/m², the required 60 minutes radiation performance may be positively appraised.

Conclusions

It is expected that the doorset discussed within this report, should be capable of providing 120 minutes integrity performance and 60 minutes radiation performance if subjected to a fire resistance test in accordance with BS EN 81-58: 2003.

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 Klefer SA 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 May 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 Primary Supporting Data

FIRES-FR-226-10-AUNE A fire resistance test conducted in accordance with EN 81-58: 2003, on a specimen of a hinged, two-panel, semi-automatic, lift landing doorset.

The doorset had clear opening dimensions of 2100 mm high by 1300 mm wide and comprised door leaves having a thickness of 50 mm. The door leaves were constructed from 1.25 mm thick folded mild steel sheet with upper and lower capping channels. Each door leaf included a vision panel having pane dimensions of 1060 mm high by 140 mm wide which comprised 6 mm thick Koulinas and Mosis wired glass.

The specimen satisfied the integrity performance requirements of the Standard for the test duration of 126 minutes and the radiation criteria for a period of 123 minutes.

Test Date : 15th December 2010

Test Sponsor : Tecnolama SA (who have provided permission for the use of this report)

Declaration by Klefer SA

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:

For and on behalf of:

Signatories


Responsible Officer
D Hankinson* - Principal Certification Engineer


Approved
A Kearns* - Technical Manager

* For and on behalf of Exova Warringtonfire

Report Issued: 28 th April 2011
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Issue 2: Change of report sponsor
(1st July 2011)

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

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