Exova Warringtonfire
Holmesfield Road
Warrington
WA1 2DS
United Kingdom

T : +44 (0) 1925 655 116
F : +44 (0) 1925 655 419
E : warrington@exova.com
W: www.exova.com

Testing. Advising. Assuring.

Title:

An ambient temperature air leakage test in accordance with BS EN 1634-3: 2004, on a single-acting, single-leaf doorset incorporating a Threshold seal

WF Report No:

319466

Prepared for:

CCE. COSTRUZIONI CHIUSURE ERMETICHE SRL

VIA DELL'ARTIGIANATO 16,
VILLA DEL CONTE
35010
ITALY

Date:

06th August 2012

Notified Body No:

0833

UKAS TESTING
0249

Summary

Objective

To evaluate the performance of a specimen of a single-acting, single-leaf, doorset when fitted with a threshold smoke seal and subjected to a test utilising the test method detailed within BS EN 1634-3: 2004, 3.1.2.

Approved Document B (Fire Safety) of the Building Regulations requires doorsets shall "meet the additional classification requirement of S_a when tested to BS EN 1634-3 Fire resistance tests for door and shutter assemblies, Part 3 – Smoke control doors".

The classification requirement of S_a is specified within EN 13501-2:2003 as "when the maximum leakage rate measured at ambient temperature, and at a pressure of up to 25 Pa, does not exceed 3m^3/h per metre length of the gap at the threshold."

In the absence of other criteria, this guidance has been adopted in reporting the results of this test. The leakage rates at other pressures are also included in this report.

Test Sponsor

CCE. COSTRUZIONI CHIUSURE ERMETICHE SRL, VIA DELL'ARTIGIANATO 16, VILLA DEL CONTE, 35010, ITALY

Summary of Tested Specimens

The specimen doorset had overall nominal dimensions of 2055 mm high by 1005 mm wide and incorporated a door leaf of overall dimensions 2005 mm high by 930 mm wide by 44 mm thick. The doorset was fixed within a plywood faced, timber stud partition, to form the test construction such that it opened away from the test rig. The door leaf incorporated a drop down threshold seal referenced 'Model Superior (code ASSUP)'

Full details of the exact manner of installation are included in the Schedule of Components.

Test Results:

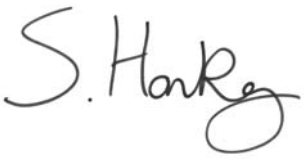
	Leakage Rate (m^3/m/h)			Leakage Rate (m^3/m/h)		
	+10Pa	**+25Pa**	**+50Pa**	**-10Pa**	**-25Pa**	**-50Pa**
	0.35	0.42	0.23	0.23	0.23	0.42

Date of Test 29th June 2012

Signatories

Responsible Officer
N. Howard*
Testing officer

Approved
D. Hankinson*
Principal Certification Engineer



Head of Department
S. Hankey*
Operations Manager

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

Report Issued

Date : 06th August 2012

CONTENTS **PAGE NO.**

Test Procedure

Introduction

The doorset was required to provide a smoke leakage separating function and was therefore tested in accordance with BS EN 1634-3: 2001 'Fire resistance tests for doors and shutter assemblies - Part 3: Smoke control doors and shutters'. This test report should be read in conjunction with that Standard and with BS EN 1363-1: 1999, 'Fire resistance tests - Part 1: General requirements' and EN ISO 13943 Fire Safety - Vocabulary.

Guidance with respect to the performance of fire doors required to resist the passage of smoke at ambient temperature conditions is given in Approved Document B (Fire Safety) of the Building Regulations.

Certain aspects of some test specifications are open to different interpretations. The Fire Test Study Group has identified a number of such areas and has agreed Resolutions which define common agreement of interpretations between fire test laboratories which are members of the Group. Where such Resolutions are applicable to this test they have been followed.

Instruction to test

The test was conducted on the 29th June 2012 on behalf of **CCE. COSTRUZIONI CHIUSURE ERMETICHE SRL**

Test Specimen Construction

A comprehensive description of the test construction is given in the Schedule of Components. The description is based on a detailed survey of the specimens and information supplied by the sponsor of the test.

Installation

The specimen threshold seal was supplied by the test sponsor 1 week prior to the test. **Exova Warringtonfire** was not involved in any selection or sampling procedures of the specimens or any of the components.

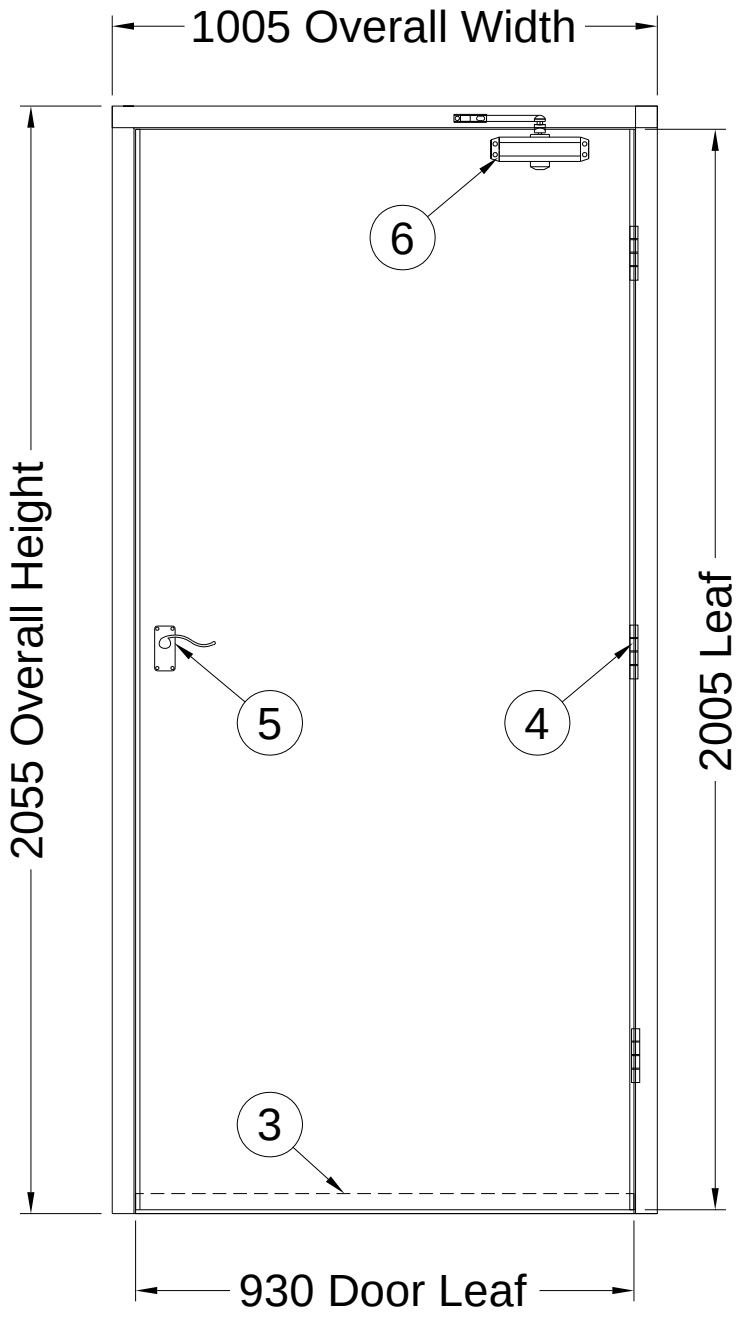
A representative of **Exova Warringtonfire** installed the doorset within the partition on the 27th June 2012.

Preparation

Prior to the evaluation the gaps between the leaf and the frame were measured and the values recorded. The door gaps were then sealed and the differential pressures were applied. The leakage rates measured were recorded as the base rig leakage. The door gaps apart from the threshold were then sealed and the leakage measured at the same differential pressures. The above procedure was then repeated with the airflow in the opposite direction.

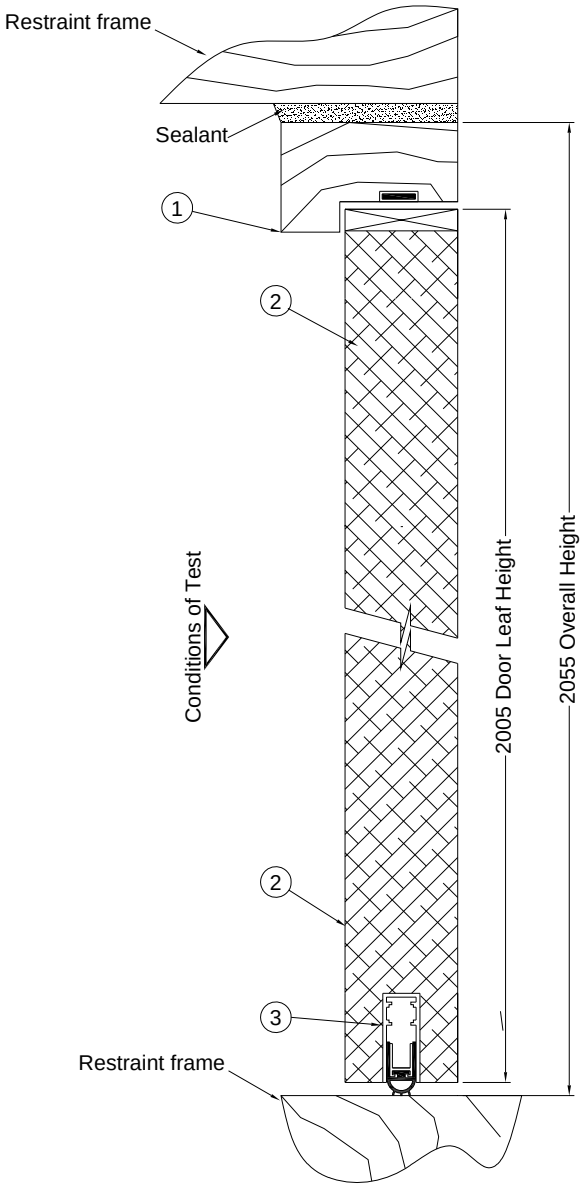
Test Specimen

Figure 1- General Elevation of Test Specimen



Do not scale. All dimensions are in mm

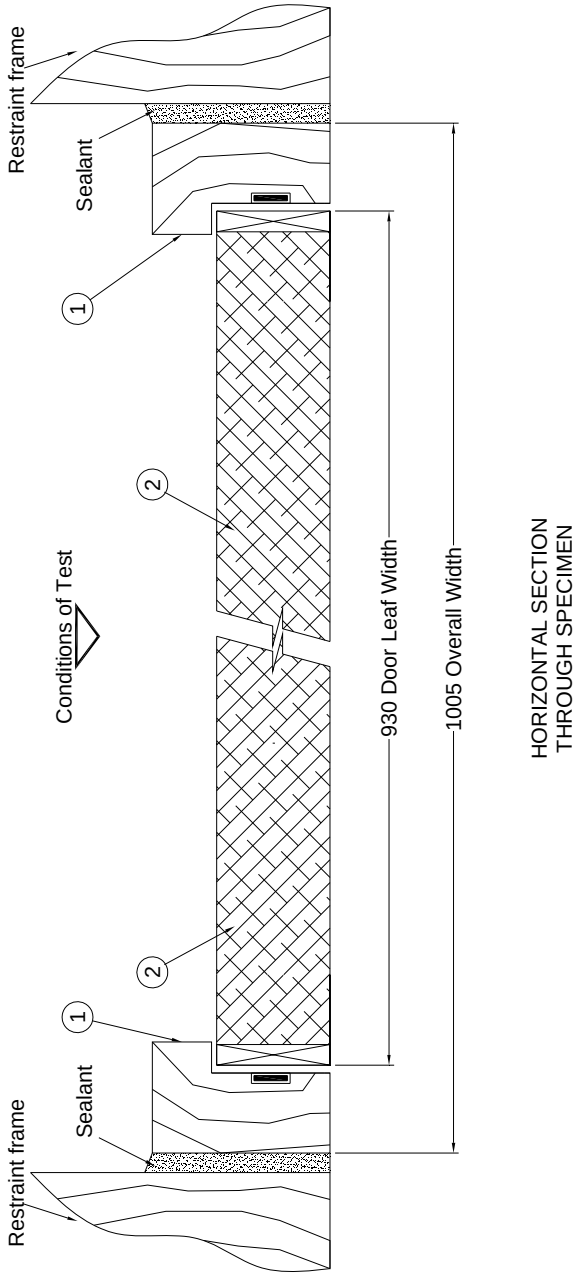
Figure 2 – Details of Door Leaves



VERTICAL SECTION
THROUGH SPECIMEN

Do not scale. All dimensions are in mm

Figure 3 – Details of Door Leaves



Do not scale. All dimensions are in mm

Schedule of Components

(Refer to Figures 1 to)
(All values are nominal unless stated otherwise)
(All other details are as stated by the sponsor)

Item		Description
1. Door Frame		
Material	:	Pine, Softwood
Density	:	510 ~ 550 kg/m^3
Overall size	:	70 mm x 44 mm, with 44 mm x 12 mm deep rebate
Jambs to head jointing method	:	Stub mortice & screwed, using 75 mm long x 4.6 mm diameter countersunk head wood screws
Fixing method	:	Screwed
Fixing method	:	Screwed
Fixings		
i. type	:	Countersunk head wood screws
ii. material	:	Steel
iii. overall size	:	75 mm long x 4.6 mm diameter
iv. centres	:	7 off along the hinged jambs, approximately 100 mm above and below each hinge and near foot of jambs
Intumescent Seal		
Manufacturer	:	Intumescent Seals Ltd
Material	:	Graphite based intumescent in a Polyvinyl Chloride carrier
Overall size	:	15 mm x 4 mm, carrier
Fitting method	:	Self adhered into a groove located centrally within in the jambs and head at a nominal distance of 23 mm from edge of seal to edge of frame The seals were interrupted at the hinge positions
2. Door Leaf		
Manufacturer	:	Halspan Ltd
Reference	:	Prima
Material	:	3 layer particle board
Thickness	:	44 mm
Overall size	:	926 mm x 2010 mm
Lippings		
Material	:	Hardwood
Thickness	:	8 mm
Fixing method	:	Bonded to the vertical edges of the door using a PVA adhesive

Item		Description
3. Threshold Seal		
Manufacturer	:	C.C.E. Construzioni Chiusure Ermetiche Srl
Reference	:	Model Superior (code ASSUP)
Materials		
i. casing	:	Extruded Aluminium
Thicknesses		
i. casing	:	1.3 mm
ii. seal	:	0.8 mm
Overall sizes		
i. casing	:	35 mm high x 14.5 mm wide x 926 mm long
ii. seal	:	20 mm high x 9.6 mm wide
Fixing method	:	Friction fitted into a rebate in the base of the door leaf
4. Hinge		
Manufacturer	:	Royde & Tucker Ltd
Reference	:	H 102-fr-BZP
Primary material	:	Bright zinc plated steel
Size		
i. knuckle	:	104 mm long by 13.7 mm diameter
ii. blades	:	100 mm long by 35 mm wide by 3 mm thick
Fixings		
i. type	:	Countersunk head wood screws
ii. material	:	Steel
iii. sizes	:	29 mm long by 5.1 mm diameter
iv. number off per blade	:	5 off
v. maximum distance of fixing screws from face of door leaf	:	32 mm
Bedding material	:	1 mm Interdens sheet material
5. Lever Handle		
Manufacturer	:	Magnet
Material	:	Aluminium
Overall size	:	103 mm long x 21 mm diameter tapering to 10 mm, complete with 105 mm x 38 mm backing plate
6. Door Closer		
Manufacturer	:	Ingersoll Rand Architectural Hardware
Reference	:	Briton 121
Material		
i. body	:	Die cast alloy
ii. closer arm	:	Steel
Overall size	:	182 mm long x 47 mm high x 63 mm deep

Test Data and Information

General

The following data, which was recorded during the tests, is included in the report:

- Table of the net leakage through the specimen at specified pressure differentials.
- Graph of the net leakages through the specimen at specified pressure differentials.

Leakage Calculation

The readings were corrected for each leakage measurement to a reference temperature of 15°C and standard atmospheric pressure (1 atmosphere equals 101325 Pa) utilising the following formula:

$$Q = Qa \times \frac{(Pa + p)}{101325} \times \frac{293.15}{(Ta + 273.15)} \times (1 - 0.3795) \times \frac{Mw}{100} \times \frac{Es}{Pa + p}$$

Where Q = Adjusted rate of air flow (m^3/h)

Qa = Measured rate of airflow (m^3/h)

p = Pressure increase (Pa)

Pa = Barometric Pressure (Pa)

Ta = Air temperature (°C)

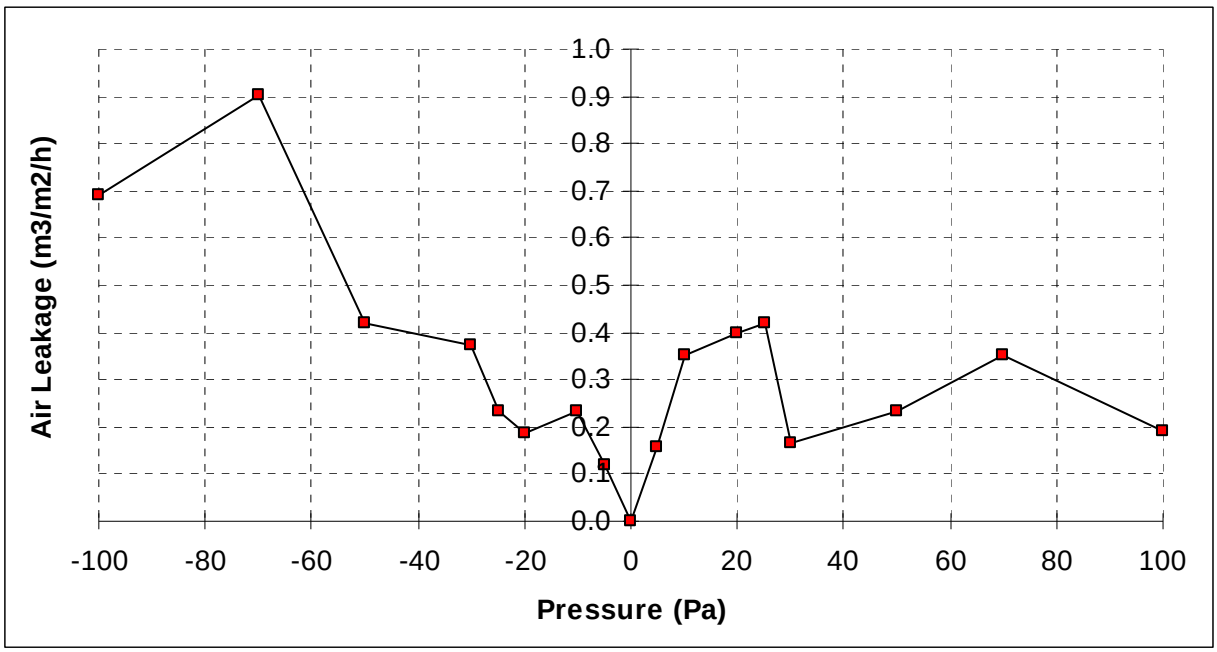
Mw = Relative Humidity (%)

Es = Saturated water vapour pressure (Pa)

Leakage Data

Net Leakages at Specified Pressure Differentials

Pa	m3/m/h
-100	0.69
-70	0.90
-50	**0.42**
-30	0.37
-25	**0.23**
-20	0.19
-10	**0.23**
-5	0.12
0	0.00
5	0.16
10	**0.35**
20	0.40
25	**0.42**
30	0.16
50	**0.23**
70	0.35
100	0.19



Performance Criterion

Approved Document B (Fire Safety) of the Building Regulations requires doorsets shall "meet the additional classification requirement of S_a when tested to BS EN 1634-3: 2001 Fire resistance tests for door and shutter assemblies, Part 3 – Smoke control doors".

The classification requirement of S_a are specified within EN 13501-2:2003 as "when the maximum leakage rate measured at ambient temperature, and at a pressure of up to 25 Pa, does not exceed $3m^3/h$ per meter leakage at the threshold position."

In the absence of any other criteria, this guidance has been adopted in reporting the results of this test. The leakage rates at other pressures are also included in this report.

Ongoing Implications

Limitations

The results relate only to the behaviour of the specimens under the particular conditions of test.

The test results relate only to the specimens tested. Application of the results to specimens of different dimensions or incorporating different components should be the subject of a design appraisal.

Conclusions

Evaluation against objective

A specimen of a single-acting, single-leaf doorset fitted with a threshold drop down seal has been subjected to a test in accordance with BS EN 1634-3:2001.

The performance of the specimen was assessed against the criteria detailed within the Standard and the following results obtained:

Test Results:

Leakage Rate ($m^3/m/h$)			Leakage Rate ($m^3/m/h$)		
+10Pa	**+25Pa**	**+50Pa**	**-10Pa**	**-25Pa**	**-50Pa**
0.35	0.42	0.23	0.23	0.23	0.42