Chiltern
INTERNATIONAL FIRE

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CONFIDENTIAL

Test Report : Chilt/RF01061 Revision A

A fire resistance test performed on two single leaf, single acting doorsets with glazed apertures

Test conducted in accordance with BS 476 : Part 22 : 1987

Test Date: 25 July 2001

Primary Sponsor :
Acell Doors Ltd
Chalex Industrial Estate
Manor Hall Road
Southwick
Sussex BN42 4PA

Secondary Sponsor:
Mila Hardware UK Ltd
1 Brunel Close
Drayton Fields Industrial Estate
Daventry
Northants NN11 5RB

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation

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UKAS TESTING
No. 1762

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A member of the ITL Chiltern Group of companies
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Registered Number 3125010 England

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1. Introduction

The doorsets were manufactured and supplied for test by the client and delivered on 20 July 2001. Chiltern International Fire Limited (CIFL) constructed a timber stud/plasterboard clad partition and installed the doorsets into the partition.

2. Specification

Details of the specimen are shown in Figures 1 to 5.

2.1 Door leaves

The left leaf was designated doorset A and measured 2040mm high x 830mm wide x 45mm thick. The right leaf was designated doorset B and measured 2040mm high x 840mm wide x 45mm thick. Both leaves were hung to open in towards the furnace, which is considered to be the most onerous direction based on experience of testing doors of similar construction. It is therefore the opinion of the laboratory that the test results can be applied to doors opening in either direction. The results of this test were obtained from a doorsets fitted with engaged latches.

2.2 Door perimeter gaps

The gaps between the edge of the doors and frame were measured prior to test. A total of 18 readings were taken. The measurements (in mm) are given in Figure 5.

2.3 Closer Forces

Measured in accordance with FTSG Resolution No 63.

	Opening Force (Nm)	Closing Force (Nm)
Doorset A	7	2
Doorset B	8	1

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3. Test Conditions

3.1 Where areas of the test specification are ambiguous or open to interpretation the Fire Test Study Group Resolutions No's 51, 63, 70, 71 and 72 have been followed (further specific details are available on request). These Resolutions provide basis of common agreements between the fire test laboratories which are members of this Group.

3.2 The ambient temperature of the test area at commencement of test was 25°C.

3.3 After the first 5 minutes of the test, the furnace pressure was maintained at 0 ± 2 Pa with respect to atmosphere, at a point 1m from the notional floor level.

3.4 The furnace was controlled to follow the temperature/time relationship specified in BS 476: Part 20: 1987 as closely as possible, using the average of six thermocouples suitably distributed within the furnace. The temperatures recorded are shown graphically in Section 4.1.

3.5 The temperature of the unexposed face was monitored by means of five thermocouples fixed to the surface of each door leaf, and three thermocouples attached to each frame, one at midheight on each jamb and one centrally located above the leaf on each frame head. Two thermocouples were attached to the glazed aperture on doorset A and four thermocouples were attached to the glazed apertures on doorset B. The thermocouple positions are shown in Figure 5. The average temperature of each door leaf and, maximum temperature of each doorset are shown graphically in Section 4.2.

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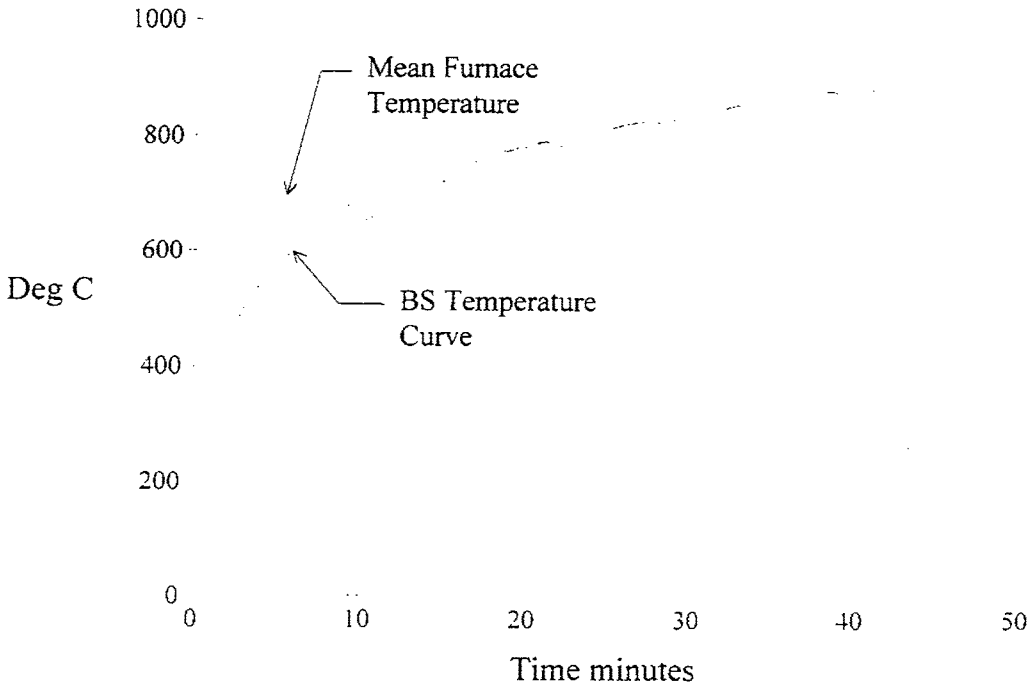
4. Test Results

The following data and observations were recorded during the test.

4.1 Furnace temperature curve



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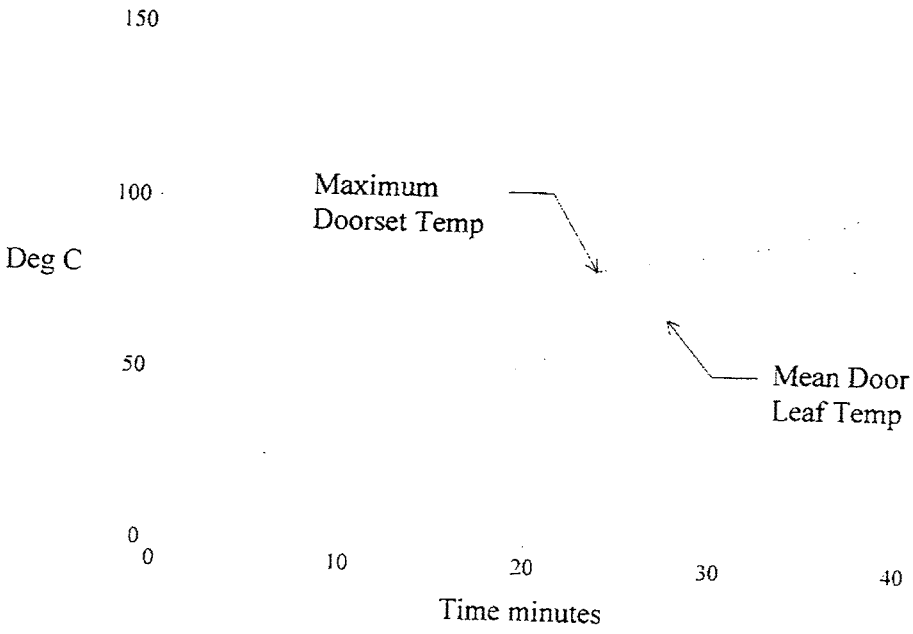
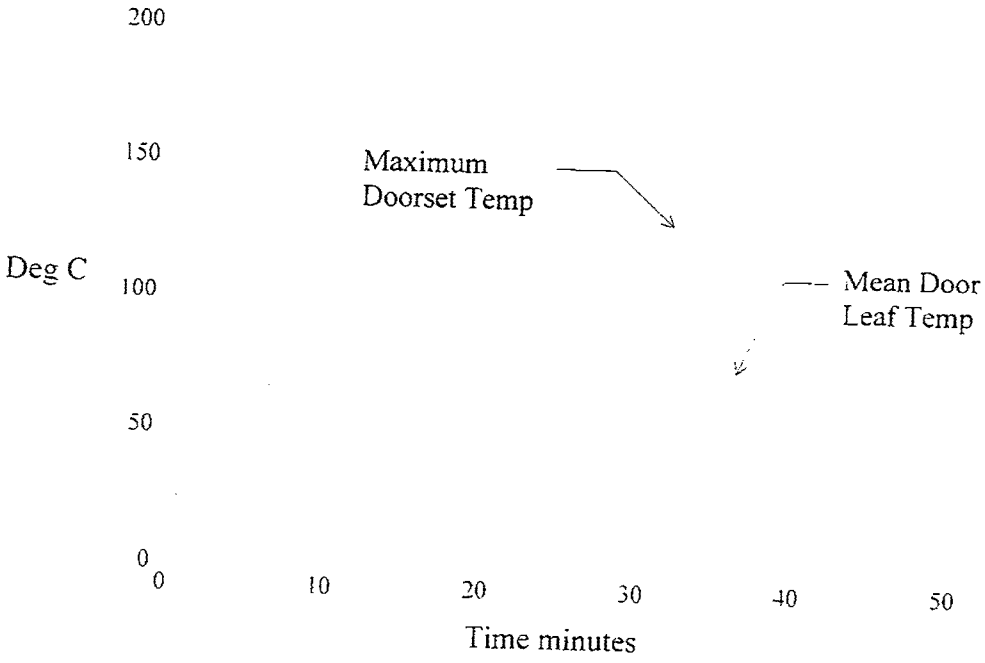
4.2 Unexposed face temperature curves

Doorset A



Doorset B



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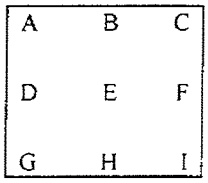
4.3 Door Distortion Data

The following tables show the distortion of the doors in mm.
A positive measurement indicates distortion towards the fire.
A negative measurement indicates distortion away from the fire.



Doorset A (hung on the left and opening in towards the fire)

Time	A	B	C	D	E	F	G	H	I
10	1	0.5	-1	-1	-2	0	1	2	0
20	1	0	0	3	-3	2	1	2	3
30	2	0.5	1.5	-10	-4	1	3	3	5
40	6.5	0.5	7.5	-11	-4	2	3	2	7

* Due to the nature of the specimen it was not possible to take distortion measurements recording the vertical drop of the leaf

Doorset B (hung on the left and opening in towards the fire)

Time	A	B	C	D	E	F	G	H	I
10	0.5	-1.5	-2	-1	0	3	2	-3	4
20	1.5	-0.5	-2	-1	-1	2	1	3	0
30	3	1	-0.5	-2	-3	2	2	2	2
40	9	2.5	4.5	-4	-5	2	2	0	2

* Due to the nature of the specimen it was not possible to take distortion measurements recording the vertical drop of the leaf

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4.4 Observations

All comments relate to the unexposed face unless otherwise specified.

Time	Comments
00.00	Test started.
01.53	The exposed face glass on both leaves is cracking.
02.55	Doorset B, there is smoke issuing from the perimeter of the leaf.
03.14	Doorset A, there is smoke issuing from the perimeter of the leaf.
05.01	Doorset B, there is smoke issuing from the right vertical edge of the left glazed aperture.
05.27	Doorset A, there is smoke issuing from the bottom horizontal edge of the glazed aperture.
06.03	Both doorsets, the unexposed face glass is cracking.
07.31	Doorset A, there is smoke issuing from the perimeter letterbox, the smoke is issuing from between the leaf and the letterbox.
17.32	Doorset B, there is smoke issuing from a position 100mm above the latch position on the closing edge.
18.43	Doorset A, there is an increase in the level of smoke issuing from along the leaf head and around the glazing beads. Doorset B, there is an increase in the level of smoke issuing from along the leaf head and from around the glazing beads and the latch position.
21.27	Both doorsets, the intumescent around the glazing is reacting on the unexposed face.
35.57	Doorset A, there is continuous flaming from the bottom closing corner of the leaf thereby constituting **INTEGRITY FAILURE**.
40.03	Doorset B, there is a glow visible at the top closing corner of the leaf.
40.23	Doorset B, a cotton pad integrity test was performed at the top closing corner of the leaf, no failure.
42.14	Doorset B, exposed face observation, right hand glazed aperture the exposed face glass has fallen into the furnace.

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42.40 Doorset A, there is continuous flaming from the glazed aperture igniting the leaf head thereby constituting further **INTEGRITY FAILURE.**

44.00 Doorset B, there is continuous flaming from the left glazed aperture igniting the leaf head thereby constituting **INTEGRITY FAILURE.**

44.15 Doorset B, there is continuous flaming from the right glazed aperture igniting the head thereby constituting further **INTEGRITY FAILURE.**

44.35 Test terminated.

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4.5 Times to failure

When tested in accordance with BS 476: Part 22: 1987, Method 8, Determination of fire resistance of uninsulated doorsets and shutter assemblies, the requirements of the standard were satisfied for the following periods:

	Doorset A	Doorset B
Integrity	35 (thirty five) minutes	44 (forty four) minutes
Insulation	0 (zero) minutes *	0 (zero) minutes *

* In accordance with Section 8.6.1 of BS 476: Part 22: 1987, the specimen has not been evaluated for insulation.

5. Limitations

The results only relate to the behaviour of the element of construction under the particular conditions of test; they are not intended to be the sole criteria for assessing the potential fire performance of the element in use nor do they reflect the actual behaviour in fires.

The results of this test were obtained using the door to frame gaps recorded in Figure 5. The fire resistance performance of doors of this design may change if substantially different gaps are employed.

The specification and interpretation of fire test methods are the subject of ongoing development and refinement. Changes in associated legislation may also occur. For these reasons it is recommended that the relevance of test reports over 5 years old should be considered by the user. CIFL will be able to offer, on behalf of the legal owner, a review of the procedures adopted for a particular test to ensure that they are consistent with current practices, and if required may endorse the test report.

J J OSBORN
Laboratory Manager

R S CHAGGER
Senior Fire Test Engineer

Date of issue: 8th January 2002

Revision A - January 2002 - Inclusion of Secondary Sponsor

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Description of Construction (refers to Figures 1 to 4)

Leaf - doorset A

		Species/type	Dimensions (mm)	Density (kg/m³)	Moisture (% w/w)	Key to figures
Stiles & muntin		Laminated spruce - 'Kerto'	40 wide x 40 thick	450**	-	1
Rails	Top	Laminated spruce - 'Kerto' ⁼	40 wide x 40 thick	450**	-	2
	Mid	White deal	50 wide x 40 thick	-	-	2a
	Bottom	Laminated spruce - 'Kerto'	40 wide x 40 thick	450**	-	2
Core		Acell phenolic foam	40 thick	220*	-	3
Facings		Moulded Acell GRP with integrated fibreglass (panel effect)	2 thick	-	-	4
Lippings		None fitted	-	-	-	-
Vertical edge strip		Acell Aluminium Fast Fit	1.8 thick profiled aluminium	-	-	14

* Stated density, not checked by laboratory
⁼ Top rail was fitted after the glazing unit was installed

** Nominal density

Leaf - doorset B

		Species/type	Dimensions (mm)	Density (kg/m³)	Moisture (% w/w)	Key to figures
Stiles & muntin		Laminated spruce - 'Kerto'	40 wide x 40 thick	450**	-	8
Rails	Top	Laminated spruce - 'Kerto'	40 wide x 40 thick	450**	-	9
	Mid	Laminated spruce - 'Kerto'	40 wide x 40 thick	450**	-	13
	Bottom	Laminated spruce - 'Kerto'	40 wide x 40 thick	450**	-	10
Core		Acell phenolic foam	40 thick	220*	-	11
Facings		Moulded Acell GRP with integrated fibreglass (panel effect)	2 thick	-	-	12
Lippings		None fitted	-	-	-	-
Vertical edge strip		Acell Aluminium Fast Fit	1.8 thick profiled aluminium	-	-	14

* Stated density, not checked by laboratory

** Nominal density

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Door frame - both doorsets

	Species/type	Dimensions (mm)	Density (kg/m³)	Moisture (% w/w)	Key to figures
Head & Jambs	Sapele	75 wide x 57 thick	640**	-	5
Stops	Integral	20 deep	-	-	-
Architrave	European redwood	70 wide x 16 thick	510**	-	-
Threshold	Exetex Ref: MWK20 - weather bar kit - aluminium construction	68 wide x 15 high (threshold profile)	-	-	7

* Stated density not checked by laboratory

** Nominal density

Intumescent materials - both doorsets

		Make/type	Size (mm)	Location (all dimensions in mm)	Key to figures
Door edges		None fitted	-	-	-
Frame reveal	Head	Mann McGowan Fabrications Pyrostrip 100P SSSA/SFF	20 x 4	Fitted 20 from the exposed face	15
	Jambs	Mann McGowan Fabrications Pyrostrip 100P SSSA/SFF	20 x 4	Fitted 20 from the exposed face	15
Around hinges		Partially interrupted	-	5mm of strip remaining past the hinge blade	-
Under hinge blade		Mann McGowan Fabrications Pyrohinge	2 thick	Fitted beneath the hinge blade on the leaf and frame	-
Encasing latch body		Mann McGowan Fabrications 500SA	2 thick	Fitted to line the latch body cut out	-
Under latch forend		None fitted	-	-	-
Under latch keep		None fitted	-	-	-
Glazing perimeter		Mann McGowan Fabrications Pyroglaze 30	10 x 2	Fitted between the glass and PVCu channel*	-
Glazing liner		Mann McGowan Fabrications 100EC	2 thick	Fitted to line the perimeter of the glazing systems PVCu channel*	-
Gasket		Schlegal - Q-LON7307	-	Located 5 from the unexposed face within the integral stop	6

* See Figure 4 for intumescent glazing detail

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Ironmongery - doorset A

	Make/type	Size (mm)	Location (all dimensions in mm)	Key to figures
Hinges	3 No Royde & Tucker Hi load 102 lift off hinges	100 x 30 (blade size)	Fitted 152, 972 and 1760 from the head of the leaf	16
Closer	(Perco) Ref-85R6	(Unknown)	Fitted 1180 from the head of the leaf to the top of the closer unit	17
3 point locking latch system	Mila Multipoint Lock ref – 7921 W3 XL	Full height of leaf x 20 wide	Located within the edge of the leaf housed within the Acell Aluminium Fast Fit profile	18
Ironmongery	Mila- stainless steel lever type handle	(Unknown)	Fitted appropriate to latch	20
Letterbox	Paddock Fire Master	269 wide x 49 high	Fitted within the mid rail	21

Ironmongery - doorset B

	Make/type	Size (mm)	Location (all dimensions in mm)	Key to figures
Hinges	3 No Royde & Tucker Hi load 102 lift off hinges	100 x 30 (blade size)	Fitted 152, 972 and 1760 from the head of the leaf	16
Closer	(Perco) Ref-85R6	(Unknown)	Fitted 1180 from the head of the leaf to the top of the closer unit	17
3 point locking latch system	Mila Multipoint Lock ref – 7921 W3 XL	Full height of leaf x 20 wide	Located within the edge of the leaf housed within the Acell Aluminium Fast Fit profile	18
Ironmongery	Mila- stainless steel lever type handle	(Unknown)	Fitted appropriate to latch	20

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Glazing - doorset A

	Make/type	Size (mm)	Location (all dimensions in mm)	Key to figures
Glass type	Pilkington Georgian wired cast plate safety glass double glazed unit with steel spacer (6-6-6 configuration)	18 thick (overall thickness)	-	19
Sight size	-	595 wide x 1220 high	Located 100 from the head of the leaf and 120 from the hanging edge	-
Overall aperture size	-	824 wide x 1220 high	-	-
Expansion allowance	-	1-2 on vertical edges only	-	-
Glazing clip	Mila Ref: MIL02	'L' profile 100 x 23 x 15 (2 thick)	Located within the PVC 'u' channel on alternate sides of the glass and held in position with 2 No 45mm long steel screws	(figure 4)

Glazing - doorset B

		Make/type	Size (mm)	Location (all dimensions in mm)	Key to figures
Glass type		Pilkington Georgian wired cast plate safety glass double glazed unit with steel spacer (6-6-6 configuration)	18 thick (overall thickness)	-	19
Sight size	Left	-	245 wide x 950 high	Located 95 from the head of the leaf and 113 from the hanging edge of the leaf	-
	Right	-	245 wide x 950 high	Located 95 from the head of the leaf and 113 from the closing edge of the leaf	-
Overall aperture size	Left	-	274 wide x 1020 high	-	-
	Right	-	274 wide x 1020 high	-	-
Expansion allowance		-	1-2 on vertical edges only	-	-
Glazing clip		Mila Ref: MIL02	'L' profile 100 x 23 x 15 (2 thick)	Located within the PVC 'u' channel on alternate sides of the glass and held in position with 2 No 45mm long steel screws	(figure 4)

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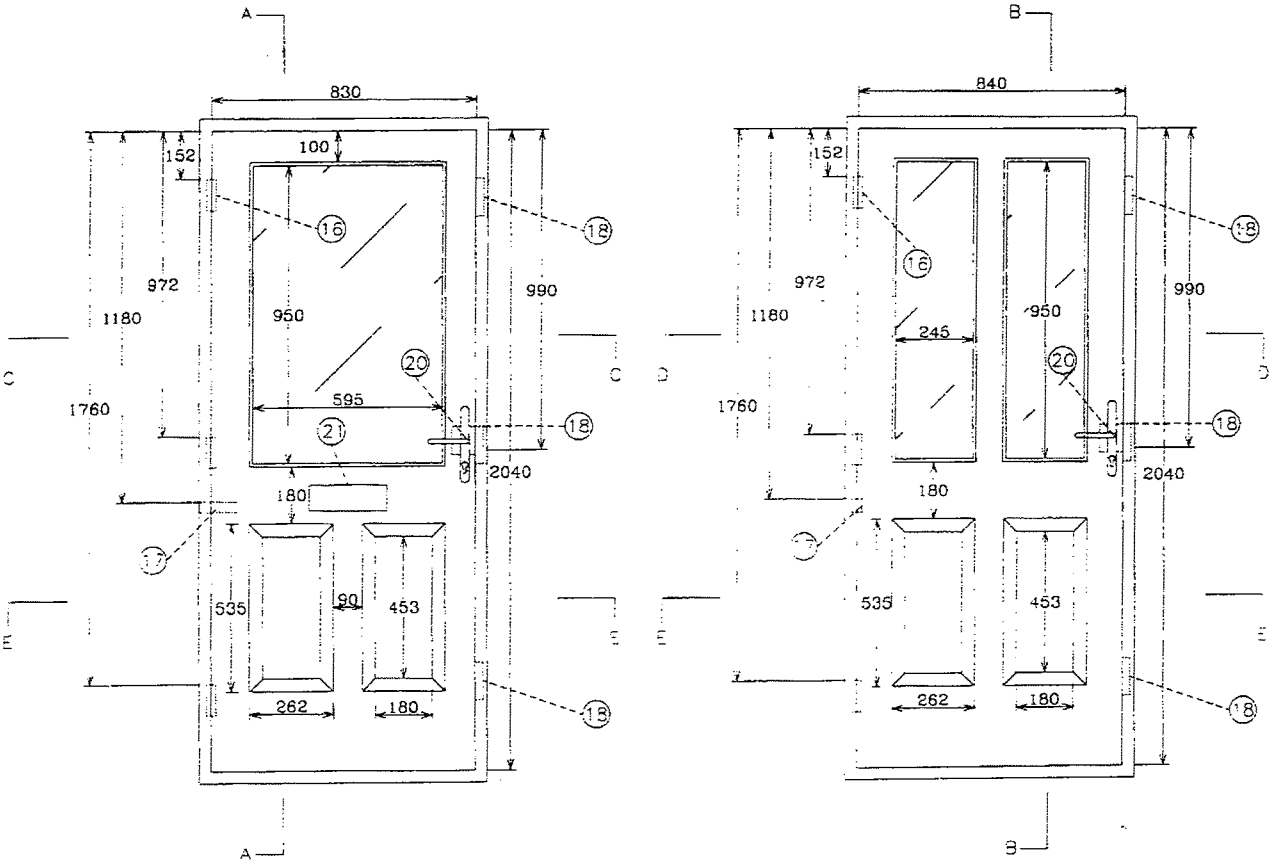
Figure 1 of 5 | Acell Doors Ltd



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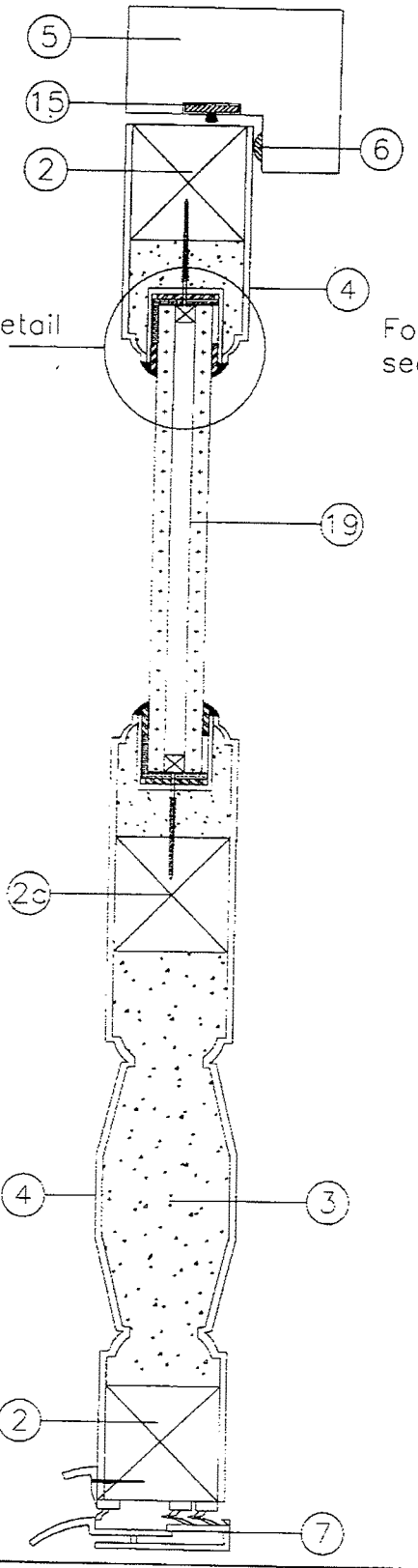
Title
Unexposed elevation showing Ironmongery positions

Date Drawn	Drawn By	Scale
27/09/01	MC	NTS

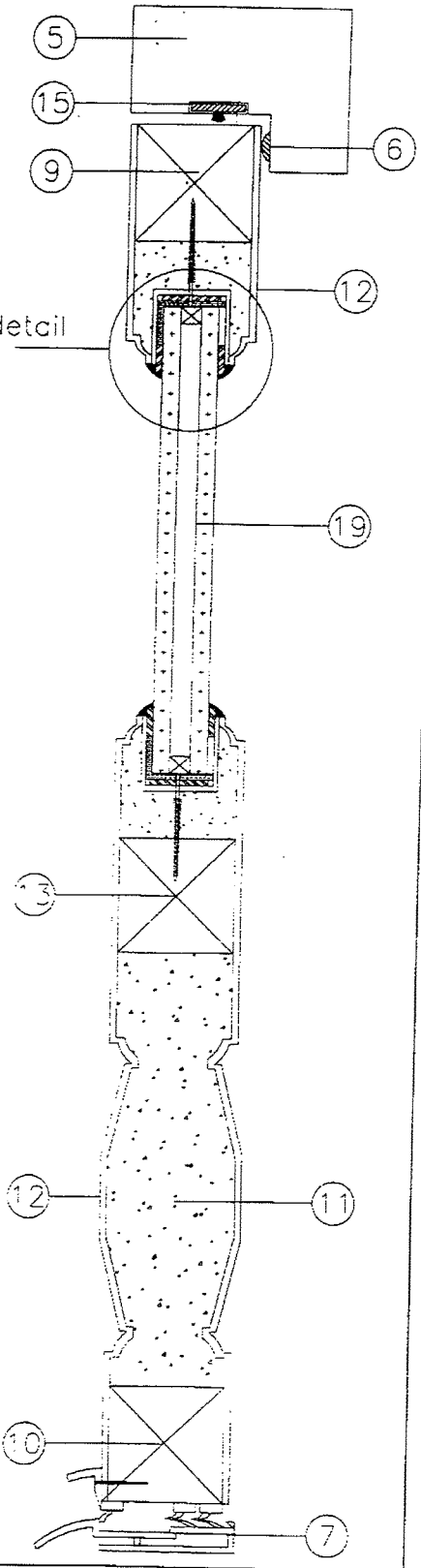
Project No. CHILT/RF01061

Figure 2 of 5 | Acell Doors Ltd

Section A–A



Section B–B



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Title: Sections A–A and B–B

Date Drawn	Drawn By	Scale
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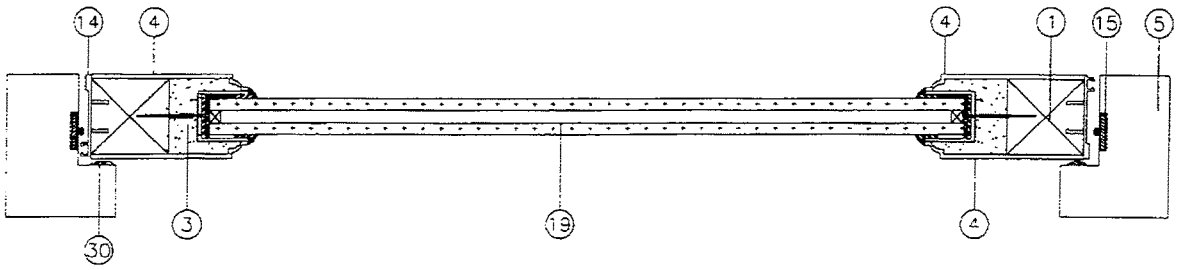
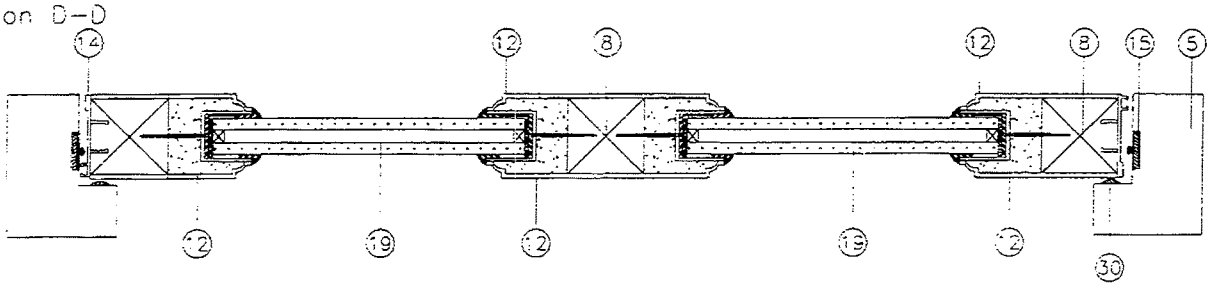
Figure 3 of 5 Acell Doors Ltd

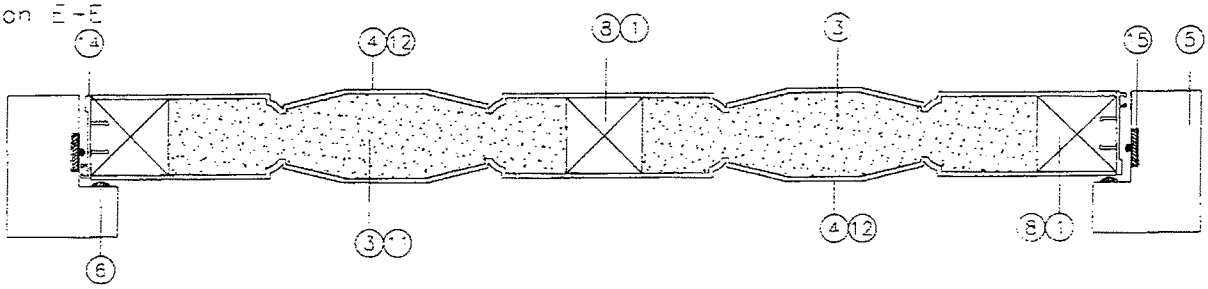
Section C–C



Section D–D



Section E–E



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Sections C–C, D–D and E–E

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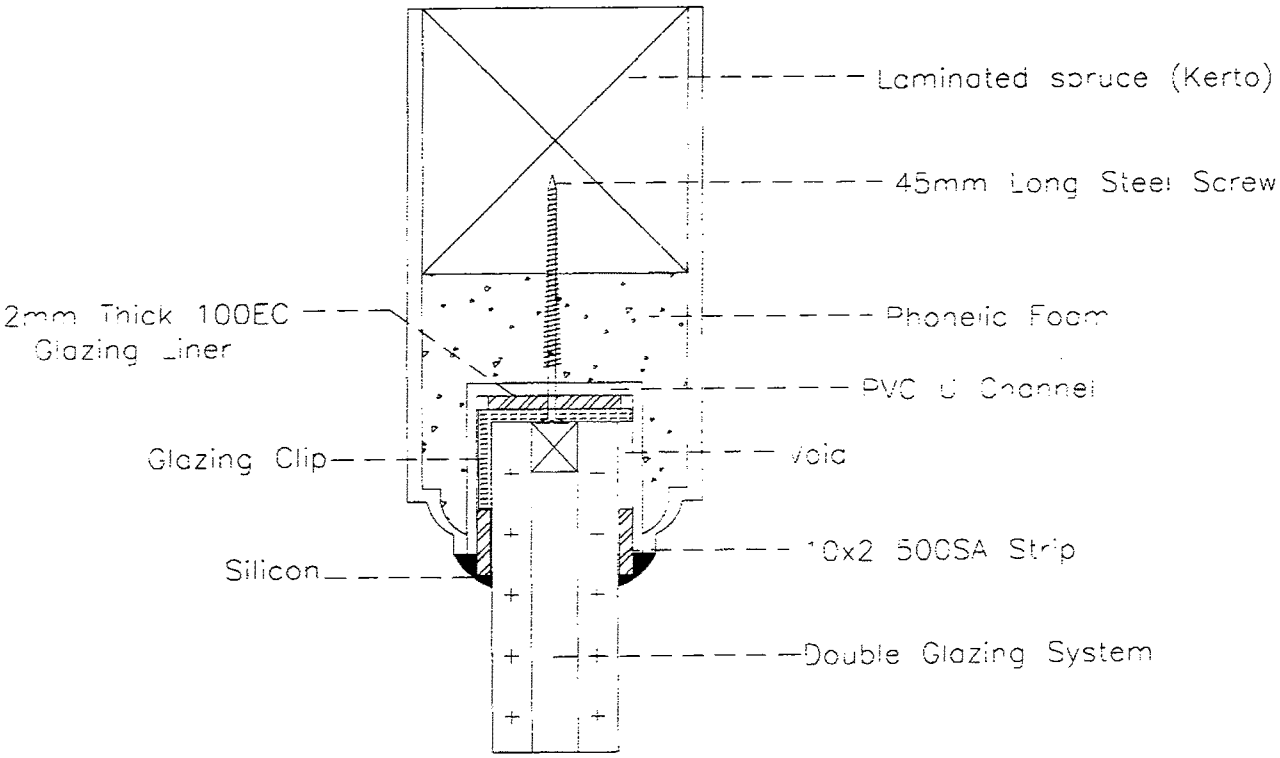
Figure 4 of 5 | Acell Doors Ltd



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Title: Internal glazing detail

Date Drawn	Drawn By	Scale
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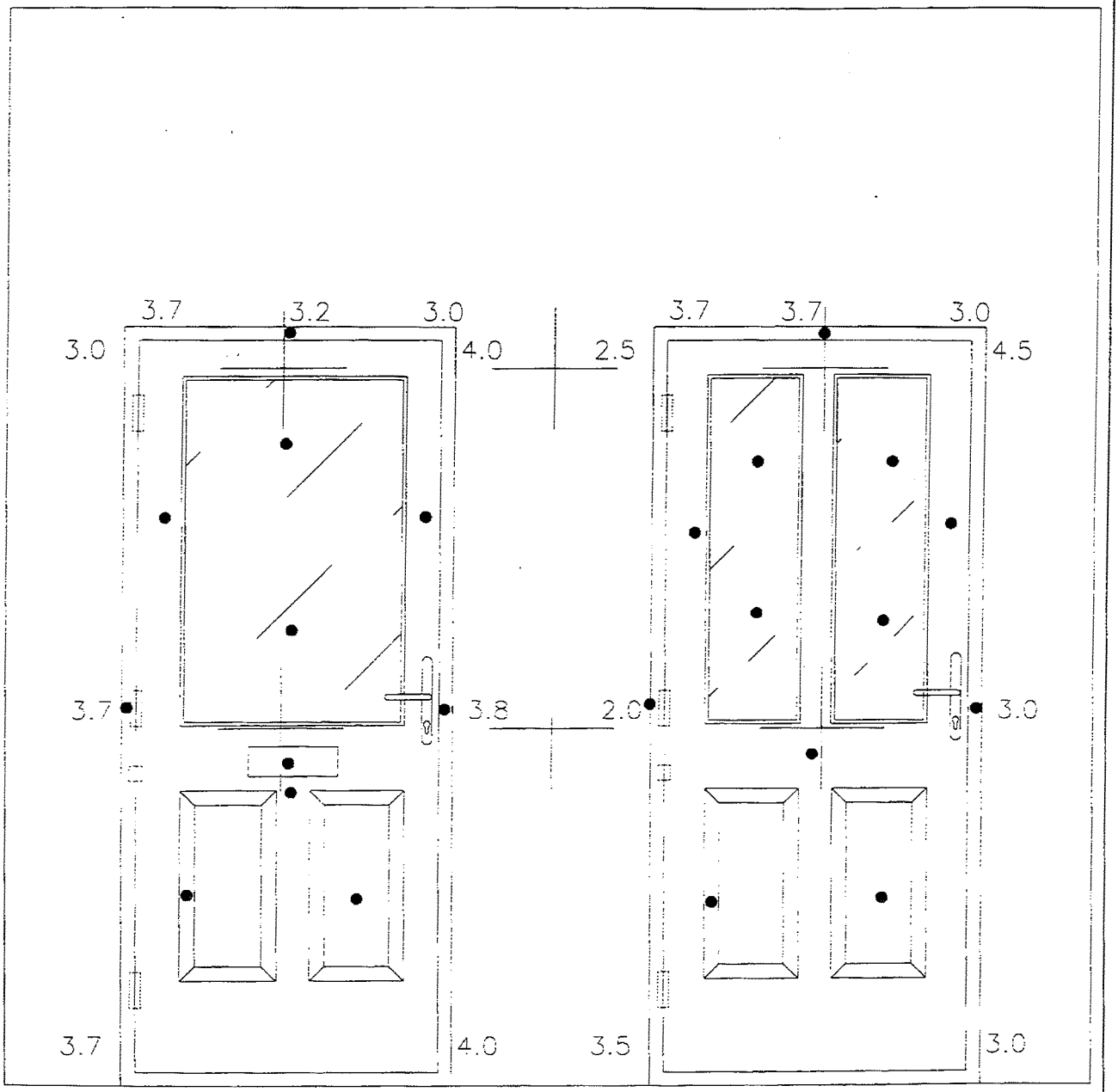
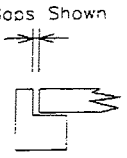
Figure 5 of 5	Acell Doors Ltd



+ : Furnace Thermocouples

• : Unexposed Face Thermocouples

Gaps Shown



Viewed From Unexposed Face

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Title		
Thermocouple Positions And Door Gaps (mm)		
Date Drawn 27/09/01	Drawn By MC	Scale NTS
Project No. CHILT/RF01061		Page 19 of 19