





DOUBLE-LEAF COMPOSITE TIMBER DOOR with TWO GLAZED ELEMENTS of the consultance with BS EN 1634-1: 2008 Test Sponsor: Garish Crown Fire Engineering & Consultance Unit 25, Upper G/F. Block P. W. L.

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Report Number:

Date of Issue:

2015-03-10 of asting and of the street of th HKAS has accredited Forte Testing and Consultants Company Limited (Reg. No. 191 - TEST) under HOKLAS for specific laboratory activities as listed in the HOKLAS directory of accredited laboratories. The results shown in this report were determined by this laboratory in accordance with terms of accreditation. This report may not be reproduced, except in full, without prior written approval The state of the s from FORTE.

HOKLAS Approved Signatory:

Ir. Dr Chan Yuk Kit





1. Scope of Test

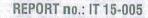
This report is a record of a fire resistance test conducted by Forte Testing and Consultants Co., Ltd, in conformity with requirements in BS EN 1634-1: 2008 "Fire resistance and smoke control tests for door, shutter and openable window assemblies and elements of building hardware Part 1: Fire resistance tests for doors, shutters and openable windows" and particular requirements in BS EN 1363-1: 1999 "Fire resistance tests — Part 1: General requirements".

The test subjects were a double acting double-leaf composite timber door with two glazed elements, namely Door A, and a flush type single acting single-leaf composite timber door with a glazed element, namely Door B. The specimens were supplied for test by Garish Crown Fire Engineering & Consultancy and Shun Hing Fire Rated Building Materials Limited, the Sponsors.

This report contained test results and details for Door A and test results and details for Door B was recorded in other reports, numbered IT15-045 / IT15-047.

Door A achieved the following fire resistance:

Susta	ined Flaming	139 Minutes	Door Frame	Max. Temp. Rise(I2)	139 Minutes
THE RESIDENCE OF THE PROPERTY OF THE PARTY O	Gauge n Pad	139 Minutes	Door Leaves	Average Temp. Rise Max. Temp. Rise (I ₂)	139 Minutes
AND THE STATE OF T	Financia (1934) de la manda (1934) de la prima de la manda (1934) de l	noi Kation	Glazed Elements	Average Temp. Rise Max. Temp. Rise	139 Minutes
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2. Test Information

FORTE Testing and Consultants Company Limited		
West Side of Huan Xiang Shan, Xin Yu Road, Shajin, Baoan District,		
Shenzhen, Guangdong Province, China.		
Garish Crown Fire Engineering & Consultancy		
Shun Hing Wood Working Company Limited		
Shun Hing Wood Working Company Limited		
Door A: QT 15-011A; Door B: QT 15-011B		
2015-01-09		
QT 15-011		
*With this test, separate report for each specimen was required by the		
Sponsors.		
A total of two sets of report (Report nex)IT15-005 and IT15-046) had issued on specimen named Door A		
2015-01-16 Start Time: 10:50		
Ms. Cheng San Mei, Samoni / Ms. Dong Xingmei		
Mr. K. W. Yip – Official Delegate of the Sponsor		
Version1 - 2015-03-10		

3. Construction Details of Specimen

3.1 Specimen Description

3.1.1 Door Frame

The composite door frame overall sized 1653 mm (width) x 2858 mm (height). The sectional dimension of the rectangular door frame was 45 mm (w) x 100 mm (thick).

The sub-frame was made with film plywood sized 87 mm (w) x 18 mm (t). The sub-frame was fixed into the concrete supporting frame by M10 x 135 mm (l) wood screws with plastic sleeves at approximate 620 mm to 670 mm centre to centre. There were 4 numbers of fixing at each jamb and 3 numbers at the head of door frame.

The door frame was made of wooden post that protected by 2 mm (t) intumescent pad and 5 mm (t) fire board, then finished with 3 mm (t) timber facing. The door frame fixed onto the sub-frame by M4 x 40 mm (long) screws at approximate 200 mm to 250 mm centre to centre. There were 14 numbers of fixings on each vertical jamb and 24 numbers on the head of the door frame.

Wooden architraves sized 50 mm (w) x 15 mm (t) were fixed over the door frame on exposed side. The architraves were fixed by screws at approximate of 300 - 400 mm centre to centre.

2 number of 20 mm (w) \times 4 mm (t) intumescent seal with plastic fins were fitted into the grooves at the head and each jamb with 5 mm separation between two seals.

The intumescent seals with plastic fins were interrupted at top pivot.

A 15-3 Set a Time (C. 1) STANDARD VISION OF THE OFFICE AND CONTROL OF



REPORT no.: IT 15-005

2 mm (t) intumescent pad was fitted underneath the intumescent seals.

The space between door frame and sub-frame was filled with ceramic fibre and lined up with fire sealant.

3.1.2 Door Leaves

The specimen comprised of two unequal width door leaf: an active leaf sized 1050 mm (w) x 2800 mm (h) x 62 mm (t) and an inactive leaf sized 500 mm (w) x 2800 (h) x 62 mm (t). The stiles and rails were made of 3 numbers of 25 mm (w) x 32 mm (t) wooden slabs. The space between stiles and rails were filled with 32 mm (t) perlite core. Both sides of the door core were covered by triple layer of 5 mm + 3 mm (t) fire board and finished by a layer of 4 mm (t) medium density fibre (MDF) board facing on fire exposed side and a layer of 4 mm (t) plywood facing on the non-fire exposed side. The fire board was fixed onto the door core by glue and screws and the facing was fixed onto the sub-facing by glue.

The specimen was an non-rebated round meeting edge.

2 number of 20 mm (w) x 4 mm (t) intumescent seal with plastic fins was fitted into the groove along the meeting edge on the active door leaf with 5 mm separation between two seals.

1 number of 38 mm (w) x 4 mm (t) intumescent seal was fitted into the groove along the meeting edge on the inactive door leaf.

1 number of 38 mm (w) x 4 mm (t) intumescent seal was fitted into the groove along the top edges and pivoted edge on each door leaf.

1 number of 20 mm (w) x 4 mm (t) intumescent seal with plastic fins and 2 numbers of 10 mm (w) x 4 mm (t) intumescent seal with plastic fins was fitted together into the groove along the bottom edge of each door leaf.

2 mm (t) intumescent pad was fitted underneath the intumescent seals.

The width of intumescent seal was partially reduced at flush bolt positions.

The door sub-lipping was made of 3 mm (t) fire board and the door lipping was made of wooden strip.

3.1.3 Glazed Elements

The specimen comprised of two glazed elements on the active door leaf.

The upper glazed element was visually sized of 210 mm (w) x 1560 mm (h). The upper glazed element was installed 350 mm away from the top edge and 300 mm away from the meeting edge of the door leaf. The lower glazed element was visually sized of 260 mm (w) x 260 mm (h). The lower glazed element was installed 194 mm below the top edge and 200 mm away from the meeting edge.

Each glazed element consisted of a piece of 42 mm (t) glass pane. The glass panes were set and lined with ceramic fibre then clamped with 1.5 mm (t) metal plate & angle and timber glazing beads. The glazing beads on both side was charactered with size 45 mm (width, parallel to the glass) x 12 mm (thick, perpendicular to the glass). The glazing beads were fixed onto the door leaf by screws at approximate 150 mm - 300 mm centre to centre.

The gaps between glazing beads and glass pane were caulked with fire sealant.

3,124 Ironmongery

Each door leaf was supported into the door frame by top pivot and floor hinge.

A rim lock with cylinder was installed 1000 mm above the bottom edge of the active leaf.

A lever handle was installed 1100 mm above the bottom edge of the active leaf on the non-fire exposed side.

A flush bolt was installed at the top and another at the bottom of the meeting edge on the inactive leaf.

Intumescent materials and fire sealant were applied to mortised area for ironmongeries.





3.2 **Material Schedule**

Parts specifications were summarized in the following tables. A star mark "*" indicates those not verified by FORTE.

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91			88	10	D-S

Door Frame	MATERIA INCAR CONSUME IN THE PROPERTY OF PROCEEDING THE PROPERTY OF THE PROCESS OF THE PROPERTY OF THE PROPERT	
Manufacturer:	Shun Hing Wood Working Company Limited	
Material:	Hardwood	
Density:	550 - 700 kg/m³ *	
Moisture Content:	12 - 17 % *	
Overall Sizes:	1653 mm x 2858 mm	
Dimensions:	45 mm x 100 mm	
Connection Method of Door Frame Head and Jambs:	By Tongue and Groove Joint and Fixed by \$5 mm x 50 mm Screws or Nails	
Fixing Method to Sub-frame:	By M4 x 40 mm Screws at Approximate 200 mm to 250 mm Centre to Centre	
Gap Filling between Door Frame and Sub-frame	Ceramic Fibre and Fire Sealant	

Sub-frame

Manufacturer:	Shun Hing Wood Working Company Limited	
Material:	Film Plyweod	
Density:	350 kg/m ³ *	
Sizes:	87, mm x 18 mm	
Fixing Method to Concrete Supporting	M10 x 135 mm Wood Screws with Plastic Sleeves at Approximate	
Frame:	620 mm to 670 mm Centre to Centre.	

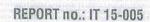
Architraves

Manufacturer:	Shun Hing Wood Working Company Limited	
Material:	Hardwood	
Density:	550 - 700 kg/m³ *	
Moisture Content:	12 - 17 % * ********************************	
Sizes:	50 mm x 15 mm	
Fixing Method:	By Screws at Approximate of 300 - 400 mm Centre to Centre.	



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Man	ufacturer:	Shun Hing Wood Working Company Limited		
1/5/27/2015	all Sizes:	(1050+500) mm x 2800 mm x 62 mm		
of the Art	Material:	Softwood *		
	CONTROL NO CONTROL OF THE CONTROL OF T			
ton	Width:	Main Stiles and Rails - 3 x 25 mm Mid Rails and Aparture of Glazed Element - 25 mm 32 mm 350 - 450 kg/m³ * 12 - 17 % * Perlite 32 mm		
Skeleton	Thickness:	20 mm		
S	CANCELLANGE A PARTICULAR DESCRIPTION OF A CANCEL CONTROL OF THE PARTICULAR DESCRIPTION OF THE PA	32 mm		
MATERIAL SETT	Density:	350 - 450 kg/m ³ *		
CT MODEST	Moisture Content:	12 - 17 % *		
의	Material:	Perlite		
Core	Thickness:	32 mm		
N September 1	Density:	380 kg/m ³ *		
Fire	Board	32 mm 380 kg/m³ *		
Supp	olier: The state of the state o	Shun Hing Wood Working Company Limited		
Bran	d: https://www.commercia.com/second/s	Gemtree *		
Mate	rial:	Magnesium Oxide *		
Dens	sity:	950 kg/m ³ *		
This!	CONTROL OF THE SECRET REPORT OF THE SECRET RESIDENCE O	3 mm - Sub-facing of the Door Leaf and Sub-lipping of the Door Leaf		
ITIC	(ness:	5 mm - Door Frame and Sub-facing of the Door Leaf		
Door	Leaves Facing			
Supp		Chun Wing Wood Working Company Limited		
oupp	ALGO CAST AND	Shun Hing Wood Working Company Limited		
Mate	rial:	Fire Exposed Side - Medium Density Fibre Board Non-fire Exposed Side - Plywood		
Thicl	(ness:	4 mm		
THICE	MIG55.	(5) 4 111111		
Lippi	ing ufacturer:	reason and the control of the contro		
-	ufacturer:	Shun Hing Wood Working Company Limited		
Mate		Hardwood		
Dens		550 - 700 kg/m³ *		
	ture Content	12 - 17 % *		
Thick	mess:	10 mm		
111101	(1003)	POR CONTROL OF THE CO		
Glac	s Pane - Upper	TOWN TO THE THE TOWN OF THE TOWN TO THE TOWN TOWN TOWN TOWN TOWN TOWN TOWN TOWN		
		Shenzhen Zhong Xin Chang Technology Company Limited		
Supplier: Shenzhen Zhong Xin Chang Tecl Brand: Ying Mu *				
N Corporation of the control of the				
Thickness: 42 mm		以此,15 m 20 m 2		
Overall Sizes: 260 mm x 1610 mm		The state of the s		
Visual Sizes: 210 mm x 1560 mm				
Depth of Cover of Glass Edge: 25 mm				
Fixing Method: Set and Lined with Ceramic Fibre then Clamped with 1.5 mm Plate & Angle and Timber Glazing Beads				



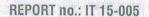


Glass Pane - Lower	ANDERSON ODER ER GARANTE VIEW (A AND A DESTREON DE L'EN ANDREASE, L'EN METRIC PARTIE PRESENTATION DE L'ENTREMENT L'ENTREMENTATION DE L'ENTREME DE L'ENTREME DE L'ENTRE DE L'ENTRE DE L'ENTRE L'ENTRE DE L'ENTRE DE L'ENTRE DE L L'ENTRE DE L'ENTRE L'E	TEST DECAMENDADE DE SETA MENTRE DELL'ARREST DE SETA DE L'ARREST DE SETA DE L'ARREST DE SETA DE L'ARREST DE SET CONSENTANTE DE L'ARREST DE		
Supplier:	Shenzhen Longdian Sci-tech Industrila Company Limited			
Brand:	Ying Mu *	Ying Mu *		
Thickness:	42 mm			
Overall Sizes:	310 mm x 310 mm			
Visual Sizes:	260 mm x 260 mm	THE STATE OF THE PROPERTY OF T		
Depth of Cover of Glass Edge:	25 mm	The state of the s		
Fixing Method:	Set and Lined with Caramic Fibra than Clamped with the mm Motal			
Glazed Aperture Lining	The state of the s	Eite Hill Wetar		
Supplier:	Garish Crown Fire Engineering & C	Consultancy		
Brand: Miles Table College Col	Ying Mu *			
Material:	Ceramic Fibre Tape	STATE OF THE STATE		
Thickness:	5 mm - Clamped between the Glas 2 mm - Set below the Glass Pane	S Pane and the Metal Angle		
Glazing Bead	The state of the s	The property of the property o		
Manufacturer:	Shun Hing Wood Working Compar	ny Limited		
Material:	Hardwood XXX	THE BUILDING STATE OF THE PROPERTY OF THE PROP		
Sizes:	45 mm x 12 mm	patementaria de como en el estado de la como en el estado de como en el estado en el estado en el estado en el Estado de estado en el entre el entre el entre el entre el entre el estado en el entre el estado en el entre e		
Density of Timber Glazing Bead:	550 - 7,00 kg/m ³ *	DET DATING AREA OF TAX OF PROPERTY OF THE PROP		
Fixing Method:	By Screws at Approximate 150 mr	n - 300 mm Centre to Centre.		
Top Pivot and Floor Spring Hinge	By agrows at Approximate 100 III	STREET, CONTROL OF THE		
Supplier:	Tung Fat Ho Building Material Limited	Commy Hardware Company Limited		
Brand:	Exidor *	Commy		
Model:	2950-EN1-4-NHO-SPO-DA-SS *	NH-2000-450 *		
Material:	Stainless Steel *	Stainless Steel *		
Material: Rim Lock and Cylinder	Employee A Process and Allery (Control of the Control of the Contr	A STATE OF THE PROPERTY OF THE		
Supplier: 😅 🖰	Commy Hardware Company Limite	ed construction of the second		
Brand:	Commy			
Model:	LK 558S *			
Material:	Stainless Steel *			
Lever Handle				
Supplier:	Garish Crown Fire Engineering & C	Garish Crown Fire Engineering & Consultancy		
Material:	Stainless Steel *			
Location Applied:	At 1100 mm above the Bottom Edge of the Active Leaf on the Non-fire Exposed Side			



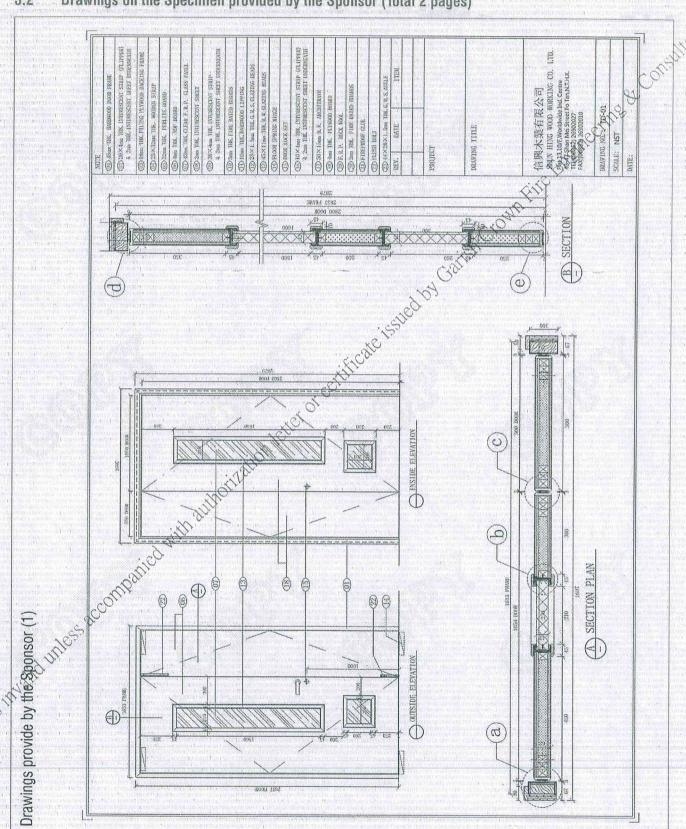
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Flush Bolt		China Ilina Wood Wooding Oome and Ilina Il			
Supplier:		Shun Hing Wood Working Company Limited			
Model:		Not Provided	AND DESCRIPTION OF THE PROPERTY OF THE PROPERT		
Material:		Stainless Steel *	g Edge of the Inactive Door Leaf		
Size:		150 mm - At the Bottom Me	150 mm - At the Bottom Meeting Edge of the Inactive Door Leaf		
Intumescent Material	DESCRIPTIONS LABORATED ASSESSMENT OF STREET OF STREET ASSESSMENT OF STREET O	Lie (1991), and a subcoverse and out to out the line and object of the subcoverse and the	ng & Consultancy		
Supplier:	T TOTTING A NEW WILLIAM BALLANDER MED LANDRED	Garish Crown Fire Engineering	ng & Consultancy		
Brand:	THE THE CHIEF FEBRUARS	Ying Mu	The state of the s		
AS THE THREE P. CO. AS A SECRET OF THE PARTY OF	Model:	YM2004	Chesterius pre sarries travers to the sarries to th		
Door Frame	Size:	20 mm x 4 mm	Company of the Compan		
Top and Pivoted Edge	Model:	YM3804	THE THE STATE AND THE STATE OF		
of Door Leaf	Size:	38 mm x 4 mm	The second secon		
Meeting Edge on	Model:	YM2004	Calsh		
Active Door Leaf	Size:	20 mm x 4 mm	The second secon		
Meeting Edge on	Model:	YM3804	THE MANAGEMENT AND THE PROPERTY OF THE PROPERT		
nactive Door Leaf	Size:	YM2004 20 mm x 4 mm YM3804 38 mm x 4 mm	LATINIANSE (1814 (1794)) OLIDINI UTINISKO NA PODILI NA POTE TREBI (1814) OLI PRESIDEN OTEVIL TVIKAS LEDIN AND OMILLAND VILLEDOM POTENIANSELISMI (1814)		
Bottom Edge on Each	Model:	38 mm x 4 mm YM1004	YM2004		
Door Leaf	Size:	10 mm x 4 mm	20 mm x 4 mm		
Intumescent Pad	A CARLON AND CARROLL AND A CARLON APPLICATION AND A CARLON APPLICATION AND A CARLON APPLICATION AND A CARLON ACCURATE AND A CARLON A	of of	The state of the s		
Supplier:	TENTON E DISSENSO (AND NO ANDRESS SELANTAGES DE SANCES SE ANDRESS (N. 1881)	Garish Brown Fire Engineering & Consultancy			
Brand:	CHARTON SERVICE CONTRACTOR SERVICE CONTRACTOR CONTRACTO	Ying Mu			
Model:	TEST PROPERTY AND TASK NO AND DONALL TASK SCHOOL DO AND SE THE PROPERTY SE	₩M100 *			
Thickness:	ACTOR APORTO-DIGITAL	2 mm	OP (See Mr. 1994) is the first and see of subsequently one of the first first state of the second of the second Or other ITEM PROFITE AND EXPENSE OF THE PROFITE SECOND SE		
Location Applied:	of Williams	At the Concealed Faces of the Ironmongeries and Underneath the Intumescent Seals			
Fire Sealant	eg A	A STATE OF THE THEORY AND THE THEORY OF THE THE THEORY OF	APPENDED AND CONTROL OF THE PROPERTY OF THE PR		
Supplier:	Harry Section 1997	Garish Crown Fire Engineering & Consultancy			
Brand:		Firemate			
Locations of Application:		Between the Gap Along the Door Frame, Sub-frame and the Test Frame			
Glue Juli	ILLIANTINE SERVINA DESCRIPTION MAAS DE PRINCES HITTERMEN PLANTINE DE MILITAGE SE SOURCE SE LA	A CONTRACTOR OF THE STATE OF TH			
Supplier:		Shun Hing Wood Working Company Limited			
Brand:		Not Provided			
Type:		木膠粉			



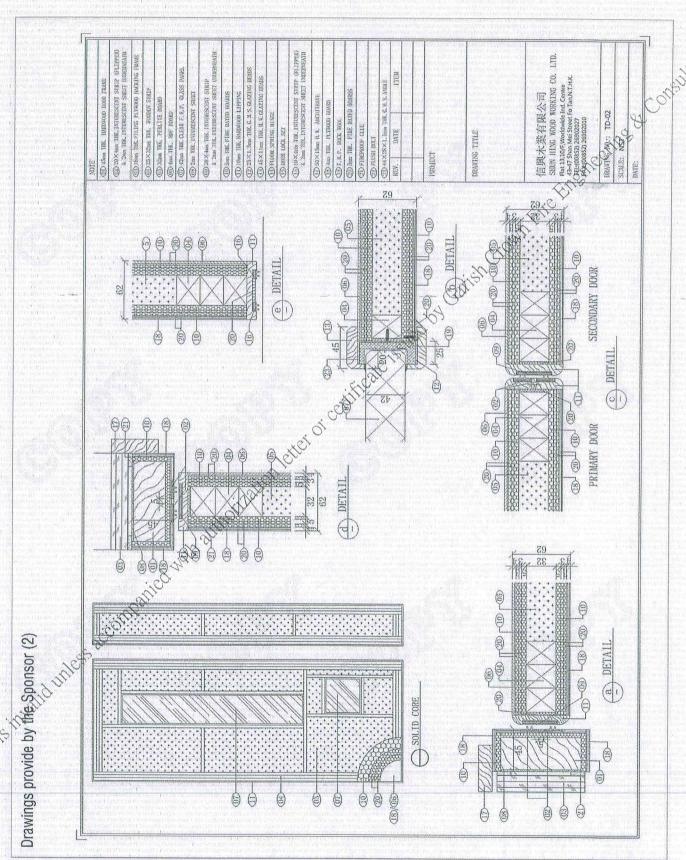


3.2 Drawings on the Specimen provided by the Sponsor (Total 2 pages)











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4. Specimen Condition

4.1 Selection of the Specimen

The specimen was selected by the Sponsor and submitted to the Test Location. FORTE did not involve in the selection of the specimen Engileeing & Co selection of the specimen.

All the components of the test specimen were supplied by the Sponsor.

4.2 Verification of the Specimen

One specimen was transferred to the Test Location on 2015-01-09 by the Sponsor.

In section 3.2 of this report, items which had been verified by FORTE was clearly identified and distinguished from those relying on Sponsor's declaration.

Supporting Construction 4.3

The specimen was fixed into a supporting construction made of fully cured reinforced normal density concrete slabs provided by FORTE. Door A was installed into one sized 1690 mm (w) x 2875 mm (h).

4.4 Installation of the Specimen

The specimen was assembled and installed by workers delegated by the Sponsor from 2015-01-10 to 2015-01-13.

4.5 Specimen Conditioning

The specimen was stored in the Test Location from 2015-01-09, the date which specimen was received, to 2015-01-16, the date which fire resistance test performed.

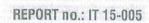
The average environment parameters in the Test Location within this period were:

Ambient Temperature (°C)	Relative Humidity (%)
16 ± 5	66 ± 5

Direction of Fire Side and Others 4.6

The Sponsor designated and installed that door leaves on specimen could be swung inward or outward the furnace

The door was UNLATCHED and UNLOCKED; the flush bolts were UNBOLTED during the test.





5. Test Method

5.1 **Pre-test Conditioning**

The pre-test conditioning of the specimen was carried out on 2015-01-15 prior to the fire test with reference to BS EN 1634-1: 2008 and clause 5.1, BS EN 14600: 2005

Ambient Temperature 5.2

The ambient temperature was measured by mineral insulated metal sheathed type K thermocouple. The measuring junction was screened by two concentric plastic pipes from radiated heat and draught, at a position approximate 1500 mm away the test construction.

5.3 **Heating Condition**

The average temperature inside the furnace was monitored and controlled throughout the test according to the standard heating curve stated in BS EN 1363-1:1999 given by the equation?

$$T = 345 \log_{10} (8t+1) + 20$$

Where.

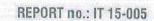
T is the average furnace temperature, in degree Cetsius

t is the time, in minutes

The temperature inside the furnace was measured in conformity with BS EN 1363-1: 1999 by 9 numbers of plate thermometers. These thermometers were evenly distributed over a vertical plane approximately 100 mm from the exposed surface of the test construction.

The positions of furnace thermocouples are shown in Figure 1. The state of the s

FORTE TESTING AND CONSULTANTS CO LTD FORTE TESTING AND CONSULTANTS CO LTD FORTE TESTING AND CONSULTANTS CO LTD





5.4 Unexposed Surface Temperature

The unexposed surface temperatures of the specimen were measured by 30 numbers of type K thermocouples.

The temperature rise was calculated by subtracting the initial average temperature from the unexposed temperature measured.

The Specimen was evaluated against the maximum temperature rise criterion given by normal procedure – Classification I₂ at the request of the Sponsor.

These thermocouples were positioned and fixed on unexposed surface of the test specimen in conformity with BS EN 1634-1: 2008.

The positions of unexposed surface temperature measurement points are shown in Figure 3. The locations of thermocouples are explained in the following table.

Thermocouple	Area	Description - Contract
U1 – U5	Door Leaves	For average and maximum unexposed surface temperature rise
U6 – U13	Door Leaves	For maximum unexposed surface temperature rise (Normal Progedure, I ₂)
U14 – U18	Door Frame	For maximum unexposed surface temperature rise
U19 – U20	Glazed Elements	For average and maximum unexposed surface temperature rise
U21-U22	Glazed Elements	For maximum unexposed surface temperature rise
U23 – U30	Door Leaves it wilder	For additional temperature rise information. Data show in Appendix A

5.5 Pressure Condition

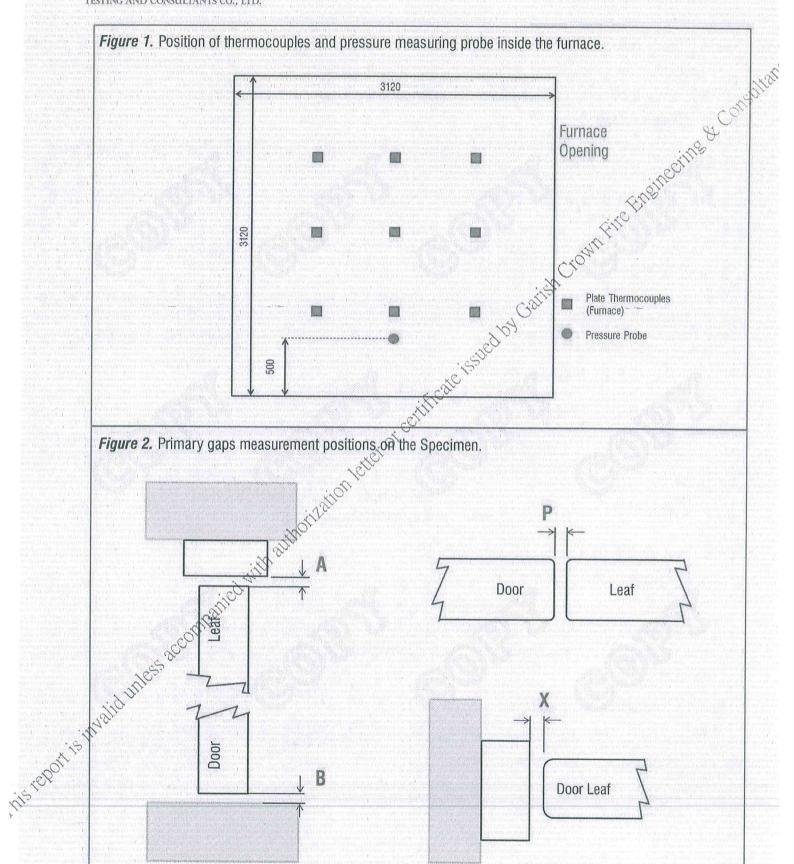
The pressure inside the furnace was continuously monitored in compliance with BS EN 1363-1: 1999 during the whole test. The pressure at a point 500 mm above the notional floor level was to be maintained 0 ± 5 Pa by five minutes from commencement of the test and 0 ± 3 Pa that from ten minutes onwards with respect to the atmosphere.

5.6 Deflection Measurements

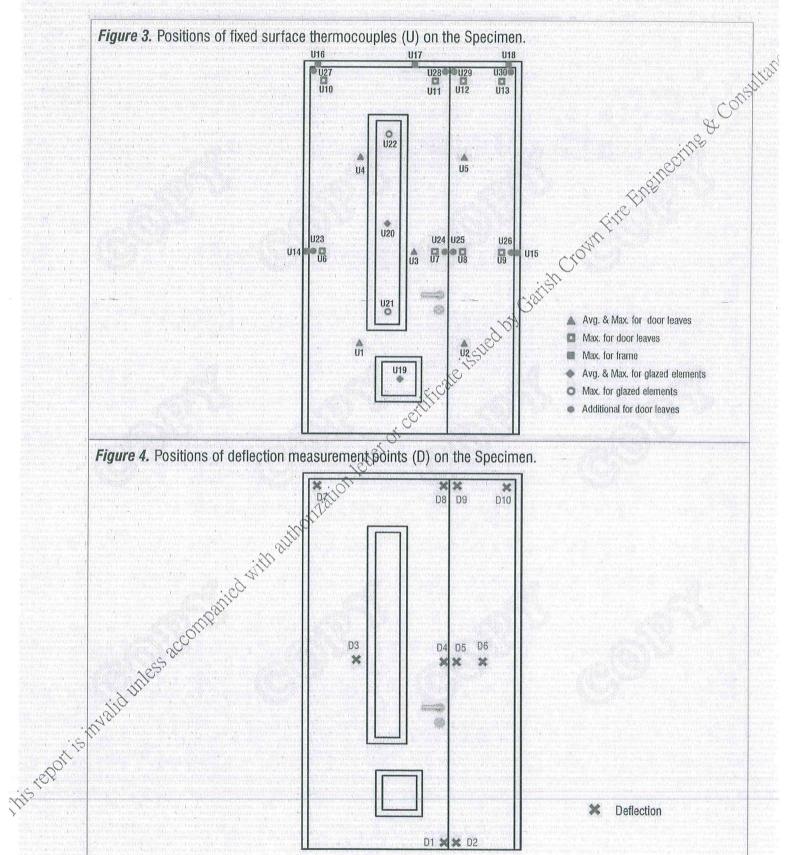
Measurements of the deflection of the test specimen were taken with a steel rule from cross line laser across the top, mid-height and bottom of the specimen.

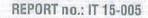
The positions of deflection measurement points are shown in Figure 4.







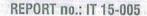






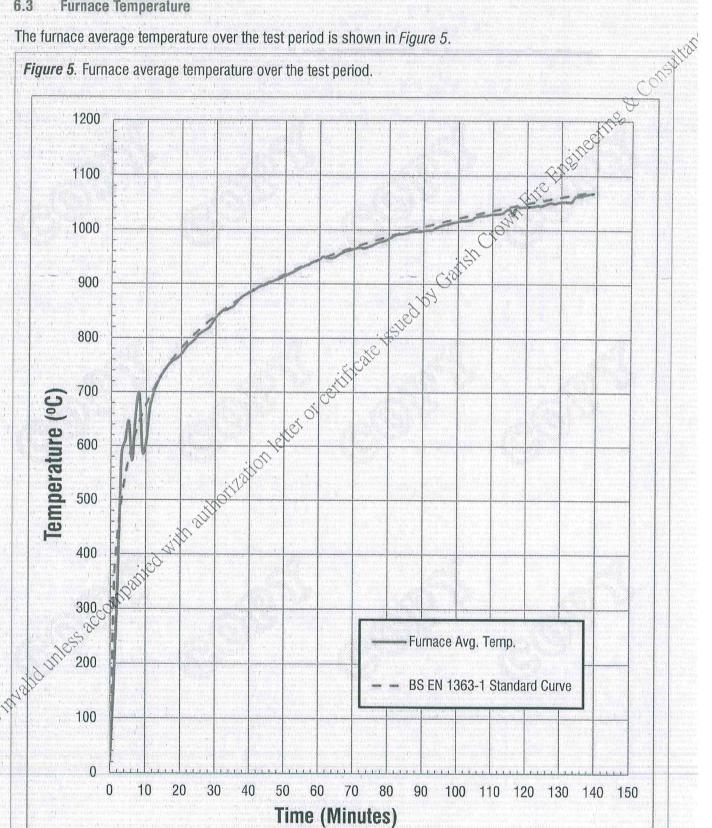
Leaf	Push	Pull
Active	115.8N	147.6N
Inactive	130.2N	127.7N

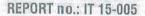
6. Test	onsultants co.	, LFD.		A CONTROL OF THE CONT		REPORT n
	ention Force	Michigan as its practical factoric	STANDER LANCE SE OF LEAVING THE STANDER THE TORISM STANDERS AND A STANDERS AND A MILE OF A STANDERS AND A STANDERS AND A MILE OF A STANDERS AND A STANDERS AND A MILE OF A STANDERS AND A STANDERS AND A STANDERS AND A MILE OF A STANDERS AND A STANDERS AND A STANDERS AND A MILE OF A STANDERS AND A STAN			
The retention respective h	on forces on nighest gauge	each door lea measurement	of the specions are summarized	men for each ed in the follow	direction of owing table.	opening were de
Le	eaf	Push	Pull	PROTATION OF THIS CO.		meteologia, tentroj suri en anterentario anti- to il entropico i anticheri e ti et establistica in establishi dell'en anticheri productioni e en- establishi dell'en anticheri principi e e e establishi dell'en anticheri productioni e e e e
Ac	tive	115.8N	147.6N	POPIARTS OF TROPES AND THE OWNER OF THE OWNER OF THE OWNER OF THE OWNER		CID
Inac	tive	130.2N	127.7N	CONTROL IN LANGE AND THE SECOND SECON		EN S
6.2 Gap	s Measurem	ent		AND CONTROL OF THE CO		THE
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6.3 **Furnace Temperature**



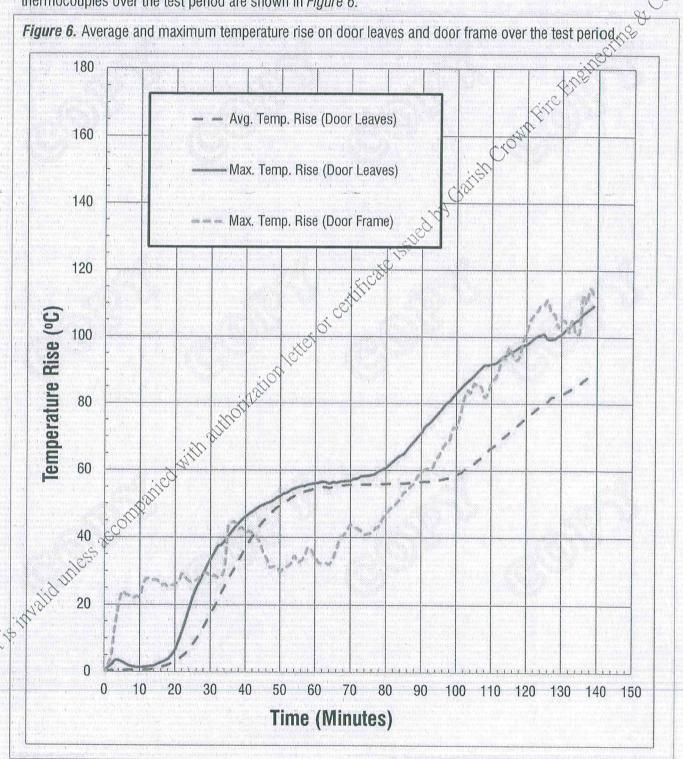




6.4 Unexposed Surface Temperature Rise

6.4.1 Fixed Surface Thermocouples – Door Leaves and Door Frame

The temperature rises of unexposed surface on door leaves and door frame measured by fixed surface thermocouples over the test period are shown in *Figure 6*.

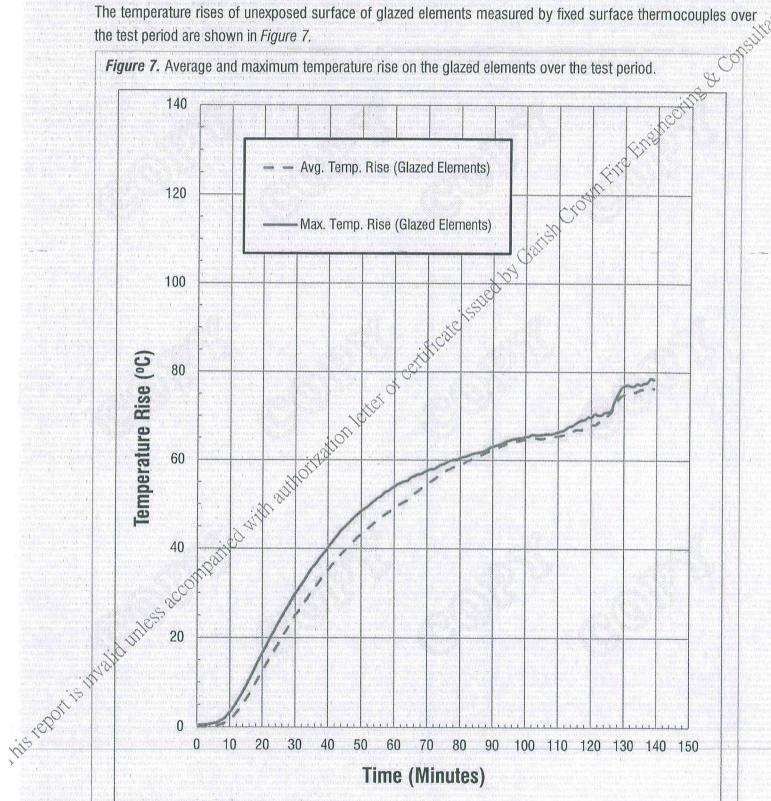






Fixed Surface Thermocouples - Glazed Elements

The temperature rises of unexposed surface of glazed elements measured by fixed surface thermocouples over the test period are shown in Figure 7.







6.4.3 <u>Fixed Surface Thermocouples – Detailed Temperature Records</u>

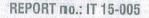
The outputs of the unexposed surface thermocouples on the specimen were summarized in the following tables. Measurements were taken in °C.

Discard - Thermocouple U7 was dysfunction at 16 minute to 31 minute of the test, therefore the date obtained from U7 within this period was discarded.

Time (min)	U1	U2	U3	U4	U5	U6	U7	U8	U9	(110 ⁰ 0)	U1
0	14.3	14.5	14.3	14.3	14.6	13.4	12.8	12.7	13090	13.3	13
10	14.7	15.1	14.8	14.8	15.3	14.5	12.2	13.2	ुं√\$5.1	14.0	14
20	17.5	17.4	18.3	18.0	17.5	16.5	Discard	15.8	16.9	17.0	16
30	33.3	35.4	30.9	27.5	32.2	27.0	Discard	30.4	31.5	31.0	30
40	55.9	52.5	53.5	45.4	49.5	46.8	55.4	48.7	49.9	52.1	49
50	66.5	62.7	66.8	62.0	61.8	59.5	63.9	61.7	61.2	64.1	58
60	69.7	67.1	70.6	69.6	67.8	64.4	67.4	66.3	65.6	68.6	63
70	70.2	68.1	71.1	71.3	69.9	66.6	68.0	67.3	66.3	70.2	66
80	69.6	69.2	71.0	71.4	70.9	€67.5	67.8	68.1	67.9	70.6	67
90	69.7	70.5	71.8	71.4	72.1	68.3	68.8	69.4	69.1	70.9	68
91	69.5	70.7	71.3	71.3	72.8	68.1	68.7	70.1	69.7	70.8	68
92	69.7	70.9	71.5	71.30	72.6	68.1	68.8	70.2	70.2	70.8	68
93	69.8	71.0	71.5	71.3	72.5	68.3	69.0	70.3	70.4	70.9	69
94	70.0	71.2		71.5	72.5	68.5	69.0	70.3	70.6	71.0	69.
95	70.1	71.5	713	71.6	72.8	68.8	69.1	71.2	71.2	71.2	69.
100	70.4	75.2	₹ 7 2.8	71.9	76.4	68.7	69.9	78.3	78.2	72.3	70.
110	75.3	88.2	80.3	73.6	89.0	74.4	79.1	91.2	90.2	79.2	75.
120	84.7	96.1	88.8	81.6	99.9	89.7	89.8	99.2	98.4	90.4	84.
130	94.00	104.1	95.6	91.9	100.1	93.4	98.0	88.4	105.6	96.5	94.
135	97.4	108.0	98.8	96.2	101.3	95.9	100.8	87.3	108.4	99.3	98.
136 ్ల	98.1	109.1	99.5	96.8	102.5	96.1	101.3	88.1	109.4	100.4	98.
136	99.0	110.5	100.2	97.8	102.9	97.3	101.9	88.5	110.0	100.8	99.
238	99.4	111.7	100.8	98.6	103.4	98.0	102.5	88.6	110.1	101.3	100
139	99.6	112.9	100.9	98.9	103.9	98.3	102.8	89.5	109.2	101.6	101



Time (min)	U12	U13	U14	U15	U16	U17	U18	U19	U20	U21
0	13.8	14.1	12.8	12.9	11.9	13.4	13.5	12.9	13.1	13.
10	14.6	15.8	14.0	18.0	35.8	25.7	36.8	14.4	15.2	16.
20	17.3	21.1	13.8	18.5	40.6	25.9	34.6	24.1	27.4	29.
30	45.5	48.0	14.8	19.8	42.6	24.9	27.0	36.1	40.2	43
40	58.9	60.6	16.6	21.8	55.8	26.8	34.0	46.2	50.4	% 53.
50	65.2	65.8	19,4	25.3	44.4	30.3	37.3	54.2	58.5	61.
60	68.9	67.6	24.1	30.0	48.5	35.0	42.5	59.9	64.5	67.
70	71.4	69.0	31.1	34.9	58.1	40.2	47.3	66.70	68.7	70.
80	75.3	70.9	38.6	39.9	61.5	46.0	51.7	\$2.2	72.0	73.
90	85.7	75.3	44.0	46.0	74.0	51.5	56.03	76.2	74.9	75.
91	87.5	76.6	44.7	46.5	74.7	51.9	55.9	76.4	75.1	75.
92	88.4	77.7	45.2	47.0	75.0	52.40	56.7	76.7	75.5	75.
93	89.4	79.2	45.8	47.8	75.0	53.1	57.7	77.0	75.7	75.
94	90.6	80.4	46.5	48.6	77.48	53.6	58.5	77.3	76.1	76.
95	91.8	81.8	47.1	49.5	78.9	54.2	59.0	77.6	76.3	76.
100	97.7	89.1	49.5	52.8	87.2	57.2	60.8	78.4	77.2	77.
110	106.4	100.4	55.1	60,0	101.0	62.5	68.4	79.0	78.2	79.
120	112.3	108.1	60.5	66.7	116.1	67.9	74.9	79.8	82.5	82.
130	115.4	108.8	64.0	70.6	119.3	73.0	80.6	90.0	86.0	83.
135	119.9	112.1	65.3	72.8	115.8	75.8	83.6	90.2	88.0	84.
136	121.3	113.20	65.4	73.3	127.0	76.0	83.7	90.5	87.8	85.
137	122.1	114.0	65.7	73.3	124.6	76.9	84.7	90.7	88.0	86.
138	122.98	114.5	66.1	74.6	128.9	77.2	85.3	91.6	87.5	87.
139	123.8	115.0	66.5	74.5	127.2	77.0	86.0	91.4	87.3	87.





6.5 Pressure

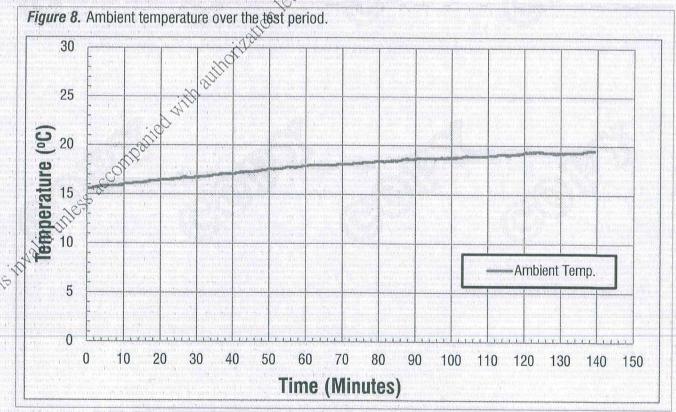
The furnace pressure differential with respect to the atmosphere at 500 mm above notional floor level over the test period is summarized in the following table.

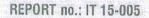
Time (min)	Pressure	Time (min)	Pressure	Time (min)	Pressure
TO DO AND AND THE TARREST AND THE PROPERTY OF	0.7	55	2.0	105	-1.0
TOTAL LEPTING 10 CONTINUES OF	-0.2	60	-0.4	110	0.6
15	0.5	65	-1.4	115	-0.9
20	0.2	70	-0.9	120	-0.2
25	0.3	75	-1.3	125	-0.5
30	-1.0	80	1.0	130	-0.3
35	-0.7	85	0.2	135	1.7
40	1.2	90	0.3	139	-0.7
45	0.5	95	-0.1	White with security managers have con- bed to the control of the control of the control security for the control of the control of	on the second pulse of the property of the second of the s
50	0.8	100	-0.90	AND TESTS OF SMEET AND THE REST OF THE SMEET AND THE SMEET	

6.6 Ambient Temperature

The ambient temperature over the test period was recorded and shown in Figure 8.

The ambient temperature at the commencement of test was 15.6°C.







6.7 **Lateral Deflections**

Measured lateral deflections over the test period are summarized in the following table. A positive measurement Town His Frightering & Const indicates a movement towards into the furnace and vice versa.

Measurements were taken in mm.

Maximum deflection value of the specimen was bolded at the following table.

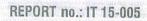
Position \ Time (min)	0	20	40	60	80	100	110	120
TOTAL AND THE PROPERTY OF THE PARTY OF THE P	+0	+0	+5	+7	+7	+10	+10	+11
TANAMENT THE D2	+0	+7	+14	+15	+12	+15	+15	+15
D3 STATE OF THE ST	+0	+15	+26	+38	+44	+48	+53	+56
D4	+0	+13	+27	+37	+47	+52	+72	+82
D5 NAUTANAMENT	+0	+19	+31	+40	+47	+63	+70	+34
D6	+0	+13	_+24	+33	+39	+50	+55	A 57
D7	+0	+4	+1	+0	-1	-5	(6)	-1
D8	+0	+3	+5	+7	+8	+100	13	+11
D9	+0	+9	+10	+15	+16	, t 16	+23	+25
D10	+0	+2	+2	+4	+2	+2	+4	+0

6.8 **Observations**

Significant behaviours of the specimen during the test period are summarized in the following table.

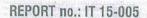
Photos taken during the test period are also attached.

Time (min.sec)	Observation (from unexposed side)
00.00	Test Started.
00.45	Smoke released from the right hinged edge and the head of door leaf.
02.36	Large amount of the smoke released from the door gaps.
04.12	Interlayer of the upper glass pane reacted.
To delicate the second of the	"Pop" sound was heard from the specimen.
05,56	Staining mark appeared around the door frame.
33.54	Interlayer of the glass panes reacted.
20.17	The interlayer of upper glass pane turned yellowish brown. The interlayer of lower glass pane turned milky.
30.00	No integrity failure had occurred.
31.26	The smoke released from the head of door frame.
O1.20	Smoke release reduced.
33.29	The middle of door leaves bended towards into the furnace.





Time (min.sec)	Observation Cont'd (from unexposed side)
42.49	The smoke released from the left corner of active door leaf and the top of meeting edge.
45.13	The smoke released from the bottom of the right jamb.
54.13	The smoke released from top left corner increased.
60.00	No integrity failure had occurred.
60.25	Cotton fibre pad test was carried out at top left corner of the active door leaf. No flaming or glowing was observed on the cotton pad.
61.30	Cotton fibre pad test was carried out at bottom of the right jambo No flaming or glowing was observed on the cotton pad.
68.43	Smoke started to release from the left bottom of left jamb.
72.16	Smoke started released from the top right corner of specimen.
78.47	Smoke started to release from the door lock. Staining mark appeared around the door lock.
88.02	Reacted intumescent seal was observed at the upper part of the meeting edge.
90.00	No integrity failure had occurred
98.32	A red spot was observed at lower portion of upper glass pane.
100.18	The red spot turned to solid white color again.
100.50	Red spots appeared at the upper glass pane and turned into yellowish brown color again. The glass pane turned dark and red in the middle portion.
102.54	The smoke release from lockset reduced. No crack on the glass pane.
113.54	Cotton fibre pad test was carried out at top meeting edge. No flaming or glowing was observed on the cotton pad. The middle of door leaves bended further towards into the furnace.
120.00	No integrity failure had occurred.
120.00 or 126.19	Cotton fibre pad test was carried out at top meeting edge. No flaming or glowing was observed on the cotton pad. White reacted intumescent material was observed along the upper portion of the meeting edge.
135.27	Cotton fibre pad test was carried out at top left corner of the active door leaf. No flaming or glowing was observed on the cotton pad.
136.23	Cotton fibre pad test was carried out at top meeting edge. No flaming or glowing was observed on the cotton pad.
139.13	Test was terminated at request of the Sponsor.





6.9 Photos

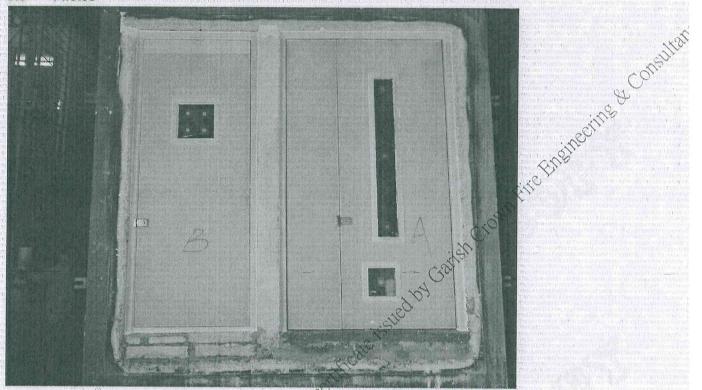


Photo 1. Exposed surface of the specimen before test. (Left: Door B; Right: Door A)

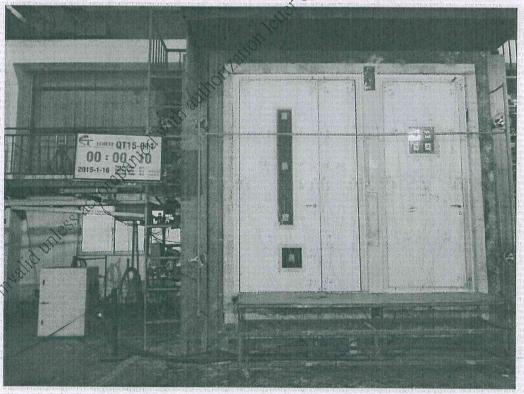
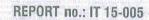


Photo 2. Unexposed surface of the specimen just after the commencement of test. (Left: Door A; Right: Door B)





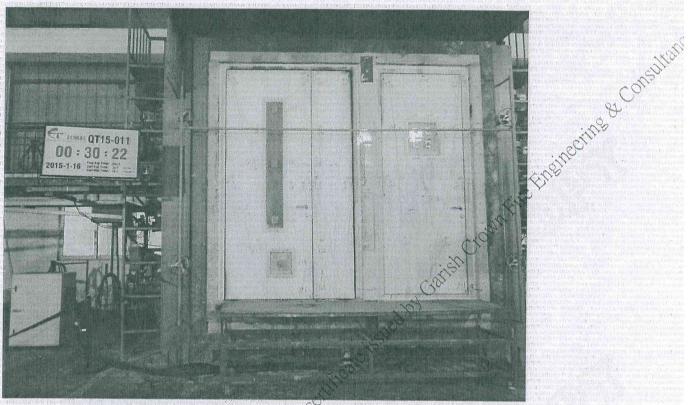


Photo 3. Unexposed surface of the specimen at 30 minute of test.

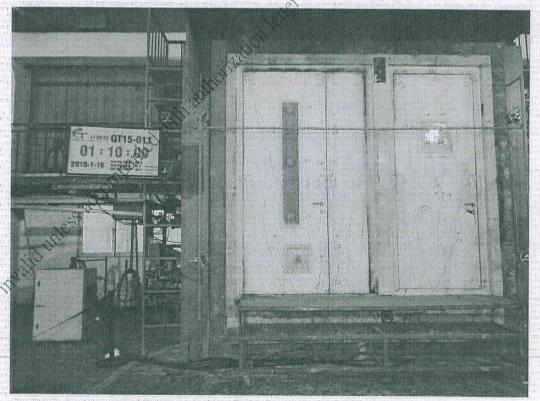


Photo 4. Unexposed surface of the specimen at 70 minute of test.



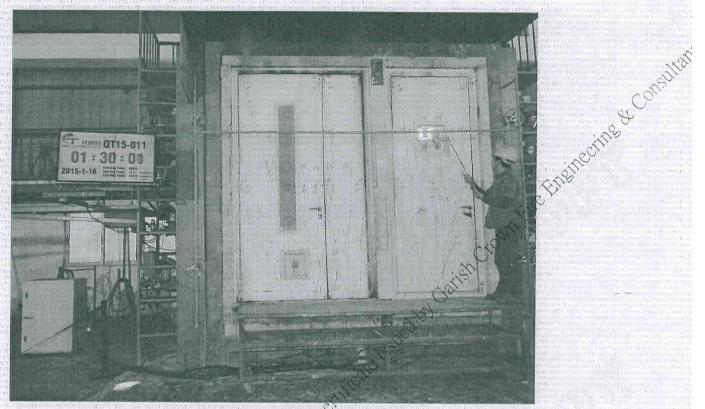


Photo 5. Unexposed surface of the specimen at 90 minute of test.

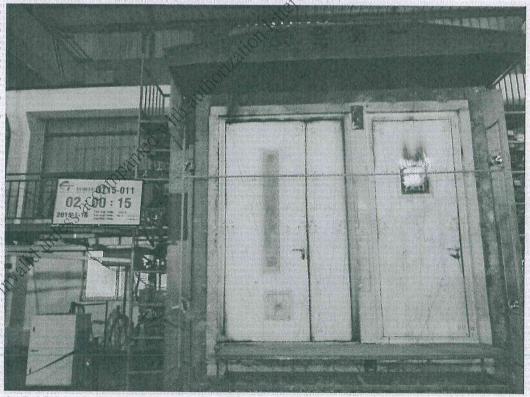


Photo 6. Unexposed surface of the specimen at 120 minute of test.

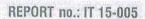






Photo 7. Unexposed surface of the specimen at the end of test.

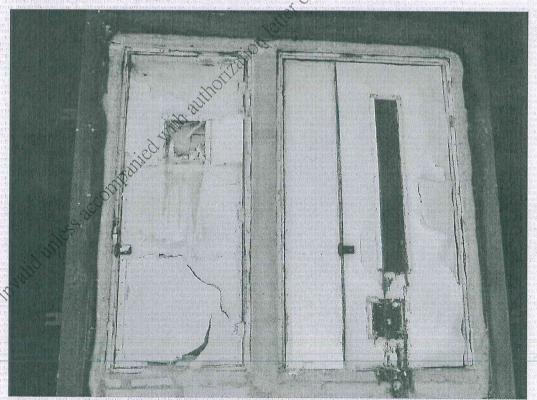
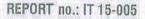


Photo 8. Exposed surface of the specimen after the test. (Left: Door B; Right: Door A)





7. Test Results

The test on Specimen, Door A was terminated after a test period of 139 minutes at request of the Sponsor.

The test data obtained from the fire resistance test was assessed against performance criteria given by BS EN 1634-1: 2008. The test results are summarized in the following table.

Performa Integrity	nce Criteria (E)	1 Company Comp	EN NESSARCENO DE SER COMPROMENTO DE SENERO DE SER COMPROMEDIO DE SENERO DE SER COMPROMEDIO DE SENERO DE SE	The second		
Criteria of Failure		Description	Elapsed Time bei	ore Failure		
Sustained	Flaming	Continuous flaming for a period of time greater than 10 seconds on unexposed surface	139 minutes (No Failure)		
Gap Ø6 mm Gauge Ø25 mm		Penetration of the gauge into the furnace through the specimen and movable along a 150 mm gap	Cion	THE LOCATION OF THE PROPERTY O		
		Penetration of the gauge into the furnace through the specimen	139 minutes (No Failure)			
Cotton Pad	EUTOROMATERIORISMO ANOROMATERIA DAN SEOCIE	Ignition of the cotton pad	139 minutes (I	tes (No Failure)		
Performa	nce Criteria	. Estil				
Insulation	(I) · · · · ·	THE STATE OF THE S	STANDARD TO SEE PROPERTY OF THE PROPERTY SPECIAL SECTION OF THE ACTION OF THE PROPERTY OF THE	AND CONTRACTOR OF THE PARTY OF		
Criteria of Failure		Description	Elapsed Time before Failure Occurrence			
Integrity Fa	llure	The performance criterion "insulation" shall automatically be assumed not to be satisfied when the "integrity" criterion ceases to be satisfied	A STATE OF THE STA			
Average	ROBERT PRODUCTION (R) () ONE CHARLE FOR THE AND IN ROBERT PRODUCTION ROBERT PRODUCTI	An increase of the average temperature of unexposed surface of the specimen above the initial average	[Door Leaves]	139 minutes (No Failure)		
Temperatur	e Kise	temperature by more than 140°C	[Glazed Elements]	139 minutes (No Failure)		
Maximum	ain	October year of the respect to the restrictive of the restrictive of the restriction of t	[Door Leaves]	139 minutes (No Failure)		
Temperatur [Normal Pr	e Rise	doorset or openable window above the initial average temperature by more than 360 °C; and any other point of the specimen above the initial average temperature by	[Door Frame]	139 minutes (No Failure)		
[worman Pr	Reministration of problem is set that the interpretation of the NOTE CONTROL TO THE OUT TO THE NOTE CONTROL TO THE OUT TO THE DOD OF THE CONTROL OF THE OUT TO SERVE THE CONTROL OF THE OUT TO SERVE THE OUT TO THE OUT TO THE OUT TO SERVE THE OUT TO THE OUT TO THE OUT TO THE SERVE THE OUT TO	more than 180 °C	[Glazed Elements] 139 min			



8. Limitations

This report details the method of construction, the test conditions and the results obtained when the specific element of construction described herein was tested following the procedure outlined in BS EN 1363-1, and where appropriate BS EN 1363-2. Any significant deviation with respect to size, construction details, loads, stresses, edge or end conditions other than those allowed under the field of direct application in the relevant test method is not covered by this report.

Because of the nature of fire resistance testing and the consequent difficulty in quantifying the uncertainty of measurement of fire resistance, it is not possible to provide a stated degree of accuracy of the result.

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9. Field of Direct Application

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The field of direct application defines the allowable changes to the test specimen following a successful fire resistance test. These variations can be introduced automatically without the need for the sponsor to seek additional evaluation, calculation or approval.

The series of rules and guidelines are defined in Clause 13 Field of direct application of test results, BS EN 1634-1: 2008 and relevant clauses and annexes. Permitted variations away from the test specimen include 1) materials and construction, 2) size variations, 3) coverage of asymmetrical doorsets and 4) supporting constructions.

The field of direct applications may only be defined following the identification of classification(s). The field of direct and, where applicable, extended application will be included in classification relevant documents.



REPORT no.: IT 15-005

Appendix A

Fixed Additional Surface Thermocouples – Detailed Temperature Records

The outputs of the additional unexposed surface thermocouples are summarized in the following tables. Measurements were taken in °C.

Temperature outputs from unexposed surface temperature U23 to U30

Time (min)	U23	U24	U25	U26	U27	U28	U29	U30
0	12.7	12.4	14.3	14.6	14.4	14.5	14.9	14.2
10	14.9	13.0	15.0	25.0	26.7	21.7	30.6	38.6
20	18.4	15.1	17.9	28.2	37.1	32.6	42.7	48.2
30	24.4	23.0	27.0	33.8	49.8	44.6	57.7	54.50
40	33.0	34.0	42.4	43.1	61.9	57.4	69.4	333
50	42.1	47.6	54.8	52.8	71.0	65.5	79.0	34.7
60	50.7	63.3	63.2	60.4	79.9	71.5	91,2	71.8
70	58.6	68.7	71.4	66.4	85.9	77.0	105.0	76.3
80	64.4	73.2	82.6	72.3	91.8	83.2	122.3	81.9
90	70.1	80.0	96.5	81.5	100.5	913	143.9	91.5
91	70.6	80.1	97.9	83.2	101.5	92.8	146.1	93.0
92	71.3	81.3	98.8	85.0	102.5	93.8	148.7	93.6
93	72.2	82.5	100.2	86.4	104.0	95.0	151.4	95.1
94	73.2	83.4	101.8	87.7	3105.1	96.2	154.6	96.5
95	74.3	84.2	103.3	89,20	106.4	97.2	156.9	97.4
100	78.8	87.8	110.3	94.6	113.4	103.0	169.6	103.0
110	91.5	102.7	124.6	PÓ3.1	130.5	116.7	202.1	114.0
120	100.7	120.1	142.7	113.7	155.4	131.6	245.5	123.1
130	111.2	142.0	144.4	126.5	178.2	151.2	269.7	141.4
135	117.5	153.2	152.1	133.4	189.7	162.8	279.6	152.1
136	119.0	1553	154.8	135.9	194.6	166.6	280.6	154.8
137	120.6	157.9	156.9	137.0	196.8	170.6	282.4	156.9
138	121.60	161.2	159.2	137.7	199.2	172.2	285.0	159.1
139	124.1	163.5	161.3	139.1	201.4	174.7	286.8	161.5

END OF REPORT

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