

# ZHONGSHAN SMARTEK SECURITY TECHNOLOGY CO., LTD. TEST REPORT

**SCOPE OF WORK**

NFPA 252-2017, CAN/ULC S104-15, UL 10C-2016(R2021) AND UL 10B-2008(R2015) TESTING  
ON ELECTRONIC LOCK, MODEL E300

**REPORT NUMBER**

210811005SHF-001

**TEST DATE**

2021-09-03

**ISSUE DATE**

2021-09-13

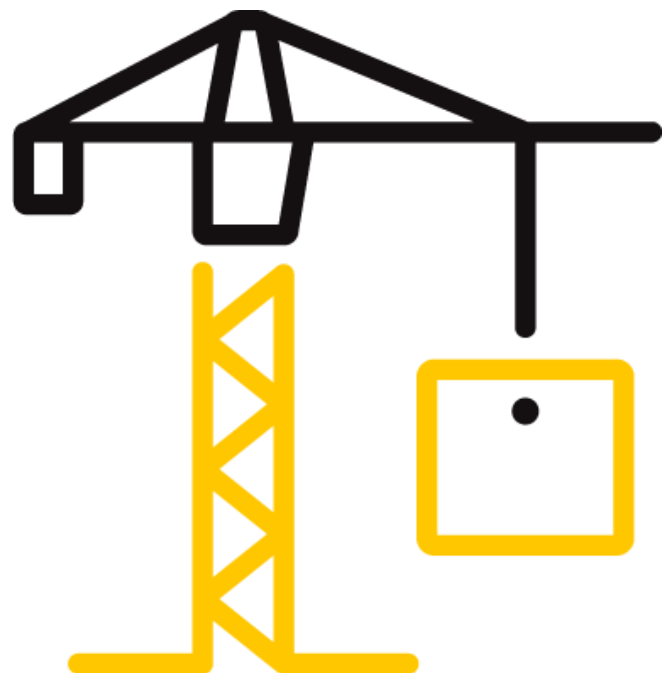
**PAGES**

29

**DOCUMENT CONTROL NUMBER**

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## TEST REPORT

Issue Date: 2021-09-13

Intertek Report No.: 210811005SHF-001

### REPORT ISSUED TO

**ZHONGSHAN SMARTEK SECURITY TECHNOLOGY CO., LTD.**

2<sup>nd</sup> Floor, Building B, No.8 Baocheng Rd. Baofeng, Xiaolan, Guangdong, China

### SECTION 1

#### SCOPE

Intertek has conducted an evaluation for Zhongshan Smartek Security Technology Co., LTD. to determine the fire resistance characteristics of the Electronic Lock, Model E300 for a 1- hour rating. This evaluation began on August 11, 2021 and was completed on September 10, 2021. The test was conducted on September 3, 2021.

The test was conducted in accordance with NFPA 252-2017 and UL 10C-2016(R2021) under positive furnace pressure. This test was also designed to demonstrate evaluation according to CAN/ULC S104-15 and UL 10B-2008(R2015) under neutral furnace pressure. All the conditions of acceptance applying to the test door in NFPA 252-2017 and UL 10C-2016(R2021) under positive furnace pressure, and in CAN/ULC S104-15 and UL 10B-2008(R2015) under neutral furnace pressure were taken into account simultaneously in this test.

This report does not constitute certification of this product nor an opinion or endorsement by this laboratory.

For INTERTEK B&C:

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<b>DATE:</b>	2021-09-13



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### SECTION 2

#### SUMMARY OF TEST RESULTS

**Product Name:** Electronic Lock

**Series/Model:** E300

#### TEST RESULT:

TITLE	RESULTS
Fire resistance with hose stream test	Met the requirements for a 1-hour fire exposure period with hose stream.

### SECTION 3

#### TEST METHODS

The specimen was evaluated in accordance with the following:

**NFPA 252-2017**, *Standard Methods of Fire Tests of Door Assemblies*

**CAN/ULC S104-15**, *Standard Method for Fire Tests of Door Assemblies*

**UL 10C-2016(R2021)**, *UL Standard for Positive Pressure Fire Tests of Door Assemblies*

**UL 10B-2008(R2015)**, *UL Standard for Fire Tests of Door Assemblies*

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### SECTION 4

#### MATERIAL SOURCE/INSTALLATION

Test specimen was provided by the client and was not independently selected for testing. Test specimen was received at the Evaluation Center on August 9, 2021.

A description of the test assembly is given in the table below. The description of the specimen is based on a survey of the specimen and information provided by the sponsor of the test. All values quoted below are nominal, unless tolerances are given. All dimensions are in mm in this report, unless otherwise specified.

TESTED ASSEMBLY DESCRIPTION		
Door	Type	Single Leaf Single Action Swing Timber Composite Fire Door
	Nominal Size	836 mm wide by 2040 mm high by 55 mm thick
	Main Material	Facing: 2.5 mm MDF, density of 816 kg/m <sup>3</sup>
		Sub-facing: 5 mm Magnesium oxide board, density of 1339 kg/m <sup>3</sup>
		Core: 40 mm Mineral board, density of 452 kg/m <sup>3</sup>
		Rail: 60 mm x 30 mm solid wood, density of 731 kg/m <sup>3</sup>
Stile: 60 mm x 30 mm solid wood, density of 731 kg/m <sup>3</sup>		
Frame	Nominal Size	906 mm wide by 2080 mm high by 140 mm deep
	Material	Solid wood, density of 731 kg/m <sup>3</sup> , clad with 5 mm Magnesium oxide board, density of 1339 kg/m <sup>3</sup> on both sides
Hardware	Electronic Lock, Model E300	Component: Mainly consisted of Front escutcheon, Back escutcheon, Mortise lock case, Strike plate, Strike box, Cylinder and Mechanical key. Brand name: Smartek
		Front escutcheon: Overall dimension: L306.31 mm x W78.2 mm x H23.5 mm; Base panel material: 1.5 mm thick cold-rolled sheet; Surface panel material: 0.6 mm thick stainless steel 304; Induction panel: ABS.

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		<p>Back escutcheon: Overall dimension: L306 mm x W78.2 mm x H30 mm; Base panel material: 1.5 mm thick cold-rolled sheet; Surface panel material: 0.6 mm thick stainless steel 304; Battery shell: ABS.</p>
		<p>Mortise lock case: Size: 150 mm x 104.4 mm x 18 mm; Backset: 70 mm; Latch throw length: 17 mm; Latch bolt: engaged; Dead bolt: disengaged</p>
		<p>Battery: VETRY POWER CELL LR6/1.5V/AA Quantity: 4 pcs, in the back escutcheon</p>
		<p>Manufacturer name: Zhongshan Smartek Security Technology Co., LTD. Manufacturer Address: 2<sup>nd</sup> Floor, Building B, No.8 Baocheng Rd. Baofeng, Xiaolan, Guangdong, China</p>
	Hinge	<p>Stainless Steel Hinge 4" x 4" x 3 mm, Quantity: 3 pcs</p>
	Bedding material for lock, hinge	2 mm thick fireproof board
Intumescent Seal		Model: RP2004W2100, 20mm*4mm
		<p>Location: 2 strips around door frame; 1 strip at right, left and top of door leaf edge; 2 strips at bottom of door leaf edge.</p>

The sample ID number assigned by the test lab is S210811005SHF.001.

The Document Register List of the Electronic Lock, the drawing of the fire door assembly and test wall construction can be found in Section 6, 7 and 8 respectively.

The test assembly was installed in a moveable restraint frame and the hardware was installed by the client. The test assembly was placed in front of the furnace for the fire exposure and was moved away from the furnace for the hose stream test. The test door assembly was built into a concrete masonry unit partition with fully mortared joints, fastened by steel bar and nails. The door clearances were adjusted so that they complied with installation instruction provided by the customer. The test measurement data was shown in Section 9.

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The test door was mounted so as to open into the furnace chamber and back escutcheon was exposed to the fire.

The nominal dimensions of the test wall were 3 m high and 2 m wide.

After positioning the assembly frame over the furnace opening, the burners were ignited, and the timer was started. Temperatures within the furnace were monitored using thermocouples and the data was recorded. The burners were controlled to keep the furnace temperatures within the allowable limits specified in the test standards. After 5 minutes, the furnace pressure was adjusted so that the neutral plane was established at a maximum of 40 in. (1016mm) above the bottom of the door as specified in the applicable positive pressure test standards. Periodic observations were made of the surfaces of the test assembly during the fire endurance test.

Immediately after the Fire Endurance Test, the assembly frame was moved into position for the Hose Stream Test. The exposed surface of the test assembly was subjected to the impact, erosion, and cooling effects of a hose stream described in the test standards.

Door deflection relative to the frame, where applicable, was monitored throughout the test. Position for measurement of deflection and unexposed temperature is presented in the drawing of Section 9.

### SECTION 5 TEST RESULTS

#### Fire Endurance Test

The measured deflection did not exceed the allowable deflection limit of one time the door thickness during the 1-hour fire endurance test. The edge adjacent to the door frame did not move from its original position in a direction perpendicular to the plane of the door for a distance greater than the door thickness during the 1-hour fire test. The actual measurements are presented in test data in Section 10.

During the 1-hour fire exposure period no flaming was observed on the unexposed face of the assembly, nor gases hot enough to ignite the cotton pad. This assembly therefore met the criteria of the test standards for flaming. No through openings or penetrations were evident at the conclusion of the fire exposure portion of the test.

This assembly therefore met the criteria of the fire endurance test for 1 hour.

#### Hose Stream Test

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According to test methods, hose stream test should be conducted for 18.8 seconds based on a total assembly area of 1.88 square meters and a required duration of 10 seconds per square meter of assembly area. The hose stream water pressure was 207 KPa.

After the hose stream, no through openings were apparent and the door latch remained engaged to the strike. The measured deflection of the edge adjacent to the door frame neither exceed the allowable deflection limit of 1-1/2 times the door thickness, nor more than 82.5 mm after the hose stream test.

This assembly therefore met the criteria of the hose stream portion of the test.

A full set of test data is included in Section 10, and photographs have been presented in Section 11.

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**SECTION 6****DOCUMENT REGISTER LIST**

<b>Model No.</b>	<b>Document Ref.</b>	<b>Document Title</b>	<b>Issue</b>	<b>Date</b>
E300	LF-E300P-01	Electronic Lock Exploded drawing	10-Aug-21	13-Sep-21
	A0400005	Mortise Lock case Dimension drawing	9-Sep-21	13-Sep-21
	LF-E300P-02	Front Escutcheon and Back Escutcheon Dimension drawing	9-Sep-21	13-Sep-21
	A210-85	Cut-out hole drawing	10-Aug-21	13-Sep-21



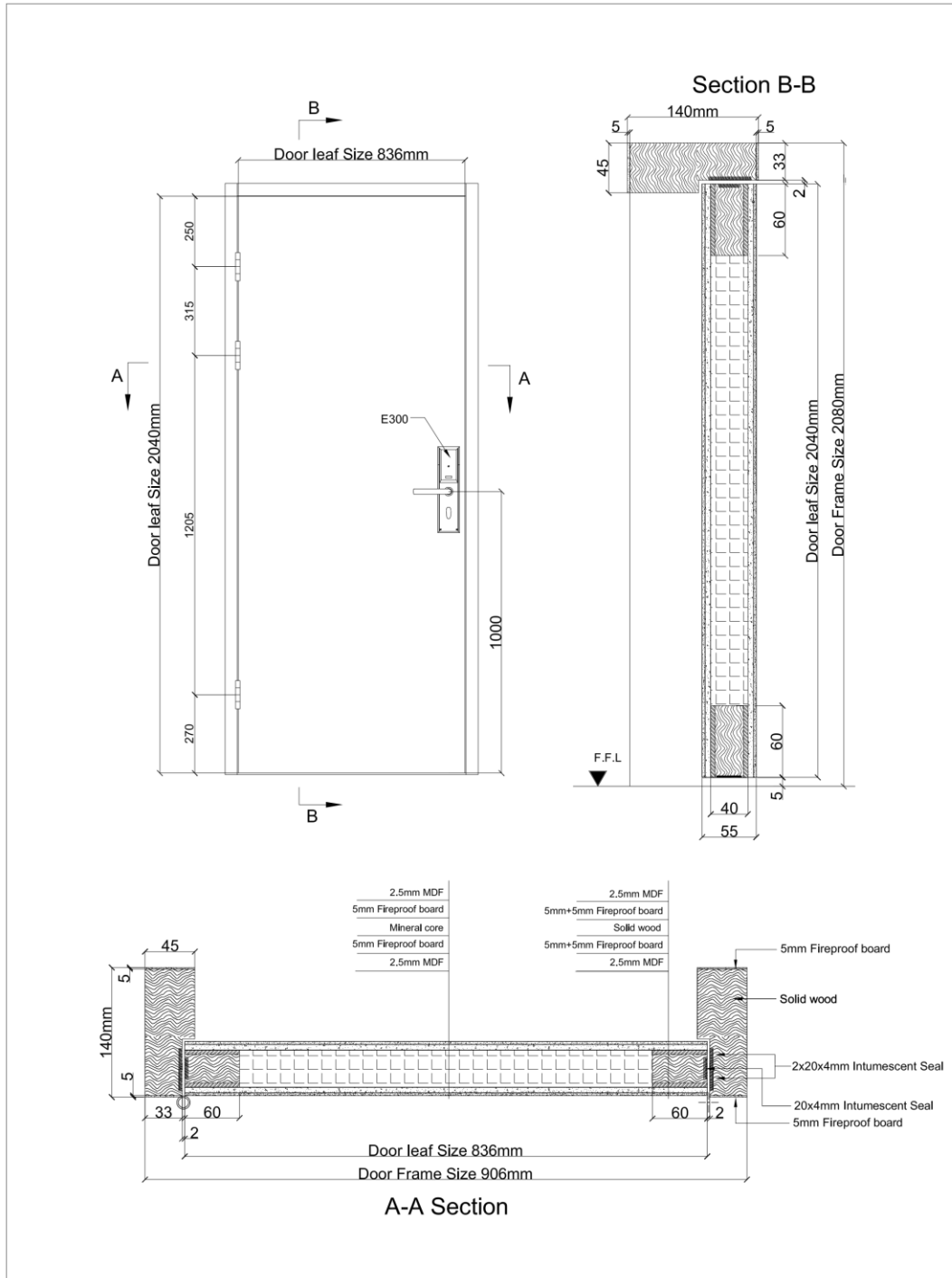
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### SECTION 7

#### FIRE DOOR ASSEMBLY DRAWINGS



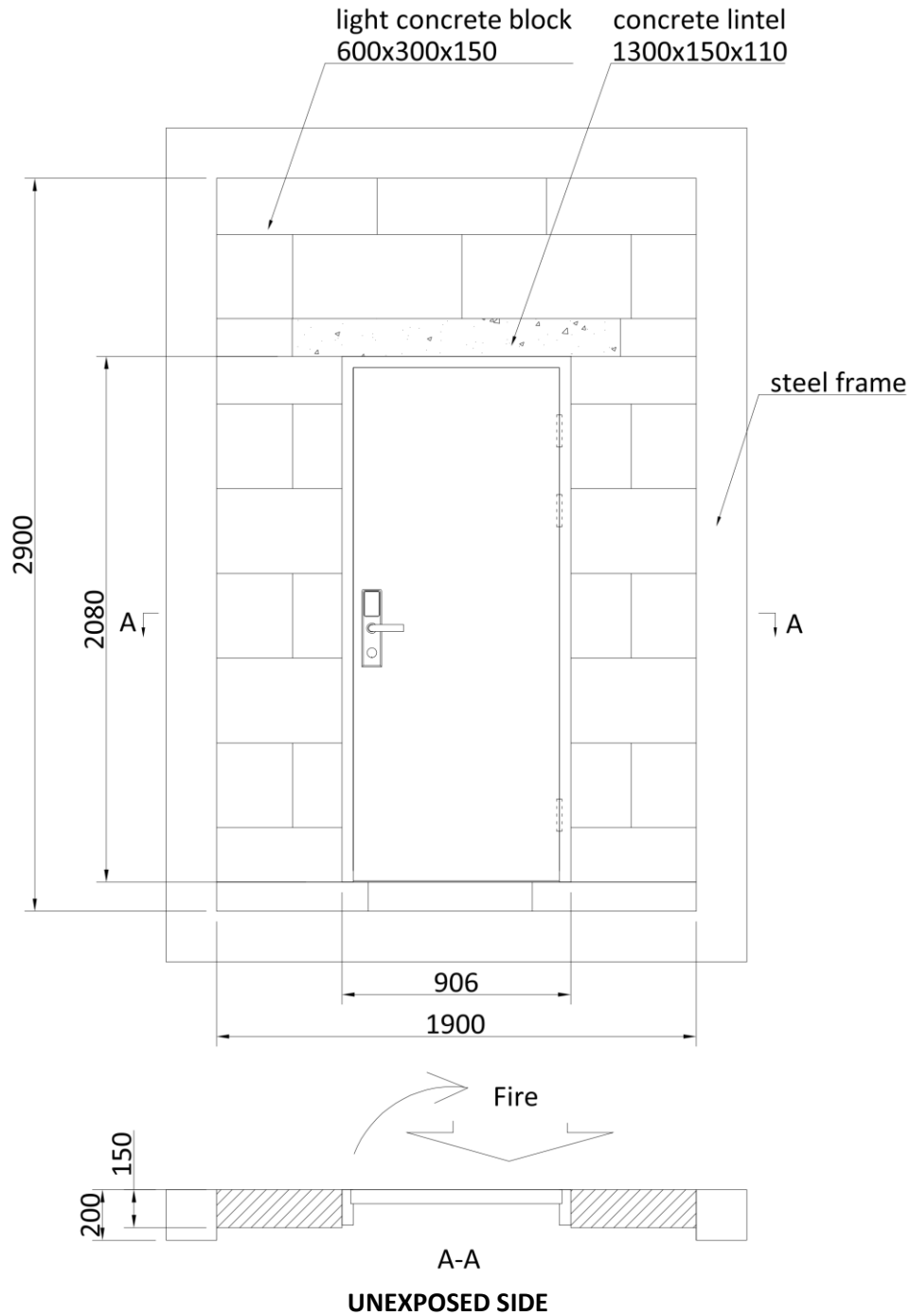
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### SECTION 8

#### TEST WALL CONSTRUCTION



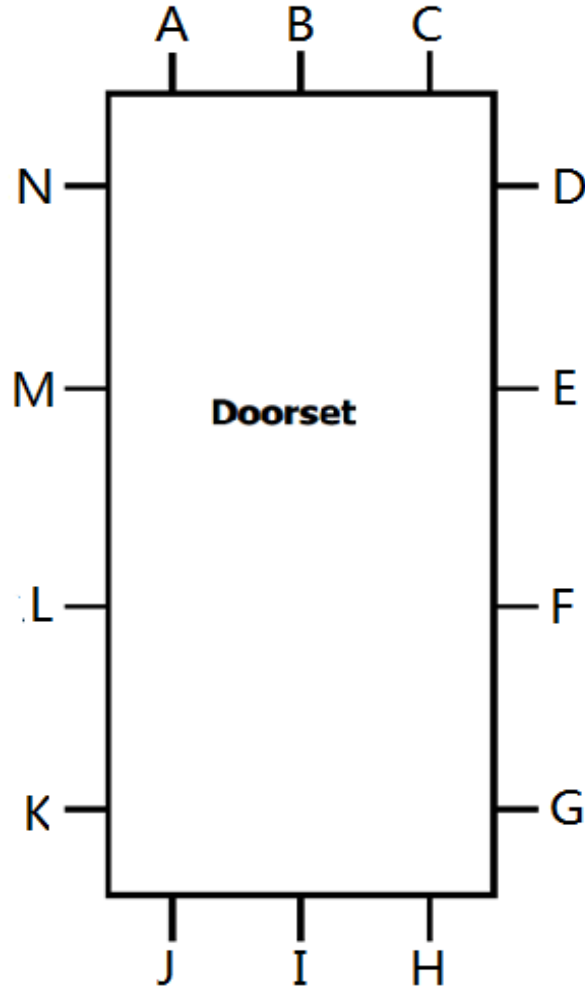
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**SECTION 9**

**TEST MEASUREMENT DATA**



**EXPOSED SIDE**

Clearance dimension in mm at each position													
A	B	C	D	E	F	G	H	I	J	K	L	M	N
0.2	0.2	0.8	0.1	0.1	0.9	2.4	8.0	6.8	7.8	0.4	0.2	0.6	2.1

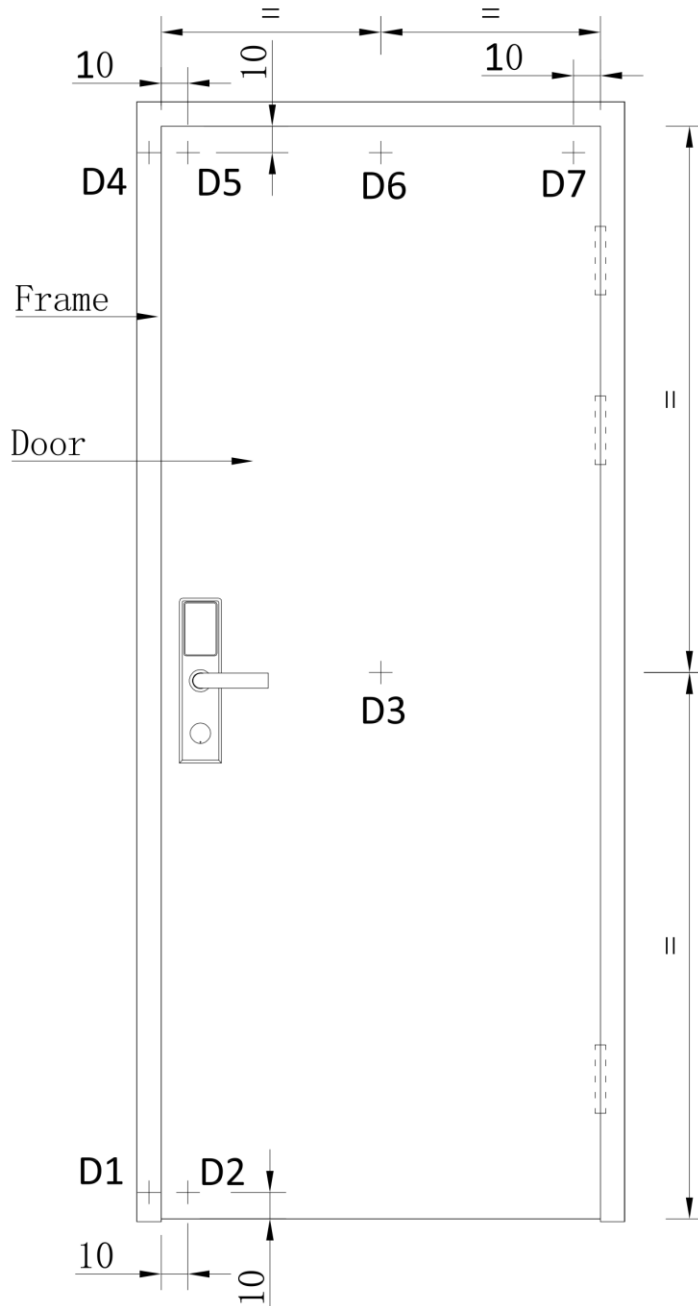
DO NOT SCALE

**DOOR ASSEMBLY INITIAL CLEARANCES**

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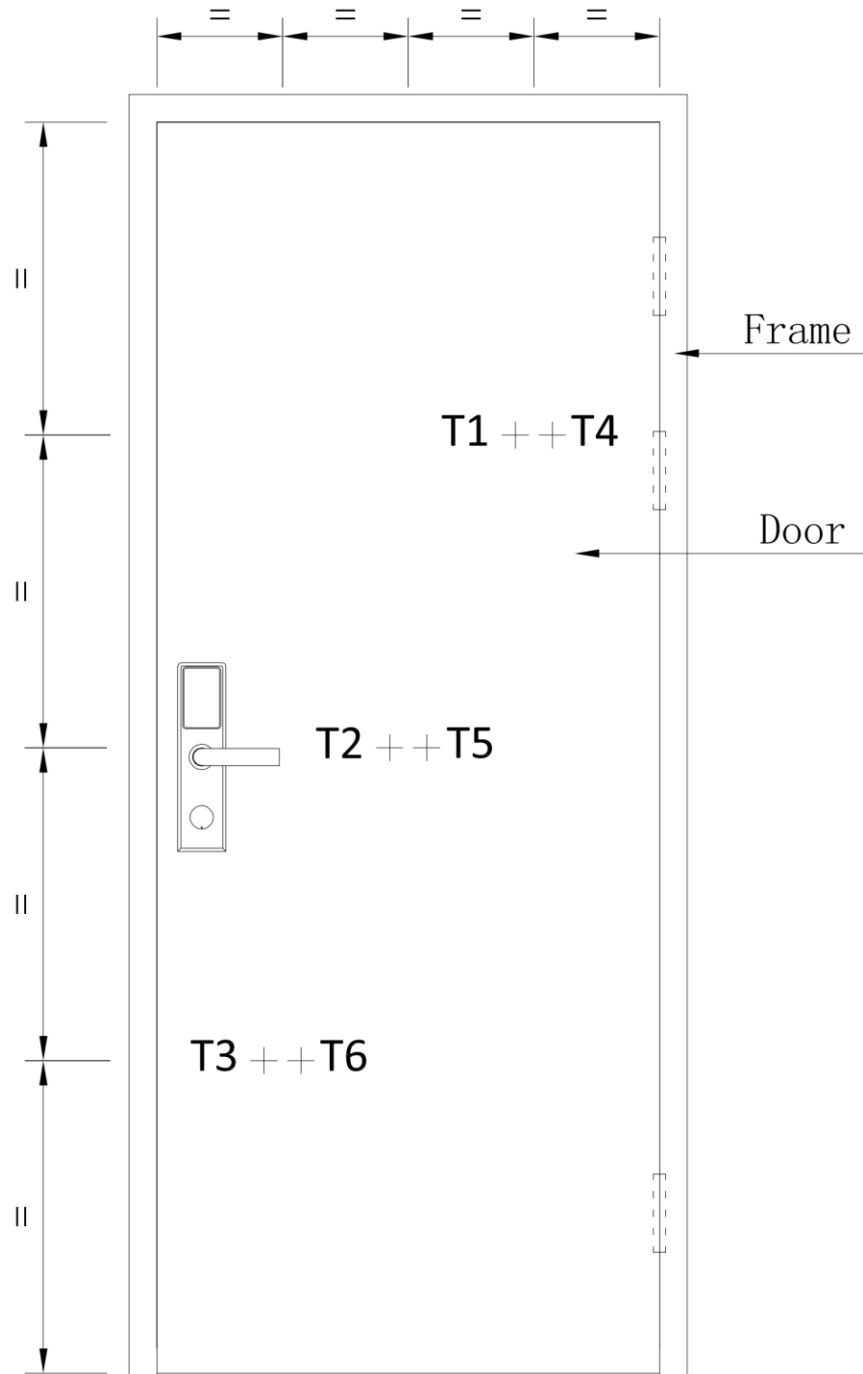
**UNEXPOSED SIDE**

**POSITION FOR MEASUREMENT OF HORIZONTAL DEFLECTION**

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**POSITION FOR MEASUREMENT OF UNEXPOSED TEMPERATURE**

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### SECTION 10

#### TEST DATA

**Standards:** NFPA 252-2017 Fire Tests of Door Assemblies**Equipment:**

ITEM	ID
<i>Vertical furnace</i>	SH1098
<i>Furnace pressure gauge</i>	SH1348&SH1097-15-4
<i>Test Clock</i>	SH1042
<i>Furnace thermocouple</i>	SH1097-1
<i>Ambient temperature gauge</i>	SH1097-11
<i>Unexposed thermocouple</i>	SH1097-12
<i>Displacement Measurements</i>	SH1163
<i>Clearance Measurements</i>	SH1057-1
<i>Oxygen Analyzer</i>	SH1318

Temperature-Time Curve:	According to NFPA 252, Section 4.1
Furnace Temperatures:	According to NFPA 252, Section 4.2
Unexposed Temperatures:	According to NFPA 252, Section 4.3, measured in the first 30 minutes
Thermocouple Pads:	Length and width $152 \pm 3$ mm, thickness $10.2 \pm 1.3$ mm, conductivity 0.055 W/mK at 65°C
Construction and Size:	According to NFPA 252, Section 5.1
Mounting:	According to NFPA 252, Section 5.2
Clearances:	According to NFPA 252, Section 5.3
Test Wall:	According to NFPA 252, Section 5.4
Hose Stream:	According to NFPA 252, Section 6.2

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### Other Evaluation Standard:

UL 10B-2008(R2015)	DESCRIPTION
Positive Pressure	No requirement.
Neutral pressure	The pressure in the furnace chamber is to be $0 \pm 0.01$ inches of water at the top of the door.
Thermocouple	For unexposed temperatures, thermocouple shall be a wire diameter of not more than 0.7mm. Each thermocouple is to be brazed to the center of the surface of the face of a copper disk 12mm in diameter and 0.2mm thick.
Thermocouple Pads	Length and width $152 \pm 3$ mm, thickness $9.5 \pm 1.6$ mm, dry weight of $67 \pm 24$ g, conductivity 0.053 W/mK at 66°C, modified Brinnell hardness (on soft face) of 2.25 to 4.5.
Cotton Pad Check	No Requirement.
Hose Stream	Immediately after to within 3 minutes of the fire endurance test.

CAN/ULC S104-15	DESCRIPTION
Positive pressure	No requirement.
Neutral pressure	The pressure in the furnace chamber shall be controlled such that a pressure of $0 \pm 2.5$ Pa is maintained at the top of the test assembly.
Thermocouple	For unexposed temperatures, thermocouple lead under the pad shall be not greater than 1 mm in diameter and shall be electrically insulated with heat resistant and moisture resistant coatings.
Thermocouple Pads	Length and width $150 \pm 3$ mm, thickness $10 \pm 1$ mm, density $500 \pm 10$ kg/m <sup>3</sup> , thermal conductivity 0.055 W/m·K at 66°C.
Cotton Pad Check	No Requirement.
Hose Stream	Within 3.5min of the termination of the fire test, directed first at the bottom and then at all parts of the exposed surface, changes in direction being made slowly.

UL 10C-2016(R2021)	DESCRIPTION
Positive pressure	After less than 5 minutes, 40 in. (1016 mm) or less from the bottom of the test assembly.
Neutral pressure	No requirement.
Thermocouple	For unexposed temperatures, thermocouple shall be a wire diameter of not more than 0.7mm. Each thermocouple is to be brazed to the center of the surface of the face of a copper disk 12mm in diameter and 0.2mm thick.

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Thermocouple Pads	Length and width $30 \pm 0.5$ mm, thickness $2 \pm 0.5$ mm, density of $900 \pm 100\text{kg/m}^3$ , thermal conductivity $0.053$ W/mK at $66^\circ\text{C}$ , modified Brinnell hardness (on soft face) of 2.25 to 4.5.
Cotton Pad Check	100mm square by 20mm thick, consist of new undyed and soft cotton fibers without any admixture of artificial fibers, weighing of 3 to 4g, dried at $100^\circ\text{C}$ for at least 30min. Attached by wire clips to a 100mm square frame of 1mm diameter wire.
Hose Stream	Immediately after and within 3 minutes of the fire endurance test.
Oxygen Percentage readings	The oxygen percentage is to be determined by centering a minimum of one 1/4-in (6.4-mm) inside diameter stainless steel tube containing eight 1/16-inch (1.6-mm) diameter holes in the damper plenum, approximately half way between the furnace and the exhaust damper. The tube is then to be connected to an oxygen analyzer which has an accuracy of $\pm 2.0$ percent in the range of 0 to 10 percent. Locating more than one probe in the plenum and averaging the readings is permitted.



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### Fire Endurance Test Observations:

Time		All observations are from the unexposed face unless noted otherwise.
Mins	Secs	
00	00	Test started.
01	49	Smoke issued from the electronic lock location of the door leaf.
02	03	Smoke issued from the top and the bottom of the door leaf.
02	26	Smoke issued from the top hinge location of the door leaf.
06	40	There was an unidentified liquid emitted from the electronic lock.
31	33	No significant change.
41	35	No significant change.
52	22	Discoloration was observed on the panel adjacent to the top hinge.
55	50	A cotton pad was applied on the electronic lock location of the door and the pad was not ignited.
60	00	Fire Test was discontinued by the request of the client. The test assembly had withstood the fire-resistance test without passage of flame or gases hot enough to ignite cotton waste. Then test assembly was to be moved into position for hose stream test.

### Hose Stream Test Observations:

Time		All observations are from the unexposed face unless noted otherwise.
Mins	Secs	
62	13	Hose stream test started.
62	32	Hose stream test was discontinued. No through openings that permitted a projection of water from the stream beyond the unexposed surface during the time of the hose stream test.

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**Temperature Data:****Mean furnace temperature together with temperature-time relationship specified in the standard**

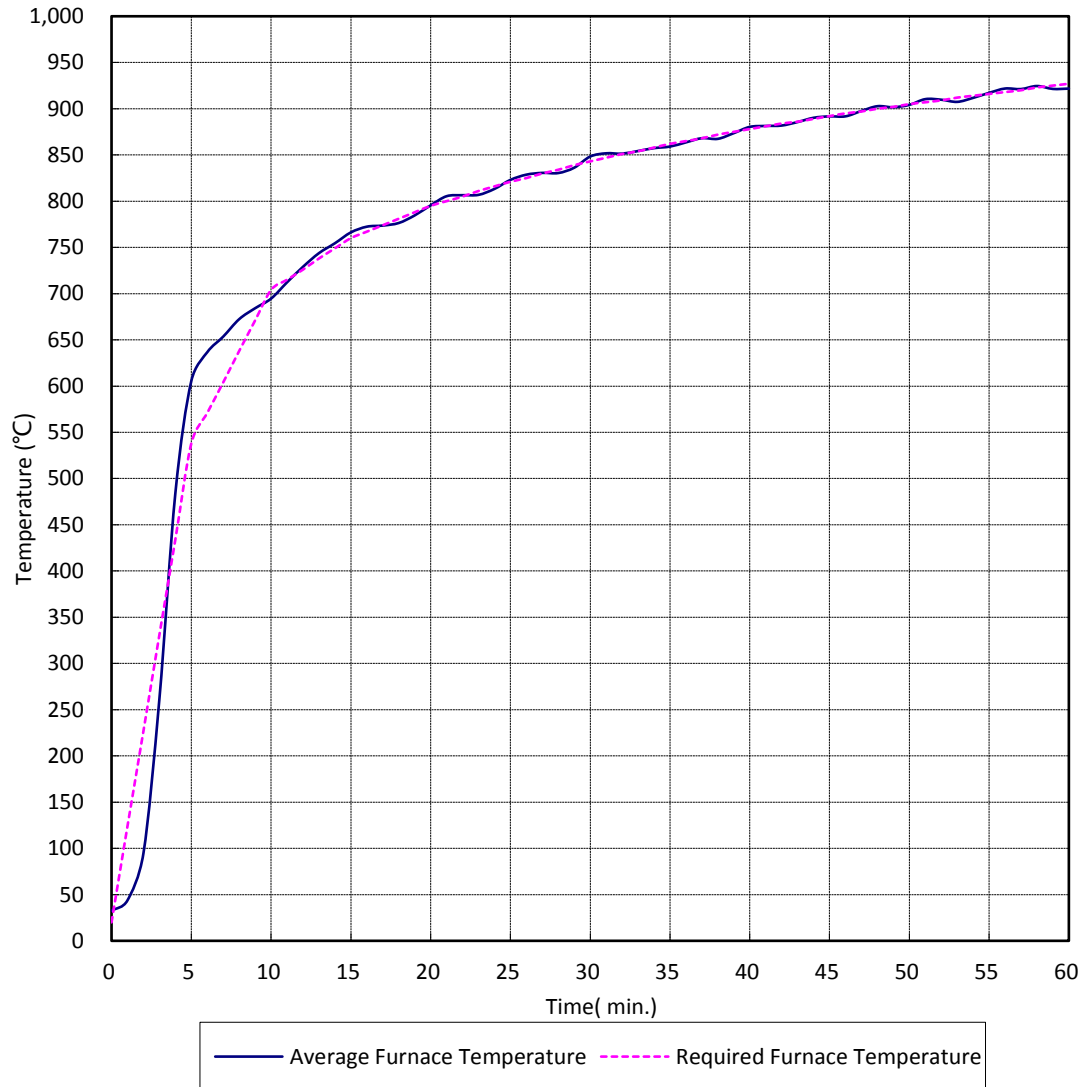
Time Mins	Specified Furnace Temperature (°C)	Furnace Mean Temperature (°C)
0	20	33
3	331	262
6	571	637
9	671	684
12	726	729
15	760	766
18	781	776
21	800	805
24	816	813
27	830	831
30	843	848
33	854	854
36	865	864
39	875	874
42	884	882
45	892	892
48	900	903
51	907	910
54	914	912
57	920	921
60	927	922

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### Graph for mean furnace temperature and temperature-time curve specified in the standard



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**Unexposed surface temperatures**

Time Mins	T1 (°C)	T2 (°C)	T3 (°C)	T4 (°C)	T5 (°C)	T6 (°C)
0	31	29	29	29	29	28
2	31	29	29	29	29	28
4	31	29	29	29	29	29
6	31	29	29	29	29	29
8	31	29	29	29	29	28
10	31	29	29	29	29	29
12	32	30	29	30	29	29
14	33	30	30	31	30	30
16	34	31	31	32	31	31
18	36	33	33	34	32	32
20	39	35	35	36	34	34
22	41	37	37	39	35	36
24	44	39	40	41	38	38
26	47	42	43	44	40	41
28	50	44	46	47	42	43
30	53	47	49	49	45	46
32	57	50	52	52	47	49
34	60	53	55	55	50	51
36	62	56	58	57	52	54
38	65	58	61	60	54	56
40	68	61	64	62	57	59
42	71	64	67	65	60	62
44	73	66	69	67	62	64
46	76	69	71	69	64	67
48	78	71	74	71	67	69
50	80	74	76	73	69	71
52	82	76	78	75	71	73
54	83	78	80	76	73	75
56	85	79	82	78	75	76
58	86	81	83	79	77	78
60	88	83	85	80	79	80

Thermocouple Pads for T1, T2 and T3 complies with the requirements of NFPA 252

Thermocouple Pads for T4, T5 and T6 complies with the requirements of UL 10C.

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### Horizontal Deflection (Positive values indicate movement into the furnace)

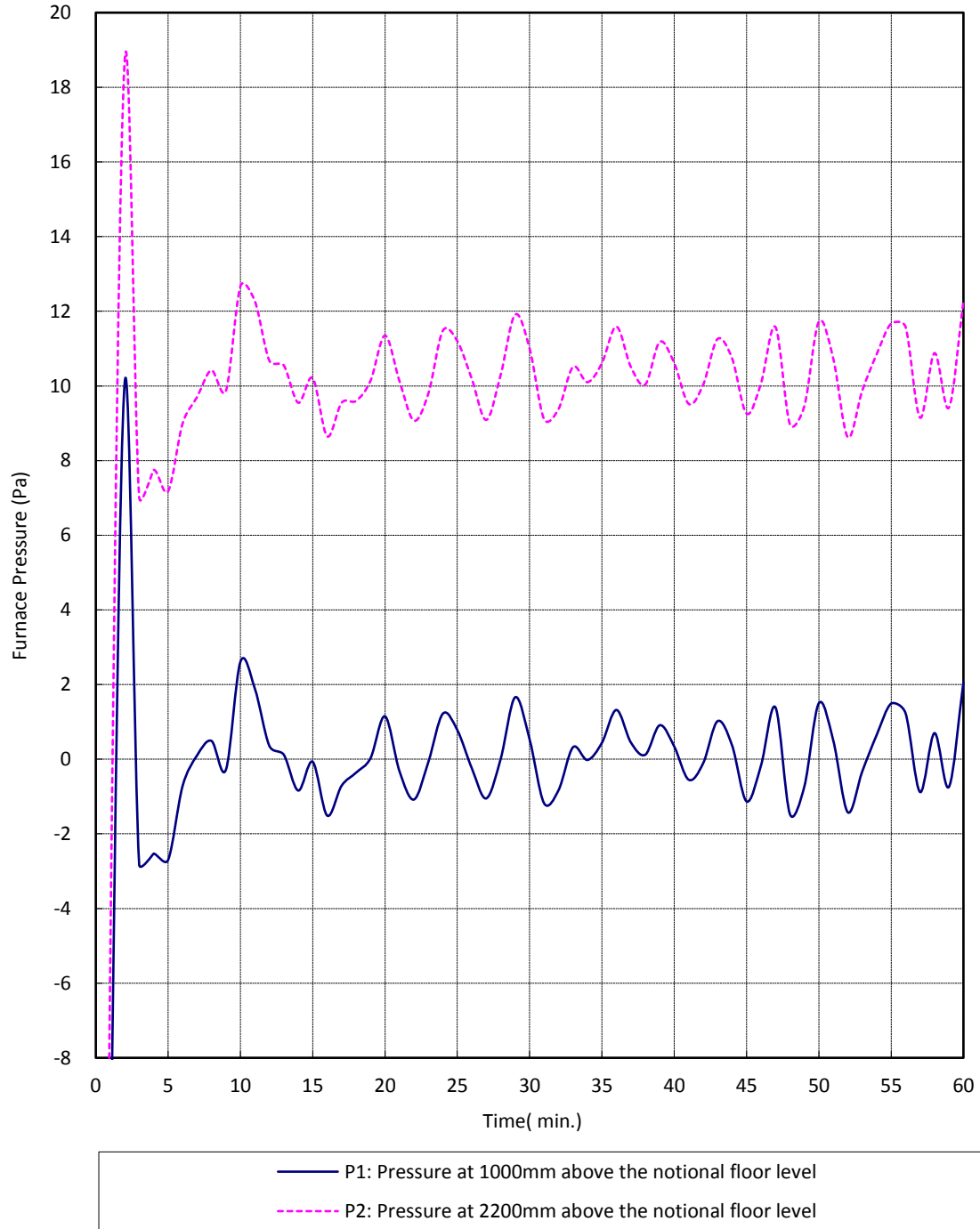
Time (Mins)	Door Frame Separation at Latch for Single Door (mm)	Maximum Pair Meeting Edge Displacement (mm)	Maximum Perpendicular Displacement where a positive measurement indicates movement towards the furnace (mm)						
			D1	D2	D3	D4	D5	D6	D7
Initial	< 12.7	N/A	0	0	0	0	0	0	0
10	< 12.7	N/A	0	-3	0	0	1	0	0
20	< 12.7	N/A	0	-3	1	0	2	1	2
30	< 12.7	N/A	0	-2	2	0	5	5	4
40	< 12.7	N/A	0	-1	4	0	6	7	5
50	< 12.7	N/A	0	-3	12	0	5	9	6
55	< 12.7	N/A	0	-3	16	0	4	10	7
Requirement	< 12.7	NA	Any portion of the edges adjacent to door frame shall not move more than the thickness of the door.						
Hose Stream	< 12.7	NA	<82.5						
Requirement	< 12.7	NA	Any portion of the edges adjacent to door frame shall not move more than 1-1/2 times the door thickness.						

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### Graph of Furnace Pressure

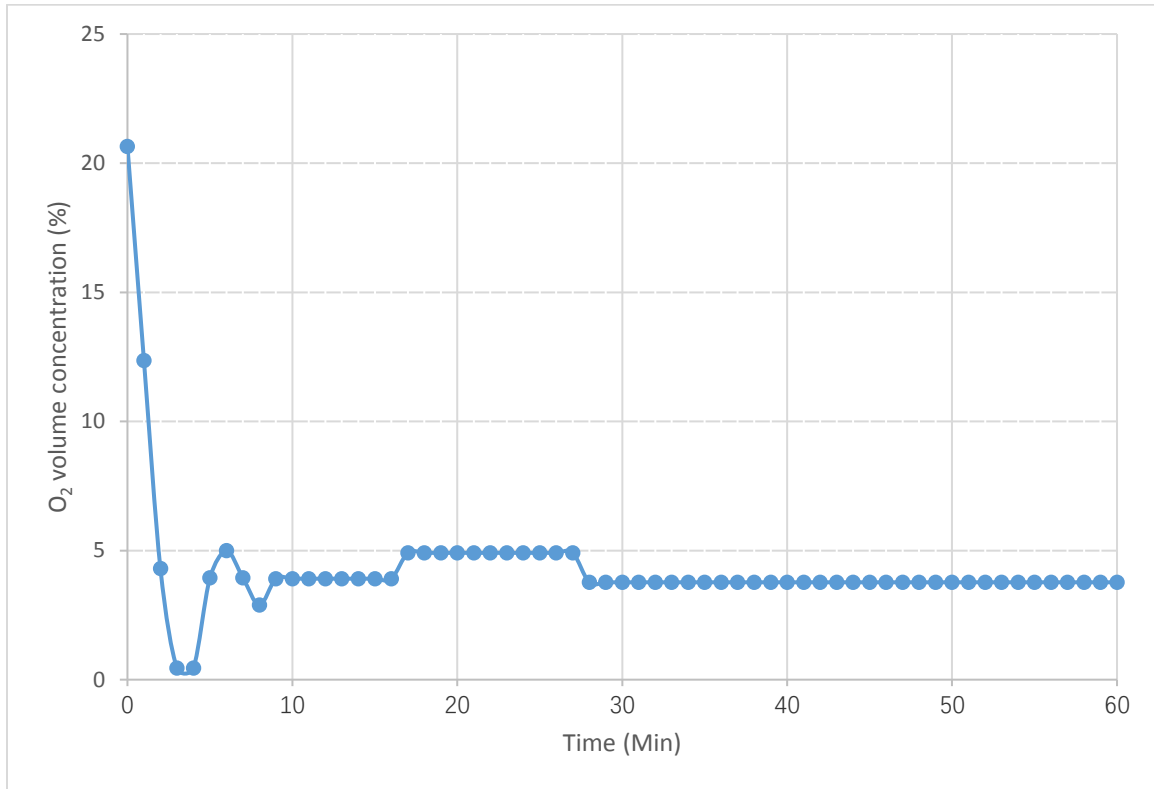


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### Oxygen concentration inside furnace



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### SECTION 11 PHOTOGRAPHS



Fig. 1 Exposed Side Prior to the Fire Test

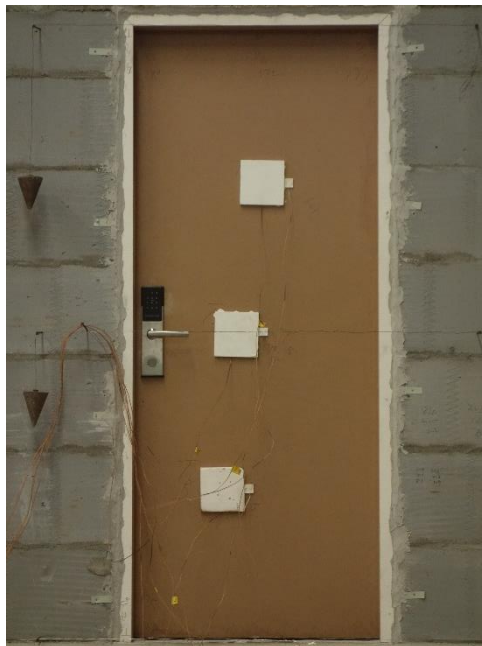


Fig. 2 Unexposed Side Prior to the Fire Test



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Fig. 3 Unexposed Side after 20 Minutes



Fig. 4 Unexposed Side after 40 Minutes

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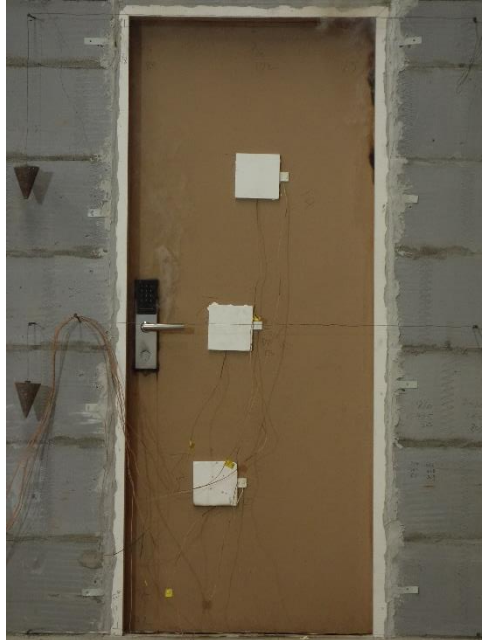


Fig. 5 Unexposed Side after 60 Minutes



Fig. 6 Exposed Side after 60 Minutes

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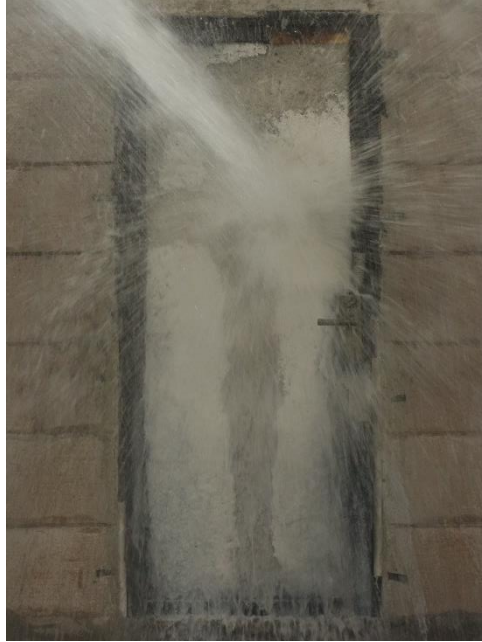


Fig. 7 Exposed Side during Hose Stream Test



Fig. 8 Exposed Side after Hose Stream Test

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Fig. 9 Unexposed Side after Hose Stream Test

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### SECTION 12 REVISION LOG

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0	2021-09-13	N/A	Original Report Issue

