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WORLDWIDE DOOR COMPONENTS, INC.
TEST REPORT

SCOPE OF WORK
NFPA 252(2012), CAN/ULC S104 (2015), UL 10C (2009) AND UL 10B (2009) TESTING ON 8'-FR FIBERGLASS DOOR, MODEL OF 970*2440

REPORT NUMBER
180522011SHF-BP-1-R1

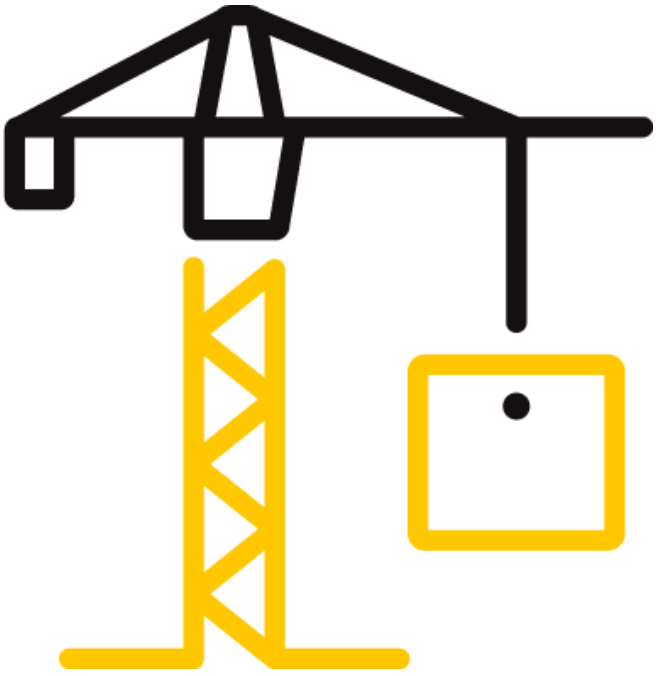
TEST DATE
08/25/16

ISSUE DATE
06/13/18

REVISED DATE
07/13/18

PAGES
29

DOCUMENT CONTROL NUMBER
LFT-APAC-SHF-OP-10f



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Issue Date: 06/13/18

Intertek Report No.: 180522011SHF-BP-1-R1

REPORT ISSUED TO

WORLDWIDE DOOR COMPONENTS, INC.
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SECTION 1

SCOPE

Intertek has conducted an evaluation for WORLDWIDE DOOR COMPONENTS, INC. to determine the fire resistance characteristics of 8'-FR Fiberglass Door, Model of 970*2440, for a 20 minutes rating without hose stream test. This evaluation began on 05/05/16 and was completed on 08/30/16. The test was conducted on 08/25/16.

The test was conducted in accordance with NFPA 252 (2012) and UL 10C (2009) under positive furnace pressure without hose stream test. This test was also designed to demonstrate evaluation according to CAN/ULC S104 (2015) and UL10B (2009) under neutral furnace pressure without hose stream test. All the conditions of acceptance applying to the tested door in NFPA 252 (2012) and UL 10C (2009) under positive furnace pressure, and in CAN/ULC S104 (2015) and UL10B (2009) 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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SECTION 2
SUMMARY OF TEST RESULTS

Product Name: 8'-FR Fiberglass Door
Series/Model: 970*2440

TEST RESULTS:

PERFORMANCE CRITERIA	RESULTS
Fire resistance without hose stream test	Met the requirements for a 20 minutes exposure period without hose stream.

SECTION 3
TEST METHODS

The specimen was evaluated in accordance with the following:

NFPA 252 (2012), *Standard Methods of Fire Tests of Door Assemblies*

CAN/ULC S104 (2015), *Standard Method for Fire Tests of Door Assemblies*

UL 10C (2009), *UL Standard for Positive Pressure Fire Tests of Door Assemblies*

UL 10B (2009), *UL Standard for Fire Tests of Door Assemblies*

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SECTION 4
MATERIAL SOURCE/INSTALLATION

The specimens were randomly selected by Intertek B&C personnel at Wuxi Lutong fiberglass door Co., ltd located at No. 123 Luzhong South Road, Luqu, Yangshan Town, Huishan District, Wuxi City, Jiangsu Province, P.R. China. The specimens were witnessed during production and tagged prior to shipment on 08/18/16.

The subject test specimen is a traceable sample selected from the manufacturer's facility. Intertek selected the specimen and has verified the composition, manufacturing techniques and quality assurance procedures.

TESTED ASSEMBLY DESCRIPTION								
Door	Type	Single Leaf Single Action Composite Fire Door Assembly						
	Nominal Size	Single Door	930	mm wide	2413	mm high	44.5	mm thickness
	Facing	Material	1.8 mm thick SMC (sheet molding compound), model of RXSMC5005, density of 1600 kg/m^3					
	Core	Material:	40.9 mm thick PU (portfolio polyether polyols), density of 60kg/m^3					
	Lipping	Material:	40.9 mm thick, 30 mm wide LVL (laminated veneer lumber), density of 570kg/m^3					
		Material:	PVC (polyvinyl chloride), density of 700kg/m^3;12mm, 10mm and 20mm wide at vertical, top and bottom position respectively					
Frame	Nominal Size		970	mm wide	2440	mm high	116	mm thickness
	Material		PVC (polyvinyl chloride), density of 700kg/m^3					
Hardware	Lock	Lock type:	Mortise lock, Model: NAM26-E71					
		Lock case size:	149 mm x102 mm					
		Backset:	70	mm	Latch throw:		19	mm
		Latch Operation	Latch:	Engaged				
	Hinge	Material:	SUS304, model of SS454034-2BB					
		Size:	4.5 in. x 4 in. x 3.4 mm, Quantity: 3					
Intumescent Seal	Type		Model: FPJ-B-15 x 6					
			Size:15x6mm,					
			Location: along top and jamb sides of door frame					

The sample ID number assigned by the test lab is S160505009SHF-001.

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The specimen is described by the client as 8'-FR Fiberglass Door, Model of 970*2440. The drawings of the test Fire Rated Door, hardware, and test wall construction can be found in Section 6, 7 and 8 respectively.

A comprehensive description of 8'-FR Fiberglass Door, Model of 970*2440 for certification is maintained on Intertek file.

The test assembly was installed in a moveable restraint frame and the hardware was installed by the client. The test assembly was moved in front of the furnace for the fire exposure. The test door was built into a concrete masonry unit partition, with fully mortared joints. 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.

The test door was oriented to open into the furnace.

The nominal dimensions of the test wall were 3 m high by 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 sill and 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.

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

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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 20 minutes 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 doors for a distance greater than the door thickness during the 20 minutes fire test. The actual measurements were presented in test data in in Section 10.

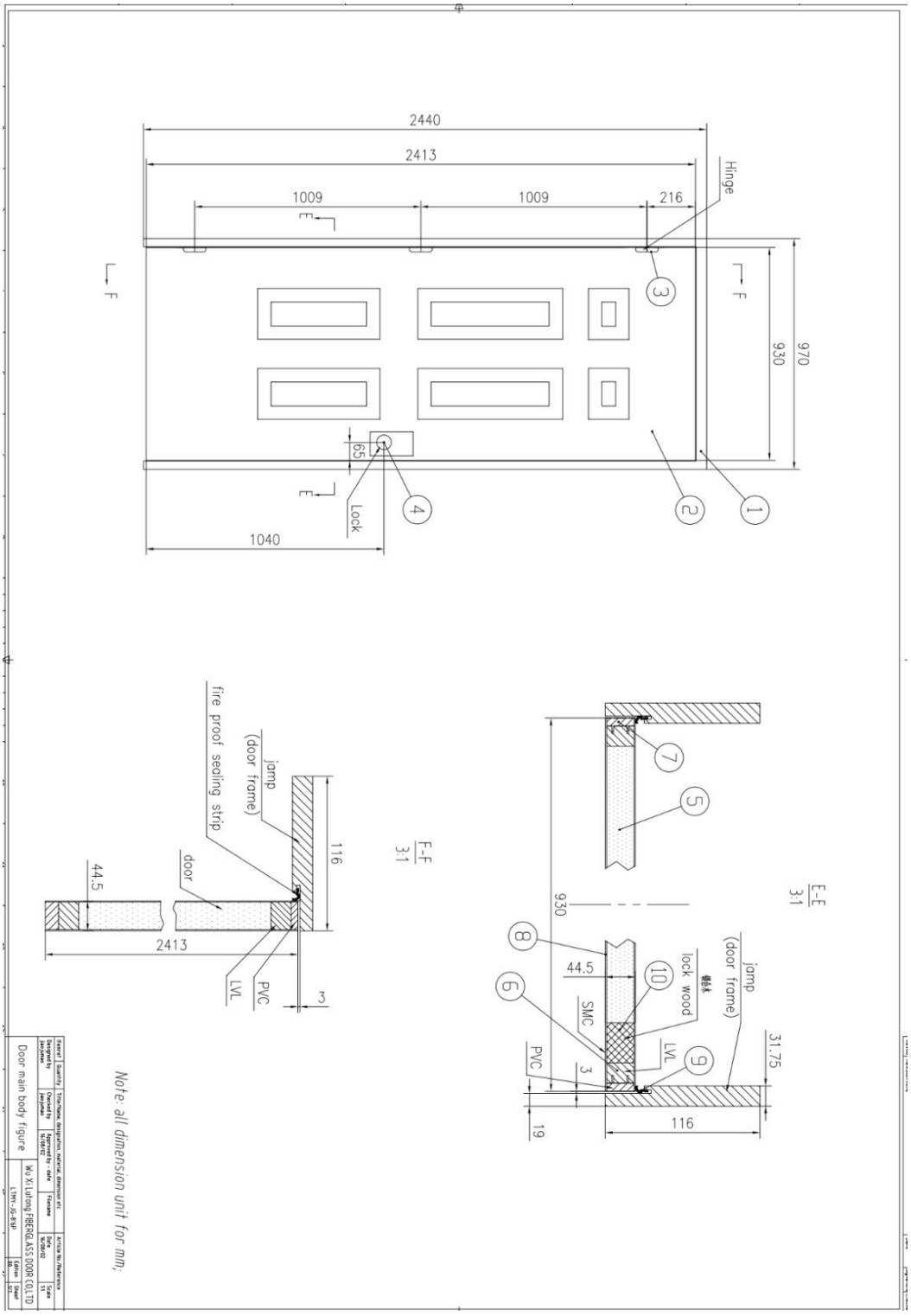
During the 20 minutes fire exposure period no significant flaming was observed on the unexposed face of the assembly, nor gases hot enough to ignite the cotton pad. This assembly therefore met the criteria of the test standards for flaming. No through openings or penetrations were evident at the conclusion of the fire exposure portion of the test.

This assembly therefore met the criteria of the fire endurance test for 20 minutes.

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

SECTION 6

FIRE DOOR ASSEMBLY DRAWINGS



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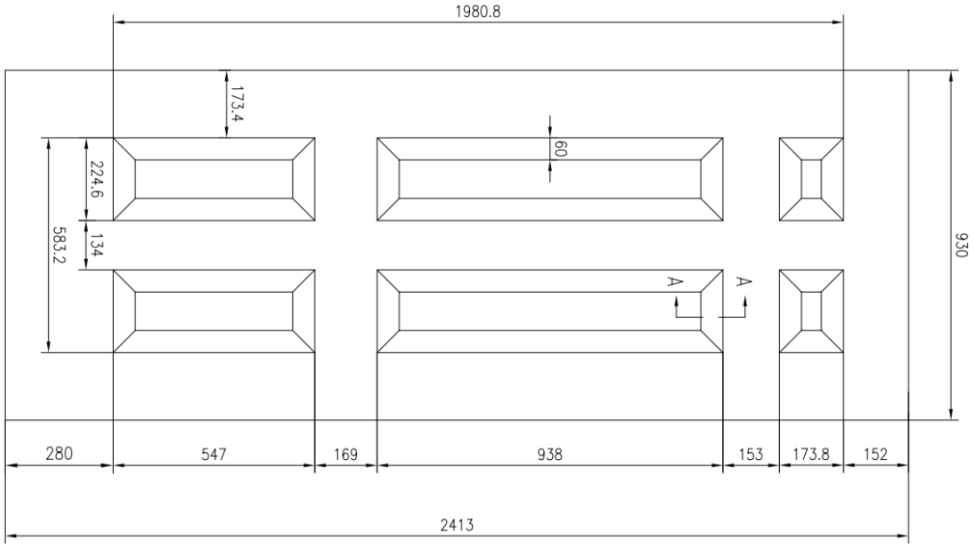

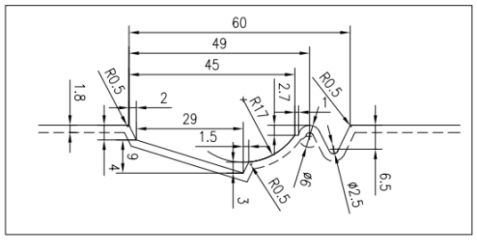

A-A
The proportion1:10

Note: all dimension unit for mm;

NO.	Code name	The name of the material	The number of	Material material	The density of (g/cm³)	Supplier name	note
1	Jamb 4 9/16 (PVC)	Door frame		Polyvinyl chloride	**0.7**	worldwide door components, Inc.	
2	LTMY-JG-8'6P-2	Fire doors 2413x930mm	1			Wu Xi Lutong FIBERGLASS DOOR CO,LTD	
3	SS454034-2BB	Door hinge	3	SUS304		JIANGMEN LIKCOO HARDWARE MANUFACTURING CO LTD	
4	NAM26-E711	Mortise lock	1	SUS304		ASSA ABLOY (Zhongshan) Security Technology Company Limited	
5	PU	Portfolio polyether polyols		Polyurethane	0.06	Zibo WoXin Environmental protection technology co., LTD	
6	LVL	Single board level material		Laminated veneer lumber	0.57	LianYungang DaHua Wood C.LTD	
7	PVC	Polyvinyl chloride (PVC)		Polyvinyl chloride	**0.7**	worldwide door components, Inc.	
8	SMC	Door piece		Sheet molding compound	1.6	ChangZhou RiXin Molding technology co., LTD	
9	FPJ-B-15x6	Fire proof sealing strip		Fireproof fiber		Hebei JianAn Doors and Windows sealing technology co., LTD	
10	LVL (Lock Wood)	Lock Wood		Laminated veneer lumber	0.57	LianYungang DaHua Wood C.LTD	

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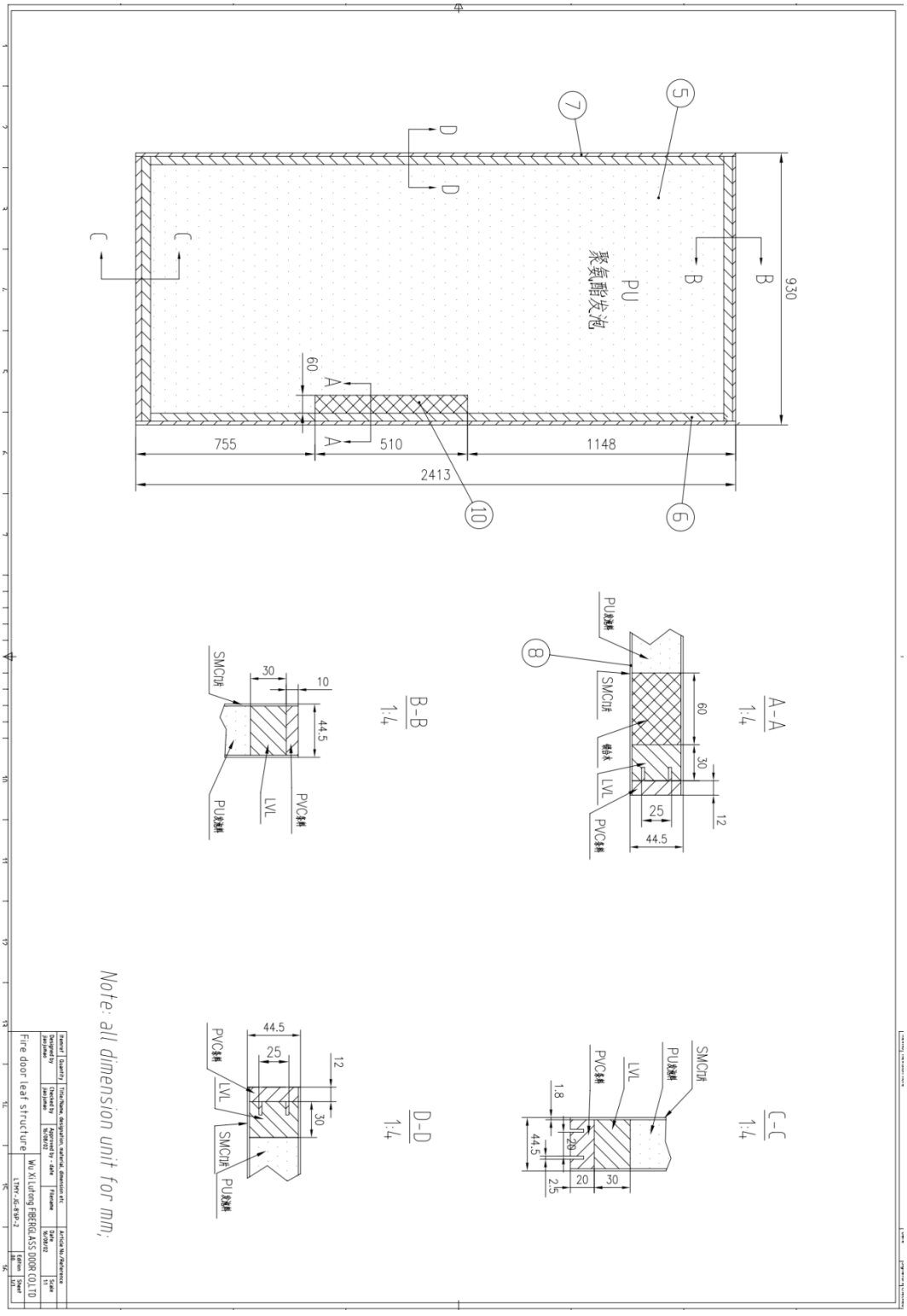
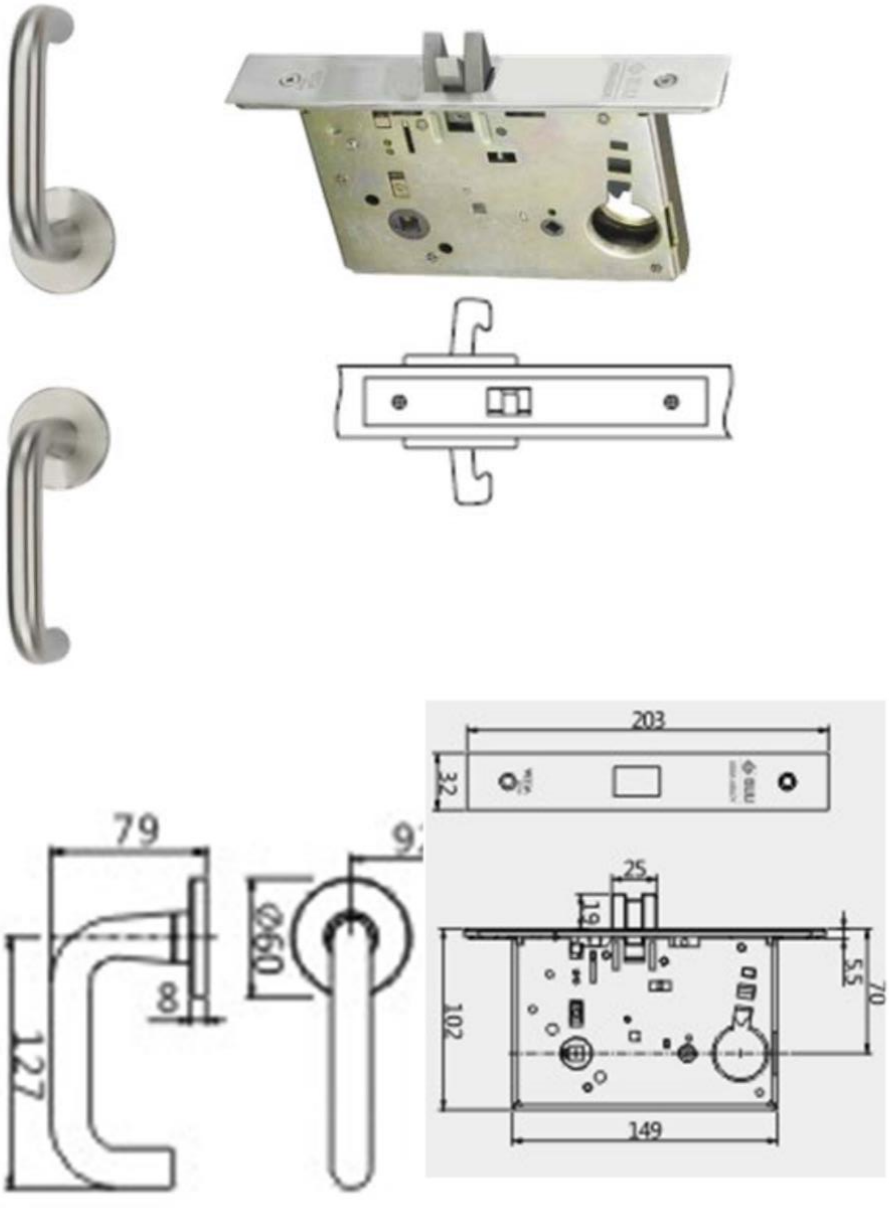
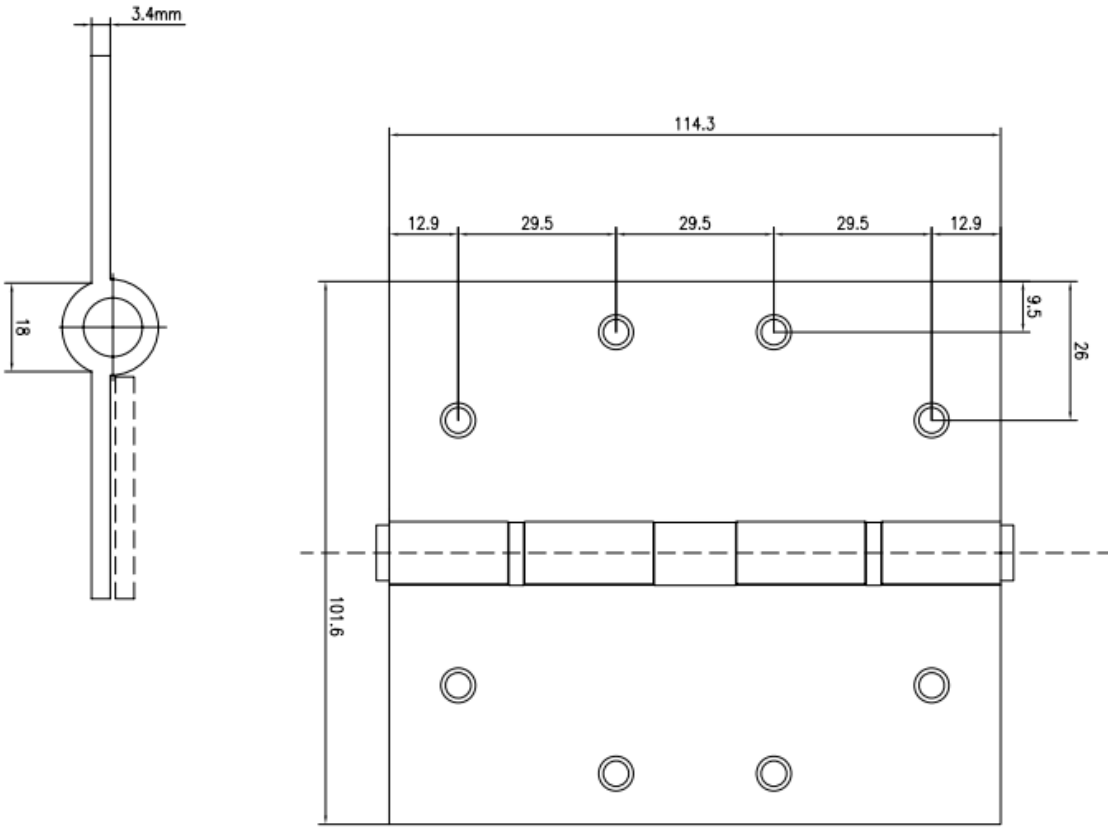


SECTION 7
HARDWARE DRAWINGS



Mortise Lock, model of NAM26-E71



Stainless steel single action spring hinge
Item No.: SS039A
Material: SUS304
Finish: SS
Dimension(H×W×T):4.5"×4"×3.4mm

Hinge, model of SS454034-2BB

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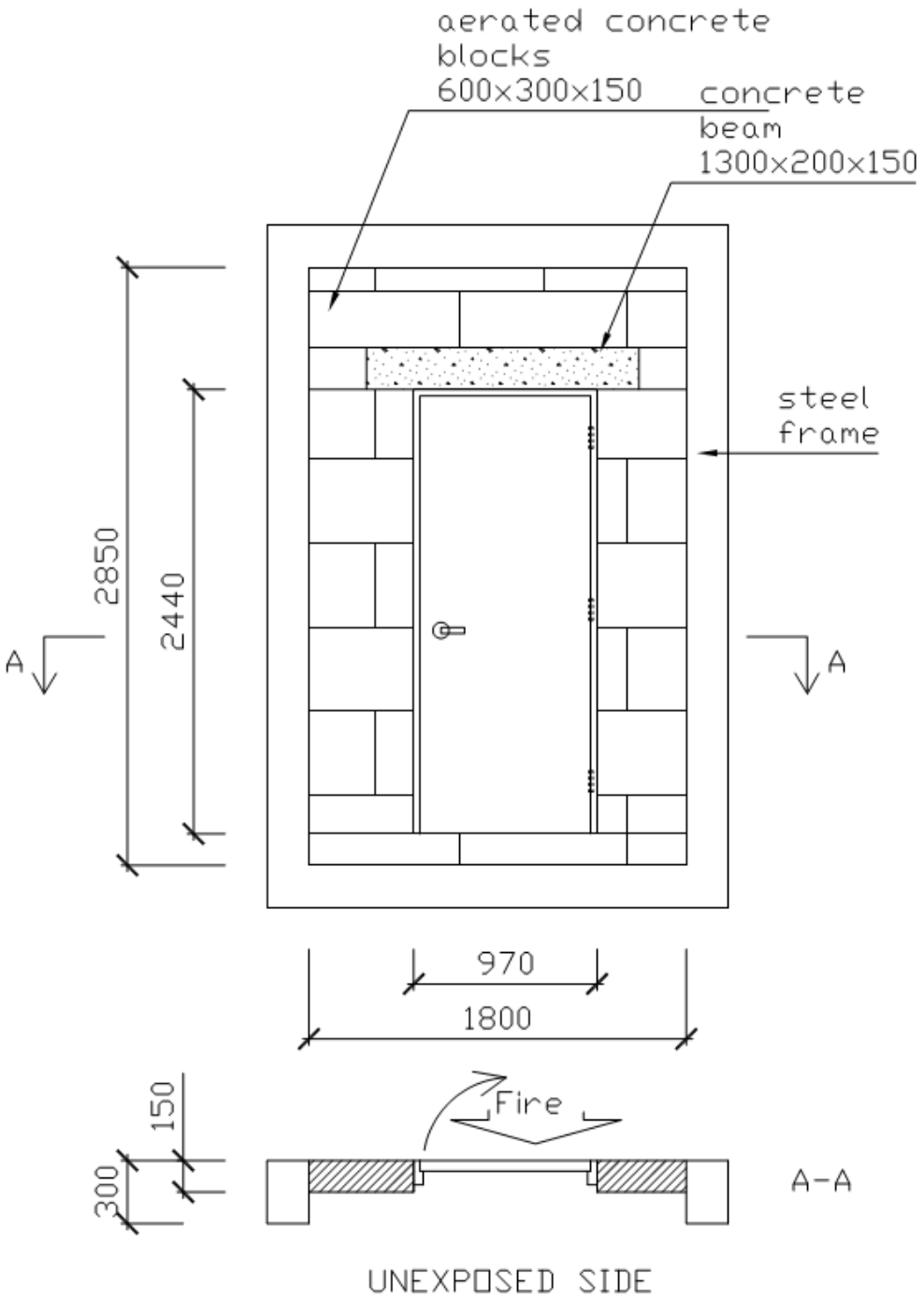
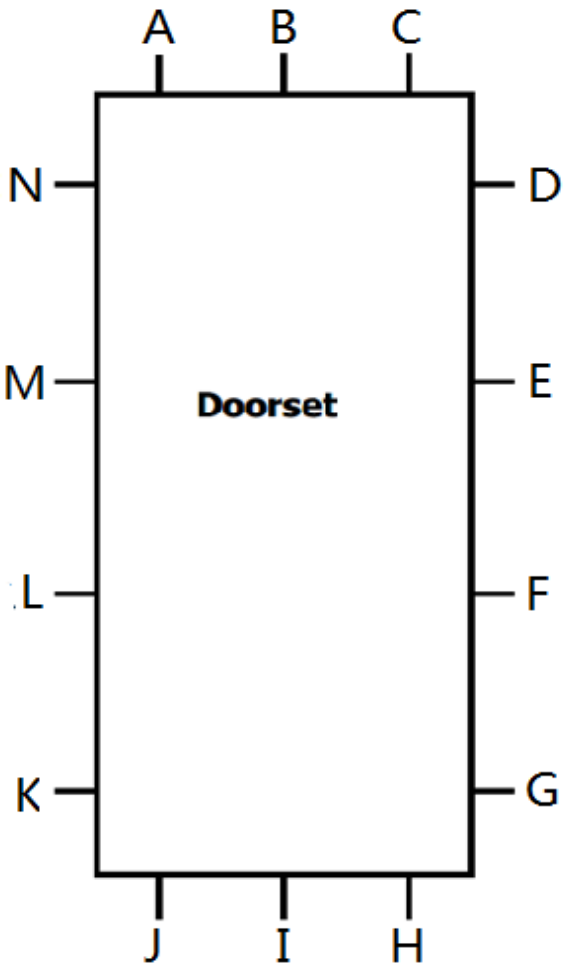
SECTION 8
TEST WALL CONSTRUCTION



SECTION 9

TEST MEASUREMENT DATA

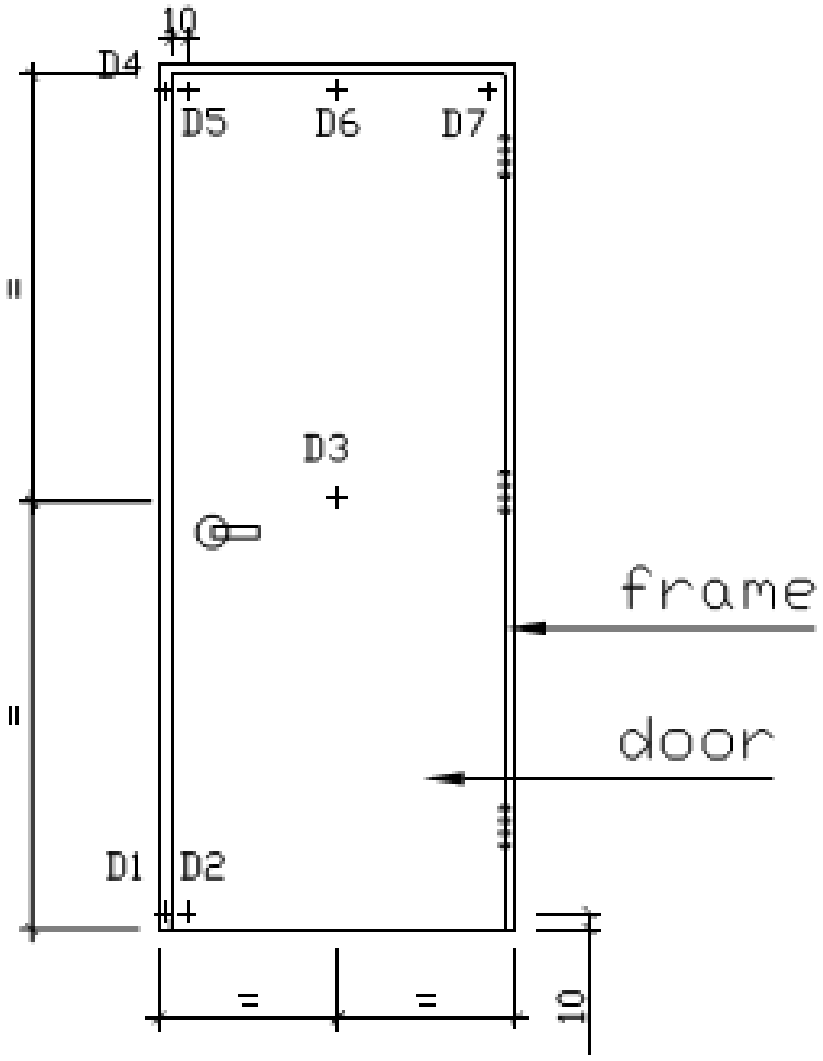


EXPOSED SIDE

Clearance dimension in mm at each position													
A	B	C	D	E	F	G	H	I	J	K	L	M	N
1.1	1.1	1.9	1.2	2.7	1.4	2.9	8.6	7.4	7.4	2.9	2.8	2.3	2.6

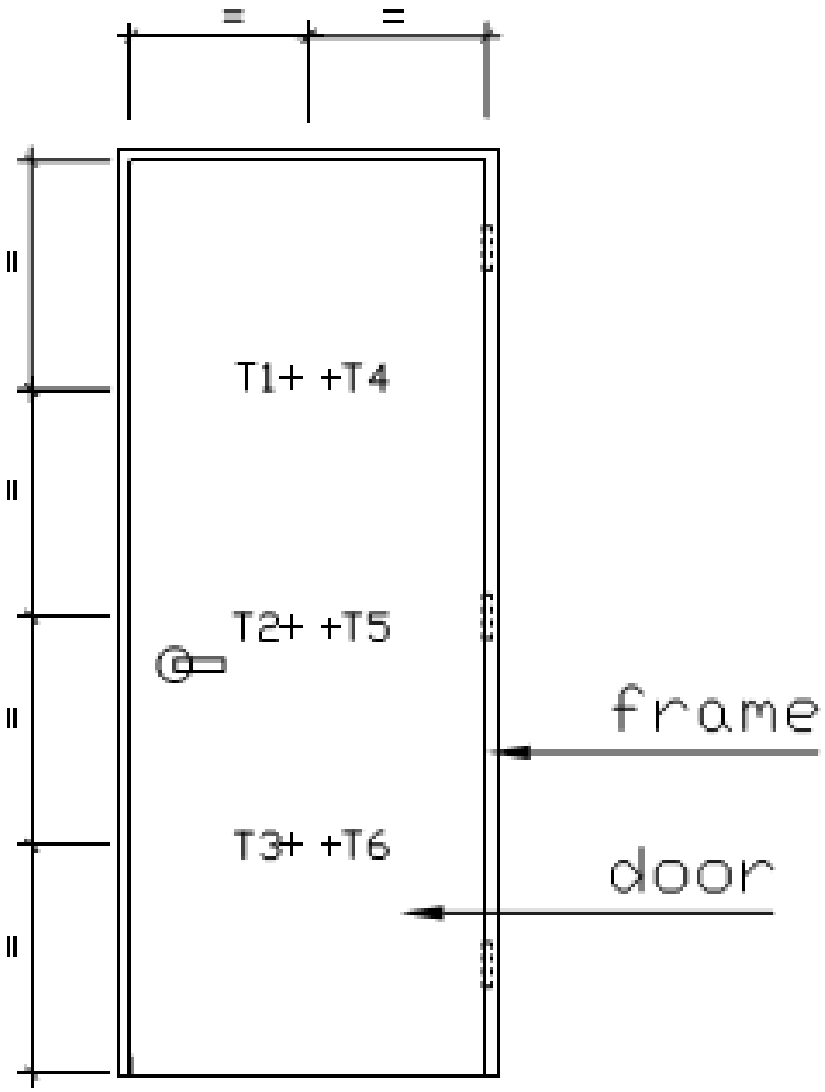
DO NOT SCALE

DOOR ASSEMBLY INITIAL CLEARANCES



UNEXPOSED SIDE

POSITON FOR MEASUREMENT OF HORZITONAL DEFLECTION



POSITON FOR MEASUREMENT OF UNEXPOSED TEMPERATURE

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SECTION 10

TEST DATA

Standards: NFPA 252-12 Fire Tests of Door Assemblies
Conditioning: 24 hours at a temperature of 50-90°F (10-32°C) and ambient humidity
Equipment:

ITEM	ID
Vertical furnace	SH1098
Furnace pressure gauge	SH1097-15
Test Clock	SH1042
Furnace thermocouple	SH1097-7~9
Ambient temperature gauge	SH1097-11
Unexposed thermocouple	SH1097-12~14
Clearance Measurements	SH1057-1
Displacement Measurements	SH1034

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 ± 3 mm, thickness 10.2 ± 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-2009	DESCRIPTION
Positive:	No requirement.
Neutral:	The pressure in the furnace chamber is to be 0 ± 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 ± 3 mm, thickness 9.5 ± 1.6 mm, dry weight of 67 ± 24g, conductivity 0.053 W/mK at 66°C, modified Brinnell hardness (on soft face) of 2.25 to 4.5
Cotton Pad:	No Requirement.
Hose Stream:	Immediately after to within 3 minutes of the fire endurance test.

CAN/ULC-S104 (2015)	DESCRIPTION
Positive:	No requirement.
Neutral:	The pressure in the furnace chamber shall be maintained as nearly equal to the atmospheric pressure as possible.
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 150 ± 3 mm, thickness 10 ± 1 mm, dry weight of 0.11 ± 0.01kg, thermal conductivity 0.05 W/mK at 65°C, hardness (modified Brinell) of 10 to 25.
Cotton Pad:	No Requirement.
Hose Stream:	Immediately following the fire endurance test, directed first at the middle and then at all parts of the exposed surface, changes in direction being made slowly.

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UL 10C-2009	DESCRIPTION
Positive:	After less than 5 minutes, 40 in. (1016 mm) or less from the bottom of the test assembly.
Neutral:	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.
Thermocouple Pads:	Length and width 30 ± 0.5 mm, thickness 2 ± 0.5 mm, density of 900 ± 200kg/m³, conductivity 0.053 W/mK at 66°C, modified Brinnell hardness (on soft face) of 2.25 to 4.5
Cotton Pad:	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℃ for at least 30min. Attached by wire clips to a 100mm square frame of 1mm diameter wire.
Hose Stream:	Immediately after and within 1-1/2 minutes of the fire endurance test.

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Test Observations:

Time		All observations are from the unexposed face unless noted otherwise.
Mins	**Secs**	
00	00	Test start.
2	19	Smoke issue from right vertical edge.
7	00	Heavy smoke issue from bottom edge of door leaf.
10	00	Discoloration is observed at top half of door leaf.
16	00	The top half of leaf turns black in appearance particularly.
20	00	Fire test is discontinued and no obvious damage is observed.

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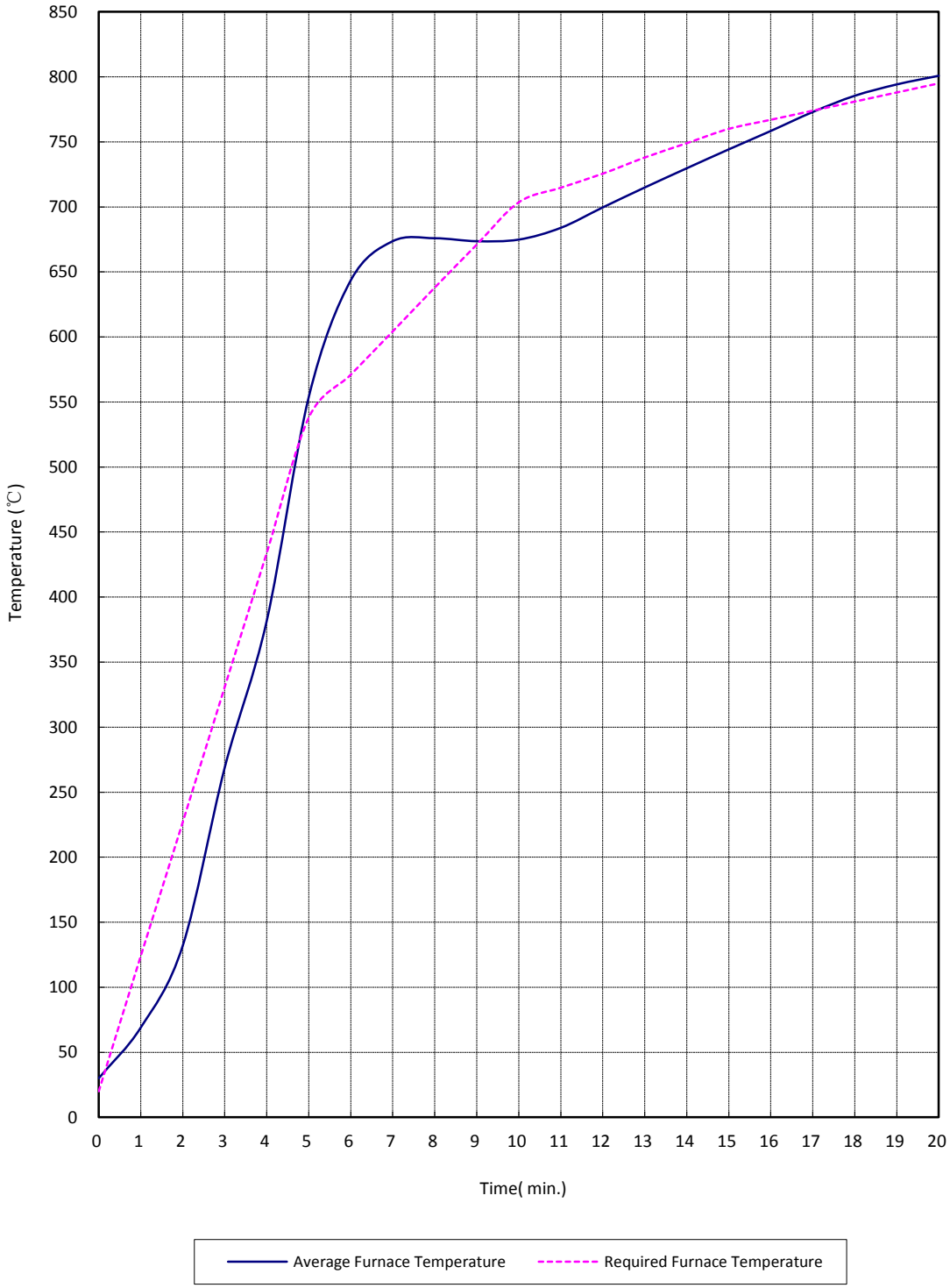
Temperature Data:

Mean furnace temperature together with temperature-time relationship specified in the standard

Time Mins	Specified Furnace Temperature (°C)	Furnace Mean Temperature (°C)
0	20	30
1	124	69
2	227	132
3	331	269
4	434	382
5	538	554
6	571	644
7	604	674
8	638	676
9	671	674
10	704	675
11	715	684
12	726	700
13	738	715
14	749	730
15	760	744
16	767	758
17	774	773
18	781	785
19	788	794
20	795	801

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	33	33	33	33	32	32
1	33	33	33	33	32	32
2	33	33	33	33	32	32
3	33	34	34	33	32	32
4	33	34	34	33	32	32
5	33	34	34	33	32	32
6	33	34	34	33	32	32
7	33	34	34	33	32	32
8	34	34	34	33	33	32
9	46	36	35	35	34	33
10	104	56	35	64	47	33
11	166	112	37	142	99	35
12	243	179	44	/	/	42
13	/	/	58	/	/	59
14	/	/	83	/	/	96
15	/	/	118	/	/	125
16	/	/	/	/	/	/
17	/	/	/	/	/	/
18	/	/	/	/	/	/
19	/	/	/	/	/	/
20	/	/	/	/	/	/

Note: Due to the burned-out of PU core after 12 minutes, the unexposed temperature increase very faster causing unexposed thermocouples drop off from the door leaf.

Thermocouple Pads for T4 - T6 complies with the requirements of NFPA 252.
Thermocouple Pads for T1 - T3 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)
Initial	< 12.7
10	< 12.7
20	< 12.7

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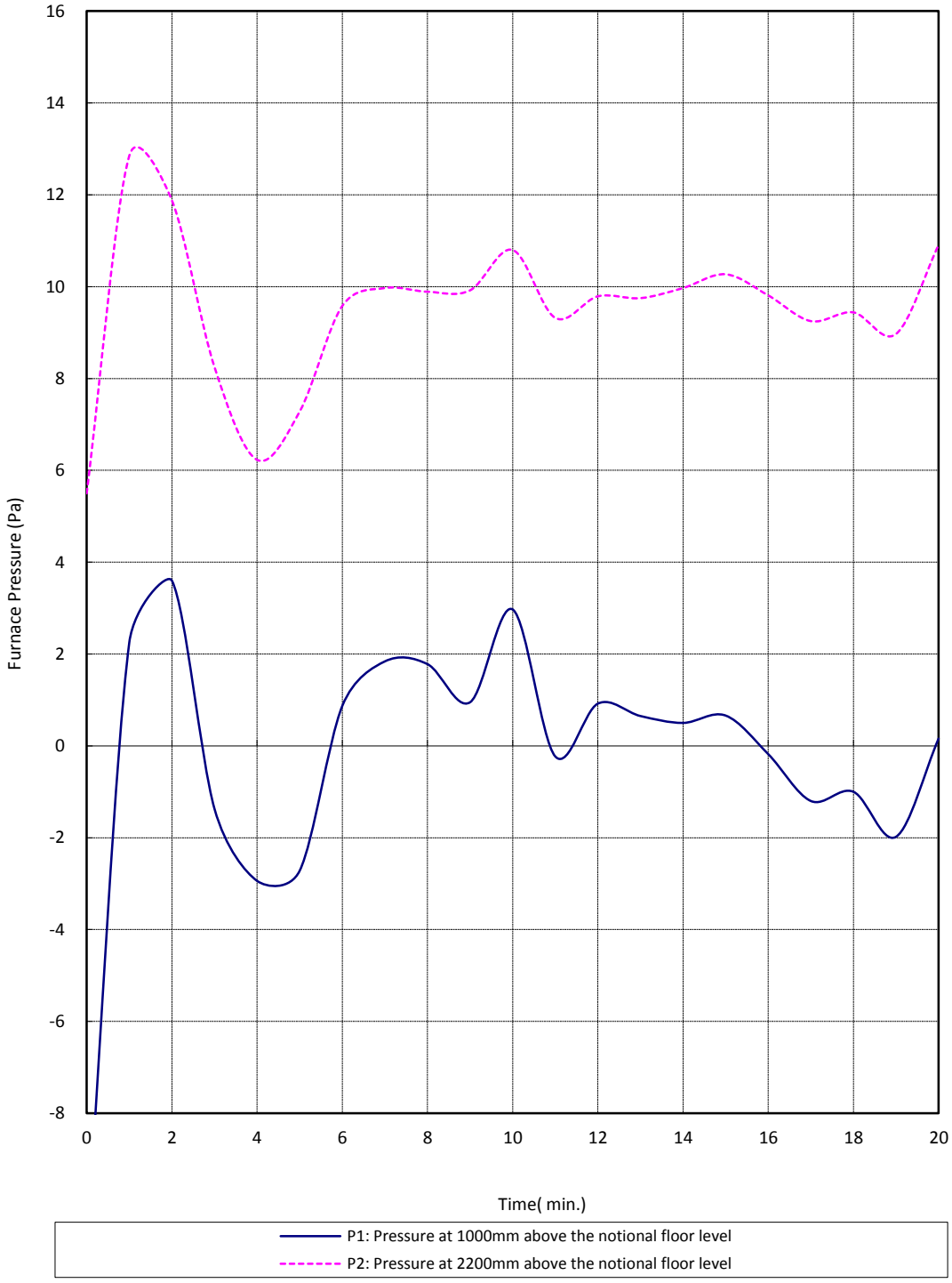
Furnace pressure



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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

Fig. 3 Unexposed Side after 10 Minutes

Fig. 4 Unexposed Side after 16 Minutes

Fig. 5 Unexposed Side after 20 Minutes

Fig. 6 Exposed Side after 20 Minutes

SECTION 12

REVISION LOG

REVISION #	DATE	PAGES	REVISION
0	06/13/18	N/A	Original Report Issue
1	07/13/18	4&9	Revised the density of PVC lipping and PVC frame