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HEZE MAOSHENG WOOD PRODUCTS CO., LTD.

TEST REPORT

SCOPE OF WORK
EN 1634-1:2014+A1:2018 TESTING ON SINGLE LEAF TIMBER DOOR WITH PARTICLE BOARD CORE, MODEL OF MS-001A

REPORT NUMBER
190920007SHF-001

TEST DATE
2019-11-11

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2019-11-27

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26

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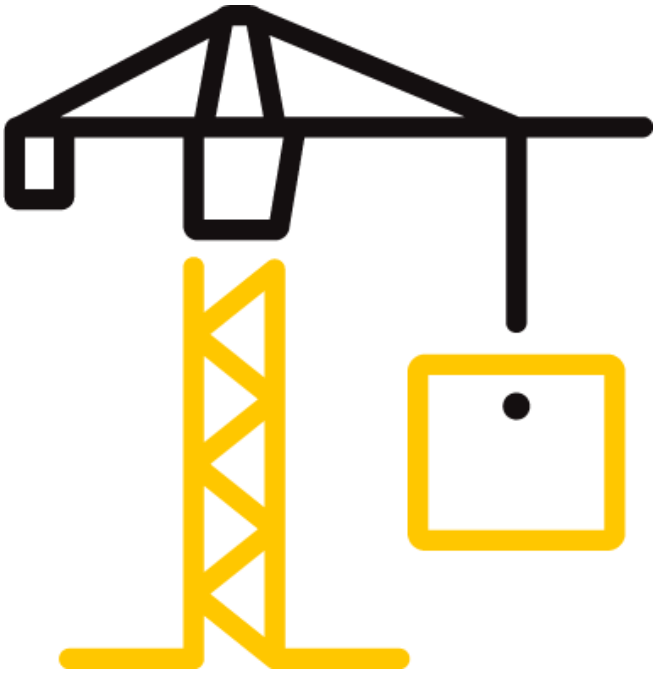

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REPORT ISSUED TO

HEZE MAOSHENG WOOD PRODUCTS CO., LTD.
ZHUANGZHAI INDUSTRY ZONE, HEZE CITY
SHANDONG PROVINCE, CHINA

SECTION 1

SCOPE

Intertek has conducted an evaluation for HEZE MAOSHENG WOOD PRODUCTS CO., LTD. to determine the fire resistance characteristics of single leaf timber door with particle board core, model of MS-001A. This evaluation began on September 20, 2019 and was completed on November 22, 2019. The test was conducted on November 11, 2019.

The test was conducted in accordance with EN 1634-1:2014+A1:2018, Fire resistance and smoke control tests for door and shutter assemblies, openable windows and elements of building hardware – Part 1: Fire resistance test for door and shutter assemblies and openable windows.

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

For INTERTEK B&C:

COMPLETED BY:	Ivy Qiu	**REVIEWED BY:**	Jason Xu
TITLE:	Project Engineer – Building & Construction	**TITLE:**	Project Engineer – Building & Construction
SIGNATURE:		**SIGNATURE:**	
DATE:	2019-11-27	**DATE:**	2019-11-27

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SECTION 2
SUMMARY OF TEST RESULTS

Product Name: Single leaf timber door with particle board core
Series/Model: MS-001A

The test assemblies satisfied the performance requirements for the following periods:

PERFORMANCE CRITERIA	RESULTS	
Integrity	Sustained flaming	36 minutes
	Gap gauge	36 minutes
	Cotton pad	36 minutes
Insulation		36 minutes

The test was discontinued after a period of 36 minutes at the request of the sponsor.

SECTION 3
TEST METHODS

The specimens were evaluated in accordance with the following:

EN 1634-1:2014+A1:2018, *Fire resistance and smoke control tests for door and shutter assemblies, openable windows and elements of building hardware – Part 1: Fire resistance test for door and shutter assemblies and openable windows*

EN 1363-1:2012, *Fire resistance tests – Part 1: General Requirements*

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SECTION 4
MATERIAL SOURCE/INSTALLATION

The specimens were randomly selected by Intertek B&C personnel Luke Lv at HEZE MAOSHENG WOOD PRODUCTS CO., LTD., located at ZHUANGZHAI INDUSTRY ZONE, HEZE CITY, SHANDONG PROVINCE, CHINA. The particle board core was witnessed during production and signed prior to shipment from September 23, 2019 to September 24, 2019. The doorsets were witnessed during production and signed prior to shipment from October 25, 2019 to October 26, 2019. The specimens were received at the Evaluation Center on November 01, 2019.

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 Swing Timber Door
	Nominal size	1105mm wide by 2260mm high by 44mm thick
	Core	44mm thick particle board, density of 600~620kg/m^3
	Lipping	4mm thick Sapelli solid wood, density of 685~705kg/m^3
Frame	Nominal size	1198mm wide by 2305mm high by 130mm deep
	Material	Sapelli solid wood, density of 685~705kg/m^3
CE Certified Hardware	Hinge	Type: 2BB butt hinge; Model: DDSS001-4×3×3.0mm-SUS201; Quantity: 4
	Lock	Type: Mortise lock, Model: GBS31F SH6072; Backset: 60mm; Latch throw: 12mm; Latch bolt: Engaged; Dead bolt: Disengaged;
	Door closer	Model: D3023BW; Installation: Surface mounted standard installation with adjustable Power Size 3 on pull side of doorset.
Intumescent seal		Model: YZ2504; Size: 25×4mm; Location: One strip mortise mounted around frame One strip mortise mounted around door leaf edge

The sample ID number assigned by the test lab is S190920007SHF.001.

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The drawings of the single leaf timber door with particle board core, hardware and test wall construction can be found in Section 6, 7 and 8 respectively.

A comprehensive description of single leaf timber door with particle board core, model of MS-001A are maintained on Intertek file.

The test assembly was installed in a steel restraint frame. The test assembly was built into a concrete masonry unit partition, with fully mortared joints. The test assembly was to be moved in front of the furnace for the fire exposure. Prior to the commencement of the EN 1634-1 fire test, the specimen to be test was checked for operability in the fire test frame by operating from fully closed to fully open, for 25 cycles. The test measurement data was shown in Section 9.

The test door was mounted so as to open into the furnace chamber.

The nominal dimension of the test wall was 3 m high by 3 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 approximately 500 mm above notional floor level. Periodic observations were made of the surfaces of the test assembly during the fire resistance test.

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

SECTION 5
TEST RESULTS

Integrity

The test assembly withstood the fire resistance test without passage of flame or gases hot enough to ignite cotton waste for 36 minutes. No through openings or penetrations were evident at this 36 minutes fire exposure portion of the test and the window bolt remained engaged to the strike. During this 36 minutes fire exposure period no significant flaming was observed on the unexposed face of the assembly.

After exposed to the fire for a period of 36 minutes, sustained flame was observed at the handle and cylinder position of doorset. The integrity failure was deemed to occur.

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This assembly therefore met the criteria of the test standards for integrity performance of 36 minutes.

Insulation

Transmission of heat through the assembly during the fire resistance test of 36 minutes did not raise the average temperature on the unexposed surface by more than 140°C above its initial value, and did not raise the maximum temperature on the unexposed surface by more than 180°C above the initial mean unexposed face temperature. In addition, the transmission of heat through the assembly did not raise the maximum temperature of the unexposed surface of the frame by more than 360°C for 36 minutes.

The Performance criteria “insulation” shall automatically be assumed not to be satisfied when the “integrity” criterion ceases to be satisfied.

This assembly therefore met the criteria of the test standards for insulation performance of 36 minutes.

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

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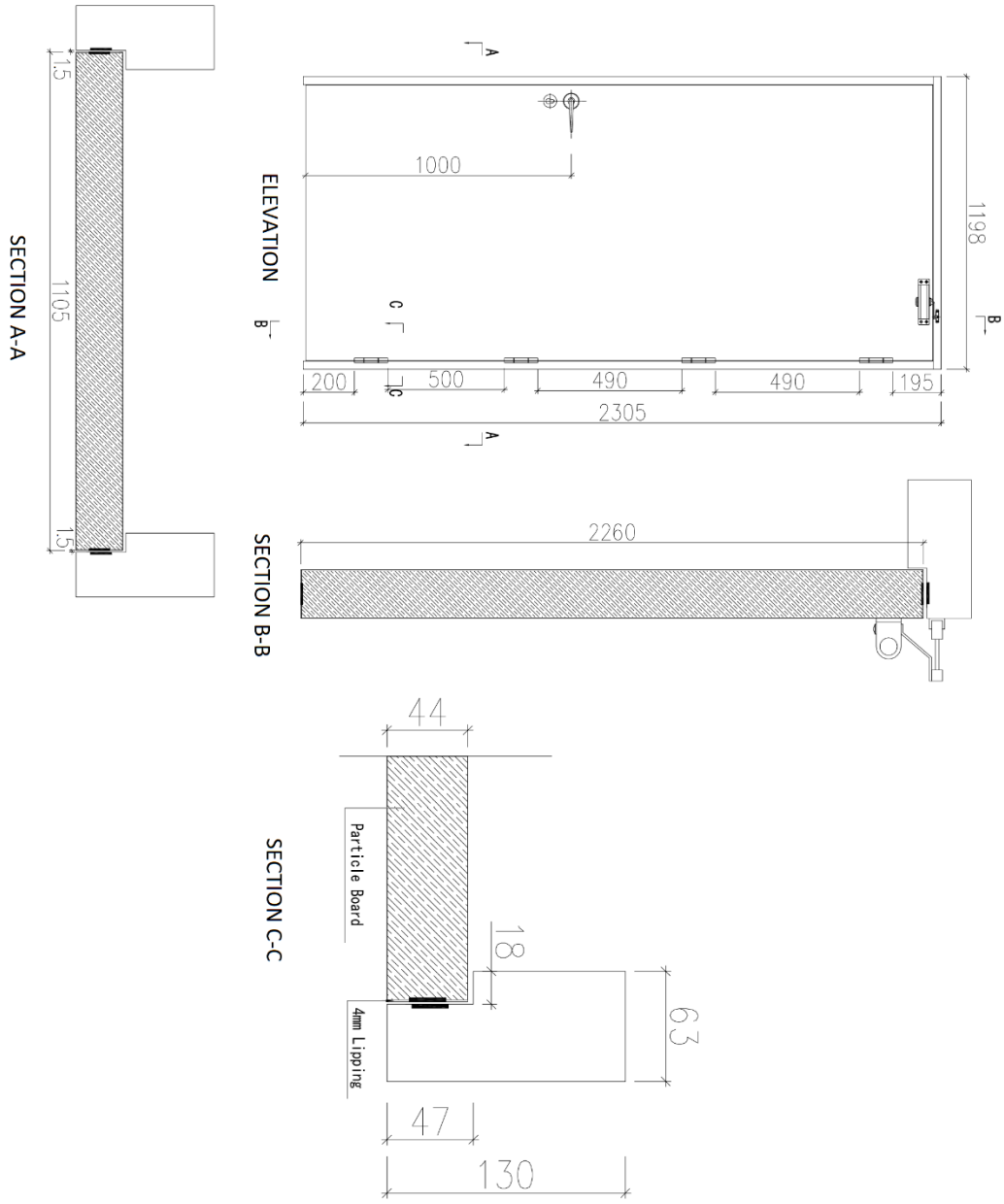
SECTION 6

FIRE DOOR ASSEMBLY DRAWING



Assembly Drawing of single leaf timber door with particle board core, model of MS-001A

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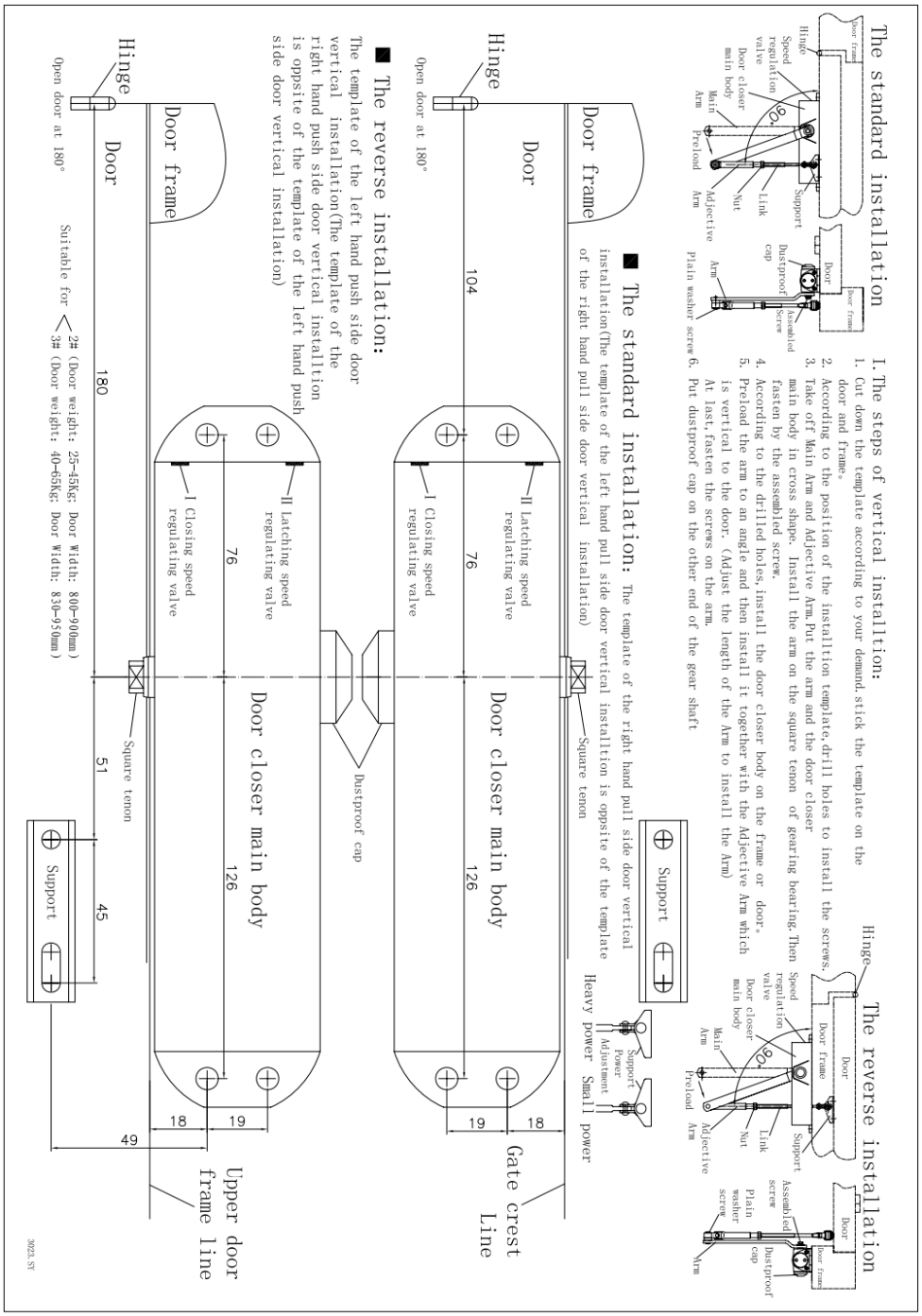
SECTION 7
HARDWARE DRAWING



Installation instruction of door closer, model of D3023BW

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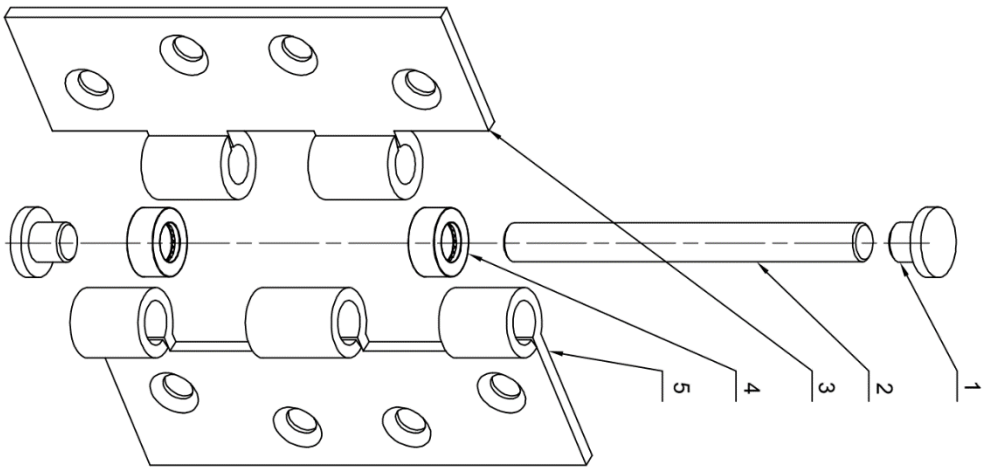

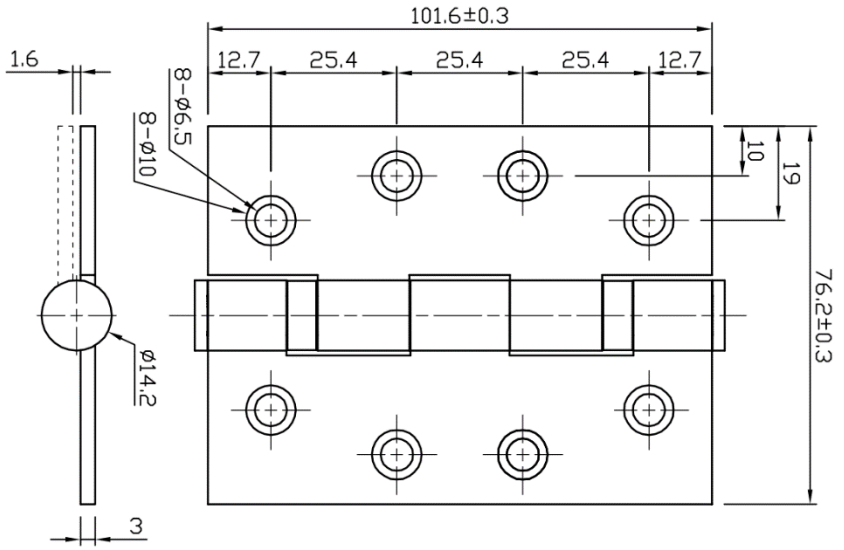

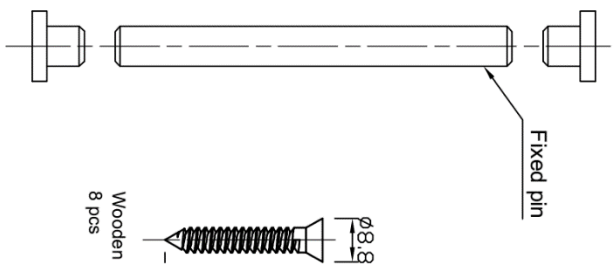

1	Flat tip	Ø14.2	SUS201	
2	Fixed pin	Ø8	SUS201	
3	Leaf 1	101.6x3	SUS201	
4	Ball bearing	Ø14.2x6.05	SUS201	
5	Leaf 2	101.6x3	SUS201	
6	Wooden screw	10#x31.75	SUS201	

Assembly drawing of Hinge, model of DDSS001-4×3×3.0mm-SUS201

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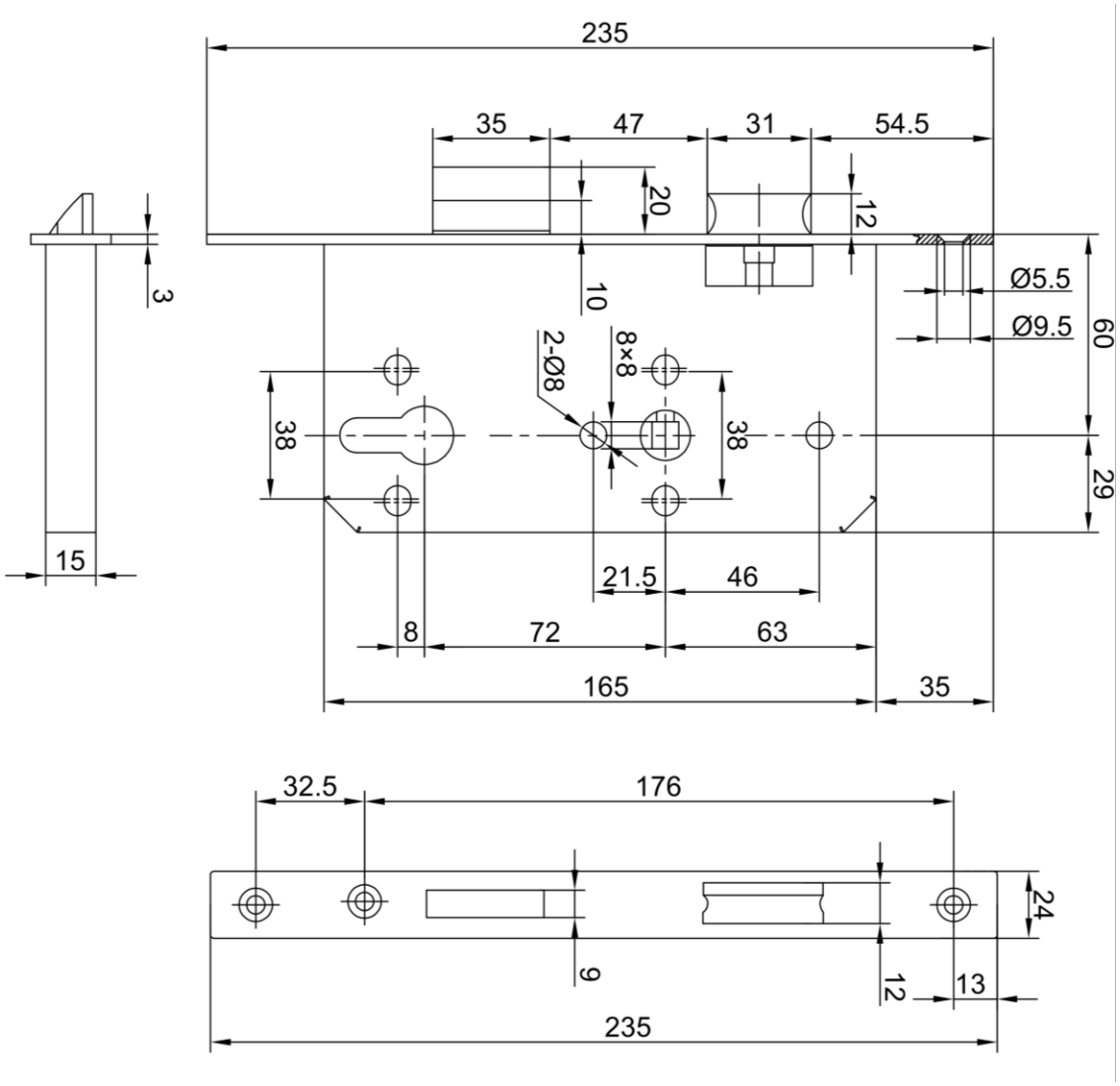

Dimension Drawing of Lock, model of GBS31F SH6072

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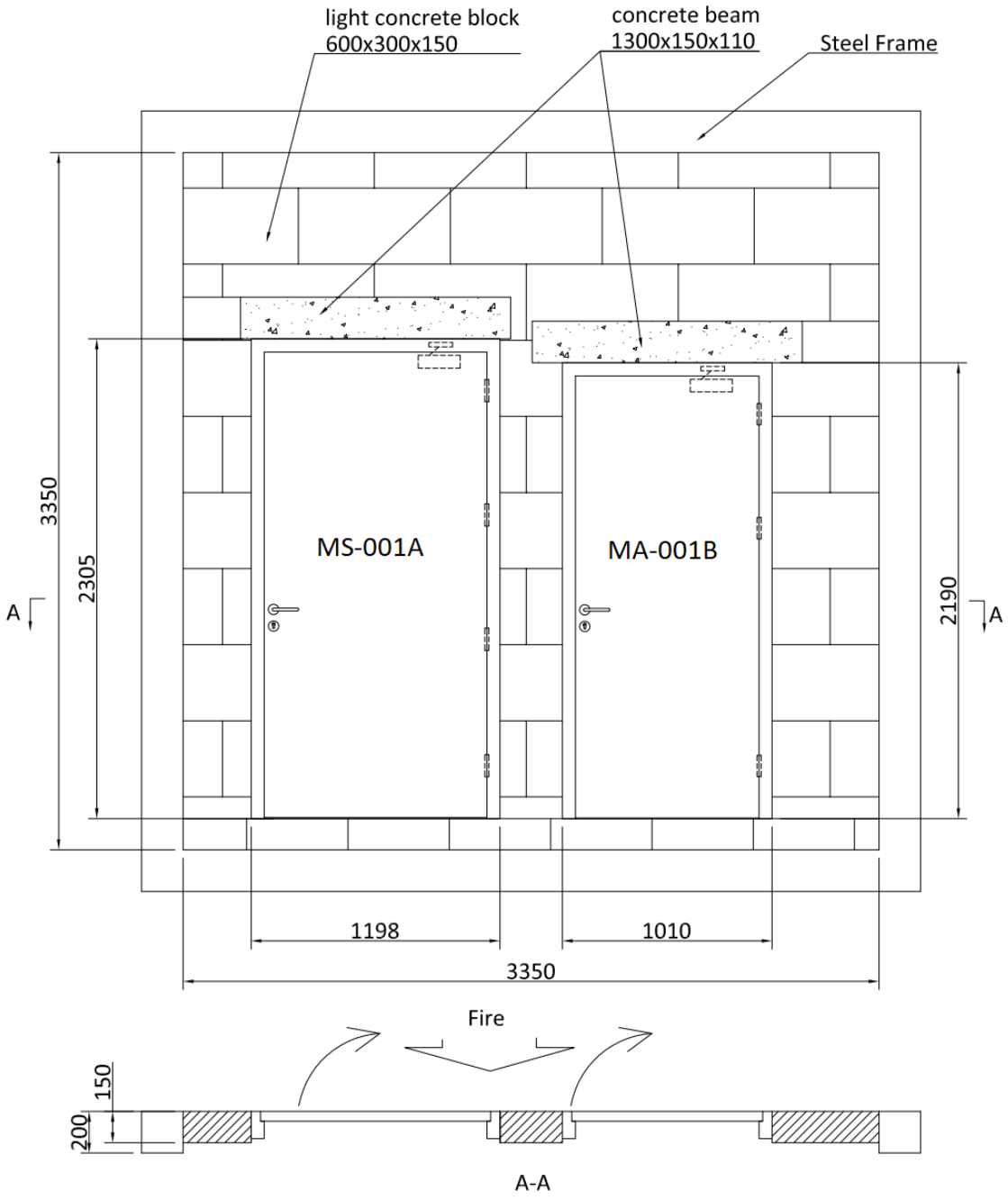
SECTION 8

TEST WALL CONSTRUCTION



UNEXPOSED SIDE

NOTE: TESTED DOOR MS-001A IS FOR THIS REPORT.

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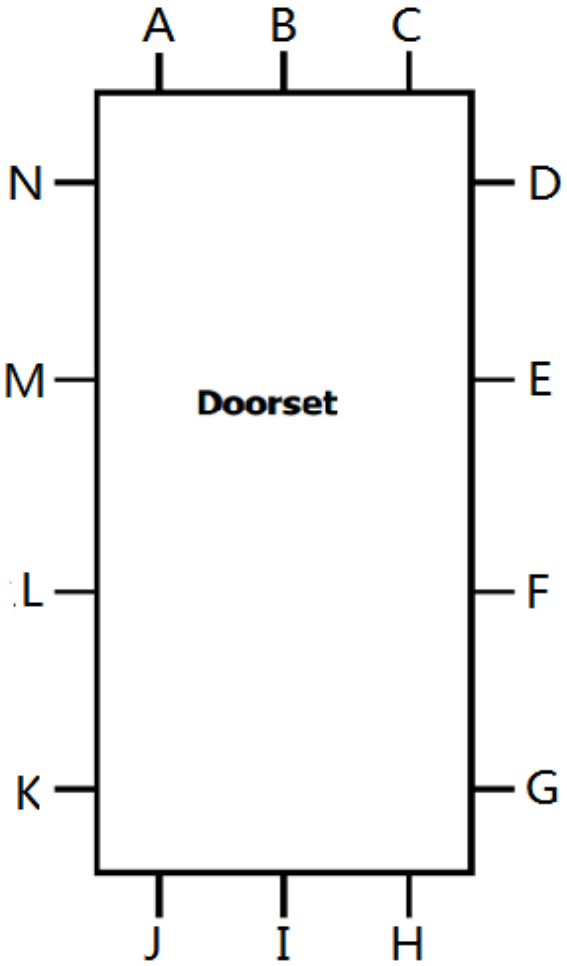
SECTION 9

TEST MEASUREMENT DATA



EXPOSED SIDE

Clearance dimension in mm at each position - the out-swing window													
A	B	C	D	E	F	G	H	I	J	K	L	M	N
1.1	1.6	1.2	1.6	1.8	1.2	0.6	4.0	2.8	5.2	1.1	0.6	1.4	2.1

DO NOT SCALE

DOOR ASSEMBLY INITIAL CLEARANCES

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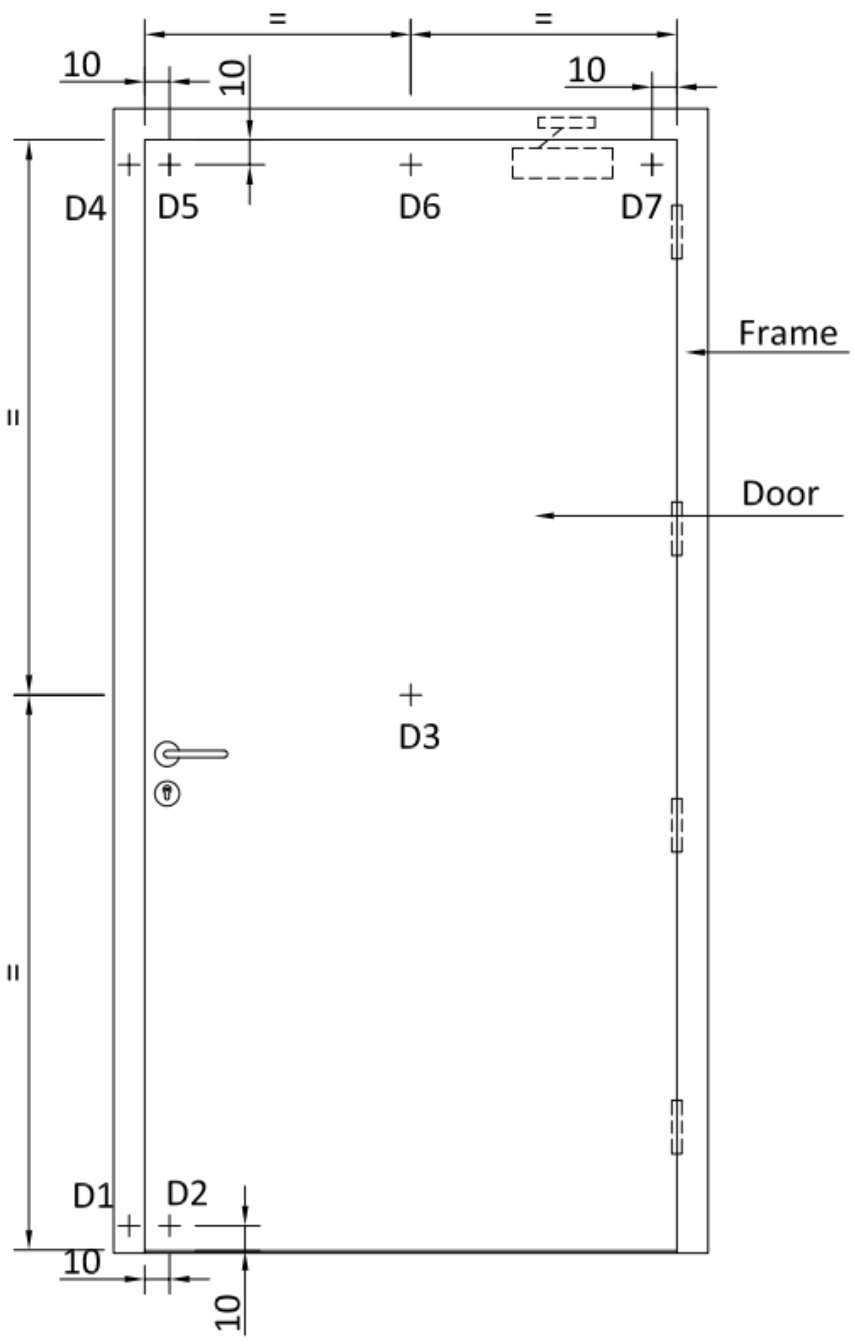

UNEXPOSED SIDE

POSITON FOR MEASUREMENT OF HORIZONTAL DEFLECTION

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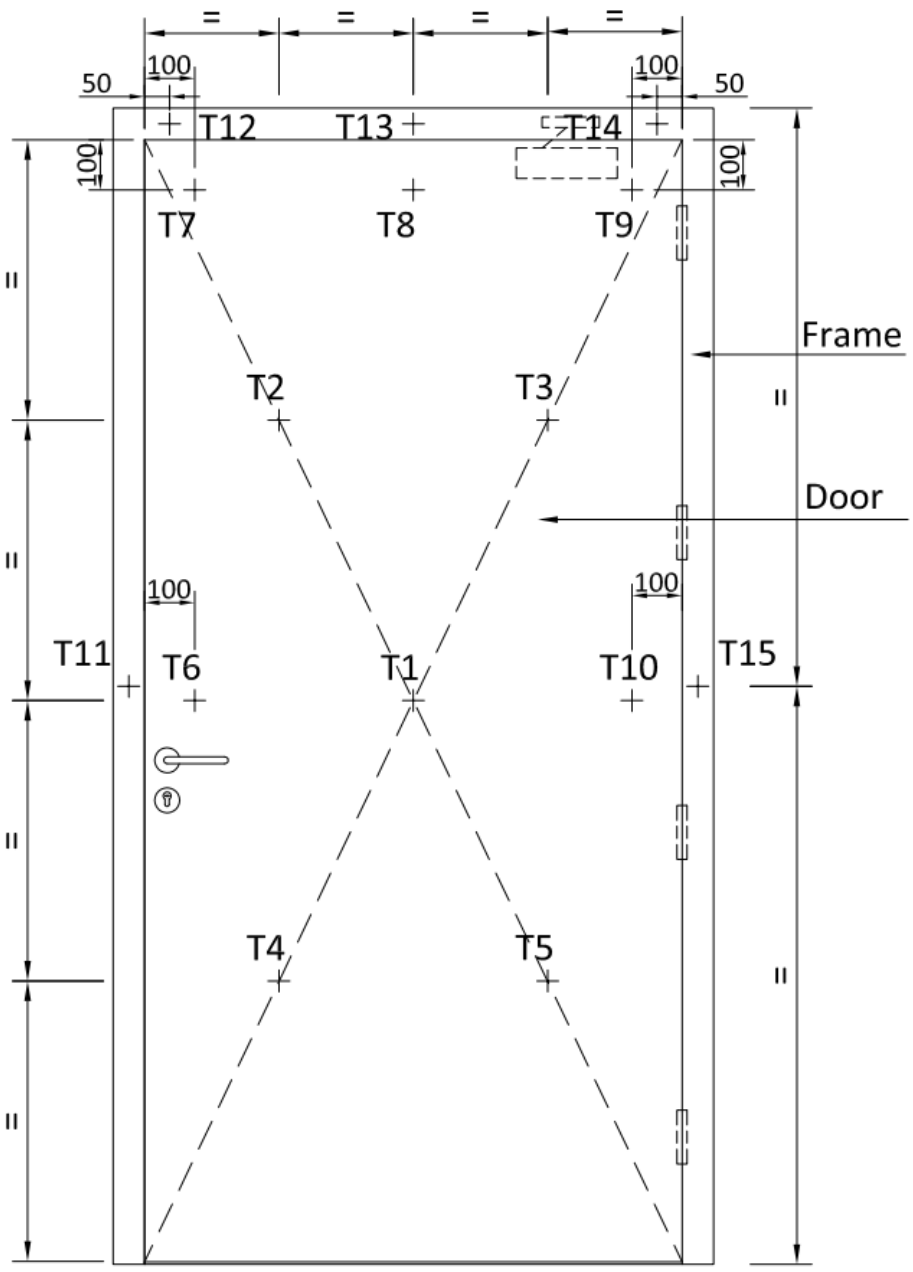

UNEXPOSED SIDE

POSITON FOR MEASUREMENT OF UNEXPOSED TEMPERATURE

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SECTION 10
TEST DATA

Standards: EN 1634-1:2014+A1:2018, Fire resistance and smoke control tests for door and shutter assemblies, openable windows and elements of building hardware – Part 1: Fire resistance test for door and shutter assemblies and openable windows

Procedure: Part 1: Fire resistance test for door and shutter assemblies and openable windows

Conditioning: According to EN1363-1, Section 8

Equipment:

ITEM	ID
Vertical furnace	SH1097
Furnace pressure gauge	SH1097-15
Test Clock	SH1042
Furnace thermocouple	SH1097-4~6
Ambient temperature gauge	SH1097-11
Unexposed thermocouple	SH1097-12~14
Clearance Measurements	SH1057-1
Displacement Measurements	SH1163

Heating Conditions: According to EN 1363-1, Section 5.1
Pressure Conditions: According to EN1363-1, Section 5.2
Ambient Conditions: 10~40°C according to EN 1363-1, Section 5.6
Test Specimen: According to EN 1634-1, Section 6
Installation of test specimen: According to EN 1634-1, Section 7
Furnace Thermocouples: According to EN 1634-1, Section 9.1.1
Unexposed Face Thermocouples: According to EN 1634-1, Section 9.1.2
Thermocouple Pads: Length and width 30 mm, thickness 2.0 ± 0.5 mm, dry density 900 ± 90 kg/m^2
Pressure Measurements: According to EN 1634-1, Section 9.2
Deflection Measurements: According to EN 1634-1, Section 9.3
Pre-test Examination: According to EN 1634-1, Section 10.1
Test Procedure: According to EN 1634-1, Section 10.2

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Test Observations:

Time		All observations are from the unexposed face unless noted otherwise.
Mins	**Secs**	
00	00	Test started.
01	30	Smoke issued from all edges of doorset.
10	01	Smoke issued from the handle and cylinder position of doorset.
24	10	Discoloration was observed at the handle and cylinder position of doorset.
28	35	A cotton pad was applied on the cylinder position of door, and the pad was not ignited.
34	53	Intermittent flame was observed at the handle and cylinder position of doorset and lasted for less than 10 seconds.
36	04	Sustained flame was observed at the handle and cylinder position of doorset. The integrity failure was deemed to occur.
36	32	Test was discontinued at the request of the client.

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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)	Time Mins	Specified Furnace Temperature (°C)	Furnace Mean Temperature (°C)
0	20	22	19	774	801
1	349	105	20	781	806
2	445	286	21	789	815
3	502	490	22	796	823
4	544	563	23	802	830
5	576	617	24	809	837
6	603	652	25	815	843
7	626	679	26	820	850
8	645	702	27	826	856
9	663	720	28	832	861
10	678	733	29	837	868
11	693	746	30	842	873
12	705	760	31	847	879
13	717	768	32	851	884
14	728	766	33	856	889
15	739	773	34	860	895
16	748	779	35	865	903
17	757	785	36	869	907
18	766	793	/	/	/

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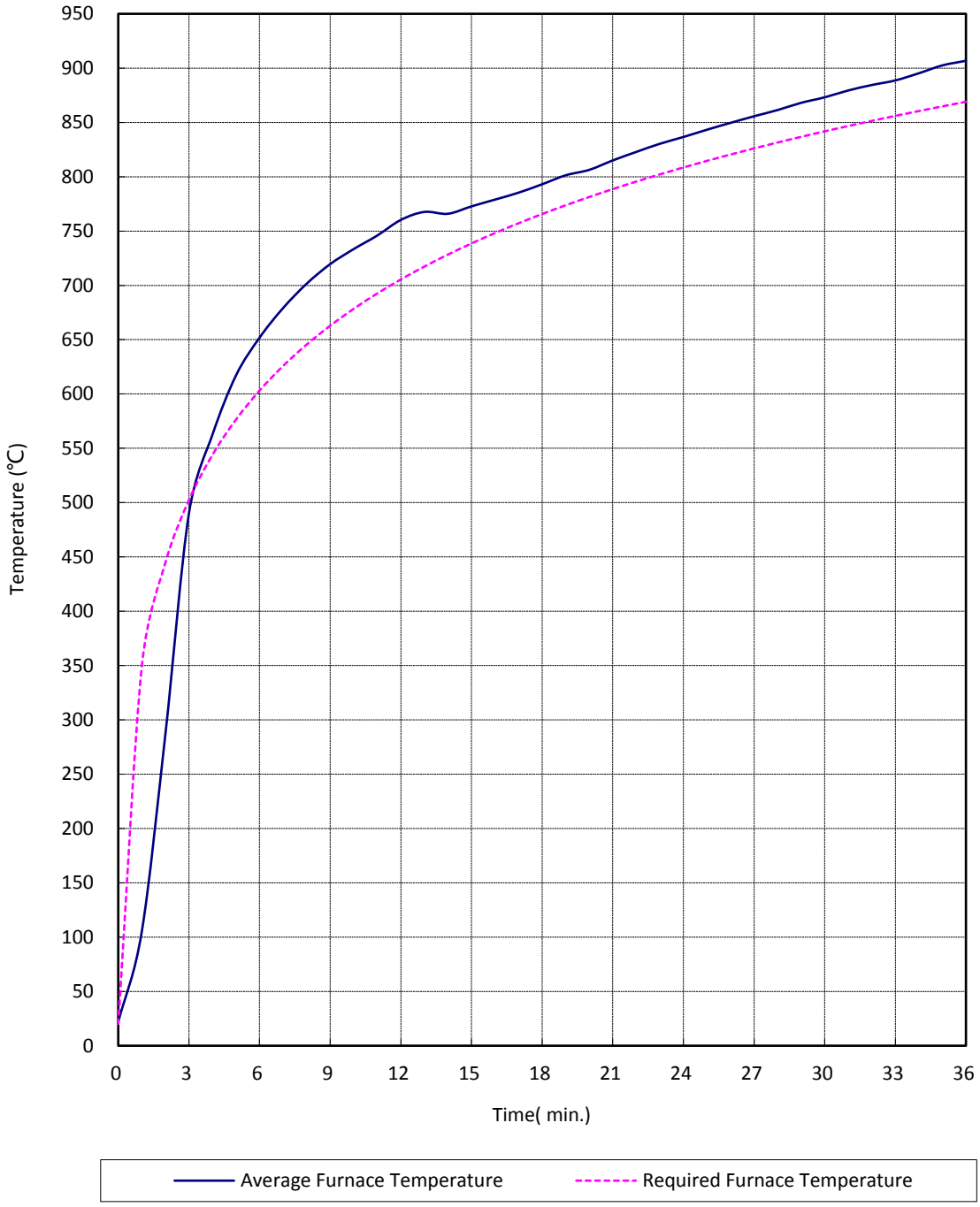
Graph for mean furnace temperature and temperature-time curve specified in the standard



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Unexposed surface temperatures

Time Mins	T1 (°C)	T2 (°C)	T3 (°C)	T4 (°C)	T5 (°C)	Mean Temperature (°C)
0	21	20	20	20	20	20
3	22	20	20	20	20	21
6	22	21	21	20	20	21
9	25	26	23	28	24	25
11	29	33	27	37	32	32
12	32	37	29	41	36	35
13	35	40	32	44	39	38
15	39	45	36	49	45	43
18	45	51	43	54	52	49
21	51	56	50	57	58	54
24	56	61	56	59	62	59
27	61	65	61	63	65	63
30	65	68	65	64	68	66
33	69	72	69	67	71	70
36	72	75	72	70	74	73

Time Mins	T6 (°C)	T7 (°C)	T8 (°C)	T9 (°C)	T10 (°C)	T11 (°C)	T12 (°C)	T13 (°C)	T14 (°C)	T15 (°C)
0	20	20	20	21	20	19	19	19	19	19
3	20	20	21	22	20	19	19	20	19	19
6	20	21	22	23	20	19	19	21	20	19
9	28	28	26	25	26	19	19	21	20	19
12	41	40	35	31	37	19	20	21	20	19
15	51	49	44	39	45	19	20	21	21	19
18	59	55	50	46	51	19	21	21	21	19
21	65	60	57	53	56	19	22	22	22	19
24	68	63	60	59	60	19	23	22	22	20
27	71	67	64	63	62	19	24	23	23	20
30	73	69	67	68	65	19	25	24	23	20
33	75	72	72	72	68	20	26	24	25	20
36	78	75	75	75	71	20	29	25	26	20

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Horizontal Deflection (Positive values indicate movement into the furnace)

Time Mins	D1 (mm)	D2 (mm)	D3 (mm)	D4 (mm)	D5 (mm)	D6 (mm)	D7 (mm)
0	0	0	0	0	0	0	0
10	0	-4	6	0	0	4	0
20	0	-3	3	0	0	4	1

Door Closer Closing Force

Closing Force		
Highest gauge reading	Distance	Moment
(N)	(m)	(N.m)
42.6	1.01	40.7
39.5	1.01	
38.7	1.01	

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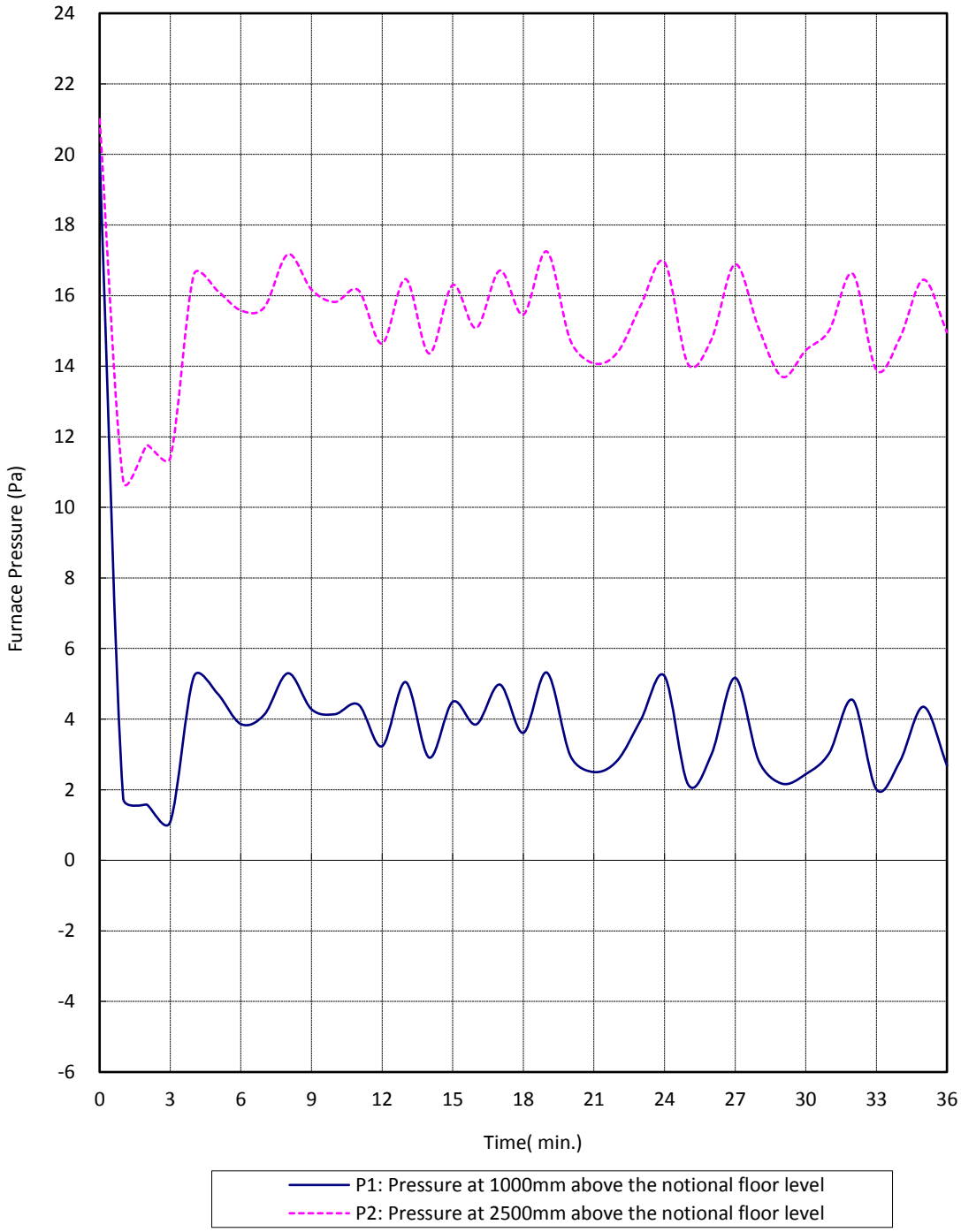
Furnace pressure



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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

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Fig. 3 Unexposed Side after 10 Minutes

Fig. 4 Unexposed Side after 28 Minutes

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Fig. 5 Unexposed Side after 30 Minutes

Fig. 6 Unexposed Side after 34 Minutes

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Fig. 7 Unexposed Side after 36 Minutes

Fig. 8 Exposed Side after 36 Minutes

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SECTION 12
REVISION LOG

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0	2019-11-27	N/A	Original Report Issue