TÜRK STANDARDLARI ENSTİTÜSÜ
DENEY ve KALİBRASYON
MERKEZİ BAŞKANLIĞI
YAPI MALZEMELERİ YANGIN VE AKUSTİK
LABORATUVAR MÜDÜRLÜĞÜ

TURKISH STANDARDS INSTITUTION
HEADSHIP OF TEST and CALIBRATION CENTER
CONSTRUCTION MATERIALS FIRE AND ACOUSTICS LABORATORY

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Test
TS EN ISO/IEC 17025
AB-0001-T

AB-0001-T

558828

02-26

MUAYENE VE DENEY RAPORU

TEST REPORT

Deneyi Talep Eden/Firma : ***(Adı, Adresi, Şehir vb.)*** *Requesting/Customer (Name, Adress, City etc.)*	YELKEN KALIP PENCERE-KAPI AKS.VE METAL SAN.TİC.A.Ş. BATTALGAZİ MAH. AHMET HAŞİM CAD. NO:27 /1 ESENYURT
Deney Talep Tarih / No : *Order Date/No.*	2.10.2025 / 2025-315362
Numunenin Tanımı : ***(Cins, Marka, Sınıf, Tip, Tür, Model vb.)*** *Sample Description (Type,Mark,Class,Model etc.)*	2025-366570, Double leaves fire door, -, -, -, -, -, 1.00, adet
Numune Kabul Tarihi : *Sample Receipt Date*	21.10.2025
Deneylerin Yapıldığı Tarih : *Date of Test*	02.01.2026 / 09.02.2026
Uygulanan Standart Metot : *Applied Standard/Method*	TS EN 1634-1+A1/TS EN 1634-1+A1 Kapı ve kepenk takımları, bina hırdavatının açılabilir pencereleri ve elemanları için yangına dayanıklılık ve duman kontrol deneyleri - Bölüm 1: Kapı ve kepenk takımları ve açılabilir pencereler için yangına dayanıklılık deneyi
Raporun Sayfa Sayısı : *Number of pages of the report*	37
Deney Sonucu : *Test Result*	-
Açıklamalar : *Remarks*	TS EN 1634-1+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

Yukarıda tanımlanan numune için laboratuvarımızda yapılan muayene ve deneylerden elde edilen sonuçlar müteakip sayfalarda verilmiştir.
The testing and /or measurement results are given on the following pages which are part of this report.

Deney laboratuvarları olarak faaliyet gösteren TSE Deney ve Kalibrasyon Merkezi Başkanlığı Deney Laboratuvarları TÜRKAK'tan AB-0001-T ile TS EN ISO/IEC 17025:2017 standardına göre akredite edilmiştir.
TSE Headship of Test and Calibration Center Testing Laboratories accredited by TÜRKAK under registration number AB-0001-T for TS EN ISO/IEC 17025:2017 as test laboratory.
TÜRKAK deney raporlarının tanımırlığı konusunda Avrupa Akreditasyon Birliği (EA) ile Çok Taraflı Anlaşma ve Uluslararası Laboratuvar Akreditasyon Birliği(ILAC) ile karşılıklı tanıma anlaşması imzalamıştır.
TURKAK is a signatory to the European co-operation for Accreditation (EA) Multilateral Agreement (MLA) and to the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangement (MRA) for the recognition of test reports.
Deney ve/veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metodları bu raporun tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.
The test and/or measurement results, the uncertainties (if applicable) with confidence probability and test methods are given on the following pages which are part of this report.

Tarih *Date*	**Deney Sorumlusu** *Person in charge of test*	**Kontrol Eden** *Reviewer*	**Onaylayan** *Approved by*
09.02.2026	HALİL SAYIM	AHMET BUMİN BAYRAM	SENCER GÜVEN

MUAYENE - DENEY SONUÇLARI *TEST RESULTS*

SUMMARY

ORDER/SPECIMEN NO	2025-315362/2025-366570
SPONSOR	YELKEN KALIP PENCERE-KAPI AKS.VE METAL SAN.TİC.A.Ş. BATTALGAZİ MAH. AHMET HAŞİM CAD. NO:27 /1 ESENYURT
PURPOSE	Determination of fire resistance performance of "Single acting (opening away from the furnace) double leaves metal door set with metal frame test sample" in accordance with TS EN 1634-1+A1:2018 , as specified below.
TESTING LABORATORY	TSE Building Materials Fire and Acoustics Laboratory Aydınlı Mah. Ulus Sok. No:7/1 Tuzla/İSTANBUL

TEST SPECIMEN DEFINITION

General:

Single acting (opening away from the furnace) double leaves metal door set with metal frame test sample with " description sponsored by "YELKEN KALIP PENCERE-KAPI AKS.VE METAL SAN.TİC.A.Ş." was tested at 02 January 2026 at TSE Construction Materials Fire and Acoustics Laboratory according to TS EN 1634-1+A1:2018.

Application:

Single acting (opening away from the furnace) double leaves metal door set with metal frame test sample with " description sponsored by "YELKEN KALIP PENCERE-KAPI AKS.VE METAL SAN.TİC.A.Ş." mounted in a low density masonry supporting construction which was builded by the sponsor with masonry mortar. Technical drawings of test sample are given in Article 7.

Note: The sample was tested opening away from the furnace.
Note: The door was tested with the door unlocked but latched.

Sampling:

Samples were not independently selected for testing.

Conditioning:

No conditioning was performed.

MUAYENE - DENEY SONUÇLARI *TEST RESULTS*

TEST RESULTS

Performances	Criteria	Time (completed minute)	Failure (minute and second)
INTEGRITY (E)	Sustained flaming	71	71 min 1 sec
	Cracks or openings in excess of Φ6 (150mm)	75	No failure
	Cracks or openings in excess of Φ25	75	No failure
	Ignition of a cotton pad	75	No failure
INSULATION (I_2)	Average temperature, increase of Δ140°C	75	No failure
	Maximum temperature on leaf/leaves, increase of Δ180°C	75	No failure
	Maximum temperature on the frame, increase of Δ360°C	75	No failure
RADIATION (W)	-	No measurement.*	

Test Duration: The test was terminated at 75th minute at the request of the sponsor.
Test date: 02.01.2026
*An element which satisfies the thermal insulation criterion is also deemed to satisfy the Radiation (W) requirement for the same period.

Unexposed face before test

Exposed face before test

1. TEST SPECIMEN

1.1. GENERAL

Test sample was mounted on aerated concrete block wall of which dimensions 4050 height and 4070 mm width and the wall was erected by sponsor.

1.2. MATERIALS AND SUPPORTING CONSTRUCTION

Low density rigid standard supporting construction was used as given in TS EN 1363-1: 2020 Clause 7.2.2.2 for testing.

Aerated concrete blocks were used to construct standard supporting construction in this test. Each block dimensions were 60 cm length, 25 cm height and 20 cm width. Density of each block was measured 450 kg/m³.

1.3. VERIFICATION OF TEST SPECIMEN

Properties such as thickness and density etc. of the materials inside the sample were verified with the sample according to Clause 6.6 of TS EN 1634-1+A1:2018.

Hardwares or accessories on the sample if can not be verified brand-model, dimensions and locations by the laboratory else base on firm declaration and responsibility belongs to the sponsor.

Note:From the unexposed face, the right leaf is called 'passive leaf' and the left leaf is called 'active leaf'.

Leaf;

-Nominal thickness: 83 mm (for both leaves)

-Leaf components (from unexposed side)

Material	Thickness (mm)	Density (kg/m³)
Metal sheet	1,5	-
Stonewool	25	-
Plasterboard(FR Knauf*)	12,5	-
Plasterboard(FR Knauf*)	12,5	-
Stonewool	30	-
Metal sheet	1,5	-

-Total leaf dimensions: 2115 mm x 1770 mm (from the unexposed side)

-Total leaf dimensions: 2100 mm x 1710 mm (from the exposed side)

-Active leaf dimensions: 2115 mm x 915 mm (from the unexposed side)

-Active leaf dimensions: 2100 mm x 865 mm (from the exposed side)

-Passive leaf dimensions: 2115 mm x 880 mm (from the unexposed side)

-Passive leaf dimensions: 2100 mm x 900 mm (from the exposed side)

-Active leaf mass: 108,74 kg

-Passive Leaf mass: 107,5 kg

-Support profiles: On both wings, an omega support profile with a thickness of 1.5 mm is installed at a distance of 200 mm from the wing edge and 275 mm from the hinge edge, in contact with both inner surfaces of the wing. The profile has long sides measuring 58 mm and a short side width of 26 mm, and extends along the full length of the wing (see Figure 7.8)

Frame;

-Frame material: Metal sheet
-Thickness of frame: 2 mm
-Width of frame: 225 mm
-Frame type: Adjustable
-Door height: 2180 mm (from the unexposed side)
-Door width: 1875 mm (from the unexposed side)
-Door height: 2180 mm (from the exposed side)
-Door width: 1875 mm (from the exposed side)
-Frame clear opening (width x height): 1710 mm x 2100 mm
-Architrave material: Metal sheet
-Thickness and width of unexposed face architrave: 15 mm x 60 mm
-Thickness and width of exposed face architrave: 15 mm x 60 mm

Mounting and fixing applications;
Insulation, filling etc.

Application section	Type/Colour	Brand/Name	Code
Gap between door frame and wall.	Ceramic wool	Technotherm*	-
Under the unexposed face architraves	Ceramic wool	Technotherm*	-
Under the unexposed face architraves	Acrylic mastic	Pyroplex	-
Joint gap between the exposed face architrave	Mortar	-	-

Fixing multipart frame components to one another;

Application section	Type/Quantity	Diameter (Φ) (mm)	Length (u) (mm)
Right jamb of frame	Metal fixing screw (4 pieces)	5	80
Left jamb of frame	Metal fixing screw (4 pieces)	5	80

Hardware;

Type	Brand/Name	Code	Quantity
Door closer	Assa abloy	-	2 pieces
Lock cylinder	İTO	P220-Tek Kanat panik kiliti*	1 adet pieces
Door handle	İTO	-	1 piece
Drop seal	Assa abloy	-	2 pieces
Panic bar	İTO	P240-Çift kanat dik kilitlemeli panik bar	1 piece
Hinges	Köseoğlu	Binili tip sac kanat menteşesi*	6 pieces

Hinges diameter and length: 16 mm x 100 mm (Φ,u).
Distance from top of leaf to top edge of top hinge: 210 mm
Distance from bottom of leaf to bottom edge of middle hinge: 1505 mm
Distance from bottom of leaf to bottom edge of bottom hinge: 235 mm
-Distance from the panic bar latch to the bottom of the leaf: 1005 mm

Seals (intumescent, fire etc.)

Application section	Type	Rows	Brand/Code	Dimension (mm)
Frame head	Intumescent strip,black	1	Marvon*/-	1,5x20
Frame side jambs	Intumescent strip,black	2	Marvon*/-	1,5x20
Leading edge of the active leaf	Intumescent strip,black	1	Marvon*/-	1,5x20
Leading edge of the passive leaf	Intumescent strip,black	1	Marvon*/-	1,5x20

Seals (smoke, acoustic etc.)

Application section	Type	Rows	Brand/Code	Dimension (mm)
Frame head	Smoke seal	1	Erjoy plastik*/PVC*	-
Frame side jambs	Smoke seal	1	Erjoy plastik*/PVC*	-

*: Given characteristics were customer declarations. No measurements and/or verification carried out by the laboratory about these characteristics.

Gap Measurement

Gap measurements conducted according to Clause 10.1.2 of TS EN 1634-1+A1:2018

Gap measurement locations and each measured section detail for gaps between the frame and the leaf and between the two leaves in the closed position from unexposed face are given in the Figure 7.1.

The gap measurement values and the maximum allowable gap measurements in application are given in the tables below.

	a	b*	c
1	0,60	4,30	0,10
2	0,30	4,60	0,10
3	0,60	5,50	0,10
4	0,20	4,40	0,10
5	0,60	3,50	0,15
6	2,20	3,00	0,25
7	6,90	6,50	0,80
8	5,50	6,45	0,70
9	2,80	5,70	0,60
10	0,35	7,50	0,05
11	0,40	6,45	0,05
12	0,75	4,90	0,05
13	1,15	6,90	0,75
14	1,25	6,30	0,60
15	2,10	6,30	0,65
16	-	1,00	-
17	-	1,90	-
18	-	5,25	-
19	-	13,20	-
20	-	9,10	-
21	-	5,30	-

Table 1.1. The gap measurement values (mm)

*= Primary gap

Measurement section	No	Mean Value (mm)	Maximum Value (mm)	Maximum Permitted Gap Size (mm)
Right leaf (passive leaf) hinged edge to frame	$b_{1,2,3}$	4,80	5,50	**7,15**
Right leaf (passive leaf) to frame head	$b_{4,5,6}$	3,63	4,40	**6,02**
Left leaf (active leaf) to frame head	$b_{7,8,9}$	6,22	6,50	**8,36**
Left leaf (active leaf) hinged edge to frame	$b_{10,11,12}$	6,28	7,50	**8,89**
Between the two leaves	$b_{13,14,15}$	6,50	6,90	**8,70**
Left (active) leaf bottom edge to sill	$b_{16,17,18}$	2,72	5,25	**5,98**
Right (passive) leaf bottom edge to sill	$b_{19,20,21}$	9,20	13,20	**13,20**

Table 1.2. Permitted gap size in application (mm)

1.4. MOUNTING

Fresh mortar was being prepared with required proportions of water. It was applied to sample gaps of 3-4 mm thickness. The aerated concrete blocks were built by the bricklayer of the company in a staggered manner by applied in real case. The sample was adjusted and mounted in the wall cavity and has been ready for use by making final adjustments.

1.5. CONDITIONING

No conditioning was performed.

1.6. VERIFICATION TESTS BEFORE TESTING

-According to TS EN 1634-1+A1:2018 article 10.1.3 in closed position, force measurement was performed and measured 75 N for active leaf and 85 N for passive leaf.

1.7. THERMOCOUPLE INSTALLATION and DEFLECTION MEASUREMENT

Unexposed face thermocouples and deflection measurement positions are given in the Figure 7.2 and Figure 7.3. The numbering in the figure is the same as the numbering of thermocouples. Time dependent displacement values are given in the table below.

DEFLECTION / TIME (min)	D1	D2	D3	D4	D6	D7	D8	D9	D10	D11
0	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
10	3,90	0,00	-14,01	-2,16	5,68	2,15	0,00	-0,35	24,46	-13,47
20	6,74	0,00	-20,48	-3,23	5,32	-2,15	6,00	-1,06	28,72	-17,02
30	7,81	0,00	-22,63	-3,23	3,19	-3,23	9,00	0,00	34,03	-18,43
40	7,45	-3,00	-25,87	-2,16	5,68	-2,15	6,00	-1,42	35,45	-23,04
50	6,39	-5,00	-23,71	-4,31	0,71	-2,15	8,00	2,84	45,02	-26,23
60	8,16	-5,00	-25,87	-5,39	1,77	-1,08	-15,00	6,03	48,21	-25,17
70	6,03	-4,00	-25,87	-3,23	5,68	-1,08	6,00	4,61	52,11	-22,33

Table 1.3. Deflection measurement values (mm)

Note: Negative values in the table shows deflection away from the furnace.

2. TEST PROCEDURE

General

Single acting (opening away from the furnace) double leaves metal door set with metal frame test sample with " description as specified in the illustrations was sponsored by "YELKEN KALIP PENCERE-KAPI AKS.VE METAL SAN.TİC.A.Ş." was tested at 02 January 2026 at TSE Construction Materials Fire and Acoustics Laboratory according to TS EN 1634-1+A1:2018.

Temperature: 15,3 °C and Humidity: 22,9% RH were measured before the test.Ambient temperature-time graphic is given in the Figure 6.1.

2.1. DEVICES

General

All devices, equipment and apparatus in the test fulfil the conditions according to TS EN 1363-1:2020 and TS EN 1634-1+A1:2018.

Furnace

Vertical furnace of which internal dimensions are 4mx4mx1,3m has 14 thermocouples which were located inside and all measurements were followed via software automatically.

The standard temperature-time curve specified in TS EN 1363-1: 2020 Clause 5.1.1 was used in the test.

Time (min)	Furnace temperature (°C)	Time (min)	Furnace temperature (°C)
0	20	90	1006
5	576	120	1049
10	678	150	1082
15	738	180	1110
20	781	210	1133
30	842	240	1153
45	902	300	1186
60	945	360	1214

Table 2.1. Standard temperature-time curve values

Thermocouples

Thermocouples which were produced from 1000 m batch type roll thermocouples were placed on the unexposed face of the sample. Single component glue was used for mounting thermocouples to the sample.

Insulation and Integrity Criteria

Thermocouples (TC) were used for insulation criteria, cotton pads and gap gauges used for integrity criteria.

Furnace Pressure

Furnace internal pressure is controlled according to TS EN 1363-1: 2020 Clause 5.2. Furnace pressure shall not be more than 20 Pa at the top edge of the sample. Horizantal flat surface (notional floor level) was erected 300 mm above the furnace floor for simulating the continuity of the floor specified by the standard. In order to provide 0,00 Pa pressure at 0,5 m height from notional floor level, furnace pressure in the second pressure sensor (Located at 2,45 m) was adjusted to 14 Pa. Furnace pressure-time graphic is given in the Figure 6.2.

All values are in limit.

Furnace Internal Temperature

Furnace internal temperature values, upper and lower limits specified in TS EN 1363-1: 2020 are given in the Figure 6.3.

After first 10 minutes, no values at any time deviated more than 100°C as described in time temperature curve.

Tolerances

The percentage deviation (d_e) in the area of the curve of the average temperature recorded by the specified furnace thermocouples versus time from the area of the standard temperature/time curve shall be within:

a) for $5 < t \leq 10$, % 15

b) for $10 < t \leq 30$, (15 –((0,5(t–10)) %

c) for $30 < t \leq 60$, (5 - 0,083 (t - 30) %

d) for $t > 60$, 2,5 %

$d_e=(A-As)/As \times 100$

Where ;

d_e is the percentage deviation,

A is the area under the actual furnace temperature/time curve,

As is the area under the standard temperature/time curve,

t is the time in minutes.

Deviation-time graphic is given in the Figure 6.4.

All values after 5 minutes are in limit.

2.2. TEMPERATURE MEASUREMENTS

18 thermocouples were attached to the unexposed surface of the sample with insulating pads, and the first 5 thermocouples (thermocouples between TC1 and TC5) were used to measure the average temperature of the sample surface. In the surface measurement values, the average surface temperature value (initial temperature) calculated from the average temperature measurement thermocouples shall not increase more than 140°C. For any of the leaf/leaves thermocouple temperatures between TC1–TC13 for the maximum temperature value, the maximum increase value shall not be more than 180°C from the initial temperature. Also, for any of the frame thermocouple temperatures between TC14-TC18 for the maximum temperature value, the maximum increase value shall not be more than 360°C from the initial temperature.

The initial temperature value (calculated by taking the average temperature of the thermocouples on the unexposed face before the test) is 16,76 °C.

The time-dependent thermocouple temperatures are given in the Figure 6.5, Figure 6.6 and Figure 6.7.

Note:The thermocouple number 8 fell down from the sample at 24 minutes and 7 seconds, thermocouple numbers 9, fell down from the sample at 57 minutes and 38 seconds, thermocouple number 11 fell down from the sample at 30 minutes and 2 seconds, thermocouple number 12 fell down from the sample at 34 minutes and 9 seconds, thermocouple number 14 fell down from the sample at 29 minutes and 48 seconds, thermocouple number 15 fell down from the sample at 17 minutes and 42 seconds, thermocouple number 17 fell down from the sample at 19 minutes and 49 seconds.

If the sample fails from Integrity criteria, Insulation criteria also fails but not vice versa.

Radiation Measurement

No measurement performed for the testing.

MUAYENE - DENEY SONUÇLARI *TEST RESULTS*

3. OBSERVATIONS

DURATION (Minute)	NOTES
00.00	Test started.
00.50	Smoke leakage from mid-height and top of the sample between leaves
01.47	Smoke leakage from along the top edge of the active leaf between leaf and frame.
03.11	Smoke leakage from top right corner of the passive leaf between leaf and frame.
04.03	Liquid leakage from top of the sample between leafs
06.02	Smoke leakage from down left and right corner of the active leaf between leaf and frame.
07.20	Smoke leakage from top left and right corner of the sample between leaf and frame.
12.25	Smoke leakage from mid-width of the top edge of the sample between leaf and frame.
13.07	Black discoloration on mid-height and top of the sample between leaf and frame.
17.41	Cotton pad applied to left of the bottom edge between leaf and sill, no ignition observed
17.42	Thermocouple number 15 fell down from the sample.
19.49	Thermocouple number 17 fell down from the sample.
23.04	Smoke leakage from all hinge areas between leaf and frame.
24.07	Thermocouple number 8 fell down from the sample.
26.22	Liquid leakage from bottom of the sample along the sill.
29.48	Thermocouple number 14 fell down from the sample.
30.02	Thermocouple number 11 fell down from the sample.
30.19	Black discoloration along the top edge of the sample between leaf and frame.
34.09	Thermocouple number 12 fell down from the sample.
43.13	Cotton pad applied to mid-height of the sample between leafs, no ignition observed
44.57	Cotton pad applied to mid-height of the sample between leafs, no ignition observed
47.53	Roving thermocouple applied to the area of thermocouple no 8. 98 °C
56.00	Roving thermocouple applied to the area of thermocouple no 8 . 100 °C
56.20	Roving thermocouple applied to the area of thermocouple no 12. 120 °C
56.40	Roving thermocouple applied to the area of thermocouple no 11. 110 °C
57.38	Thermocouple number 9 fell down from the sample.
58.06	Roving thermocouple applied to the area of thermocouple no 8. 125,1 °C
59.19	Cotton pad applied to mid-height of the sample between leafs, no ignition observed
60.00	Roving thermocouple applied to the area of thermocouple no 17. 93 °C
60.20	Roving thermocouple applied to the area of thermocouple no 15 . 160 °C
63.50	Liquid leakage from hydraulic closer on active leaf.
67.27	Cotton pad applied to mid-height of the sample between leafs, no ignition observed
71.50	**Sustained flaming observed on right of the down edge between passive leaf and sill. (more than 10 seconds) Integrity failure.**
75.01	Test terminated.

Note:From the unexposed face, the right leaf is called 'passive leaf' and the left leaf is called 'active leaf'.

4. ASSESMENT AND TEST RESULTS

Single acting (opening away from the furnace) double leaves metal door set with metal frame test sample with " description, mounted in a low density masonry supporting construction which was builded opening away from the furnace by the sponsor, was tested at 02 January 2026.

Details about the classification of the test results was given in the relevant classification report.

Test results conducted according to TS EN 1363-1:2020 and TS EN 1634-1+A1:2018 are given below.

TEST RESULTS

Performances	Criteria	Time (completed minute)	Failure (minute and second)
INTEGRITY (E)	Sustained flaming	71	71 min 1 sec
	Cracks or openings in excess of Φ6 (150mm)	75	No failure
	Cracks or openings in excess of Φ25	75	No failure
	Ignition of a cotton pad	75	No failure
INSULATION (I_2)	Average temperature, increase of Δ140°C	75	No failure
	Maximum temperature on leaf/leaves, increase of Δ180°C	75	No failure
	Maximum temperature on the frame, increase of Δ360°C	75	No failure
RADIATION (W)	-	No measurement.*	

Test Duration: The test was terminated at 75th minute at the request of the sponsor.
Test date: 02.01.2026
*An element which satisfies the thermal insulation criterion is also deemed to satisfy the Radiation (W) requirement for the same period.

5. DIRECT FIELD OF APPLICATION OF TEST RESULTS

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

Direct field of application of test results was given in the relevant classification report.

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 EN 1363-1, and where appropriate EN 1363-2.
Any significant deviation with respect to size, constructional 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.

6. GRAPHICS

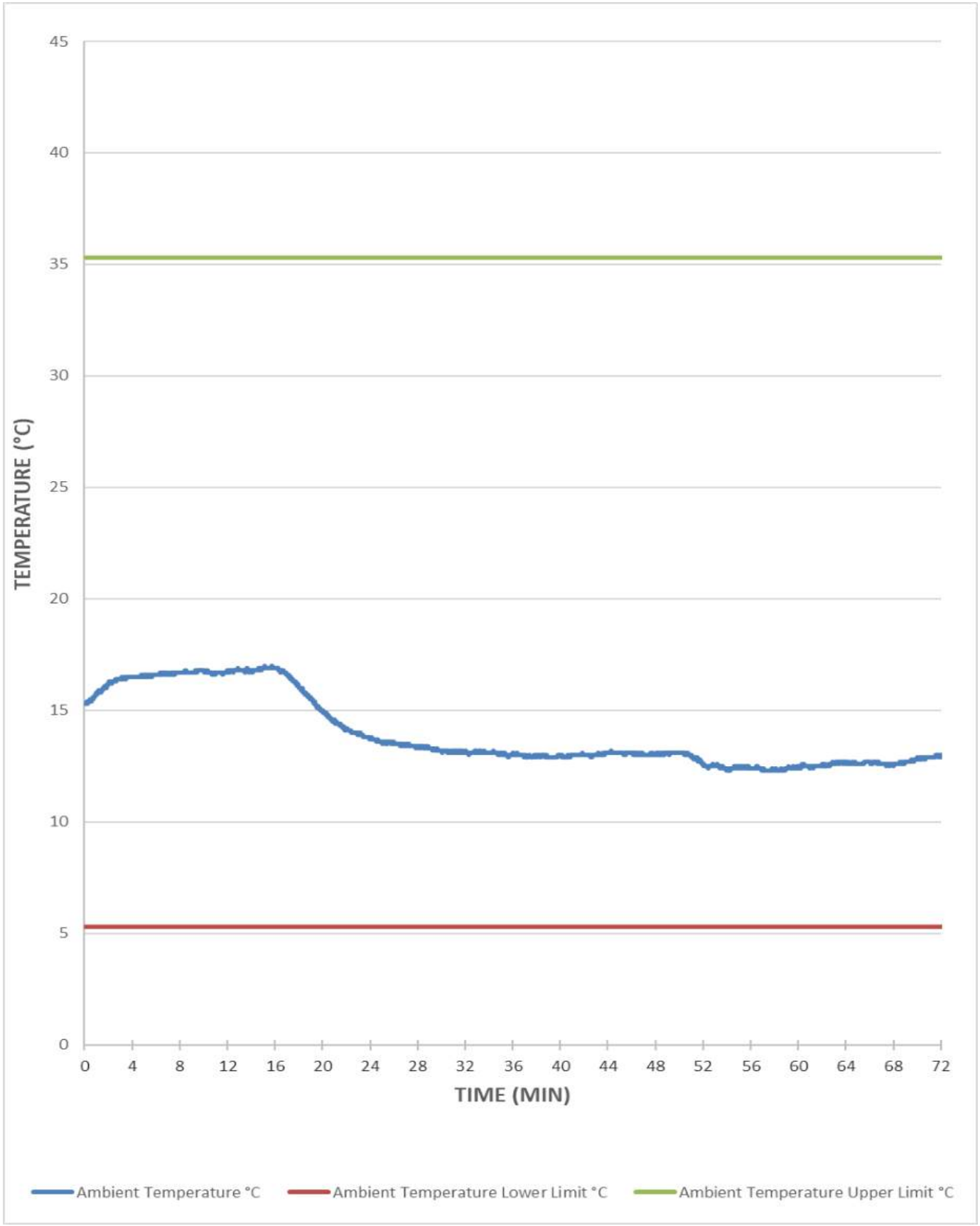


Figure 6.1. Ambient Temperature Graphic

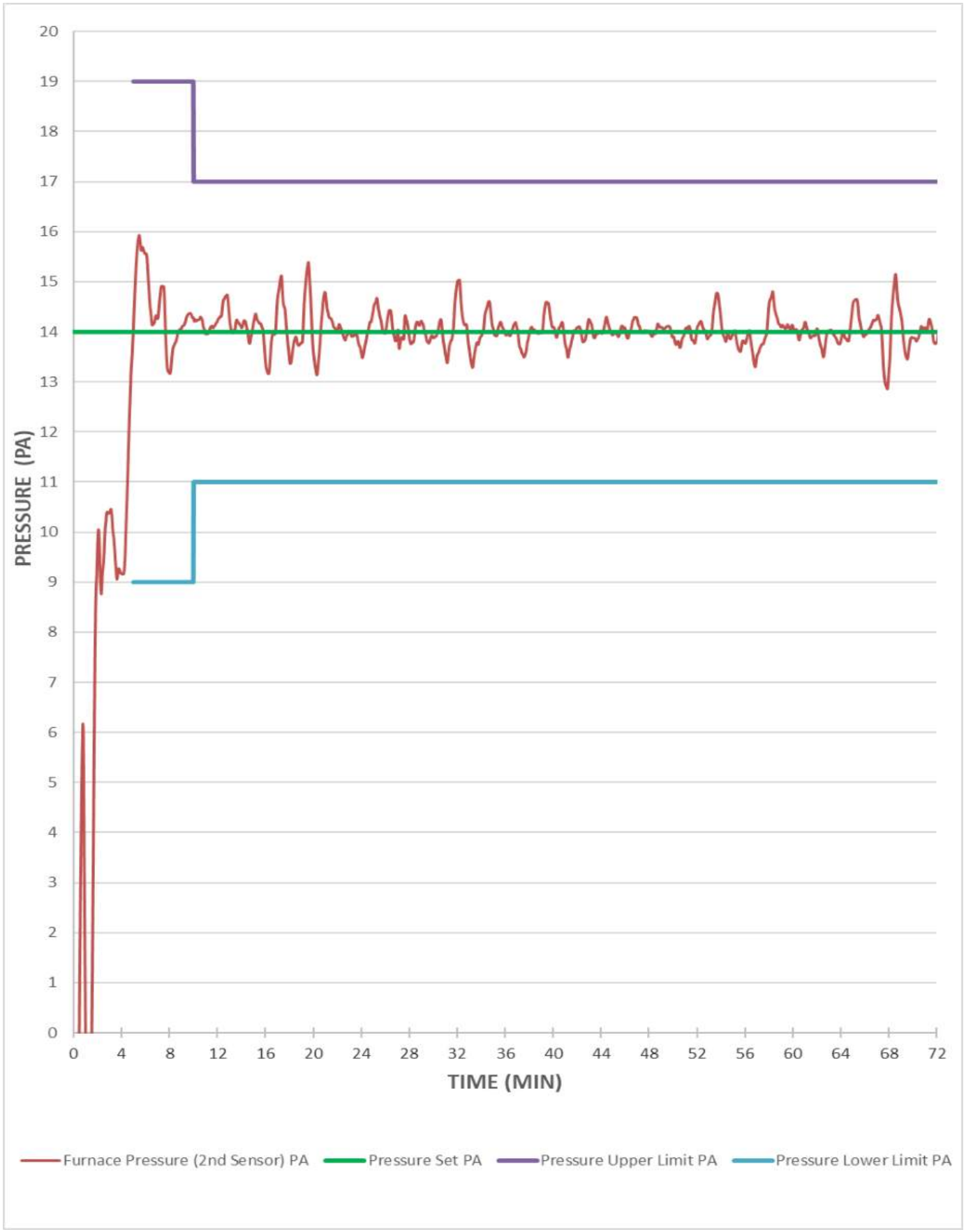


Figure 6.2. Furnace internal pressure graphic

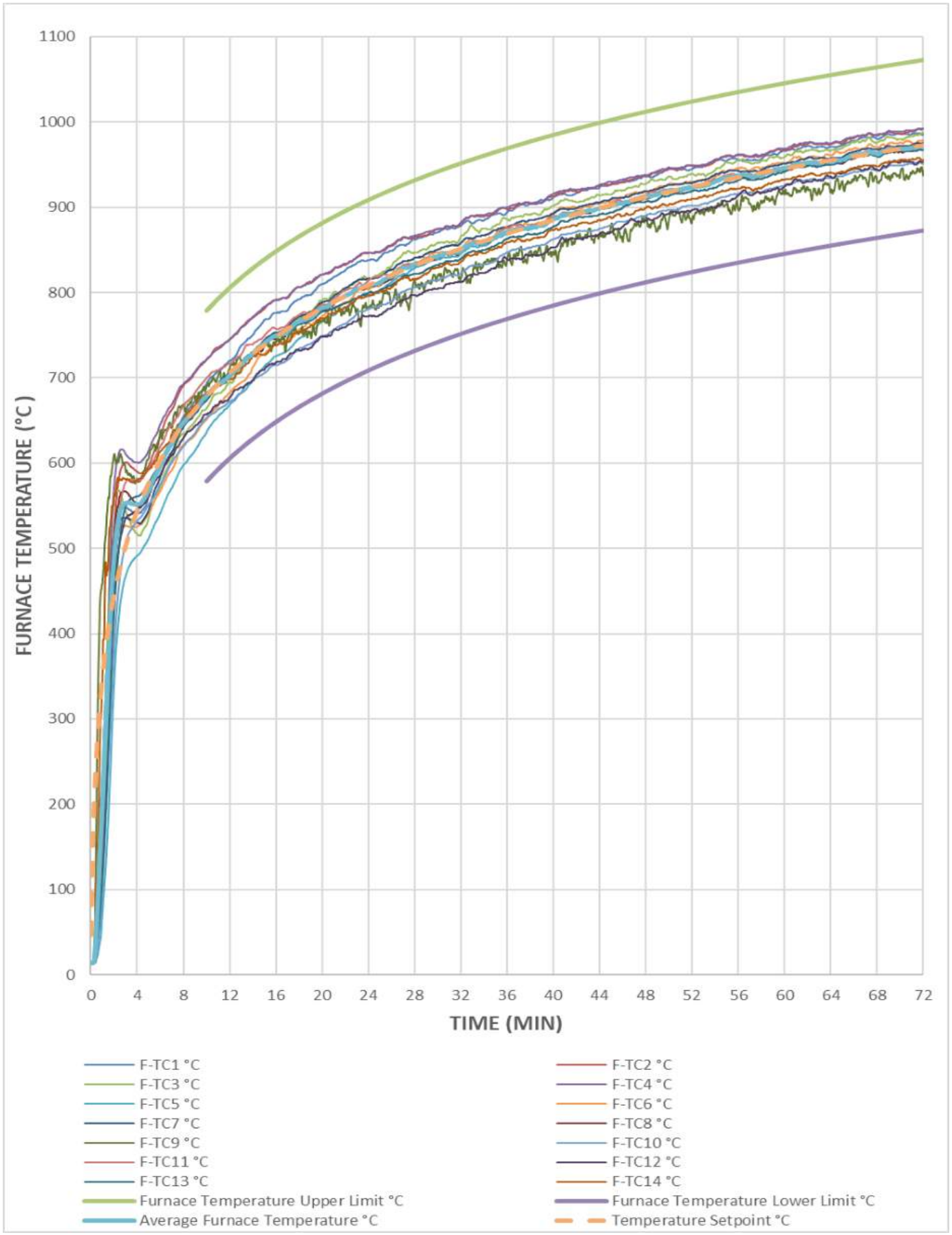


Figure 6.3. Furnace internal temperature graphic

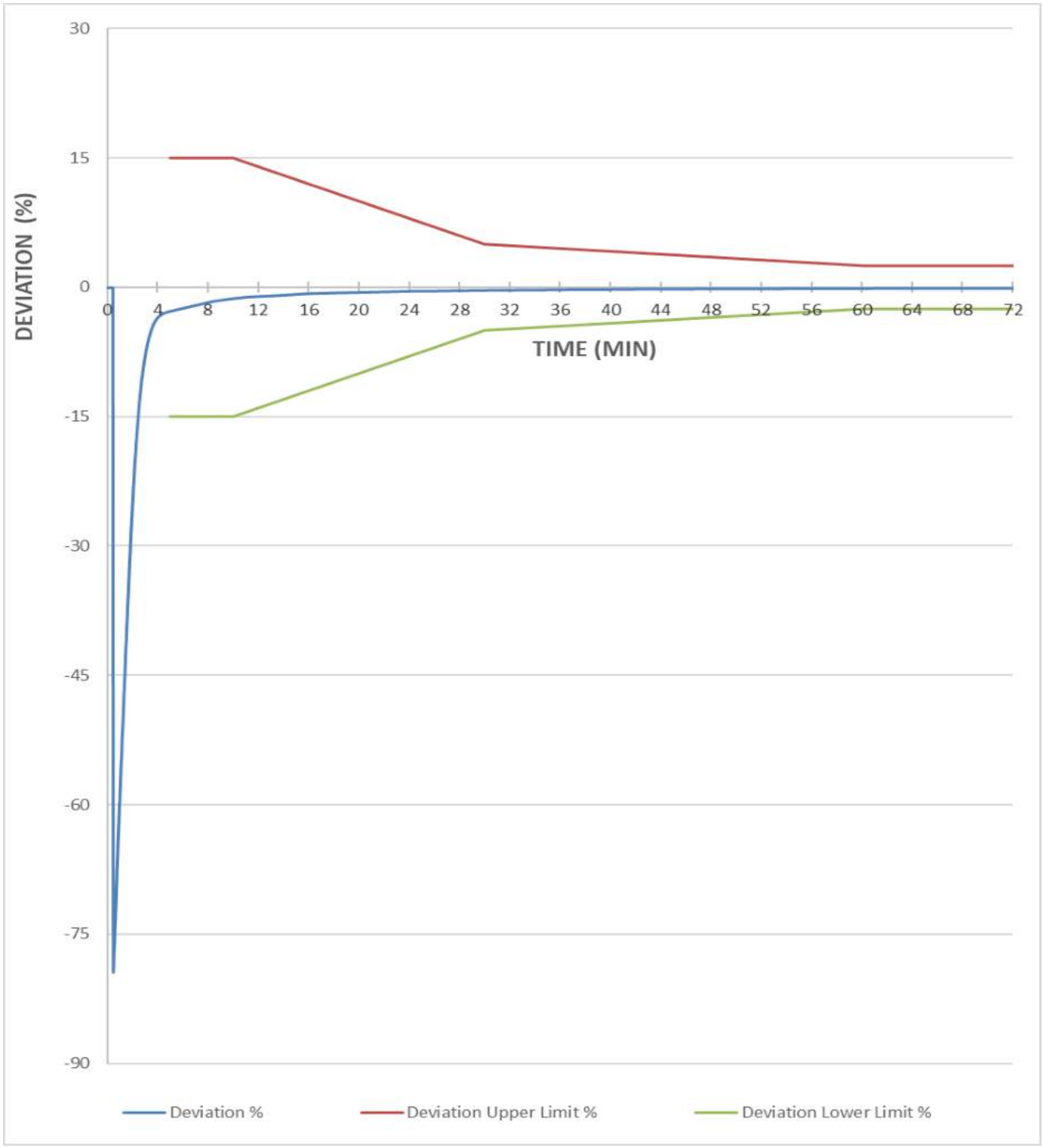


Figure 6.4. Deviation-time graphic

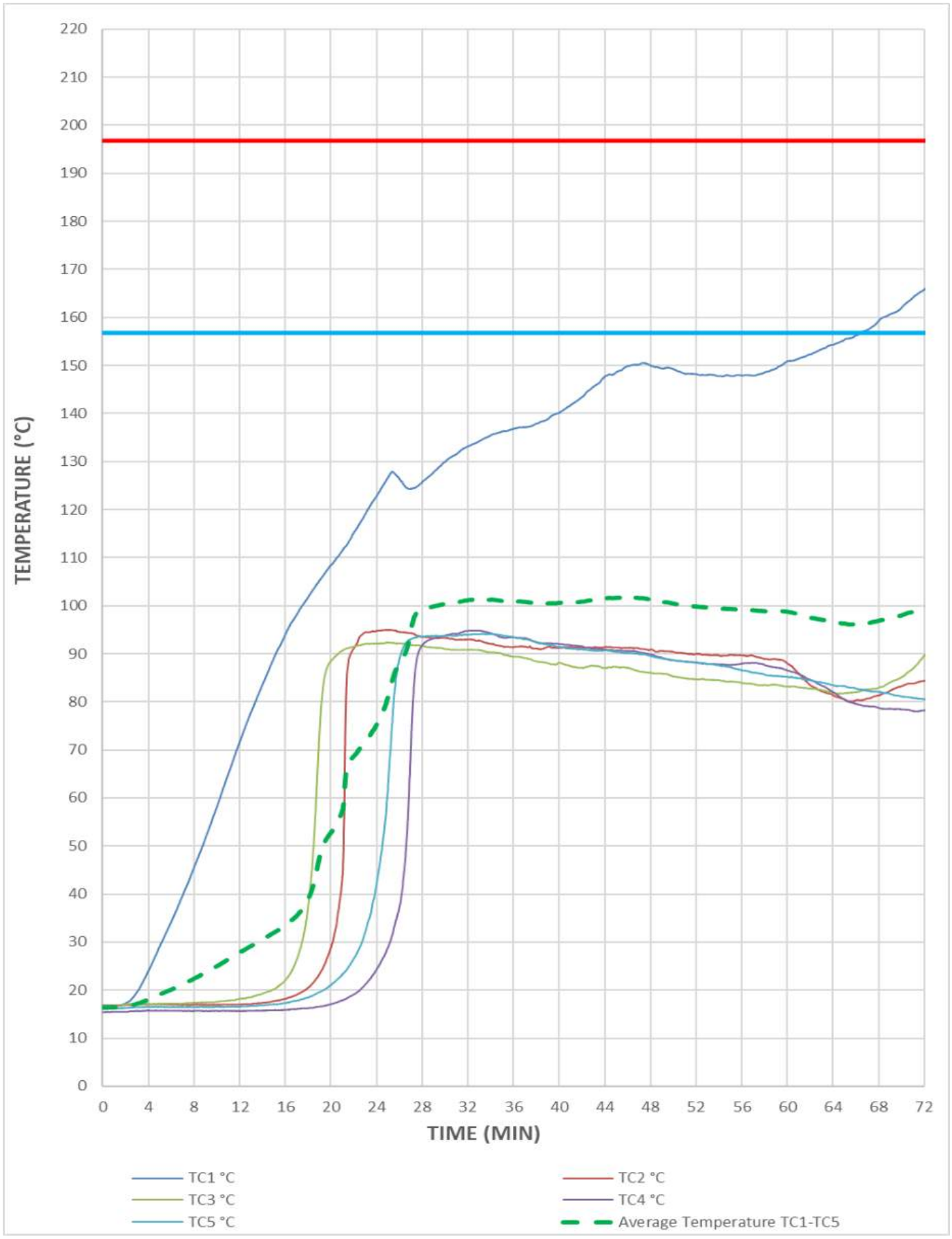


Figure 6.5. Temperatures of average and maximum unexposed face (Leaf) thermocouples (TC)

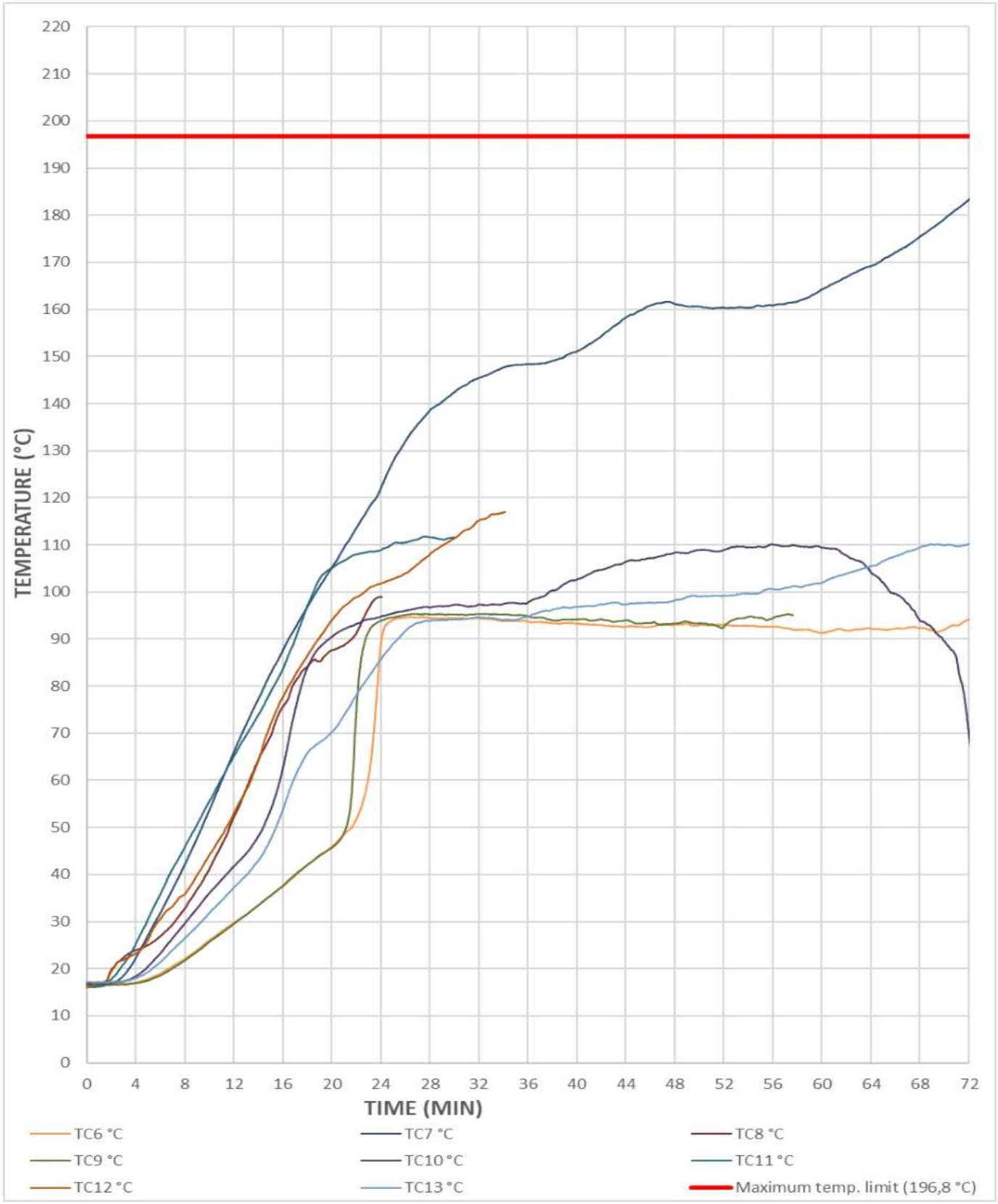


Figure 6.6. Temperatures of maximum unexposed face (leaf) thermocouples (TC)

Note: Thermocouple number 8 detached and fell from the sample at 24 minutes and 7 seconds, thermocouple number 9 at 57 minutes and 38 seconds, thermocouple number 11 at 30 minutes and 2 seconds, and thermocouple number 12 at 24 minutes and 9 seconds.

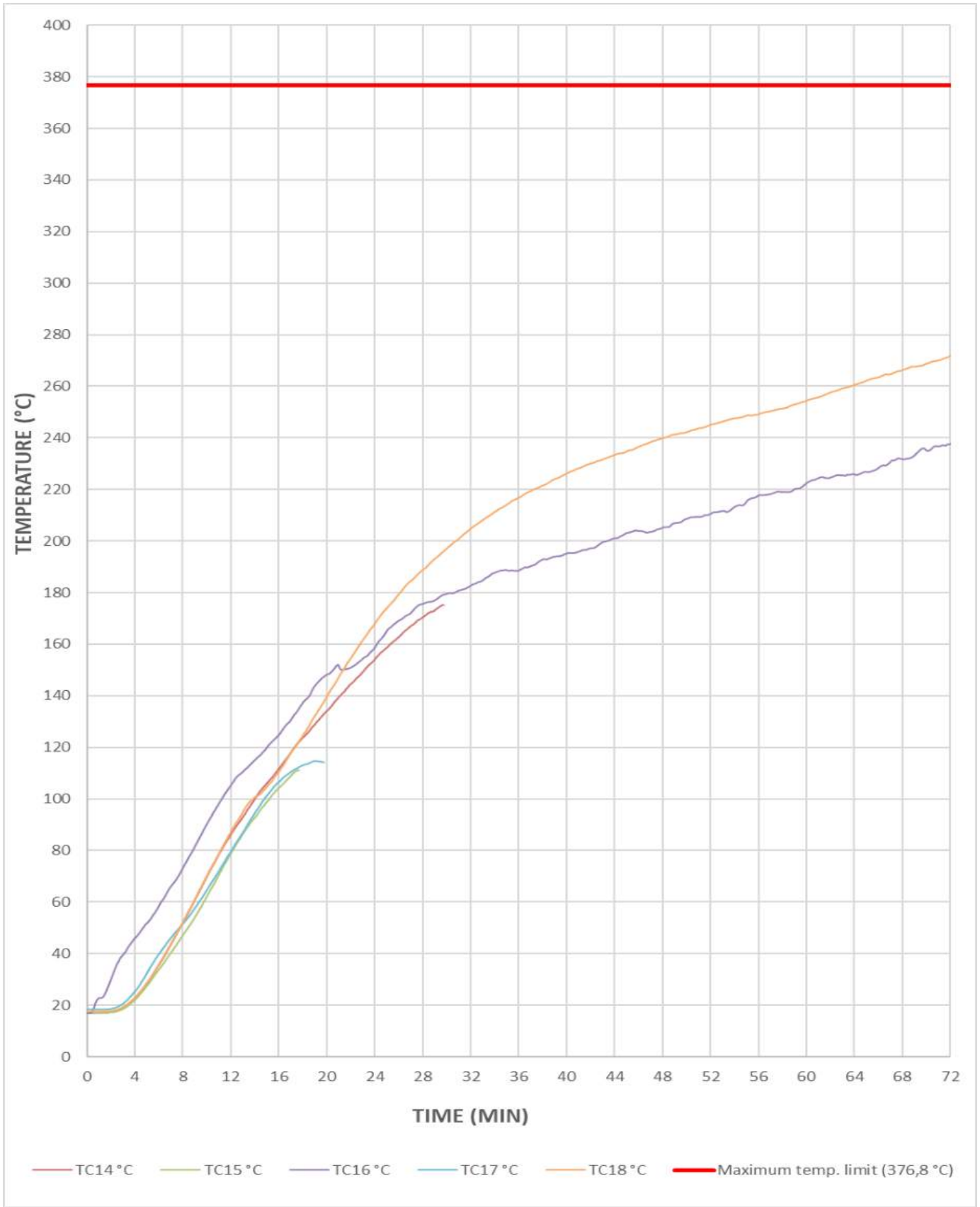


Figure 6.7. Temperatures of maximum unexposed face (frame) thermocouples (TC)

Note: Thermocouple 14 detached and fell from the anatomical specimen at 29 minutes and 48 seconds, thermocouple 15 detached and fell at 17 minutes and 42 seconds, and thermocouple 17 detached and fell at 19 minutes and 49 seconds.

7. TECHNICAL DRAWINGS

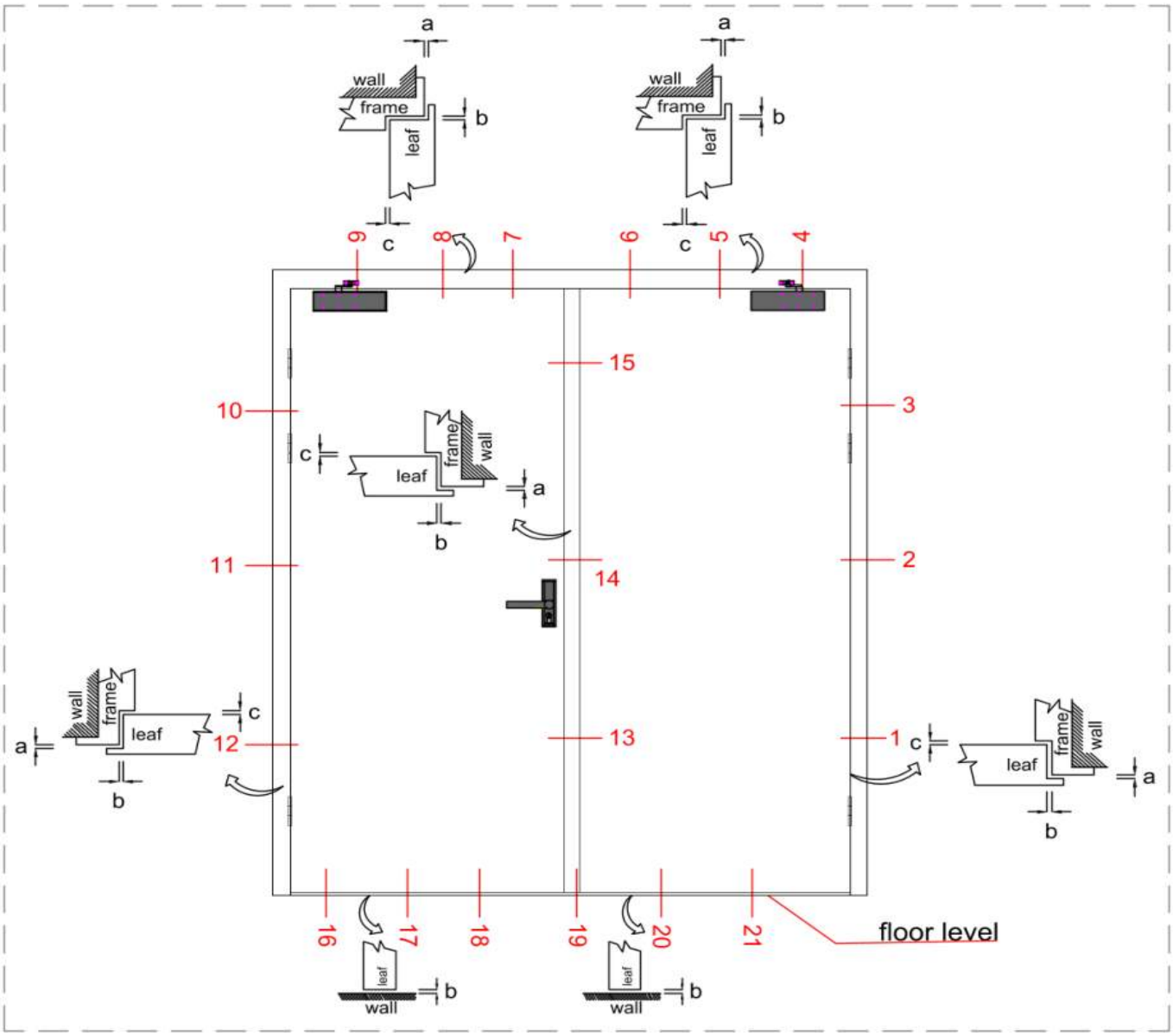
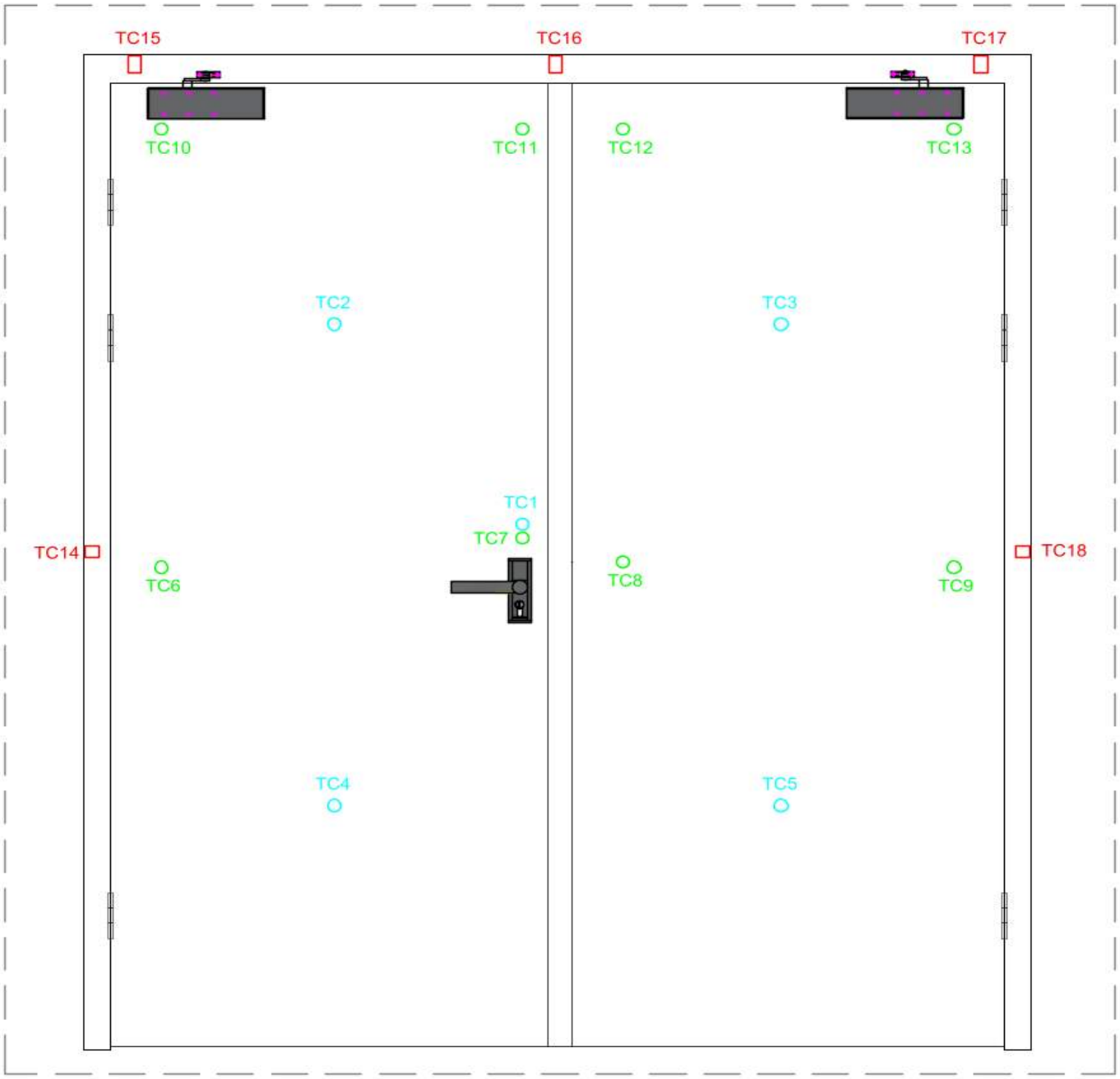
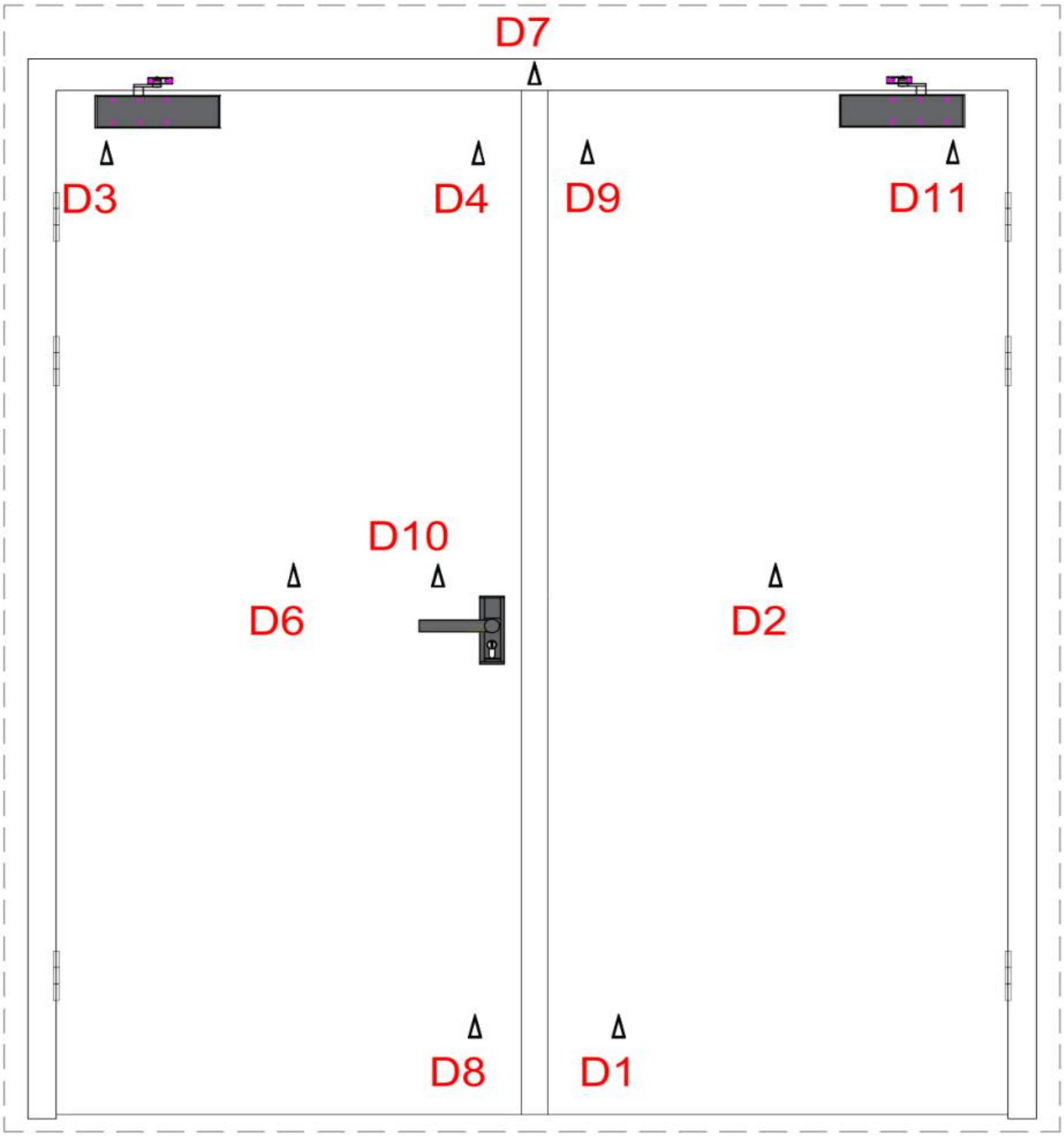


Figure 7.1.Gap measurement points and the gaps for each measurement section (Unexposed face view)



O:Leaf thermocouples (TC) (average and maximum temprateure)
□:Frame Thermocouples (TC) (maximum temprateure)

Figure 7.2.Unexposed face thermocouple measurement points



Δ:Deflection measurement points

Figure 7.3.Unexposed face deflection measurement points

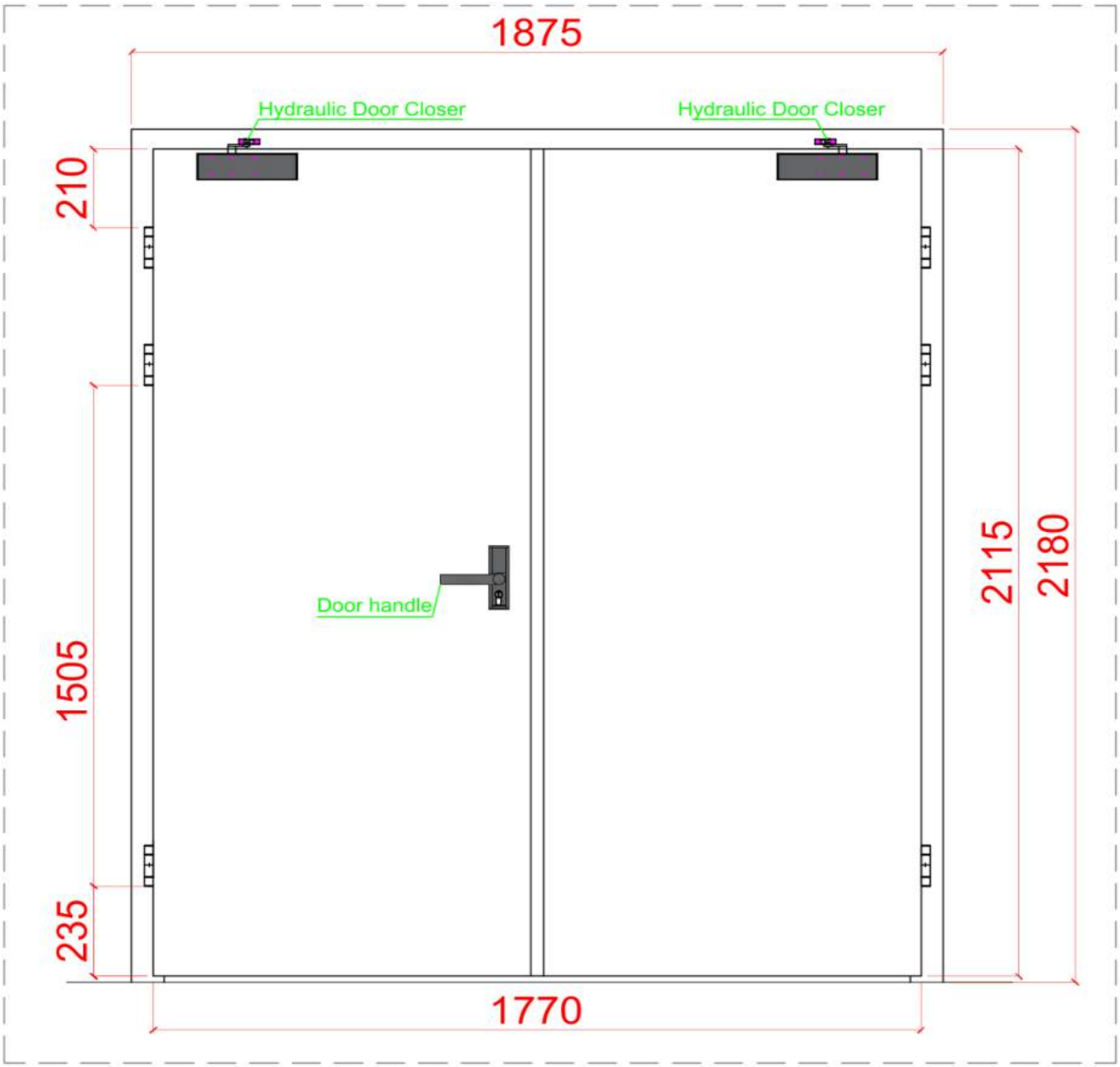


Figure 7.4.Unexposed face

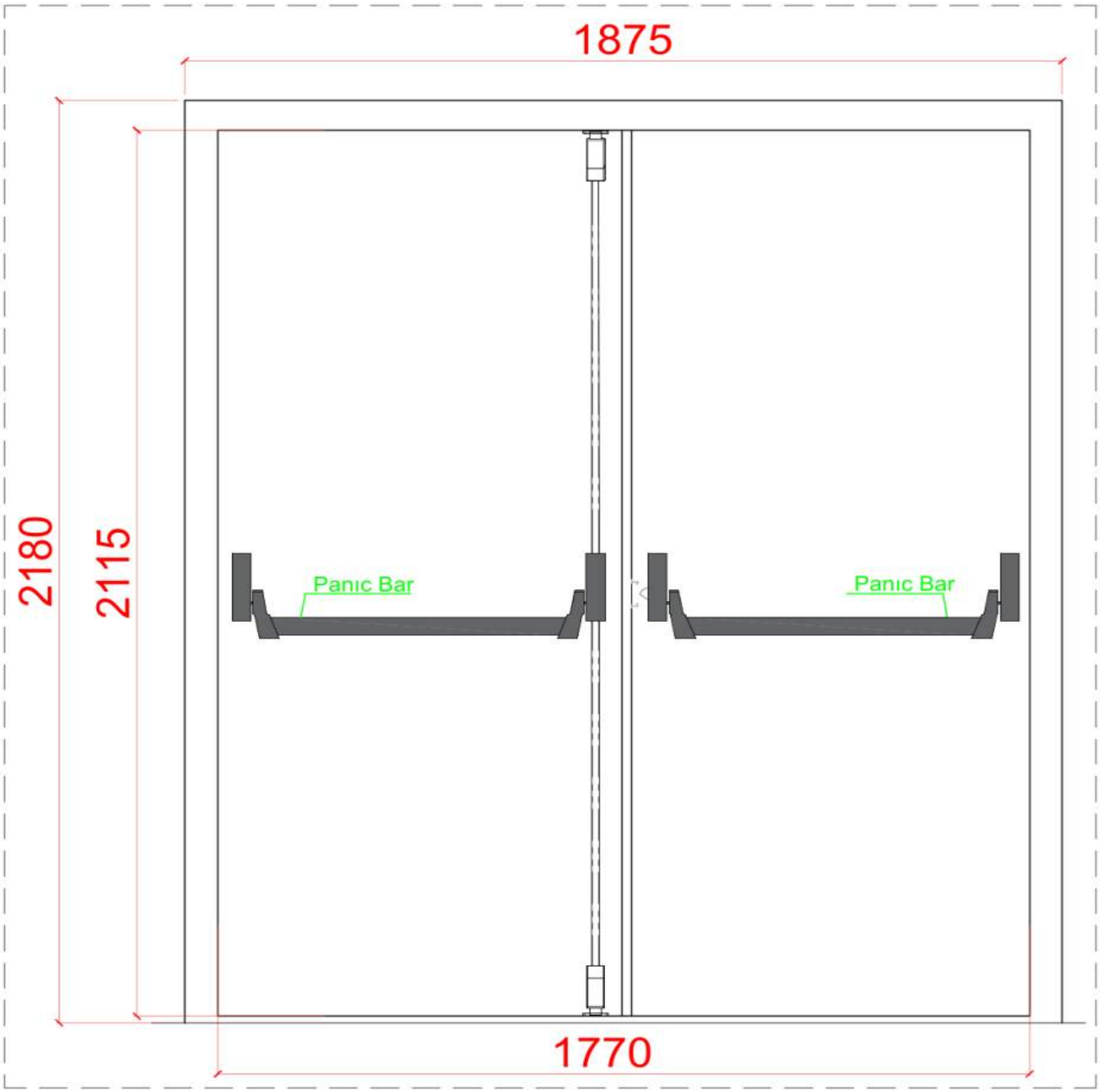


Figure 7.5.Exposed face

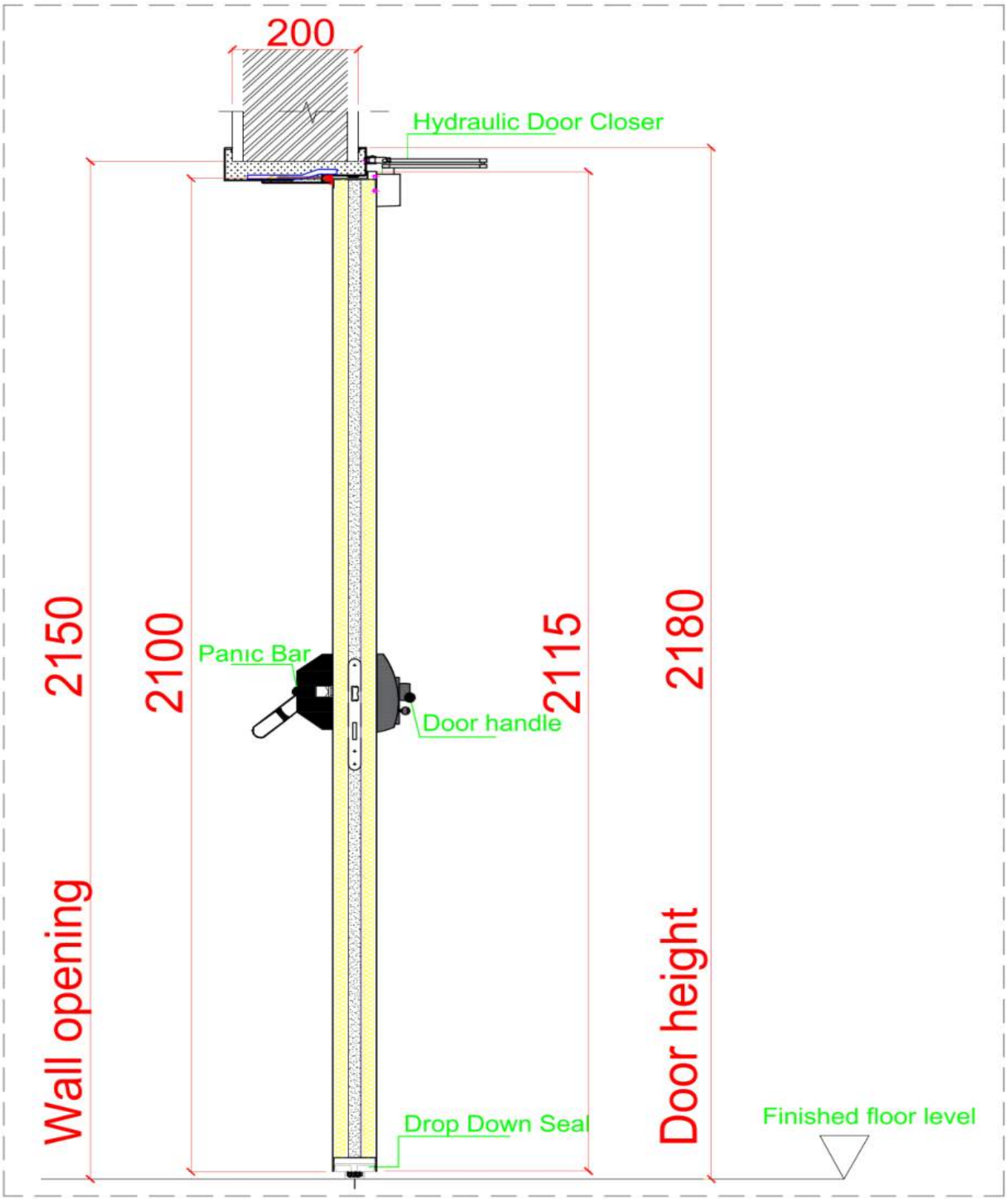


Figure 7.6.Lateral section

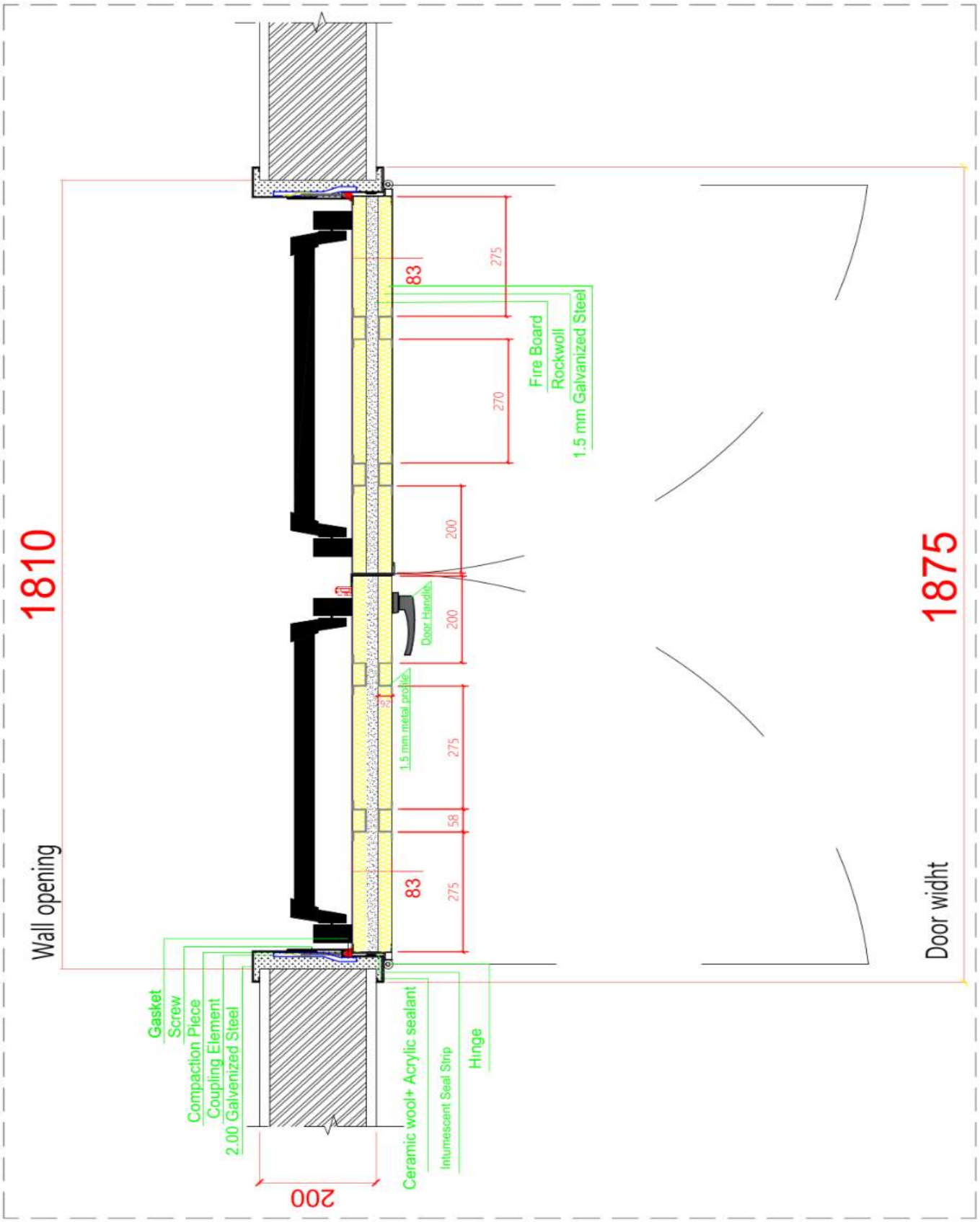


Figure 7.7.Plan section

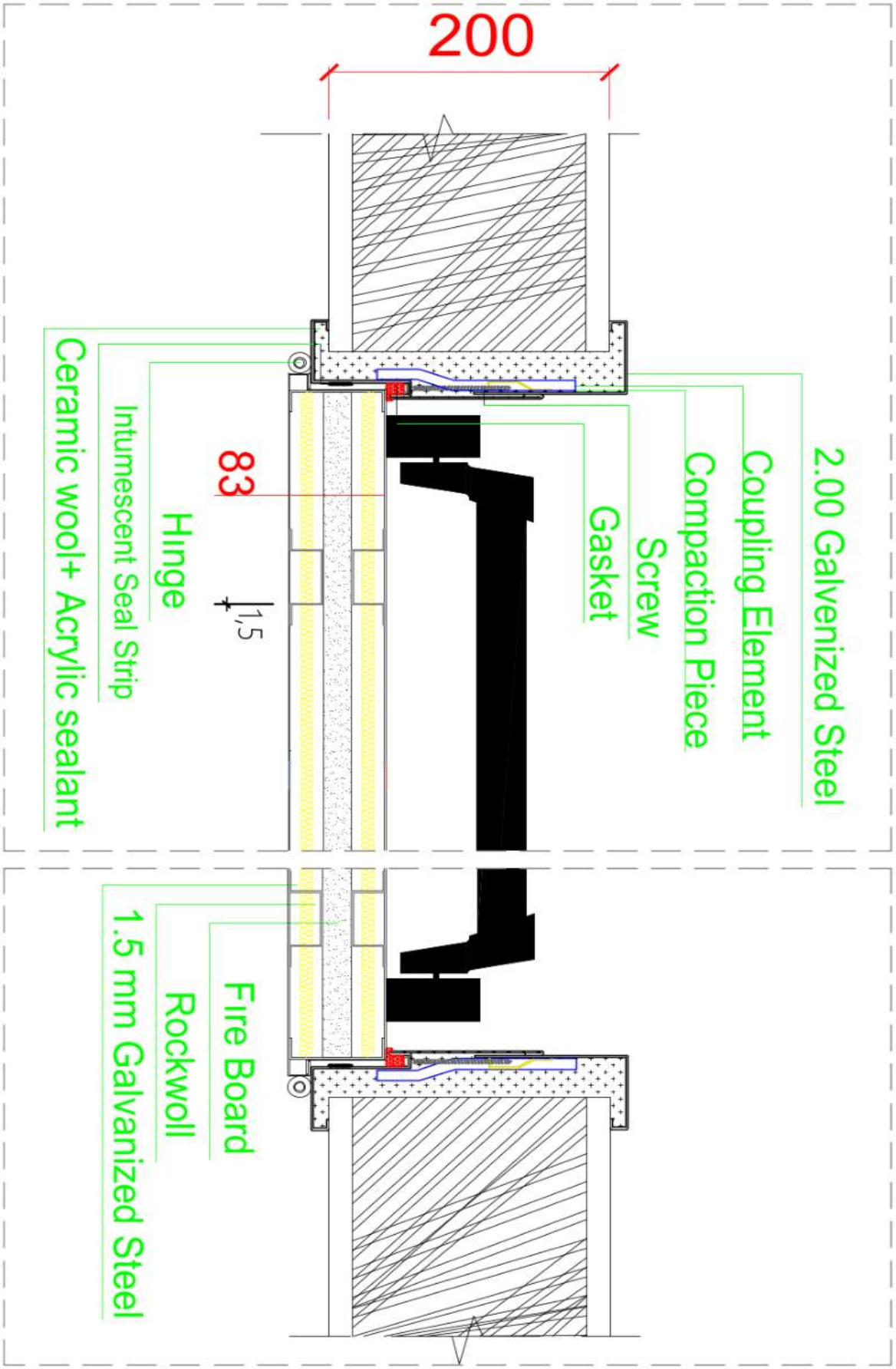


Figure 7.8.Plan section detail

8. PHOTOS

Figure 8.1.Hinge

Figure 8.2.Hinge

Figure 8.3.Door closer

Figure 8.4.Door closer

Figure 8.5.Panic bar lock

Figure 8.6.Strike plate

Figure 8.7.Door handle (unexposed face)

Figure 8.8.Panic bar (exposed face)

Figure 8.9.Drop seal of the active leaf

Figure 8.10.Drop seal of the passive leaf

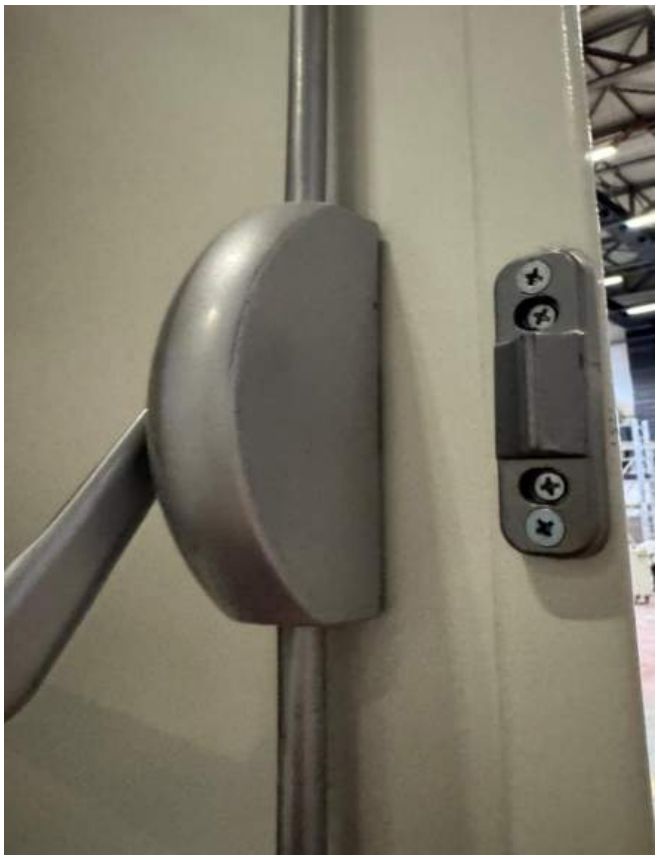


Figure 8.11.Panic bar of the passive leaf

Figure 8.12.Panic bar of the passive leaf and mechanism of lock

Figure 8.13.Leading edge of the active leaf

Figure 8.14.Leading edge of the passive leaf

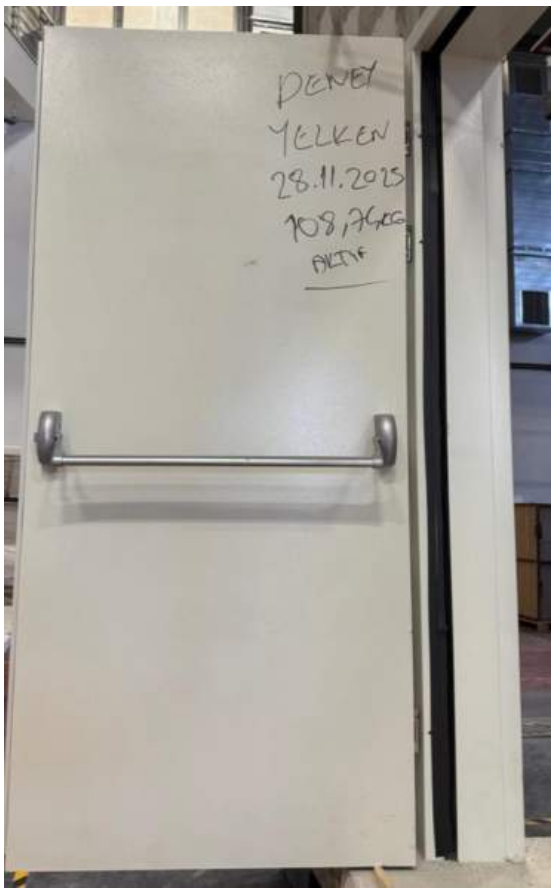


Figure 8.15.Right jamb of frame

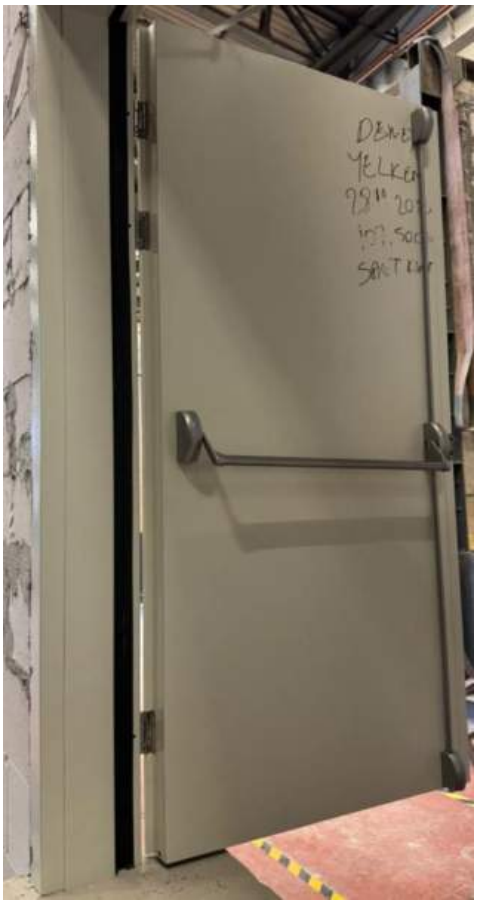


Figure 8.16.Left jamb of frame

Figure 8.17. Unexposed face during test (16th minutes)

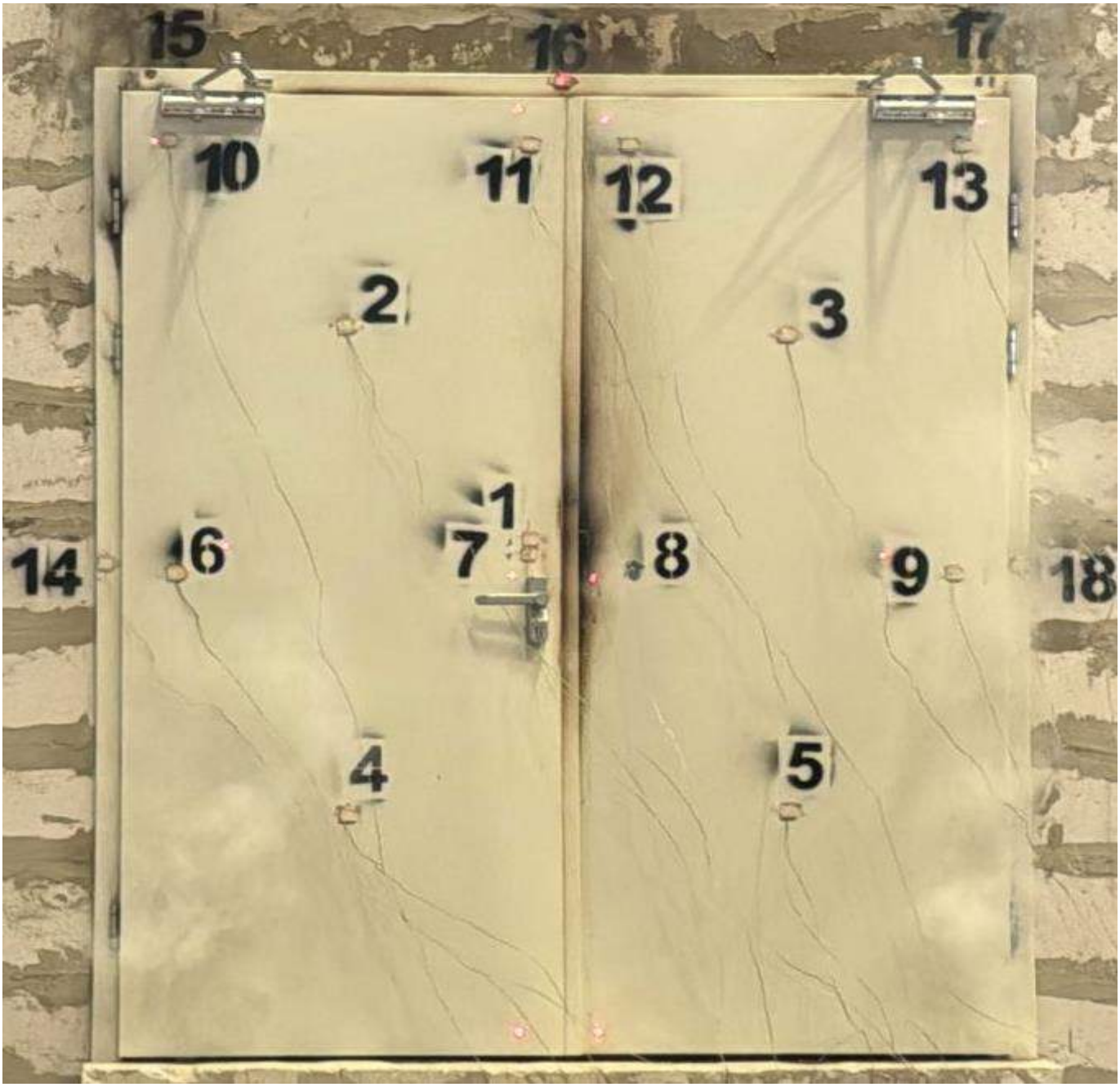


Figure 8.18. Unexposed face during test (30th minutes)

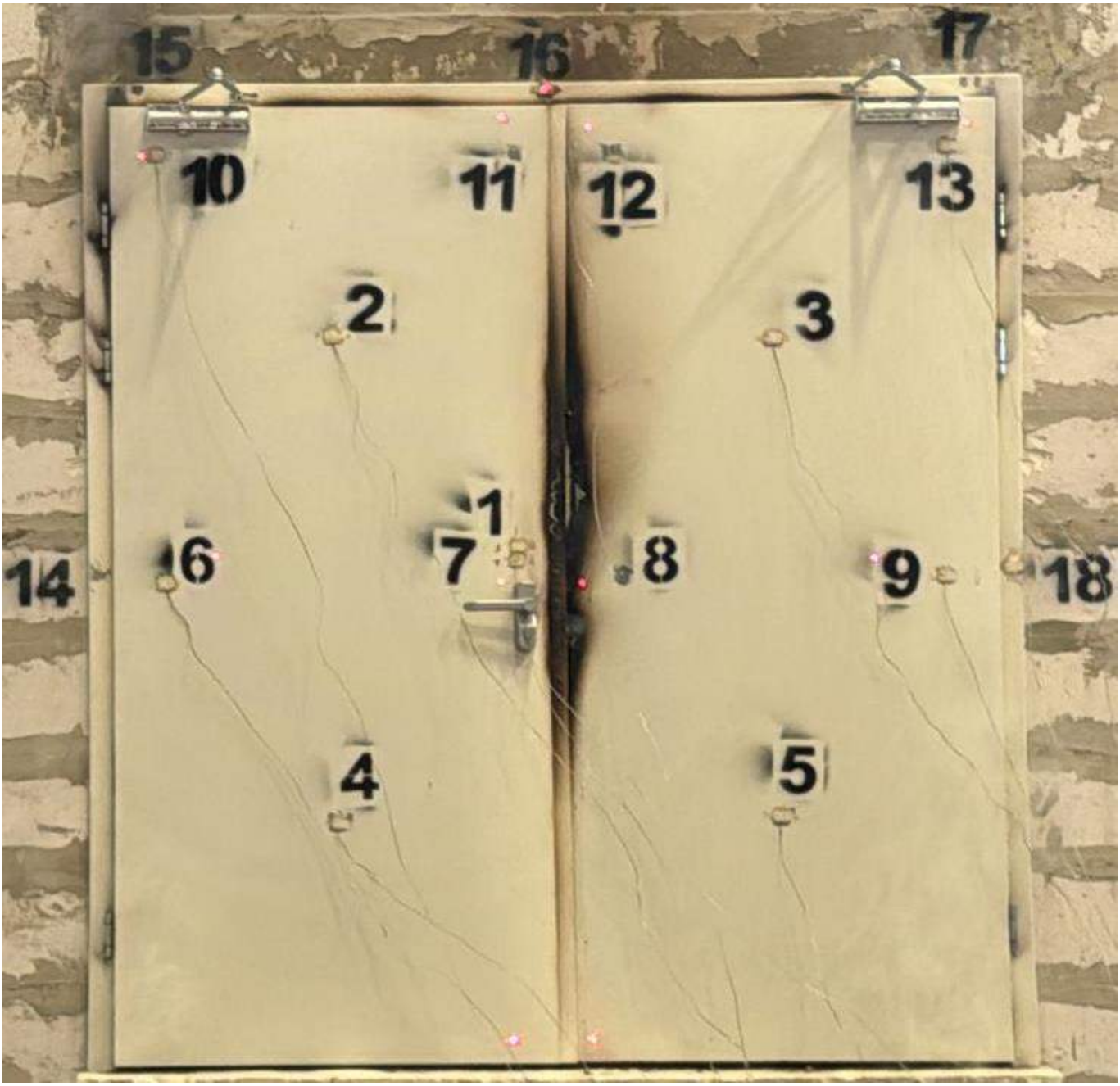


Figure 8.19. Unexposed face during test (42nd minutes)

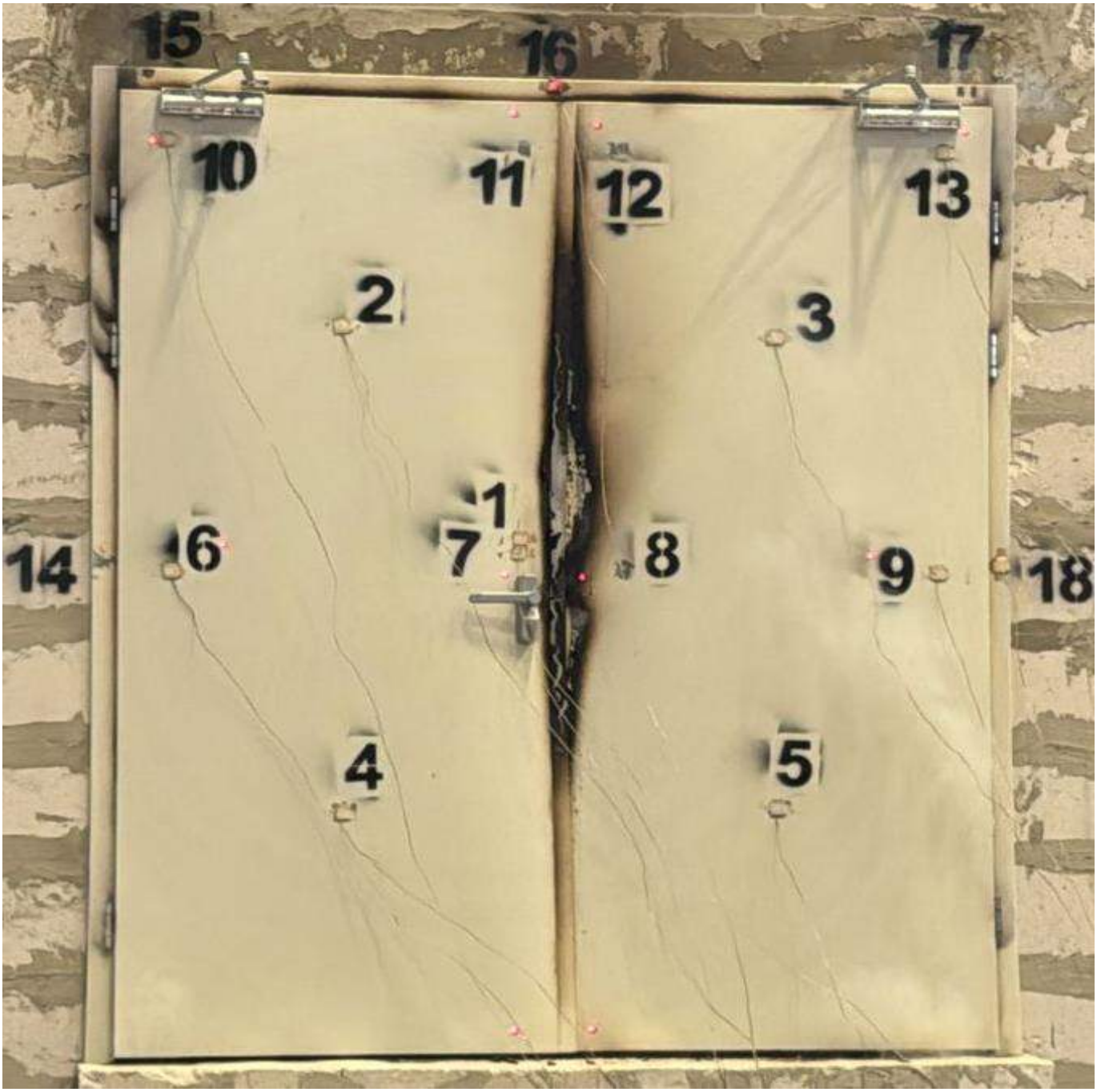


Figure 8.20. Unexposed face during test (52nd minutes)

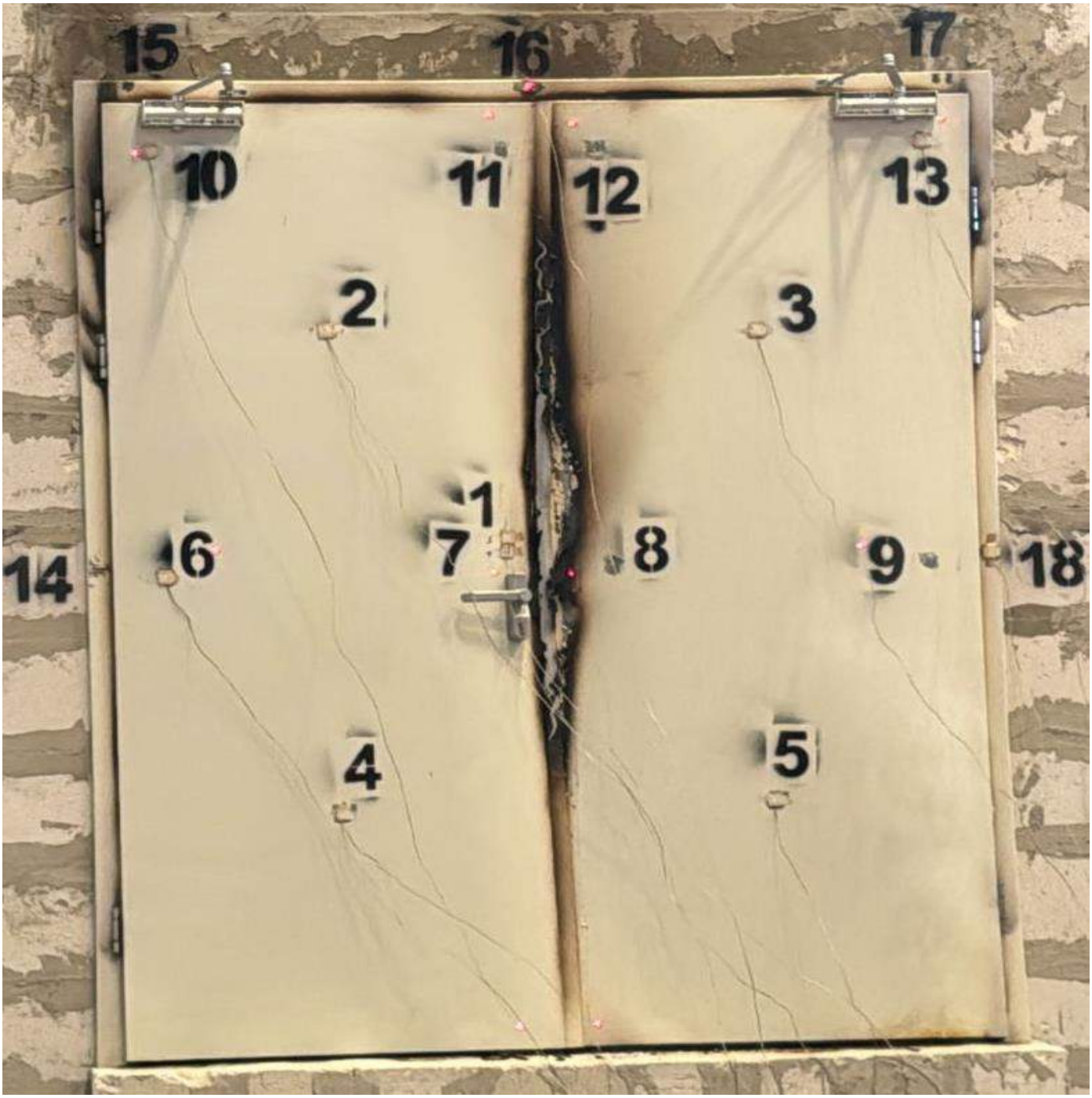


Figure 8.21. Unexposed face during test (60th minutes)

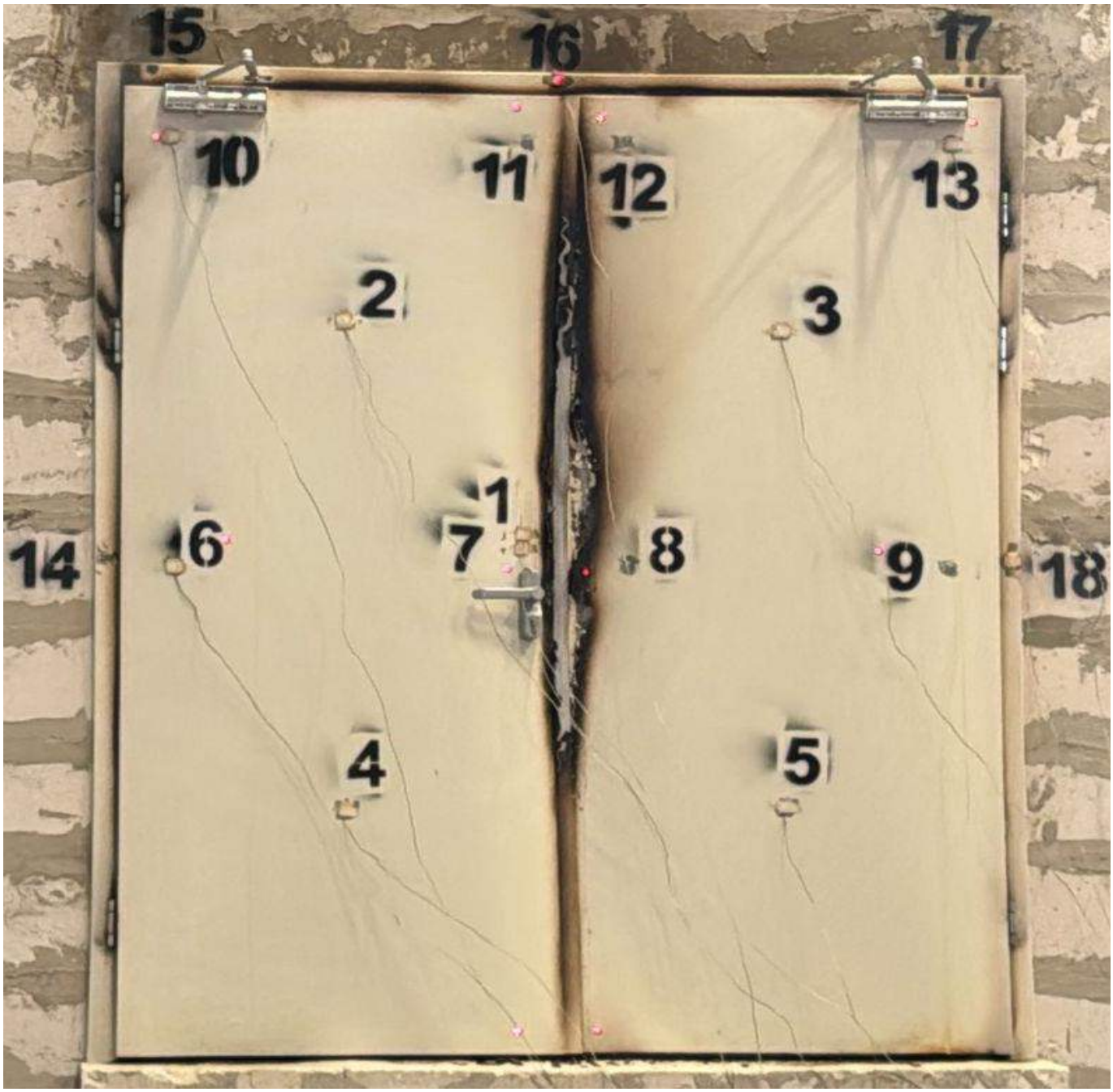


Figure 8.22. Unexposed face during test (68th minutes)

Figure 8.23. Exposed face after test

9. REFERENCES

TS EN 1363-1:2020 Fire Resistance Tests General Requirements
TS EN 1634-1+A1:2018 Fire Resistance Tests for Door and Shutter Assemblies and Openable Windows
TS EN 13501-2:2023 Fire classification of construction products and building elements – Part 2: Classification using data from fire resistance tests, excluding ventilation services
LAB-D-17-FR-006: Fire Resistance Tests Raw Data Form

This document is electronically signed.
End of test report.