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EFECTIS ERA AVRASYA TEST VE BELGELENDİRME A.Ş.

Dilovası OSB, 5. Kısım, Fırat Caddesi No:18 41455

Dilovası, Kocaeli/TURKEY

AB-0556-T
RFTR22081
27.07.2022

DENEY RAPORU

TEST REPORT

Müşterinin adı/adresi *Customer name/address*	:	METE DEKORASYON SAN. VE TİC. LTD. ŞTİ. Şafak Mah. Akdeniz Sanayi Sit. 5018 Sok. No:9 Kepez, Antalya/TURKEY
İstek numarası *Order No.*	:	EEA-22-000468
Numunenin adı ve tarifi *Name and identity of test sample*	:	Single Leaf Timber Doors "**AK-03 & AK-02**"
Numunenin kabul tarihi *The date of receipt of sample*	:	14.06.2022
Açıklamalar *Remarks*	:	
Deneyin yapıldığı tarih *Date of test*	:	15.06.2022
Raporun sayfa sayısı *Number of pages of the Report*	:	30 (Totally 43 pages with annexes)

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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

Mühür *Seal*	**Tarih** *Date*	**Deney Sorumlusu** *Person in charge of test*	**Laboratuvar Müdürü** *Head of Testing Laboratory*
Efectis	27.07.2022	*e-signed* Kerim Ege ERSÖZ	*e-signed* Ali BAYRAKTAR

1. SCOPE

Fire resistance test, in conformity with the general requirements of standards EN 1363-1:2020, with substitute or additional methods of standard EN1363-2:1999 and with the particular requirements of standard EN 1634-1:2014+A1:2018 "**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**".

2. TEST LABORATORY

Name : EFECTIS ERA AVRASYA TEST VE BELGELENDİRME A.Ş.

Address : Dilovası OSB 5. Kısım Fırat Cad. No: 18 41455 Dilovası, Kocaeli/TURKEY

3. DESCRIPTION OF THE TEST SPECIMEN

3.1. General

Product identification : Single Leaf Timber Doors **"AK-03 & AK-02"**

Door Nr.1 : **"AK-03"**
Door Nr.2 **: "AK-02"**

Direction of fire : Opening into the fire.

Manufacturer : METE DEKORASYON SAN. VE TİC. LTD. ŞTİ.
Şafak Mah. Akdeniz Sanayi Sit. 5018 Sok. No:9 Kepez, Antalya/TURKEY

Sponsor of test : METE DEKORASYON SAN. VE TİC. LTD. ŞTİ.
Şafak Mah. Akdeniz Sanayi Sit. 5018 Sok. No:9 Kepez, Antalya/TURKEY

3.2. Construction

Single action timber door constructions, Single Leaf Timber Doors **"AK-03 & AK-02"** were mounted in a masonry supporting construction, made of aerated concrete blocks with the mounting clearances dimensions of 990 x 2200 mm (w x h) for the doors.

The supporting construction was supplied by the test laboratory (Efectis Era Avrasya) and consisted of aerated concrete blocks with have a nominal gross dry density of 400 kg/m^3 and thickness of 180 mm.

3.3. Components

3.3.1. Door Nr.1:

3.3.1.1. Door Frame:

The jamb and the frame consisted of MDF and were veneered with natural timber. Polyurethane-based fire-resistant foam was used between the frame and the supporting construction. Intumescent acrylic sealant was used between the supporting construction and the jamb. PVC based sound seal was used at the rebated edge of the frame. Graphite-based fire and smoke seals were used at the frame, the contact points of the leaf. Polyurethane based adhesive was used between the jamb layers and also between the frame layers. Urea formaldehyde based adhesive was used between the jamb and natural wood veneer, and between the frame and natural wood veneer.

- *Type : Frame – MDF (First Layer); Nominal density: 748 kg/m³; Nominal thickness: 30 mm*
  - *– MDF (Second Layer); Nominal density: 700 kg/m³; Nominal thickness: 18 mm*
  - *– Natural wood veneer; Nominal density: 400 kg/m³; Nominal thickness: 0,5 + 0,5 mm (on both sides)*

  Jamb – MDF ; Nominal density: 700 kg/m³; Nominal thickness: 18 mm
  - *– MDF ; Nominal density: 850 kg/m³; Nominal thickness: 4 mm*
  - *– Natural wood veneer; Nominal density: 400 kg/m³; Nominal thickness: 0,5 + 0,5 mm (on both sides)*

- *Dimensions :*
  - *Frame studs : 35/54 x 121/178 x 2120/2180 mm (w x d x h)*
  - *Frame header : 35/54 x 121/178 x 972 mm (w x d x l)*
  - *Jamb studs : 90 x 18 x 2245/2273 mm (w x t x h)*
  - *Jamb header : 90 x 18 x 1084 mm (w x t x l)*
- *Filler :*
  - *Type : Polyurethane based fire-resistant foam – HAFELE – 003.52.318*
    - *Location : Used between the frame and the supporting construction.*
- *Sealant :*
  - *Type : Intumescent acrylic sealant – AKFİX*
    - *Location : Used between the supporting construction and the jamb.*

- *Seals :*
  - *Type : Graphite-based fire and smoke seal – HAFELE – 950.18.111*
    - *Dimensions : 15 x 4 mm (w x t)*
    - *Location : Used at the frame, the contact points of the leaf.*
  - *Type : Graphite-based fire and smoke seal – HAFELE – 950.18.101*
    - *Dimensions : 10 x 4 mm (w x t)*
    - *Location : Used at the frame, the contact points of the leaf.*
  - *Type : PVC based fire resistant roof type seal – HARMONY ACOUSTIC– 11301*
    - *Dimensions : 12 x 12 mm (w x t)*
    - *Location : Used at the rebated edge of the frame.*
- *Adhesive:*
  - *Type : Urea formaldehyde based adhesive – KLEIBERIT– 871.5*
    - *Consumption amount: 150 gr/m^2*
    - *Location : Used between the jamb and natural wood veneer.*
  - *Type : Polyurethane based adhesive – KLEIBERIT – PUR-2400*
    - *Consumption amount: 200 gr/m^2*
    - *Location : Used between the jamb layers.*
  - *Type : Polyurethane based adhesive – KLEIBERIT– PUR-2400*
    - *Consumption amount: 200 gr/m^2*
    - *Location : Used between the frame layers.*
  - *Type : Urea formaldehyde based adhesive – KLEIBERIT– 871.5*
    - *Consumption amount: 150 gr/m^2*
    - *Location : Used between the frame and natural wood veneer.*

*For detailed information, see **figures 1-7.***

3.3.1.2. *Door Leaf:*

The leaf consisted of MDF and was veneered with natural wood. Fire resistant wood chipboard was used inside the leaf. Solid chestnut was used left and right sides of the leaf. Fire resistant threshold seal was used at the bottom edge of the leaf. Urea formaldehyde based adhesive was used at the leaf; between the chipboard, MDF and natural wood veneer. Polyurethane based adhesive was used at the leaf; between the solid chestnut and chipboard, and between the solid chestnut and MDF.

- *Dimensions : 890 x 53 x 2145 mm (w x t x h)*

  Outer surface: - MDF; Nominal density: 850 kg/m³; Nominal thickness: 4 + 4 mm (on both sides)

  - Natural wood veneer; Nominal density: 400 kg/m³; Nominal thickness: 0,5 + 0,5 mm (on both sides)

- *Leaf weight: 64 kg (33,52 kg per m²)*
- *Inner surface:*
  - *Type : Fire resistant wood chipboard – STREBORD 44 – Manufacturer; FALCON PANEL PRODUCTS*
    - *Nominal thickness: 44 mm*
    - *Nominal density: 600 kg/m³*
    - *Location : Used inside the leaf. (See **figure 4 & figure 6)***
  - *Type : Solid chestnut*
    - *Dimensions : 44 x 5 mm (w x h)*
    - *Nominal density: 500 kg/m³*
    - *Location : Used left and right sides of the leaf. (See **figure 4 & figure 6**)*
- *Seal :*
  - *Type : Threshold seal – HAFELE – 950.45.165*
    - *Dimensions : 30 x 13 mm (h x t)*
    - *Location : Used at the bottom edge of the leaf.*
- *Adhesive:*
  - *Type : Urea formaldehyde based adhesive – KLEIBERIT– 871.5*
    - *Consumption amount: 150 gr/m²*
    - *Location : Used at the leaf; between the chipboard, MDF and natural wood veneer.*
  - *Type : Polyurethane based adhesive – KLEIBERIT – PUR-2400*
    - *Consumption amount: 200 gr/m²*
    - *Location : Used at the leaf; between the solid chestnut and chipboard, and between the solid chestnut and MDF.*

*For detailed information, see **figure 1-7.***

3.3.1.3. Accessories:

- *Hinges :*

The leaf was hung on three hinges.

– *Type : Stainless steel leaf hinge – HAFELE – 927.91.356*

- *Dimensions : (See **figure 8**)*
- *Locations : Starting with 250 mm distance from the bottom of the door leaf to the center of the hinge, ctc. distances were 1100 mm and 600 mm, respectively.*
- *It was fixed by chrome screws with a dimension of 5 x 25 mm (ø x l).*
- *Insulation : Graphite based intumescent pad was used under the hinges. – SEALZ – 332679; Thickness: 1 mm*

- *Lock :*

– *Type : Stainless steel card lock system – NEFLOCK – RF-8008*

- *Dimensions : 22 x 94 x 240 mm (w x d x h)*
- *Location : Used at 1000 mm from the bottom of the leaf.*
- *Gap dimensions on the door leaf for the mortise part: 22/16 x 100 x 240/150 mm (w x d x h) (See **figure 11).***
- *Latch bolt dimension: 15 x 25 mm (d x h)*
- *It was fixed by steel screws with a dimension of 5 x 40 mm (ø x l).*
- *Insulation : Graphite based intumescent pad was used under the lock. – SEALZ – 332679; Thickness: 1 mm*

- *Door closer :*

- *Type : Steel concealed door closer HAFELE – 931.30.110*
- *Dimensions : (See **figure 9)***
- *Location : Used at 80 mm from the edge of the door leaf.*
- *Gap dimensions on the door leaf: 280 x 35 x 12 mm (w x d x l) (for closer plate) 242 x 35 x 80 mm (w x d x l) (for closer body) (See **figure 13).***
- *It was fixed by steel screws with a dimension of 5 x 35 mm (ø x l).*
- *Insulation : Graphite based intumescent pad was used under the door closer – SEALZ – 332679; Thickness: 1 mm*

3.3.2. Door Nr.2:

3.3.2.1. Door Frame:

The jamb and the frame consisted of MDF and were veneered with natural timber. Polyurethane-based fire-resistant foam was used between the frame and the supporting construction. Intumescent acrylic sealant was used between the supporting construction and the jamb. PVC based sound seal was used at the rebated edge of the frame. Graphite-based fire and smoke seals were used at the frame, the contact points of the leaf. Polyurethane based adhesive was used between the jamb layers and also between the frame layers. Urea formaldehyde based adhesive was used between the jamb and natural wood veneer, and between the frame and natural wood veneer.

- *Type : Frame – MDF (First Layer); Nominal density: 748 kg/m³; Nominal thickness: 30 mm*
  - *MDF (Second Layer); Nominal density: 700 kg/m³; Nominal thickness: 18 mm*
  - *Natural wood veneer; Nominal density: 400 kg/m³; Nominal thickness: 0,5 + 0,5 mm (on both sides)*

  Jamb – MDF ; Nominal density: 700 kg/m³; Nominal thickness: 18 mm
  - *MDF ; Nominal density: 850 kg/m³; Nominal thickness: 4 mm*
  - *Natural wood veneer; Nominal density: 400 kg/m³; Nominal thickness: 0,5 + 0,5 mm (on both sides)*

- *Dimensions :*
  - *Frame studs : 35/54 x 121/178 x 2120/2180 mm (w x d x h)*
  - *Frame header : 35/54 x 121/178 x 972 mm (w x d x l)*
  - *Jamb studs : 90 x 18 x 2245/2273 (w x t x h)*
  - *Jamb header : 90 x 18 x 1084 mm (w x t x l)*
- *Filler :*
  - *Type : Polyurethane based fire-resistant foam – HAFELE – 003.52.318*
    - *Location : Used between the frame and the supporting construction.*
- *Sealant :*
  - *Type : Intumescent acrylic sealant – AKFİX*
    - *Location : Used between the supporting construction and the jamb.*
- *Seals :*
  - *Type : Graphite-based fire and smoke seal – HAFELE – 950.18.111*
    - *Dimensions : 15 x 4 mm (w x t)*
    - *Location : Used at the frame, the contact points of the leaf.*

– *Type : Graphite-based fire and smoke seal – HAFELE – 950.18.101*

o *Dimensions : 10 x 4 mm (w x t)*

o *Location : Used at the frame, the contact points of the leaf.*

– *Type : PVC based fire resistant roof type seal – HARMONY ACOUSTIC– 11301*

o *Dimensions : 12 x 12 mm (w x t)*

o *Location : Used at the rebated edge of the frame.*

- *Adhesive:*

– *Type : Urea formaldehyde based adhesive – KLEIBERIT– 871.5*

o *Consumption amount: 150 gr/m²*

o *Location : Used between the jamb and natural wood veneer.*

– *Type : Polyurethane based adhesive – KLEIBERIT – PUR-2400*

o *Consumption amount: 200 gr/m²*

o *Location : Used between the jamb layers.*

– *Type : Polyurethane based adhesive – KLEIBERIT– PUR-2400*

o *Consumption amount: 200 gr/m²*

o *Location : Used between the frame layers.*

– *Type : Urea formaldehyde based adhesive – KLEIBERIT– 871.5*

o *Consumption amount: 150 gr/m²*

o *Location : Used between the frame and natural wood veneer.*

For detailed information, see ***figures 1-7.***

3.3.2.2. Door Leaf:

The leaf consisted of MDF and was veneered with natural wood. Fire resistant wood chipboard was used inside the leaf. Solid chestnut was used left and right sides of the leaf. Fire resistant threshold seal was used at the bottom edge of the leaf. Urea formaldehyde based adhesive was used at the leaf; between the chipboard, MDF and natural wood veneer. Polyurethane based adhesive was used at the leaf; between the solid chestnut and chipboard, and between the solid chestnut and MDF.

- *Dimensions : 890 x 53 x 2145 mm (w x t x h)*

Outer surface: - MDF; Nominal density: 850 kg/m³; Nominal thickness: 4 + 4 mm (on both sides)

- Natural wood veneer; Nominal density: 400 kg/m³; Nominal thickness: 0,5 + 0,5 mm (on both sides)

- *Leaf weight: 64 kg (33,52 kg per m²)*
- *Inner surface:*
  - *Type : Fire resistant wood chipboard – STREBORD 44 – Manufacturer; FALCON PANEL PRODUCTS*
    - *Nominal thickness: 44 mm*
    - *Nominal density: 600 kg/m³*
    - *Location : Used inside the leaf. (See **figure 4 & figure 6)***
  - *Type : Solid chestnut*
    - *Dimensions : 44 x 5 mm (w x h)*
    - *Nominal density: 500 kg/m³*
    - *Location : Used at left and right sides of the leaf. (See **figure 4 & figure 6**)*
- *Seal :*
  - *Type : Threshold seal – HAFELE – 950.45.165*
    - *Dimensions : 30 x 13 mm (h x t)*
    - *Location : Used at the bottom edge of the leaf.*
- *Adhesive:*
  - *Type : Urea formaldehyde based adhesive – KLEIBERIT– 871.5*
    - *Consumption amount: 150 gr/m²*
    - *Location : Used at the leaf; between the chipboard, MDF and natural wood veneer.*
  - *Type : Polyurethane based adhesive – KLEIBERIT – PUR-2400*
    - *Consumption amount: 200 gr/m²*
    - *Location : Used at the leaf; between the solid chestnut and chipboard, and between the solid chestnut and MDF.*

*For detailed information, see **figure 1-7.***

3.3.2.3. Accessories:

- *Hinges :*

The leaf was hung on three hinges.

- *Type : Stainless steel leaf hinge – HAFELE – 927.91.356*
  - *Dimensions : (See **figure 8**)*
  - *Locations : Starting with 250 mm distance from the bottom of the door leaf to the center of the hinge, ctc. distances were 1100 mm and 600 mm, respectively.*

- *It was fixed by chrome screws with a dimension of 5 x 25 mm (ø x l).*
- *Insulation : Graphite based intumescent pad was used under the hinges. – SEALZ – 332679; Thickness: 1 mm*

- *Lock :*
  - *Type : Stainless steel card lock system – KALE – KD 040/80-625*
  - *Dimensions : (See **figure 10**)*
  - *Location : Used at 1000 mm from the bottom of the leaf.*
  - *Gap dimensions on the door leaf for the mortise part: 30/25 x 115 x 260/215 mm (w x d x h) (See **figure 12**)*
  - *Latch bolt dimension: (See **figure 10**)*
  - *Strike plate: (See **figure 10**)*
  - *It was fixed by steel screws with a dimension of 5 x 40 mm (ø x l).*
  - *Insulation : Graphite based intumescent pad was used under the lock. – SEALZ – 332679; Thickness: 1 mm*
- *Door closer :*
  - *Type : Steel concealed door closer HAFELE – 931.30.110*
  - *Dimensions : (See **figure 9**)*
  - *Location : Used at 80 mm from the edge of the door leaf.*
  - *Gap dimensions on the door leaf: 280 x 35 x 12 mm (w x d x l) (for closer plate) 242 x 35 x 80 mm (w x d x l) (for closer body) (See **figure 13**)*
  - *It was fixed by steel screws with a dimension of 5 x 35 mm (ø x l).*
  - *Insulation : Graphite based intumescent pad was used under the door closer – SEALZ – 332679; Thickness: 1 mm*

4. PRE-TEST PROCESSES

4.1. Verification of specimen

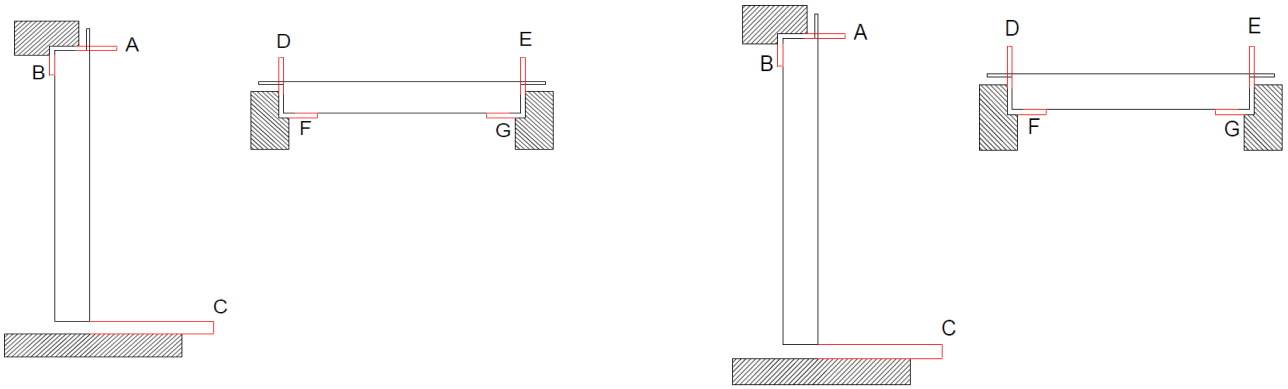
Efectis Era Avrasya A.S. randomly picked one of the two identical specimens delivered by the sponsor as the test specimen and kept the other one for further examination for each type. Materials and parts used on the test specimens and montage detail were verified against the data and drawings supplied by the customer, during installation.

The test specimen was assembled by the sponsor.

The functionality tests of the doors have been made before the fire resistance test by both laboratory and customer.

Brand, type, quantity and dimension information of the components, when it is not possible to be verified by the laboratory, are given according to the sponsor's declaration and the responsibility belongs to the sponsor. The test specimens are tested as received from the sponsor (when the laboratory does not carry out sampling).

4.2. Gap measurements



Dimensions in mm.

Door Nr.1	A	B	C	D	E	F	G
First	2,0	2,0	5,0	2,0	3,0	1,0	1,0
Second	2,0	2,0	6,0	2,0	2,0	2,0	2,0
Third	1,0	2,0	7,0	1,0	2,0	2,0	2,0
Door Nr.2	**A**	**B**	**C**	**D**	**E**	**F**	**G**
First	1,0	2,0	5,0	2,0	2,0	2,0	2,0
Second	2,0	1,0	6,0	2,0	2,0	2,0	2,0
Third	3,0	2,0	6,0	2,0	3,0	1,0	3,0

4.3. Self-closing test

The functionality tests of the door have been made before the fire resistance test by both the laboratory and customer.

Closing force of the Door Nr.1 : 16 N

Closing force of the Door Nr.2 : 17 N

The leaves of doors were submitted to 25 opening/closing operations under normal speed.
No visible disorder was noted after this test.

4.4. Direction of fire

The test was performed with hinges turning into the fire.

4.5. Conditioning

The construction was stored in the laboratory of Efectis Era Avrasya A.S. under the following conditions:

- Temperature : 26,44 ± 3,96 °C
- Relative humidity : %61,26 ± 13,74.

5. TEST PROCESS

5.1. Method

The fire test was conducted according to EN 1634-1:2014+A1:2018.
The heating of the furnace followed the standard fire curve, as specified in the EN 1363-1:2020.
The target overpressure in the furnace was 0 Pa at 500 mm above floor level and 20 Pa at the top of the test specimen.

5.2. Measurements

Following test data were measured during the test:

- Ambient temperatures inside the furnace with six plate thermocouples (Furnace TC1 to Furnace TC6), evenly distributed over the directly heated surface (**See figure A1**).
- Deviation of furnace temperature. (**See figure A2**).
- The pressure in the furnace, measured at a height of 2,9 meters above the furnace floor level (**See figure A3**).
- Ambient temperature in the laboratory (**See figure A4**).
- The surface temperatures on the unexposed side of the test specimen (TC3 up to TC36), (**See figure B2-B7**).
- There was no need to use the roving thermocouple
- The deformation of the test specimen (**See Figure B8-B9)**
- The positions of the thermocouple and displacement measurements are given in figure **B1**.

6. OBSERVATIONS

Table 1: Observations during heating.

0	The heating was started.
3	Smoke release between the leaf and the frame for the doors.
15	Smoke release from the lock area.
30	No considerable change was observed.
35	The opening has occurred between the leaf and the frame at the top right corner of the Door Nr.2. Cotton pad was applied to the opening, no flaming.
44	The opening has occurred between the leaf and the frame at the top left corner of the Door Nr.1. Cotton pad was applied to the opening, no flaming.
45	No considerable change was observed.
46	Sustained flaming between the leaf and the frame at the top left corner, of the Door Nr.1, **tf ≥10 s. Integrity (E) failed for the Door Nr.1.**
49	Temperature increased at the thermocouple Nr.12, **ΔT ≥ 180 °C. Insulation (I) failed for the Door Nr.2.**
49	Sustained flaming between the leaf and the frame at the top right corner, of the Door Nr.2, **tf ≥10 s. Integrity (E) failed for the Door Nr.2.**
50	The test was terminated 50th minutes after consultation with the sponsor.

tr: Flaming time (second)

7. TEST RESULTS

7.1 Results

The results are given in Table 2 and appendixes B and C.

During the heating, the temperature in the laboratory complied with the EN 1363-1:2020.

7.2 Uncertainty of measurements

Due to the nature of fire resistance testing, in which several non-linear effects are present in both the test configuration and the test specimen, which influence each other, it is at this moment not yet possible to give a stated degree of uncertainty of measurement.

8. SUMMARY

The most important results of the examination are given in table 2.

Table 2: Summary of test results of the test specimen

	Door Nr.1.	Door Nr.2.
Integrity, (**E**)		
– Cotton pad	no failure (not applied)	no failure (not applied)
– Gap gauges ∅ 6 mm	no failure (not applied)	no failure (not applied)
∅ 25 mm	no failure (not applied)	no failure (not applied)
– Flames longer than 10 sec.	46th minute	49th minute
Insulation, **[I]**		
– average temperature	46th minute (due to the failure of integrity.)	49th minute (due to the failure of integrity.)
– maximum temperature	46th minute – I_1 (due to the failure of integrity.) 46th minute – I_2 (due to the failure of integrity.)	49th minute – I_1 – Surface TC 12 49thminute – I_2 (due to the failure of integrity.)
The test was terminated at 50th minute after consultation with the sponsor.		

9. FIELD OF DIRECT APPLICATION OF TEST RESULTS

9.1 General

This report details the method of construction, the test conditions and the results obtained when the specific elements of construction described herein were tested following the procedure outlined in EN 1363-1:2020, and when appropriate EN 1363-2:1999. Any significant deviation with respect to size, constructional details, load 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.

Except if otherwise specified hereafter, the design of the door-unit shall be identical to that of the test specimen. It is not allowed to modify the number of door leaves and the operating mode (e.g., swing door or pivoted door, single or double acting door).

9.2 Specific Restrictions Concerning Materials and Structures

9.2.1. Timber constructions

It is not allowed to decrease the thickness of the door leaf or leaves but it is allowed to increase provide increase in weight up to 25%.

It is not allowed to change the composition (e.g., type of resin) of timber-based products (e.g., particle board, block board etc.).

It is not allowed to reduce dimensions and/or the density of the timber frames but it is allowed to increase dimensions and/or the density of the timber frames.

9.2.2. Decorative coatings

9.2.2.1. Paint

Where the paint finish is not expected to contribute to the fire resistance of the door, alternative paints are acceptable and can be added to door leaves or frames for which unfinished test specimens were tested. Where the paint finish contributes to the fire resistance of the door (e.g., intumescent paints) then no change is allowed.

9.2.2.2. Timber veneers

Decorative laminates and timber veneers up to 1,5 mm thickness are allowed to be added to the faces (but not the edges) of leaves and frames in door-sets which satisfy the insulation criteria (Allowed for only: Door Nr.1: **$EI_1$45, $EI_2$45**; Door Nr.2: **$EI_1$45, $E_2$45**).

9.2.3. Fixings

It is permitted to increase the number of fasteners used to attach the fire-resistant doors onto the supporting structures but it is not allowed to be reduced, and it is allowed to reduce the distance between the fasteners but it is not allowed to be increased.

9.2.4. Hardware

It is allowed to increase the number of movement-limiting devices such as hinges but it is not allowed to be reduced.

Where self-closing characteristics are not required, it is allowed to remove closing device.

9.3 Permissible Size Variations

9.3.1 General

Doors with dimensions which are different from those of the test specimens shall be permitted within some extent, but variations depend on the type of product and on the time during which the fire resistance criteria are met.

The increase and decrease of dimensions permitted by the field of direct application are applicable to the overall size of each leaf, each side panel, each transom panel and each over panel independently and including ant rebates which may be present on the leaf or panel.

The limits of permitted size variation are given in Annex B of the standard EN 1634-1:2014+A1:2018.

9.3.2 Dimension variations according to the type of product

9.3.2.1. Permissible dimension variations of the leaf

The amount of variation of size permitted is dependent on whether the classification time was just reached (category 'A') or whether an extended time (category 'B' overrun) in accordance with the following values was fulfilled before the test was concluded.

Classification time	All performance criteria fulfilled for at least
15 minutes	18 minutes
20 minutes	24 minutes
30 minutes	36 minutes
45 minutes	52 minutes
60 minutes	68 minutes

Consequently, increase of the dimension is only valid in case of related performance about "Category B overrun" is achieved in Clause 8, Table 2.

The 'Category A' and 'Category B' classifications of the samples "AK-03 & AK-02" is given in the classification report (EEA-22-054).

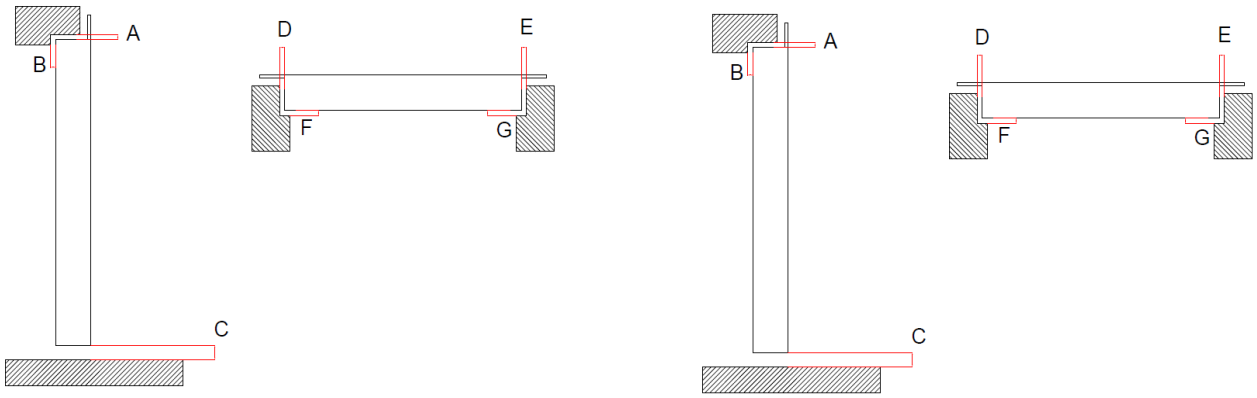
a) Category A classification:

Unlimited size reduction is permitted for all types of hinged and pivoted door sets except insulated metal doors where a reduction to 50 % width and 75 %height is the limit of variation and both insulated and non-insulated door sets with asymmetrical sized door leaves where reduction to 50 % width and height is the limit of variation.

b) Category B classification:

	Door Nr.1		Door Nr. 2	
Overall dimension of the leaf	**Min.**	**Max.**	**Min.**	**Max.**
Height	Unlimited	2466,75 mm (%15)	Unlimited	2466,75 mm (%15)
Width	Unlimited	1023,5 mm (%15)	Unlimited	1023,5 mm (%15)
Area	-	2,29 m^2 (%20)	-	2,29 m^2 (%20)

Size increases are only allowed for the door-sets provided that used with the gaps indicated in the table below:



	Average measured	Maximum measured	Practical maximum allowed
	Door Nr.1		
A	1,7	2,0	3,83
B	2,0	2,0	4,00
C	6,0	7,0	8,50
D	1,7	2,0	3,83
E	2,3	3,0	4,67
F	1,7	2,0	3,83
G	1,7	2,0	3,83
	Average measured	**Calculated maximum value**	**Practical maximum allowed**
	Door Nr.2		
A	2,0	3,0	4,50
B	1,7	2,0	3,83
C	5,7	6,0	7,83
D	2,0	2,0	4,00
E	2,3	3,0	4,67
F	1,7	2,0	3,83
G	2,3	3,0	4,67

Dimensions in mm

9.3.2.2. Other changes

For doors with smaller dimensions, the relative position of the movement-limiting devices (e.g., hinges, bolts, etc.) shall remain identical to that of the test specimen, or any modification in the distance between them shall be limited to the same reduction percentage as the dimension reduction of the test specimen.

It is not allowed to change the relative position of the movement-limiting devices (Hinges, bolts, etc.). It is permitted to modify the distance with the same percentage for the reduction of the test specimen.
For larger door set sizes the following also must be applied (Category B):
1) The height of the latch above floor level must be equal to or greater than the tested height, and the maximum of any change in height must be proportional to the increase in door set height;
2) The distance of the top hinge from the top of door leaf must be equal to or less than that tested;
3) The distance of the bottom hinge from bottom of door leaf must be equal to or less than that tested.
4) For three hinges or distortion preventers are used, the distance between bottom of the door leaf and center restraint must be equal to or greater than tested.

9.3.2.3. Timber construction

It is not allowed to change the number, size, location and orientation of any joints in the timber framing.

It is not allowed to substitute with alternatives of lesser thickness or strength for decorative timber veneers that have more than 1.5 mm thick or other claddings which themselves provide constructive benefits are part of the test specimen.

9.4 Direction of Fire

The fire resistance behavior specified in section 8 of this test report shall be valid for only the following direction of fire:

Door Nr.1 :

- Integrity : Opening into the fire and away from the fire.*
- Thermal insulation : Opening into the fire and away from the fire.*

Door Nr.2 :

- Integrity : Opening into the fire and away from the fire.*
- Thermal insulation : Opening into the fire and away from the fire.*

* Classifications for the direction “opening away from the fire” is valid as long as the conditions below are met:

- That each of the door leaves are themselves of symmetrical construction with the exception of the edges (e.g., lock/leading edge and hinge edge or double rebated doors)
- That any restraining/supporting elements of building hardware has been included in a test to EN 1634-1 when exposed in both directions so that they will retain their function when exposed to the heat of the test
- That there is no change in the number of leaves or the mode of operation (e.g., sliding, swinging, single action or double action)
- That side, over and transom panels are excluded from Table 2 unless they are fully symmetrical.

9.5 Supporting Construction

Rigid block with a nominal gross dry density of at least 400 kg/m^3, having a thickness of at least 180 mm.
Flexible construction (partition wall) with a minimum EI45 for the Door Nr.1 & Door Nr.2 classification for door according to EN 13501-2 standard.

10. DRAWINGS

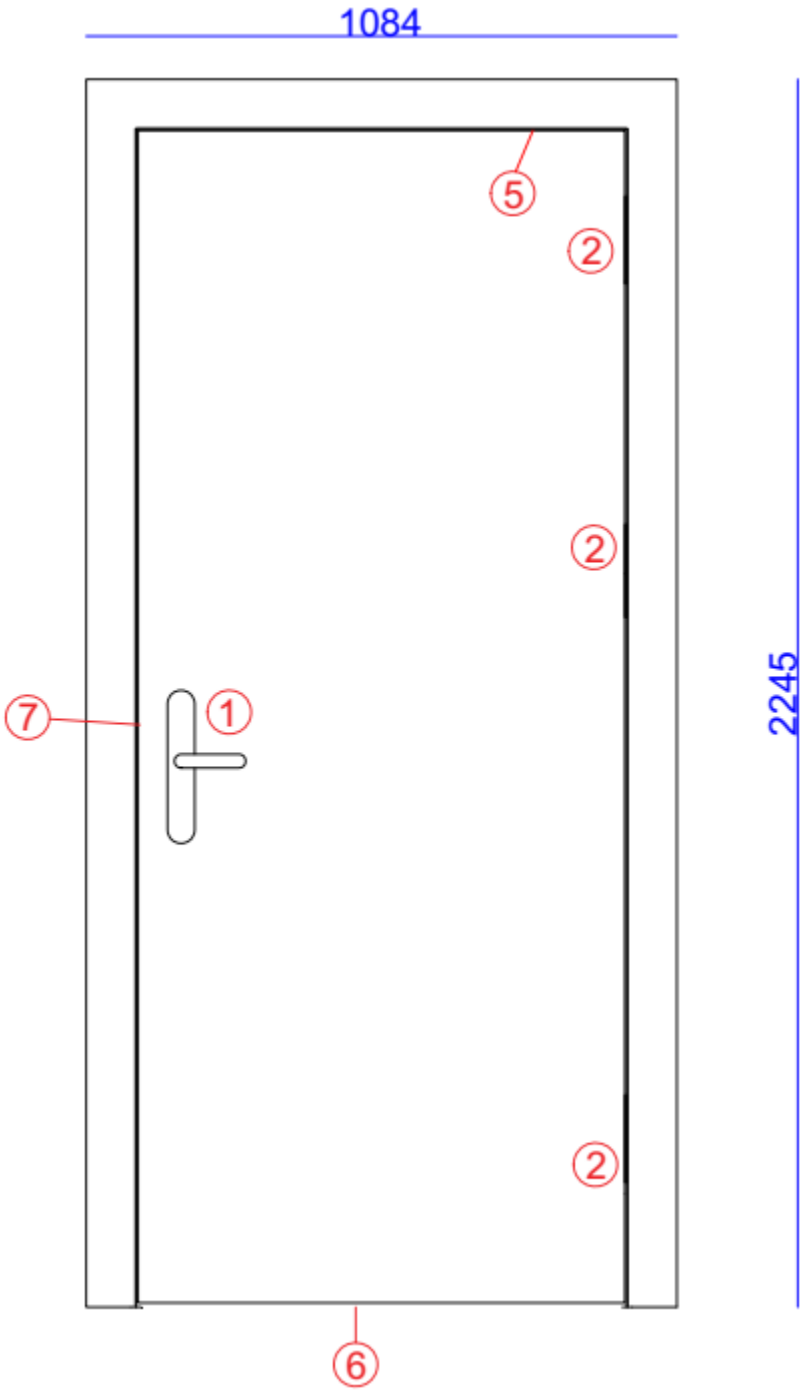


Figure 1: Unexposed side view of the Door Nr.1 and the Door Nr.2.

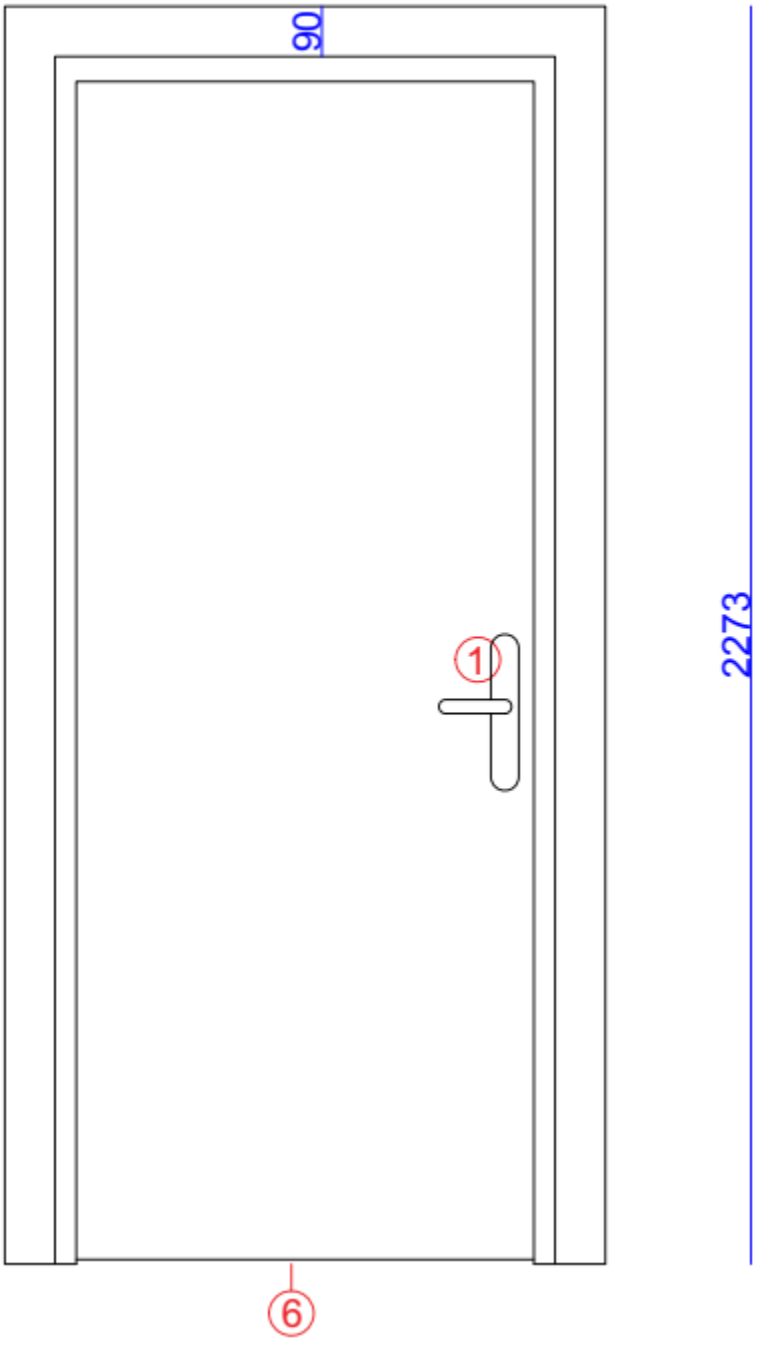


Figure 2: Exposed side view of the Door Nr.1 and the Door Nr.2.

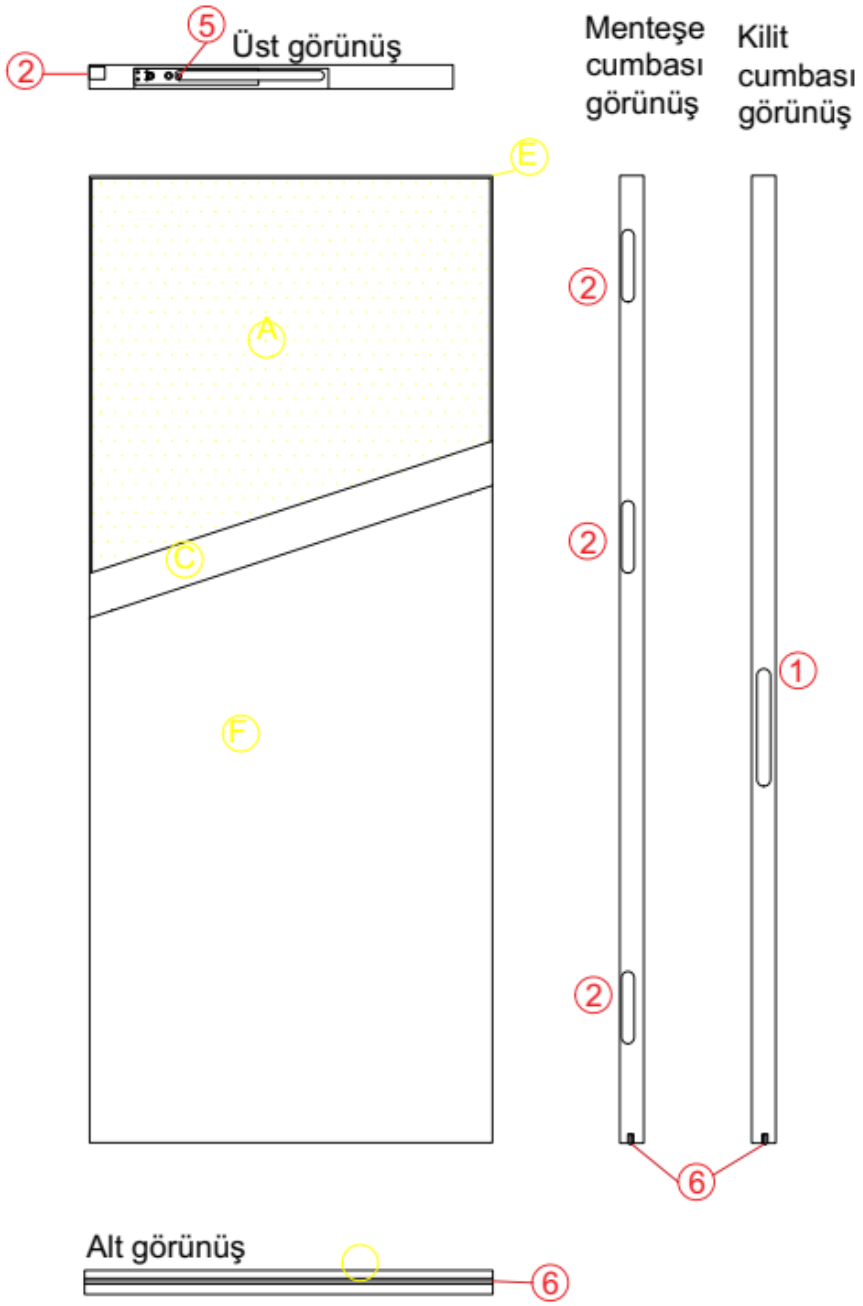


Figure 3: Leaf details of the Door Nr.1 and the Door Nr.2.

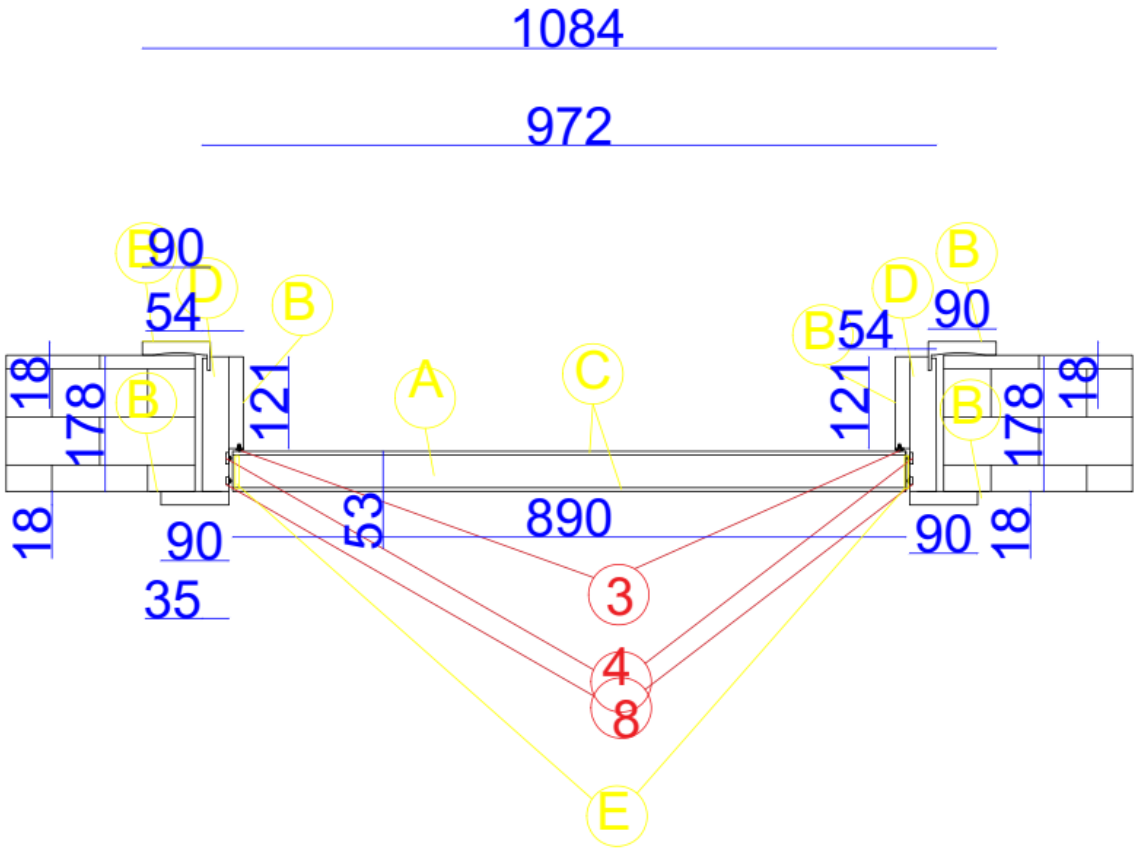


Figure 4: Cross-section view of the Door Nr.1 and the Door Nr.2.

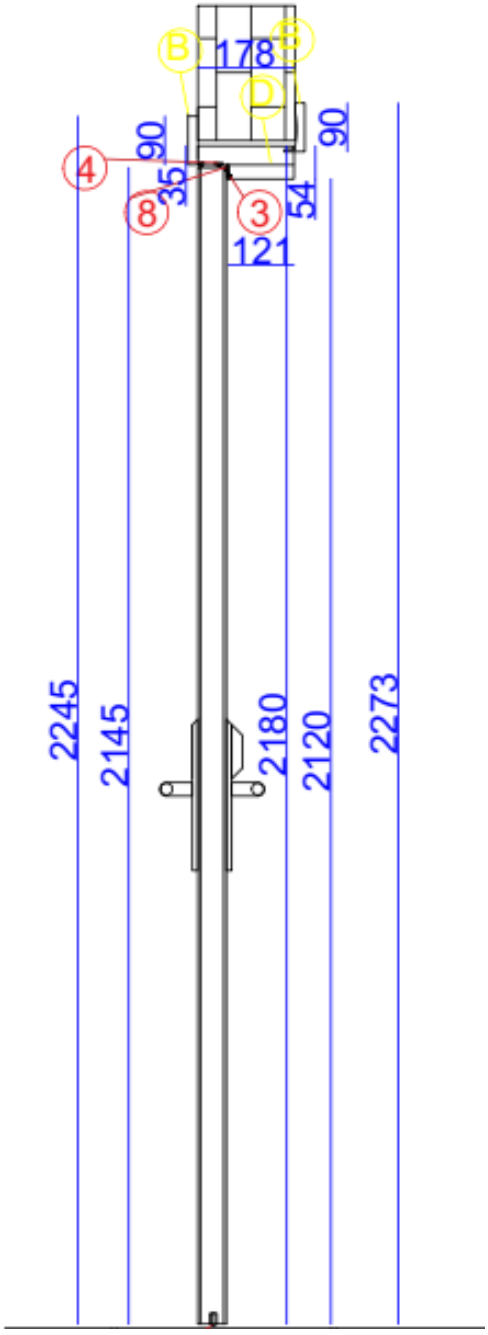


Figure 5: Vertical section view of the Door Nr.1 and the Door Nr.2.

MALZEME LİSTESİ

A 44 mm SUNTA (FALCON PANEL PRODUCTS ,STREBORD 600kg /M3)
B 18 mm MDF (YILDIZ ENTEGRE MARKA 700 kg/m3)
C 4 mm MDF (YILDIZ ENTEGRE MARKA 850 kg/m3)
D 30 mm MDF (YILDIZ ENTEGRE MARKA 748 kg/m3)
E 44 x 5 mm KESTANE MASİF (450-500 kg/m3)
F DOĞAL AHŞAP KAPLAMA (0,5 mm 400 KG/M3)
H PERVAZ VE DOĞAL KAPLAMA ARASI KLEIBERIT MARKA 750.6 PO HOTMELT TUTKAL
J PERVAZDA 18 mm VE 4 mm MDF ARASI KLEIBERIT MARKA 779.6 EVA HOTMELT TUTKAL
K KASADA 30 mm VE 18 mm MDF ARASI KLEBTH MARKA PUR-2400 TUTKAL
L KASA VE DOĞAL KAPLAMA ARASI KLEIBERIT MARKA 871.5 ÜREFORMALDEHİT TOZ TUTKAL
M KANATDA SUNTA,MASİF VE 4mm MDF VE 0.6 mm LAMİNAT ARASI KLEIBERIT MARKA 871.5 TOZ .....ÜREFORMALDEİT TUTKAL
N KANAT MASİF YAPIŞTIRMADA KLEBTH MARKA PUR-2400 TUTKAL

AKSESUAR LİSTESİ:

① KOLVE KİLİT (NEFLOCK MARKA RF8008 KODLU) , KİLİT PYROPLEX YALITIM .....ŞİLTESİ İLE SARILMIŞTIR)
② MENTEŞE (HAFELE MARKA DCH 80K GİZLİ MAT NİKEL 927.91.356) 5x25 krom vida PYROPLEX YALITIM .....ŞİLTESİ İLE SARILMIŞTIR)

③ SES FİTİLİ (HAFELE MARKA 12mm KOD: 950.48.101)
④ DUMAN FİTİLİ (HAFELE 4X15 mm kod:950.18.111)
⑤ KAPI KAPATICI (HAFELE MARKA DC302 F EN3 ,GÜMÜŞ 931.30.110) KAPATICI PYROPLEX YALITIM ŞİLTESİ .....İLE SARILMIŞTIR
⑥ GİYOTİN (HAFELE MARKA ZONE 60 950.45.165)
⑦ KİLİT KARŞILIĞI (KALE MARKA kod:KD 040/80-625)
⑧ DUMAN FİTİLİ (HAFELE 4X10 mm kod: 950.18.101)

Figure 6: Material details of the Door Nr.1.

MALZEME LİSTESİ

A 44 mm SUNTA (FALCON PANEL PRODUCTS ,STREBORD 600kg /M3)
B 18 mm MDF (YILDIZ ENTEGRE MARKA 700 kg/m3)
C 4 mm MDF (YILDIZ ENTEGRE MARKA 850 kg/m3)
D 30 mm MDF (YILDIZ ENTEGRE MARKA 748 kg/m3)
E 44 x 5 mm KESTANE MASİF (450-500 kg/m3)
F DOĞAL AHŞAP KAPLAMA (0,5 mm 400 KG/M3)
H PERVAZ VE DOĞAL KAPLAMA ARASI KLEIBERIT MARKA 750.6 PO HOTMELT TUTKAL
J PERVAZDA 18 mm VE 4 mm MDF ARASI KLEIBERIT MARKA 779.6 EVA HOTMELT TUTKAL
K KASADA 30 mm VE 18 mm MDF ARASI KLEBTH MARKA PUR-2400 TUTKAL
L KASA VE DOĞAL KAPLAMA ARASI KLEIBERIT MARKA 871.5 ÜREFORMALDEHİT TOZ TUTKAL
M KANATDA SUNTA,MASİF VE 4mm MDF VE 0.6 mm LAMİNAT ARASI KLEIBERIT MARKA 871.5 TOZ .....ÜREFORMALDEİT TUTKAL
N KANAT MASİF YAPIŞTIRMADA KLEBTH MARKA PUR-2400 TUTKAL

AKSESUAR LİSTESİ:

① KOLVE KİLİT (KALE MARKA kod:KD 040/80-625) , KİLİT PYROPLEX YALITIM .....ŞİLTESİ İLE SARILMIŞTIR)
② MENTEŞE (HAFELE MARKA DCH 80K GİZLİ MAT NİKEL 927.91.356) 5x25 krom vida PYROPLEX YALITIM .....ŞİLTESİ İLE SARILMIŞTIR)

③ SES FİTİLİ (HAFELE MARKA 12mm KOD: 950.48.101)
④ DUMAN FİTİLİ (HAFELE 4X15 mm kod:950.18.111)
⑤ KAPI KAPATICI (HAFELE MARKA DC302 F EN3 ,GÜMÜŞ 931.30.110) KAPATICI PYROPLEX YALITIM ŞİLTESİ .....İLE SARILMIŞTIR
⑥ GİYOTİN (HAFELE MARKA ZONE 60 950.45.165)
⑦ KİLİT KARŞILIĞI (KALE MARKA kod:KD 040/80-625)
⑧ DUMAN FİTİLİ (HAFELE 4X10 mm kod: 950.18.101)

Figure 7: Material details of the Door Nr.2.

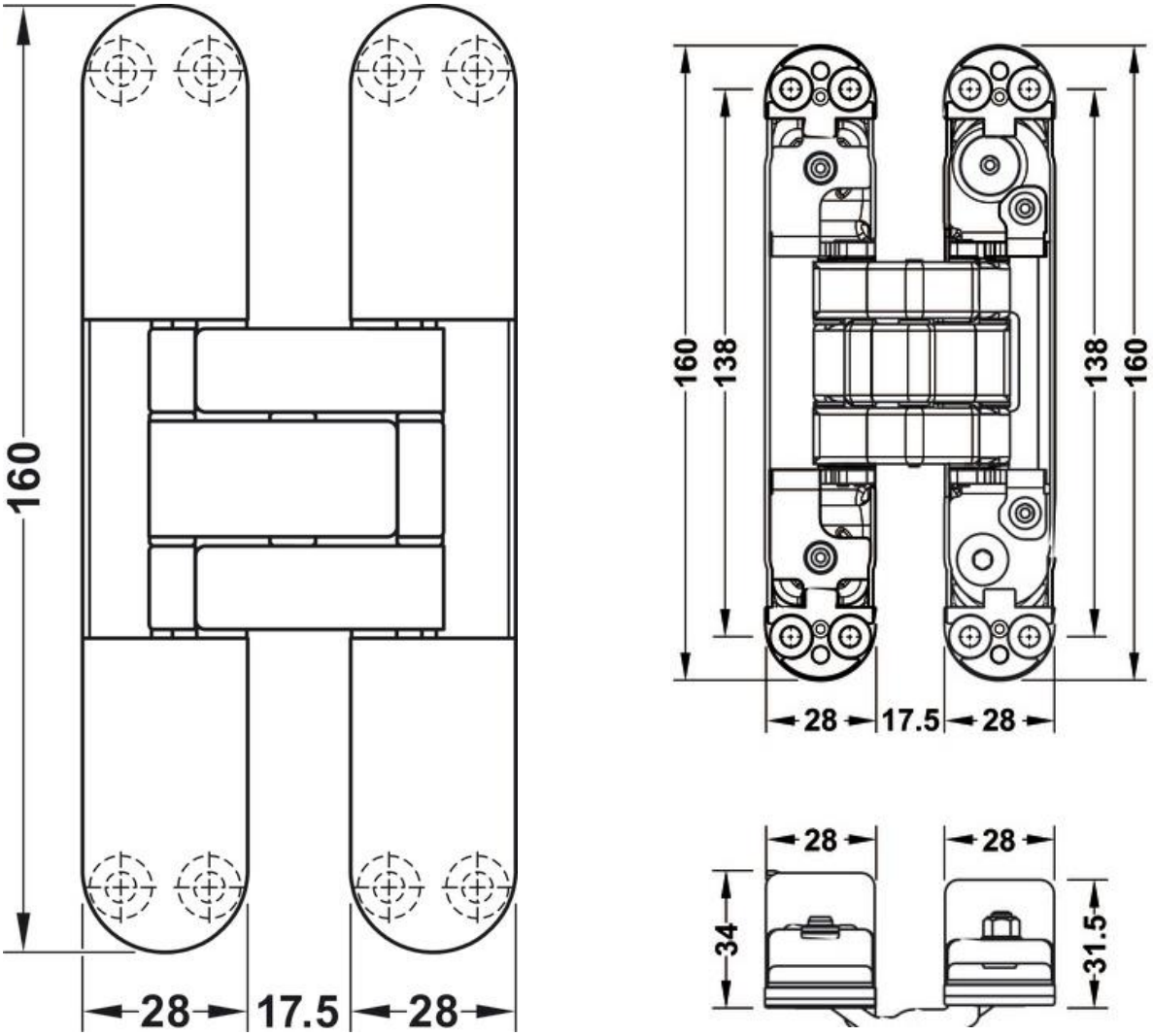


Figure 8: Detail of the hinge was used at the doors.

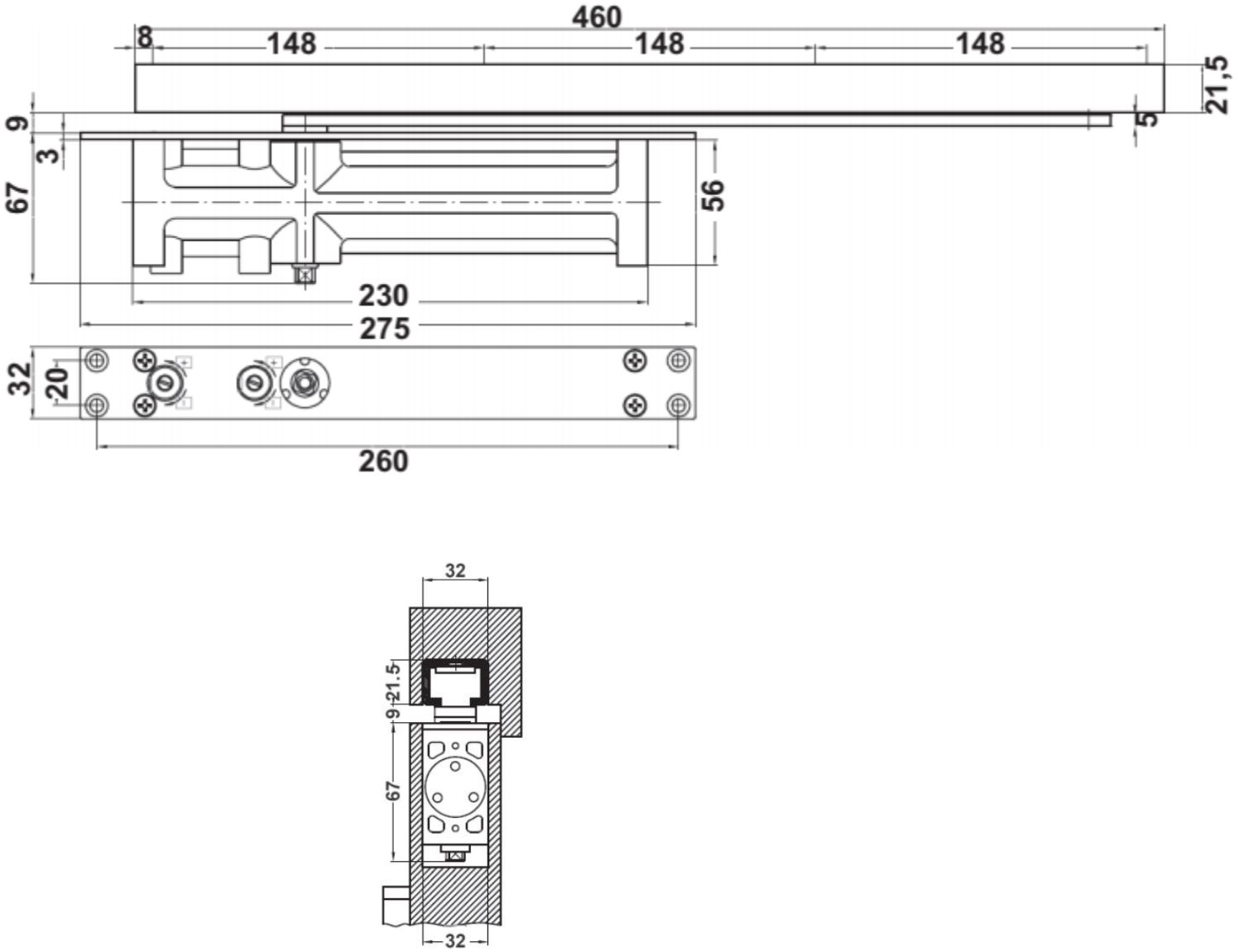


Figure 9: Detail of the door closer was used at the door.

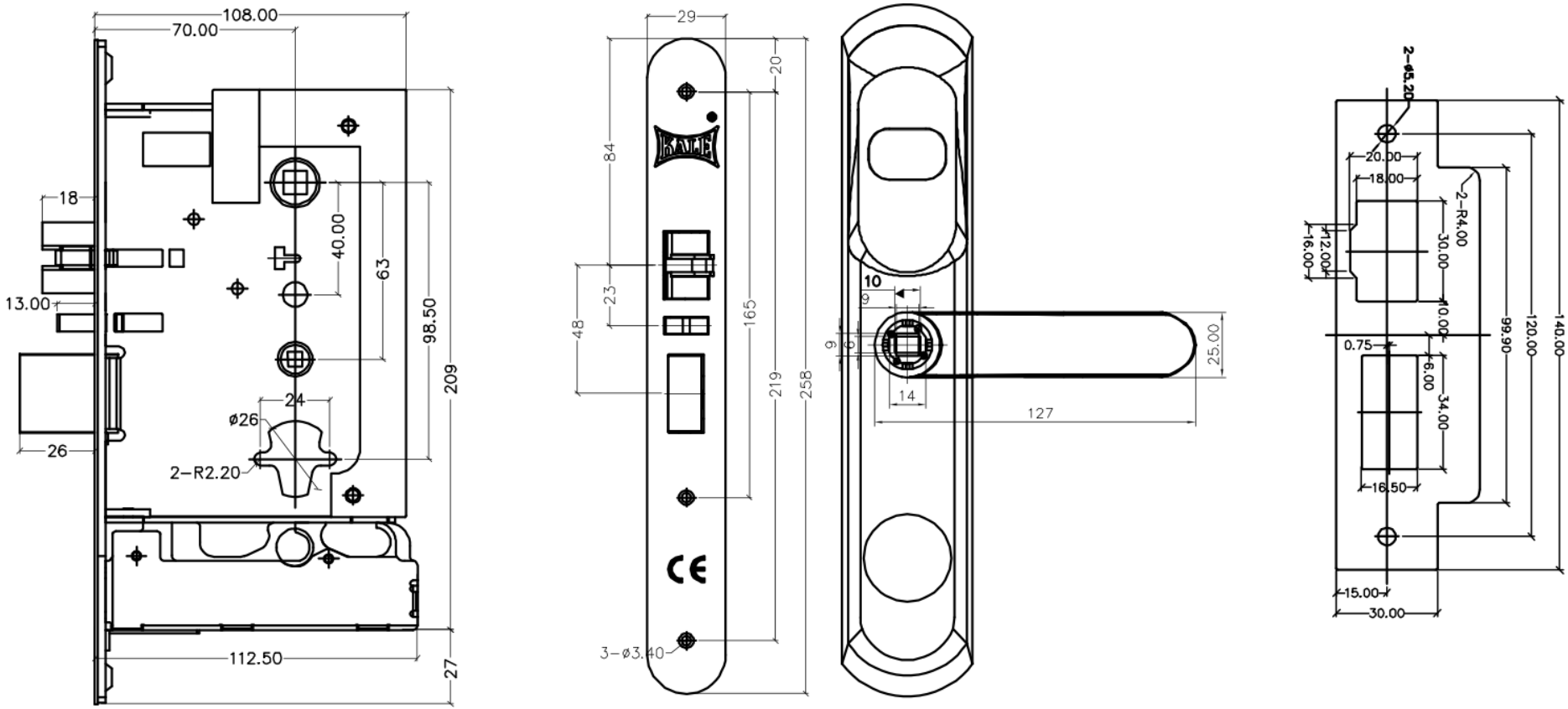


Figure 10: Detail of the card lock was used at the Door Nr.2.

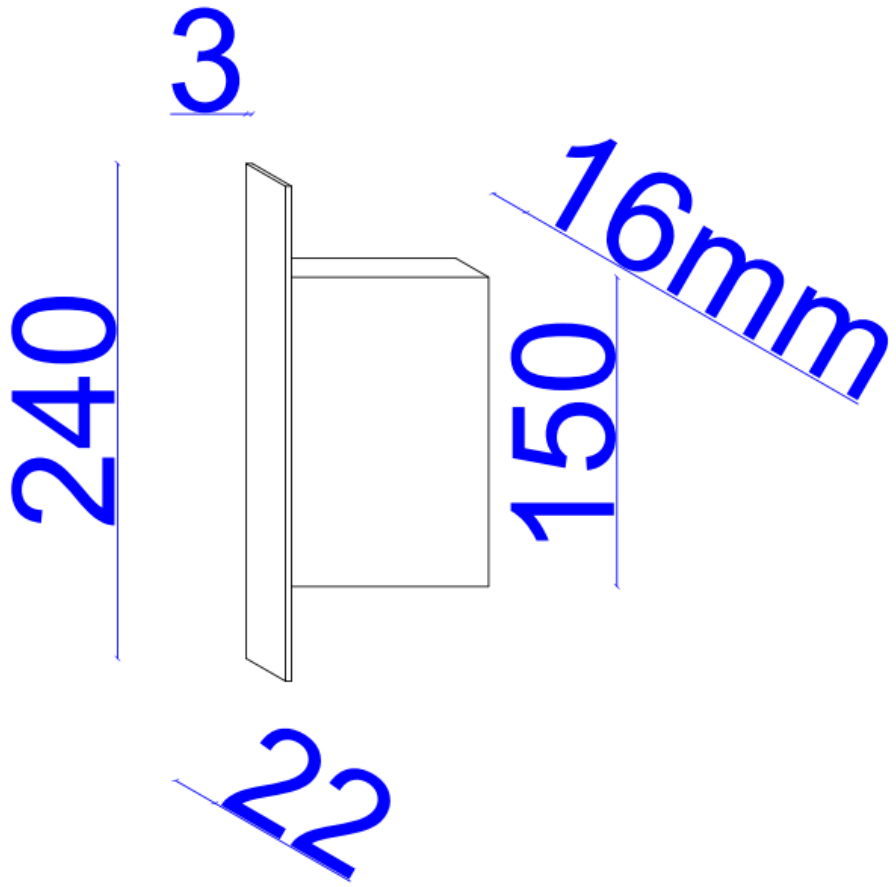


Figure 11: Door leaf lock gap for Door No. 1.

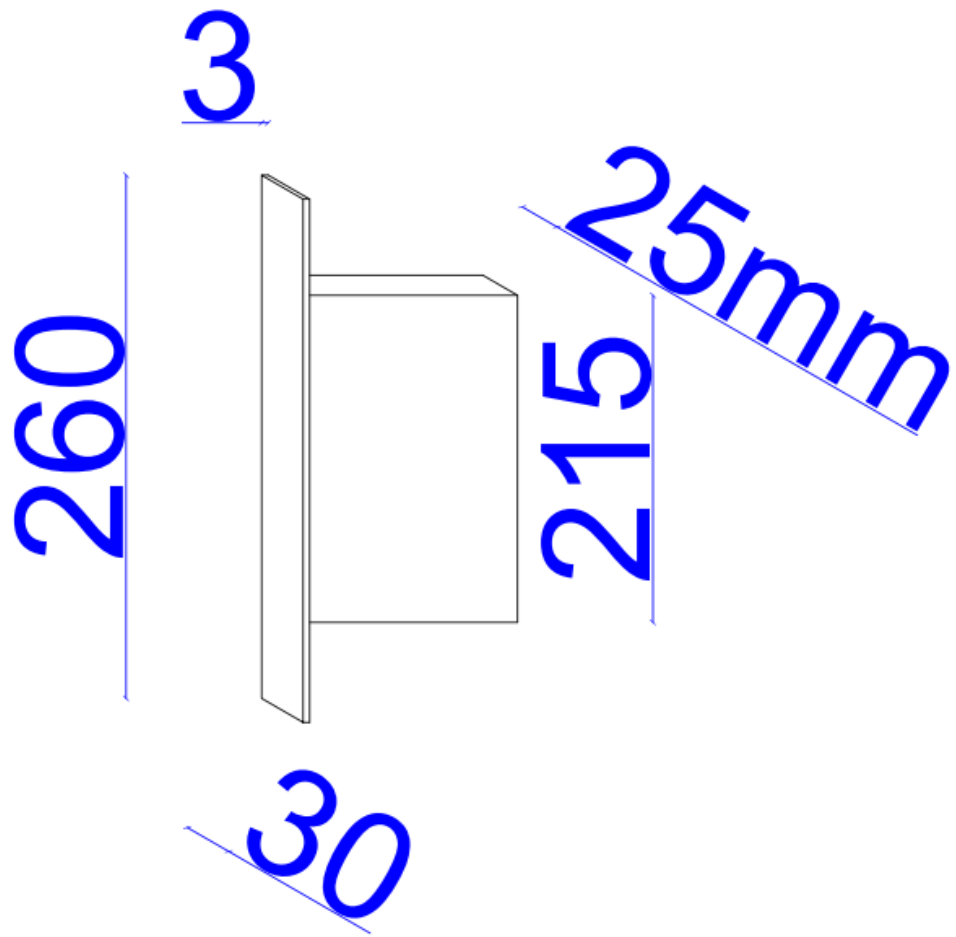


Figure 12: Door leaf lock gap for Door No. 2.

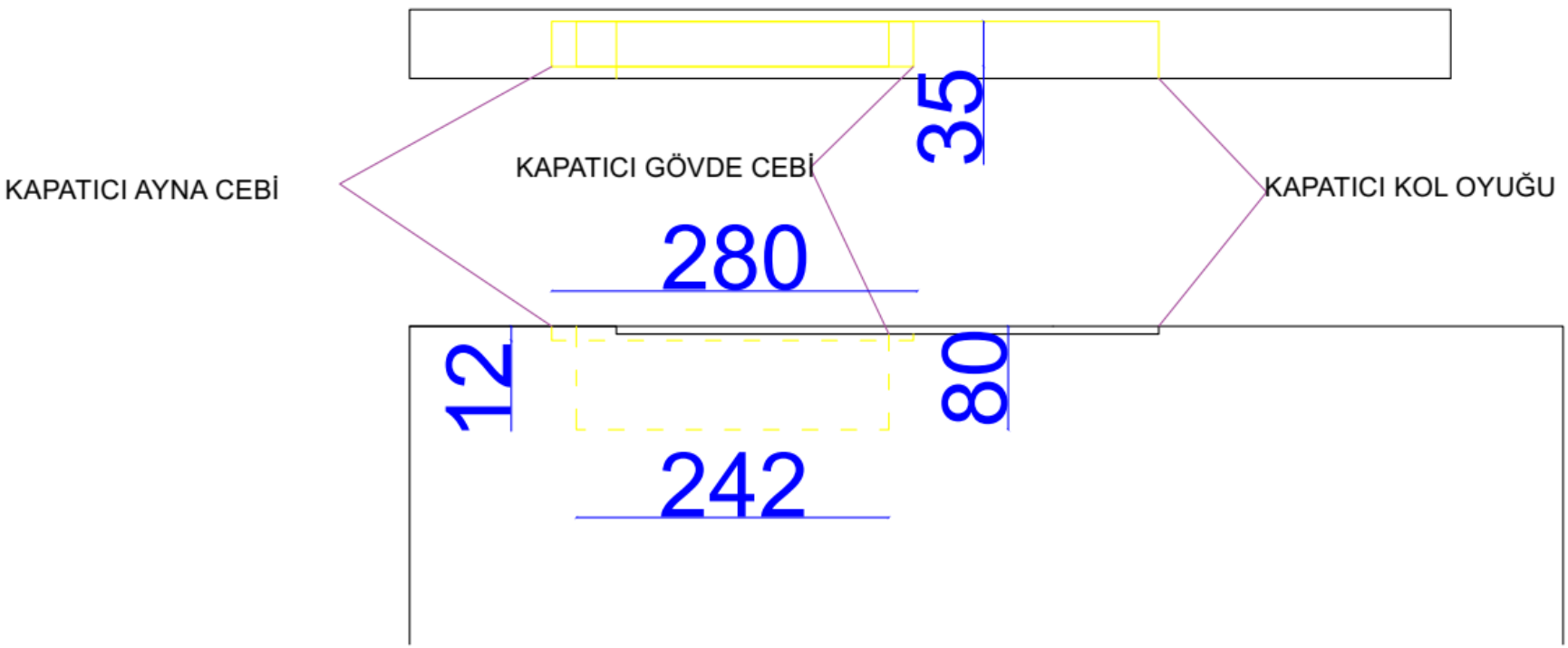


Figure 13: Door leaf closer gap for Door No. 1 and Door No. 2.

APPENDIXES:

Appendix A: Furnace and laboratory conditions

Appendix B: Test results

Appendix C: Photos

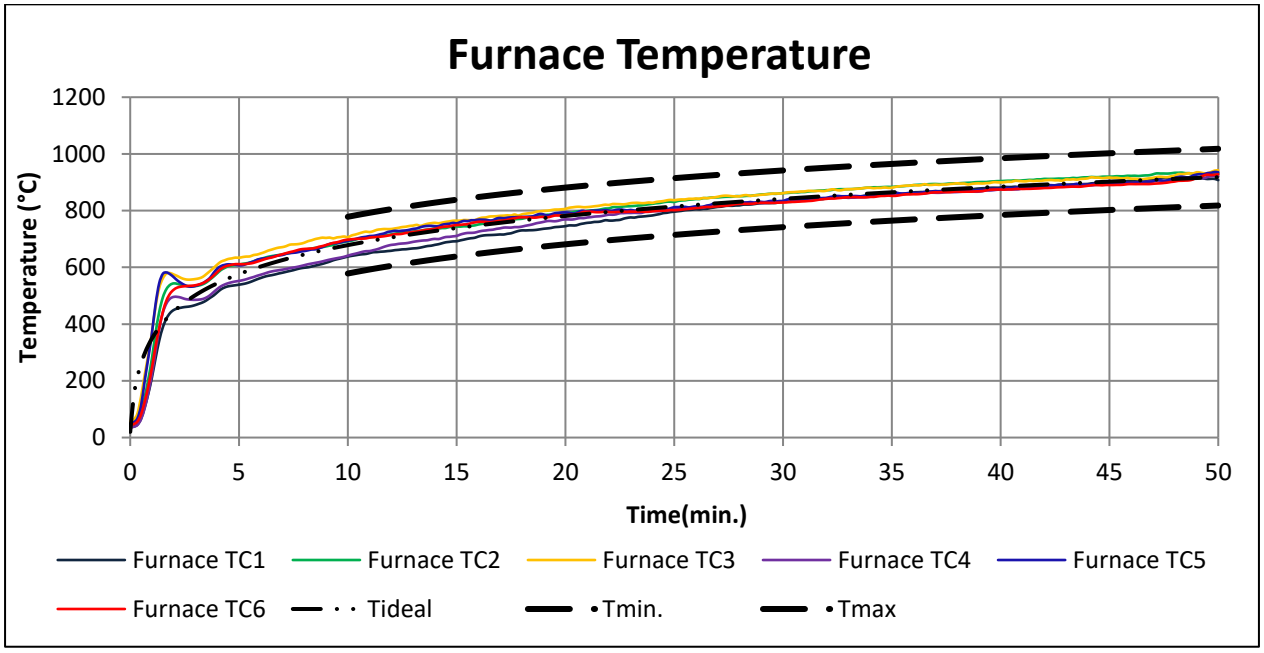


Figure A1: Furnace Temperatures

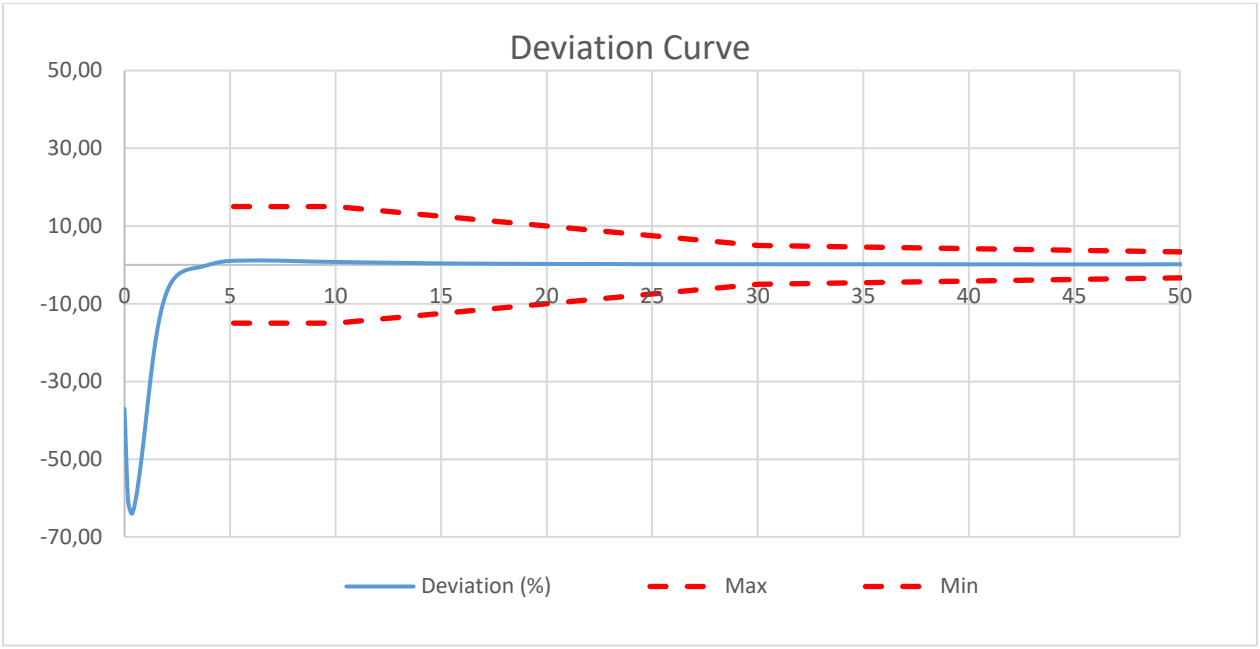


Figure A2: Deviation of furnace temperatures.

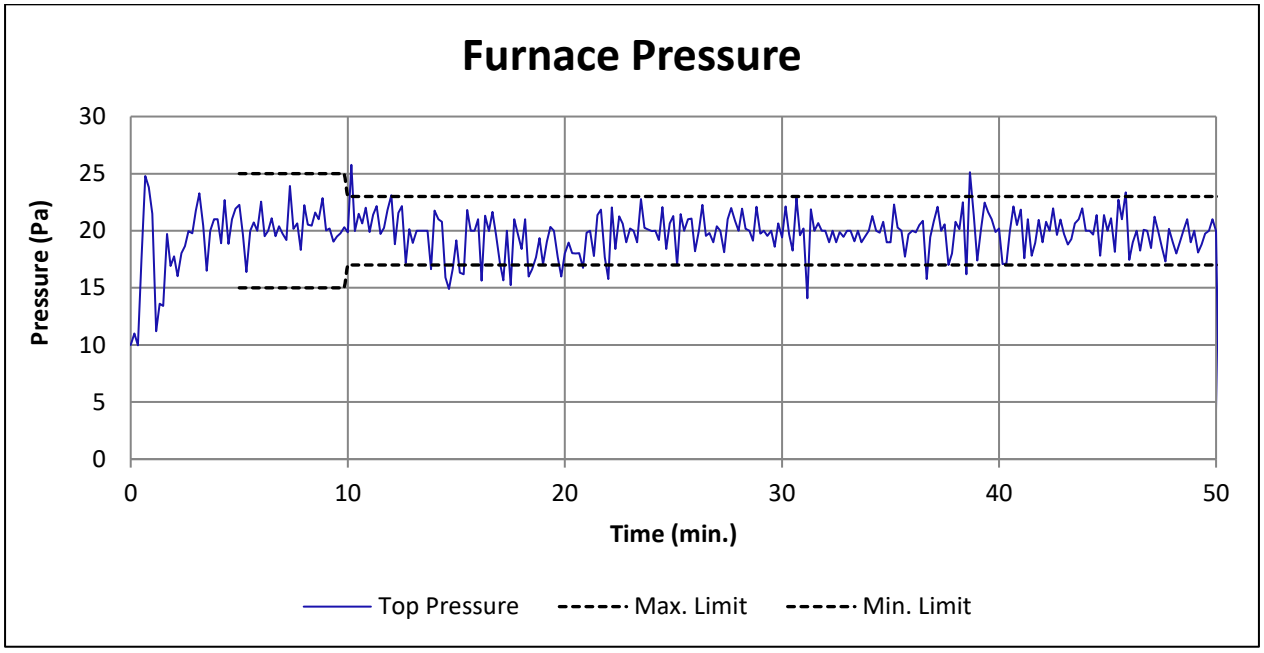


Figure A3: Pressure in the furnace

**Short-term deviations and peaks in furnace pressure were caused by deformations on the specimen and variations in ambient conditions of the laboratory.*

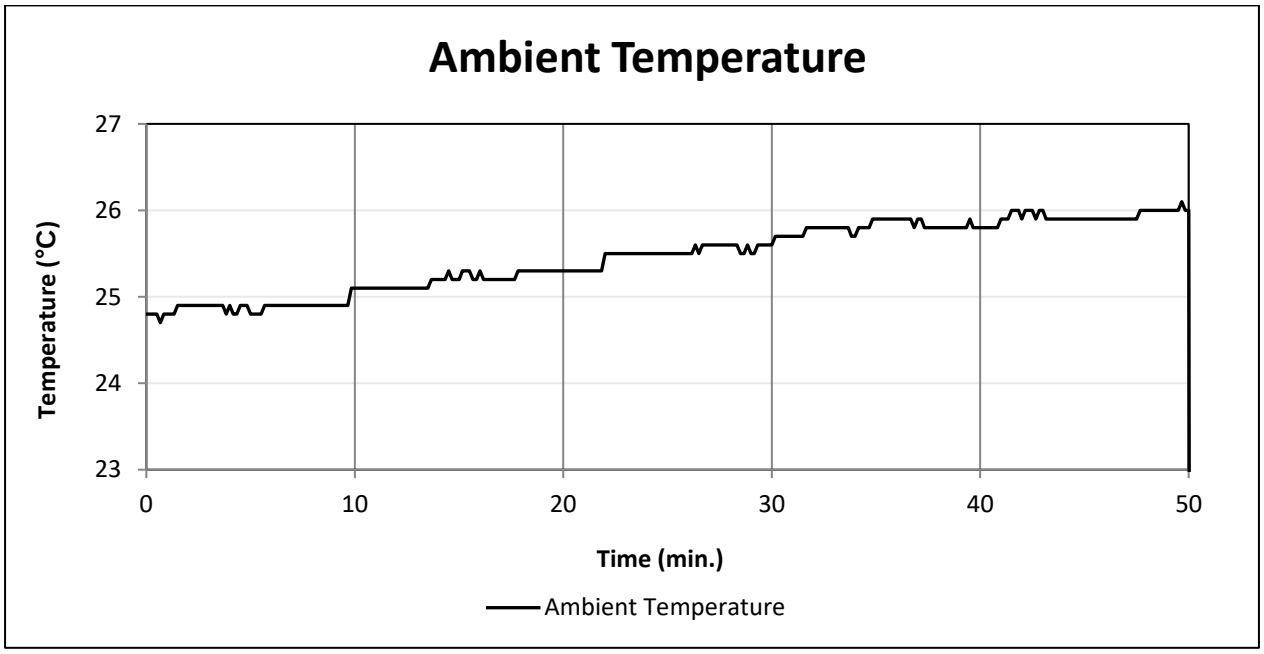


Figure A4: Ambient temperature at laboratory.

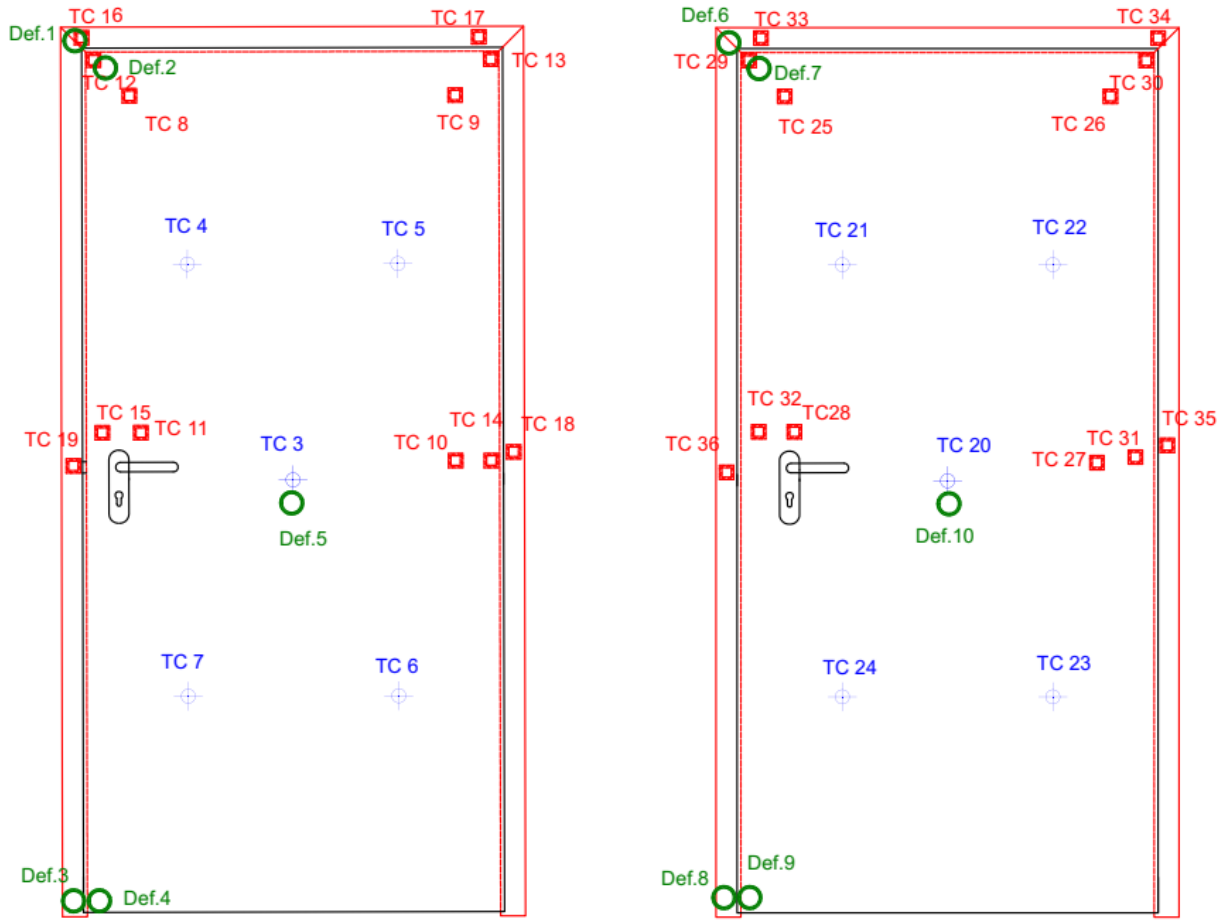


Figure B1: Locations of thermocouples and deflection sensors.

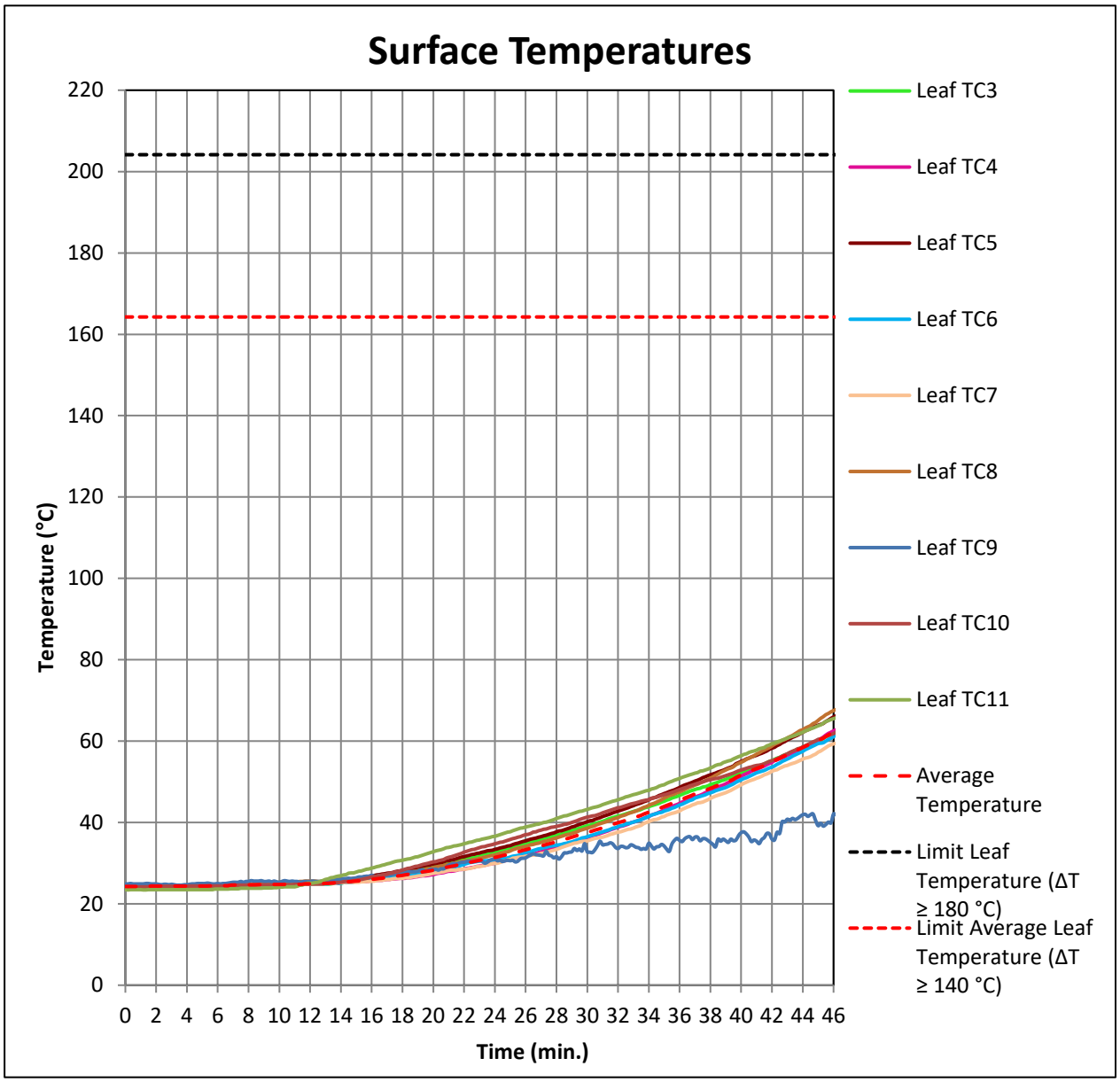


Figure B2: Surface temperatures for the Door Nr.1 (Leaf TC3 – Leaf TC11, Average temperature, Limit Leaf Temperature, and Limit Average Temperature).

* Integrity of the Door Nr.1 failed at 46th minutes.

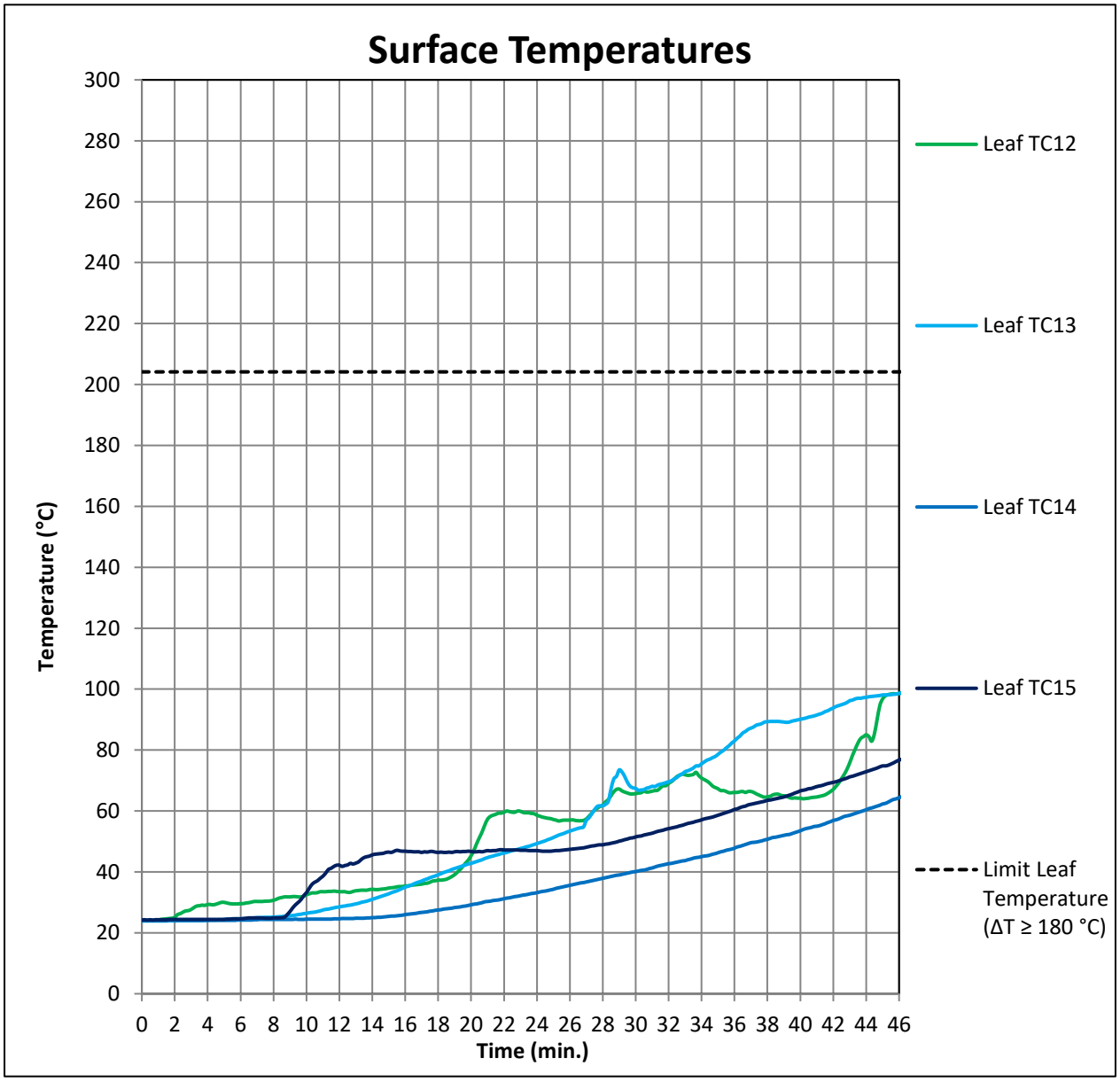


Figure B3: Surface temperatures for the Door Nr.1 (Leaf TC12 – Leaf TC15 and Limit Leaf Temperature).

* Integrity of the Door Nr.1 failed at 46th minutes.

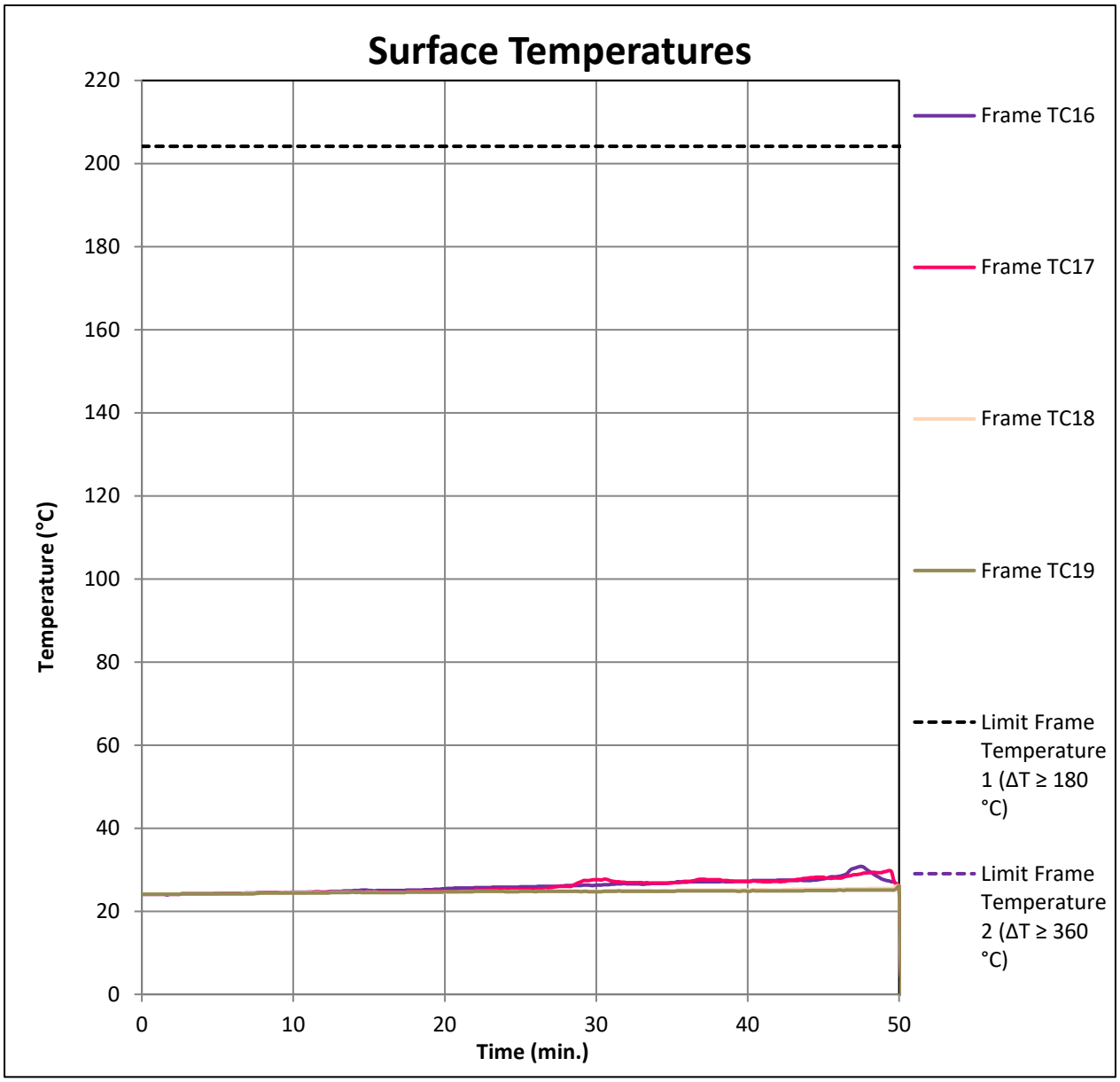


Figure B4: Surface temperatures for the Door Nr.1 (Frame TC16– Frame TC19 and Limit Frame Temperatures).

* Integrity of the Door Nr.1 failed at 46th minutes.

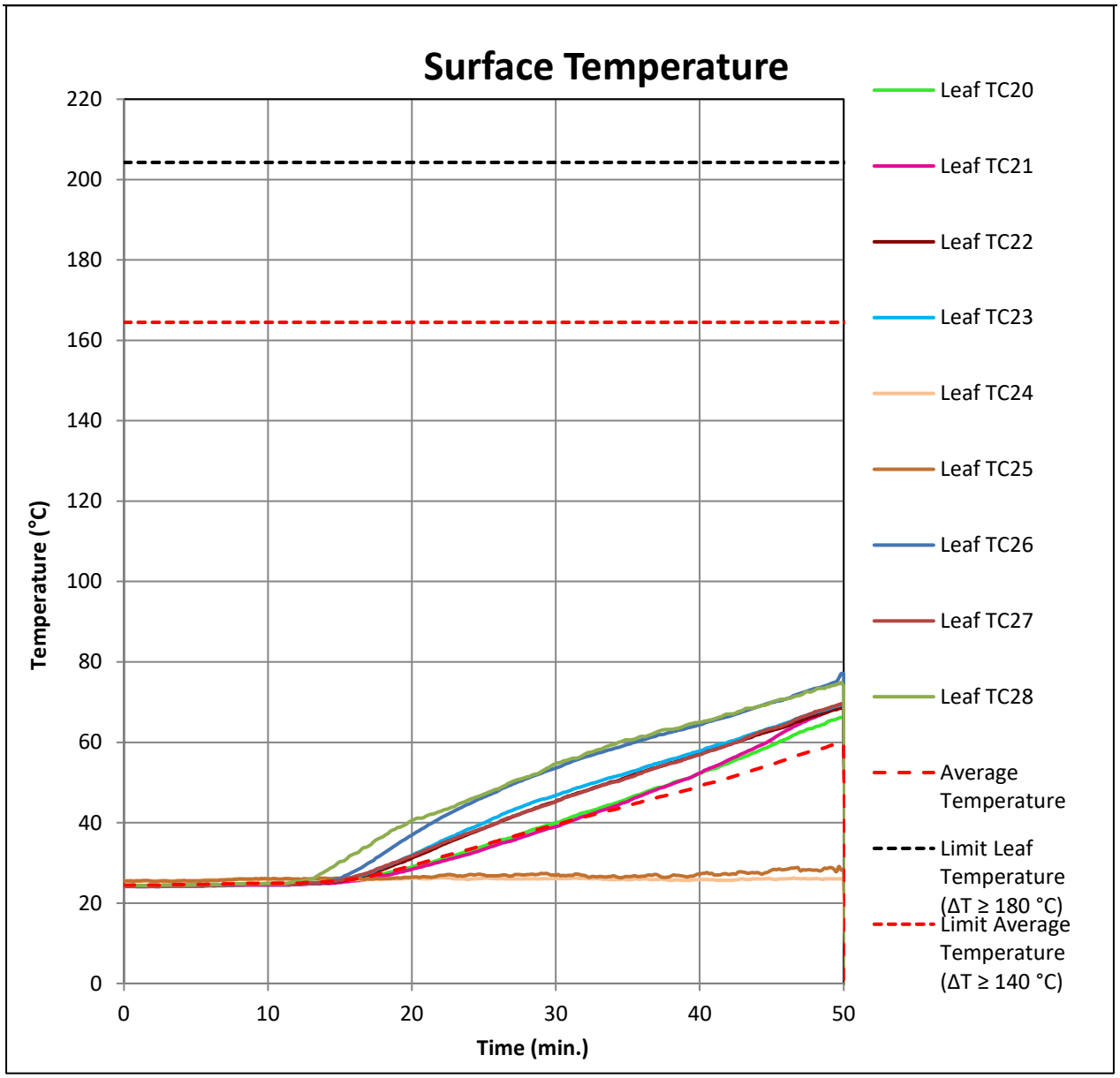


Figure B5: Surface temperatures for the Door Nr.2 (Leaf TC20 – Leaf TC28, Average temperature, Limit Leaf Temperature, and Limit Average Temperature).

* Integrity of the Door Nr.2 failed at 49th minutes.

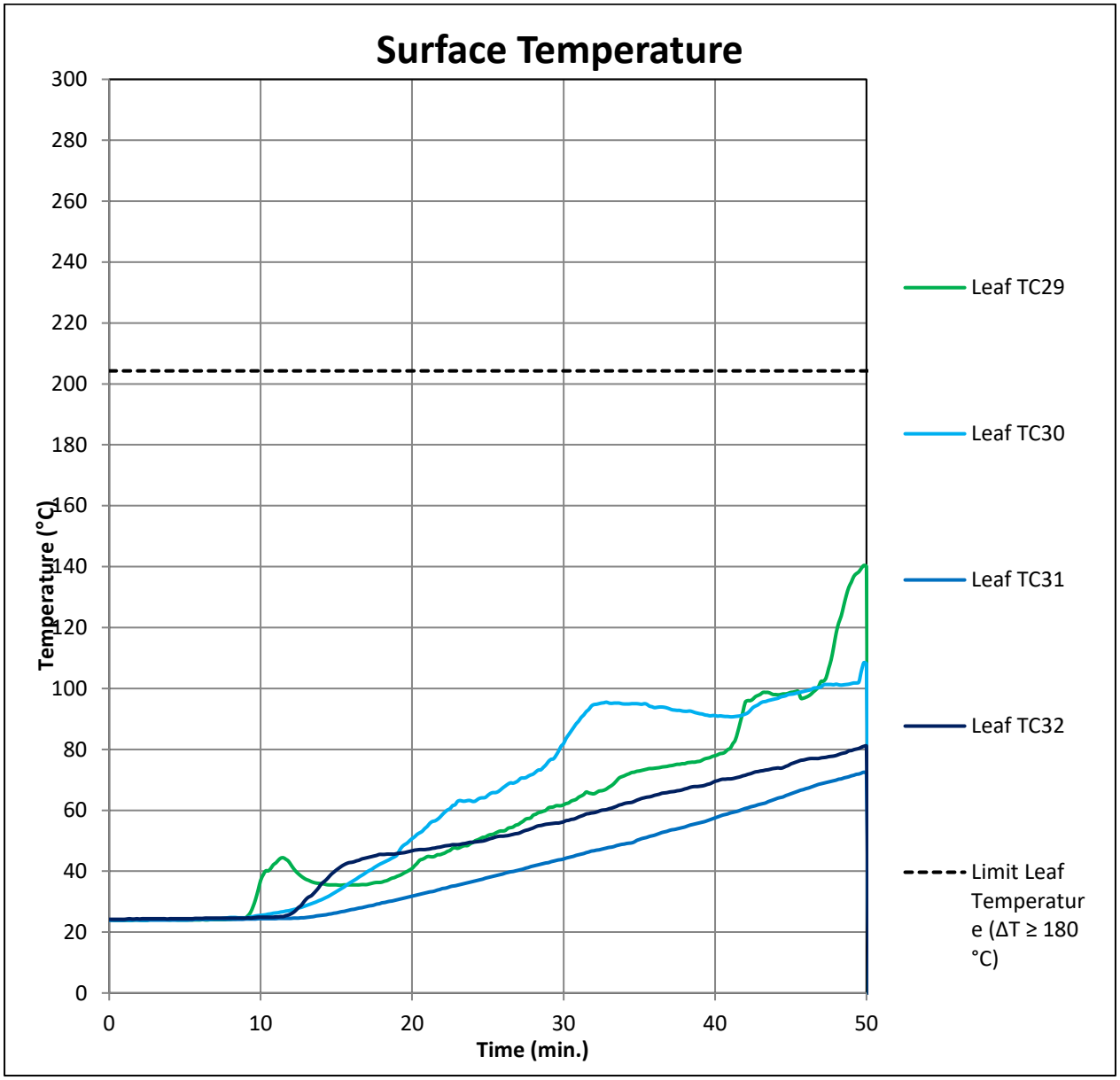


Figure B6: Surface temperatures for the Door Nr.2 (Leaf TC29 – Leaf TC32 and Limit Leaf Temperature).

* Integrity of the Door Nr.2 failed at 49th minutes.

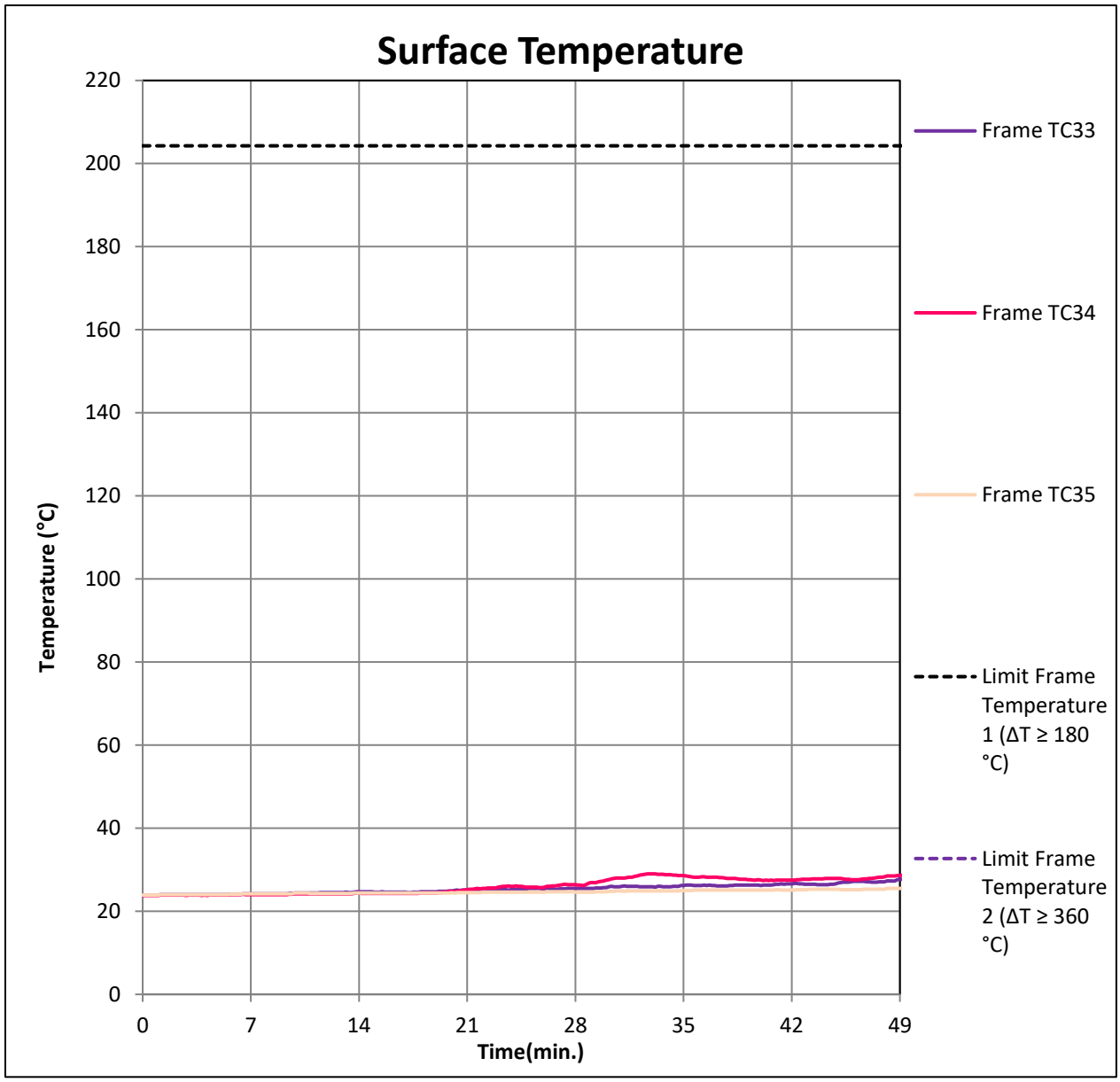


Figure B7: Surface temperatures for the Door Nr.2 (Frame TC33– Frame TC35 and Limit Frame Temperatures).

**Surface TC36 malfunctioned and did not measure.*

* Integrity of the Door Nr.2 failed at 49th minutes.

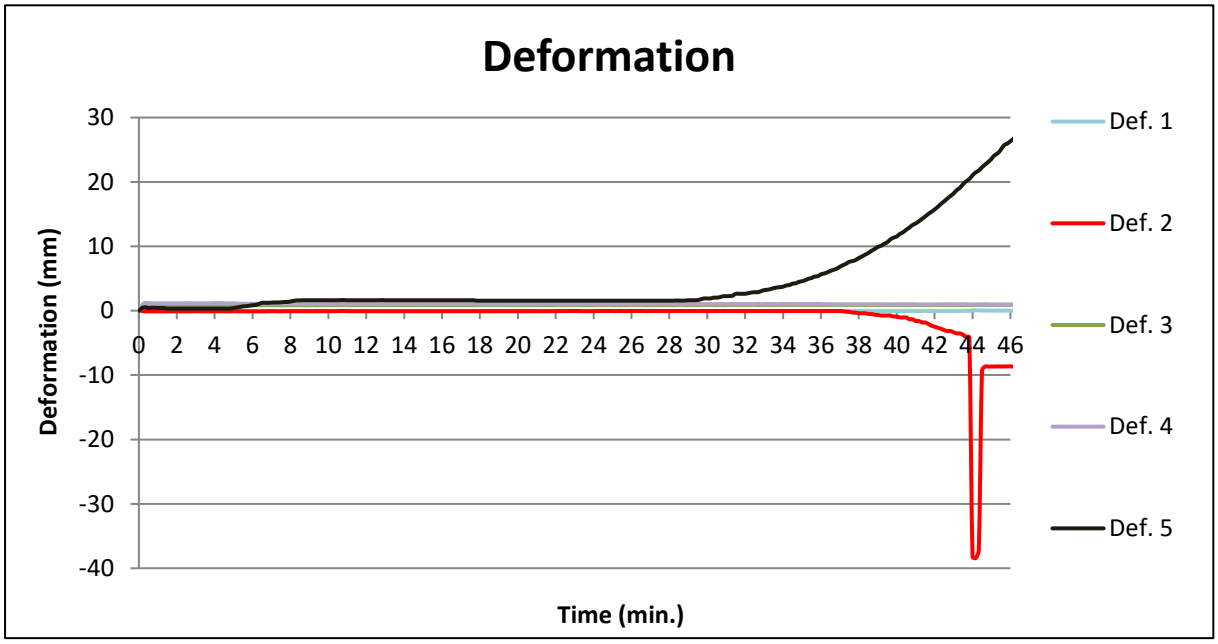


Figure B8: Deformation of the Door Nr.1(Def. 1 – Def. 5)

*Integrity of the Door Nr.1 failed at 46th minute.

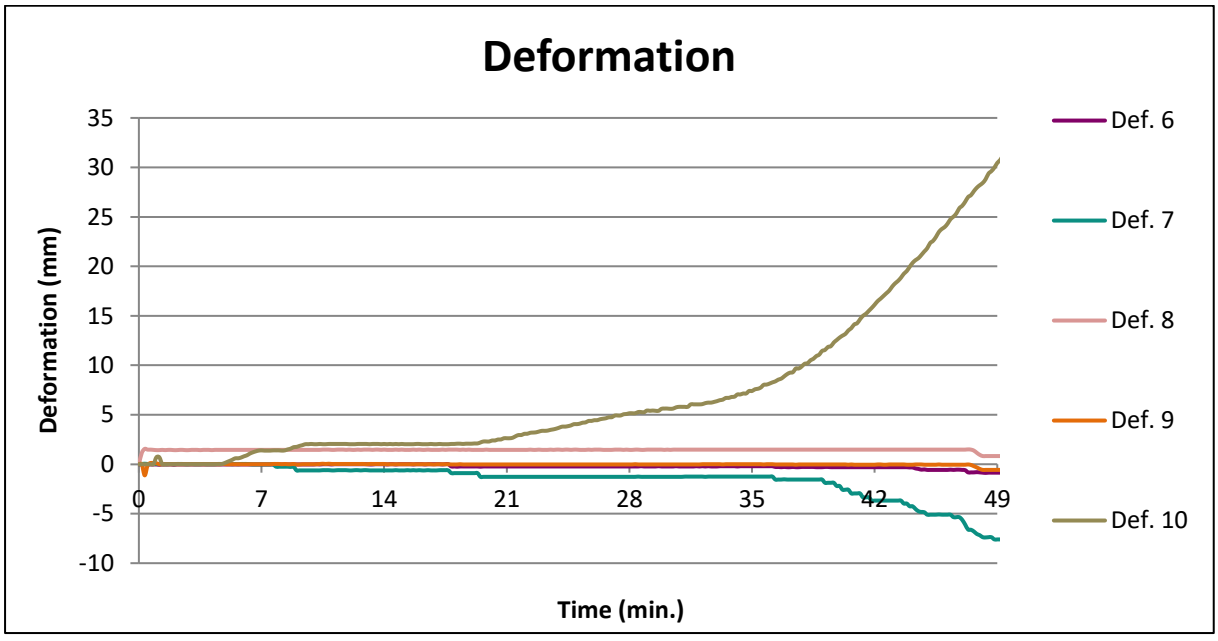


Figure B9: Deformation of the Door Nr.2 (Def. 6 – Def. 10)

*Integrity of the Door Nr.2 failed at 49th minute.

Photo C1: Unexposed side for the test specimens before the test.

Photo C2: Exposed side for the test specimens before the test.

Photo C3: Unexposed side for the test specimens after the test.