

Efectis

EFFECTIS ERA AVRASYA TEST VE BELGELENDİRME A.Ş.

Dilovası Organize Sanayi Bölgesi 5.Kısım Fırat Cad. No:18

Dilovası, Kocaeli/Türkiye

21.11.2017

RFTR17166

DENEY RAPORU

TEST REPORT

Müşterinin adı/adresi : NEVPANEL YAPI MADEN ÜRETİM İTH. İHR. SAN. VE TİC. LTD. ŞTİ.
Customer name/address Bağdat Cad. Çolakoğlu İş Merkezi No:458/30 Maltepe, İSTANBUL /TURKEY

İstek numarası : EEA-17-000771
Order No.

Numunenin adı ve tarifi : Single Side Partition Wall System Consisting of Three Layer of MgO Panels –
Name and identity of test sample "NevPanel, DragonBoardTürkiye, MagnumBoard"

Numunenin kabul tarihi : 13.11.2017
The date of receipt of sample

Açıklamalar :
Remarks

Deneyin yapıldığı tarih : 14.11.2017
Date of test

Raporun sayfa sayısı : 16 (27 pages including appendixes)
Number of pages of the Report

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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

21.11.2017

Deney Sorumlusu

Person in charge of test



Mustafa Emre ÖZBEY

Laboratuvar Müdürü

Head of Testing Laboratory



Ali BAYRAKTAR

Bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz.

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1. SCOPE

Fire resistance test, in conformity with the general requirements of standards EN1363-1:2012, with substitute or additional methods of standard EN 1363-2:1999 and with the particular requirements of standard EN 1364-1:2015 "Fire resistance tests for non-loadbearing elements- Part 1:Walls".

2. TEST LABORATORY

Name : Efectis Era Avrasya Test ve Belgelendirme A.Ş.
Address : Dilovası Organize Sanayi Bölgesi 5.Kısım Fırat Cad. No:18
Dilovası, KOCAELİ, TURKEY

3. DESCRIPTION OF THE TEST SPECIMEN**3.1. General**

Direction : Panel covered side
Product identification : Single Side Partition Wall System Consisting of Three Layer of MgO Panels – "**NevPanel, DragonBoardTürkiye, MagnumBoard**"
Manufacturer : NEVPANEL YAPI MADEN ÜRETİM İTH. İHR. SAN. VE TİC. LTD. ŞTİ.
Eskişehir Organize Sanayi Bölgesi 28. Cadde No:8 ESKİŞEHİR/TURKEY
Sponsor of test : NEVPANEL YAPI MADEN ÜRETİM İTH. İHR. SAN. VE TİC. LTD. ŞTİ.
Bağdat Cad. Çolakoğlu İş Merkezi No:458/30 Maltepe, İSTANBUL/TURKEY

3.2. Construction

Single Side Partition Wall System Consisting of Three Layer of MgO Panels – "**NevPanel, DragonBoardTürkiye, MagnumBoard**" was constructed from vertically positioned boards mounted on a metal stud frame. The total thickness of the partition wall was 102 mm.

One vertical edge was mounted as in practise and the other vertical edge was constructed as a free edge to simulate a wider wall construction in practise.

3.3. Components**3.3.1. Framework**

- **Edge and intermediate studs:**
 - Type : Box shaped profile - mild steel.
 - Dimensions : 2920 x 40 x 60 x 2 mm (h x d x w x t)
 - Locations : Distances between each profile were respectively 490, 100, 610, 510, 610 and 100 mm.

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- Fixings:
 - o Type : Steel – Self-tapping screw - Dekpax
 - o Dimensions : 7,5 x 100 mm (Ø x l)
 - o Location : 4 pcs for each edge studs. Started at 290 mm from top of the frame c.t.c. distances were respectively 750,940 and 730 mm
- Top and bottom rails:
 - Type : Box shaped profile - mild steel.
 - Dimensions : 3000 x 40 x 60 x 2 mm (l x d x w x t)
 - Locations : Top and bottom side of the panel
 - Fixings:
 - o Type : Steel – Self-tapping screw - Dekpax
 - o Dimensions : 7,5 x 100 mm (Ø x l)
- Location : 4 pcs for each top studs. Started at 290 mm from fixed edge of the frame c.t.c. distances were respectively 570,200, 780 and 880 mm. 4 pcs for each bottom studs. Started at 380 mm from free edge of the frame c.t.c. distances were respectively 710, 750 and 830 mm
- Intermediate horizontal rails:
 - Type : Box shaped profile - mild steel.
 - Dimensions : 450 x 40 x 60 x 2 mm (l x d x w x t) (4 pcs.)
450 x 40 x 60 x 2 mm (l x d x w x t) (4 pcs.)
450 x 40 x 60 x 2 mm (l x d x w x t) (2 pcs.)
 - Locations : Top and bottom distance were approximately 540 mm. Profiles were fixed with welding

3.3.2. Panels

- Type: MgO Panels - NevPanel, DragonBoardTürkiye, MagnumBoard
 - Nominal density : 1000 kg/m³
 - Moisture content : 30,56 %
 - Nominal thickness : 12 mm
 - Location : 1st and 2nd layer
- Type: MgO Panels - NevPanel, DragonBoardTürkiye, MagnumBoard
 - Nominal density : 1000 kg/m³
 - Moisture content : 46,78 %
 - Nominal thickness : 18 mm
 - Location : 3rd layer

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- First layer:

- o panels next to the free edge : 1220 x 560 mm (w x h) – at top
1220 x 2440 mm (w x h) – at bottom
- o panels in the middle : 1220 x 2440 mm (w x h) – at top
1220 x 560 mm (w x h) – at bottom
- o panels next to the fixed edge: 510 x 560 mm (w x h) – at top
510 x 2440 mm (w x h) – at bottom

- Second layer:

- o panels next to the free edge : 510x 2440 mm (w x h) – at top
510 x 560 mm (w x h) – at bottom
- o panels in the middle : 1220 x 560 mm (w x h) – at top
1220 x 2440 mm (w x h) – at bottom
- o panels next to the fixed edge: 1220 x 2440 mm (w x h) – at top
1220 x 560 mm (w x h) – at bottom

- Third layer:

- o panels next to the free edge : 1220 x 2440 mm (w x h) – at top
1220 x 560 mm (w x h) – at bottom
- o panels in the middle : 1220 x 560 mm (w x h) – at top
1220 x 2440 mm (w x h) – at bottom
- o panels next to the fixed edge: 510 x 2440 mm (w x h) – at top
510x 560 mm (w x h) – at bottom

• Fixing: The panels were fixed to the framework.

- Type: Galvanized steel screw – self-drilling screw

- o Dimensions : 39 x 32 mm (Ø x l)
- o Locations : 13 pcs. at top and bottom of the first profiles, started at 250 mm from edge of the frame c.t.c. distances were respectively 250, 100, 300, 300, 250, 250, 300, 300, 100, 250 and 250 mm
10 pcs. at middle and intermediate of the first profiles, started at 140 mm from edge of the frame c.t.c. distances were respectively 250 and 400 mm
11 pcs. at vertically of the first profiles, started at 250 mm from edge of the frame c.t.c. distances were respectively 250 mm

- Type: Galvanized steel screw – self-drilling screw

- o Dimensions : 40 x 60 mm (Ø x l)
- o Locations : 13 pcs. at top and bottom of the second profiles, started at 250 mm from edge of the frame c.t.c. distances were respectively 250, 100, 300, 300, 250, 250, 300, 300, 100, 250 and 250 mm

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10 pcs. at middle and intermediate of the second profiles, started at 125 mm from edge of the frame c.t.c. distances were respectively 300, 350, 300, 300, 300, 300, 350 and 300 mm

11 pcs. at middle and intermediate of the third profiles, started at 250 mm from edge of the frame c.t.c. distances were respectively 250 mm

- Type: Galvanized steel screw – self-drilling screw

o Dimensions : 40 x 60 mm (Ø x l)

o Locations : 13 pcs. at top and bottom of the third profiles, started at 250 mm from edge of the frame c.t.c. distances were respectively 250, 100, 300, 300, 250, 250, 300, 300, 100, 250 and 250 mm

10 pcs. at middle and intermediate of the third profiles, started at 125 mm from edge of the frame c.t.c. distances were respectively 300, 350, 300, 300, 300, 300, 350 and 300 mm

9 pcs. at middle and intermediate of the third profiles, started at 300 mm from edge of the frame c.t.c. distances were respectively 300 mm

• Joints:

- Type: Fire rated seal – Pyrocoustic

o Density : 1,6 g/ml

o Location : Between the panels.

o Reinforcement: Joint tape

➤ Type : Fibre-glass mesh tape – NevPanel

➤ Width : 50 mm

➤ Nominal mass per unit area: 46 g/m²

- Type: Fire rated seal – Pyrocoustic

o Location : Contact point of the profiles and the supporting construction

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4. PRE-TEST PROCESSES

4.1. Verification of specimen

Efectis Era Avrasya A.S. verified the used materials and parts against the supplied data and drawings during installation of the test specimen and not involved in the selection of test specimen.

The test specimen was assembled by the sponsor.

4.2. Conditioning

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

- Ambient temperature: $18,65 \pm 3,15$ °C
- Relative humidity: 58 ± 13 %

5. TEST PROCESS

5.1. Method

The fire test was conducted according to the standard EN 1364-1:2015.

The heating of the furnace followed the standard fire curve, as specified in the standard EN 1363-1:2012.

The target overpressure in the furnace was 0 Pa at 500 mm above floor level and 19 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 TC6), evenly distributed over the directly heated surface (see figure A1).
- The pressure in the furnace, measured at a height of 2,9 meter 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 (TC 3 up to TC18, see figure B2-B3).
- Deflection measurements of the test specimen (see figure B4 and Table B1).
- There was no need to use roving thermocouple.
- The positions of the thermocouple and displacement measurements are given in figure B1.

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6. OBSERVATIONS

Table 1: Observations during heating

0	Heating started. See photo C1-C2.
8	Smoke release from the joint of the panel and the framework
10	Smoke release at top edge between the panel and framework
11	Smoke release from the free edge
25	F- Deformation at joint of panels
28	Smoke release at bottom edge between the panel and framework
60	No considerable changing at the panels
80	Intensive smoke release from the surface of panels
82	Blackening from the surface of panels
120	Test was terminated after consulted with the sponsor. See photo C4.

F : Furnace side (Exposed surface)

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 standard EN 1363-1:2012.

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

Integrity, (E)		
- Cotton pad		no failure (not applied)
- Gap gauges	Ø 6 mm	no failure (not applied)
	Ø 25 mm	no failure (not applied)
- Flames longer than 10 sec.		not observed
Insulation, (I)		
- average temperature		no failure
- maximum temperature		no failure
The heating was terminated at 120 th minute after consulted with the sponsor.		

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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 was tested following the procedure outlined in EN 1363-1:2012, 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.

9.2 Specific conditions for dimensions and fixing

- decrease in height
- increase in the thickness of the wall
- increase in the thickness of component materials
- decrease in linear dimensions of boards or panels, but not thickness
- decrease in stud spacing
- decrease in distance of fixing centres
- horizontal and vertical joints, of the type tested.

9.3 Extension of height

The height of the construction may be increased to 4 meters for a fire resistance of **120 minutes** for the criteria integrity and thermal insulation, because the lateral deflection of the construction is less than 100 mm. See Table B1 – Appendix B.

9.4 Extension of width

The width of an identical construction may be increased, because the construction is tested with a width of 3 meters with one vertical free edge.

9.5 Direction of flame

- Integrity : Panel covered side
- Insulation: Panel covered side

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10. DRAWINGS

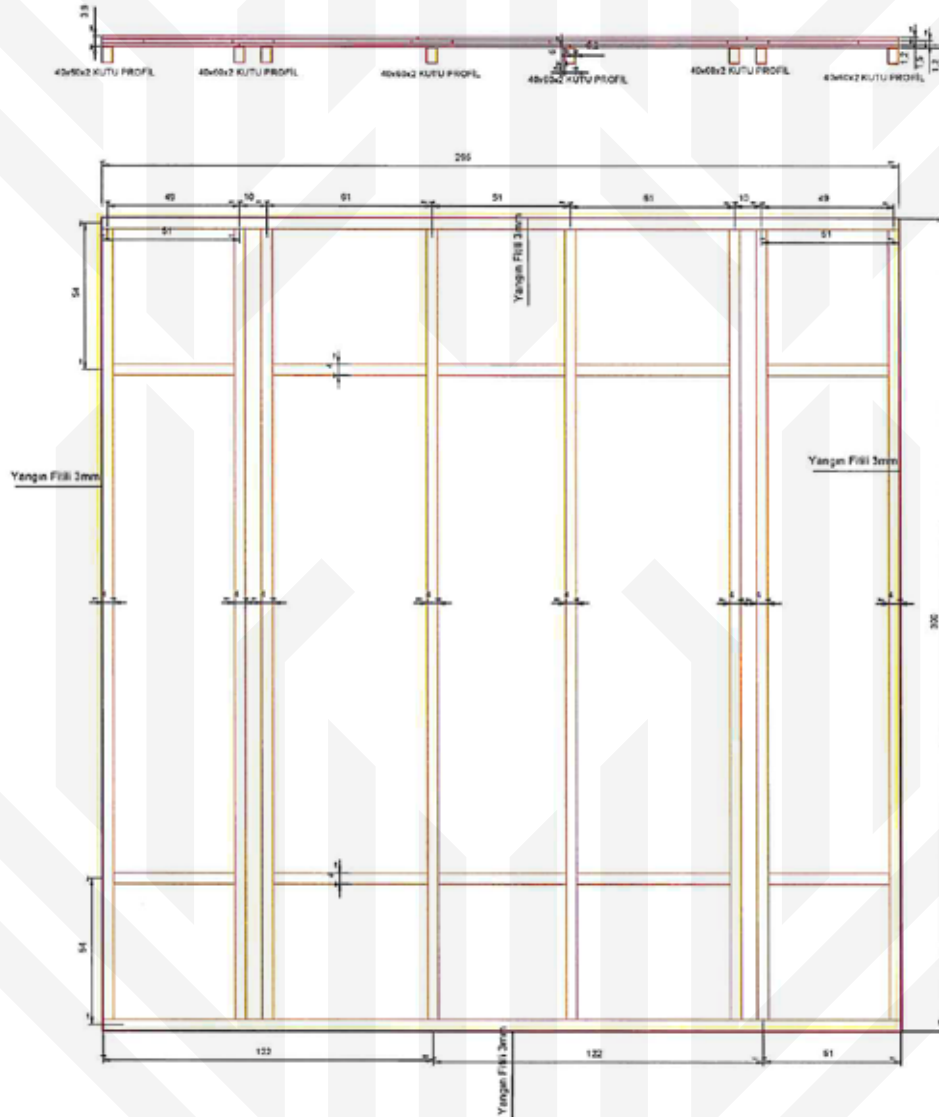


Figure 1: Details of framework profiles

Bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz.

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1.KAT PANEL GÖRÜNÜMÜ

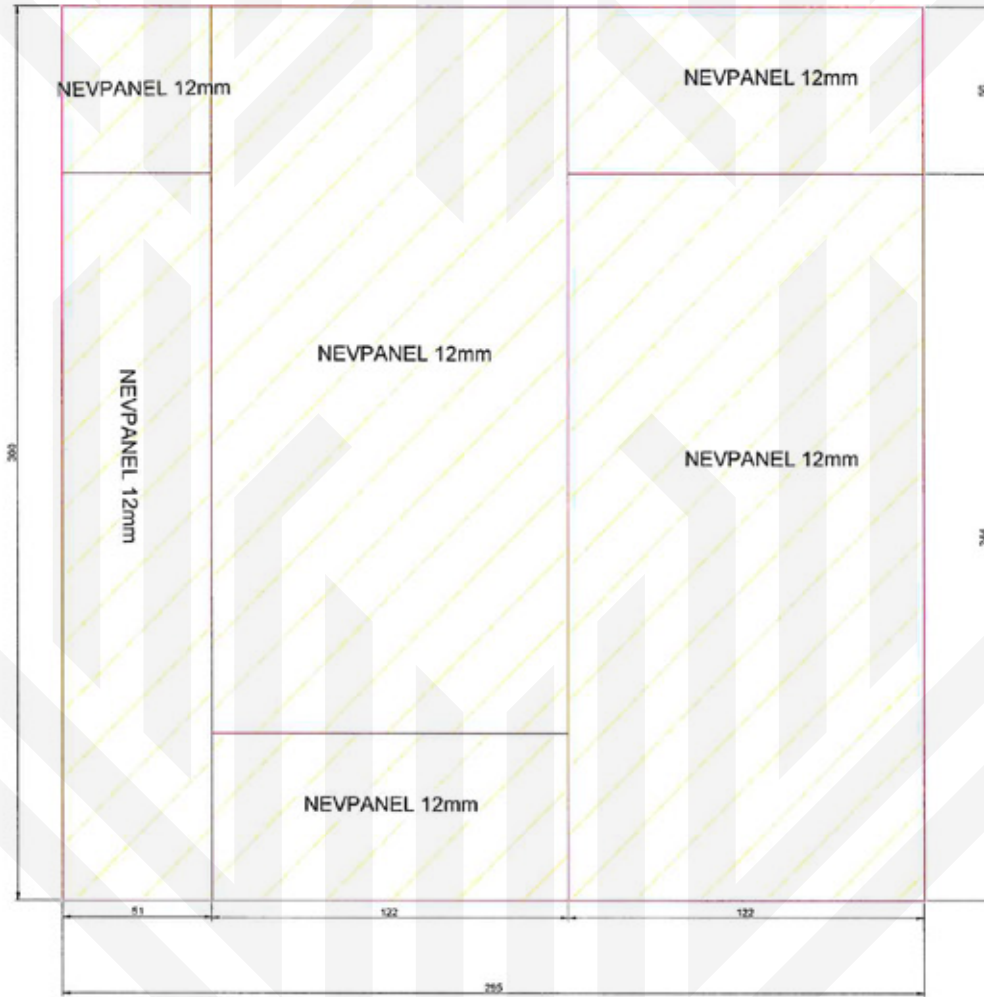


Figure 2: Details of 1. layer panels

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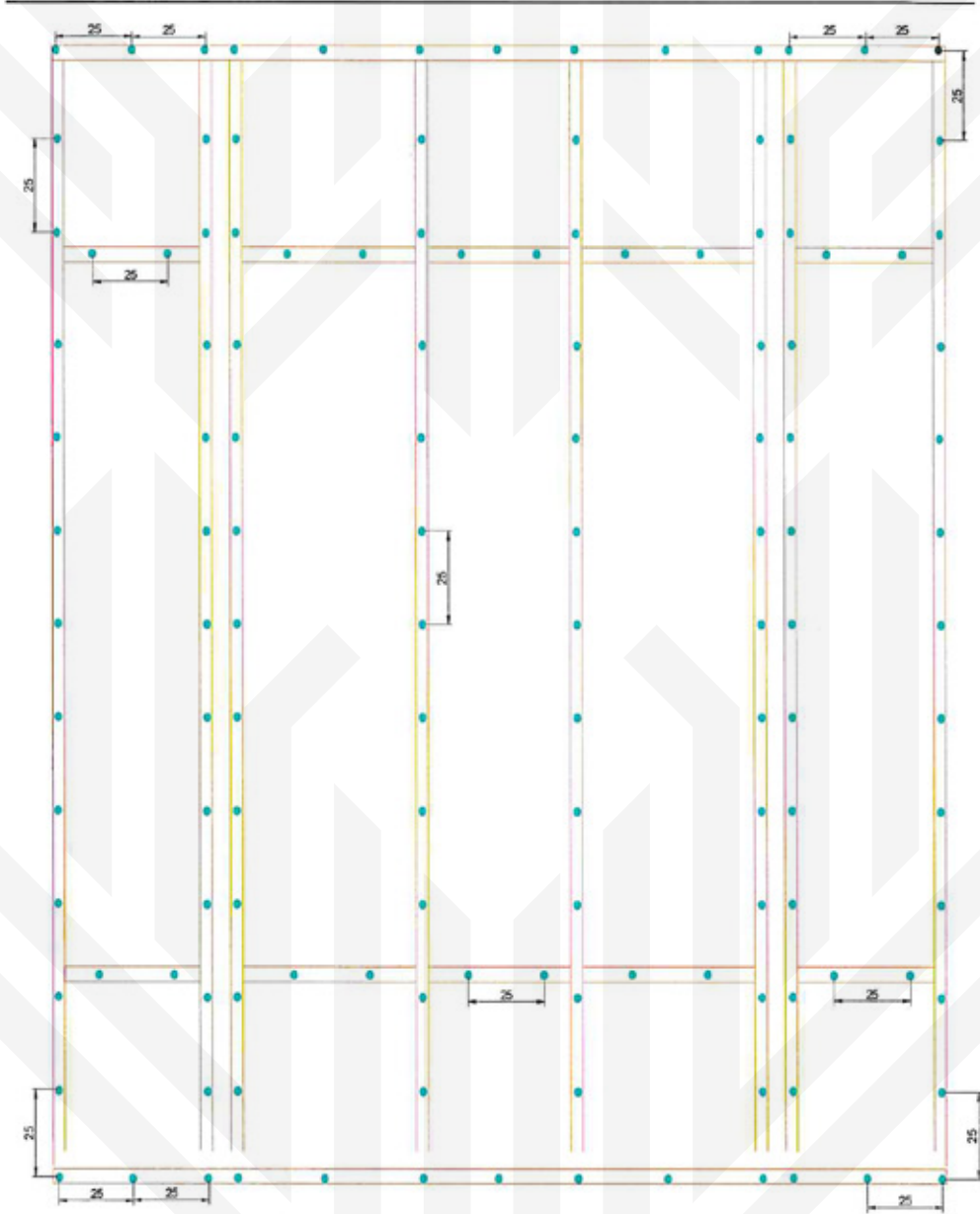


Figure 3: Location of screws of 1. layer panels

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2.KAT PANEL GÖRÜNÜMÜ

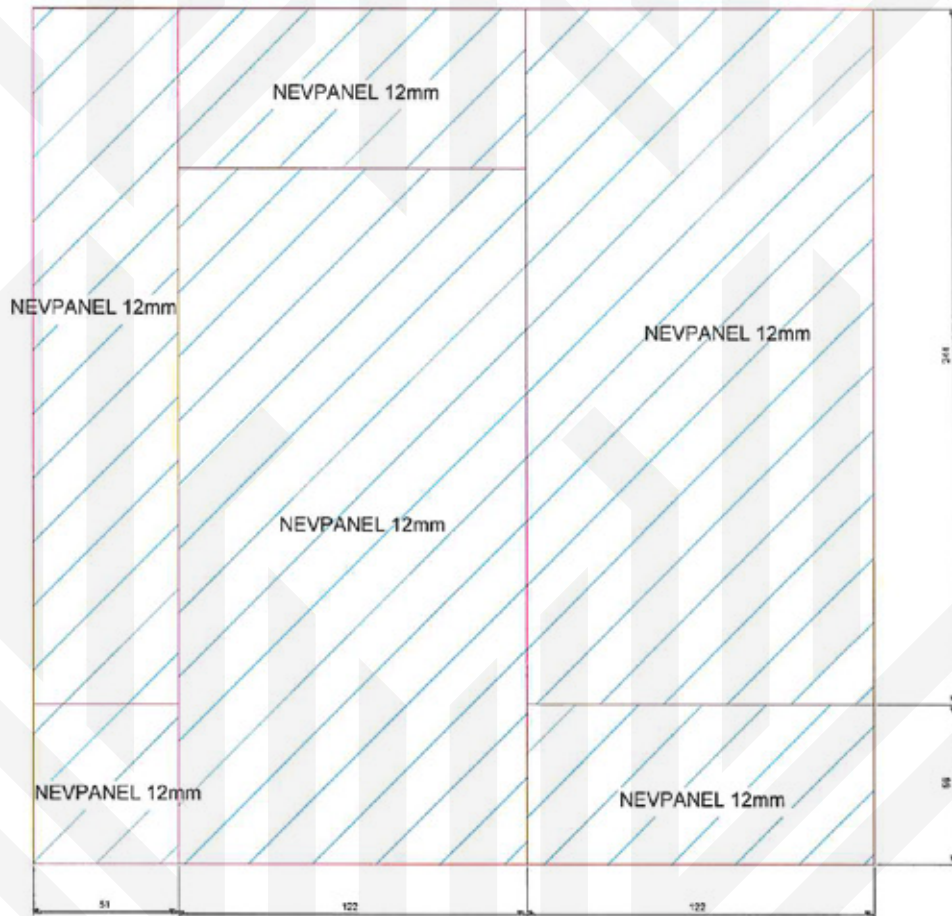


Figure 4: Details of 2. layer panels

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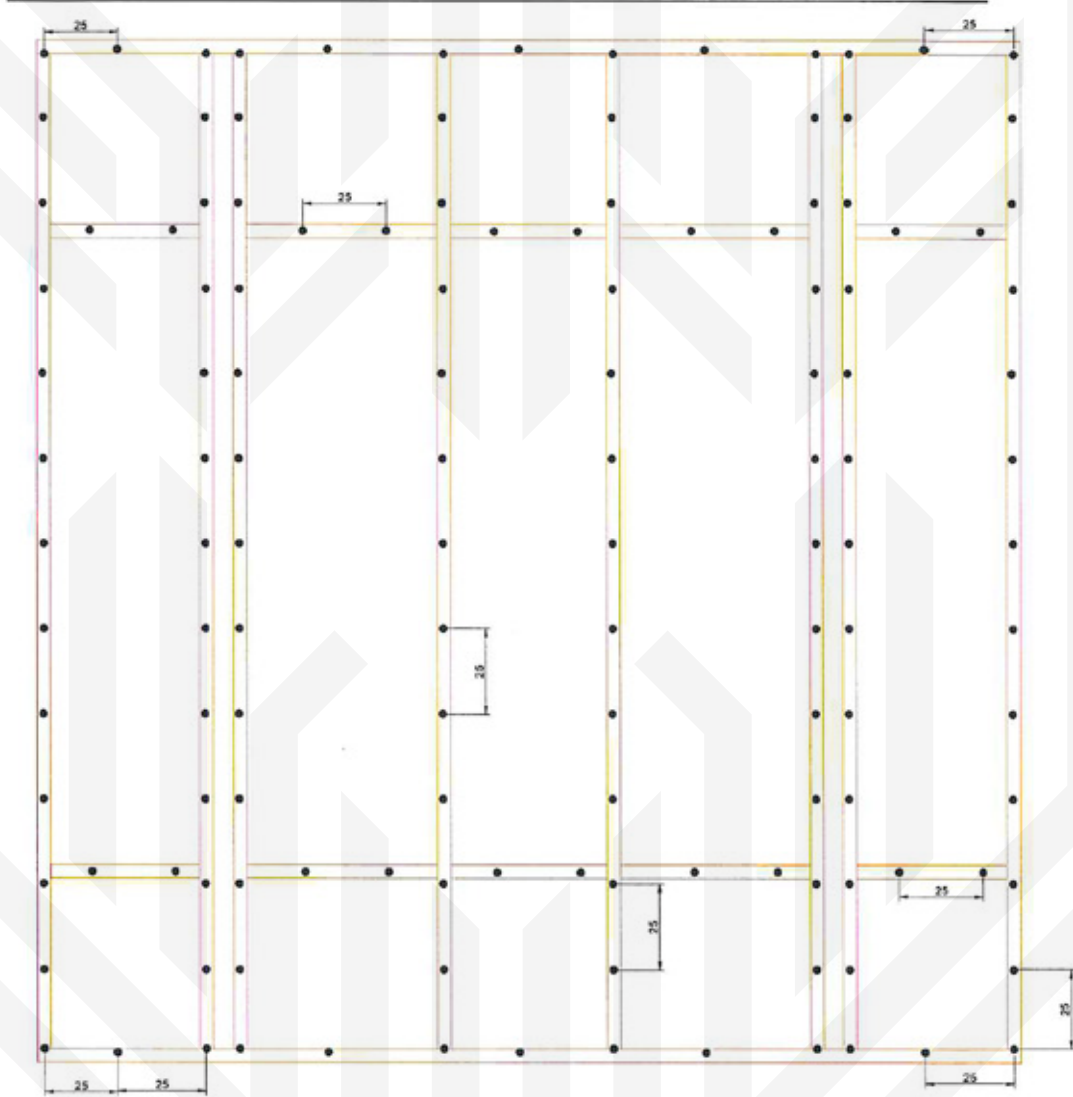


Figure 5: Location of screws of 2. layer panels

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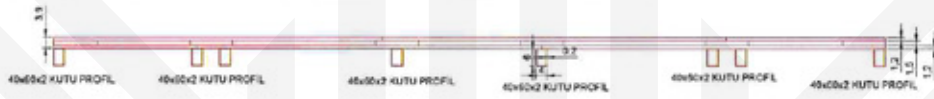
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3.KAT PANEL GÖRÜNÜMÜ



Figure 6: Details of 3. layer panels

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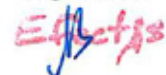
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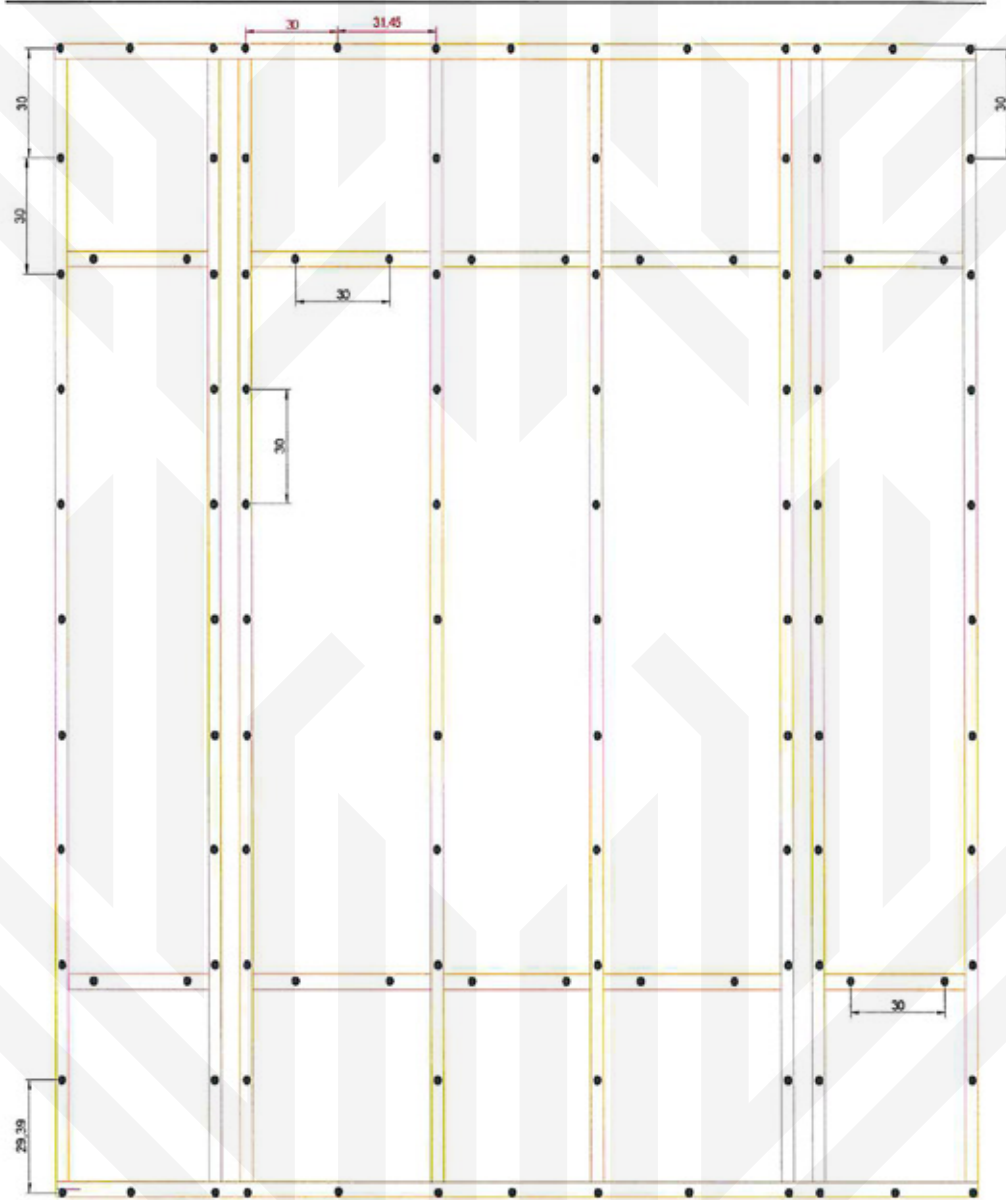


Figure 7: Location of screws of 3. layer panels

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APPENDIXES:

Appendix A: Furnace and laboratory conditions

Appendix B: Test results

Appendix C: Photos

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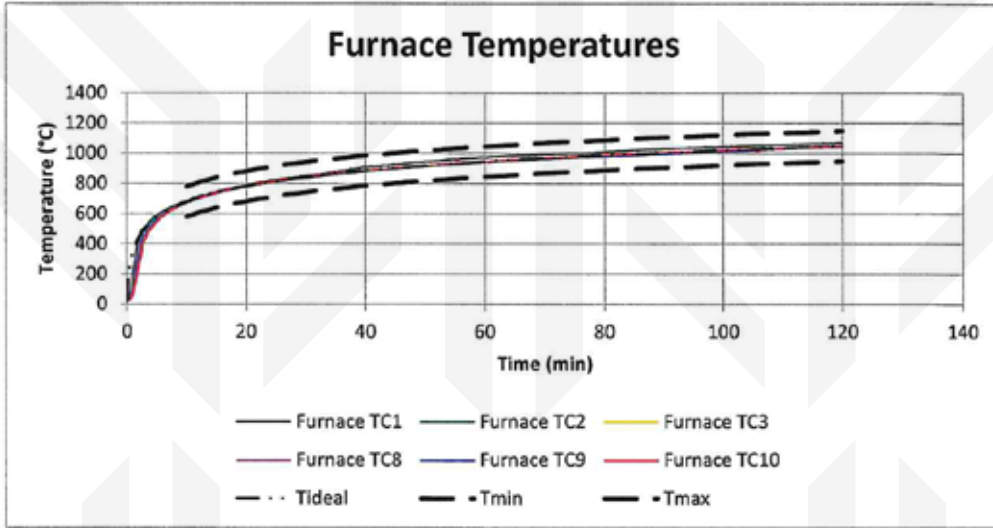


Figure A1: Furnace Temperatures

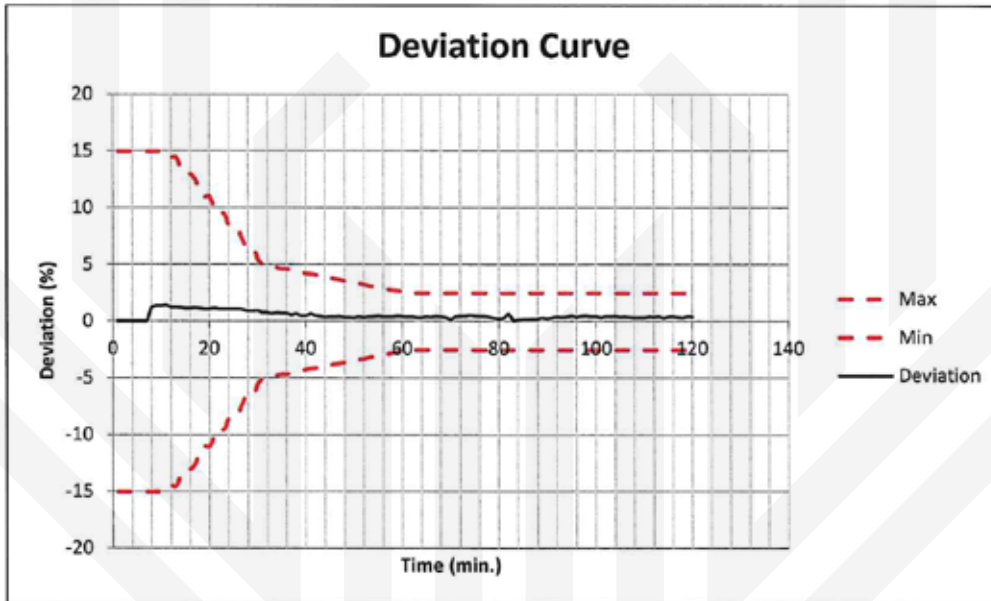


Figure A2: Deviation of furnace temperature

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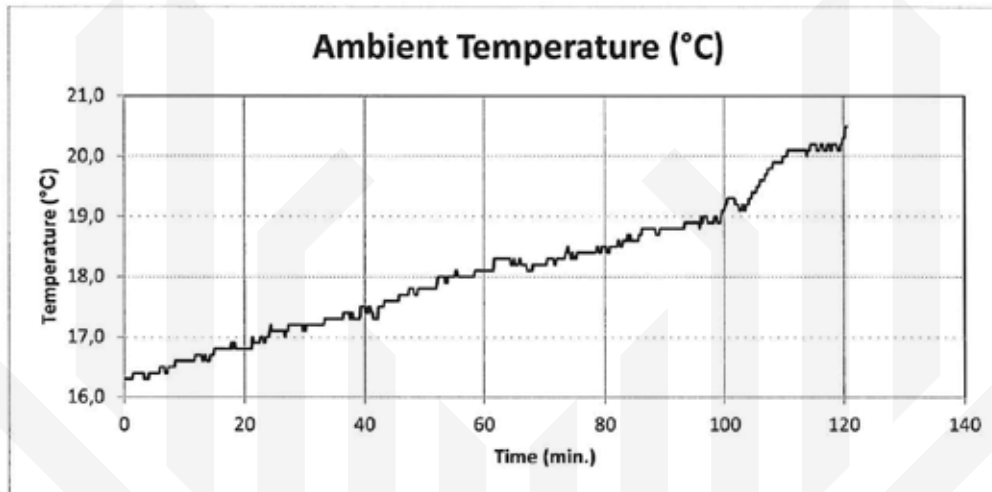
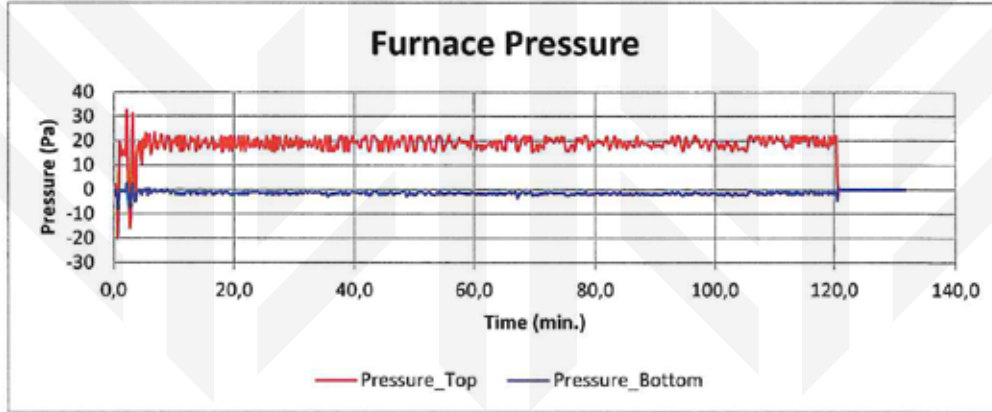
A-1/2


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Ek B

EFFECTIS ERA AVRASYA TEST VE BELGELENDİRME A.Ş.

21.11.2017

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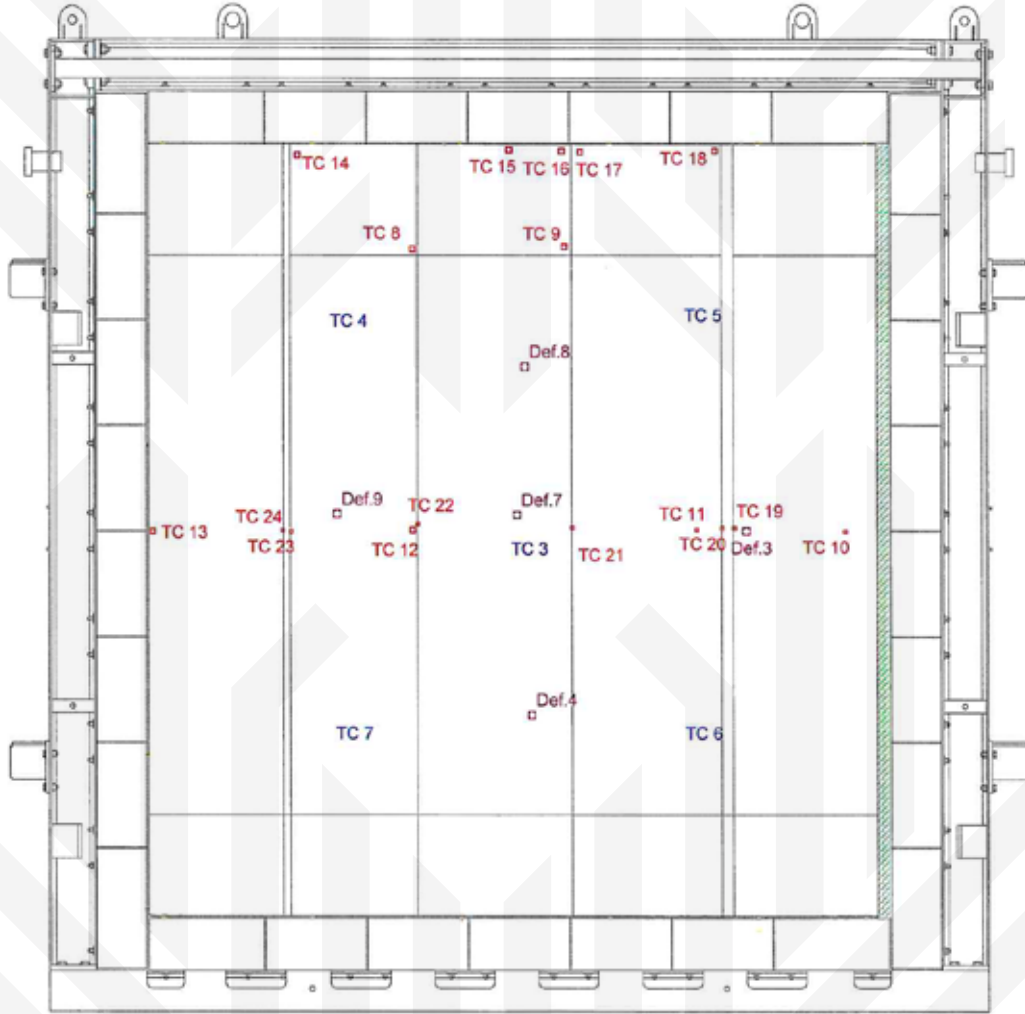


Figure B1: Locations of thermocouples and deflection sensors

Bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz.

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Ek B

EFFECTIS ERA AVRASYA TEST VE BELGELENDİRME A.Ş.

21.11.2017

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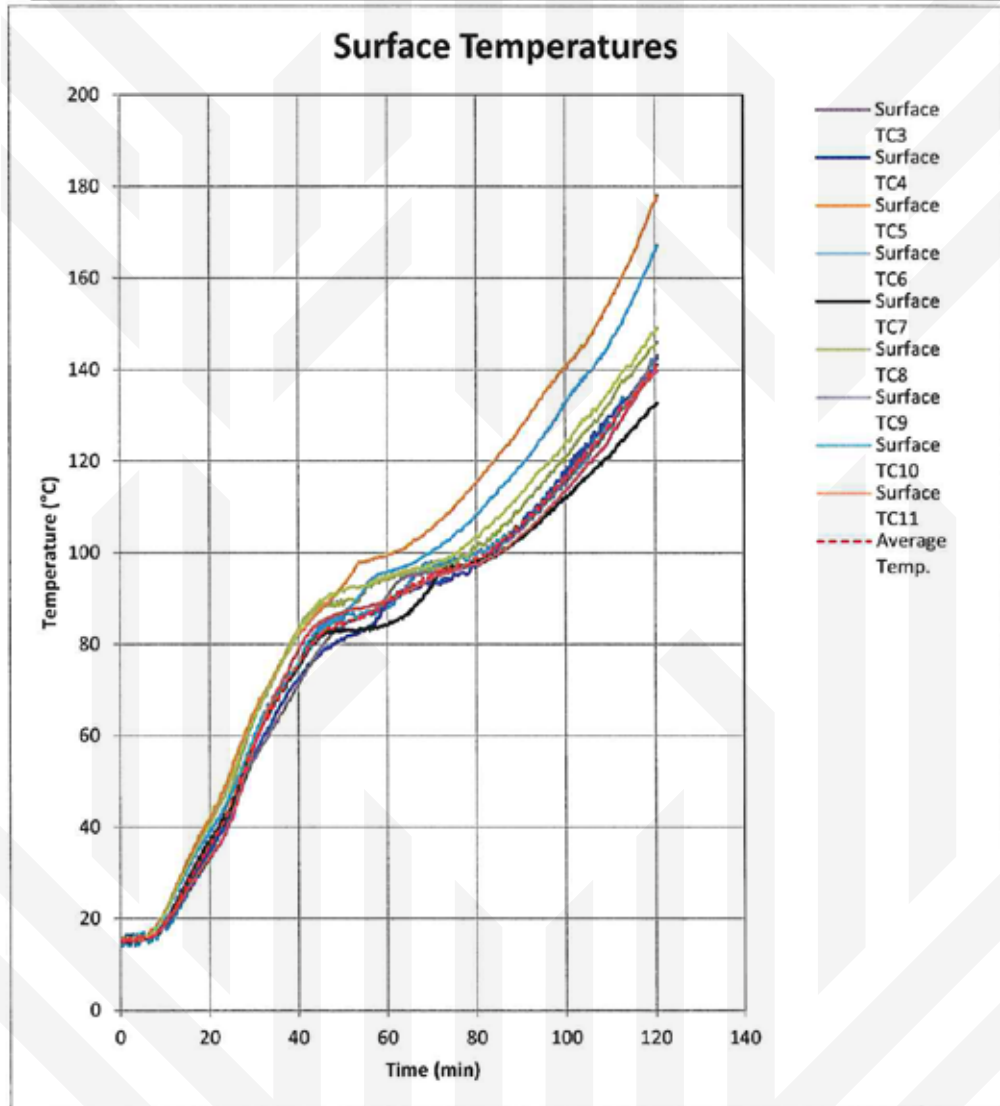


Figure B2: Surface temperatures (Thermocouple sensors for average temperature)

Bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz.
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21.11.2017

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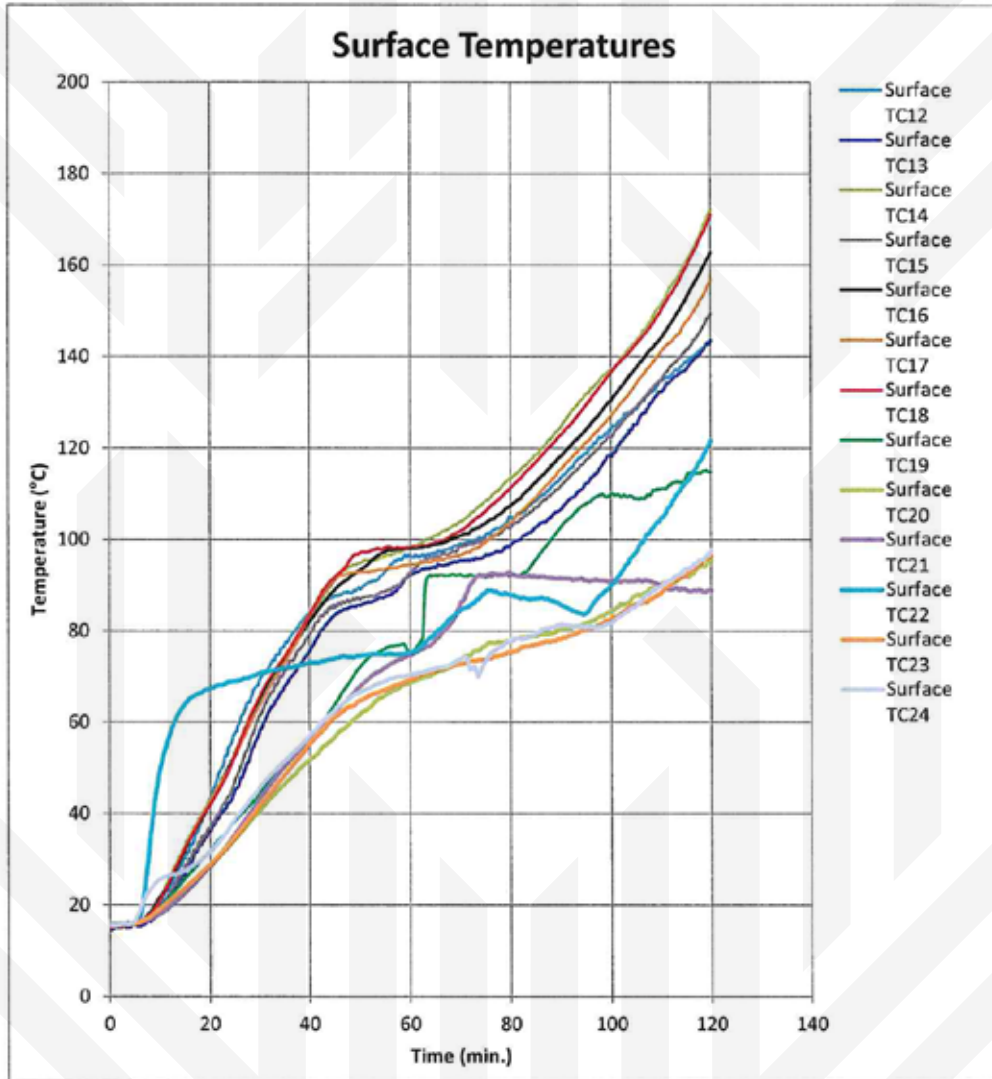


Figure B3: Surface temperatures (Thermocouple sensors for maximum temperature)

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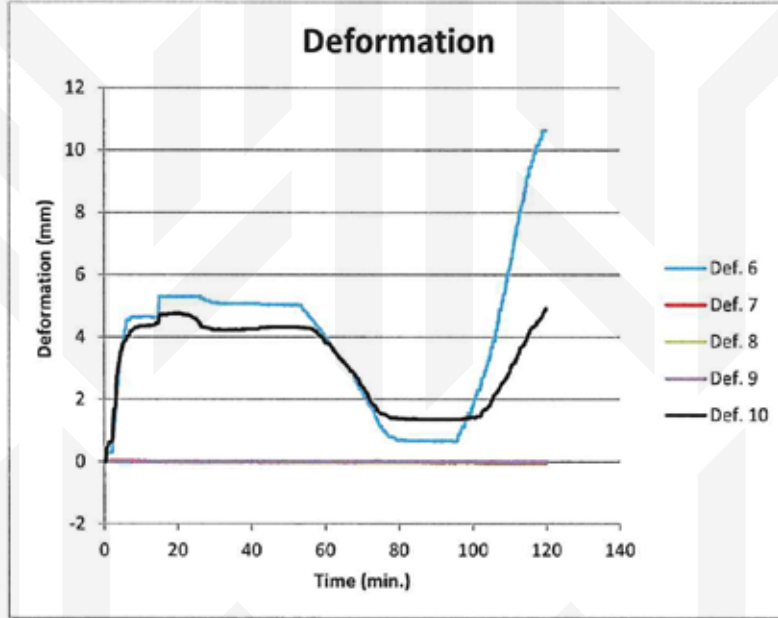


Figure B4: Deformation of the wall.

Bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz.

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Table B1: Data obtained from deformation sensors

Time (min)	Def. 6	Def. 7	Def. 8	Def. 9	Def. 10
0,00	0,00	0,00	0,00	0,00	0,00
3,00	1,28	0,00	0,00	0,00	1,70
6,00	4,53	0,00	0,00	0,00	3,95
9,00	4,65	0,03	0,00	0,00	4,33
12,00	4,65	0,00	0,00	0,00	4,35
15,00	5,30	0,00	0,00	0,00	4,70
18,00	5,30	0,00	0,00	0,00	4,75
21,00	5,30	0,00	-0,03	0,00	4,75
24,00	5,30	0,00	-0,03	-0,03	4,63
27,00	5,23	0,00	-0,03	0,00	4,33
30,00	5,10	0,00	-0,03	0,00	4,23
33,00	5,08	0,00	-0,03	0,00	4,23
36,00	5,08	0,00	0,00	0,00	4,23
39,00	5,08	0,00	0,00	0,00	4,25
42,00	5,08	0,00	0,00	0,00	4,25
45,00	5,05	-0,03	0,00	0,00	4,30
48,00	5,05	-0,03	-0,03	0,00	4,33
51,00	5,03	-0,03	-0,03	0,00	4,33
54,00	4,90	-0,03	-0,03	0,00	4,30
57,00	4,50	-0,03	-0,03	0,00	4,20
60,00	3,98	-0,03	-0,03	0,00	3,83
63,00	3,48	-0,03	-0,03	0,00	3,45
66,00	3,05	-0,03	-0,03	0,00	3,05
69,00	2,40	-0,03	-0,03	0,00	2,65
72,00	1,83	-0,03	-0,03	0,00	2,03
75,00	1,13	-0,03	-0,03	0,00	1,55
78,00	0,80	-0,03	-0,03	0,00	1,43
81,00	0,70	-0,03	-0,03	0,00	1,38
84,00	0,68	-0,03	-0,03	0,00	1,35
87,00	0,68	-0,03	-0,03	0,00	1,35
90,00	0,68	-0,05	-0,03	0,00	1,35
93,00	0,68	-0,03	-0,03	0,00	1,35
96,00	0,85	-0,03	-0,03	0,00	1,35
99,00	1,53	-0,03	-0,03	0,00	1,40
102,00	2,30	-0,05	-0,03	0,00	1,45
105,00	3,65	-0,05	-0,03	0,00	1,93
108,00	5,15	-0,05	-0,03	0,00	2,53
111,00	6,80	-0,05	-0,03	0,00	3,15
114,00	8,38	-0,05	-0,03	-0,03	3,75
117,00	9,90	-0,03	-0,03	0,00	4,38
120,00	10,63	-0,05	-0,03	0,00	4,93

Bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz.

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Appendix C

EFFECTIS ERA AVRASYA TEST VE BELGELENDİRME A.Ş.

21.11.2017

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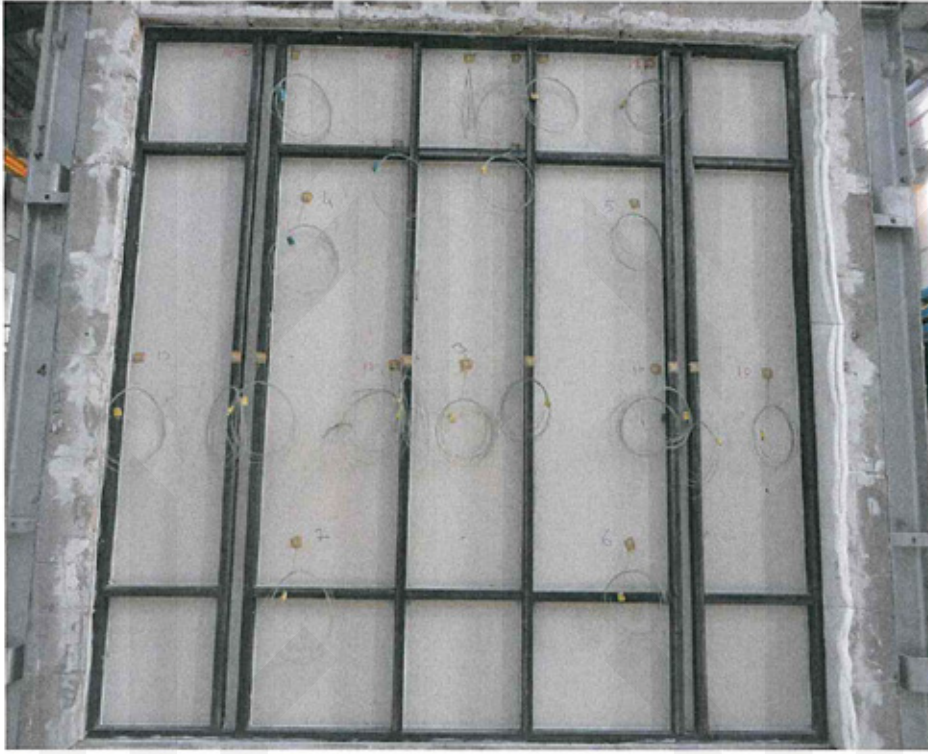


Photo C1: Unexposed side of the test specimen before the test

Bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz.
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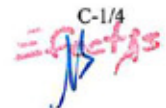
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Appendix C

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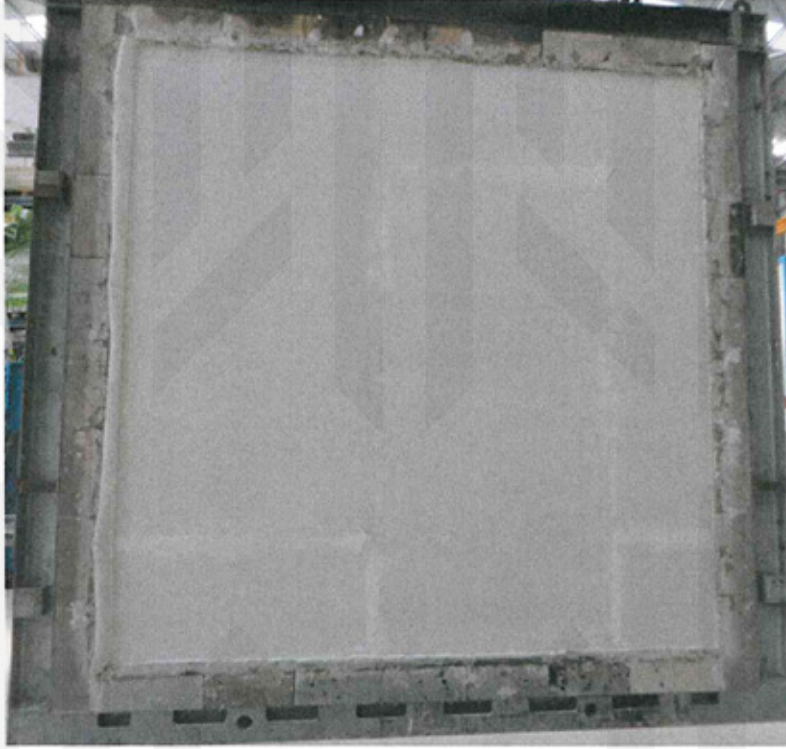


Photo C2: Exposed side of the test specimen before the test

Bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz.

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Appendix C

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Photo C3: Unexposed side of the test specimen at 90th minute of the test

Bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz.

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Appendix C

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Photo C4: Unexposed side of the test specimen after the test

Bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz.
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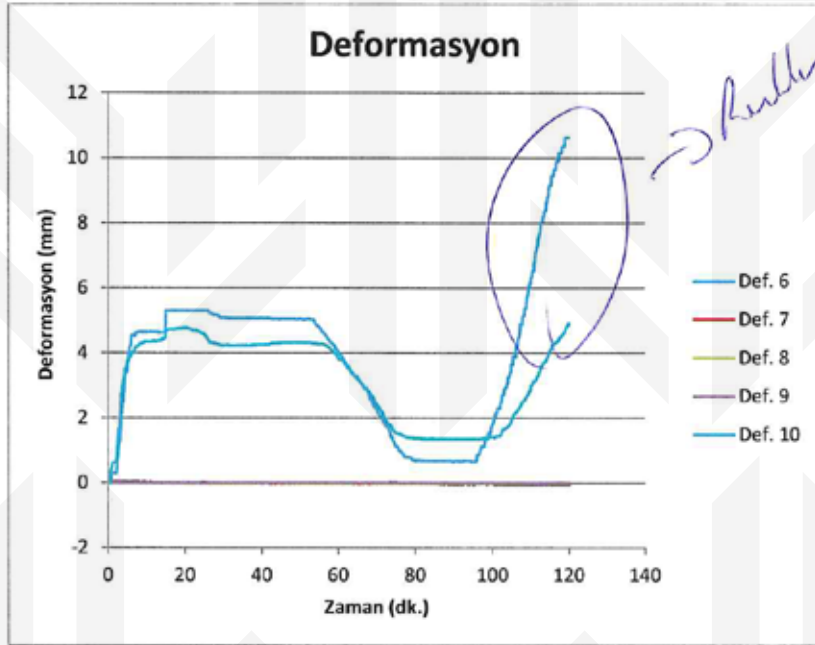


Ek B

EFFECTIS ERA AVRASYA TEST VE BELGELENDİRME A.Ş.

21.11.2017

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Şekil B4: Duvar sehim grafiği.

Tablo B1: Sehim sensörlerinden elde edilen veriler.

Time (min)	Def. 6	Def. 7	Def. 8	Def. 9	Def. 10
0.00	0.00	0.00	0.00	0.00	0.00
3.00	1.28	0.00	0.00	0.00	1.70
6.00	4.53	0.00	0.00	0.00	3.95
9.00	4.65	0.03	0.00	0.00	4.33
12.00	4.65	0.00	0.00	0.00	4.35
15.00	5.30	0.00	0.00	0.00	4.70
18.00	5.30	0.00	0.00	0.00	4.75
21.00	5.30	0.00	-0.03	0.00	4.75
24.00	5.30	0.00	-0.03	-0.03	4.63
27.00	5.23	0.00	-0.03	0.00	4.33
30.00	5.10	0.00	-0.03	0.00	4.23
33.00	5.08	0.00	-0.03	0.00	4.23
36.00	5.08	0.00	0.00	0.00	4.23
39.00	5.08	0.00	0.00	0.00	4.25

Bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz.

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