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EFFECTIS ERA AVRASYA TEST VE BELGELENDİRME A.Ş.

TOSB TAYSAD Organize San. Böl. 1. CD. ,15. Yol No: 1

Şekerpinar – Çayırova, KOCAELİ

DENEY RAPORU

TEST REPORT

AB-0556-T

17.11.2016

RFTR16191

Müşterinin adı/adresi <i>Customer name/address</i>	:	NEVPANEL YAPI MADEN ÜRETİM İTH. İHR. SAN. VE TİC. LTD. ŞTİ. Bağdat Cad. Çolakoğlu İş Merkezi No:458/30 Maltepe, İSTANBUL /TURKEY
İstek numarası <i>Order No.</i>	:	EEA-16-000724-rev
Numunenin adı ve tarifi <i>Name and identity of test sample</i>	:	Partition Wall System Consisting of Single Layer of MgO Panels – “NevPanel, DragonBoardTürkiye, MagnumBoard”
Numunenin kabul tarihi <i>The date of receipt of sample</i>	:	25.10.2016
Açıklamalar <i>Remarks</i>	:	
Deneyin yapıldığı tarih <i>Date of test</i>	:	27.10.2016
Raporun sayfa sayısı <i>Number of pages of the Report</i>	:	14 (26 pages including appendixes)
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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		



Tarih
Date

17.11.2016

Deney Sorumlusu
Person in charge of test

Sinem YANAR

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.S.
Address : TOSB TAYSAD Organize San. Böl. 1, CD. 15, Yol No: 1
Şekerpınar – Çayırova, KOCAELİ, TURKEY

3. DESCRIPTION OF THE TEST SPECIMEN

3.1. General

Product identification : Partition Wall System Consisting of Single 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

Partition Wall System Consisting of Single Layer of MgO Panels – **"NevPanel, DragonBoardTürkiye, MagnumBoard"** was constructed from vertically positioned boards mounted on a metal stud frame. Single layer of panel with 15 mm thickness was used at each side. The total thickness of the partition wall was 140 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 : 2980 x 40 x 80 x 1,5 mm (h x d x w x t)
 - Locations : Distances between each profile were respectively 460, 50, 480, 565, 570, 65 and 440 mm.

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- Fixings:
 - o Type : Galvanized steel – NevPanel screw with dowel
 - o Dimensions : 12 x 60 mm (Ø x l)
 - o Location : 10 pcs for each edge studs. C.t.c. distance was ca. 330 mm.
- The studs had 20 mm gap at top to let the profiles expand freely.
- Top and bottom rails:
 - Type : Box shaped profile - mild steel.
 - Dimensions : 2950 x 40 x 80 x 1,5 mm (l x d x w x t)
 - Locations : Distances between each profile were respectively 500, 1840 and 480 mm.
 - Fixings:
 - o Type : Galvanized steel – NevPanel screw with dowel
 - o Dimensions : 12 x 60 mm (Ø x l)
 - o Location : 8 pcs for each profile. C.t.c. distance was ca. 300 mm.
- Studs and rails were covered vertically and horizontally with MgO panels at both side of the framework. Width of panels at free edge side and fixed edge side was 95 mm, the width of others was 150 mm.
 - Fixings: Galvanized steel screw – NevPanel Point head screw
 - o Dimensions : 4,2 x 50 mm (Ø x l)
 - o Locations : Vertical and horizontal c.t.c distance was approximately 200 mm.

3.3.2. Panels

- Type: MgO Panels - NevPanel, DragonBoardTürkiye, MagnumBoard
- Nominal density : 1000 kg/m³
- Moisture content : 0,66 %
- Nominal thickness : 15 mm
- Dimensions:
 - Unexposed side:
 - o panels next to the free edge : 510 x 1895 mm (w x h) – at middle
510 x 545 mm (w x h) – at top and bottom
 - o panels in the middle : 1220 x 1895 mm (w x h) – at middle
1220 x 545 mm (w x h) – at top and bottom
 - o panels next to the fixed edge: 1220 x 1895 mm (w x h) – at middle
1220 x 545 mm (w x h) – at top and bottom
 - Exposed side:

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- panels next to the free edge : 510 x 2440 mm (w x h) – at middle
510 x 545 mm (w x h) – at top
- panels in the middle : 1220 x 2440 mm (w x h) – at middle
1220 x 545 mm (w x h) – at top
- panels next to the fixed edge: 1220 x 2240 mm (w x h) – at middle
1220 x 545 mm (w x h) – at top
- Fixing: The panels were fixed to the framework.
 - Type: Galvanized steel screw – NevPanel Point head screw
 - Dimensions : 4,2 x 50 mm (Ø x l)
 - Locations : Vertical c.t.c distance was approximately 130 mm and horizontal c.t.c distance was approximately 150 mm.
- Joints:
 - Type: Water based joint paste – NevPanel N01
 - Dry density : 1556,5 ± 20 kg/m³
 - Consumption : 150 gr/m²
 - Location : Between the panels.
 - Reinforcement: Joint tape
 - Type : Fibre-glass self-adhesive mesh tape – NevPanel
 - Width : 50 mm
 - Nominal mass per unit area: 46 g/m²
 - Type: Water based finishing paste – NevPanel N01
 - Dry density : 1395,5 ± 20 kg/m³
 - Consumption : 150 gr/m²
 - Location : On the joint tape surface.

3.3.3. Insulation

- Type : Stone wool – TERRAWOOL
- Nominal thickness : 80 mm
- Density : 70 kg/m³

For further information, see figures 1-6.

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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.
24	Smoke release at the top of fixed edge.
108	Deformation on the partition wall through inside.
110	Smoke release from joint of panels.
113	F – Opening occurred at joint of panels.
159	Deformation at joint of panels.
170	Opening and blackening at joint of panels.
180	Test was terminated after consulted with the sponsor. See photo C3-C4-C5.

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	∅ 6 mm	no failure (not applied)
	∅ 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 180 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 **180 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.

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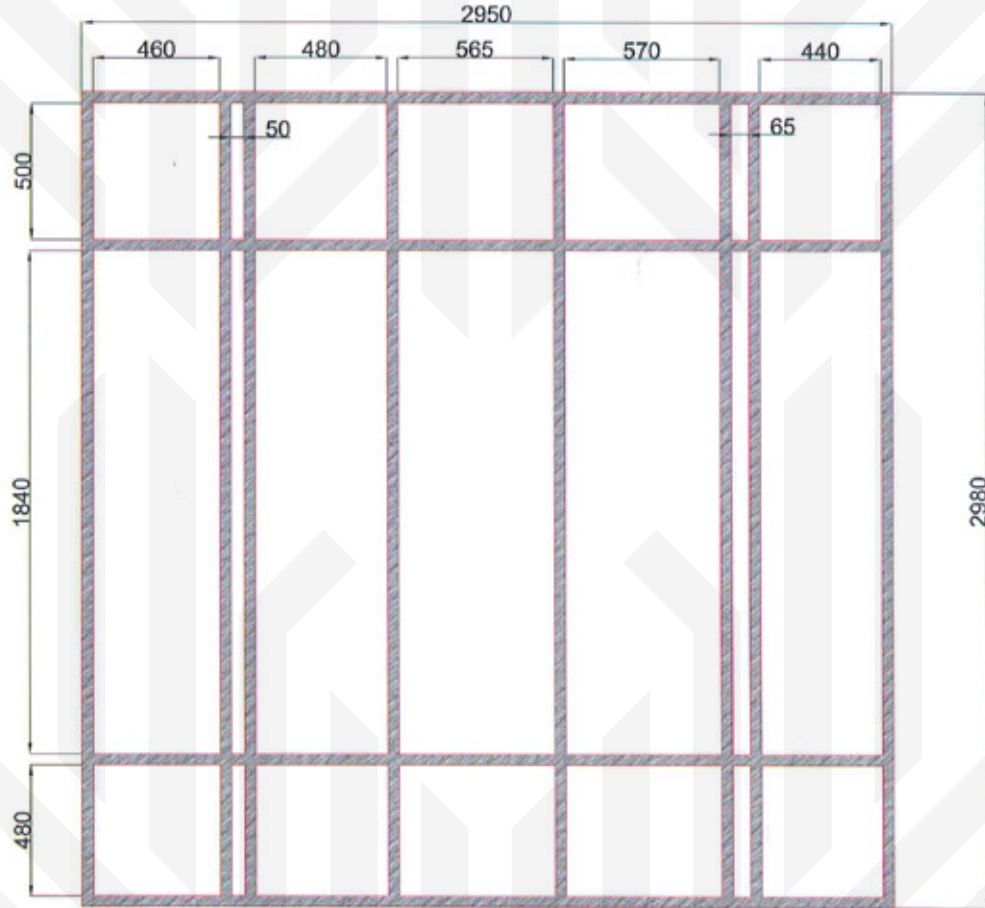
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10. DRAWINGS



KARKAS GÖRÜNÜMÜ

40 x 80 x 1.5 mm PROFİL

Figure 1: View of framework.

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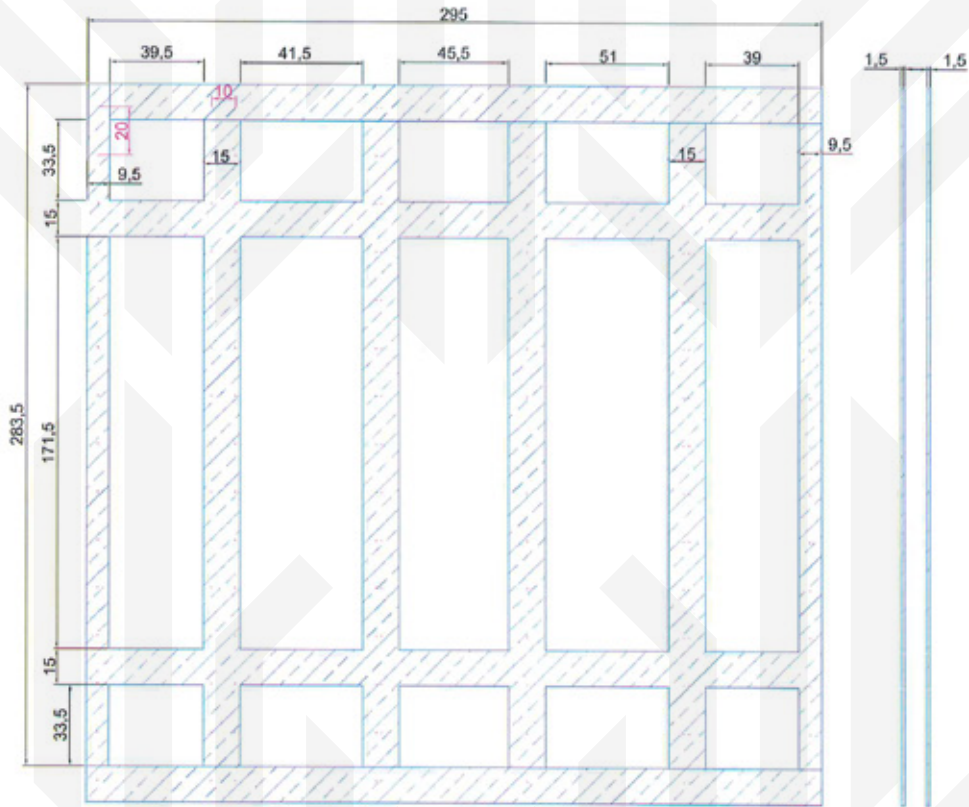
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150 x 15mm NEVPANEL BOARD

Figure 2: Covering panel of studs and rails.

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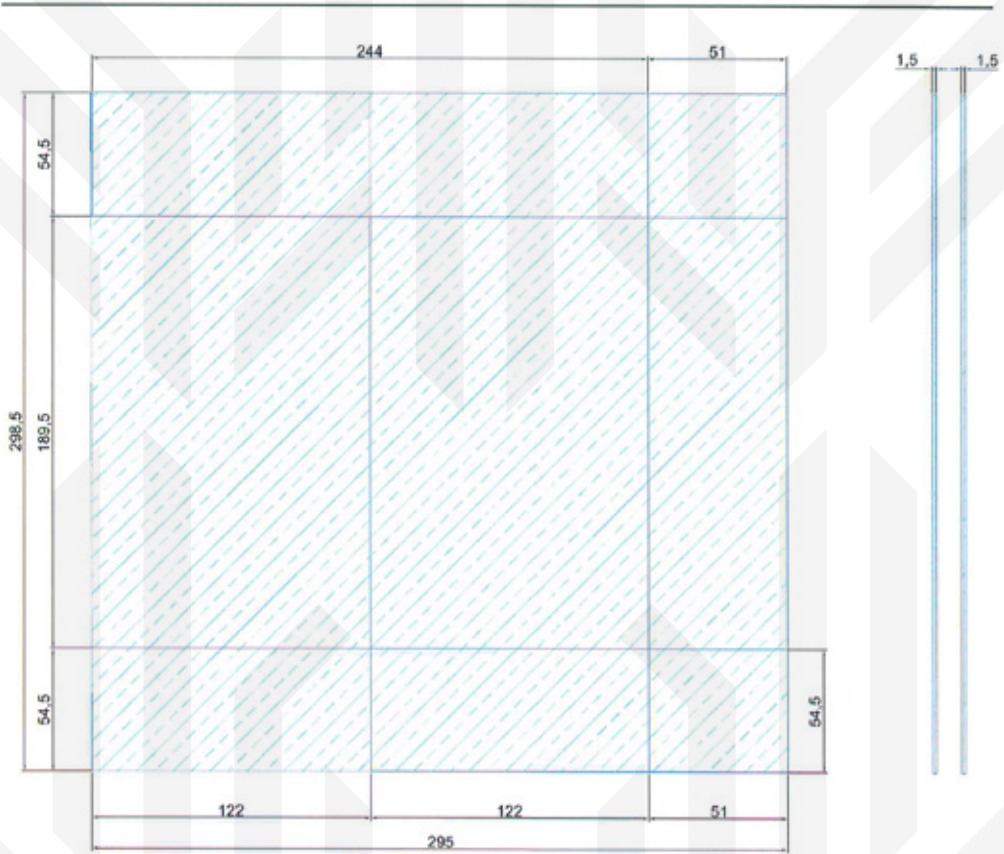
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ÖN YÜZEY

Figure 3: Unexposed side view of the panels.

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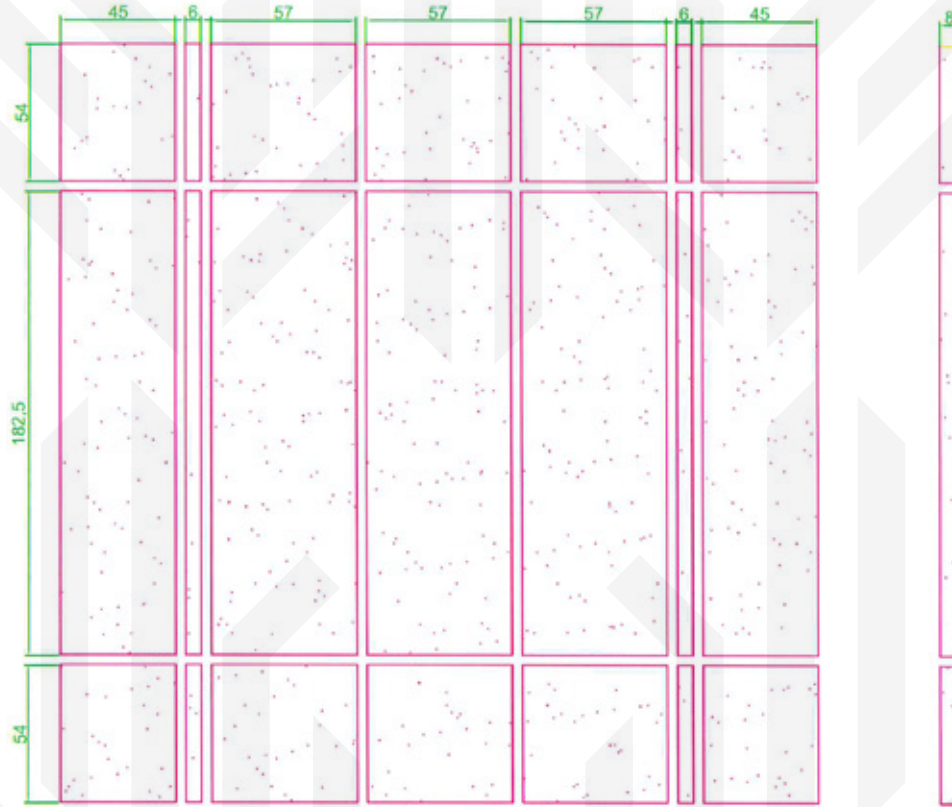
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80mm Stone wool - TERRAWOOL

Figure 4: View of stone wool insulation.

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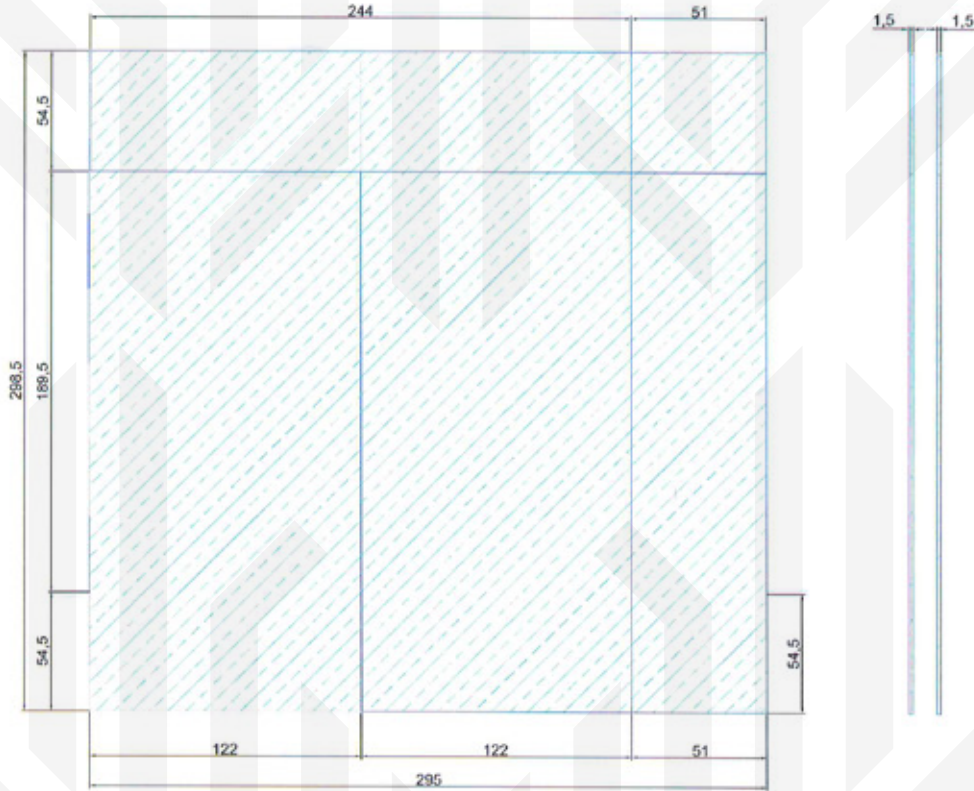
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ARKA YÜZEY

Figure 5: Exposed side view of the panels.

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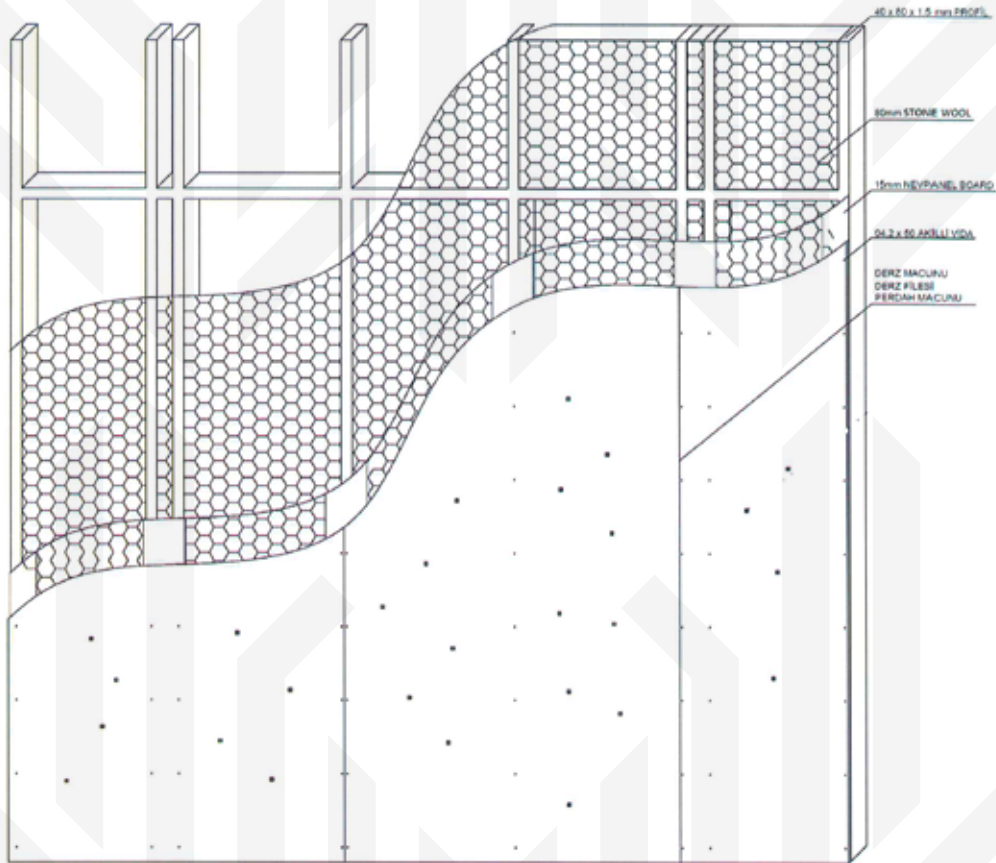


Figure 6: Assembly view of the specimen.

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APPENDIXES:

Appendix A: Furnace and laboratory conditions

Appendix B: Test results

Appendix C: Photos

Bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz.

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Appendix A

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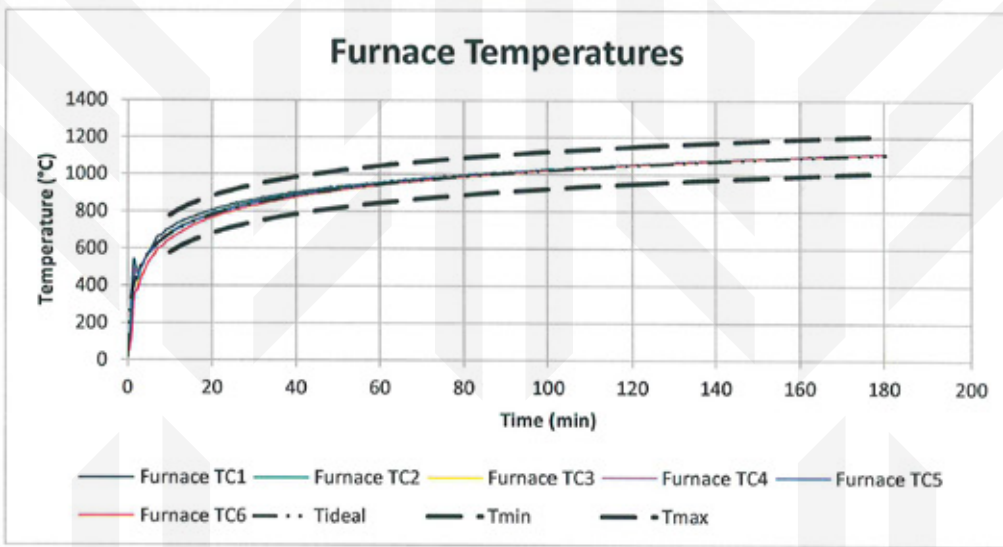


Figure A1: Furnace Temperatures

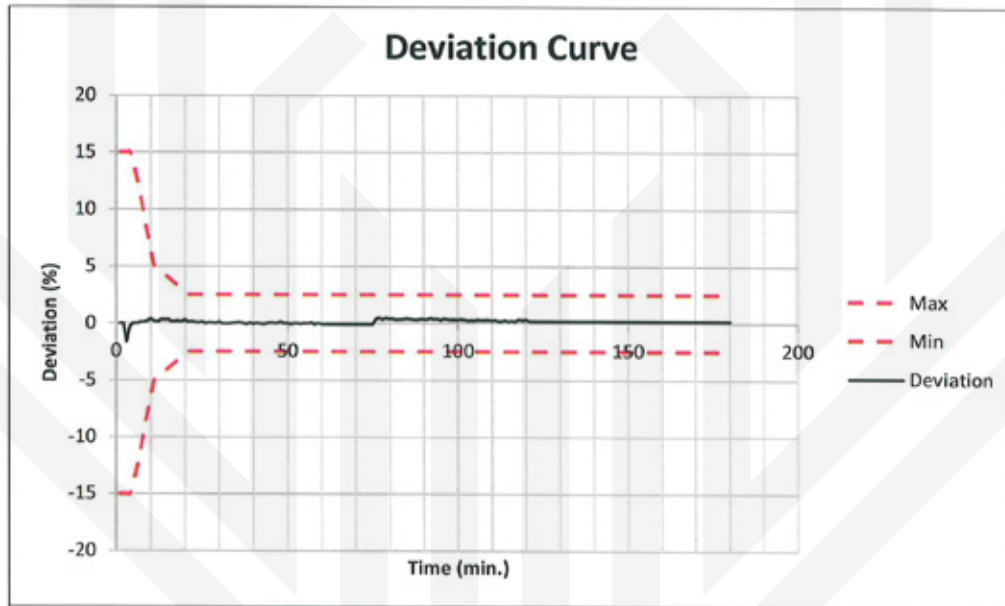


Figure A2: Deviation of furnace temperature

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Appendix A

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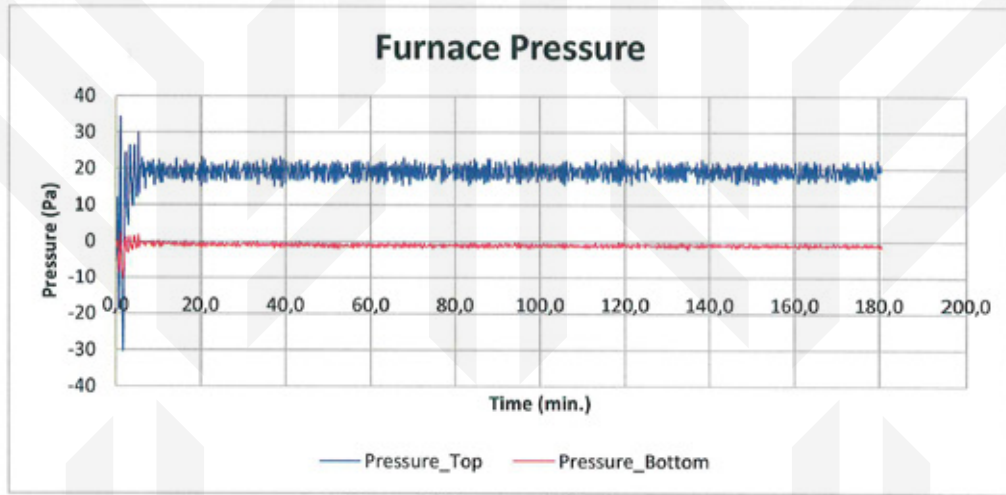


Figure A3: Pressure in the furnace

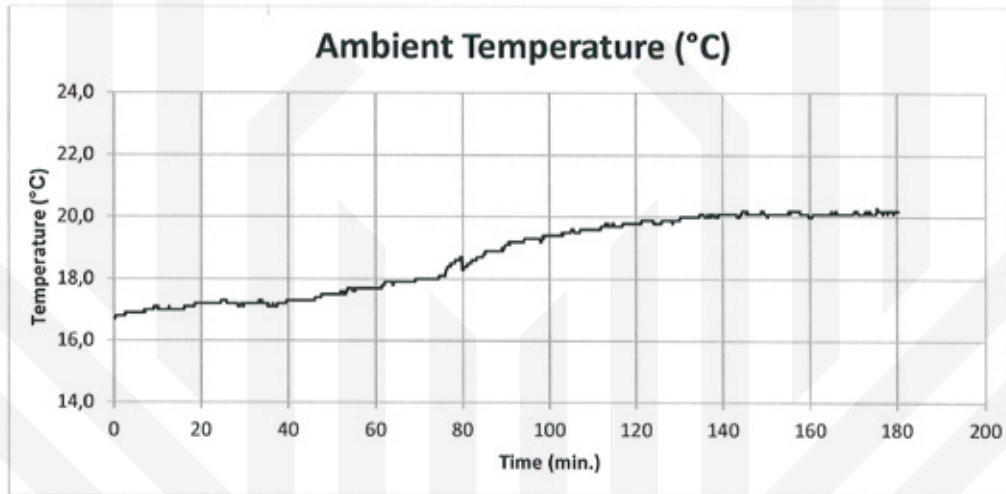


Figure A4: Ambient temperature at laboratory

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Appendix B

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UNEXPOSED SIDE OF TEST FRAME

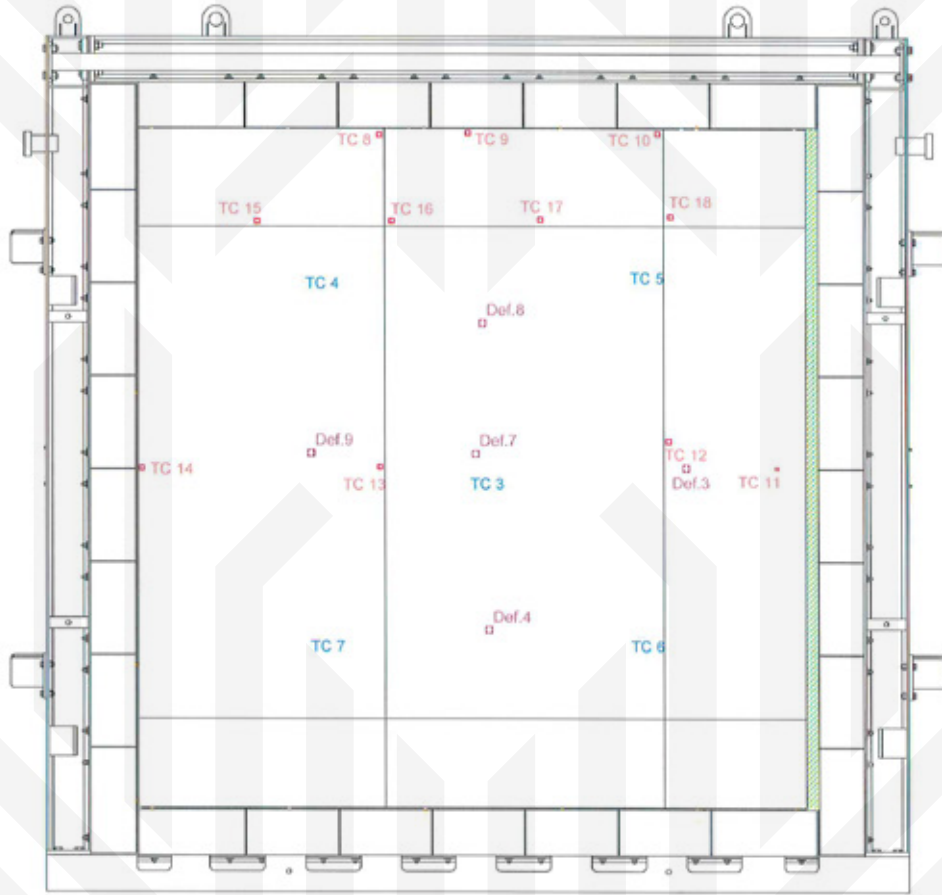


Figure B1: Locations of thermocouples and deflection sensors

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Appendix B

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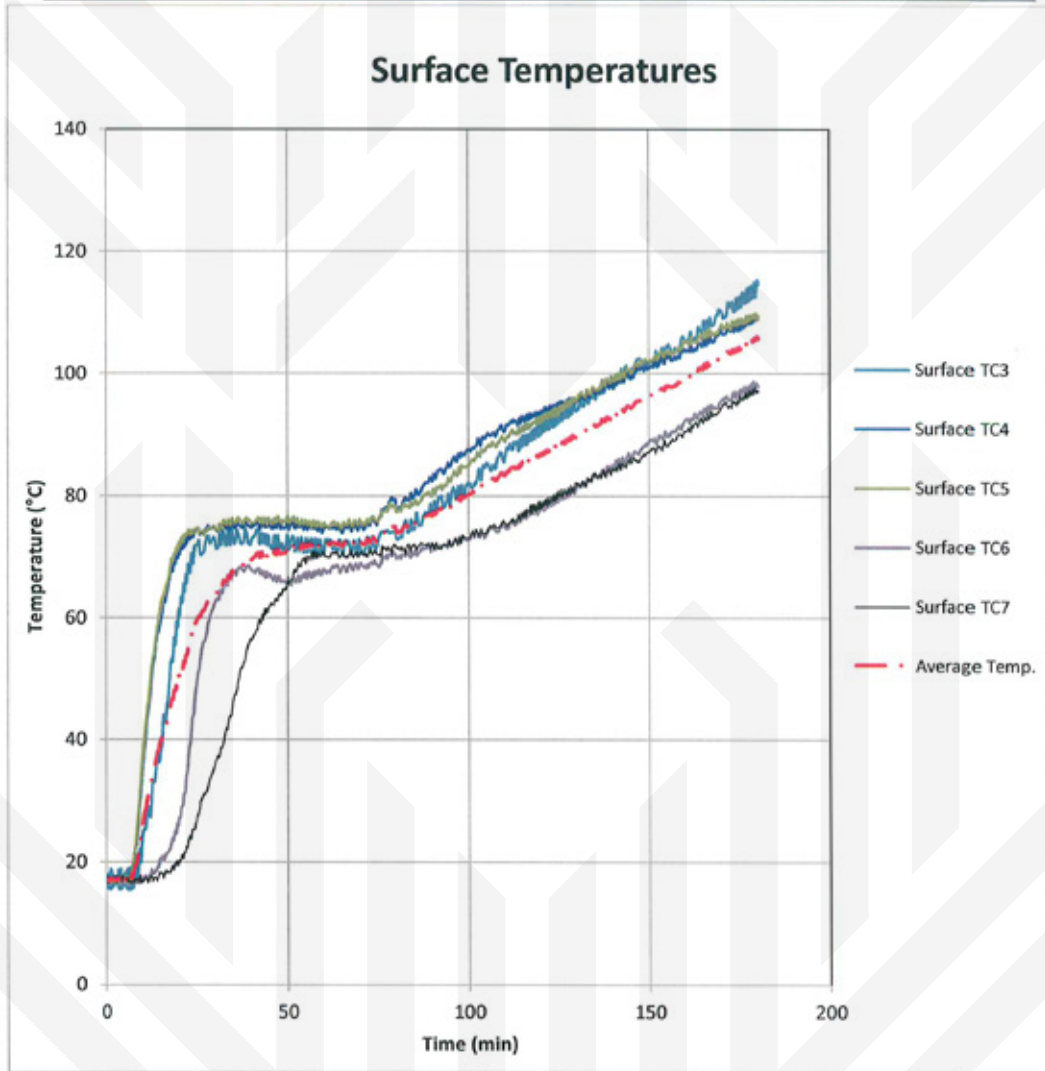


Figure B2: Surface temperatures (Thermocouple sensors for average temperature)

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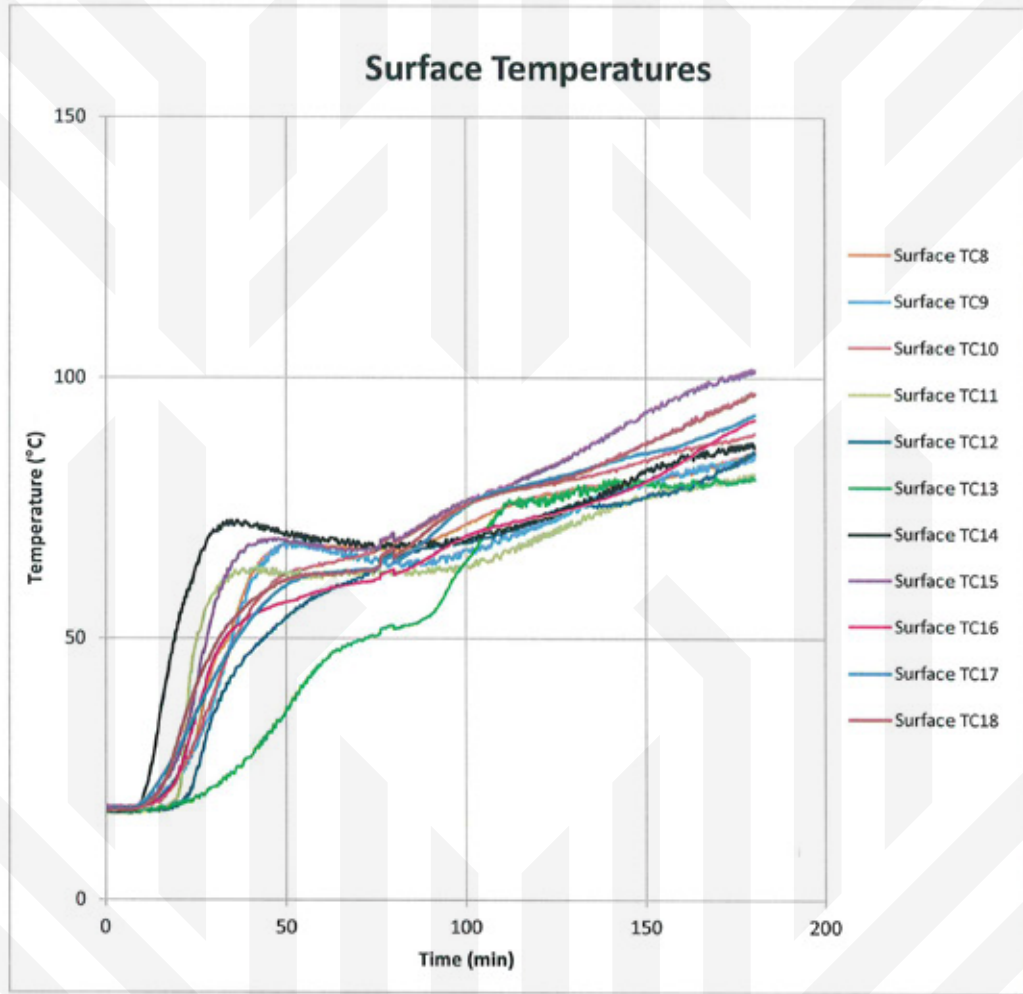


Figure B3: Surface temperatures (Thermocouple sensors for maximum temperature)

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Appendix B

EFFECTIS ERA AVRASYA TEST VE BELGELENDİRME A.Ş.

AB-0556-T

17.11.2016

RFTR16191

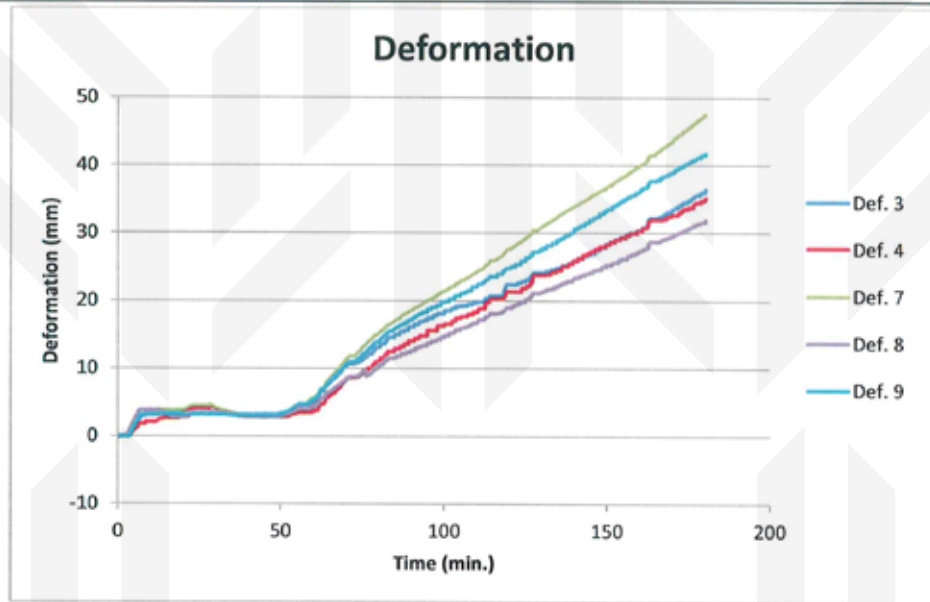


Figure B4: Deformation of the wall.

Table B1: Data obtained from deformation sensors

Time (min.)	Def. 3 (mm)	Def. 4 (mm)	Def. 7 (mm)	Def. 8 (mm)	Def. 9 (mm)
0,0	0,00	0,00	0,00	0,00	0,00
4,0	0,75	0,40	1,28	1,15	0,55
8,0	2,98	1,73	3,78	3,78	3,08
12,0	3,30	2,13	3,85	3,78	3,18
16,0	3,38	2,55	3,83	2,90	3,18
20,0	3,33	3,35	3,83	2,75	3,15
24,0	3,38	4,00	4,48	3,35	3,15
28,0	3,40	3,95	4,43	3,35	3,13
32,0	3,38	3,70	3,90	3,33	3,13
36,0	3,28	3,13	3,23	3,08	3,00
40,0	3,20	2,83	2,83	2,83	3,00
44,0	3,20	2,78	2,80	2,78	2,98
48,0	3,25	2,78	2,85	2,80	3,03
52,0	3,50	2,78	3,60	3,20	3,60

Bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz.

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Time (min.)	Def. 3 (mm)	Def. 4 (mm)	Def. 7 (mm)	Def. 8 (mm)	Def. 9 (mm)
56,0	4,55	3,35	4,78	3,93	4,68
60,0	4,85	3,48	5,55	4,28	5,35
64,0	7,33	5,45	7,90	6,08	7,53
68,0	9,28	7,08	10,00	7,53	9,50
72,0	10,68	8,53	11,83	8,73	10,98
76,0	11,58	9,53	13,40	9,50	12,30
80,0	13,13	10,95	15,18	10,35	13,95
84,0	14,50	12,38	16,70	11,45	15,50
88,0	15,63	13,48	17,95	12,10	16,50
92,0	16,50	14,30	19,08	12,95	17,80
96,0	17,43	15,48	20,15	13,70	18,73
100,0	18,03	16,15	21,40	14,58	19,78
104,0	19,13	17,33	22,55	15,65	20,73
108,0	19,48	17,88	23,60	16,25	21,45
112,0	19,83	18,73	24,73	17,15	22,75
116,0	20,70	20,15	26,05	18,05	23,55
120,0	22,38	21,23	27,60	18,90	24,78
124,0	22,88	21,75	28,83	19,83	25,83
128,0	24,10	23,68	30,40	21,13	27,20
132,0	24,33	23,78	31,48	21,63	28,15
136,0	24,83	24,43	32,83	22,48	29,18
140,0	25,80	25,80	33,98	23,33	30,65
144,0	26,75	26,90	34,95	23,98	31,50
148,0	27,83	27,88	36,20	24,60	32,85
152,0	28,63	28,58	37,40	25,55	34,00
156,0	29,63	29,55	38,53	26,18	35,03
160,0	30,30	30,23	39,78	27,23	35,95
164,0	32,18	31,88	41,53	28,70	37,68
168,0	32,78	32,05	42,75	29,10	38,45
172,0	34,00	32,85	44,40	29,95	39,48
176,0	35,10	33,65	45,78	30,85	40,60
180,0	35,98	34,73	47,33	31,55	41,48

Bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz.

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Appendix C

EFFECTIS ERA AVRASYA TEST VE BELGELENDİRME A.Ş.

AB-0556-T

17.11.2016

RFTR16191

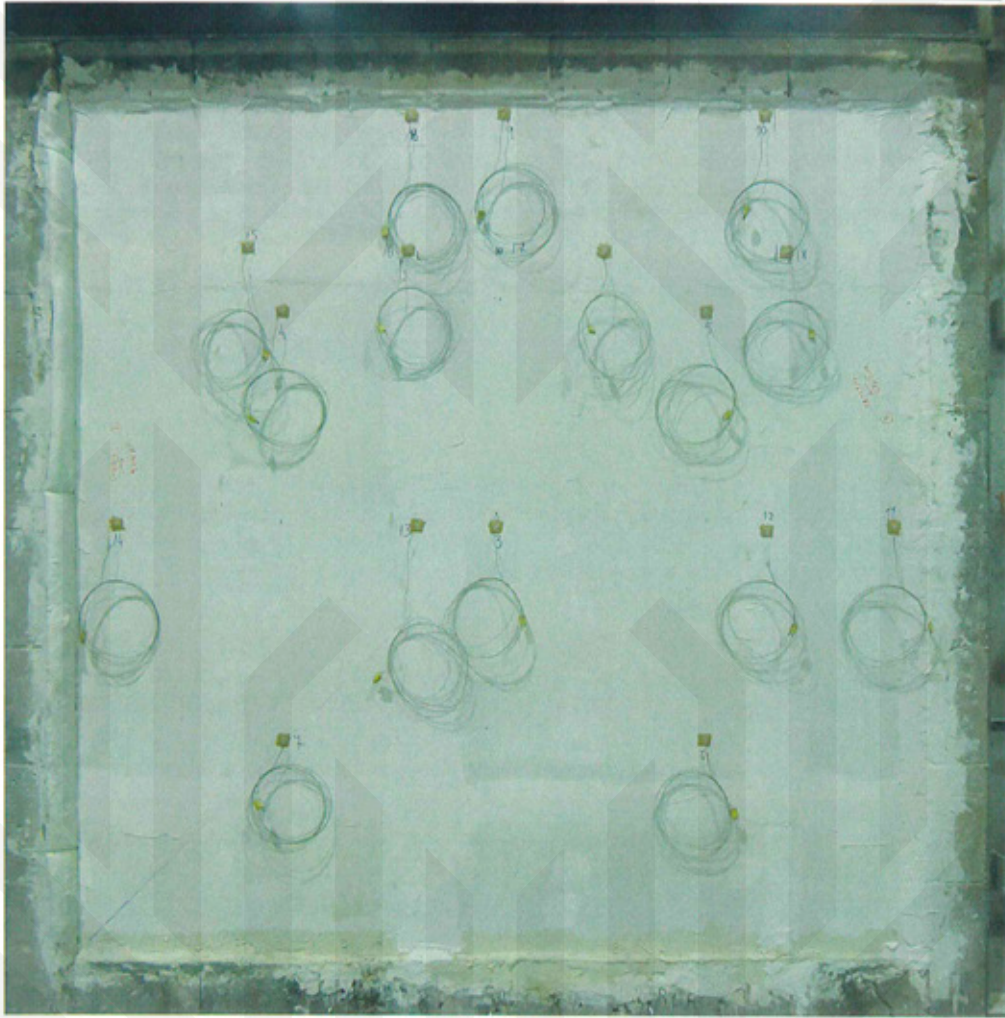


Photo C1: Unexposed side of the test specimen before the test

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

EFFECTIS ERA AVRASYA TEST VE BELGELENDİRME A.Ş.

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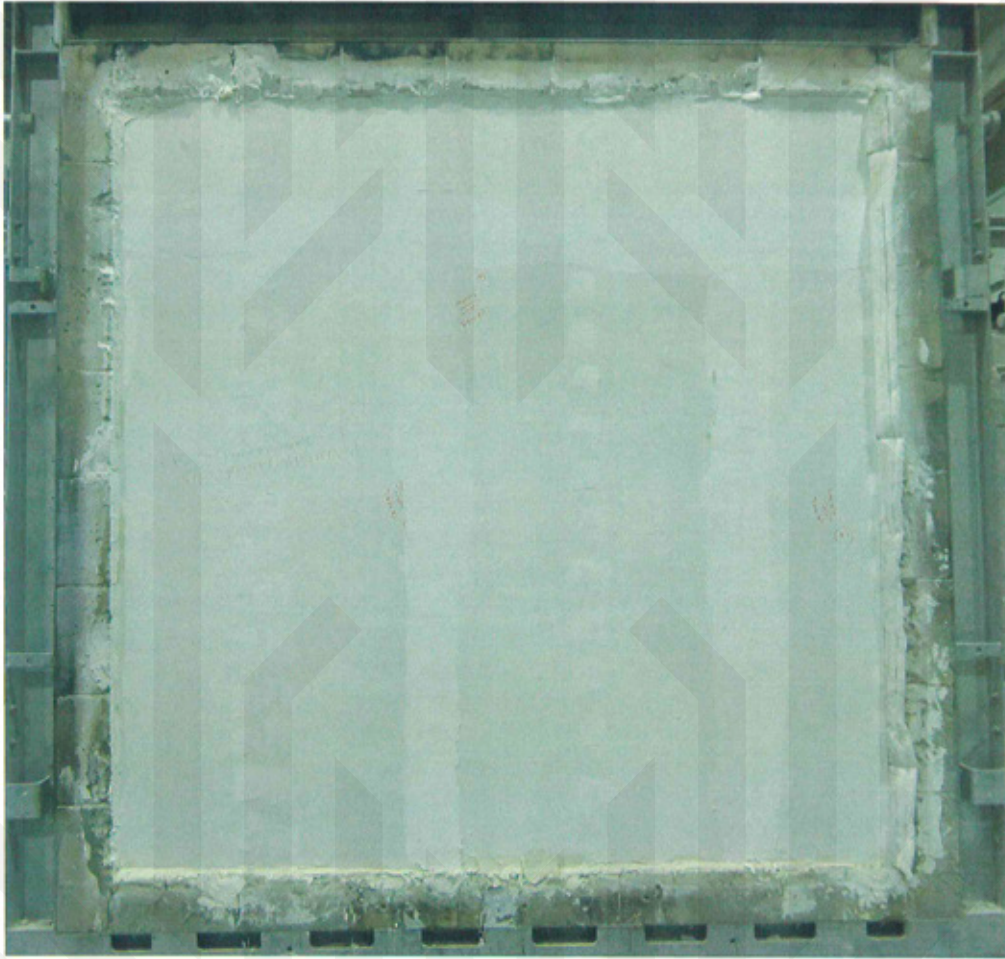


Photo C2: Exposed side of the test specimen before the test

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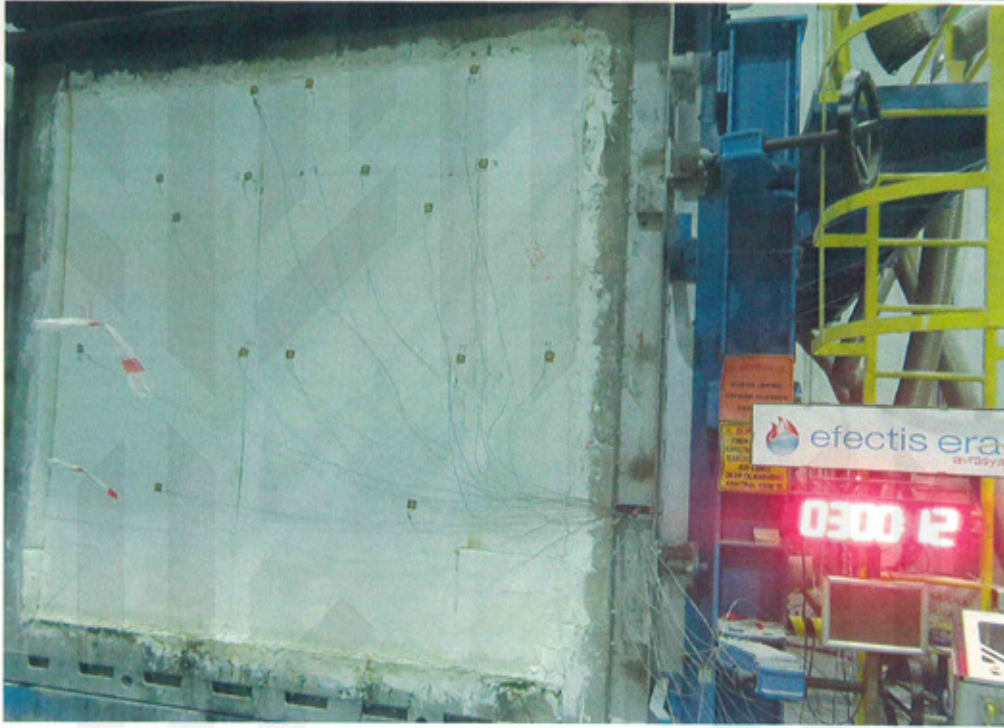
Appendix C

EFFECTIS ERA AVRASYA TEST VE BELGELENDİRME A.Ş.

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Photo C3: Unexposed side of the test specimen at 180th minute of the test

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

EFFECTIS ERA AVRASYA TEST VE BELGELENDİRME A.Ş.

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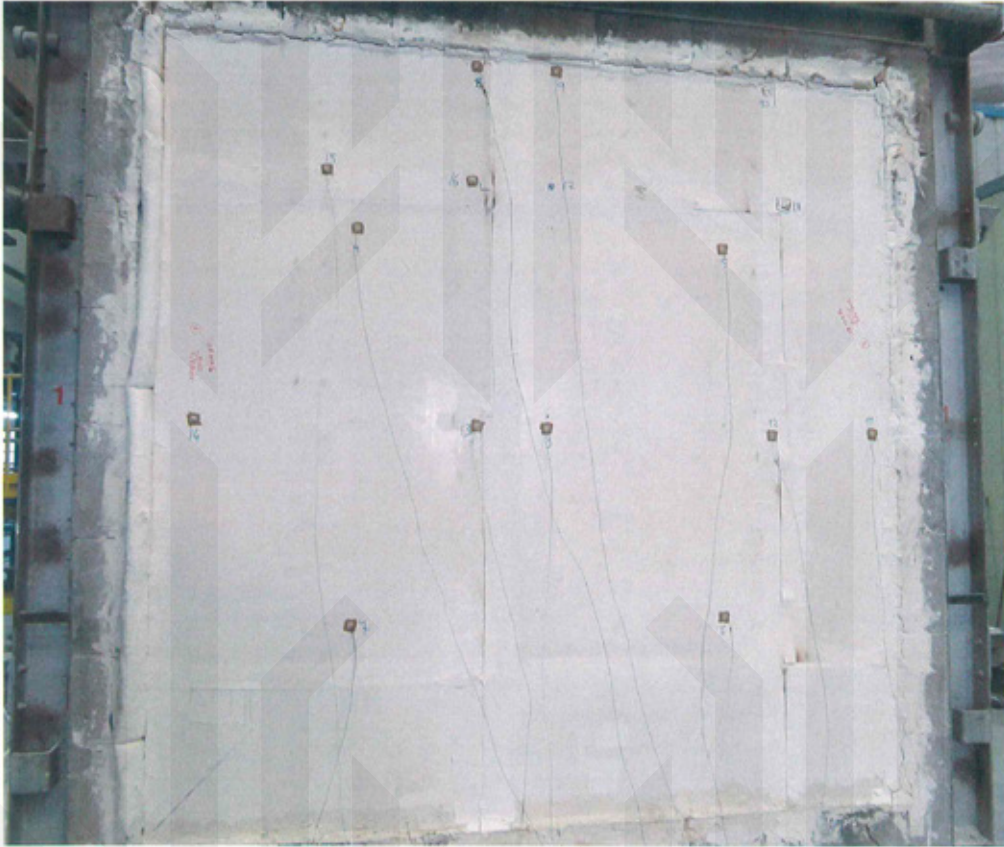


Photo C4: Unexposed side of the test specimen after the test

Bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz.
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Photo C5: Exposed side of the test specimen after the test

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