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EFFECTIS ERA AVRASYA TEST VE BELGELENDİRME A.Ş.

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

Şekerpınar – Çayırova, KOCAELİ

DENEY RAPORU

TEST REPORT

AB-0556-T

22.01.2016

RFTR16016

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-15-000771
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>	: 08.12.2015
Açıklamalar <i>Remarks</i>	:
Deneyin yapıldığı tarih <i>Date of test</i>	: 09.12.2015
Raporun sayfa sayısı <i>Number of pages of the Report</i>	: 11 (24 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

22.01.2016

Deney Sorumlusu
Person in charge of test


Sinem ÖZTÜRK

Laboratuvar Müdürü
Head of Testing Laboratory


Ali BAYRAKTAR

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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 Layers of MgO Panels – "**NevPanel, DragonBoardTürkiye, MagnumBoard**" was constructed from vertically positioned boards mounted on a metal stud frame. The total thickness of the partiitiion wall was 99 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.

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3.3. Components

3.3.1. Framework

- Studs and horizontal intermediate profiles:
 - Type: DC75 - C shaped profile - galvanized steel.
 - Dimensions: 2985/2950 x 42 x 73 x 0,8 mm (l x d x w x t).
 - Fixing:
 - Type : Galvanized steel – NevPanel screw with dowel
 - Dimensions : 12 x 60 mm (Ø x l)
 - Location : 11 pcs for each edge studs. Ctc. distance was ca. 300 mm.
- The studs had 15 mm gap at top to let the profiles expand freely. Each stud has ca. 300 mm distance to each other.
- Top and bottom rails:
 - Type: DU75 - U shaped profile –galvanized steel.
 - Dimensions: 2985 x 28 x 75 x 0,8 mm (l x d x w x t)
 - Fixing:
 - Type : Galvanized steel – NevPanel screw with dowel
 - Dimensions : 12 x 60 mm (Ø x l)
 - Location : 11 pcs for each profile. Ctc. distance was ca. 300 mm.

See Figure 1-2 for details.

3.3.2. Panels

- Type: MgO Panels - NevPanel, DragonBoardTürkiye, MagnumBoard
- Nominal density : 1000 kg/m³
- Nominal thickness : 12 mm
- Dimensions:
 - Unexposed side:
 - panels next to the free edge: 510 x 2440 mm (w x l) and 510 x 550 mm (w x l)
 - panels in the middle: 1220 x 2440 mm (w x l) and 1220 x 550 mm (w x l)

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- o panels next to the fixed edge: 1220 x 2440 mm (w x l) and 1220 x 550 mm (w x l)
- Exposed side:
 - o panels next to the free edge: 1220 x 2440 mm (w x l) and 1220 x 550 mm (w x l)
 - o panels in the middle: 1220 x 2440 mm (w x l) and 1220 x 550 mm (w x l)
 - o panels next to the fixed edge: 510 x 2440 mm (w x l) and 510 x 550 mm (w x l).
- Fixing:
 - Type: Galvanized steel screw – NevPanel Point head screw
 - o Dimensions : 3,9 x 25 mm (Ø x l).
 - o Locations : Fixed the panel to the steel framework. 9 pcs for each studs. C/c distance was ca. 300 mm.
- Joints:
 - Type: Water based joint paste – NevPanel N01
 - o Dry density : 1556,5 ± 20 kg/m³
 - o Consumption : 150 gr/m²
 - o Location : Between the panels.
 - o 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
 - o Dry density : 1395,5 ± 20 kg/m³
 - o Consumption : 150 gr/m²
 - o Location : On the joint tape surface.

3.3.3. Insulation

- Type : Stone wool – WOOLER
- Nominal thickness : 50 mm
- Density : 50 kg/m³

For further information, see figures 1-2.

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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 (NEVPANEL YAPI MADEN ÜRETİM İTH. İHR. SAN. VE TİC. LTD. ŞTİ.)

4.2. Conditioning

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

- Ambient temperature: $15,75 \pm 1,25$ °C.
- Relative humidity: 58 ± 4 %.

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 TC16, see figure B2 and 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.
6	Smoke release at the bottom edge of the specimen.
14	Smoke release at the fixed and free edge of the specimen.
15	F – Panel joints became clear.
30	Maintaining both integrity and the insulation.
40	Deformation at middle panel increased
45	Panel joints became clear
51	Colour changed around the vertical edge of Thermocouple 12.
56	Deflection exceed 100 mm.
57	Smoke release at horizontal joints and the vertical edge near to Thermocouple 12.
60	Maintaining both integrity and the insulation.
61	Colour changed at the horizontal edges
74	Colour changed at the vertical edge next to free edge.
83	Fixing points blackened.
86	Temperature increased at Thermocouple Nr. 14, $\Delta T > 180$ °C. Insulation (I) failed.
103	Joint tapes flaked off at the vertical edge between fixed edge panel and middle panel. Opening observed.
107	Cotton pad was applied on to the opening. No ignition
112	Cotton pad was applied on to the opening. No ignition
118	Cotton pad was applied on to the opening. No ignition
121	Cotton pad was applied on to the opening. No ignition. Test was terminated after consulted with the customer. See photo C4-C5.

Bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz.
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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.
- Gap gauges \varnothing 6 mm	no failure (not applied)
\varnothing 25 mm	no failure (not applied)
- Flames longer than 10 sec.	not observed.
Insulation, (I)	
- average temperature	no failure
- maximum temperature	86 th minute by TC 14.
The heating was terminated at 121 st minute after consulted with the customer.	

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

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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
- increase in the number of horizontal joints
- increase in the number of horizontal joints
- 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 **45 minutes** for the criteria integrity and thermal insulation and **120 minutes** for integrity only 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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10. DRAWINGS

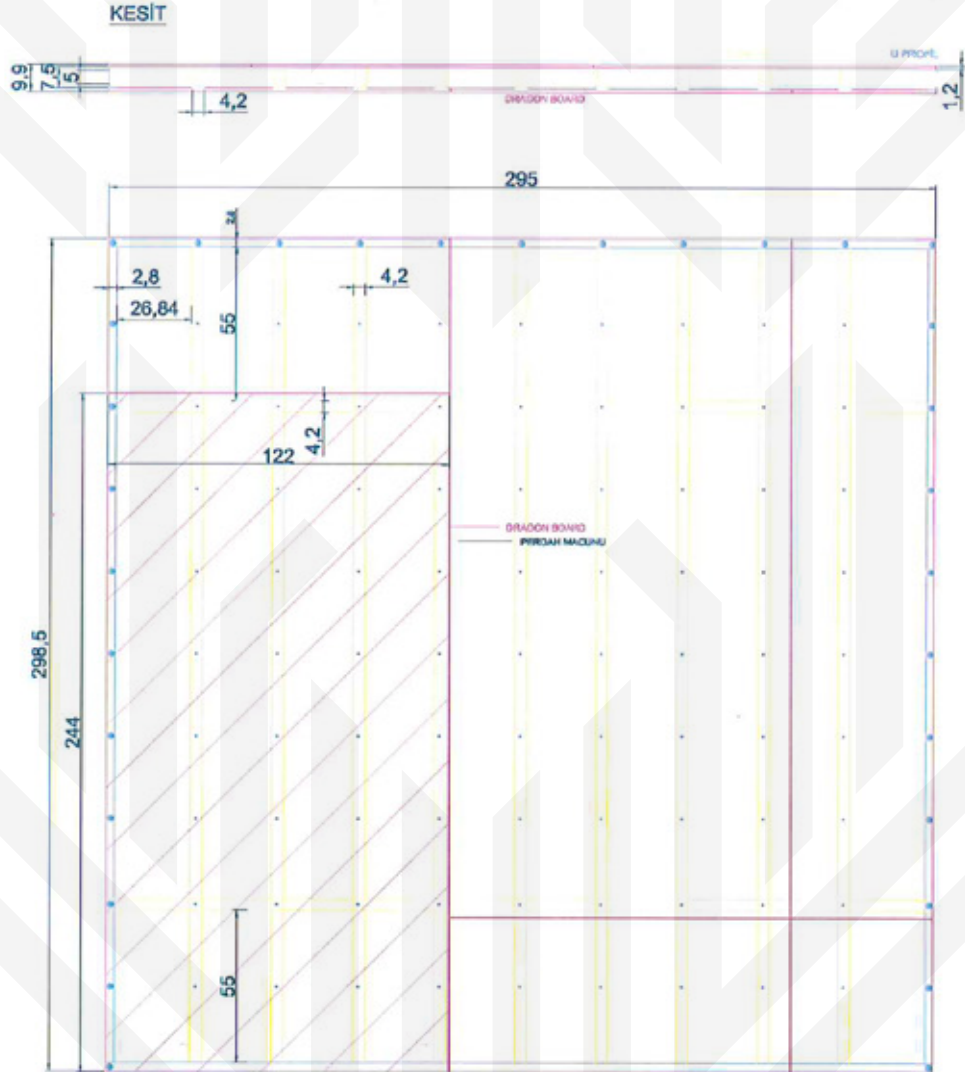


Figure 1: Exposed side and cross section view of the specimen.

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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

EFFECTIS ERA AVRASYA TEST VE BELGELENDİRME A.Ş.

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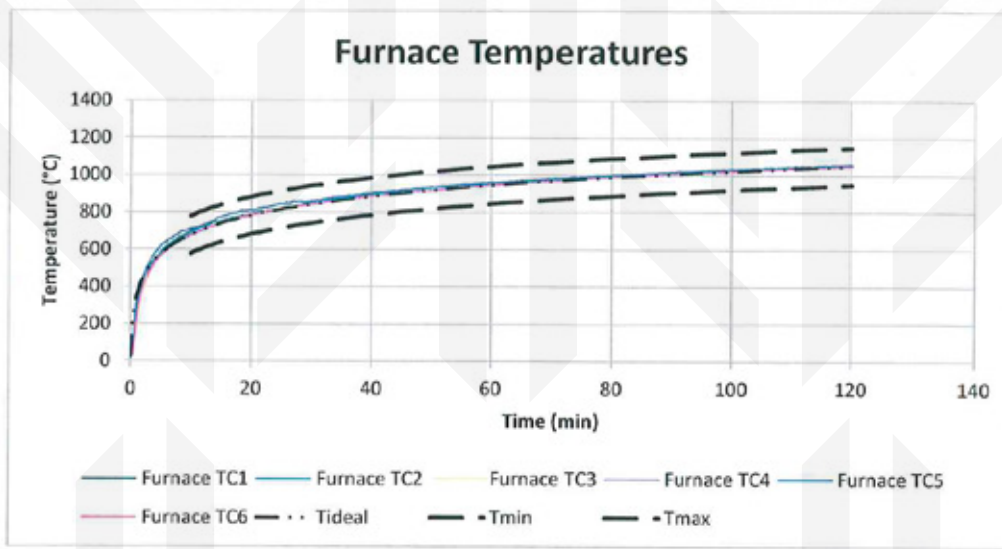


Figure A1: Furnace Temperatures

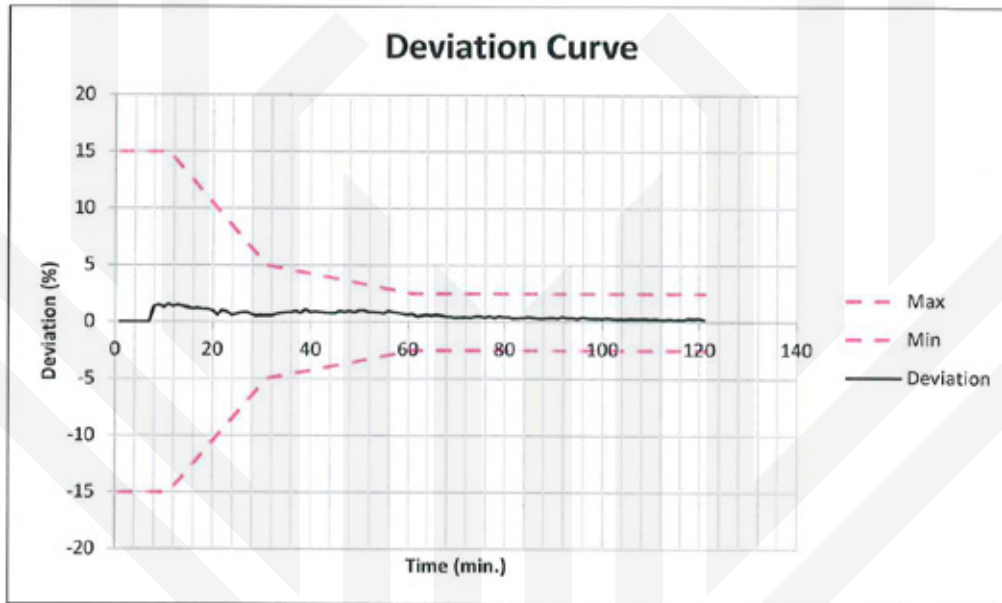


Figure A2: Deviation of furnace temperature

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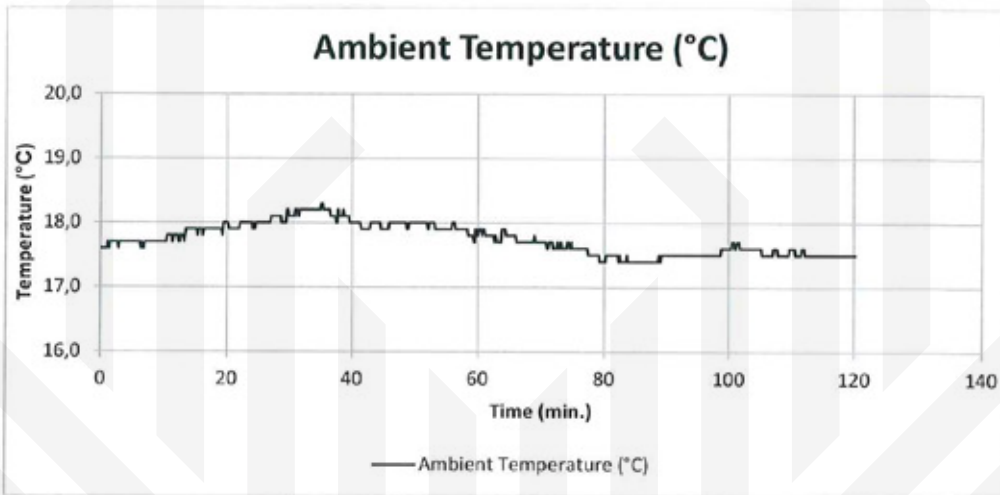
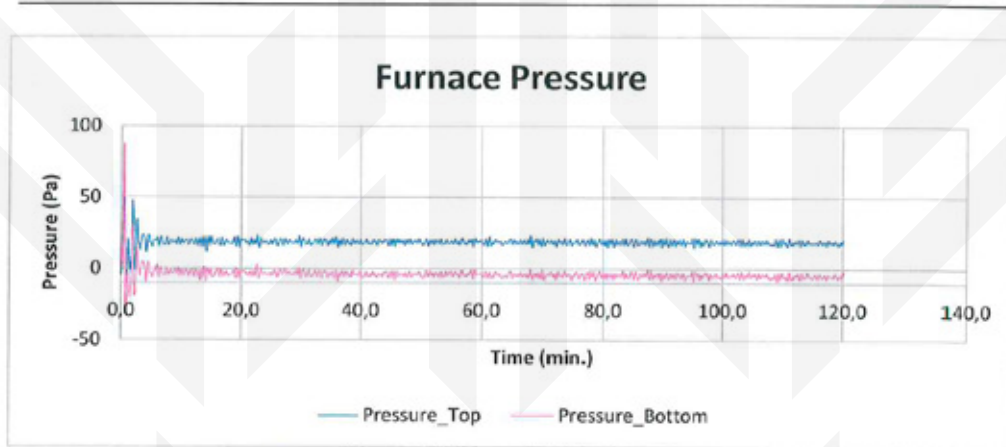
Appendix A

EFFECTIS ERA AVRASYA TEST VE BELGELENDİRME A.Ş.

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Appendix B

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UNEXPOSED SIDE OF TEST FRAME

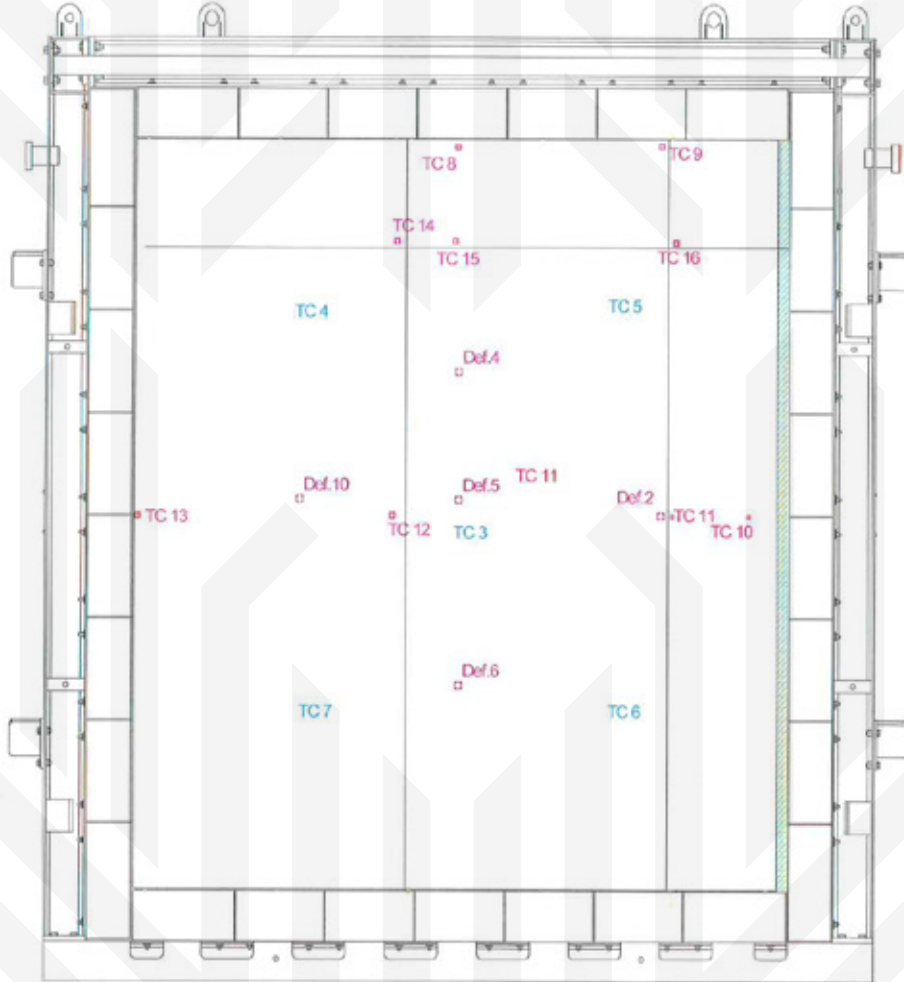


Figure B1: Locations of thermocouples and deflection sensors

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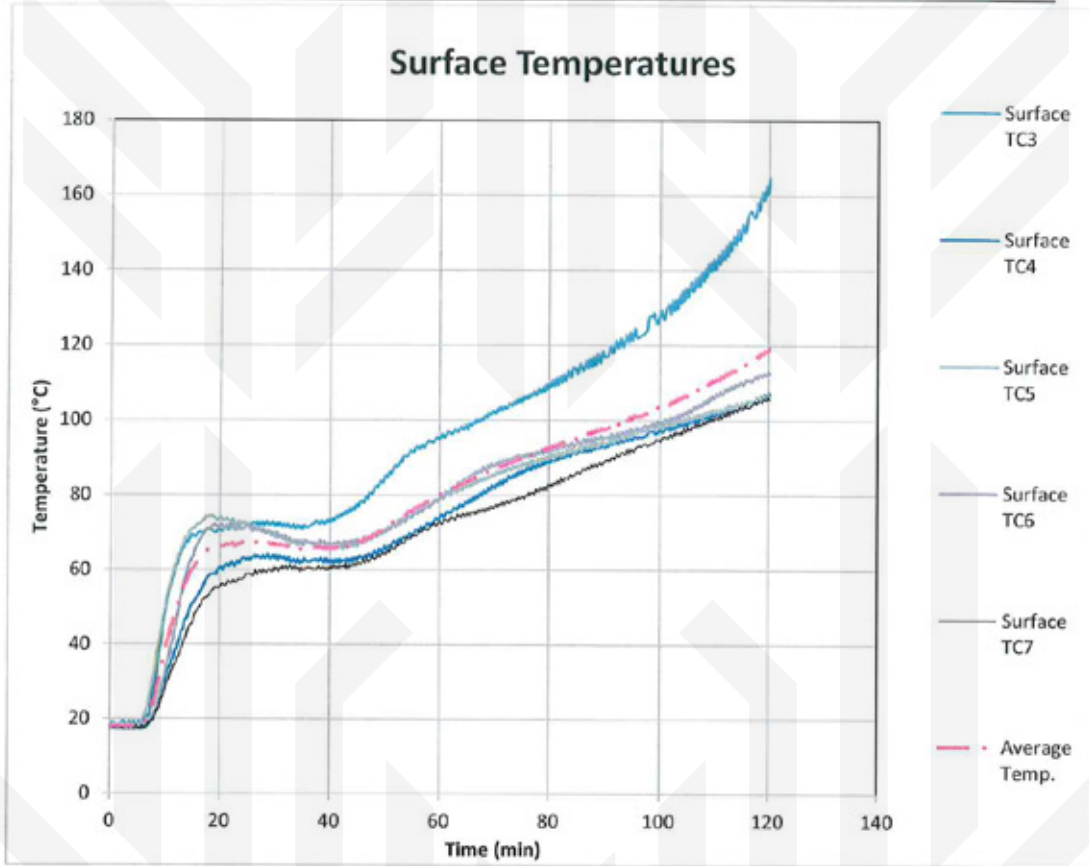


Figure B2: Surface temperatures (Thermocouple sensors for average temperature)

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Appendix B

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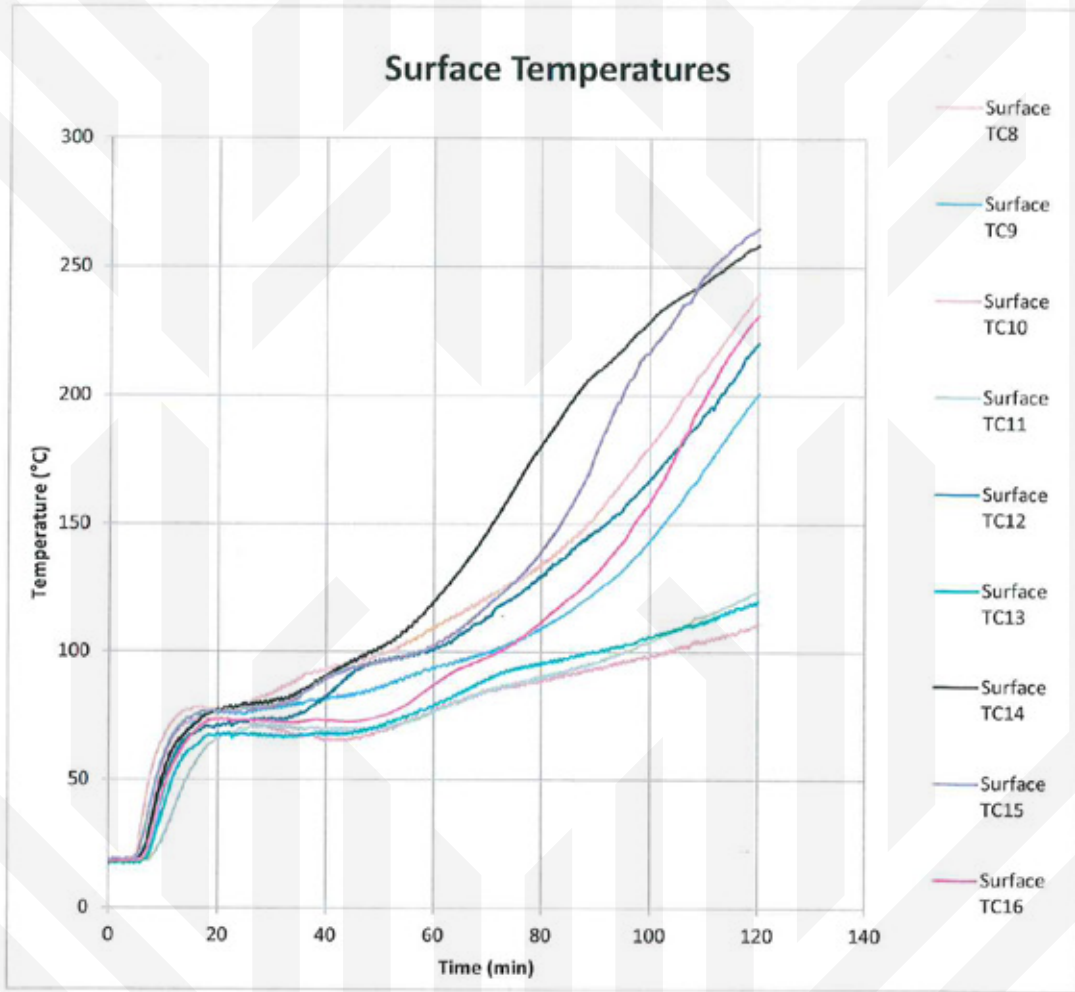


Figure B3: Surface temperatures (Thermocouple sensors for maximum temperature)

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Appendix B

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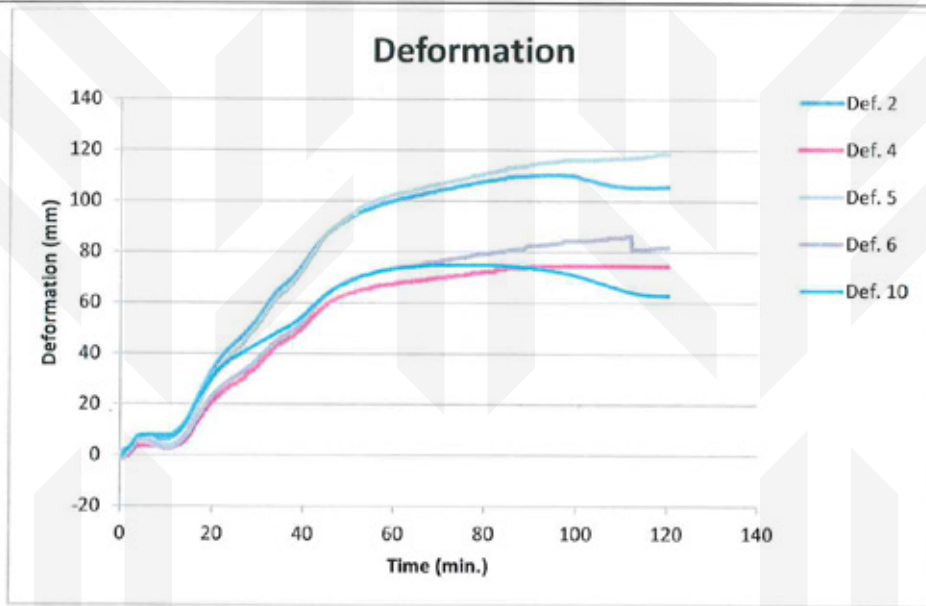


Figure B4: Deformation of the wall.

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Appendix B

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Table B1: Data obtained from deformation sensors

Time (min)	Def. 2	Def. 4	Def. 5	Def. 6	Def. 10
0,0	0,00	0,00	0,00	0,00	0,00
2,0	2,03	0,15	0,85	0,90	2,95
4,0	7,20	3,60	6,90	5,75	7,68
6,0	7,35	3,60	6,90	5,78	8,10
8,0	6,45	3,58	5,15	3,58	8,20
10,0	6,33	3,58	4,08	2,60	8,18
12,0	7,80	3,58	4,58	3,30	9,13
14,0	11,95	5,28	7,70	7,18	12,60
16,0	18,85	10,30	14,45	11,80	18,73
18,0	26,53	16,05	23,03	17,88	25,08
20,0	33,35	20,83	29,85	23,05	30,30
22,0	38,55	23,95	35,13	26,80	34,48
24,0	42,50	27,03	39,15	29,30	37,50
26,0	45,75	28,95	42,30	31,83	39,50
28,0	49,33	32,38	47,10	34,55	41,78
30,0	53,85	34,88	51,23	37,90	43,85
32,0	59,10	38,98	56,35	41,35	45,98
34,0	64,33	42,70	61,25	44,78	48,03
36,0	67,48	44,85	64,48	47,00	49,83
38,0	70,68	47,30	68,48	49,60	52,20
40,0	75,18	50,53	73,05	52,40	55,03
42,0	80,05	53,93	78,70	57,05	58,55
44,0	84,65	57,50	84,13	61,38	61,83
46,0	88,28	60,38	88,40	64,43	64,55
48,0	90,83	62,05	90,93	66,75	66,58
50,0	93,15	63,53	93,60	68,65	68,15
52,0	95,18	64,68	97,00	70,08	70,08
54,0	96,50	65,30	98,50	70,95	71,13
56,0	97,88	66,43	100,13	71,98	72,08
58,0	98,95	66,80	101,30	73,08	72,68
60,0	100,00	67,18	102,30	73,50	73,25
62,0	101,08	67,93	103,35	74,28	73,80
64,0	101,75	68,18	103,83	74,30	74,00
66,0	102,38	68,53	104,88	74,78	74,45

Bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz.

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Appendix B

EFFECTIS ERA AVRASYA TEST VE BELGELENDİRME A.Ş.

AB-0556-T

22.01.2016

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Time (min)	Def. 2	Def. 4	Def. 5	Def. 6	Def. 10
68,0	103,48	69,48	106,00	75,83	74,85
70,0	104,20	69,83	106,68	76,35	74,85
72,0	104,80	70,30	107,40	76,93	74,85
74,0	105,70	70,73	108,20	77,50	74,90
76,0	106,38	71,25	108,93	78,20	74,90
78,0	107,03	71,68	109,78	78,68	74,93
80,0	107,58	71,95	110,58	79,13	74,93
82,0	108,18	72,10	111,25	79,80	74,85
84,0	108,83	73,18	112,23	80,10	74,78
86,0	109,45	73,80	113,00	80,63	74,48
88,0	109,70	73,80	113,55	81,25	74,03
90,0	110,05	74,28	114,28	82,45	73,70
92,0	110,18	74,28	114,83	82,65	73,28
94,0	110,33	74,40	115,33	83,05	72,80
96,0	110,33	74,40	115,68	83,40	72,13
98,0	110,13	74,55	116,05	84,28	71,48
100,0	109,53	74,55	116,05	84,28	70,60
102,0	108,58	74,55	116,05	84,38	69,70
104,0	107,68	74,55	116,13	84,65	68,55
106,0	106,85	74,55	116,35	85,05	67,33
108,0	106,08	74,55	116,60	85,58	66,35
110,0	105,68	74,55	116,63	85,58	65,13
112,0	105,48	74,53	116,98	86,23	64,20
114,0	105,48	74,50	117,33	81,10	63,55
116,0	105,48	74,50	117,70	81,10	63,18
118,0	105,55	74,43	118,33	81,78	63,00
120,0	105,63	74,43	118,50	81,80	62,98

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

22.01.2016

RFTR16016

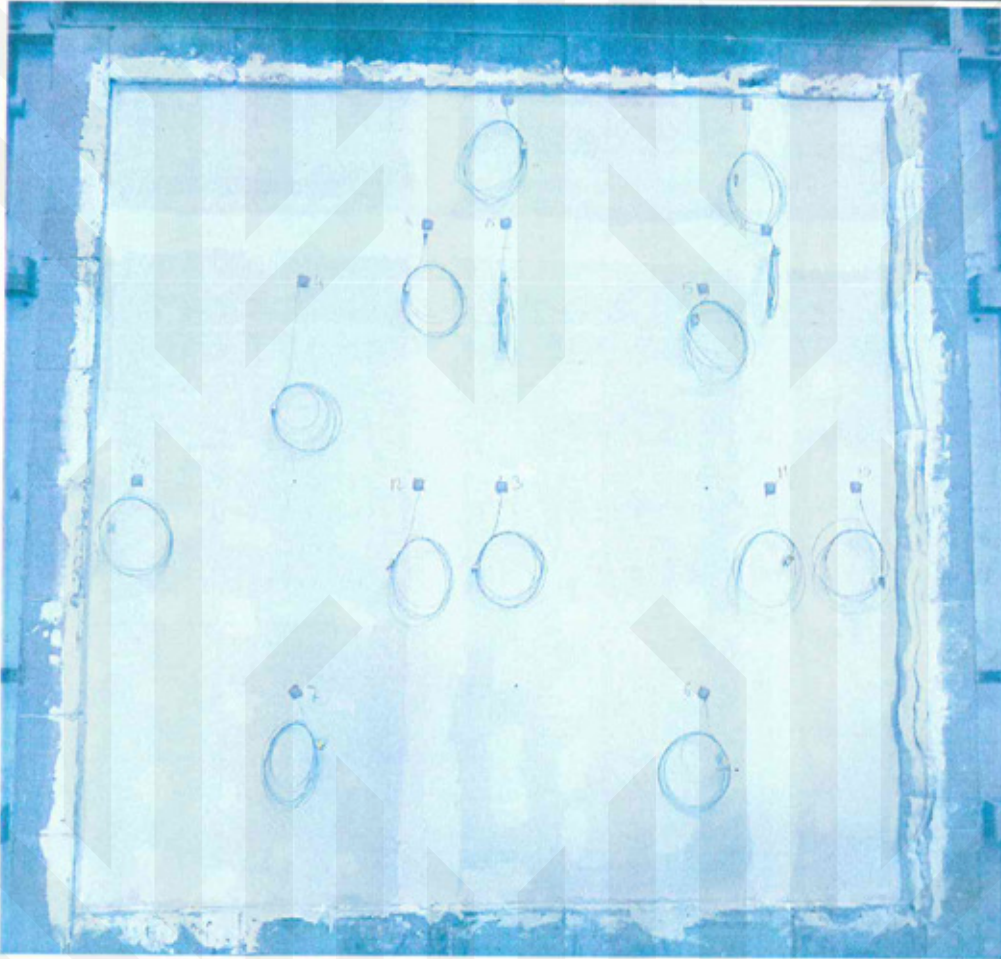


Photo C1: Unexposed side of the test specimen before the test

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

EFFECTIS ERA AVRASYA TEST VE BELGELENDİRME A.Ş.

AB-0556-T

22.01.2016

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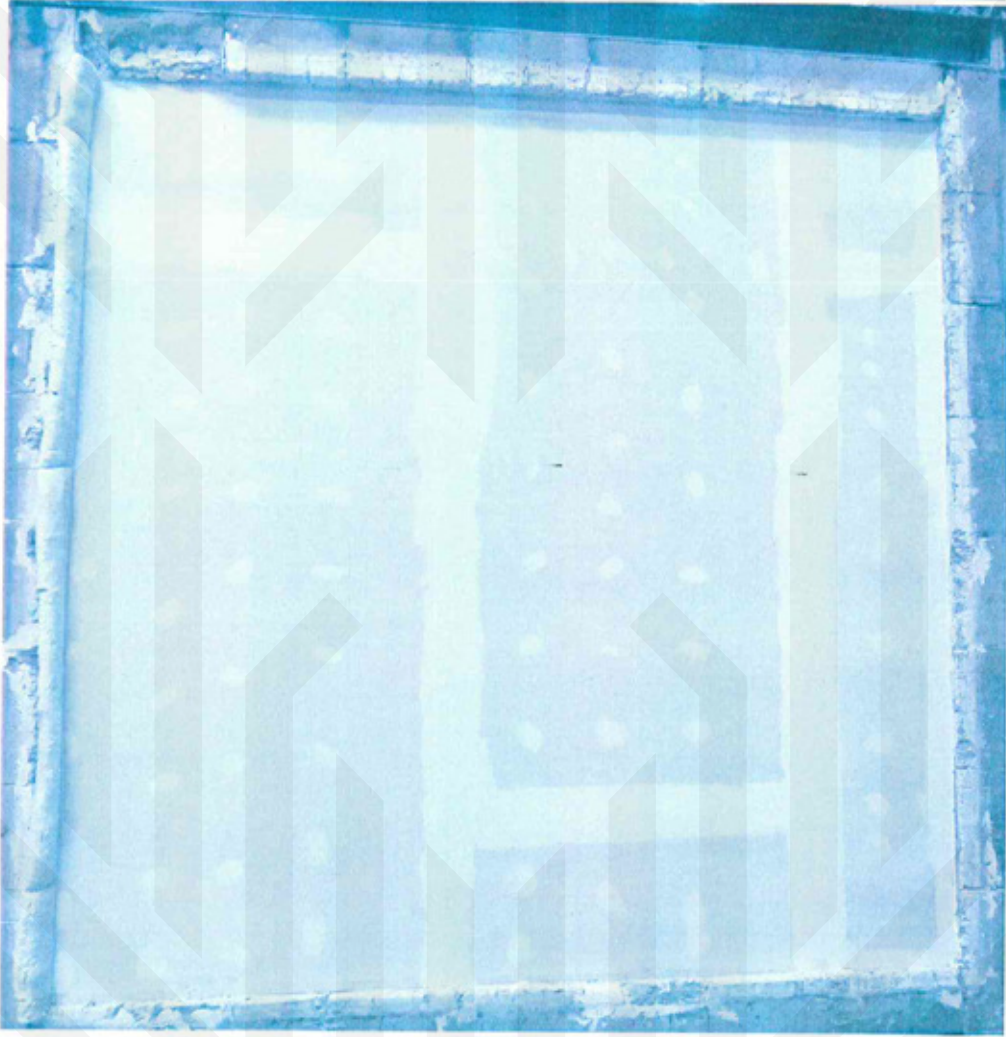


Photo C2: Exposed side of the test specimen before the test

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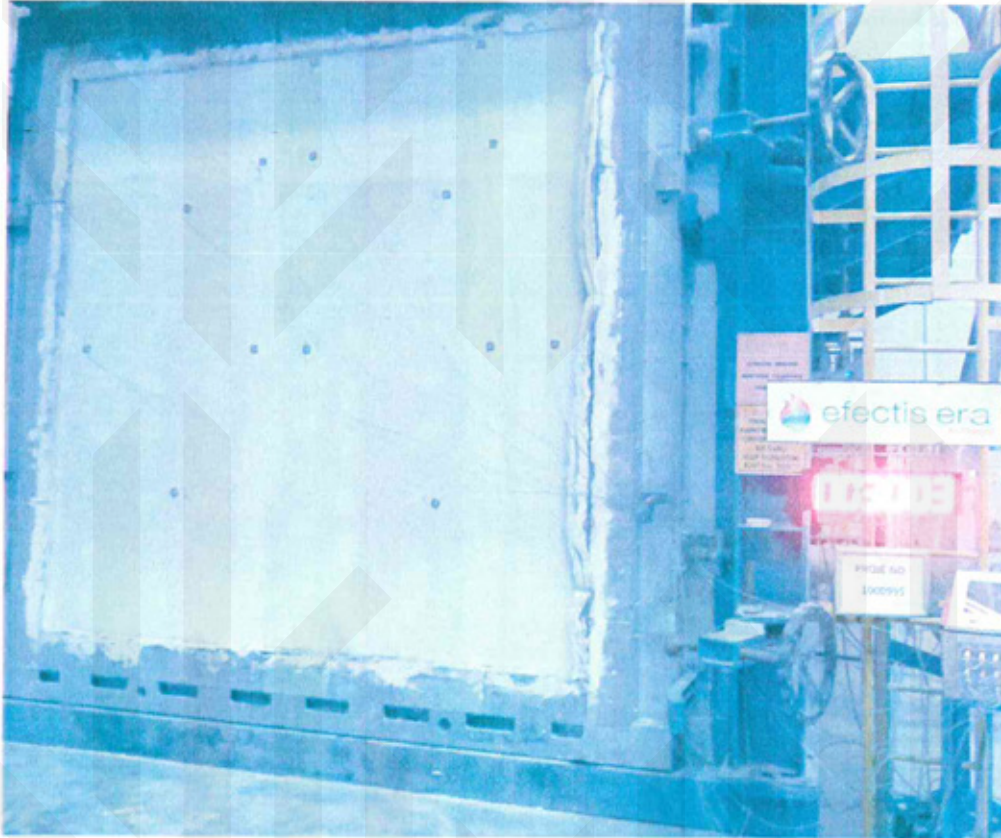
Appendix C

EFFECTIS ERA AVRASYA TEST VE BELGELENDİRME A.Ş.

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Photo C3: Unexposed side of the test specimen at 30th 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.

AB-0556-T

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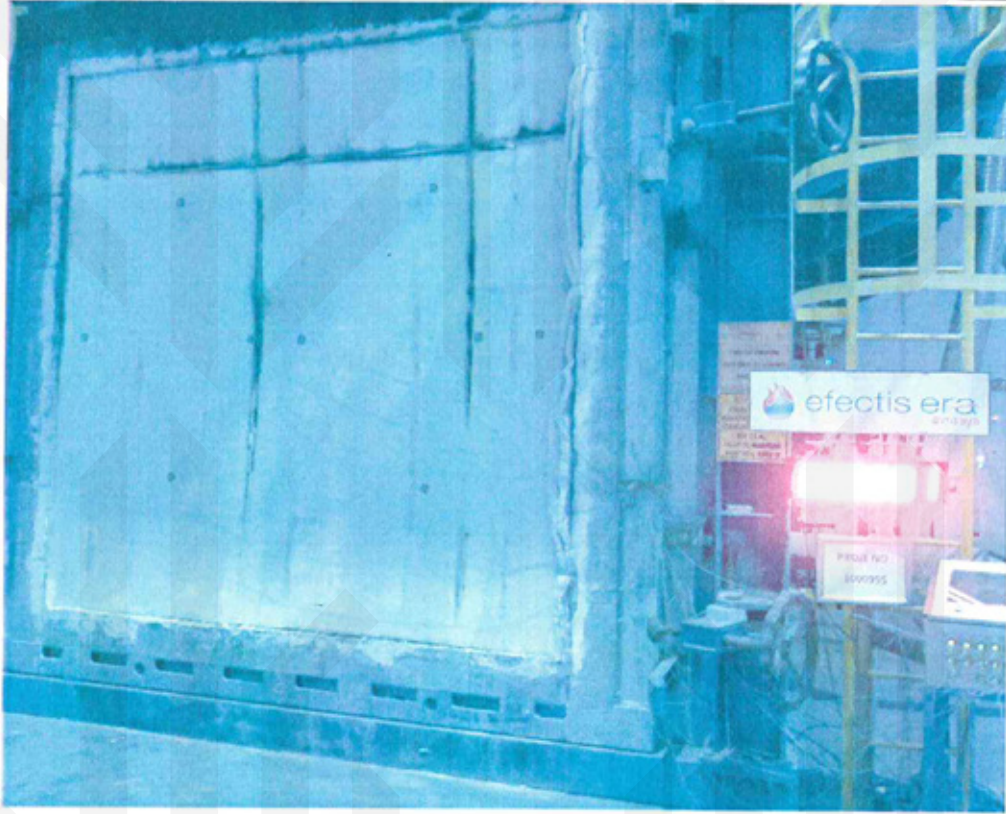


Photo C4: Unexposed side of the test specimen after the test

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

EFFECTIS ERA AVRASYA TEST VE BELGELENDİRME A.Ş.

AB-0556-T

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Photo C5: Exposed side of the test specimen after the test

Bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz.
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