



**BSN YAPI MALZEMELERİ İTHALAT İHRACAT  
İNŞAAT SAN. VE TİC. LTD. ŞTİ.**

**PLASTER  
TEST REPORT**

**Report No/Date: 397E/02.05.2017**

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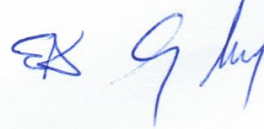
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**BSN YAPI MALZEMELERİ İTHALAT İHRACAT İNŞAAT SAN. VE TİC. LTD. ŞTİ.**

BSN Natural Shield branded plaster samples declared as your production and defined as heat&fire insulation plaster were brought to laboratory and tested. Test results are presented below. Tests carried out are listed below in Table 1.

**Table 1.** Test conducted on plaster samples

Test	Standard
Compressive Strength	BS EN 679
Water Absorbtion	BS EN 772-15
Water Vapour Transmission Properties	BS EN 12086
Thermal Conductivity	BS EN 12667
Reaction To Fire	BS EN 13501-1 BS EN ISO 1182
Determination of the freeze-thaw resistance of autoclaved aerated concrete.	BS EN 15304
Acoustics. Laboratory measurement of sound insulation of building elements. Measurement of airborne sound insulation	BS EN 10140-2



## 1. Test Results

### 1.1.Determination Of The Compressive Strength

Tests were carried out on BSN Natural Shield branded plaster samples. Determination of the compressive strength test was carried out according to EN 679 standard. The test specimen was loaded gradually without shock at a constant rate corresponding to a stress increase of  $(0,1 \pm 0,05)$  MPa per second until failure of the test specimen occurred. The maximum load carried by the test specimen was recorded. Test results are given below in Table 2.

**Tablo 2.** Compressive strength test results

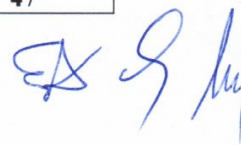
Sample	Dimensions (mm)			Load (N)	Compressive Strength (MPa)
	a	b	h		
1	150.0	150.0	150.0	28225.7	1.25
2	150.0	150.0	150.0	27632.1	1.23
3	150.0	150.0	150.0	28623.7	1.27
<b>Average</b>					<b>1.25</b>

### 1.2.Water Absorbtion By Mass Test Results

Tests were carried out on BSN Natural Shield branded plaster samples. Water absorption test was carried out according to EN 772-15 standard. Test results are given below in Table 3.

**Table 3.** Water absorption test results

Sample	Water Absorption by Mass (%)
1	47
2	47
3	48
<b>Average</b>	<b>47</b>




### 1.3.Determination Of Water Vapour Transmission Properties

Tests were carried out on BSN Natural Shield branded plaster samples. Determination of the water vapour transmission properties test was carried out according to EN 12086 standard 7.1 set A procedure. Test results are given below in Table 4.

**Table 4.** Water vapour transmission properties test results

Sample	G (mg/h)	g (mg/(m <sup>2</sup> .h))	W (mg/(m <sup>2</sup> .h.Pa))	Z (m <sup>2</sup> .h.Pa/mg)	δ (mg/(m.h.Pa))	μ	sd (m)
1	28.4850	4329.0274	3.0922	0.3234	0.1358	5.0800	0.2231
2	29.2120	4439.5137	3.1711	0.3153	0.1324	5.2096	0.2176
3	29.8640	4538.6018	3.2419	0.3085	0.1296	5.3259	0.2128
4	29.9700	4554.7112	3.2534	0.3074	0.1291	5.3448	0.2121
5	30.5210	4638.4498	3.3132	0.3018	0.1268	5.4431	0.2083
<b>Average</b>	<b>29.6104</b>	<b>4500.0608</b>	<b>3.2143</b>	<b>0.3113</b>	<b>0.1307</b>	<b>5.2807</b>	<b>0.2148</b>

### 1.4.Thermal Conductivity Test

Tests were carried out on BSN Natural Shield branded plaster samples. Thermal conductivity test was carried out according to EN 12667 standart with test method determination of thermal resistance by means of heat flow meter. Test results are given below in Table 5.

**Table 5.** Thermal conductivity test results

Specimen	Thickness (mm)	Thermal conductivity, λ (W/mK)
1	50.03	0.039
2	50.07	0.039
3	50.12	0.040
<b>Average</b>		<b>0.039</b>

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### 1.5.Reaction to fire

Tests were carried out on BSN Natural Shield branded plaster samples. Reaction to fire test was carried out according to EN ISO 1182 standard. The test was carried out in a test chamber. Test results were evaluated according to EN 13501-1 which were classified as A1. Plaster sample which satisfy all criteria are given below.

Gross heat of combustion PCS  $\leq 2,0$  MJ/kg,  
Temperature difference (increase)  $\Delta T \leq 30$  °C,  
Mass difference (loss)  $\Delta m \leq 50$  %,  
Flaming time  $t_f = 0$  s.

### 1.6. Freeze-Thaw Resistance Test

Tests were carried out on BSN Natural Shield branded plaster samples. Freeze-Thaw resistance test was carried out according to EN 15304 standard. The test was carried out in a temperature and humidity controlled test chamber. Specimens were frozen in air at a temperature of  $(-15 \pm 2)$  °C for 8 hours, then specimens were thawed in air at a temperature of  $(20 \pm 2)$  °C for 8 hours. After the completion of freeze-thaw cycles, specimens were tested in a compression test device. Test results and number of freeze-thaw cycles are given below in Table 6.

**Table 6.** Freeze-thaw resistance test results

Specimen	Compressive Strength (MPa)		
	Number of Freeze-Thaw Cycle		
	0	28	56
1	1.25	0.88	0.55
2	1.23	1.03	0.68
3	1.27	0.93	0.66
<b>Average</b>	<b>1.25</b>	<b>0.95</b>	<b>0.63</b>



### 1.7. Acoustics. Laboratory measurement of sound insulation of building elements. Measurement of airborne sound insulation

Tests were carried out on BSN Natural Shield branded plaster samples. Determination of the acoustics test was carried out according to EN ISO 10140-2 standard. Test results were evaluated according to the EN ISO 717-1 standard. Test data and curves given below in Annex. Test wall consist of a pumice concrete wall and Natural Shield plaster on both face of pumice concrete wall. BSN Natural Shield plaster applied on pumice concrete wall have a thickness of 150 mm. Plaster thicknesses are 20 mm on both face of pumice concrete wall.

Test results,


*R'<sub>w</sub>(C;C<sub>tr</sub>) values 42 (-1;-4) dB,*

*D<sub>n,w</sub>(C;C<sub>tr</sub>) values 41 (0;-3) dB,*


*D<sub>nT,w</sub>(C;C<sub>tr</sub>) values 45 (-1;-4) dB*

were obtained.

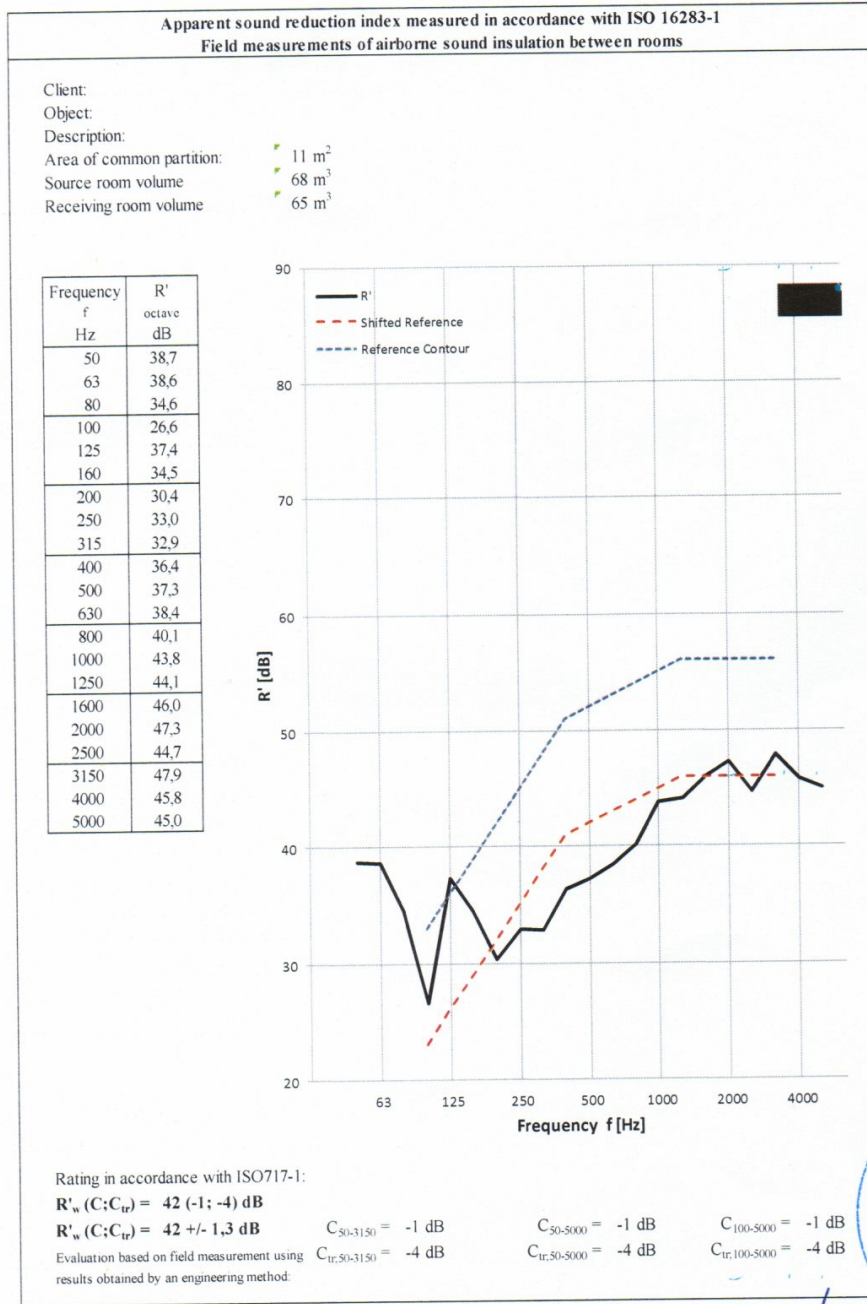
  
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### Annex. Acoustic Test Results



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Figure 1. Apparent sound reduction index



Figure 2. Normalized level difference





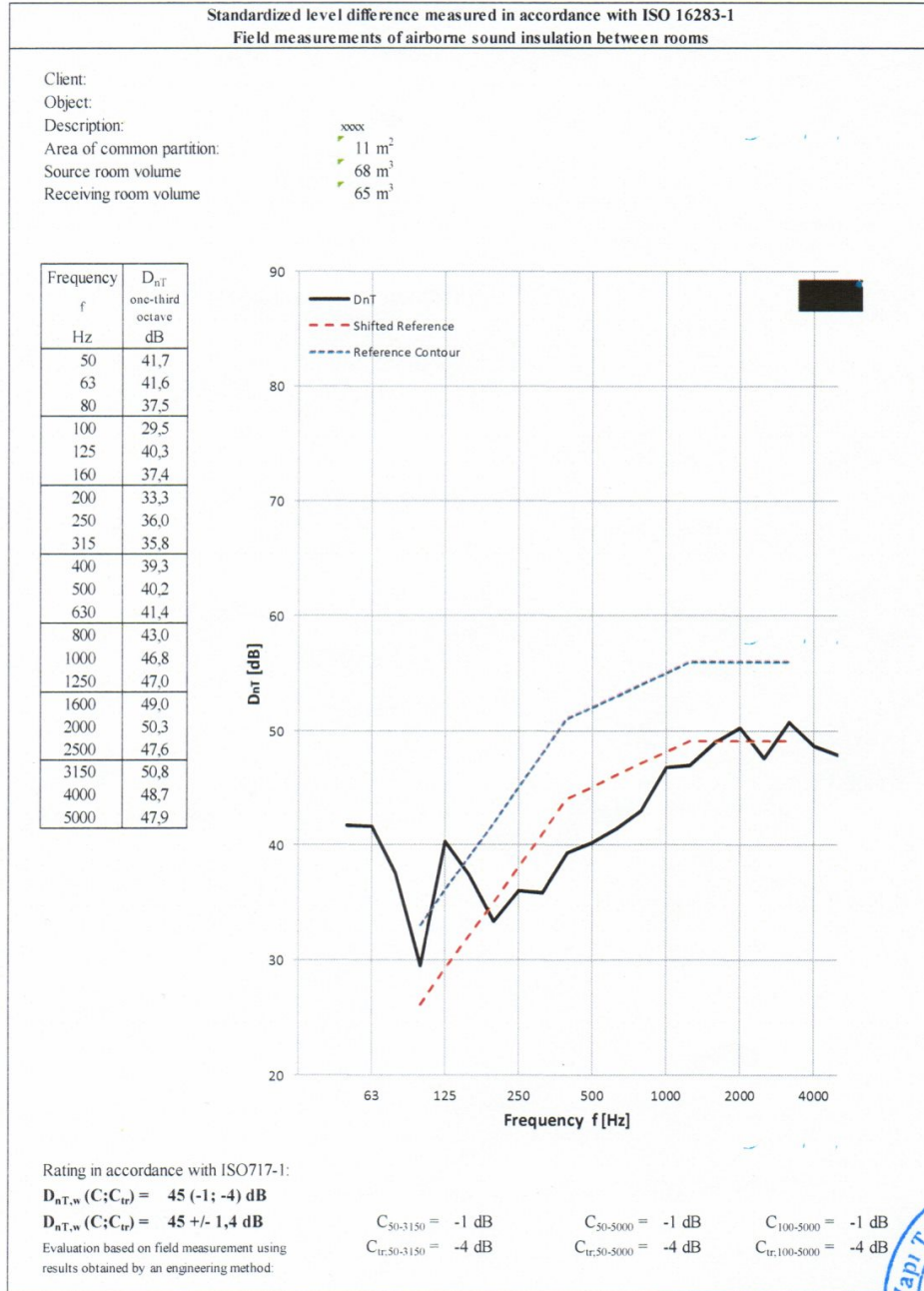


Figure 3. Standardized level difference

