nuh AAC Wall Blocks

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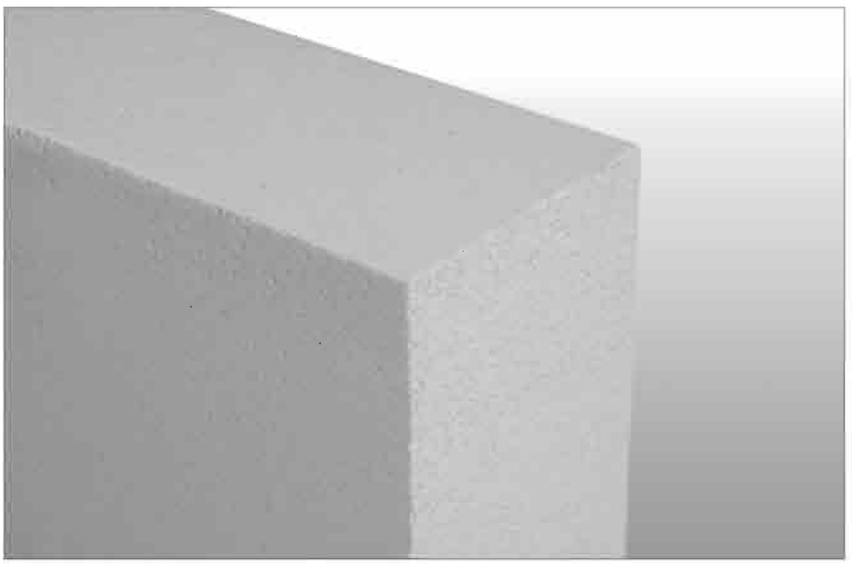
EKOBLOK



AAC in general is produced in different density classes. Today, most of the AAC production throughout the world is mainly constituted of 400 kg/m³ density blocks.

PHYSICAL PROPERTIES

AAC CLASS	UNIT WEIGHT (Kg/m³)	AVERAGE COMPRESSIVE STRENGTH (Kg/cm²)	THERMAL CONDUCTIVITY VALUE λ_h (W/mK)	
			EN 1745	TS 825
G2/350	350	23	0,09	0,11

AAC DENSITY CLASSES ACCORDING TO DIN STANDARDS

DENSITY CLASSES	300	350	400	450	500	550	600
DRY DENSITIES (Kg/m³)	> 250 - ≤ 300	> 300 - ≤ 350	> 350 - ≤ 400	>400 - ≤ 450	> 450 - ≤ 500	> 500 - ≤ 550	> 550 - ≤ 600

Nuh Gazbeton is only one of the few producers of 350 kg/m³ density class in the world.

Advantages of eko-blok;

- √ Lowest thermal conductivity values
- √ Less wall thicknesses
- √ Less dead-loads
- √ Larger building spaces
- √ Saves money during transportation
- √ Less wall costs.

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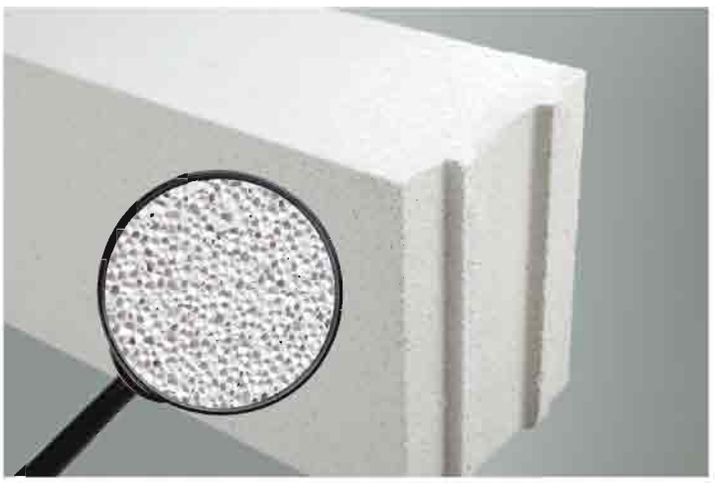

Nuh Group is the warranty of quality and experience of the Turkey construction sector. The latest production of Nuh Yapi is the AAC at standards of EN 771-4. AAC is a porous wall material which is a basic mixture of silica aggregate, lime and cement as well as aluminium powder to provide porous substance. The mixture is horizontaly and verticaly cut through by wires and the cake is hardened by steam cure.

AAC TECHNICAL VALUES

CLASS	G2/0.35	G2/0.40	G3/ 0.50
COMPRESSIVE STRENGTH (N/mm^2)	2.3	2.5	3.5
DRY DENSITY (Kg/m^3)	350	400	500
SHRINKAGE (mm/m)	0.1 – 0.2	0.1 – 0.2	0.1 – 0.2
POROSITY %	86	84	80
THERMAL CONDUCTIVITY λ (W/mK)	0.09	0.11	0.13

AAC PRODUCT PROPERTIES

CLASS	Dry Unit Weight (Kg/m^3)	Unit Weight in Storage* (Kg/m^3)	Average Compressive Strength (Kg/cm^2 / N/mm^2)	Thermal Conductivity Value (W/mK) EN 1745	Thermal Conductivity Value TS 825 (W/mK)	Shrinkage (mm/m)	Average Modulus of Elasticity (Kg/cm^2)
G2/350	350	490	23/ 2,3	0,09	0,11	aver. 0,10	11,000
G2/400	400	560	25 / 2,5	0,11	0,13	aver. 0,10	12,500
G3/500	500	700	35 / 3,5	0,13	0,16	aver. 0,10	15,000

* Weight can be decrease in the storage according to waiting period

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CERTIFICATE OF QUALITY

CERTIFICATE OF QUALITY					
	SIZE (mm)	DRY DENSITY (Kg/dm^3)	COMPRESSIVE STRENGTH (N/mm^2)	SHRINKAGE (mm/m)	DIMENSIONAL ACCURACY (mm)
G2 / 0.35 AAC*	600 x 250 x 75	0,30 - 0,35	aver. 2,3	Max 0,2	±1 - 1,5
	600 x 250 x 85				
	600 x 250 x 100				
	600 x 250 x 125				
	600 x 250 x 135				
	600 x 250 x 150				
	600 x 250 x 175				
	600 x 250 x 200				
	600 x 250 x 250				
	600 x 250 x 300				
G2 / 0.40 AAC*	600 x 250 x 75	0,35 - 0,40	Min. 2,5	Max 0,2	±1 - 1,5
	600 x 250 x 85				
	600 x 250 x 100				
	600 x 250 x 125				
	600 x 250 x 135				
	600 x 250 x 150				
	600 x 250 x 175				
	600 x 250 x 200				
	600 x 250 x 250				
	600 x 250 x 300				
G3 / 0.50 AAC*	600 x 250 x 75	0,45 - 0,50	Min. 3,5	Max 0,2	±1 - 1,5
	600 x 250 x 85				
	600 x 250 x 100				
	600 x 250 x 125				
	600 x 250 x 135				
	600 x 250 x 150				
	600 x 250 x 175				
	600 x 250 x 200				
	600 x 250 x 250				
	600 x 250 x 300				

* Tests are being performed according to(EN771-4, EN772-1, EN 772-13, EN772-16. EN680)

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PRECISION BLOCKS	PRODUCT DIMENSIONS (mm)
	
Thicknesses	75 85 100 125 135 150 175 200 250 300 325 350 375 400
Height	250
Length	600
Product Classes	G2/350 - G2/400

PROFILE WALL BLOCKS	PRODUCT DIMENSIONS (mm)
	
Thicknesses	100 125 150 190 200 250 300
Height	250
Length	600
Product Classes	G2/350 - G2/400

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AAC PRODUCT TYPES

INFILL BLOCKS		PRODUCT DIMENSIONS (mm)
	Thicknesses	250
	Height	400
	Length	600
	Product Classes	G2/350 - G2/400

INSULATION PLATES		PRODUCT DIMENSIONS (mm)			
	Thicknesses	50	60	75	100
	Height	400			
	Length	600			
	Product Classes	Insulation Plates			

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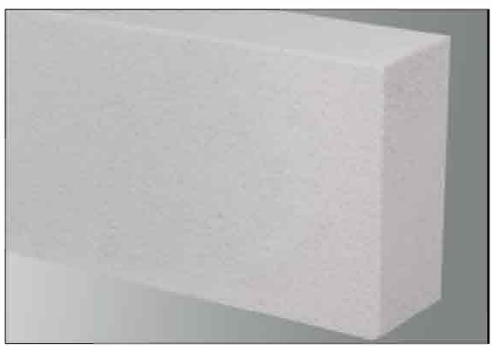
LINTEL		Lintel Dimensions (mm)	Average Compressive Strength (Kg/cm^2)	Safety Coefficient
	**Thicknesses**	100 125 135 150 200 250	35	Min. 2
	Height	250		
	Length	1000-1500-2000-2500-3000-3500-4000		
	Product Classes	G3/500		

SUPPORT DISTANCE OF LINTELS

Openings (mm)	Min.support distance (mm)	Lintels Length (mm)
800	200	1200
1000	200	1400
1200	200	1600
1500	225	1950
1800	270	2340
2000	300	2600
2500	375	3250

*According to earthquake regulations each of the support distance of the window and door lintels does not less than 15% of the openings and not less than 200mm.

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AAC PRODUCT TYPES

THIN LAYER (T) READY MASONARY MORTAR	
Compressive Strength	Category M 5
Initial Shear Strength	0,30 N/mm^2
Chloride Contents	max. 0,01 Cl %
Reaction to Fire	Class A1
Water Absorption	2 kg/m^2 0.5 minute
Water Vapour Permeability	μ 5/20
Thermal Conductivity	0,54 W / mK$_{\lambda 10\,dry}$

AAC Glue Mortar is produced according to TS EN 998-2.
AAC Glue Mortar is come out to the market in 25 kg bag.

CONSUMPTION QUANTITIES FOR AAC GLUE MORTAR	
Wall Thicknesses (mm)	**Glue Mortar Quantity** (Kg/m^2)
100	1,50
125	1,88
135	2,00
150	2,25
175	2,63
200	3,00
250	3,75
300	4,50

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COMPARISON OF U VALUES

U values (W/m² K) for AAC external walls at 350 kg/m³ density within TS 825 (7.3.2) (W/m²K)														
	STANDARD U	Product Dimensions												
		7,5	10,0	12,5	15,0	17,5	20,0	22,5	25,0	27,5	30,0	32,5	35,0	37,5	40,0
REGION 1	0,7	1,17	0,93	0,77	0,65	0,57	0,50	0,45	0,41	0,37	0,35	0,32	0,30	0,28	0,26
REGION2	0,6	1,17	0,93	0,77	0,65	0,57	0,50	0,45	0,41	0,37	0,35	0,32	0,30	0,28	0,26
REGION3	0,5	1,17	0,93	0,77	0,65	0,57	0,50	0,45	0,41	0,37	0,35	0,32	0,30	0,28	0,26
REGION4	0,4	1,17	0,93	0,77	0,65	0,57	0,50	0,45	0,41	0,37	0,35	0,32	0,30	0,28	0,26

U values (W /m² K) for AAC external walls at 400 kg/m³ density within TS 825 (7.3.2) (W/m²K)														
	STANDARD U													
		7,5	10,0	12,5	15,0	17,5	20,0	22,5	25,0	27,5	30,0	32,5	35,0	37,5	40,0
REGION 1	0,7	1,34	1,06	0,88	0,76	0,66	0,59	0,53	0,48	0,44	0,40	0,37	0,35	0,33	0,31
REGION2	0,6	1,34	1,06	0,88	0,76	0,66	0,59	0,53	0,48	0,44	0,40	0,37	0,35	0,33	0,31
REGION3	0,5	1,34	1,06	0,88	0,76	0,66	0,59	0,53	0,48	0,44	0,40	0,37	0,35	0,33	0,31
REGION4	0,4	1,34	1,06	0,88	0,76	0,66	0,59	0,53	0,48	0,44	0,40	0,37	0,35	0,33	0,31

* Grey cells are not comply the standards

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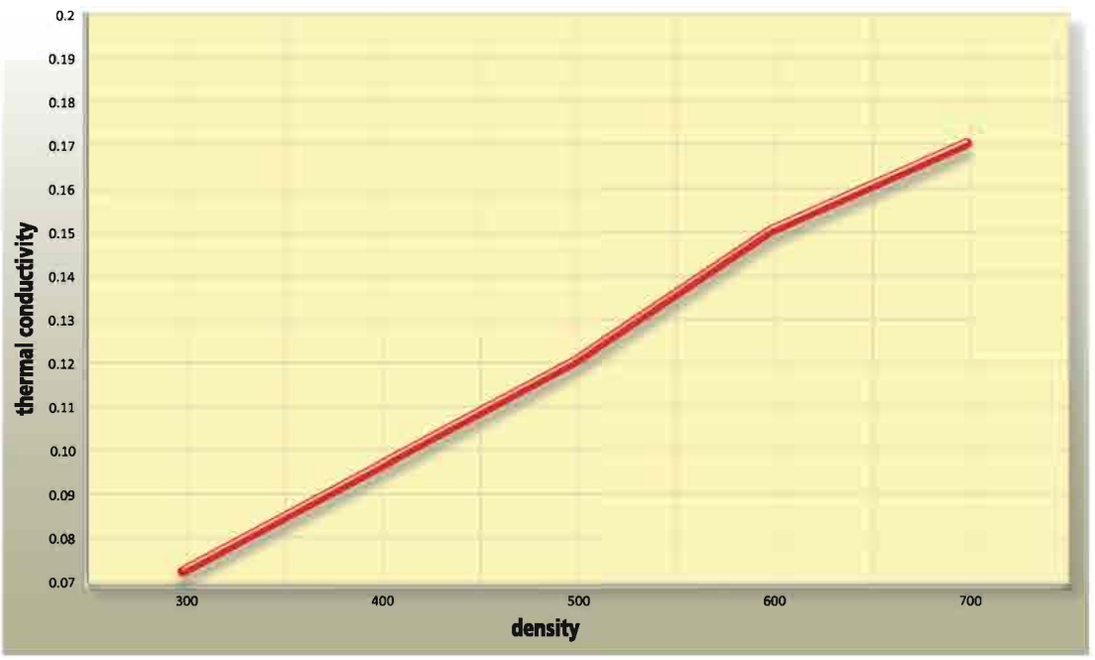
THERMAL CONDUCTIVITY

DENSITY-THERMAL CONDUCTIVITY



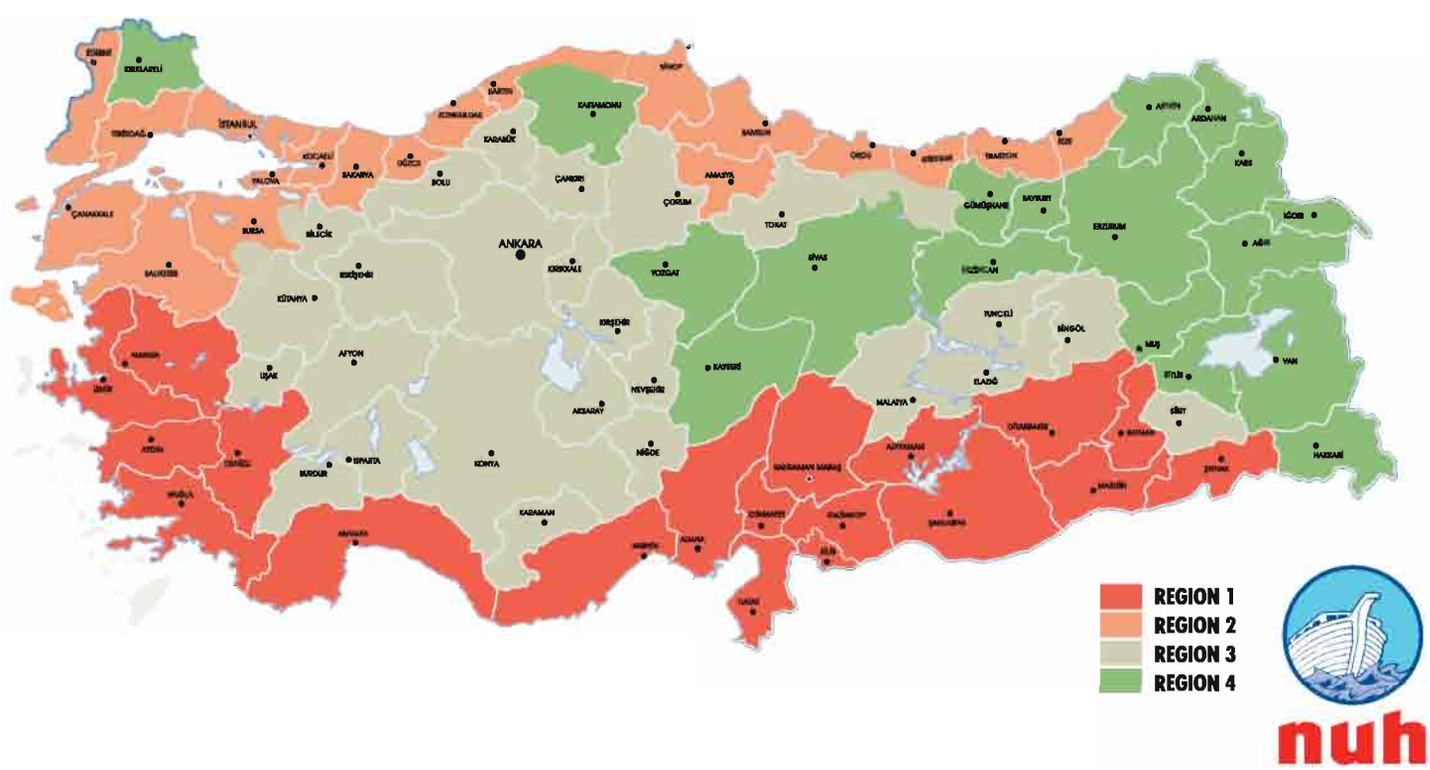
COMPARISON OF DIFFERENT WALL MATERIALS IN DENSITY AND THERMAL CONDUCTIVITY VALUES

AAC VALUES BY REGION

	U WALL (W/m^2K)
REGION 1	0,70
REGION2	0,60
REGION3	0,50
REGION4	0,40

A study conducted by İstanbul Technical University shows the minimum required wall thicknesses of eko-blok and G2/400 AAC blocks through the four climate regions described in TS825

AAC WALL THICKNESSES THROUGH THE CLIMATE REGIONS(EXTERNAL WALLS)				
	REGION 1	REGION 2	REGION 3	REGION 4
G2/350	15,0	17,5	20,0	27,5
G2/400	17,5	20,0	25,0	32,5



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THERMAL RESISTANCE

R Value				
MATERIAL	**DRY DENSITY** (Kg/m^3)	**THERMAL CONDUCTIVITY** (W/mK)	**THICKNESSES** (mm)	**THERMAL RESISTANCE VALUES** (m^2K/W)*
G2/350*	350	0,11	100	1,11
			125	1,34
			150	1,57
			175	1,79
			200	2,02
			250	2,47
			300	2,93
G2/400**	400	0,13	100	0,97
			125	1,16
			150	1,36
			175	1,55
			200	1,74
			250	2,13
			300	2,51
G3/500***	500	0,16	100	0,80
			125	0,95
			150	1,11
			175	1,26
			200	1,42
			250	1,73
			300	2,05

* Thermal Resistance Value (R) for 350kg/m^3 density
** Thermal Resistance Value (R) for 400kg/m^3 density
*** Thermal Reststance Value(R) for 500kg/m^3 density

It is accepted as inner walls10 mm gypsum plaster and external walls 20mm cement based plaster in the calculations.

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Flammability class of materials Annex 2 / Flammability Classes for Building Materials (excluding Flooring Materials) (According to TS EN 13501-1)	
Flammability Class	Description
A1	A1 class materials, fire including the fully developed fire any do not contribute to combustion in stages. Thus, It is considered to provide enough for all the features by automatically determined to lower classes of these materials.
A2	It provides criteria set for Class B according to EN 13823 . In addition, these materials should not contribute significantly to the fire load and fire growth under full advanced fire condition these materials.
B	In addition to the criteria set for the C-Class It provides more stringent requirements.
C	In addition to the defined criteria for class D it provides more stringent requirements. Also one lateral spread of flame attacks made against thermal flame should remain a limited extent .
D	Class E and provide the criteria for significant non- flame spread a little materials that resist fire for a long time against attack. Additionally, it has been sufficiently limited and must be resistant to temperature reveal thermal attack by a single burning object made with conditions.
E	Significantly less non- flame propagation across a small flame attack while resistive materials.
F	unsubstituted determination fire performance and it is not classified materials as one of the class A1,A2 , B, C , D and E.

Annex-2/C Building Materials - Flammability Class A1) (Flammability class A1 without the need to test and evaluate the materials $A1_{fl}$)	
Gas (porous) concrete units	Cement and / or fine material of water-based binders such as lime (siliceous agents, PFA, volatile furnace slag) and units produced by the combination with the pore producing materials . It covers precast units.

Aerated concrete is a class A1 non-combustible material.

* According to the regulations on the protection of buildings from fire

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FIRE VALUES

* Annex 3 Fire Resistance (Resistance) Symbols and Periods. Appendix 3 / Fire Resistance of Building Elements (Resistance) Symbols	
R	The load carrying capacity
E	Integrity
I	Insulation

Fire resistance of non-bearing wall		
Density (kg/m³)	**Standard fire resistance**	**The minimum wall thickness (mm)**
350-700	EI 30	50
	EI 60	50
	EI 90	75
	EI 120	75
	EI 180	100
	EI 240	150
	EI 360	150

EN 13501-2 : 2007 + A1: 2009 ACCORDING TO THE CLASSIFICATION OF FIRE RESISTANCE PERFORMANCE REPORT	
Product Name	**G2/400 Nuh partition wall system consists of autoclaved aerated concrete blocks (600x250x100 mm)**
Fire Resistance	**EI 180, E180**

* Efectis Era Avrasya Testing Laboratory
** According to the regulations on the protection of buildings from fire

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SOUND INSULATION VALUES

SOUND RESISTANCE VALUES OF NUH AAC WALL BLOCKS ACCORDING TO DIFFERENT DENSITIES*				
CLASS	**DENSITY** (Kg/m^3)	**THICKNESSES** (cm)	**WEIGHT** (Kg/m^2)	**R VALUES** (dB)
G2	350	10	35	32
		15	52	36
		20	70	39
		25	87	42
		30	105	44
G2	400	10	40	33
		15	60	38
		20	80	41
		25	100	43
		30	120	46
G3	500	10	50	36
		15	75	40
		20	100	44
		25	125	46
		30	150	48

* Walls are estimated as without plaster.

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PALLET TABLE

BLOCK DIMENSIONS (cm)			PCS	M³	M²
60	25	7,5	96	1,080	14,40
		8,5	84	1,071	12,60
		10	72	1,080	10,80
		12,5	60	1,125	9,00
		13,5	54	1,0935	8,10
		15	48	1,080	7,20
		17,5	42	1,103	6,30
		20	36	1,080	5,40
		25	30	1,125	4,50
		30	24	1,080	3,60
INFILL DIMENSIONS					
60	40	25	18	1,080	4,32

STANDARD pallet dimensions 120 cm x 75 cm
* Class G2/400

QUALITY CERTIFICATES

TÜRK STANDARDLARI ENSTİTÜSÜ
TÜRK STANDARDLARINA UYGUNLUK BELGESİ
TURKISH STANDARDS INSTITUTION
CERTIFICATE OF CONFORMITY TO TURKISH STANDARDS

TÜRK STANDARDLARI ENSTİTÜSÜ
TÜRK STANDARDLARINA UYGUNLUK BELGESİ
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TÜRK STANDARDLARI ENSTİTÜSÜ
TURKISH STANDARDS INSTITUTION

FABRİKA ÜRETİM KONTROLU UYGUNLUK BELGESİ

1783 - CPR – 030

NUH YAPI ÜRÜNLERİ A.Ş.
19 Mayıs Mah. İnönü Caddesi No:102 Kat: 6 7 Kadıköy/İSTANBUL

(firması) tarafından ya da namına,

Hacı Akif Mahallesi Nuh Çimento Caddesi No:28 Körfez/KOCAELİ

(adresi) üretim tesis(ler)inde üretilen,

GAZBETON KAGİR BİRİMLER

Kategori I
Taşıyıcı Olmayan, Düzgün Şekilli, Lamba Zivanalı ve Açık Hava Şartlarına Maruz Bırakılmayan Tip

a) Ticari Model "Nuh Gazbeton (G2)"
b) Ticari Model "Nuh Gazbeton (G4)"
c) Ticari Model "Nuh Ekoblok (G2)"

EN 771-4:2011

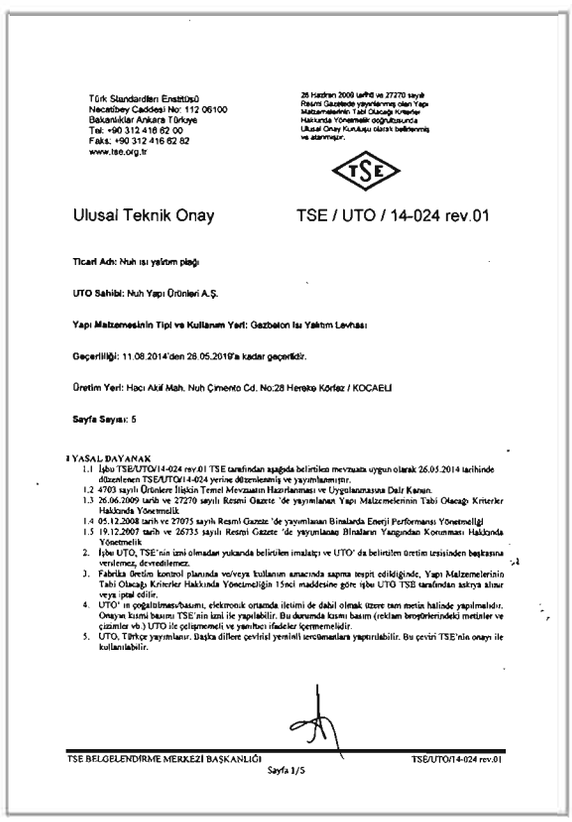
KALİTE YÖNETİM ŞİSTEMİ BELGESİ
QUALITY MANAGEMENT SYSTEM CERTIFICATE
EK / ANNEX

K - Q
TSE-ISO-EN
9000

KALİTE YÖNETİM SİSTEMİ BELGESİ
QUALITY MANAGEMENT SYSTEM CERTIFICATE

K - Q
TSE-ISO-EN
9000

TÜRK STANDARDLARI ENSTİTÜSÜ



Türk Standardları Enstitüsü
Necatibey Caddesi No: 112 06100
Bakanlıklar Ankara Türkiye
Tel: +90 312 416 82 00
Faks: +90 312 416 82 82
www.tse.org.tr

26 Haziran 2009 tarihli ve 27270 sayılı Resmi Gazetede yayımlanmış olan Yapı Malzemelerinin Tabi Olacağı Kriterler Hakkında Yönetmelik doğrultusunda Ulusal Onay Kuruluşu olarak belirlenmiş ve atanmıştır.

Ulusal Teknik Onay

TSE / UTO / 14-024 rev.01

Ticari Adı: Nuh ısı yalıtım plağı

UTO Sahibi: Nuh Yapı Ürünleri A.Ş.

Yapı Malzemesinin Tipi ve Kullanım Yeri: Gazbeton Isı Yalıtım Levhası

Geçerliliği: 11.08.2014'den 28.05.2019'a kadar geçerlidir.

Üretim Yeri: Hacı Akif Mah. Nuh Çimento Cd. No:28 Hereke Körfez / KOCAELİ

Sayfa Sayısı: 5

1 YASAL DAYANAK

1.1 İşbu TSE/UTO/14-024 rev.01 TSE tarafından aşağıda belirtilen mevzuata uygun olarak 26.05.2014 tarihinde düzenlenen TSE/UTO/14-024 yerine düzenlenmiş ve yayımlanmıştır.
1.2 4703 sayılı Ürünlere İlişkin Temel Mevzuatın Hazırlanması ve Uygulanmasına Dair Kanun.
1.3 26.06.2009 tarih ve 27270 sayılı Resmi Gazete 'de yayımlanan Yapı Malzemelerinin Tabi Olacağı Kriterler Hakkında Yönetmelik
1.4 05.12.2008 tarih ve 27075 sayılı Resmi Gazete 'de yayımlanan Binalarda Enerji Performansı Yönetmeliği
1.5 19.12.2007 tarih ve 26735 sayılı Resmi Gazete 'de yayımlanan Binaların Yangından Korunması Hakkında Yönetmelik

2. İşbu UTO, TSE'nin izni olmadan yukarıda belirtilen imalatçı ve UTO' da belirtilen üretim tesisinden başkasına verilemez, devredilemez.
3. Fabrika üretim kontrol planında ve/veya kullanım amacında sapma tespit edildiğinde, Yapı Malzemelerinin Tabi Olacağı Kriterler Hakkında Yönetmeliğin 15nci maddesine göre işbu UTO TSE tarafından askıya alınır veya iptal edilir.
4. UTO' in çoğaltılması/basımı, elektronik ortamda iletimi de dahil olmak üzere tam metin halinde yapılmalıdır. Onayın kısmi basımı TSE'nin izni ile yapılabilir. Bu durumda kısmi basım (reklam broşürlerindeki metinler ve çizimler vb.) UTO ile çelişmemeli ve yanıltıcı ifadeler içermemelidir.
5. UTO, Türkçe yayımlanır. Başka dillere çevirisi yeminli tercümanlara yaptırılabilir. Bu çeviri TSE'nin onayı ile kullanılabilir.

TSE BELGELENDİRME MERKEZİ BAŞKANLIĞI

TSE/UTO/14-024 rev.01

nuh GAZBETON

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