İTBAK İNŞAAT TEKNİK DEĞERLENDİRME ARAŞTIRMA VE BELGELENDİRME A.Ş.

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General Part

Technical Assessment Body issuing the ETA:	**İTBAK İnşaat Teknik Değerlendirme Araştırma ve Belgelendirme A.Ş.** Mustafa Kemal Mah. 2123. Cadde Cepa Ofis No: 2-D Daire 901-902 Çankaya 06530 Ankara Türkiye +90 312 285 63 80
Trade name of the construction product	**Termoküp**
Product family to which the construction product belongs	Thermal insulation products
Manufacturer	NUH YAPI ÜRÜNLERİ A.Ş.
Manufacturing plant(s)	Hacı Akif Mah. Nuh Çimento Cad. No:32 41800 Hereke Körfez/Kocaeli- TURKEY www.nuhyapi.com.tr
This European Technical Assessment contains	13 pages including and an Annex which form an integral part of this assessment.
This European Technical Assessment is issued in accordance with regulation (EU) No 305/2011, on the basis of	European Assessment Document 040012-00-1201, edition August 2014
This version replaces	ETA 15/0218, issued on 30/05/2017

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Specific parts

1. Technical description of the product

1.1. Definition of product

This European Technical Assessment (ETA) applies to the thermal insulation boards made of mineral material with the trade name Termoküp.

Termoküp is a mineral thermal insulation board made of calcium silicate hydrate and calcium borate silicate hydrate. The insulation board is manufactured mainly of quartzite powder, calcium hydrate, cement and boron oxide compounds if applicable by adding a foaming agent. The insulation board is high-pressure steam cured (autoclaved) and can have a water-repellent treatment.

The boards are produced with density (130-140 kg/m^3) and a declared value of thermal conductivity of λ=0,045 W/(m.K). The boards can be subjected to compressive load of at most 400 kPa.

Geometric properties of Termoküp are as follows:

Nominal length: 400-1200 mm
Nominal width: 200-600 mm
Nominal thickness: 30-600 mm
Squareness ≤ 4 mm/m
Flatness ≤ 2 mm

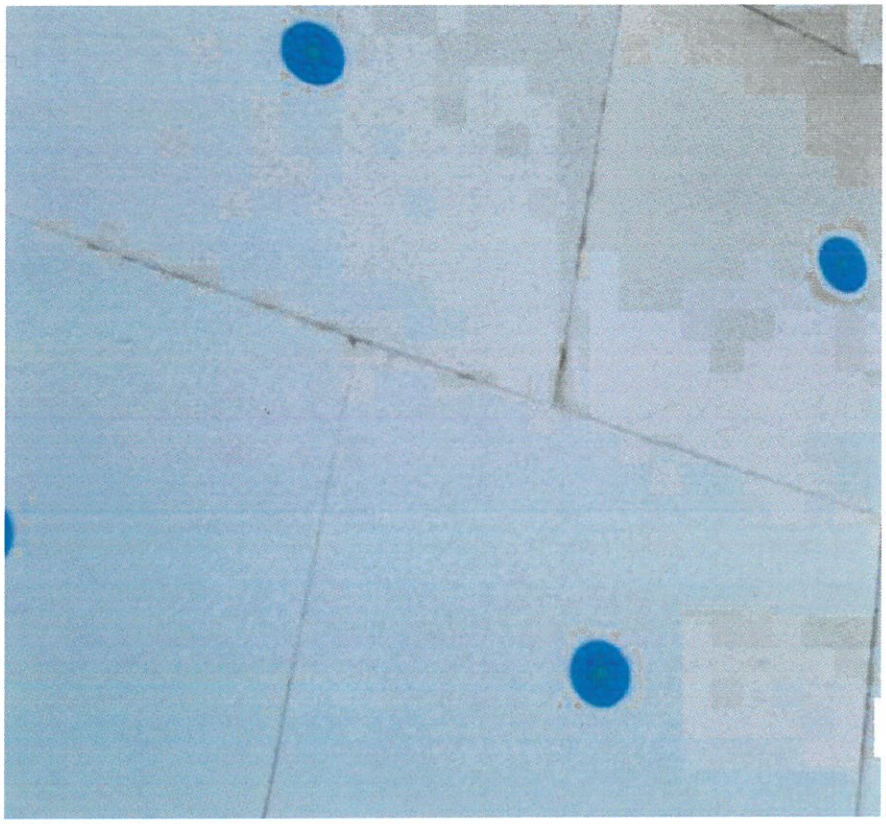

Figure 1: Termoküp thermal insulation board

2. Specification of the intended use(s) in accordance with the applicable European Assessment Document (hereinafter EAD)

The thermal insulation boards are used for the following intended uses:

- Application for walls
  - ✓ External insulation of walls
  - ✓ Internal insulation of walls
  - ✓ Internal- external insulation of columns and beams
  - ✓ core insulation of cavity walls
- Application for roofs
  - ✓ External insulation of the roof (below roofing and waterproofing)
  - ✓ Insulation between rafters
- Application for floors/ceilings
  - ✓ Internal insulation of ceilings
  - ✓ Internal insulation of floors and bedplates below screed (where the thermal insulation boards are subjected to compressive load)

The thermal insulation boards can be glued to the substructure and can be plastered, coated or painted. Fixing with suitable anchors is possible.

This European Technical Assessment does not cover the thermal insulation boards in thermal insulation systems/kits.

2.2. General assumptions

The insulation boards are manufactured is accordance with the provisions of the European Technical Assessment using the manufacturing process as identified is the inspection of the manufacturing plant by (ITBAK) and laid down in the technical file.

It is the responsibility of the European Technical Assessment holder to ensure that all necessary information on design and installation is submitted to those responsible for design and execution of the construction.

The ETA only applies to the manufacture and use of the thermal insulation board made of mineral material. Verification of stability of the works including application of load on the products is not subject to the European Technical Assessment.

2.2.1. Design

The following conditions shall be observed:

- Design of the thermal insulation boards is carried out under the responsibility of an engineer experienced in these elements and producer's application documents.
- Design of the works shall account for the protection of the thermal insulation boards.
- The thermal insulation boards shall be installed in structures where they are protected from precipitation, weathering and contacting with water

2.2.2. Packaging, transport, storage

Packaging of the product shall be such that the thermal insulation board is protected from humidity and dramatic stroke during transport and storage unless there are other measures for this purpose provided for by the manufacturer.

2.2.3. Installation and use of the product in the works

The thermal insulation board are designed and installed according to the instructions from the manufacturer.

The insulation board shall only be installed in structures where it is protected from precipitation, wetting and weathering.

Concerning the application of the insulation board, the respective national regulations shall be observed. The design value of thermal conductivity shall be laid down according to relevant national provisions.

The insulation board shall be glued, board to board (no glue in the joints), on the good bearing substructure with suitable glue.

They are laid as system, and can be fixed by means of anchors.

The product shall be protected from moisture during installation.

2.3. Assumed working life

The provisions made in this European Technical Assessment are based on an assumed intended working life for the thermal insulation boards of 50 years, when installed in the works, provided that the thermal insulation boards are subject to appropriate installation and use (see Clause 2.2.3) These provisions are based upon the current state of the art and the available knowledge and experience[1]

The indications gives as to the working life of the construction product cannot be interpreted as a guarantee neither given by the product manufacturer or his representative nor by EOTA nor by the Technical Assessment Body, but are regarded only as a means for choosing the appropriate products in relation to the expected economically reasonable working life of the works.

3. Performance of the product and references to the methods used for its assessment

This European Technical Assessment for the thermal insulation boards part of this document is issued on the basis of agreed data, deposited at ITBAK, which identifies the thermal insulation boards that have been assessed and judged. Changes to materials, to the composition or to characteristics of the product, or to the production process, which could result in this deposited data being incorrect, should be immediately notified to ITBAK before the changes are introduces. ITBAK will decide whether or not such changes affect the European Technical Assessment, and, if so, whether further assessment or alternations to the European Technical Assessment are considered necessary.

Assessment of the performance of the thermal insulation boards part of this document for the intended use in the sense of; basic requirement for construction work 2, 3 and 6 and general aspects relating to the performances of the construction product (showed in detail in Table 1) have been made in accordance with the European Assessment Document (EAD) 040012-00-1201, edition August 2014 for thermal insulation board made of mineral material.

[1] The real working life of a product incorporated in a specific works depends on the environmental conditions to which that works is subject, and the particular conditions of the design, execution, use and maintenance of that works may be outside this ETA. Therefore, it cannot be excluded that in these cases the real working life of the product may also be shorter than assumed working life.

Table 1: Essential characteristics of the product and methods and criteria for assessing the performance of the product in relation to those essential characteristics

Basic requirements for construction work (BWR)	Essential characteristics	Performance
BWR 2- Safety in case of fire	Reaction to fire	Clause 3.1.1
BWR 3- Hygiene, health and the environment	Content and/or release of dangerous substances	Clause 3.2.1
	Water vapour transmission	Clause 3.2.2
BWR 6- Energy economy and heat retention	Thermal conductivity	Clause 3.3.1
	Dimensions / Geometry	Clause 3.3.2
	Water absorption	Clause 3.3.3
General aspects relating to the performances of the construction product	Density	Clause 3.4.1
	Bending strength	Clause 3.4.2
	Compressive stress/strength	Clause 3.4.3
	Dimensional stability	Clause 3.4.4
	Tensile strength perpendicular to faces	Clause 3.4.5
	Behaviour under point load	Clause 3.4.6
	Porosity	Clause 3.4.7

BWRs 1, 4, 5 and 7 are not relevant according to EAD 040012-00-1201

3.1. Safety in case of fire (BWR 2)

3.1.1. Reaction to fire

The reaction to fire according to EN 13501-1 of Termoküp is class A1

3.2. Hygiene, health and the environment (BWR 3)

3.2.1. Content and/or release of dangerous substances

On dangerous substances, the thermal insulation boards comply with EAD 040012-00-1201 "Thermal insulation board made of mineral material", Edition August 2014. A manufacturer's declaration to this effect has been submitted.

According to the manufacturer's declaration, the product specification has been compared with the list of dangerous substances of the European Commission to verify that that it does not contain such substances above the acceptable limits.

In addition to the specific clauses relating to dangerous substances contained in this European Technical Assessment, there may be other requirements applicable to the products falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the Construction Product Directive, these requirements need also to be complied with, when and where they apply.

3.2.2. Water vapour transmission

The water vapour diffusion resistance factor, μ, according to EN 12086, climatic condition A of Termoküp is less than 5.

Before testing, the samples are stored to constant mass 23 °C/50 % relative humidity.

3.3. Energy economy and heat retention (BWR 6)

3.3.1. Thermal conductivity

The thermal conductivity is determined by measuring the thermal conductivity according to EN 12667 after storing the thermal insulation boards in a climate of 23 °C and 50 % relative humidity.

The declared value of the thermal conductivity applies to Category I.

The declared value of the thermal conductivity, determined in accordance with EN ISO 10456 at 23 °C and 50 % relative humidity is as follows:

- $\lambda_{23,50}$: 0,045 W/(m.K)

These declared values of the thermal conductivity apply to the density range given in Clause 3.4.1

3.3.2. Dimensions / Geometry

The length and width of Termoküp are determined according to EN 822 and shown in Clause 1.1. The tolerances in length and width according to EN 13163 are as follows:

Table 2: Classes of dimensional tolerances

Property	Class	Tolerance
Length	L (2)	± 1,5 mm
Width	W (2)	± 1,5 mm

The Thickness of Termoküp is determined according to EN 823 and shown in Clause 1.1. The test is performed with a load equal to 250±5 Pa and no test result deviates from the nominal thickness by more than ± 2 mm.

The squareness of Termoküp is determined according to EN 824 and shown in Clause 1.1. The deviation from the squareness does not exceed 5mm/m in the direction of length and width and 2 mm, respectively, in the direction of thickness.

The flatness of Termoküp is determined according to EN 825. The deviation from the flatness does not exceed 1 mm.

3.3.3. Water absorption

3.3.3.1. Short-term water absorption

The short term water absorption by partial immersion of Termoküp is determined according to EN 1609, method B. No value of the short term water absorption exceeds 15,0 kg/m^2. Before testing, the samples are dried to constant mass at 40 °C.

3.3.3.2. Long-term water absorption

The long term water absorption by partial immersion of Termoküp is determined according to EN 12087, method 1 B. No value of the long term water absorption exceeds 20,0 kg/m^2. Before testing, the samples are dried to constant mass at 40 °C.

3.4. General aspects relating to the performances of the construction product

3.4.1. Density

The density of Termoküp is determined according to EN 1602. The value of the density is 132 kg/m³ .Before testing, the samples are dried to constant mass at 105 °C.

3.4.2. Bending strength

The bending strength of Termoküp is determined according to EN 12089, test method B.

The value of bending strength is at least 200 kPa.

Before testing, the samples are dried to constant mass at 40 °C.

3.4.3. Compressive strength

The compressive strength of Termoküp is determined according to EN 826.

The value of compressive strength is at least 400 kPa.

Before testing, the samples are dried to constant mass at 40 °C.

3.4.4. Dimensional stability

The dimensional stability of Termoküp under specified temperature is determined in accordance with EN 1604. The test is performed after 48 h storage at (70 ± 2) °C.

The maximum value of relative change in length $\Delta_{\varepsilon l}$, does not exceed 0,5 %

The maximum value of relative change in width $\Delta_{\varepsilon b}$, does not exceed 0,5 %

The maximum value of relative change in thickness $\Delta_{\varepsilon d}$, does not exceed 1 %

The dimensional stability of Termoküp under specified temperature and humidity conditions is determined in accordance with EN 1604. The test is performed after 48 h storage at (23 ± 2) °C and (90 ± 5) % relative humidity.

The maximum value of relative change in length $\Delta_{\varepsilon l}$, does not exceed 0,5 %

The maximum value of relative change in width $\Delta_{\varepsilon b}$, does not exceed 0,5 %

The maximum value of relative change in thickness $\Delta_{\varepsilon d}$, does not exceed 1 %

3.4.5. Tensile strength perpendicular to faces

The tensile strength perpendicular to faces of Termoküp is determined according to EN 1607.

The value of tensile strength perpendicular to faces is at least 80 kPa. Before testing, the samples are dried to constant mass at 40 °C.

3.4.6. Behaviour under point load

The deformation of Termoküp under a point load of 1000 N is determined according to EN 12430. No value of the deformation exceeds 1,5 mm. Thus, the level for deformation under point load is PL(P)1,5

Before testing, the samples are dried to constant mass at 40 °C.

3.4.7. Porosity

No performance determined

3.4.8. Designation code

A designation code for the product can be given by the manufacturer as described in the following:

• Short-term water absorption	WSi
• Long-term water absorption	WL(P)i
• Water vapour diffusion	MUi
• Compressive strength	CS(Y)i
• Behaviour under point load	PL(P)i
• Bending strength	BSi
• Tensile strength perpendicular to faces	TRi
• Dimensional stability under specified temperatures	DS(70,-)
• Dimensional stability under specified temperature and humidity conditions	DS(23,90) or DS(70,90)

"i" shall be used to indicate the relevant level / class or value.

4. Assessment and verification of constancy of performance (hereinafter AVCP) system applied, with reference to its legal base

According to the decision 1999/91/EC of the European Commission decision (OJ L 29/44 of 03/02/99), as amended by Decision of the European Commission 2001/596/EC (OJ L 209/33 of 02/08/2001) the system of assessment and verification of constancy of performance (see Annex V to the regulation (EU) No 305/2011) is 3. This system provides for:

- the manufacturer shall carry out factory product control,
- the notified body shall carry out Initial type-testing of the product.

5. Technical details necessary for the implementation of the AVCP system, as provided for in the applicable EAD

5.1. Task of the manufacturer

5.1.1. Factory production control

The manufacturer shall exercise permanent internal control of production. All the elements, requirements and provisions adopted by the manufacturer shall be documented in a systematic manner in the form of written policies and procedures, including records of results performed. This production control system shall insure that the product is in conformity with this European technical assessment.

The manufacturer may only use initial material stated in the technical documentation of this European technical assessment.

The factory production control shall be in accordance with the "Nuh Yapı Ürünleri Control Plan" relating to this European Technical Assessment which is part of the technical documentation of this European Technical Assessment. The control plan is laid down in the context of the factory production control system operated by the manufacturer and deposited at ITBAK[2]

The prescribed test plan defined in Annexes 1 gives the type and frequency of checks and tests conducted during production and on the final product as part of the continuous internal production control.

The results of factory production control shall be recorded and evaluated in accordance with the provisions of the control plan.

[2] The control plan is a confidential part of the European technical assessment and only handed over to the notified body or bodies involved in the procedure of attestation of conformity.

5.1.2. Declaration of performance

The manufacturer is responsible for preparing the declaration of performance. When all the criteria of the assessment and verification of constancy of performance are met, the manufacturer shall issue a declaration of performance.

5.2. Task of the notified body

5.2.1. Initial type-testing of the product

The initial type-testing have been conducted by the ITBAK to issue this European Technical Assessment, in accordance with the European Assessment Document (EAD) 040012-00-1201, edition August 2014 for "thermal insulation board made of mineral material".

The verifications underlying this European Technical Assessment have been furnished on samples from the current production; these will replace the initial type-testing carried out by the manufacturer.

Issued in Ankara on 23.03.2023

By

Board Member of İTBAK

H. Alper TÜREDİ

and

Deputy General Manager

of İTBAK

Abdullah KUYUMCU

Annexes

Test plan

No	Subject/type of control	Test or control method	Criteria, if any	Minimum number of samples	Minimum frequency of control*
1	Reaction to fire	See EN 13167	See clause 2.2.1.2	1	Once per 2 years
2	Thermal conductivity	See clause 2.2.4.1	See clause 2.2.4.2	1	Annually
3	Dimensions / Geometry	See clause 2.2.5.1	See clause 2.2.5.2	See clause 2.2.5.1	Daily
4	Water absorption	See clause 2.2.6.1	See clause 2.2.6.2	See clause 2.2.6.1	Annually
5	Density	See clause 2.2.7.1	See clause 2.2.7.2	See clause 2.2.7.1	Daily
6	Bending strength	See clause 2.2.8.1	See clause 2.2.8.2	See clause 2.2.8.1	Annually
7	Compressive stress/strength	See clause 2.2.9.1	See clause 2.2.9.2	See clause 2.2.9.1	Daily
8	Behaviour under point load	See clause 2.2.12.1	See clause 2.2.12.2	See clause 2.2.12.1	Annually

Termoküp Prescribed test Plan - 1	**Annex 1** of European Technical Assessment ETA-15/0218

References

EN 822 Thermal insulating products for building applications - Determination of length and width

EN 823 Thermal insulating products for building applications - Determination of thickness

EN 824 Thermal insulating products for building applications - Determination of squareness

EN 825 Thermal insulating products for building applications - Determination of flatness

EN 826 Thermal insulating products for building applications - Determination of compression behaviour

EN 993-1 Methods of test for dense shaped refractory products – Part 1: Determination of bulk density, apparent porosity and true porosity

EN 1602 Thermal insulating products for building applications - Determination of the apparent density

EN 1604 Thermal insulating products for building applications - Determination of dimensional stability under specified temperature and humidity conditions

EN 1605 Thermal insulating products for building applications - Determination of deformation under specified compressive load and temperature conditions

EN 1606 Thermal insulating products for building applications - Determination of tensile strength perpendicular to faces

EN 1607 Thermal insulating products for building applications - Determination of tensile strength perpendicular to faces

EN 1609 Thermal insulating products for building applications – Determination of short term water absorption by partial immersion

EN ISO 10456 Building materials and products –Hygrothermal properties –Tabulated design values and procedures for determining declared and design thermalValues

EN 12086 Thermal insulating products for building applications - Determination of water vapour transmission

EN 12087 Thermal insulating products for building applications - Determination of long term water absorption by immersion

EN 12089 Thermal insulating products for building applications - Determination of bending behaviour

EN 12430 Thermal insulating products for building applications - Determination of behaviour under point load

EN 12667 Thermal performance of building materials and products – Determination of thermal resistance by means of guarded hot plate and heat flow meter methods – Products of high and medium thermal resistance

Termoküp References	**Annex 2** of European Technical Assessment ETA-15/0218

References

EN 12939 Thermal performance of building materials and products -Determination of thermal resistance by means of guarded hot plate and heat flow meter methods – Thick products of high and medium thermal resistance

EN 13163:2013-03 Thermal insulation products for buildings - Factory made expanded polystyrene (EPS) products – Specification

EN 13167:2013-03 Thermal insulation products for buildings - Factory made cellular glass (CG) products – Specification

EN 13172 Thermal insulating products - Evaluation of conformity

EN 13501-1 Fire classification of construction products and building elements – Part 1: Classification using data from reaction to fire tests

EN 13823 Reaction to fire tests for building products - Building products excludingfloorings exposed to the thermal attack by a single burning item

EN 15715:2010-04 Thermal insulation products – Instructions for mounting and fixing for reaction to fire testing – Factory made products

European Assessment Document (EAD) 040012-00-1201, edition August 2014 for thermal insulation board made of mineral material.

Termoküp References	**Annex 2** of European Technical Assessment ETA-15/0218