

EUROPEAN TECHNICAL ASSESSMENT

ETA – 16/0069
of 04.04.2016.

I GENERAL PART

**Technical Assessment Body issuing
the ETA**

ÉMI Építésügyi Minőségellenőrző Innovációs
Nonprofit Kft.

**Trade name of the construction
product**

Thermo-Block

**Product family to which the
construction product belongs**

Non load-bearing permanent shuttering kits based
on blocks of EPS

Manufacturer

Thermo-Block Kft.
8000 Székesfehérvár, Szent Gellért u. 8/c
Hungary

Manufacturing plant(s)

Plant 1
(as given in the Control Plan)

**This European Technical
Assessment contains**

16 pages including 1 Annex(es) 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**

ETAG 009, Non load-bearing permanent
shuttering kits / systems based on hollow blocks
or panels of insulating materials and sometimes
concrete (Edition June 2002), used as European
Assessment Document (EAD)

The original official language of this European Technical Assessment is Hungarian. Translations of this European Technical Assessment in other languages shall fully correspond to the original issued document and should be identified as such.

Communication of this European Technical Assessment, including transmission by electronic means, shall be in full (except the confidential Annex(es) referred to above).

II SPECIFIC PARTS

1 TECHNICAL DESCRIPTION OF THE PRODUCT

The Thermo-Block shuttering element-leaves based on EPS (EPS – EN 13163 – T2 – L2 – W2 – S2 – P3 – BS200 – CS(10)100 – DS(N)5 –TR150) are connected by spacers made of EPS. The installation of the elements is helped by tongues arranged on their upper side, which exactly fit into the grooves on the lower part of the elements. The nominal density of the EPS is $(26 \pm 10\%) \text{ kg / m}^3$.

Element types:

Thermo-Block element types	Nominal dimensions of the elements (thickness / height / length) (mm)	Thickness			Overall thickness (mm)
		Outer leaf (mm)	Concrete core (mm)	Inner leaf (mm)	
wall element type 25	250/250/1000	65	140	45	250
wall element type 35	350/250/1000	165	140	45	350
wall element type 44	440/250/1000	255	140	45	440
lintel element type 25	250/250/1000	65	140	45	250
lintel element type 35	350/250/1000	165	140	45	350
lintel element type 44	440/250/1000	255	140	45	440
ring beam element type 25	250/250/1000	65	140	-	250
ring beam element type 35	350/250/1000	165	140	-	350
ring beam element type 44	440/250/1000	255	140	-	440
lock element	140/250/65	-	-	-	140

Same shuttering elements are used for constructing of both external and internal walls.

The shuttering kit also includes lintel, ring beam and lock elements.

Dimensioned technical drawings of the elements are given in Annex 1.

During installation of the wall structures made of Thermo-Block shuttering kits, the shaped moulded EPS leaves connected by EPS spacers are supplied with structurally designed reinforcement and the gaps are filled in with concrete (in 3-line sessions, min. concrete strength is C16/20 (EN 206:2013)).

The external/internal finishes and the filling concrete are not the parts of kit.

The wall is installed on a pre-constructed traditional base structure provided with waterproofing. After the concrete has hardened the EPS leaves and spacers do not have any structural function.

The ETA-holder has the responsibility to guarantee that the information about the installation is sufficiently communicated to all the participants concerned.

Buildings made from Thermo-Block permanent shuttering kit shall be realised on the basis of an installation plan.

In every case the reinforced concrete structures made from the shuttering kit can only be installed under a check of a civil engineer. The structural design shall be performed by considering the smallest horizontal cross-section area.

During the concrete hardening period the shuttering elements of the walls shall be secured against uplift and movement.

The plans shall include the standard specification, content and description of the concrete technology to be used.

The manufacturer's documentation shall contain instructions regarding the packaging, transport and storage, and the product has to be protected against weather effects and mechanical damages.

The elements are manufactured, considering the requirements of the ETA, according to the manufacturer's technical documentation deposited at ÉMI Nonprofit Kft.

2 SPECIFICATION OF THE INTENDED USE(S) IN ACCORDANCE WITH THE APPLICABLE EUROPEAN ASSESSMENT DOCUMENT

The Thermo-Block permanent shuttering kits are intended to be used for construction of internal walls as well as external walls.

In accordance with EOTA TR 034 the following use categories apply:

- Category IA 2: product with no direct contact to (e.g. covered products) but possible impact on indoor air
- Category S/W 3: Product with no contact to and no impact on soil-, ground- and surface water

The provision made in this European Technical Assessment are based on a working life of the shuttering kits of 50 years, provided that the conditions laid down for the packaging, transport, storage, installation, use, maintenance and repair are met.

The indication given on the working life cannot be interpreted as a guarantee given by the manufacturer or the assessment body. They are to be regarded only as a means for the specifiers to choose the appropriate criteria in relation to the expected economically reasonable working life.

For the intended use it is essential to protect this type of construction against the effects of adverse weather conditions.

3 PERFORMANCE OF THE PRODUCT AND REFERENCES TO THE METHODS USED FOR ITS ASSESSMENT

3.1 Mechanical resistance and stability

3.1.1 Resulting structural pattern

According to the definition given in clause 2.2 of ETAG 009, the walls made from the kit have grid structural pattern.

3.1.2 Efficiency of filling

Assessment of the efficiency of filling according to clause 5.1.2 of ETAG 009 has been performed by checking of a trial wall structure built by the manufacturer.

The requirements of clause 6.1.2 of ETAG 009 are met.

3.1.3 Possibility of steel reinforcement

Assessment of the possibility of steel reinforcement according to clause 5.1.3 of ETAG 009 has been performed by checking of a trial wall structure built by the manufacturer and on the basis of the manufacturer's technical documentation.

The requirements of clause 6.1.3 of ETAG 009 are met.

3.2 Safety in case of fire

3.2.1 Reaction to fire

The expanded polystyrene (EPS) used for the shuttering elements is classified as class E according to EN 13501-1:2007+A1:2009.

3.2.2 Resistance to fire

No performance assessed.

3.3 Hygiene, health and environment

3.3.1 Content and/or release of dangerous substances

On basis of manufacturer's declaration the raw material contains dangerous substances listed in 1272/2008/EC are as follows:

- pentan, content (w/w) $\leq 4,5\%$
- isopentane; content (w/w) $\leq 1,1\%$

Regarding the 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, regulation and administrative provisions). In order to meet the provision of the Construction Products Regulation (CPR), these requirements need also to be complied with, when and where they apply.

3.3.2 Water vapour permeability

According to Table F.2 in Annex F of EN 13163:2012+A1:2015 the water vapour permeability coefficient of EPS raw material is $\mu = 30-70$.

Verifying the risk for interstitial condensation regarding the whole wall structure can be performed by calculation according to EN ISO 13788:2012. During the calculation the water vapour diffusion resistance factor of concrete can be considered according to EN ISO 10456:2007/AC:2009.

3.3.3 Water absorption

Determination of the water absorption was performed by observing the filling in the blocks with fresh concrete. The water absorption of the shuttering elements from either inner or outer sources did not cause any damages, the shuttering elements dried out during the evaporation period.

The requirements of clause 6.3.3 of ETAG 009 are met.

3.3.4 Water tightness

No performance assessed.

3.4 Safety and accessibility in use

3.4.1 Bond strength and resistance to impact load

No performance assessed.

3.4.2 Resistance to filling pressure

Assessment of the resistance to filling pressure, considering a three-course concreting, has been performed by checking of a trial wall structure built by the manufacturer (maximum filling height: 0,75 m).

As results of the check the following can be stated:

- the shuttering elements did not break,
- there was not significant deformation on the shuttering elements.

The bending strength of EPS shuttering element is 200 kPa (BS200) on basis of the test performed according to EN 12089:2013.

The requirements of clause 6.4.2 of ETAG 009 are met.

3.4.3 Safety against personal injuries

The Thermo-Block shuttering elements do not have any sharp or cutting edges. Considering the type of surface there is no risk of abrasion or cutting people.

The requirements of 6.4.3 clause of ETAG 009 are met.

3.5 Protection against noise

3.5.1 Airborne sound insulation

On basis of the laboratory test performed according to EN ISO 10140-2:2010 the airborne sound insulation of the wall structure with a concrete core thickness of 14 cm (with wall element type 44) is:

$$R_w (C; C_{tr}) = 39 (-1; -4) \text{ dB.}$$

3.5.2 Sound absorption

No performance assessed.

3.6 Energy economy and heat retention

3.6.1 Thermal resistance

The declared thermal conductivity coefficient of EPS material of the Thermo-Block shuttering kit, on basis of laboratory tests according to EN 12667:2001 and calculation according to Annex A of EN 13163:2012+A1:2015, is:

$$\lambda_{\text{EPS},90/90} = 0,031 \text{ W/mK.}$$

Thermal resistance (R_{wall}) of the wall structures without finishes and considering a concrete infill of $\lambda_c = 2,3 \text{ W/mK}$ (according to EN ISO 10456:2007/AC:2009), $\lambda_{\text{EPS},D} = 0,032 \text{ W/mK}$ and without considering surface resistances and the effect of EPS spacers, on basis of calculation according to EN ISO 6946:2007 are as follows:

Wall type	R_{wall} ($\text{m}^2\text{K/W}$)
25	3,50
35	6,62
44	9,43

3.6.2 Influence of moisture transfer on insulating capacity of wall

No performance assessed.

3.6.3 Thermal inertia

No performance assessed.

3.7 Sustainable use of natural resource

There is no relevant performance assessed regarding this essential requirement.

3.8 Aspects of durability and serviceability

3.8.1 Resistance to physical agent

The relative changes of EPS-leaves under normal conditions (23 °C / 50 %) in length, width and thickness did not exceed 0,5 % (DS(N)5).

The requirements of 6.7.1.1 clause of ETAG 009 are met.

3.8.2 Resistance to chemical agent

EPS-leaves of Thermo-Block permanent shuttering kits and the spacer made of EPS resist to corrosion.

The kit does not include any metal components.

The requirements of clause 6.7.1.2 of ETAG 009 regarding the resistance to corrosion are met.

3.8.3 Resistance to biological agent

EPS, as a thermal insulation material, is a sufficient protection against fungi, bacteria, algae and insects. EPS does not provide a food for them.

The product does not contain voids suitable for habitation of vermin's and pests.

The requirements of clause 6.7.1.3 of ETAG 009 are met.

3.8.4 Resistance to normal use damage

During general use Thermo-Block permanent shuttering kit is protected against normal impact loads by gypsum boards and rendered surfaces.

The placement of vertical pipes between the shuttering leaves, according to the manufacturer's instructions, shall be done before concreting.

Vertical and the horizontal grooves for pipes outside the wall shall be cut in the EPS-leaves, between the plastic spacers and without touching the concrete core.

Fixing objects in the shuttering leaves is not possible. They shall be fixed, according to the manufacturer's instructions, to the concrete core.

The requirements of clause 6.7.2.1, 6.7.2.2 and 6.7.2.3 of ETAG 009 are met.

4 ASSESSMENT AND VERIFICATION OF CONSTANCY OF PERFORMANCE (HEREINAFTER AVCP) SYSTEM APPLIED, WITH REFERENCE TO ITS LEGAL BASE

According to decision 98/279/EC of the European Commission (EC OJ N°L127, 29.4.1998) (amended by the decision 2001/596/EC (EC OJ N°L209, 2.8.2001)) AVCP system of 2+ is applied (see Annex V to Regulation (EU) 305/2011).

5 TECHNICAL DETAILS NECESSARY FOR THE IMPLEMENTATION OF THE AVCP SYSTEM, ACCORDING TO ETAG 009 USED AS APPLICABLE EAD

5.1 Tasks for the manufacturer

5.1.1 Assessment of the performance of the construction product

Regarding the construction product in question this European Technical Assessment is the assessment of the products performance for the manufacturer, hence the manufacturer does not have to perform the tasks given in point 1.3.(a)(i), Annex V of Regulation (EU) 305/2011.

5.1.2 Factory production control

The manufacturer shall exercise permanent factory production control. 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. The factory production control system must provide the product is in conformity with this European Technical Assessment.

The manufacturer may only use raw material stated in the technical documentation¹ of this European Technical Assessment.

In the frame of the factory production control the manufacturer shall perform controls according to the Control plan² which belongs to this European Technical Assessment.

Content, type and frequency of the factory production control performed by the manufacturer are included in the Control plan which is the part of technical documentation of this European Technical Assessment.

Results of the factory production control shall be recorded and assessed on controlling sheets.

Controlling sheets shall be signed by responsible persons. Sheets shall be provided for the notified certification body involved in the continuous surveillance.

¹ Technical documentation of this European Technical Assessment is deposited at ÉMI Nonprofit Kft. and it will be provided for the notified certification body involved in the procedure regarding the assessment and verification of constancy of performance of the product.

² Control plan is deposited at ÉMI Nonprofit Kft. and it will be provided for the notified certification body involved in the procedure regarding the assessment and verification of constancy of performance of the product.

5.2 Tasks for the notified certification body

5.2.1 Initial inspection of the manufacturing plant and of the production control

The notified certification body has to prove that the manufacturing plant and the factory production control according to the Control plan, especially regarding the staff and the tools, are applicable for the continuous and regular manufacturing of the product according to the requirements laid down in clause 2 of the European Technical Assessment and its Annexes.

5.2.2 Continuous surveillance, assessment and evaluation of factory production control

The notified certification body shall perform an inspection for surveillance of the manufacturing plant once a year.

It is necessary to prove that the factory production control system and specified manufacturing process are in accordance with the Control plan.

Continuous surveillance and assessment of the factory production control shall be performed according to the Control plan.

Issued in Szentendre on 04.04.2016.

by

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head of technical assessment office



ANNEXES

ANNEX 1 Technical drawings of the elements