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Authorised and notified according to Article 10 of the Council Directive of 21 December 1988 on the approximation of laws, regulations and administrative provisions of Member States relating to construction products (89/106/EEC)

DIBt

Mitglied der EOTA
Member of EOTA

European Technical Approval ETA-05/0090

English translation prepared by DIBt - Original version in German language

Handelsbezeichnung *Trade name*	DURISOL-, HARML-, ISOSPAN- und THERMOSPAN-Mantelsteine aus Holzspanbeton *DURISOL-, HARML-, ISOSPAN- and THERMOSPAN hollow blocks made of wood-chips aggregate concrete*
Zulassungsinhaber *Holder of approval*	Durisol-Werke GesmbH Nachfg. Kommanditgesellschaft Durisolstrasse 1 2481 Achau ÖSTERREICH
Zulassungsgegenstand und Verwendungszweck *Generic type and use of construction product*	Nicht lasttragendes verlorenes Schalungssysteme "DURISOL" , "HARML", "ISOSPAN" und "THERMOSPAN" bestehend aus Mantelsteinen aus Holzspanbeton *Non-load bearing permanent shuttering kits "DURISOL" , "HARML", "ISOSPAN" and "THERMOSPAN" based on hollow blocks of wood-chips aggregate concrete*
Geltungsdauer: *Validity:* vom *from*	25 November 2005
bis *to*	25 November 2010
Herstellwerk *Manufacturing plant*	Durisol-Werke GesmbH Nachfg. Kommanditgesellschaft Durisolstrasse 1 2481 Achau ÖSTERREICH

Diese Zulassung umfasst *This Approval contains*	32 Seiten einschließlich 18 Anhänge *32 pages including 18 annexes*

3.3 CE marking

The CE marking shall be affixed on the ...(product itself - indicate where on the product, if necessary - or the label attached to it; packaging; accompanying commercial document, e.g. the EC declaration of conformity). The letters "CE" shall be followed by the identification number of the approved certification body, where relevant, and be accompanied by the following additional information:

- the name and address of the producer (legal entity responsible for the manufacturer),
- the last two digits of the year in which the CE marking was affixed,
- the number of the EC certificate of conformity for the product (only for reaction to fire)
- the number of the EC certificate for the factory production control,
- the number of the European Technical Approval,
- the number of the guideline for ETAG 009
- Euroclass according to EN 13501-1 (see 2.2.3.2)
- Fire resistance class according to EN 13501-2 in dependence of minimum thickness of concrete core (see 2.2.3.2)
- protection against noise "no performance determined"
- the nominal values of thermal resistance R_{DI} of the used wood-chips aggregate concrete according to EN 13163:2001-10, chapter 4.2.1 (see 2.2.7.1)

4 Assumptions under which the fitness of the product for the intended use was favourably assessed

4.1 Manufacturing

The European Technical Approval is issued for the product on the basis of agreed data/information, deposited with Deutsches Institut für Bautechnik, which identifies the product that has been assessed and judged. Changes to the product or production process, which could result in this deposited data/information being incorrect, should be notified to Deutsches Institut für Bautechnik before the changes are introduced. Deutsches Institut für Bautechnik will decide whether or not such changes affect the ETA and consequently the validity of the CE marking on the basis of the ETA and if so whether further assessment or alterations to the ETA shall be necessary.

4.2 Installation

4.2.1 General

The manufacturer shall ensure that the requirements in accordance with sections 1, 2, and 4 are made known to those involved in planning and execution. The installation guide is deposited at DIBt and shall be present at every construction site. If the manufacturer's instructions contain other specifications than those stated here, the specifications of the ETA shall apply.

After installation of the hollow blocks (see 4.2.2) the site-mixed or ready mixed concrete is brought in and compacted.

In end use conditions concrete walls of grid type[14] of plain or reinforced concrete according to EN 1992-1-1 or corresponding national rules will be formed.

For structural design dimension and weights given in Annexes D5, H4, I5 and T4 have to be used.

In end use conditions the wood-chips concrete leaves of the hollow blocks and the strips of insulating material are the main part of the thermal insulation of the walls.

14 see ETAG 009 chapter 2.2

4.2.2 Installation of the hollow blocks

The hollow blocks are put together on site in layers without adhesive. To receive stable floor high formworks the vertical joints between two elements of one layer have to be shifted of half of the element length to the vertical joints of the previous and next layer (see Annexes D3, D4, H3, I3, I4, T3), so that the middle planes of the on top of each other lying webs are in one plane.

First of all one layer of hollow blocks shall be laid exactly according to the planed elevation and alignment for the entire floor plan.

Subsequently, according to the installation guide of the manufacturer, the walls are to be stacked in bond (see Annexes D4, D5, H3, I3, I4 und T4) to floor height. Thereby the necessary reinforcement also shall be installed according to the installation guide.

Rectangular wall corners are to be formed according to Annexes D3, D4, H3, I3, I4 and T3. The lintel elements shall be supported.

4.2.3 Installation of the reinforcement

In general only plain concrete walls can be realised with this systems. According to the installation guide it is possible to install reinforcement as following:

- in every horizontal connection between the vertical columns of the grid
- in every vertical column one single reinforcement bar, a mesh of reinforcement bars or a reinforcement cage for the whole column

The preconditions for the installation of reinforcement are:

- The horizontal dimensions of meshes or cages for the vertical reinforcement including spacers shall be appropriately smaller than the corresponding minimum dimensions of the concrete core
- Planning shall allow for sufficient spaces in the reinforcement for discharge pipes or concreting tubes.
- The resistance of the wood-chip aggregate concrete to carbonisation and to chloride penetration has not been examined, i.e., the full concrete cover according to EN 1992-1-1 or corresponding national rules shall be applied.
- The minimum and maximum distance between reinforcing bars shall be in accordance with EN 1992-1-1 or corresponding national rules.
- If more than one bar is installed as vertical reinforcement all the bars shall be joined to a mesh (e.g. by welded or knotted on cross bars).

The lintels in every case have to be reinforced as beams according to EN 1992-1-1 or corresponding national rules.

4.2.4 Concreting

For the production of normal concrete EN 206-1:2001-07 shall apply. Concrete within and below the lower flow class range F3 shall be compacted by shaking. Concrete within and above the upper flow class range F3 sufficiently can be compacted by poking. The flow class of fresh concrete shall not be higher than F5 and depending on the thickness of the concrete core not lower than given in ETAG 009, sub-clause 7.2.2. The maximum aggregate sizes depending on the thickness of the concrete core shall not be higher than given in ETAG 009, sub-clause 7.2.2. The concrete shall have rapid or middle strength development according to EN 206-1:2001-07, Table 12.

Placing the concrete shall be performed only by persons who were instructed in the works and in the proper handling of the shuttering system. To allow a safe handling workers an independent self-supporting carrying scaffolding is necessary.

The maximum filling rate shall not exceed 3 m/h. The concrete shall be placed in layers of approximately 1 m.

If equivalent national rules are not available the following instructions shall be considered:

Horizontal day joints are to be arranged preferably at the height of the floor. In the case these cannot be achieved vertical composite reinforcement bars has to be installed. The composite reinforcement shall comply the following requirements:

- two adjacent vertical composite reinforcement bars shall not be situated in the same plane parallel to the surface of the wall,
- the distance between two composite reinforcement bars in wall direction shall be at least 10 cm and not larger than 50 cm,
- the total section area of the composite reinforcement bars shall not be smaller than 1/2000 of the section area of the concrete,
- anchorage length of the composite reinforcement bars on both sides of the day joint shall at least be 20 cm

Before the further placing of concrete, cement laitance and detached / loose concrete shall be removed and the day joints shall be sufficiently pre-wetted. At the time of concreting the surface of the older concrete shall be slightly moist, so that the cement paste of the newly brought in concrete can combine well with the older concrete.

If no day joint is planned, placing of concrete in layers may only be interrupted as long as the concrete layer brought in last not yet solidified so that a good and even bond is still possible between the two concrete layers. When using internal vibrators the vibrating cylinder shall still penetrate into the already compressed lower concrete layer.

The concrete may fall freely only up to a height of 2 m, beyond that the concrete shall be poured through discharge pipes or concreting tubes with a maximum diameter of 100 mm and shall be led almost directly to the place of installation.

Pouring cones are to be avoided by short distances between the places of fill in.

After concreting the walls may not deviate from the plumb line more than 5 mm per running meter wall height.

The ceiling may only be placed on walls made of hollow blocks if a sufficient strength of the infill concrete exists.

4.2.5 Ducts crossing and lying in the wall

Horizontally passing ducts are to be installed according to the installation guide of the ETA applicant and are to be taken into account when designing the wall.

Horizontal ducts lying in the wall cores are to be avoided. If absolutely necessary, these are to be taken into account when designing the wall.

Also vertical ducts in the concrete core shall be considered, if their diameter exceeds 1/6 of the thickness of the concrete core and the distance of the pipes is less than 2 m.

4.2.6 Reworking and finishes

Walls of the type "DURISOL", "HARML", "ISOSPAN" and "THERMOSPAN" are to be protected by finishes. Finishes are not part of the kit and therefore not considered in this ETA. For external surfaces preferably the used rendering systems should meet the requirement of ETAG 004[15]. The execution of the rendering shall be performed according to applicable national rules.
Before rendering the roof of the building shall be closed and the surfaces of the walls shall be free from impureness.

4.2.7 Fixing of objects

Fixing of objects in the shuttering leaves is not possible, the part of fixings which is significant for the mechanical resistance shall be in the concrete. The influence of the fixing to the reduction of the thermal resistance has to be considered according to EN ISO 6946.

15 EOTA Guideline for External Thermal Insulation Composite Systems with rendering

5 Indications to the manufacturer

5.1 Packaging, transport and storage

The hollow blocks have to be protected against damage.

5.2 Use, maintenance, repair

Regular checks should be carried out on render finishes to ensure that any damage is detected and repaired as soon as possible.

Concerning recommendations on use, maintenance and repair ETAG 009, section 7.5 shall apply.

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Beglaubigt:
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