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

MEMBER OF EOTA

European Technical Approval ETA-13/0614

Trade name:

Jackon Thermomur 350

Holder of approval:

Jackon Danmark A/S
Lundagervej 20
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Generic type and use of construction product:

Non load-bearing permanent shuttering system based on shuttering elements of EPS

Valid from:
to:

2013-06-28
2018-06-28

Manufacturing plant:

Jackon Danmark AS
Sørkilen 3
No-1620 Gressvik

This European Technical Approval contains:

16 pages including 1 Annex which form an integral part of the document



European Organisation for Technical Approvals

Europæisk Organisation for Tekniske Godkendelser

I LEGAL BASIS AND GENERAL CONDITIONS

1 This European Technical Approval is issued by ETA-Danmark A/S in accordance with:

- Council Directive 89/106/EEC of 21 December 1988 on the approximation of laws, regulations and administrative provisions of Member States relating to construction products¹⁾, as amended by Council Directive 93/68/EEC of 22 July 1993²⁾.
- Bekendtgørelse 559 af 27-06-1994 (afløser bekendtgørelse 480 af 25-06-1991) om ikrafttræden af EF direktiv af 21. december 1988 om indbyrdes tilnærmelse af medlemsstaternes love og administrative bestemmelser om byggevarer.
- Common Procedural Rules for Requesting, Preparing and the Granting of European Technical Approvals set out in the Annex to Commission Decision 94/23/EC³⁾.
- Guideline for European Technical Approval of Non load-bearing permanent shuttering kits/system based on hollow blocks or panels of insulating materials and sometimes concrete, ETA-Guideline N° 009, Edition June 2002.

2 ETA-Danmark A/S is authorized to check whether the provisions of this European Technical Approval are met. Checking may take place in the manufacturing plant. Nevertheless, the responsibility for the conformity of the products to the European Technical Approval and for their fitness for the intended use remains with the holder of the European Technical Approval.

3 This European Technical Approval is not to be transferred to manufacturers or agents of manufacturers other than those indicated on page 1, or manufacturing plants other than those indicated on page 1 of this European Technical Approval.

4 This European Technical Approval may be withdrawn by ETA-Danmark A/S pursuant to Article 5(1) of Council Directive 89/106/EEC.

1) Official Journal of the European Communities N° L40, 11 Feb 1989, p 12.

2) Official Journal of the European Communities N° L220, 30 Aug 1993, p 1.

3) Official Journal of the European Communities N° L 17, 20 Jan 1994, p 34.

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6 This European Technical Approval is issued by ETA-Danmark A/S in Danish. This version corresponds fully to the version circulated within EOTA. Translations into other languages have to be designated as such.

II SPECIAL CONDITIONS OF THE EUROPEAN TECHNICAL APPROVAL

1 Definition of product and intended use

1.1 Product description

Jackon Thermomur 350 is a non-loadbearing permanent shuttering system based on elements made of EPS and HDPE with rib parts of HDPE (see Annex 1) applicable as formwork for reinforced concrete walls cast in-situ.

The shuttering elements consist of two one-layered, 100 mm thick expanded polystyrene (EPS) leaves. High density polyethylene (HDPE) rail anchors are integrated in the shuttering leaves when they are moulded. The rail anchors are vertical and serve as clamps for fastening of gypsum, plywood or wood battens.

The upper and lower surfaces of the shuttering leaves are staggered to ensure precise locking between the elements. The outer and inner surfaces as well as the vertical end surfaces of the shuttering elements are smooth.

The distance between the rail anchors are 150 mm. The rail anchors are visible at the inner and outer surface of the shuttering elements where the spacers are fastened. The rail anchors provide a concrete thickness of 150 mm.

The shape of the spacers makes them suitable for precise location of the reinforcement bars for the concrete and secures a correct position of the reinforcement.

The kit consists of the following elements:

- standard shuttering elements – Top element – Half element
- Corner elements
- Extended foundation shuttering leaves

For the shuttering leaves expanded polystyrene particle foam designated EPS-EN13163:2012 T2-L3-W3-Sb2-P3-BS250-DS(N)3-CS(10)150 according to EN 13163 is used.

The tensile strength of the EPS-leaves perpendicular to faces shall be more than 100 kPa (TR100, according to EN 13163) and the relative changes in length, width and thickness under specified temperature and humidity conditions shall not exceed more than 3 % after exposing them for 48 h at 70 °C (DS(70, -)3, according to EN 13163).

The apparent density ρ_a of the EPS-leaves is in the range between 23 and 30 kg/m³ according EN 13163 and the modulus of shear according EN 12090 shall be at least 1,0 MPa and must not exceed 3,8 MPa.

The declared value of thermal conductivity is $\lambda_D = 0.030$ W/(m K) according EN 13163.

The material characteristics, dimensions and tolerances of the shuttering elements not indicated in Annex 1 are given in the technical documentation of the ETA.

The technical documentation of the ETA is deposited with ETA-Danmark and, as far as relevant for the tasks of the approved bodies involved in the attestation of conformity procedure, is handed over to the approved bodies.

Assembly of the shuttering kit is done at the construction site.

1.2 Intended use

The kit is intended to be used for the construction of internal walls as well as external walls above or below ground which are load-bearing (structural) or non-loadbearing (non-structural), including those which are subject to fire regulations.

When using this type of construction below ground, a waterproofing according to applicable national rules shall be provided depending on whether ground water not exerting pressure or ground water exerting pressure is to be dealt with. The waterproofing shall be protected from mechanical damage by a smash-resistant protective layer.

The provisions made in this European technical approval are based on an assumed working life of the shuttering kit of at least 50 years, provided that the conditions laid down in sections 4.2, 5.1 and 5.2 for the packaging, transport, storage, installation, use, maintenance and repair are met.

The indications given on the working life cannot be interpreted as a guarantee given by the producer, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

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

2 Characteristics of product and assessment

Characteristics of products and systems

The assessment of the fitness of the shuttering system for the intended use has been made in compliance with ETAG 009, Guideline for European Technical Approval of "Non load bearing permanent shuttering kits/systems based on shuttering elements or blocks of insulating materials and sometimes concrete", edition June 2002.

The ETA is issued for the shuttering kit "Jackon Thermomur 350" on the basis of agreed information, deposited with ETA-Danmark, which identifies the shuttering kit that has been assessed and evaluated. Changes to the production process, the kit or the components which could result in this deposited information being incorrect, shall be notified to ETA-Danmark before the changes are introduced. ETA-Danmark 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 and/or alterations to the ETA shall be necessary.

2.1 ER 1 Mechanical resistance and stability

2.1.1 Resulting structural pattern

In end use conditions walls made with shuttering elements "Jackon Termomur 350" are continuous type concrete walls according to ETAG 009, paragraph 2.2.

2.1.2 Efficiency of filling

Considering the instructions in chap. 4.2 and the installation guide of the ETA holder the efficient filling of concrete without bursting of the shuttering and without voids or any uncovered reinforcement in the concrete core is possible, and the requirements according to ETAG 009, chapter 6.1.2 are considered satisfied.

2.1.3 Possibility of steel reinforcement

The instructions in the installation guide of the ETA holder are appropriate to install steel reinforcement for walls according to EN 1992-1-1 or corresponding national rules.

The requirements according to ETAG 009, chapter 6.1.3 are met satisfactorily.

2.2 ER 2 Safety in case of fire

2.2.1 Reaction to fire

The shuttering elements of Jackon Thermomur 350 are classified as Euroclass F (No performance determined according to EN 13501-1).

Note: A European reference fire scenario for facades has not been laid down. In some Member States the classification of permanent shuttering systems according to EN 13501-1 might not be sufficient for the use in facades. An additional assessment of permanent shuttering systems according to national provisions (e. g. on the basis of a large scale test) might necessary to comply with Member States regulations, until the existing European classification system has been completed.

2.2.2 Resistance to fire

The walls will be exposed to the fire on only one side.

According to ETAG 009, Annex C, Table 1, for a continuous type of load-bearing walls ("REI") or non-loadbearing walls ("EI") and a minimum concrete strength of C 20/25 the system meets the criteria for REI90 and EI 90 for elements with a concrete core thickness of 150 mm

To classify the shuttering elements of the criteria stated above the following preconditions has to be fulfilled according to Annex C of the ETAG 009.

- The design of the building has to take into consideration the secondary effects of fire. Especially constraints, introduced by thermal strain, should be sufficiently low and appropriate building joints should be foreseen. The rules valid in place of use, govern. Structural requirements under normal conditions, valid in the place of use, may require larger dimensions. Concrete cover for the reinforcement has to be observed according to the rules valid in the place of use.
- A normal weight concrete as defined in EN 206-1 or EN 1992-1-1 shall be used. As far as European standards EN 206-1 or EN 1992-1-1 are not in force, an equivalent concrete according to national rules, valid in the place of use, is acceptable.
- The strength of concrete shall be between C 16/20 and C 50/60 according to EN 206-1. In lack of availability of European standard EN 206-1, alternatively a concrete according to national rules, valid in the place of use, with a compressive strength which fits in the interval given above, is also considered as appropriate.

Note: The classifications of the walls constructed with the shuttering system "Jackson Thermomur 350" regarding to fire resistance are valid only for walls without openings (for windows or doors for examples).

2.3 ER 3 Hygiene, health and environment

2.3.1 Content and/or release of regulated substances

According to the manufacturers declaration the shuttering elements "Jackson Thermomur 350" contain no substances according to Directive 67/546/EEC and Regulation (EC) No 1272/2008 and/or listed in the "Indicative list on dangerous substances" of the EGDS - taking into account the installation conditions of the construction product and the release scenarios resulting from there.

Note: In addition to the specific clauses relating to dangerous substances contained in this European technical approval, 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 Products Directive, these requirements need also to be complied with, when and where they apply.

2.3.2 Water vapour permeability

The tabulated design value of the water vapour diffusion resistance coefficient of expanded polystyrene (EPS) according to EN 125248 is $\mu = 60$.

Using this value to verify the annual moisture balance or the maximum amount of interstitial condensation according to EN ISO 13788 will be on the safe side.

The values for the water vapour diffusion resistance of concrete depending on density and type are tabulated in EN 12524

2.3.3 Water absorption

No performance determined

2.3.4 Water tightness

No performance determined

2.4 ER 4 Safety in use

2.4.1 Bond strength and resistance to impact load

No performance determined

2.4.2 Resistance to filling pressure

To resist the filling pressure the bending tensile strength of the EPS-shuttering leaves shall be more than 250 kPa (BS150 - see also designation code of EPS in clause 2.1.1). The pull-out strength between HDPE-spacers and EPS-shuttering leaves shall be at least 484 N.

The requirements according to ETAG 009, chapter 6.4.2 are met satisfactorily.

2.4.3 Safety against personal injuries

Delivered on site, the shuttering elements do not have sharp or cutting edges. Because of the soft surface of the shuttering leaves there is no risk of abrasion or of cutting people.

The requirements according to ETAG 009, chapter 6.4.3 are met satisfactorily.

2.5 ER 5 Protection against noise

2.5.1 Airborne sound insulation

No performance determined

2.5.2 Sound absorption

No performance determined.

2.6 ER 6 Energy economy and heat retention

2.6.1 Thermal resistance

Determination of the thermal conductivity of EPS according to EN 13163. The declared value of thermal conductivity is $\lambda_D = 0.030$ W/mK.

The table below shows the thermal resistance R of the elements in end use conditions (with concrete infill and rendering applied on the outside of the EPS surface), calculated in accordance with EN ISO 69469 from the declared value of thermal conductivity $\lambda_D = 0.030 \text{ W/mK}$ according to EN 13163 for the shuttering leaves. The thermal conductivity of the concrete core, gypsum board and wood are according to EN 12524.

Wall structure, outer wall	U-value, W/m ² K
<ul style="list-style-type: none"> - 100 mm. EPS Super - Concrete core - 100 mm. EPS Super 	0,14
<ul style="list-style-type: none"> - 26 mm gipsum board - 45 mm wood battens pr. 600 mm with lambda 32 insulation - 100 mm. EPS Super - Concrete core - 100 mm. EPS Super 	0,12
<ul style="list-style-type: none"> - 15 mm gypsum board - 70 mm wood battens pr. 600 mm med lambda 32 insulation - 100 mm EPS Super - Concrete core - 100 mm EPS Super 	0,11
Wall structure, basement wall	
<ul style="list-style-type: none"> - 100 mm EPS Super - Concrete core - 100 mm EPS Super - 50 mm. Jackon board EPS 80 	0,12

2.6.2 Thermal inertia

No performance determined.

2.7 Aspects of durability and serviceability

2.7.1 Resistance to deterioration

Physical agents

The relative changes of the EPS-leaves (see chapter 2.1.1) in length, width and thickness under specified temperature and humidity conditions shall not exceed more than 3 % after exposing them for 48 h at 70 °C (DS(70, -)3, according to EN 13163).

The requirements according to ETAG 009, chapter 6.7.1.1 are met satisfactorily.

Chemical agents

Spacers are made of polyethylene. There is no corrosion of spacer in concrete.

The finishes of the wall are not part of the ETA. Determination of the cleaning agent of the surface is not possible.

The requirements according to ETAG 009, chapter 6.7.1.2 are met satisfactorily.

Biological agents

The application of EPS as thermal insulating material for decades has shown that it sufficiently protects against fungi, bacteria, algae and insects.

EPS does not provide a food value and in general it does not contain voids suitable for habitation by vermin. The requirements according to ETAG 009, chapter 6.7.1.3 are met satisfactorily.

2.7.2 Resistance to normal use damage

Normal use impacts

Concrete walls (without consideration of the finishes), erected with shuttering system "Jackson Thermomur 350" and designed according EN 1992-1-1 respectively in lack of availability of EN 1992-1-1 according national design rules, lead to the assumption that concrete infill insures an adequate resistance of the complete wall under normal used impact loads.

The requirements according to ETAG 009, chapter 6.7.2.1 are met satisfactorily.

Incorporation of ducts

The instructions in the installation guide of the ETA holder are appropriate to produce horizontal perforations through the walls. The voids for horizontally passing ducts are made on-site; the voids diameter shall coincide with the diameter of the duct, before placing the concrete the ducts are installed in the voids

The requirements according to ETAG 009, chapter 6.7.2.2 are met satisfactorily.

Fixings of objects

Fixing of objects in the shuttering leaves into the rail anchors is possible for external cladding and internal gypsum boards and linings. The part of fixings which is relevant for the mechanical resistance shall be in the concrete.

3 Attestation of Conformity and CE marking

3.1 Attestation of Conformity system

According to the Decision 98/279/EC of 05 December 1997 amended by the decision 2001/596/EC of the European Commission¹ system 2+ of the attestation of conformity applies.

This system of attestation of conformity is defined as follows:

- a) Tasks for the manufacturer:
 - 1) Factory production control,
 - 2) Initial type testing of the product,
- b) Tasks for the notified body:
 - 1) Certification of factory production control on the basis of:
 - Initial inspection of factory and of factory production control;
 - Continuous surveillance, assessment and approval of factory production control.

3.2 Responsibilities

3.2.1 Tasks of the manufacturer

3.2.1.1 Factory production control

The manufacturer has a factory production control system in the plant and exercises permanent internal control of production. All the elements, requirements and provisions adopted by the manufacturer are documented in a systematic manner in the form of written policies and procedures. This production control system ensures that the product is in conformity with the European Technical Approval.

The manufacturer shall only use raw materials supplied with the relevant inspection documents as laid down in the control plan⁴. The incoming raw materials shall be subject to controls and tests by the manufacturer before acceptance. Check of materials, shall include control of the inspection documents presented by suppliers (comparison with nominal values) by verifying dimension and determining material properties, e.g. mechanical properties and HDPE properties.

The manufactured components are checked visually and for dimensions.

The control plan, which is part of the technical documentation of this European Technical Approval, includes details of the extent, nature and frequency of testing and controls to be performed within the factory production control and has been agreed between the approval holder and ETA-Danmark.

The results of factory production control are recorded and evaluated. The records include at least the following information:

- Designation of the product, basic material and components;
- Type of control or testing;
- Date of manufacture of the product and date of testing of the product or basic material and components;
- Result of control and testing and, if appropriate, comparison with requirements;
- Signature of person responsible for factory production control.

The records shall be presented to ETA-Danmark on request.

⁴ The control plan has been deposited at ETA-Danmark and is only made available to the approved bodies involved in the conformity attestation procedure.

3.2.1.2 Initial type testing of the product

For initial type-testing the results of the tests performed as part of the assessment for the European Technical Approval shall be used unless there are changes in the production line or plant. In such cases the necessary initial type testing has to be agreed between ETA Danmark and the notified body.

3.2.2. Tasks of notified bodies

3.2.2.1 Initial inspection of the factory and the factory production control

The notified body should ascertain that, in accordance with the control plan, the factory, in particular the staff and equipment, and the factory production control, are suitable to ensure a continuous and orderly manufacturing of the Jackson Thermomur 350 to the specifications given in part 2.

3.2.2.2 Continuous surveillance

The approved body shall visit the factory at least once a year for routine inspections. It shall be verified that the system of factory production control and the specified manufacturing processes are maintained, taking account of the control plan.

The results of product certification and continuous surveillance shall be made available on demand by the certification body to ETA-Danmark. Where the provisions of the European Technical Approval and the control plan are no longer fulfilled, the certificate of conformity shall be withdrawn by the notified body.

3.3 CE marking

The CE marking shall be affixed on each packaging or on the accompanying commercial documents. The initials "CE" shall be followed by the identification number of the notified body and shall be accompanied by the following information:

- Name or identifying mark of the manufacturer
- The last two digits of the year in which the marking was affixed
- Number of the European Technical Approval
- Name and size of product
- Number of the ETA Guideline
- (ETAG no. 009)
- Number of the EC Certificate of Conformity
- Reaction to fire: Class F according to EN 13501-1
- Resistance to fire: Class according to EN 13501-2,
- Protection against noise "no performance determined",
- EPS-EN13163:2012 T2-L3-W3-Sb2-P3-BS250-DS(N)3-CS(10)150
- the declared value of thermal resistance R_D of the hollow blocks with concrete infill and without rendering

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

4.1 Manufacturing

The shuttering elements are manufactured in accordance with the provisions of the European technical approval using the automated manufacturing process as identified during the inspection of the plant by ETA-Danmark and the approved body and laid down in the technical documentation.

The European technical approval is issued for the product on the basis of agreed data/information, deposited with the ETA-Danmark, 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 ETA-Danmark before the changes are introduced.

ETA-Danmark will decide whether or not such changes affect the approval and consequently the validity of the CE marking on the basis of the approval and if so whether further assessment or alterations to the approval 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 with ETA-Danmark and shall be present at every construction site. If the manufacturer's instructions contain provisions which differ from those stated here, the specifications of the ETA shall apply.

After installation of the shuttering elements (see clause 4.2.2) the site-mixed or ready mixed concrete is brought in and compacted (see clause 4.2.3).

In end use conditions concrete walls of a continuous type of plain or reinforced concrete will be formed according to EN 1992-1-1 or according to corresponding national.

In end use conditions the EPS-shuttering leaves are the main part of the thermal insulation of the walls.

4.2.2 Installation of the shuttering elements

The shuttering elements are put together on site in layers without mortar or adhesive. To receive stable floor high formworks the vertical joints between two elements of one layer have to be shifted of at least 25 cm to the vertical joints of the previous and next layer. It is important to ensure that the HDPE-spacers are aligned one above the other.

First of all two layers of the entire floor plan shall be interlocked according to the installation guide of the ETA holder.

Afterwards leveling to the subsoil is performed (foundation, bottom plate, and slabs). Voids between the shuttering leaves and the uneven subsoil shall be sealed with PU foam before concreting.

The HDPE-spacer shall be stacked (one upon the other) for avoiding segregation of concrete.

Subsequently, according to the installation guide of the ETA holder, the walls shall be interlocked to floor height, leveled and fastened to pull-push props (scaffolding supports).

The pull-push props shall be arranged at a distance of 3,0 m, to be connected over the entire wall height with the shuttering elements and to be fastened to the floor.

The necessary reinforcement according to the structural analysis shall also be installed in an appropriate way.

Corner shuttering elements and T shuttering elements shall be formed according to the manufacturers installation manual.

The values of thermal resistance respectively thermal conductivity shall be laid down according to the relevant national technical regulation.

Further information is given in the installation manual.

4.2.3 Concreting

For the production of normal concrete with a minimum compressive strength class C20/25 EN 206-1 shall apply. The consistency of concrete on compacting by shaking shall be within the lower consistency range F3 and on compacting by poking within the upper consistency range F3. The maximum aggregate size shall be at least 4 mm and shall not exceed 16 mm. The concrete shall have rapid or middle strength development according to EN 206-1, Table 12.

Placing the concrete shall be performed only by persons who were instructed in the functions and in the proper handling of the shuttering system.

Placing the concrete shall be performed in layers of 0.90 m at a maximum vertical concreting rate of 1.0 m/h. If equivalent national rules are not available the following instructions shall be considered:

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 bond well with the older concrete.

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

The concrete may fall freely only up to a maximum height of 2 m, beyond that the concrete shall be placed by discharge pipes or concreting tubes with a diameter of 100 mm at the most and shall be led directly to the place of installation. Cones from pouring shall be avoided by short distances of the places of fill in.

Planning shall allow for sufficient spaces in the reinforcement for discharge pipes or concreting tubes.

After concreting, the walls may not deviate from the plumb line more than 5 mm per running meter wall height, respectively for a wall height greater than 3.0 m not more than 16 mm.

The floor slab may only be placed on walls made of shuttering elements if a sufficient strength of the infill concrete has been reached.

4.2.4 Ducts crossing and situated inside the wall

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

Horizontal ducts situated inside the wall cores shall be avoided. If absolutely necessary, these shall 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.

4.2.5 Reworking and finishes

Walls of the type "Jackson Thermomur 350" shall be protected by finishes (e. g. rendering, plasters, cladding, panelling, coatings). Finishes are not part of the kit and therefore not considered in this ETA. Preferably, for external surfaces the used rendering systems should meet the requirement of ETAG 004. The cladding respectively paneling or their substructures shall be anchored in the concrete core or the rail anchors depending on the imposed loads. The execution of the rendering shall be performed according to applicable national rules.

The protection by finishes should be implemented preferably within one month after erecting the structural structure, because of the detrimental influence of weather and UV-radiation on the surface of the EPS-leaves.

4.2.6 Fixing of objects

Fixing of objects in the shuttering leaves is possible for external cladding and internal gypsum boards and linings by screws into the rail anchors. The part of fixings which is relevant for the mechanical resistance shall be in the concrete core. The influence of the fixing to the reduction of the thermal resistance has to be considered according to EN ISO 6946.

5 Indications to the manufacturer

5.1 Packaging, transport and storage

The shuttering elements have to be protected against damage, soiling and intensive action of water during transport and storage. If necessary the elements have to be covered.

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.

The recommendations on use, maintenance and repair in ETAG 009, section 7.5 shall be considered.

The shuttering elements have to be protected against high temperature, overheating and intensive exposure to weather and UV-radiation. If necessary, the elements have to be covered.



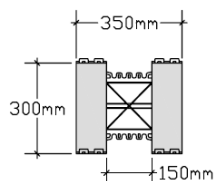
Thomas Bruun
Manager, ETA-Danmark

Annex 1
Jackon Thermomur 350
Components and materials

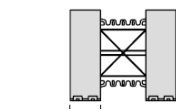
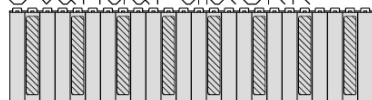
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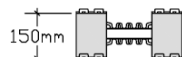
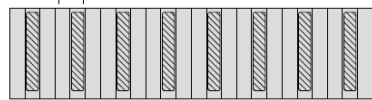
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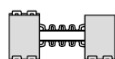
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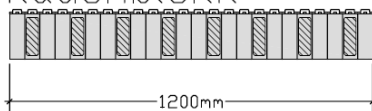
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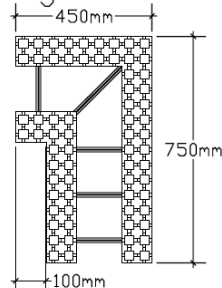
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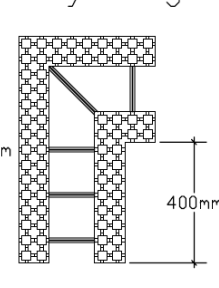
Radonblokk



Venstrehjørne



Høyrehjørne



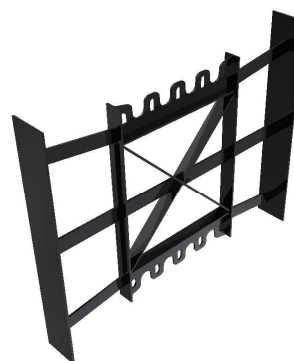
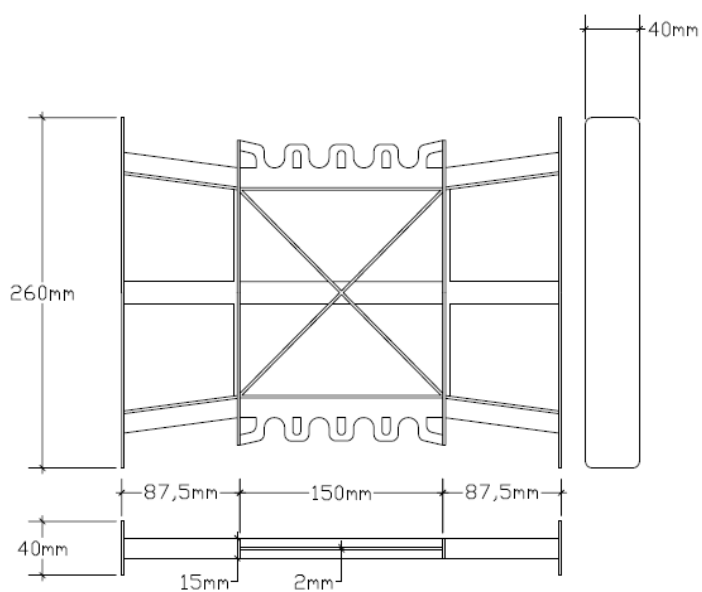
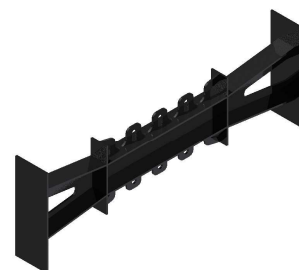
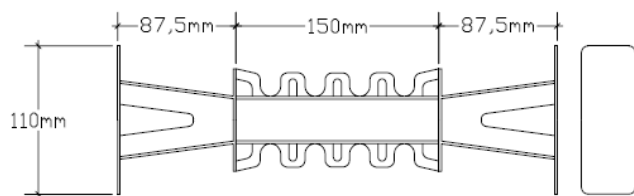
Material characteristics for the EPS:

Bending strength $\sigma_b \geq 250$ kPa according to EN 12089

Dimension stability change ≤ 1 % according to EN 13163 and EN 1604

Compressive stress at 10% relative deformation $\sigma_{10} \geq 120$ kPa according to EN 826

Spacer



Material characteristics for HDPE:

Yield strength (tensile stress at yield) $\sigma_y \geq 25$ MPa According to ISO 527-1

Young's Modulus ≥ 1100 MPa According to ISO 527-1