

TimBet

Product and technology development of
low energy consumption constructions

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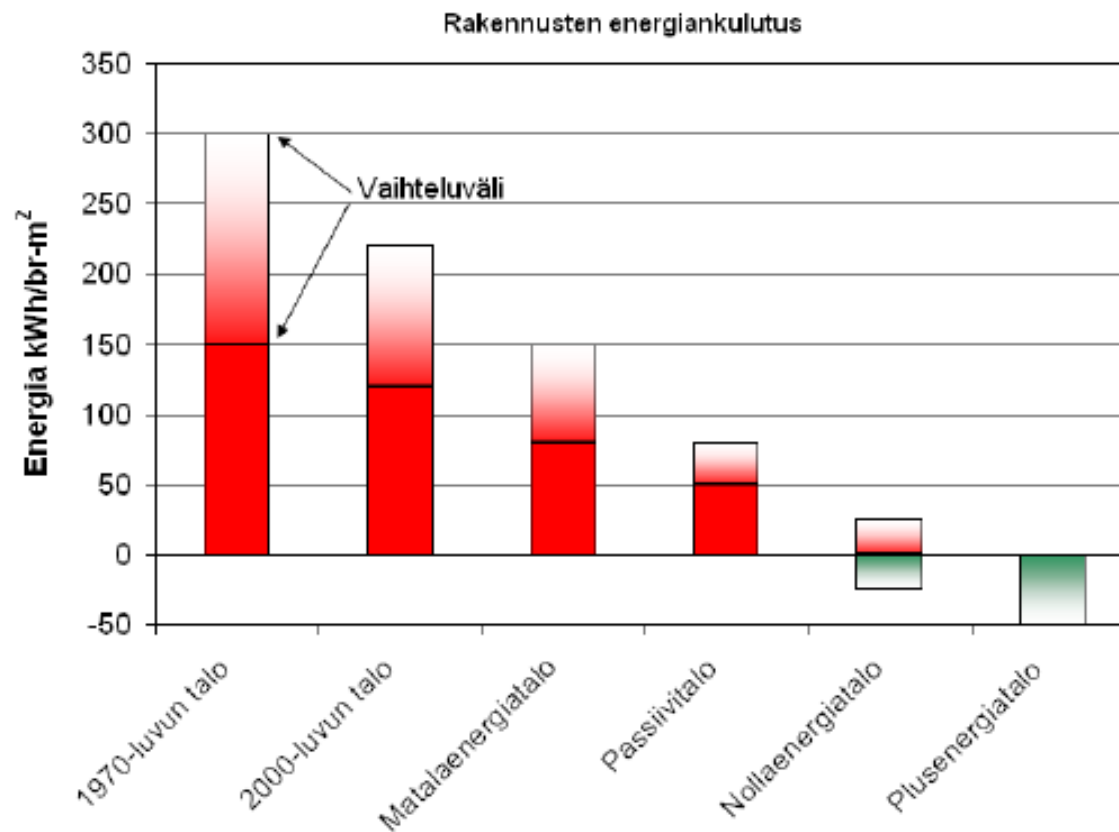
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Presumptions for the development of the Tim-Bet constructions

- Increasing demand for:
 - suitable materials and solutions for constructing a low energy consumption building
 - building materials with low CO2 content
- According to Directive 2010/31/EU The Energy Performance of Buildings all public use buildings (build since 2019) and all other buildings (build since 2021) in EU must meet the nearly zero-energy building requirement. The requirements for building materials CO2 content will be stricter.
- Various states building standards require faster transition to stricter standards but prevalent construction solutions can't meet the requirements.

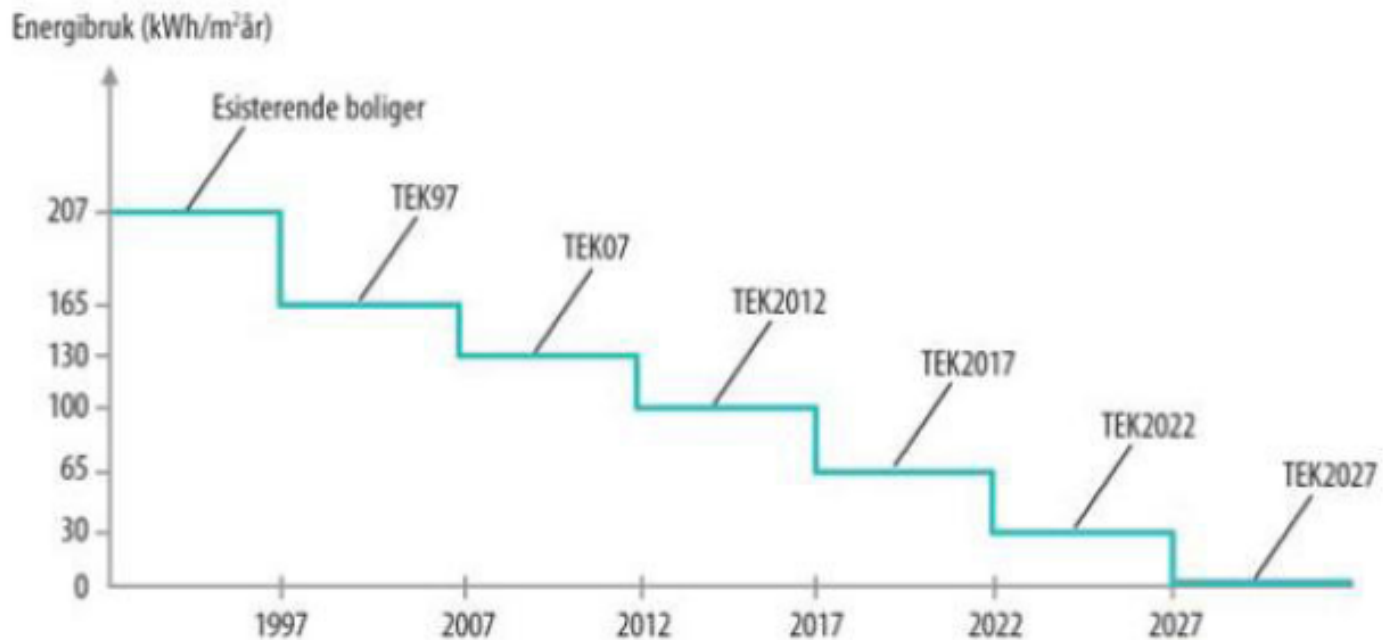
Buildings energy demand

Total energy demand in different building concepts (VTT, Finland)




Stricter requirements

The Norwegian “Low Energy Commission“s report of August 2009 proposed tightening of the Building Code:



Technological characteristics

- Tim-Bet - new composite construction
- Combined use of materials
- Enables significantly reduce the thickness of the insulation layer and the thickness of the construction element (compared to timber-frame and sandwich-elements)
- Industrial fabrication, principles of element construction – controlled quality
- Use of local materials
- Easily transported –advantages in exporting
- Fast assembling – reduces work and time expense insitu



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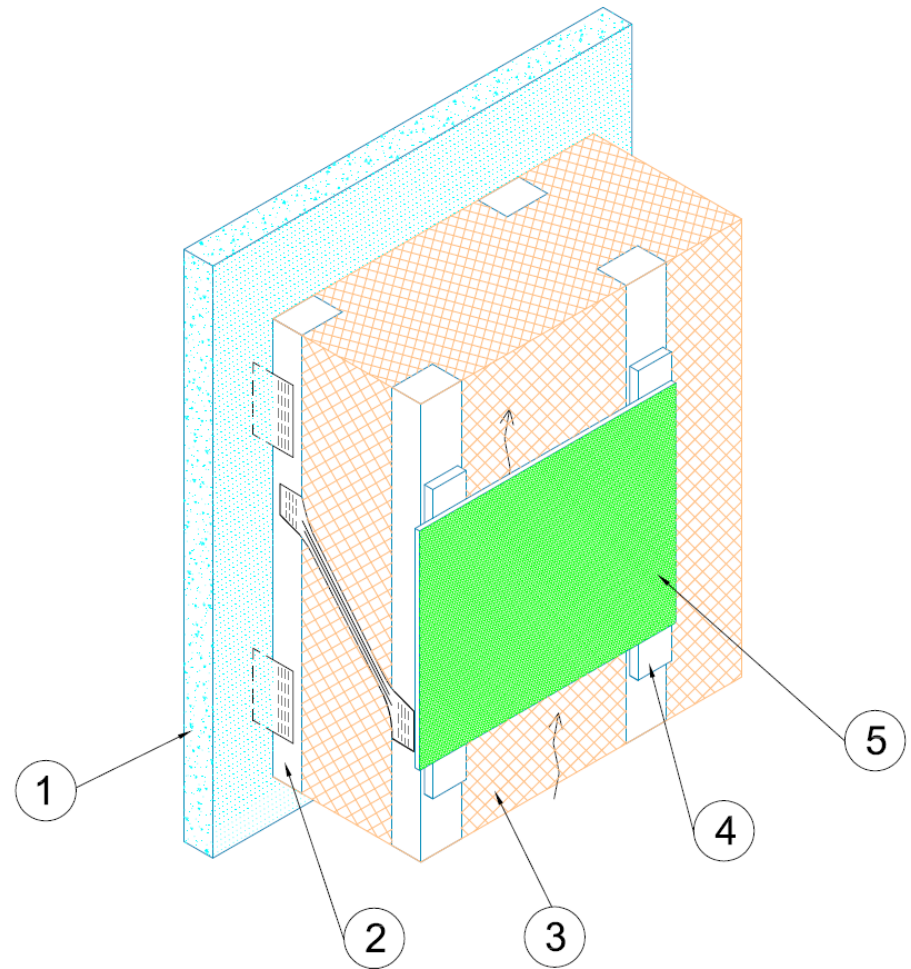
constructional advantages

- Comprehensive solutions from one manufacturer
- Practicable and durable interior decoration
- Indoor climate similar to masonry building
- Universal facade solutions
- Easy installation of pipes and cables into the elements

Tim-Bet construction

- Bearing frame: timber-metal-composite joist
- Insulation: closed cell polyurethane foam Basf ($\lambda = 0,034 \text{ W/mK}$)
- Inner layer: thin reinforced concrete slab
- Big variety of different facade solutions for best outlook

Tim-Bet construction element section



Tim-Bet EXTERNAL WALL SECTION

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1. REINFORCED CONCRETE / FOAM CONCRETE 50...70mm

2. TIMBER-STEEL FRAME / I-JOIST / TIMBER FRAME

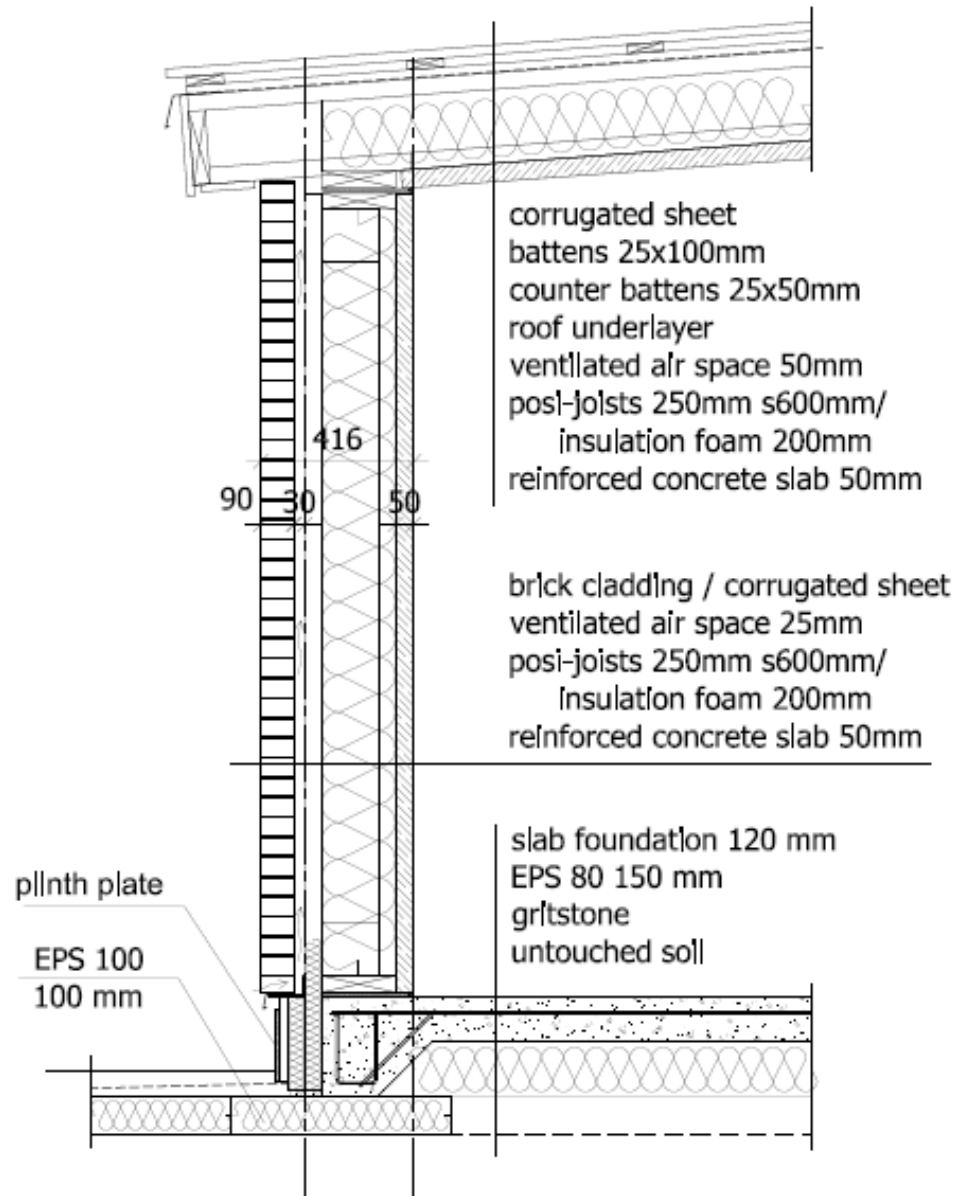
3. FOAM-INSULATION 150...400mm

4. VERTICAL BATTENS / AIR GAP

5. FACADE PLATE / TIMBER CLADDING / MASONRY / CONCRETE

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Section of a simple one-storey building

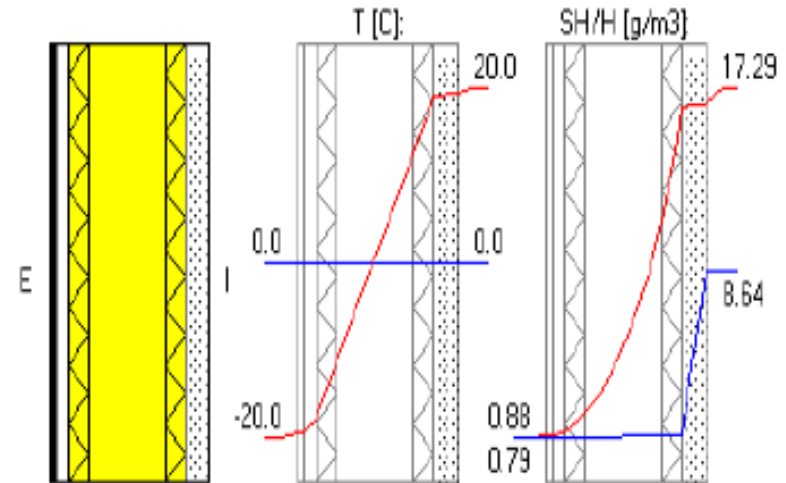


Building physical properties

- Good thermal insulation
- Good vapor isolation and wind barrier properties
- Good air-tightness
- Minimal thermal bridges, easily feasible connections between elements
- Better thermal inertia because of concrete layer (unlike the conventional low-weight constructions) – is a premise for high-quality indoor climate
- Suitable for buildings with low energy consumption
- Good fire resistance (tested fire sensitivity of the insulation foam: B-s1,d0)
- Good sound tightness (using light-weight and heavy-weight construction layers)

Thermal resistance (examples)

TIM-BET 250mm external wall element Insulation: 250mm PU-foam (open cells)	
U-value: Thickness: Weight: λ	0.155 W/m²K 337 mm 145 kg/m ² 0.038 W/mK
TIM-BET 300mm external wall element Insulation: 300mm PU-foam (closed cells)	
U-value: Thickness: Weight: λ	0.096 W/m²K 387 mm 154 kg/m ² 0.021 W/mK





Area of use

- Residential buildings 1-2-storey buildings:
 - External wall elements
 - Floors between storeys
 - Combined roofs
 - Floors on the ground
- Large frame structures suspended external wall elements



Target groups of the product

- Passive houses
- Low energy consumption buildings
- New build
- Reconstruction of apartments, office and industrial buildings external walls



Potential markets:

- Estonia
- Finland, Sweden, Norway
- Latvia, Lithuania, Poland
- Germany, Austria
- France, Benelux
- Russia



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Experience and competence of the team

- Development, design and manufacturing
 - Thin shell constructions
 - Technology for Posi-Joist™ systems and nail plate trusses
 - Solutions for mounted constructions
 - Energy efficient buildings



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Planned actions for development:

- Composing bussiness plan, market analysis
- Development and improvement of technical solutions.
- Development of the manufacturing process technology
- Procurement of the necessary equipment

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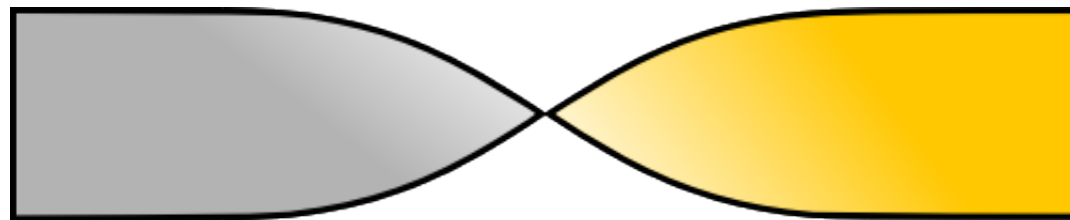
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