



# Construct

High quality wood products for  
energy conscious & innovative construction



Most  
energy-efficient  
product combination  
(see page 18)

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# 1. Building energy-conscious & innovative

## Airtight, fire safe and insulating structures

Unilin division panels offers construction professionals a wide range of high-quality building products.

These products can be used, amongst other places, in roofs, walls, floors, and concrete formwork.

Our panels, beams and wood fibre insulation materials are used to obtain airtight, fireproof, permeable and insulating building solutions:

- Reduce cold bridges.
- Reduce thermal and energy losses.

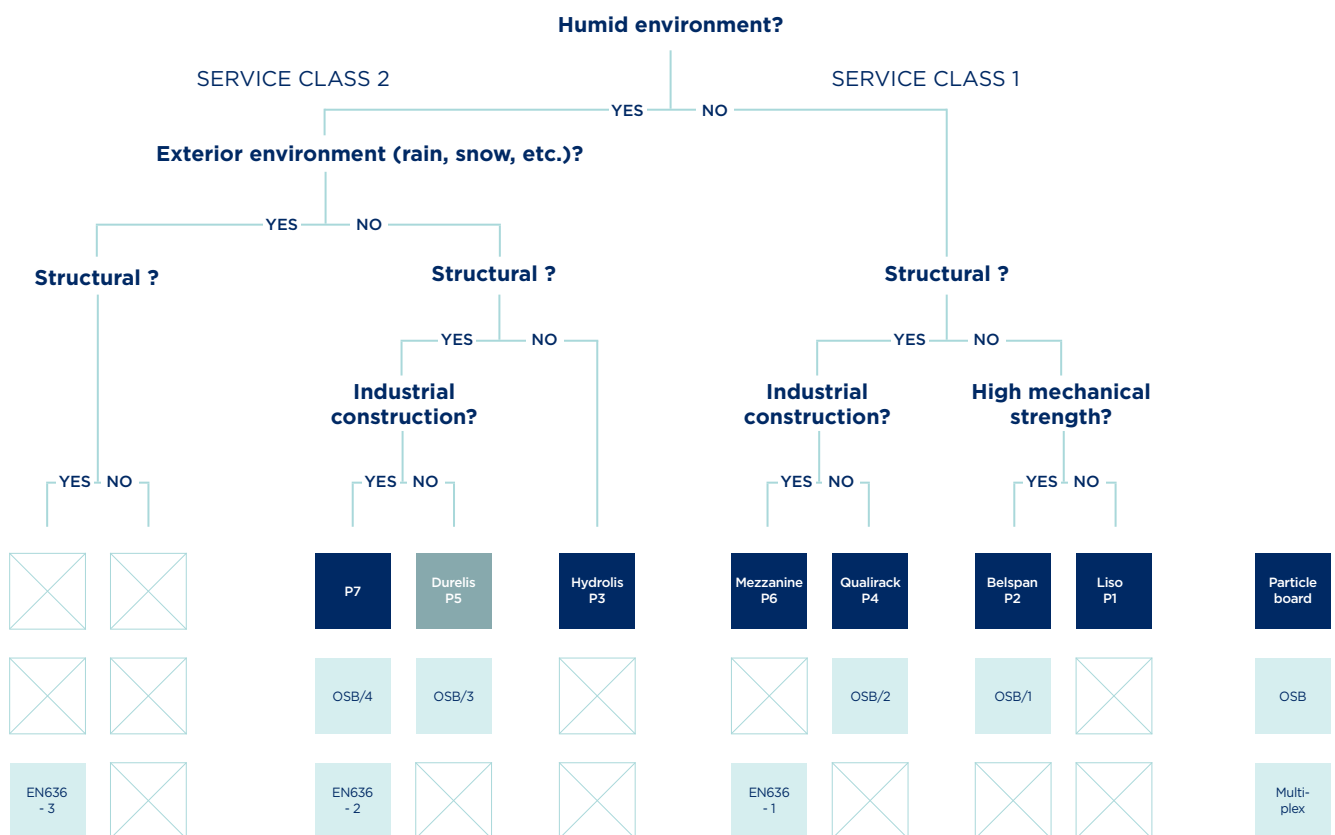


Did you know that you can also turn to Unilin Panels for panels that are suitable for drywall construction? This applies to both reinforcement panels and finishing panels.



## Wood based panels strength classes

Wood based panels are classified by its properties according to a standard that defines the area of application of the product. Durelis is produced according to the CE product class P5 for chipboard which makes the board suitable for structural applications in dry (service class 1) and humid (service class 2) environments; just like OSB/3. The use of fine, high-quality chips ensures high strength and stiffness, equal in all directions, and increased airtightness.



Did you know that at Unilin Panels we are strongly committed to the reuse of materials? Our particle boards are made from more than 95% recycled wood and 100% recovered wood. By recycling wood and keeping it in circulation for as long as possible, we are actively contributing to a circular economy, helping you to reduce your ecological footprint. PEFC/FSC certificates are also available on request.

### Origin of raw materials:

- 100% recovered wood
- +95% recycled wood
- PEFC/FSC available on request

Did you know that our melamine-faced particle boards are **C2C Bronze 4.0 certified**? We are proud to be a pioneer in this!



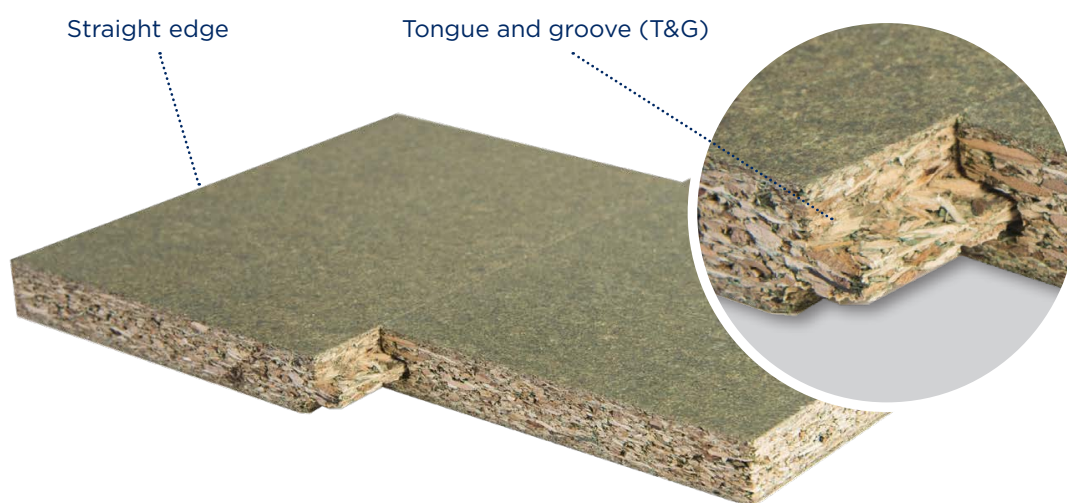


## 2. Structural panels



### Durelis

Premium moisture-resistant construction board



#### Standard features



##### Increased airtightness

- $\dot{V}_{50}$  value: 0,0026 m<sup>3</sup>/m<sup>2</sup>.h.Pa



##### Structural and racking board

- Increased screw withdrawal strength
- Bi-directional strength and stiffness



##### Moisture-resistant

- Less susceptible to swelling (V313)



##### Ecological construction board

- 95% recycled wood
- 100% recovered wood



##### Smooth surface

- Easy paintable

#### Possible finishes



##### Durelis Vapourblock

- Extremely airtight (see page 7)



##### Tecto White

- White lacquered finish



##### Tecto Prime

- Paintable primer coating

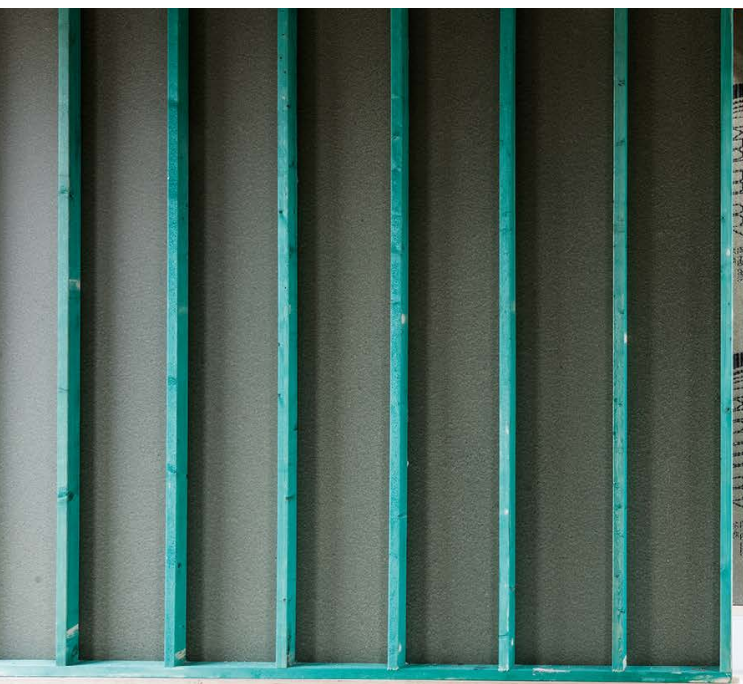


##### Sanded



##### Tongue & Groove



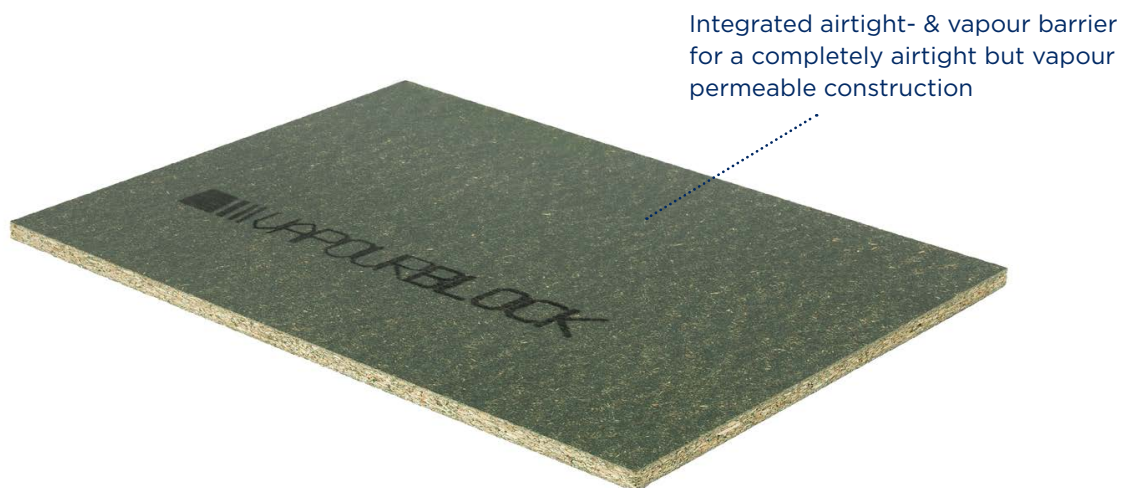






# Durelis Vapourblock

Extremely airtight with integrated vapour barrier



## Standard features

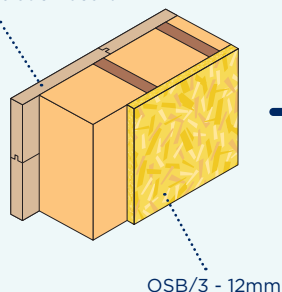
- **Extremely airtight coating:**  
 $\alpha_{50}$  value:  $< 0,001 \text{ m}^3/\text{m}^2 \cdot \text{h} \cdot \text{Pa}$
- **No extra airtight & vapour barrier needed for vapour permeable construction**
- **Reduced risk of cracks and air leaks in foils**

## Possible finishes

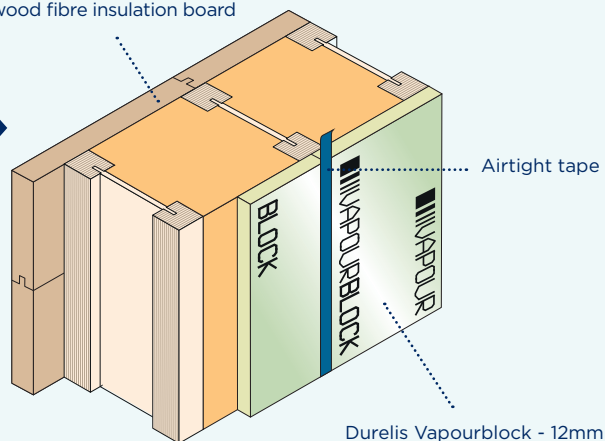


Tongue & Groove

Non-airtight wall construction  
wood fibre insulation board



Airtight and vapour-open wall construction  
wood fibre insulation board



- **Primary annual energy consumption: -30%**
- **3.6 times more airtight than recommended standard for airtight sheeting.**

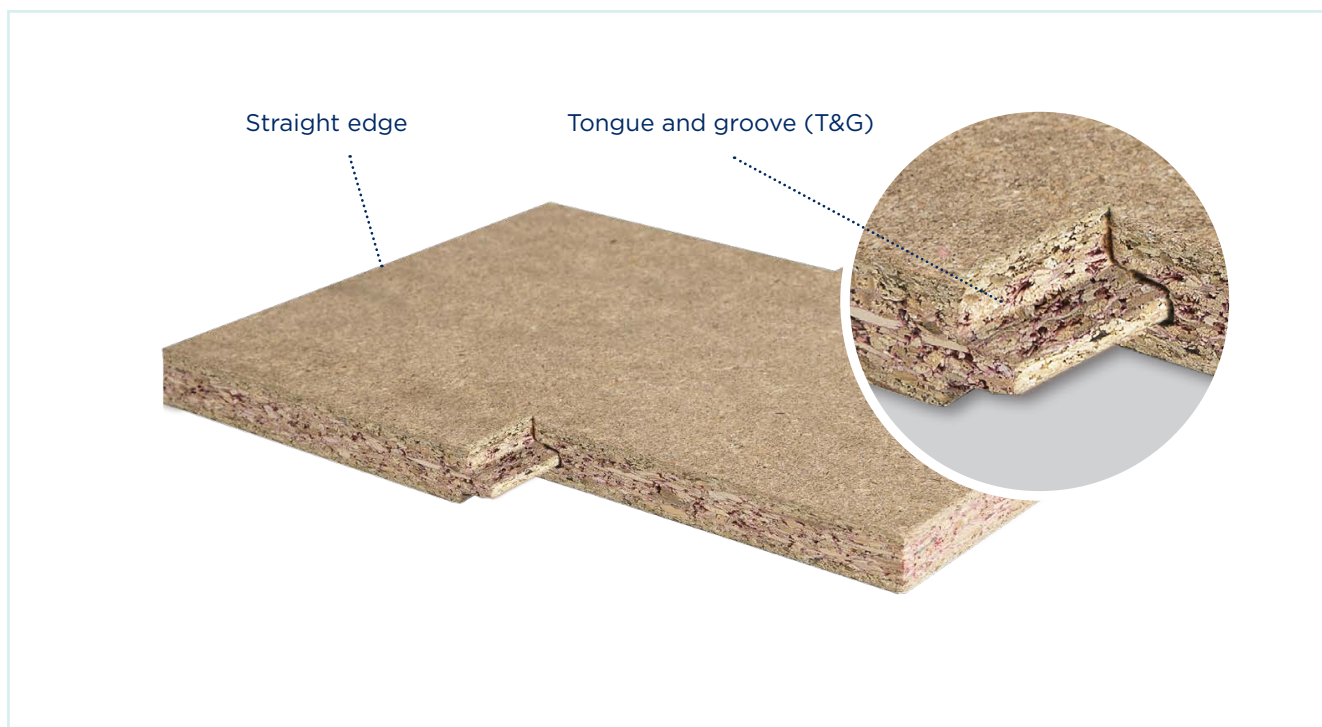


Most energy-efficient product combination (see page 18)



# Hydroflam

## Fire retardant construction board



### Standard features



#### Structural construction board P5

- Increased screw withdrawal resistance
- Bi-directional strength and stiffness



#### Fire reaction class B-s2, d0

- Fire retardant and moisture resistant



#### Fire resistant constructions REI60

- Reduced charring rate



#### Increased airtightness

- $v_{50}$  value: 0,0026 m<sup>3</sup>/m<sup>2</sup>.h.Pa



#### Ecological construction board

- 95% recycled wood
- 100% recovered wood

### Possible finishes



#### Sanded



#### Tongue & Groove



## Limited fire spread and fire reaction



Fire safety is essential! During fire, every second counts for a safe evacuation. Unilin fire retardant panels throughout treated to slow the spreading of fire. The release of flammable gases is reduced so there is a limited contribution to flashover. This greatly reduces the (nominal) **charring rate** of the panel from 0.90 mm/min (standard) to **0.50 - 0.55 mm/min**.

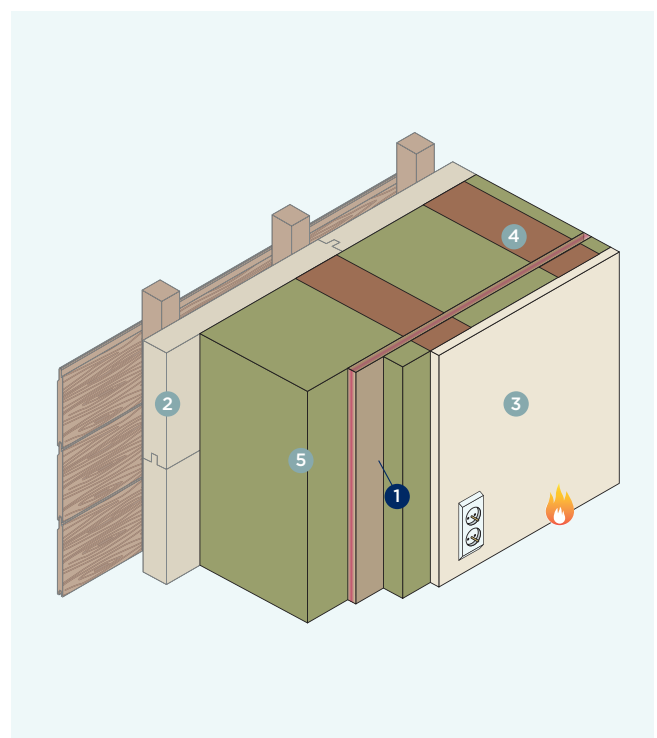
FIRE TEST 

## Cost-effective and fire retardant timber frame wall (REI 60)

### Standard features

- 60 minutes structural fire resistant
- Insulating - U value 0.22 to 0.24 W/m<sup>2</sup>K
- Very compact - 21 cm
- High loading - 3 to 5 levels
- Choice of external cladding

- ① Hydroflam - 12 mm
- ② Wood fibre insulation - 18 mm
- ③ Fermacell panel - 12,5 mm
- ④ Timber beams - 45 mm x 140 mm
- ⑤ Rockwool fibre insulation









## RWH (CE: MDF.RWH)

Vapour permeable racking panel,  
or used as rigid underlay



### Standard features



#### MDF.RWH product class

- High processability
- Vapour-permeable wood fibre structure



#### Racking panel or rigid underlay

- Racking panel for walls
- Rigid underlay for pitched roofs or walls



#### Extremely vapour permeable

- Accelerated drying
- Reduced risk of condensation



#### Thermal insulating

- Reduced thermal conductivity  $\lambda$



#### Moisture-resistant

- Use in humid environment

### Possible finishes



#### Tongue & Groove



# Structural panels product comparison



## Strength and stiffness

Thickness (mm)

Bending strength (characteristic) - major axis (N/mm<sup>2</sup>)

Bending strength (characteristic) - minor axis (N/mm<sup>2</sup>)

Stiffness modulus (E-modulus) - major axis (N/mm<sup>2</sup>)

Stiffness modulus (E-modulus) - minor axis (N/mm<sup>2</sup>)

Swelling 24h immersion (%) EN317

- + Durelis, Hydroflam & RWH have bi-directional strength and stiffness properties, independent of direction. There is no weak axis.



## Airtightness

Airtightness  $v_{50}$  (m<sup>3</sup>/ m<sup>2</sup>.h.Pa)\*

Number of times more airtight than recommended standard for airtight sheeting.

- + Durelis & Hydroflam have an increased airtightness **as standard**.
- + Vapourblock-finish is **extremely airtight**, ideal for energy neutral or passive constructions..



## Vapour permeability

Vapour permeability  $\mu$  (-)

Vapour permeability  $S_d$  (m)

- + Unilin panel on exterior side: Durelis, Hydroflam and RWH are very vapour permeable. Water vapour and construction moisture can vent quickly.
- + Unilin panel on interior side: **Vapourblock = Airtight with integrated vapour barrier.**



## Fire safety

Fire reaction class\*\*

Nominal charring rate  $\beta$  (mm/min)\*\*

- + Hydroflam has a limited contribution to fire spreading (class B) and a slower combustion.



## Insulating capacity

Thermal conductivity  $\lambda$  (W/mk)

- + RWH has a better thermal insulating capacity (low conductivity) than chipboard or OSB.

\* Values based on Leuven University test reports for Unilin board material and "Air permeability requirements for air barrier materials in passive houses - J.Langemans" for OSB3.

\*\* Fire reaction class according to EN13986:2004, or own certificate, :2004, combustion speed according to EN1995-1-2 and internal tests.

Moisture resistant chipboard P5 (EN 312)					Fire retardant and moisture resistant chipboard P5 (EN312)	MDF.RWH (EN622-5)	
Durelis (unsanded)		Durelis Vapourblock			Hydroflam (unsanded)	RWH	OSB/3 (EN300)
12	15	12	15		12	16	12 - 15
18	16	18	16		18	14	20
18	16	18	16		18	14	10
2550	2400	2550	2400		2550	1600	3500
2550	2400	2550	2400		2550	1600	1400
11	10	11	10		11	15	15

±0,00588	±0,0026	±0,000506	±0,000308	±0,00588	-	0.001-0.01
0,3	0,7	3,6	5,8	0,3		

50	50	510	510	50	20	30-170 (WTCB)
0,6	0,75	6,1	7,6	0,6	0,32	0,36 - 2,55

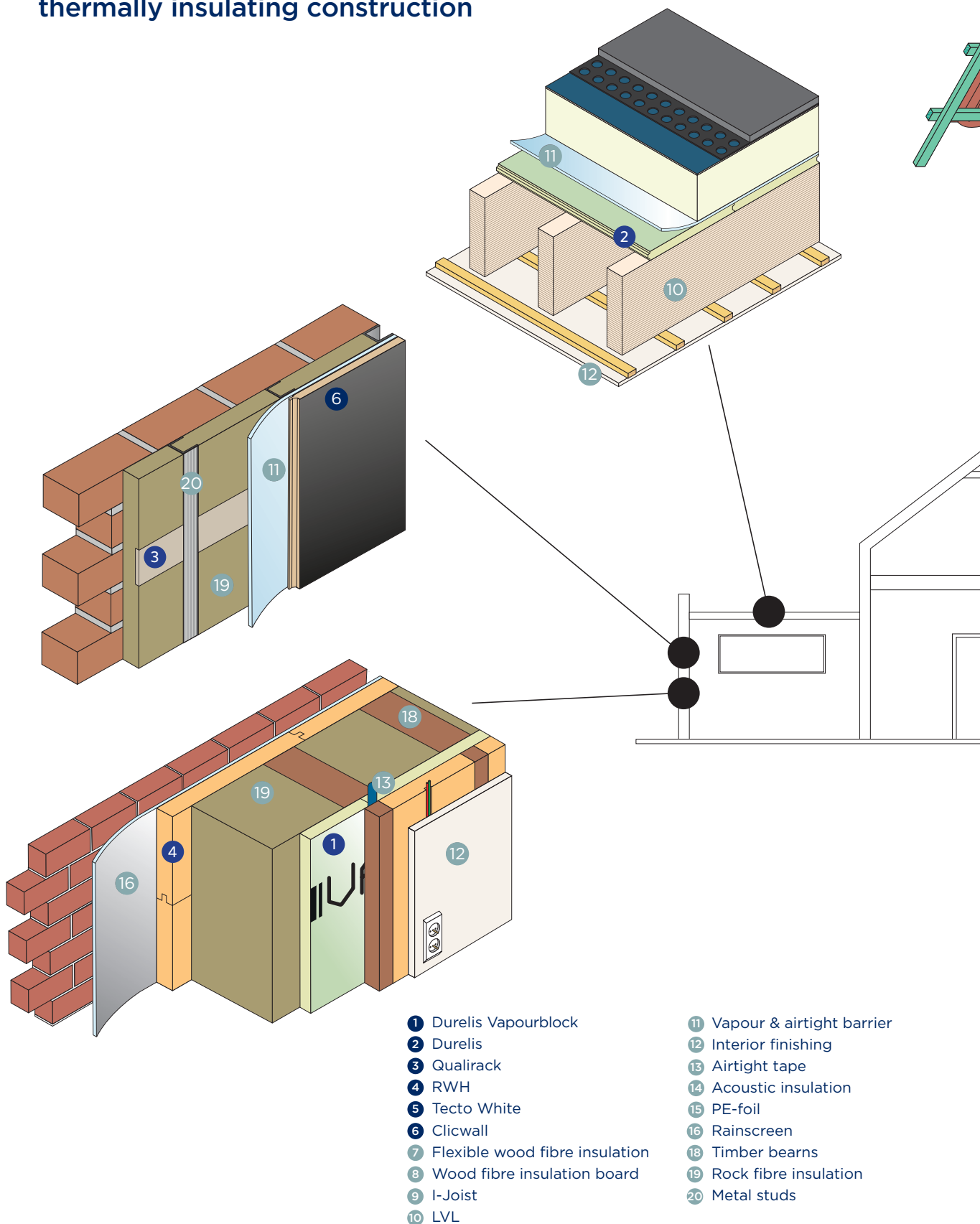
- ⊕ **Panel placed on exterior side:** board must be vapour permeable (low Sd value), for venting water vapour and construction moisture. The more vapour permeable, the better vapour and moisture dry out.
- ⊕ **Panel placed on interior side:** the cladding must be vapour permeable, but must slow the vapour transport from the inside to the outside (**vapour barrier**) to prevent condensation and mould. This is avoided by a minimum: **Sd value interior sheeting > 5 x Sd value exterior sheeting.**

D-s <sub>2</sub> ,d <sub>0</sub>	D-s <sub>2</sub> ,d <sub>0</sub>	D-s <sub>2</sub> ,d <sub>0</sub>	D-s <sub>2</sub> ,d <sub>0</sub>	B-s <sub>2</sub> ,d <sub>0</sub>	D-s <sub>2</sub> ,d <sub>0</sub>	D-s <sub>2</sub> ,d <sub>0</sub>
0,9	0,9	0,9	0,9	0,50 - 0,55	-	0,9

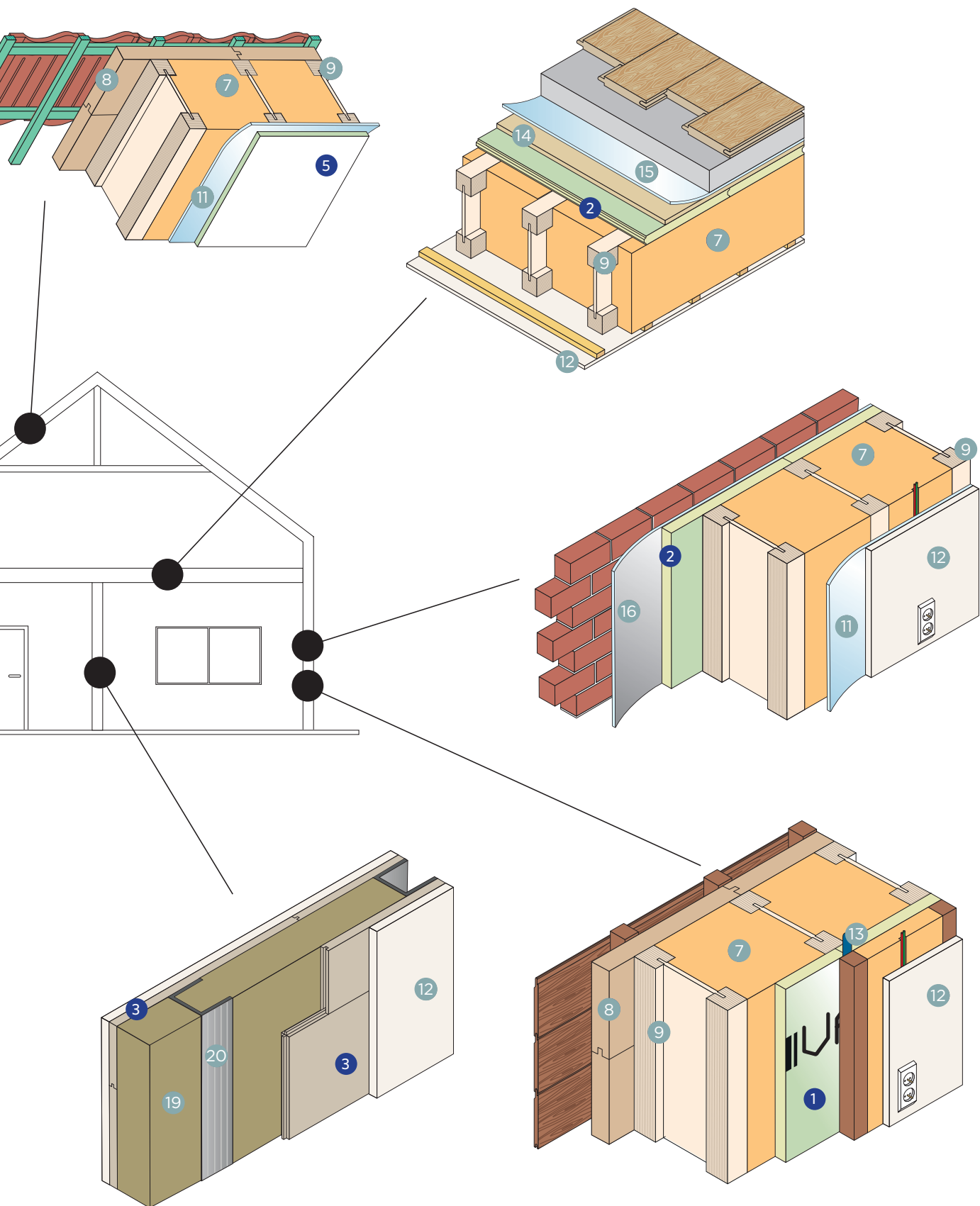
0,14	0,14	0,14	0,14	0,14	0,10	0,13
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### 3. The ideal product combination

Airtight, vapour permeable and thermally insulating construction



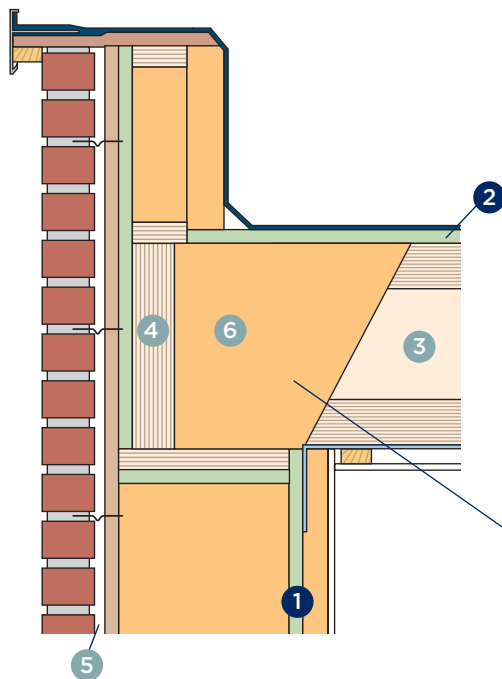




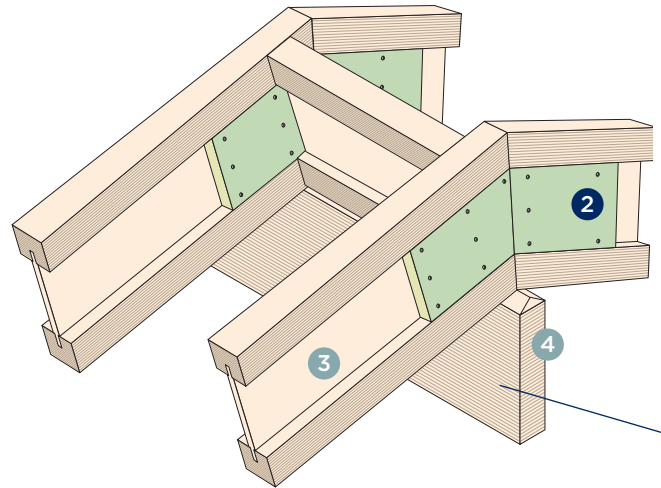
# Construction details

Attention for your project right down to the details

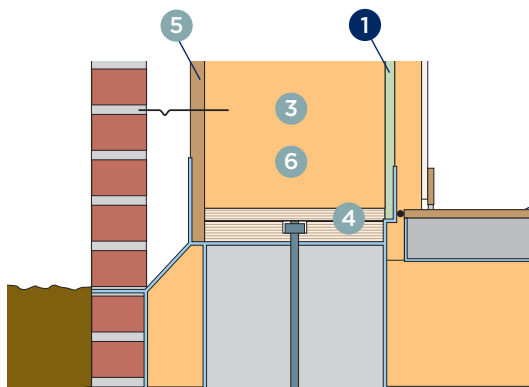
Wall with flat roof connection



Ridge beam support

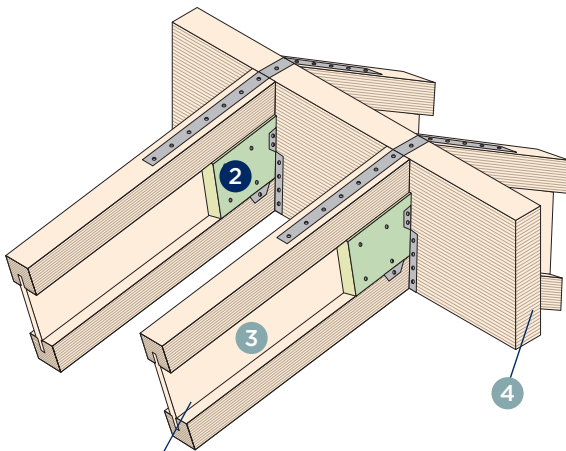


Foundation connection

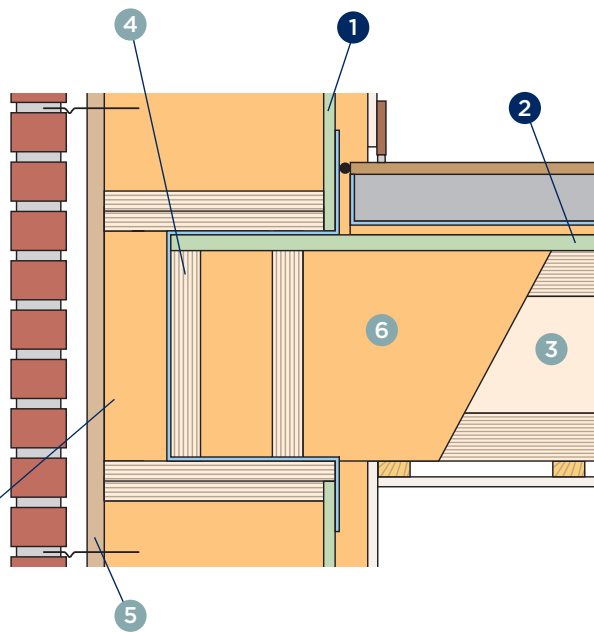


- 1 Durelis Vapourblock
- 2 Durelis
- 3 I-Joist
- 4 LVL
- 5 Flexible wood fibre insulation
- 6 Wood fibre insulation board

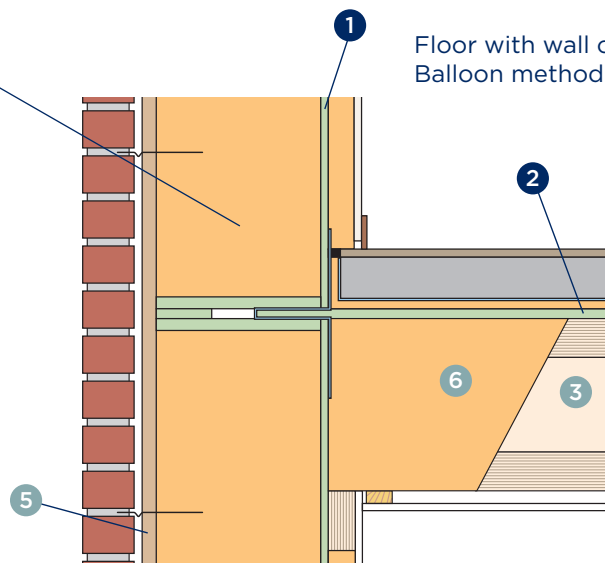
Ridge beam connection



Floor with wall connection  
Platform method



Floor with wall connection  
Balloon method







## 4. The most sustainable product combination for your construction

**Building energy-efficient is the future. To promote this, energy performance regulations have been created for every construction and renovation project. These requirements are regularly tightened to achieve the level of “nearly zero energy consuming”.**

- **Airtight construction:** Airtightness is essential. The energy loss through air leaks and non-airtight board material can increase quickly. Airtightness is expressed in  $\text{m}^3/\text{m}^2 \cdot \text{h} \cdot \text{Pa}$ .
- **Insulating capacity:** Energy waste is avoided by optimal insulation and limiting thermal bridges. Thermal insulation is expressed in  $\text{W}/\text{m}^2 \cdot \text{K}$ .

### Building energy-efficient with Unilin division panels

**Unilin Panels has a large range that supports low energy and energy efficient construction.**

**Airtight board material** creates an airtight barrier. This reduces the energy consumption for heating or cooling because the air losses are reduced.

### Impact on construction of Durelis, Vapourblock

**Unilin is an innovator in the field of energy-efficient products.** To demonstrate the importance of these products, a theoretical study of sustainability was carried out by an approved engineering consultancy.

The purpose of the study was **to identify the most cost effective combination of board material, beams and insulation in one residential model.** In addition to being energy efficient, our products are also cost efficient.

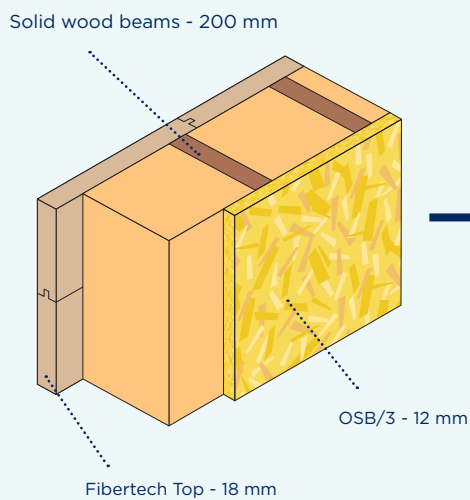
**How was the study done?** Because air tightness and insulation are mainly of importance in the outer shell of a project, the external walls of the model were examined and the remaining parts kept constant.

In total, 1,485 different combinations of materials in the outer shell were compared with one another in this theoretical model.

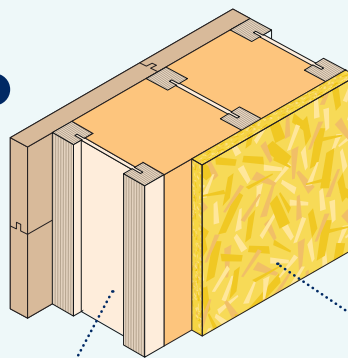
**In the theoretical study we compared the effect of different wall compositions on:**

- **Primary annual energy consumption:** what is the effect of Unilin products on the primary annual energy consumption. The less consumption, the lower the energy cost.
- **U value:** the heat transfer coefficient shows the amount of heat lost through the construction. The lower the U value, the better the project is insulated.

## BASIC WALL CONSTRUCTION Theoretical residential model



1

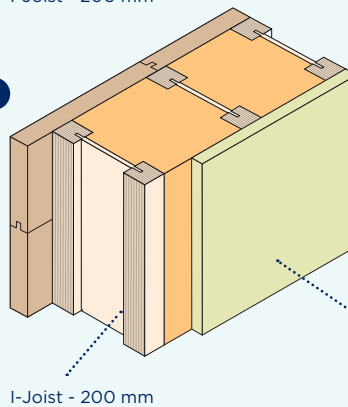


ADVANTAGE over  
BASIC WALL

IMPACT I-JOIST

Primary annual energy  
consumption: - 4%  
U value: - 17%

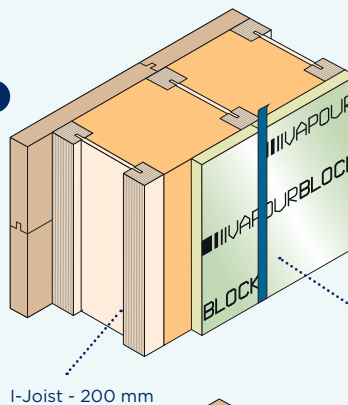
2



IMPACT DURELIS and I-JOIST

Primary annual energy  
consumption: - 19%  
U value: - 17%

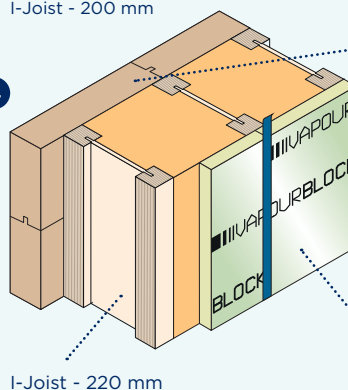
3



IMPACT DURELIS  
Vapourblock and I-JOIST

Consommation énergétique  
annuelle primaire: - 33%  
U value: - 17%

4



Primary annual energy  
consumption: - 36%  
U value: - 29%

## Conclusion

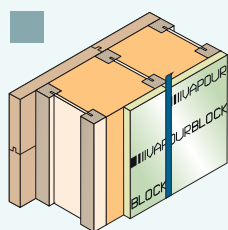
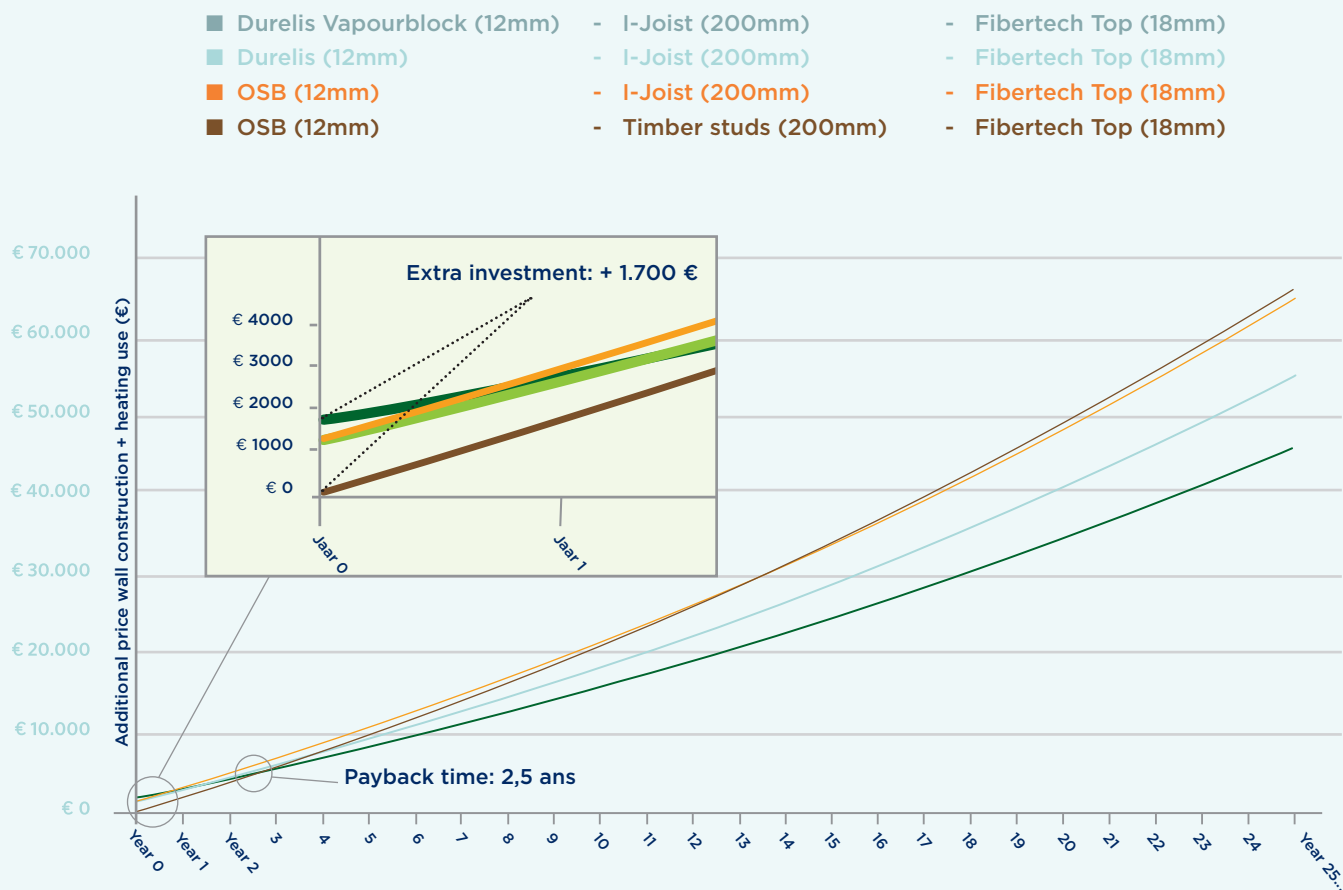
The Unilin airtight panels and the I-Joist profiles have a major impact on the annual primary energy consumption and energy score of your project. This lowers energy costs and enables the value of your project to be increased.



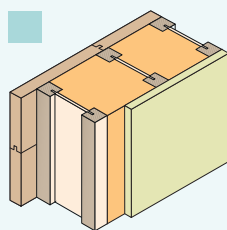
## Time to recover your investment

Construction materials have their cost. The selection is best done carefully. Airtight and insulated construction is an investment that increases the value of your project but mainly pays for itself due to its energy efficiency.

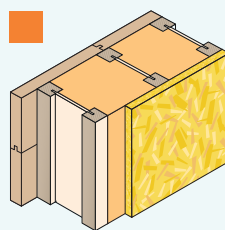
To quantify this the payback time was calculated in the study for the residential model by comparing the cost price and the annual heating costs per wall assembly.



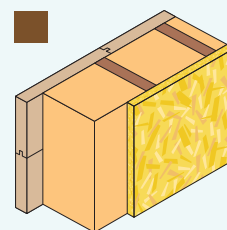
Construction 3 \*



Construction 2 \*



Construction 1 \*



Basic construction\*

\* Construction composition, see page 21

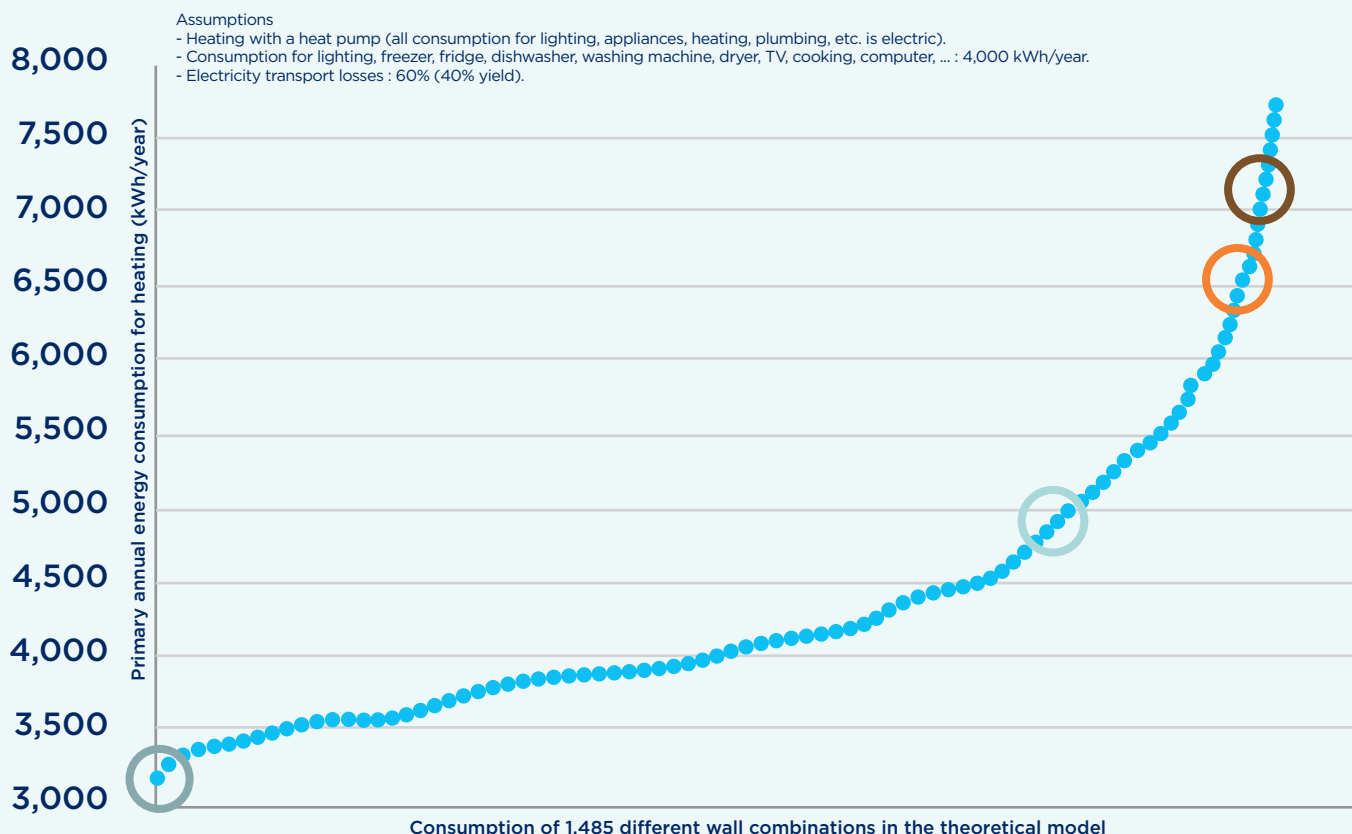


# Primary annual energy consumption

The primary annual energy consumption for heating was examined for 1,485 different wall combinations in the residential theoretical model. How much primary energy is used each year for heating.

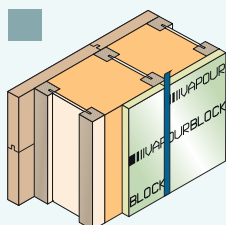
The lower this consumption, the more energy efficient the project:

- Low energy cost
- Added value for your creation



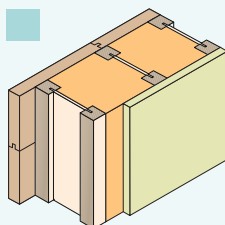
Primary annual energy consumption for heating:

3038 kWh/year



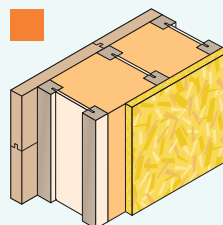
Construction 3 \*

4946 kWh/year



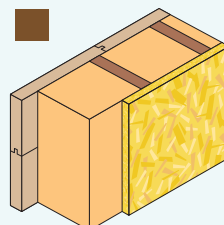
Construction 2 \*

6569 kWh/year



Construction 1 \*

7035 kWh/year





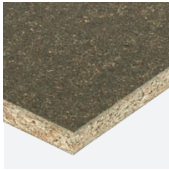


Basic construction\*

## Conclusion

The primary annual energy consumption is significantly lower with Unilin airtight board material and I-Joist profiles. This means the investment is quickly recovered. After this payback time, the yield grows exponentially and major savings are made on energy.

## 5. Concrete formwork

Depending on the level of finish you require, you can choose between raw, lacquered or melamine-faced panels. These are available for structural or non-structural concrete formwork. Standard solutions are always in stock; custom sizes are available on request. For a high-quality, cost-efficient result you can rely on.

	NON-STRUCTURAL P3	STRUCTURAL P5
<b>MELAMINE</b> <ul style="list-style-type: none"> <li>• Highest concrete quality</li> <li>• 2-sided <b>smooth and resistant</b> protective layer</li> <li>• <b>Reduces cavities</b> in the concrete surface</li> <li>• <b>The least colour difference</b> in the concrete surface</li> </ul>	 <p><b>Betonspan</b></p>	 <p><b>Betonspan Plus</b></p>
<b>LACQUERED</b> <ul style="list-style-type: none"> <li>• UV <b>acrylic lacquer</b></li> <li>• Surface <b>resistant</b> to construction chemicals</li> <li>• Very <b>easy to clean and remove formwork</b></li> <li>• <b>Fewer concrete flakes</b></li> </ul>	 <p><b>Acryspan 1s</b> lacquered on one side</p>	 <p><b>Betonforce Black</b> Reduced swelling due to air humidity during storage</p>
<b>RAW</b> <ul style="list-style-type: none"> <li>• <b>Traditional applications</b></li> <li>• <b>Non-architectonic</b> concrete surfaces</li> </ul>	 <p><b>Hydrolis WRB</b></p>	 <p><b>Durelis Topfinish</b></p>

# How a Unilin customer uses the concrete formwork panels for a high quality result.

## 1. Applications:

The concrete formwork panels are typically used in simple and traditional formwork modules. Applications with low material costs, limited repetition and minimal loads.

## 2. Installation:

The panels are integrated into modules, nailed or screwed from outside to inside without having to drill into the surface. After this, formwork removal oil is sprayed on the panels.

## 3. Finish:

Any penetrations through the panel are sealed with silicone or polyester filler. Rough and sawn edges are sealed with a waterproofing sealant (e.g. acrylic paint).

## 4. Disassembly:

The panels must be cleaned and dried before they are stacked. Damaged panels are not reused.

## 5. Storage:

The panels are stored in a dry environment and covered with a tarpaulin or plastic covering.





## 6. Références

Unilin, division panels, panel materials are used in many public buildings, commercial projects and residential projects.







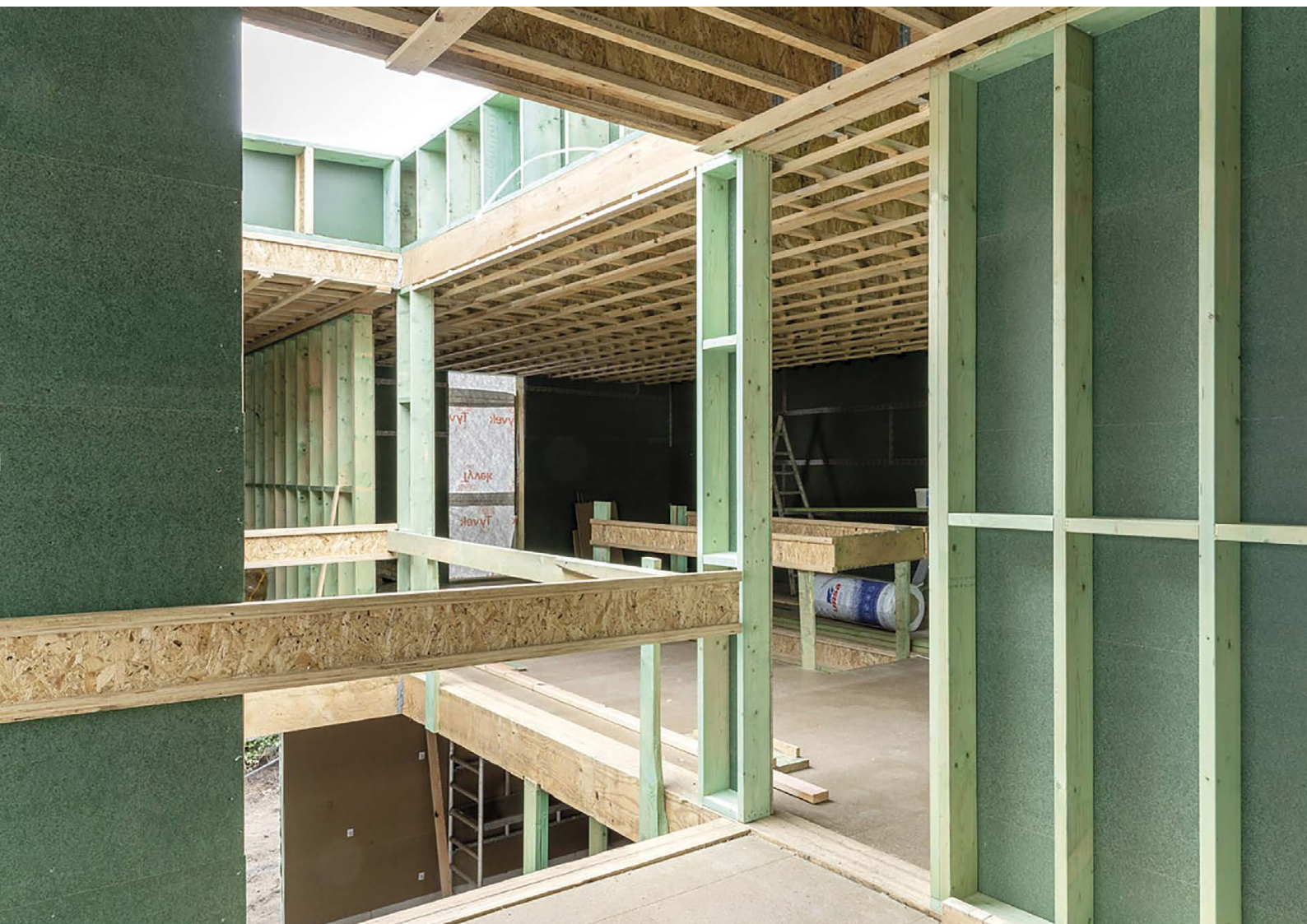
Tecto White



Durelis



Betonforce Black



## Unilin Panels

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Unilin, division panels, part of the Unilin group, has been supplying innovative wood solutions for construction and interior projects since 1960. Our chipboard, MDF, HDF, HPL and melamine boards find their way into commercial outlets in wood and building materials, industrial processors and DIY chains worldwide.

We develop solutions tailored to your needs with creativity as our engine and innovation as our driving force. In addition, we continuously invest in product design and new technologies. That makes us today a leading international player and a lasting partner in our industry.

Our 1,300 employees give their best every day in our production facilities in Belgium and France. Together we produce 2.1 million m<sup>3</sup> of panel material every year.



## Unilin Panels

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