WOODEN SLAB-ON-GROUND CONCEPT DATASHEET

A FOUNDATION FOR CHANGE

A strong, circular, and low-carbon alternative to concrete.

WOPAS WOODEN SLAB-ON-GROUND

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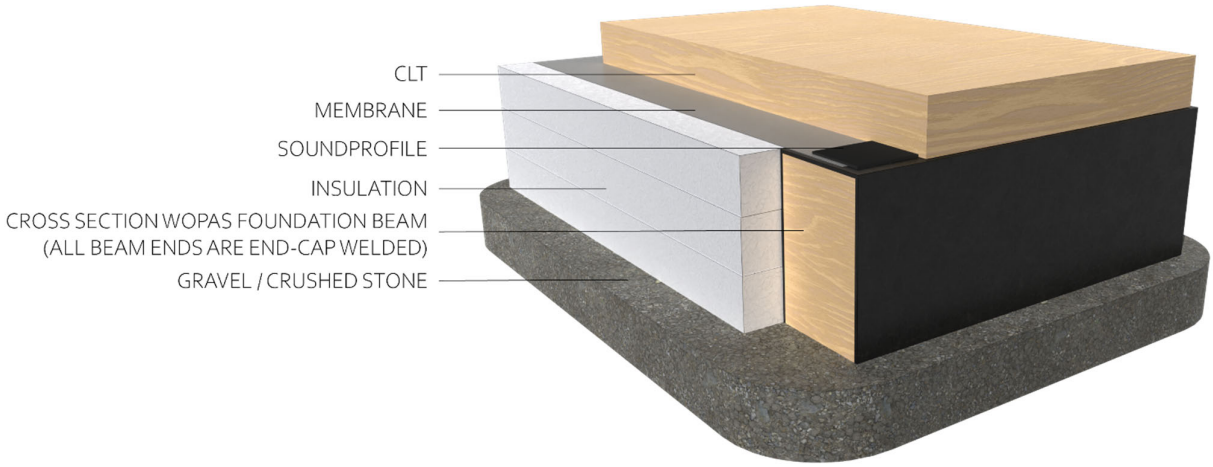


WOPAS wood technology enables foundations with radically lower environmental impact — built entirely without concrete or reinforcement. The system is based on WOPAS foundation beams, forming a perimeter beam system that, together with a wooden floor structure, creates the WOPAS wooden slab-on-ground. Today's reinforced concrete slabs face challenges such as high CO_2 emissions, long drying times, and complex material recycling. The WOPAS wooden slab-on-ground offers a radical alternative:

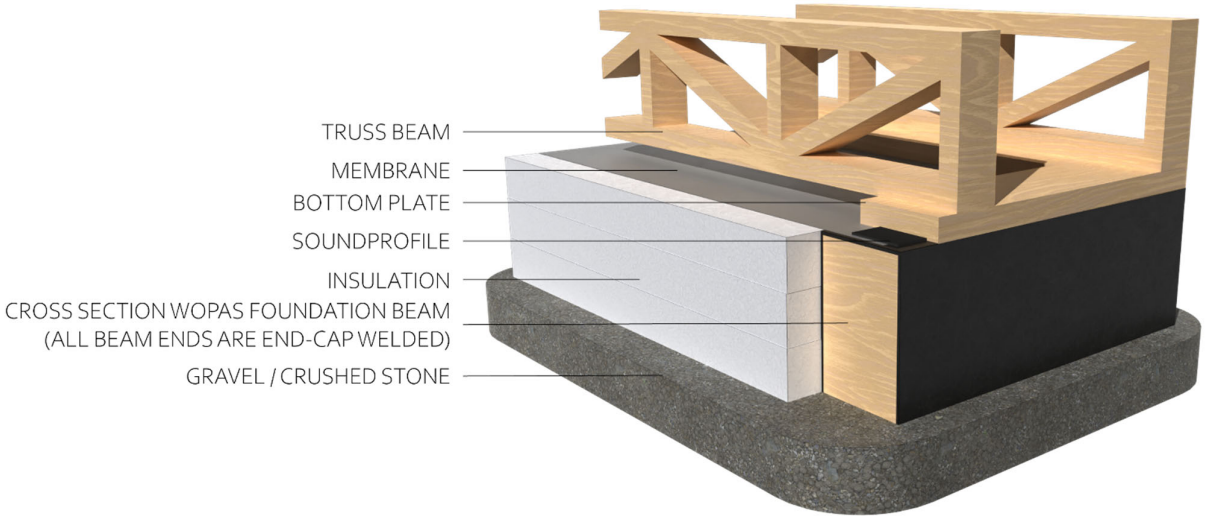
Circular –
the wooden core and recyclable PE encapsulation enable future disassembly and reuse.

Efficient construction process –
no concrete, no drying times, shorter construction period, and fewer parties involved

Flexible –
suitable for single-family homes, multi-residential buildings, modular construction, and public buildings

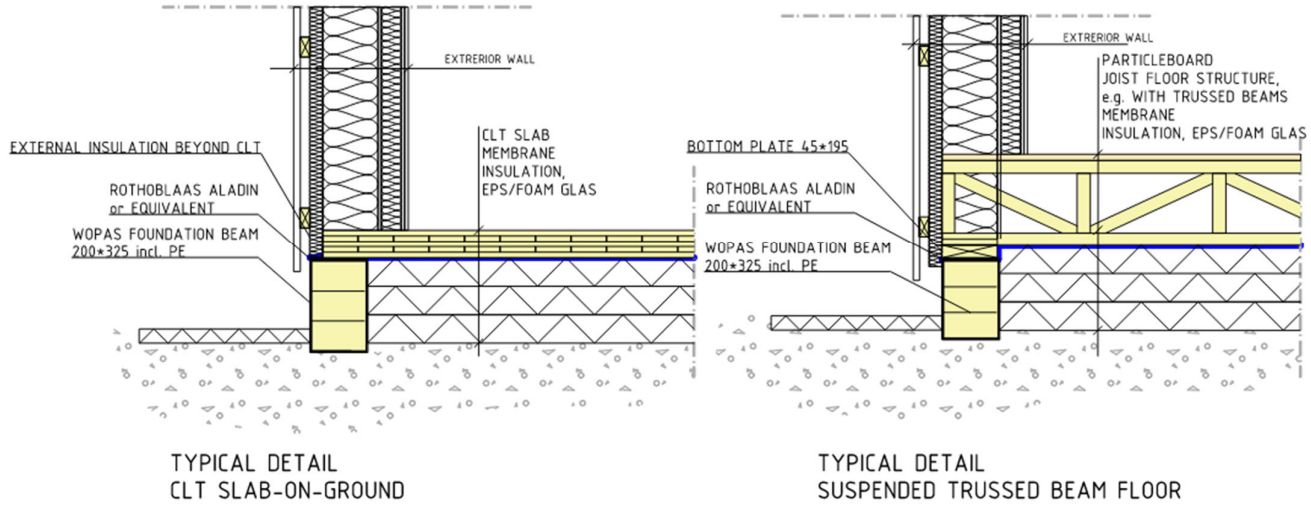
Robust –
the technology is well-proven in other WOPAS products such as poles, sleepers and marine applications

Climate-smart –
up to 70% lower CO_2 footprint compared to a conventional concrete slab.



SYSTEM DESIGN AND COMPOSITION

The **WOPAS wooden slab-on-ground** is built around WOPAS foundation beams made of glulam and PE. The wood protection is based on WOPAS' patented technology, where PE is extruded onto the timber and the ends are sealed with welded PE caps. The PE encapsulation preserves a low moisture content and creates an environment with limited oxygen exposure. The foundation beams are installed vertically and form the structural frame along the building's edges. WOPAS beams can also be placed within the frame as cross beams to distribute loads.



Floor structure: The WOPAS wooden slab-on-ground allows for a wide range of wooden floor structures, such as traditional stud joists (C24), Kerto beams, Masonite beams, trusses, or cross-laminated timber (CLT). Concrete or hybrid floor slabs with concrete are also possible, though with reduced CO_2 efficiency. In this document, we present two main alternatives: 1: CLT floor slab, and 2: Joist floor system. The latter is illustrated using trussed beams and solid timber joists but could just as well be Kerto beams or Masonite beams.

Insulation: The WOPAS wooden slab-on-ground is compatible with most common insulation types. Options include conventional rigid insulation boards (EPS/XPS), compacted foam glass aggregate, foam glass boards, expanded clay (LECA), or similar materials.

Membrane: A radon- and moisture-protective membrane is installed on top of the insulation and foundation beams, creating a separating layer that protects the organic building materials above the beams.

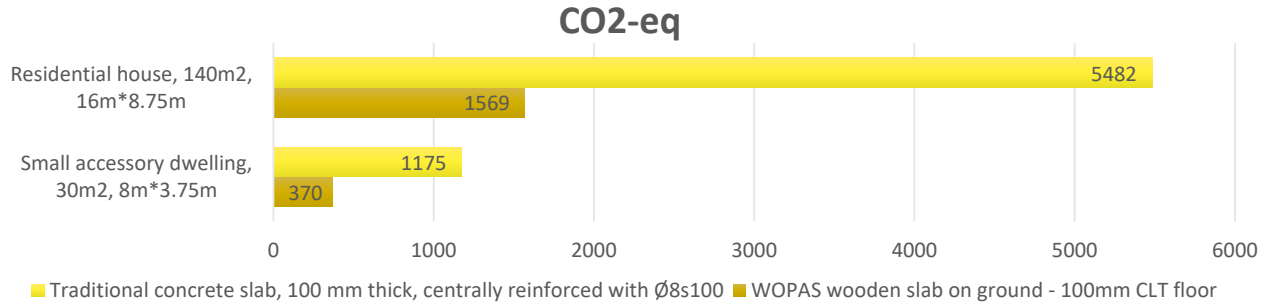
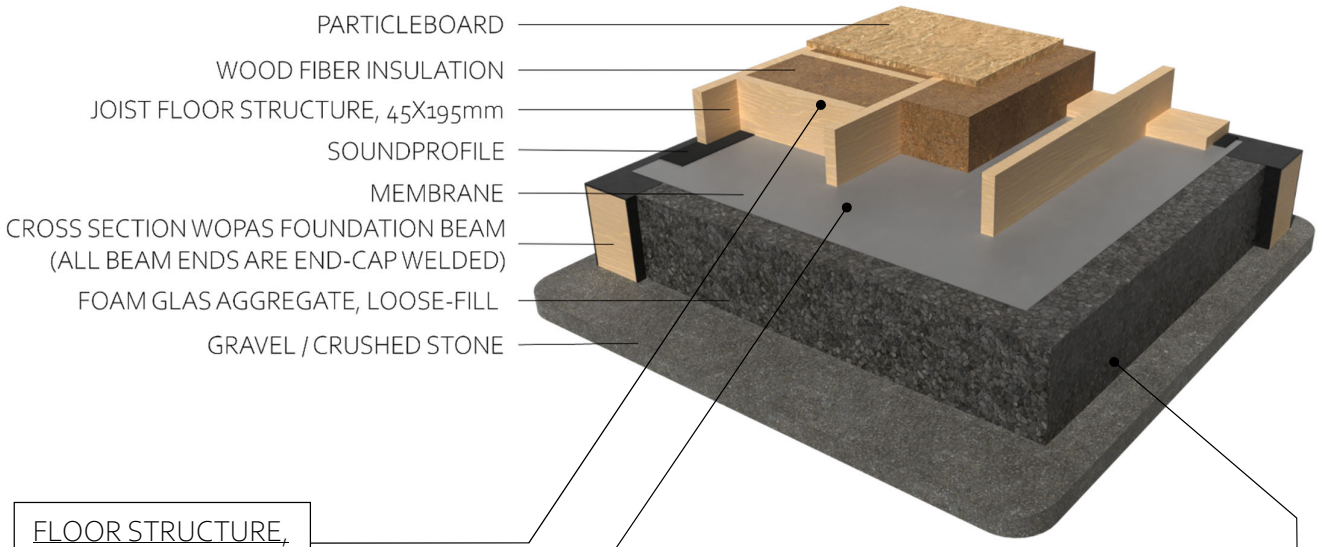


Table 1 – Reports CO_2-equivalent emissions for a conventional reinforced concrete slab (excluding edge beam) versus the WOPAS wooden slab-on-ground including WOPAS foundation beams, membrane, and CLT. Insulation is excluded in both cases, as the same insulation can be used. Data sourced from the Boverket Climate Database; life-cycle stages A1–A5 included. For project-specific calculations (e.g., multi-residential, 2–4 storeys), please contact us.

HOW DO YOU WANT TO BUILD YOUR WOPAS WOODEN SLAB-ON-GROUND?

The WOPAS wooden slab-on-ground is not a one-size-fits-all solution. The choice of insulation, membrane, and floor structure can be configured to meet the preferences of the architect, structural engineer, developer, and contractor for each specific project. A selection of possible configurations is illustrated below:



FLOOR STRUCTURE, examples:
Truss beam
Solid timber, c24
Kerto beam
Masonite Beams
CLT
Concrete

MEMBRANE, examples:
Self-adhesive membrane -
e.g. *Rothoblaas barrier alu net adhesive 300 (B=1.2m)*
Wider alternatives, tape-jointed –
e.g. *Rothoblaas radon floor (B=4m)* or *Termi floor (B=6m)*

INSULATION, examples:
EPS/XPS
Foam glas boars
Foam glas aggregate, compacted
Expanded clay (LECA)

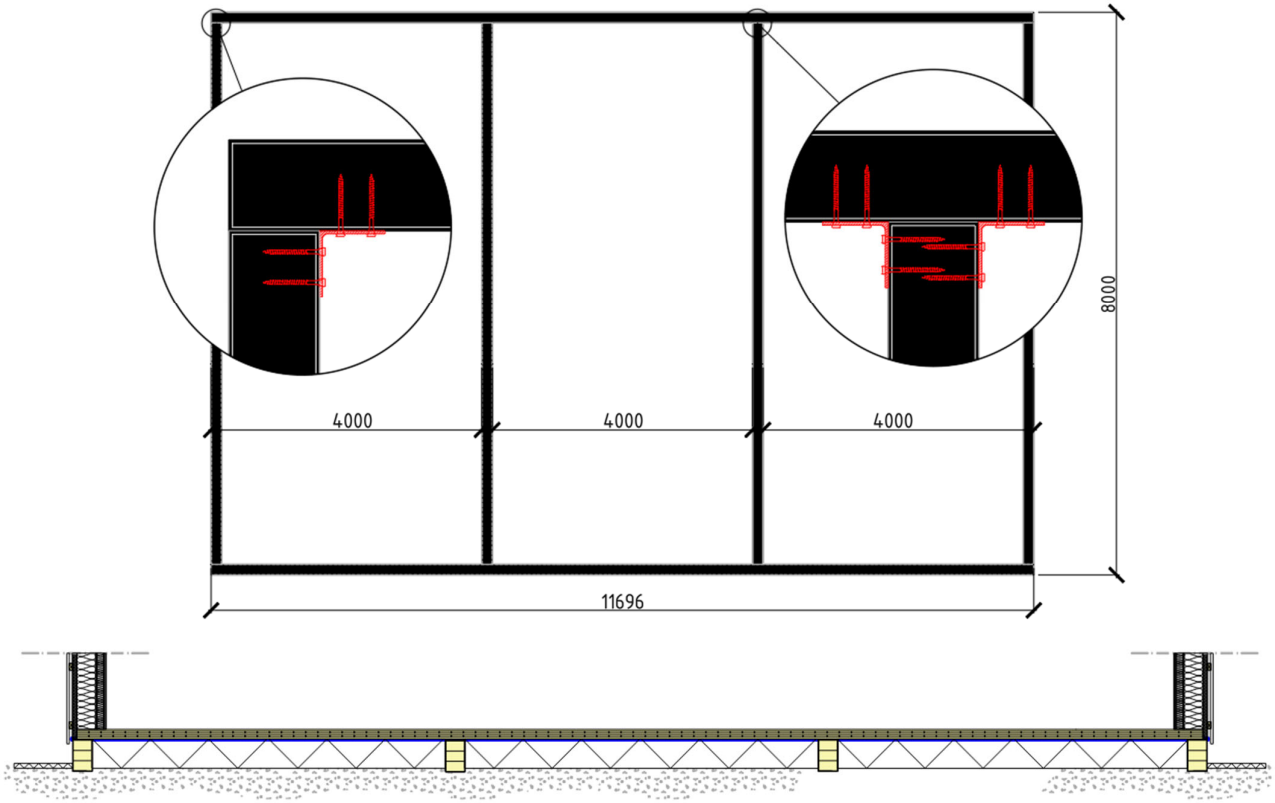
When rigid insulation boards are used, a self-adhesive membrane can be applied and joined directly on the insulation layer. For loose-fill insulation, it is recommended that the membrane joints are placed over the WOPAS foundation beams. Membranes are available in widths up to 4–6 m, which, when using loose-fill insulation, defines the maximum spacing between cross beams. When joints are made directly on the insulation boards, this limitation does not apply. The membrane is installed with overlaps that are taped and sealed according to the manufacturer's instructions.

The floor structure acts as a stiff diaphragm (joist systems require a subfloor such as particleboard or similar) and provides a dry, level surface capable of supporting both exterior and interior walls. Choosing a joist floor system creates an additional installation cavity within the foundation, which is an advantage in buildings with extensive technical systems.

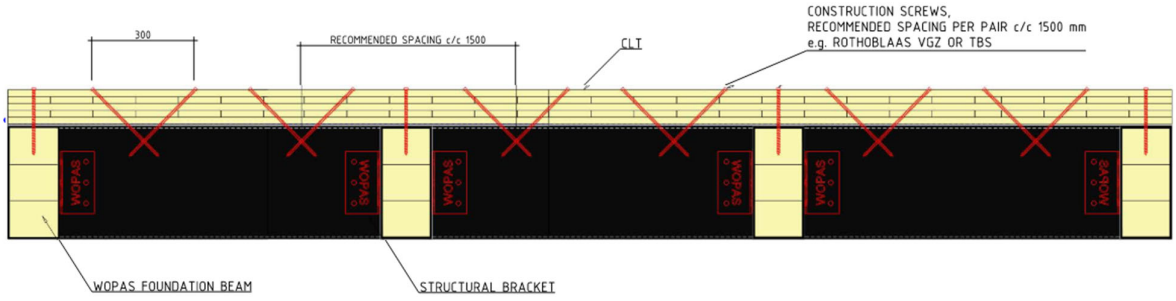
Our experience shows that an increasing number of projects prefer foam glass due to its environmental benefits. However, other insulation types are often chosen since foam glass has slightly lower thermal performance. When using a joist floor structure, the potential for foam glass increases—it is ideally suited as insulation below the membrane, combined with insulation above the membrane (e.g., wood fiber, glass wool, or mineral wool). This combination results in a market-leading foundation from a sustainability perspective—durable throughout the building's lifetime and contributing positively to its overall energy performance.

MECHANICAL CONNECTION

Mechanical fasteners connect all parts of the system. The CLT slab or sill plate is screwed into the foundation beams using structural screws, such as Rothoblaas TBS or VGZ. Angle brackets are used at corners for reinforcement. The result is a fully mechanical, concrete-free foundation—simple and quick to assemble, and buildable by the same carpentry crew that erects the rest of the house.



TYPICAL SECTION - WOPAS WOODEN SLAB-ON-GROUND WITH CLT



TYPICAL DETAIL – CONNECTION BETWEEN CLT/BOTTOM PLATE AND WOPAS BEAM – NOT TO SCALE

Component list for the foundation concept shown in the above illustrations:

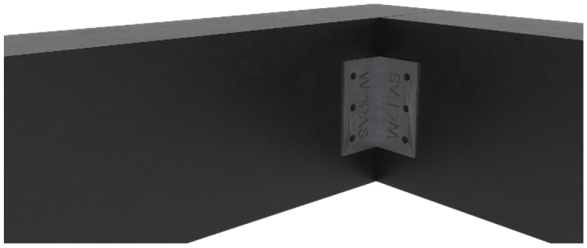
- ✓ **WOPAS foundation beam:** 4 pcs 200×325 mm – L = 7600 mm
- ✓ **WOPAS foundation beam:** 2 pcs 200×325 mm – L = 11,696 mm (alt. spliced)
- ✓ **Structural base fasteners with corresponding screws:** 12 pcs
- ✓ **Structural screws, e.g. Rothoblaas VGZ:** approx. 70 pcs
- ✓ **Insulation boards (EPS):** approx. 90 pcs 2400×1200×100 mm (≈ 82 m³)
- ✓ **Membrane:** Rothoblaas RADON FLOOR, 1 roll of 25 m
- ✓ **CLT panels:** 4 pcs 2000×11,696×80 mm

CONSTRUCTION PROCESS

The installation of the WOPAS wooden slab-on-ground is simple, fast, and entirely mechanical. After site preparation, the WOPAS foundation beams are positioned, aligned, and assembled. Insulation, membrane, and acoustic and air-sealing profiles are then installed, leaving the foundation ready for the chosen floor structure. No concrete casting, no drying times, and minimal weather sensitivity – the foundation can be completed in just one day.

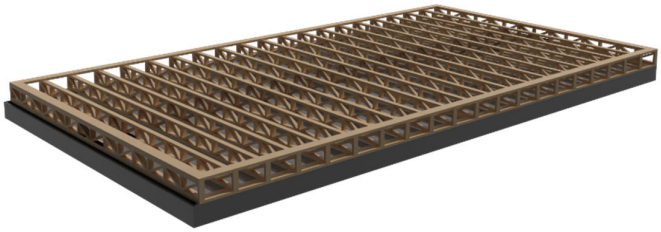
1. **Placement of foundation beams on a gravel or crushed stone bed**

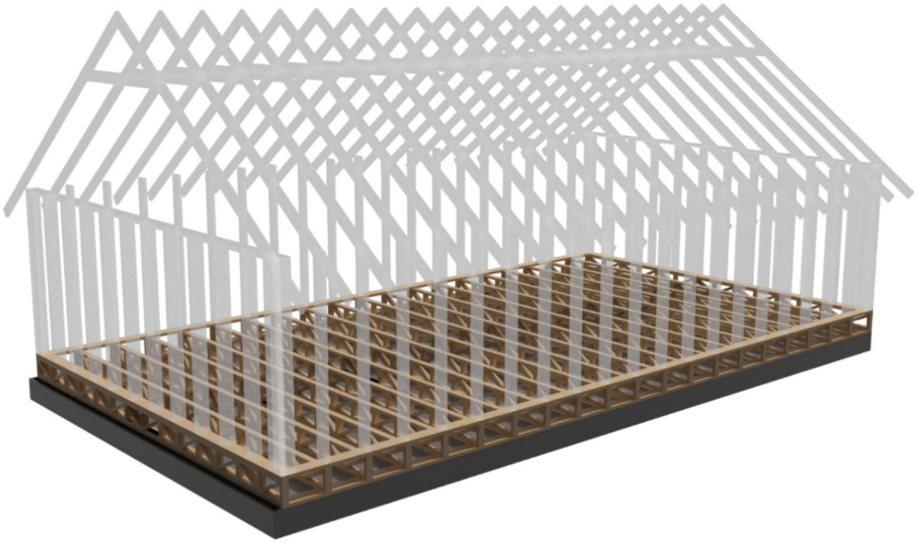
2. **Install angle brackets**



3. **Install insulation, membrane, and sealing profile**

4. **Install the desired floor structure**





Once the foundation is assembled, the structural framing can begin immediately — the same carpentry crew continues building directly on top of the WOPAS wooden slab-on-ground. Depending on the type of joist system used, the cavity can either be filled with board insulation (wood fiber, mineral wool, or glass wool) or blown-in insulation later, in connection with the wall and roof insulation work.

ABOUT WOPAS AS

WOPAS AS was founded in 2017 and combines wood and polyethylene (PE) to create CO_2-efficient and circular products such as utility poles, sleepers, marine piles, and posts for corrosive agricultural environments. More recently, the technology has been applied to solar mounting systems and pole barns in the agricultural industry.

What all WOPAS products have in common is that the technology enables wood to function as a load-bearing material even where moisture meets air. This is made possible through WOPAS' patented process of extruding PE directly onto the wood, providing a *constructive wood protection* instead of traditional biocide-based treatments. WOPAS AS is a fully owned subsidiary of the family-owned company Hallingplast AS, founded in the 1960s and today employing around 100 people.

FAQ

What type of wood is used in WOPAS foundation beams?
We use GL30c glulam as the primary load-bearing material. For larger projects, other engineered wood products such as Kerto beams, beech veneer (BauBuche), or similar high-strength timber materials can also be used.

How is the wood protected?
The wood is encapsulated through extrusion in recycled polyethylene (PE100) — the same material used for drinking water pipes. This provides a long service life and very low climate impact. In WOPAS foundation beams, 100% of the polyethylene is recycled.

Is any concrete used in the WOPAS wooden slab-on-ground?
No. The foundation is, by default, entirely concrete-free, resulting in no drying times, shorter construction, and a significantly reduced carbon footprint. However, a concrete or hybrid floor can be used both partially or fully.

Is the technology proven?
Yes. The same wood/PE technology has been used since 2017 in poles, sleepers, and marine piles, with documented performance and long-term testing.

What is the expected service life?
The technical service life of WOPAS products made with PE100 is defined as at least 80 years. The same material, when used for water and seabed pipelines, has a design lifespan of around 100 years.

Can WOPAS be used in demanding environments?
Yes. The product withstands the entire pH range and can be used in both drinking water sources and extreme, corrosive environments.

Has WOPAS been tested?
Yes. The material has undergone extensive testing, including mechanical strength, fatigue tests, fastener performance, and third-party inspections.

Why is the climate impact so much lower compared to a traditional concrete slab?
A concrete slab relies on energy-intensive materials such as cement and steel, while the WOPAS wooden slab-on-ground uses renewable wood and recycled PE, resulting in a radically lower CO_2 footprint.

Is the WOPAS wooden slab-on-ground expensive?
The material cost is comparable to a traditional concrete slab. Considering total construction cost — including labor hours, workflow, and elimination of drying times — the WOPAS system often provides economic advantages.

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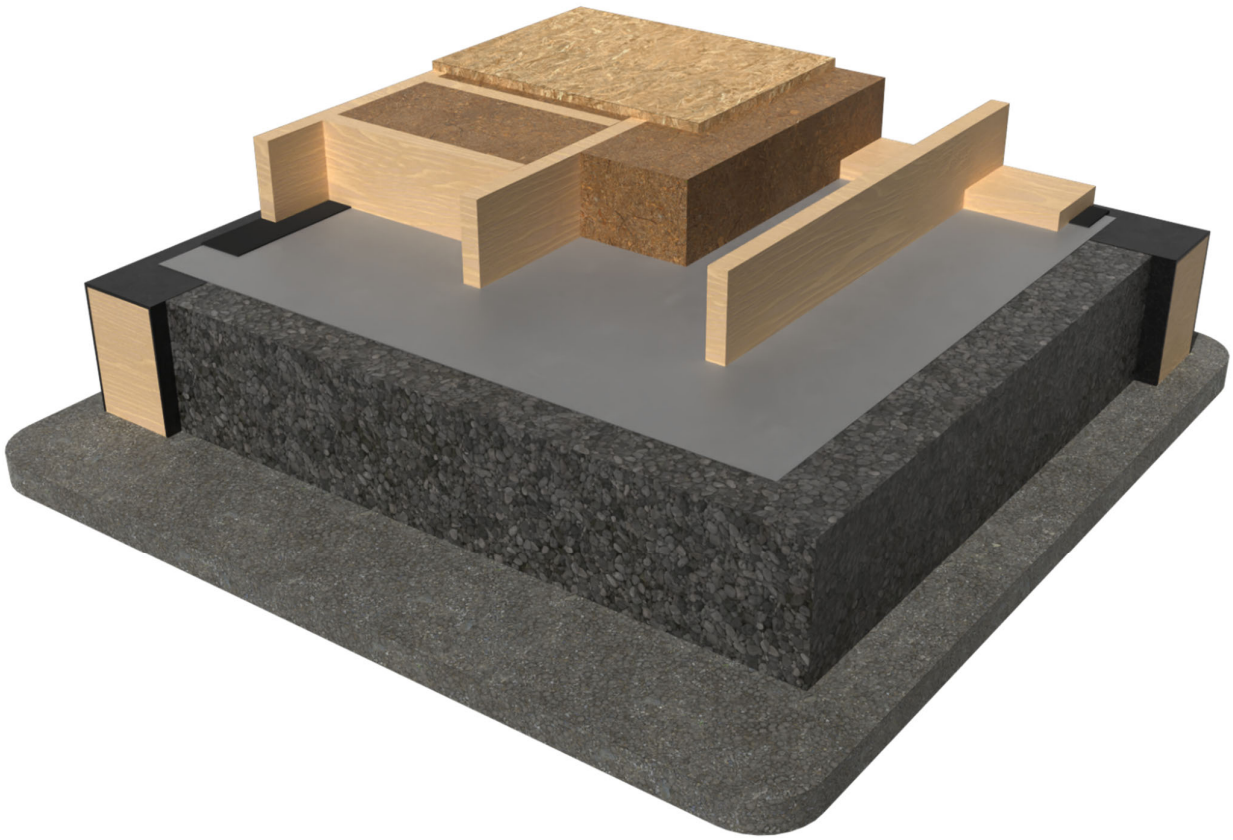
SUMMARY & CONTACT

The WOPAS wooden slab-on-ground is a sustainable and circular foundation solution that combines the climate benefits of wood with the unique properties of polyethylene. The result is a foundation that is strong, stable, and future-proof — while offering a radically low CO_2 footprint.

The WOPAS wooden slab-on-ground can be configured to suit your specific project and design preferences — the example below shows a joist floor combined with loose-fill foam glass insulation and WOPAS foundation beams.



If you're interested in the **WOPAS wooden slab-on-ground**, please get in touch and share your project details — including location and, if possible, dimensioned drawings or sketches.

For more information and contact:

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