elka®

WINNER
German Sustainability Award Companies 2025

Ecological
Climate-Friendly
Circular

Healthy Home Building with Wood

Sawn Timber · Natural Wood Panels · esb

Projekt: NarrativA architecten NL
Foto: Joni Israeli

Essential guide for timber construction decision-makers

Carpenters, Roofers,
Architects & Planners,
Clay & Drywall Construction

elka: Partner of the Trades

elka

» The material
THE FUTURE IS MADE OF
is wood! «

Prof.-Dr. Schellnhuber

one of the world's most
renowned climate experts

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Sawn Timber & Engineered Wood in Perfection – Since 1906

The perfect choice for sustainable building projects and creative craftsmanship

elka-Holzwerke was founded in 1906 and is located in Morbach, Rhineland-Palatinate, in the heart of the vast Hunsrück forest region. The family-owned company, now in its fourth generation, has been committed for many years to healthy living environments, emission reduction, and sustainability. elka is a member of the German Sustainable Building Council (DGNB e.V.) and features its products in the DGNB Navigator. **The company was awarded the German Sustainability Award 2025.**

At the modern sawmill, sawn and structural timber is produced, with part of the sawn wood further processed into three-layer natural wood panels under the brand name “elka vita.”

The fresh wood chips and sawdust generated in the sawmill are pressed into wood-based materials such as particle boards and esb construction panels. esb and esb Plus are brands of elka-Holzwerke and have received multiple awards from independent institutes. Thanks to their use of fresh wood, esb panels are ideally suited for circular construction.

Through an exemplary value chain and a unique cascading production process, every part of the harvested roundwood is fully utilized.

wood
Wide Range of Sawn Timber
Main and Side Cuts, Spruce & Douglas Fir

span
Specialty Panels P1 - P6

esb
Elka Strong Board Flooring Panels
esb Standard
esb Plus (Blue Angel & Sentinel Haus certified)

vita
Low-emission, three-layer natural wood panels in spruce & Douglas fir

Elka uses only wood from sustainable, controlled forestry. As part of this commitment, we primarily source wood from certified forests. These certifications include PEFC (Programme for the Endorsement of Forest Certification Schemes) and FSC® (Forest Stewardship Council®).

Customers both in Germany and abroad – as well as leading purchasing associations in the timber trade and industrial clients – value the wide range of elka products. Bundled purchasing and customer-focused logistics save elka clients time and money.

Sustainable Cascading Production at the Morbach Site

Sustainability – A Principle Rooted in Forestry...

Hans Carl von Carlowitz
(1645 - 1714)

„That is why knowledge, planning, dedication, and foresight are essential to ensure the sustainable use of forests – because wood is an indispensable resource without which our country cannot thrive in the long term.“

loosely based on:
Sylvicultura Oeconomica –
A Guide to the Cultivation of Wild Trees
Leipzig, 1713

As Relevant Today as 300 Years Ago

The term „sustainability“ is ubiquitous today – but few know that it originally comes from German forestry. As early as the 18th century, it was understood that forests could only be used sustainably if no more wood was taken than could naturally regrow. Carl von Carlowitz articulated this principle in 1713 in his work *Sylvicultura Oeconomica*, laying the foundation for a mindset that remains valid today: **sustainability means using resources responsibly – ecologically, economically, and socially.**

Germany is among the countries with the oldest tradition of sustainable forestry in the world. For over 300 years, our forests have been carefully managed, reforested, and preserved for future generations. Wood from these forests is not only a natural building material – it also actively contributes to climate protection: as it grows, a tree absorbs CO_2, which remains stored long-term in wood products.

Sustainability begins with raw materials

elka-Holzwerke relies exclusively on wood from controlled forestry with short transport routes. The roundwood comes from within approximately 150 km of our site in Morbach. This not only conserves natural resources but also minimizes CO_2 emissions from long-distance transport. This sustainable sourcing supports regional economic value and ensures that only high-quality, certified wood is used in production.

Zero-waste cascading production – 100% wood utilization

At elka, sustainability starts with production: every part of the wood is fully utilized. From structural timber and solid wood panels to esb boards, a cascading use process ensures that wood residues and sawdust are further processed. This efficient approach minimizes waste and maximizes resource use.

One cubic meter of wood stores one ton of CO_2 – wood as a climate protector

Unlike stone or concrete, wood stores CO_2 long-term instead of releasing it during production. As it grows, a tree absorbs CO_2 from the atmosphere, which is then locked into wood products like the esb panel. Thanks to the long service life of these panels, the CO_2 remains securely stored for decades. Wood therefore has a better environmental footprint than conventional building materials and actively contributes to climate protection.

Our trained procurement team inspects the quality and origin of the logs. In doing so, elka relies on long-standing and trusted partnerships with our suppliers and logistics providers.

...a lived reality at elka

Healthy living – Low-VOC esb panel instead of high-emission OSB

The esb panel from elka is made primarily from fresh, low-resin spruce wood, which is especially low in VOCs (volatile organic compounds). By avoiding high-emission raw materials and using user-friendly, low-emission adhesives, the esb panel is particularly healthy for indoor environments and ideal for ecological interior construction.

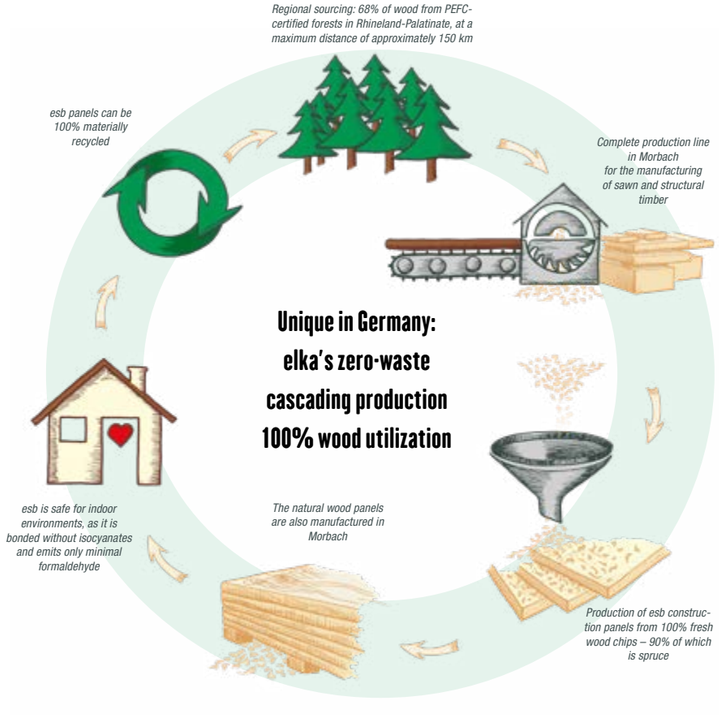
Free from reclaimed wood – Maximum purity and minimal pollutants

Unlike many other wood-based materials, the esb panel contains no reclaimed wood from classes A1-A3 or recycled wood, as these are often contaminated with harmful substances or old coatings. Studies show that up to 69% of reclaimed wood is no longer suitable for safe reuse. elka therefore relies exclusively on clean, fresh wood to ensure the highest level of healthy living.

[1] Source: https://d-nb.info/1275165559/34

Deconstructability and recyclability of the esb panel

The esb panel is not only sustainably produced but also suitable for the circular economy. Thanks to its homogeneous material structure, it can be easily reused or recycled during deconstruction. Its high dimensional stability and robustness allow it to be reused in construction, saving valuable resources and reducing waste. This approach aligns with the standards of the German Sustainable Building Council (DGNB).



The Kuntz family business at the German Sustainability Award 2025 ceremony in Düsseldorf, from left: Larissa Kuntz, Dagmar Hilden-Kuntz, and Karl-Robert Kuntz

Sustainable Commitment from elka-Holzwerke

Elka pursues a holistic approach to sustainability that goes beyond modernizing production. By 2028, an energy transformation aims to reduce CO_2 emissions by 40%, cut production waste, and save up to 11,000 m³ of fresh water annually. The company was honored with the German Sustainability Award 2025 for its exemplary strategy and is actively committed to future-oriented forest management. Through close collaboration with forest owners and sustainable investments, elka is securing the future of timber construction.

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HOLZ RETTET KLIMA
1 m³ bindet 1 t CO_2

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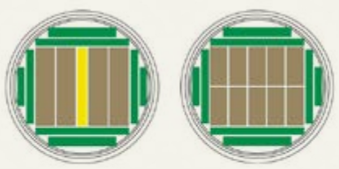
Sawn & Structural Timber

The basis for modern construction

- **Production capacity**/year:
  Sawn timber approx. 150 Tm^3
  Drying 70 Tm^3
  Planing mill 15 Tm^3
- **Wood types:** Spruce and Douglas fir
- **Band saw technology**
- **Products:**
  Square timber, Planks
  Structural timber
  Boards (graded or narrow boards)
  Eave boards/Tapered boards



Heart-free cutting

Capabilities:
Up to 10-strand cutting

Sawn timber has a long tradition at elka – sawmills have been a key pillar of the company since 1906. At our highly flexible sawmill in Morbach, we cut approximately 300,000 solid cubic meters of regional spruce and Douglas fir each year.

We primarily deliver our customized products to Germany, Belgium, France, the Netherlands, and England. elka's sawn timber is used in house construction, the packaging industry, and in trade. The variety and quality, along with extensive refinement options for our timber products, make elka-Holzwerke one of Germany's leading sawmills at brand level – and a strong partner for both trade and industry.

Specialization in Customer Requirements

Our highly flexible cutting line allows for a wide range of dimensions in spruce and Douglas fir. The product range includes square and cross beams, planks and boards of all kinds, as well as custom cutting and an extensive planing program – planed on all four sides, with chamfer or rounding, according to customer specifications. In addition, we offer drying chambers and red or yellow impregnation treatments.

Quality

From selecting roundwood from sustainably managed forests to delivering the finished product to the customer, elka follows the principle: everything from a single source. Combined with state-of-the-art technology, exceptional expertise, and advanced quality management, this forms the foundation for our customers' satisfaction.

Complete Service

Our employees provide excellent and prompt customer service thanks to their strong advisory expertise – both on-site and throughout the order process.

Quality all along the line

Three-layer natural wood panels “vita“

The perfect choice for sustainable construction projects and creative craftsmanship

- **Production capacity**/year: approx. 12 Tm^3
- **Wood types**: Spruce and Douglas fir
- **Dimensions, square cut**:
  5050x2050 / 2525x2050 /
  5050x1025 mm
  Thicknesses: 16, 19, 22, 27, 34, 42 mm
  Available in grades: AB/B, B/C, B/C+,
  and C+/C
- **Tongue and groove dimensions**:
  2525x1025, 2525x683, 5050x683,
  5050x1025 mm
- **Certifications**:[1)]
  DGNB / QNG ready / FSC / PEFC /
  Blauer Engel
  Sentinel Holding Institut Produktpass

Upon request, VITA wood panels are available with precision-milled tongue and groove joints, including a chamfer for clean edges. This precise processing ensures quick, easy, and visually appealing installation – ideal for professional applications.

With our vita product line, we are setting new standards in the processing and application of natural wood panels. These three-layer wood panels made from sustainable, locally sourced spruce or Douglas fir combine excellent material properties with a strong commitment to environmental responsibility.

Elka-Holzwerke uses only wood from sustainably managed forests in the region. This not only results in a high-quality product, but also makes an active contribution to climate protection and the strengthening of local economic cycles. Our production merges traditional craftsmanship with cutting-edge technology – delivering natural wood panels that exceed your expectations in every aspect.

vita offers you exceptional flexibility in application:

- **Interior finishing:** The natural aesthetics and excellent technical properties make these panels the ideal choice for wall and ceiling cladding. The wood’s breathable structure contributes to a healthy indoor climate.
- **Furniture making:** For architects, carpenters, and craftsmen who value design and sustainability, vita provides a premium foundation for durable and elegant furniture pieces.
- **Timber construction:** Thanks to its structural properties, vita meets the requirements of a construction panel and is perfectly suited for load-bearing structures.
- **Additional applications:** Whether you are working on custom residential projects or sophisticated commercial buildings – vita adapts to your creative and technical requirements. Your imagination knows no bounds.

Your reliable partner in timber construction

With vita, you are choosing a product that perfectly balances functionality, aesthetics, and sustainability. Whether for innovative architectural projects or traditional craftsmanship – vita is the solution you can rely on.

Discover the possibilities. Choose quality. Choose vita by Elka-Holzwerke.

DGNB NAVIGATOR Registrierungs-Code KKFGDE www.dgnb-navigator.de

1) BLAUER ENGEL DAS UMWELTZEICHEN www.blauer-engel.de/uz76

1) FSC www.fsc.org FSC® C100151 Das Zeichen für verantwortungsvolle Waldwirtschaft

1) PEFC PEFC/04-31-0625

MADE FROM FRESH SPRUCE WOOD NATURALLY V.O.C.-POOR!

MADE IN GERMANY PRODUCT FROM GERMANY

1) QNG READY

1) Available on request

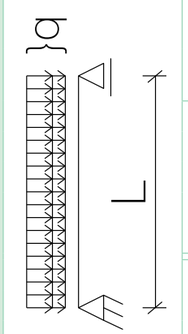
vita – Natural. Sustainable. Versatile.

vita Load table

Standard dimensions:
505x205cm / 505x102,5cm / 252,5x205 cm

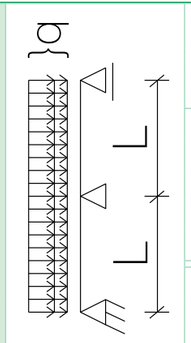
The table does not replace individual structural calculations that take all local conditions into account. The manufacturer reserves the right to make changes in line with technical progress. The data provided serves as general information and does not constitute a guarantee of specific properties.

SINGLE-SPAN BEAM



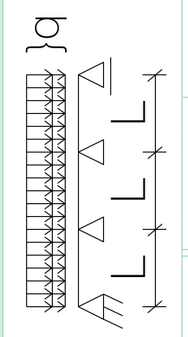
Top layer lamella	Load in KN/m², q_k	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0
	Panel-thickness	Span length in m								
5 mm	15 mm	0,89	0,78	0,71	0,66	0,62	0,59	0,56	0,54	0,52
5 mm	19 mm	1,13	0,99	0,90	0,83	0,78	0,74	0,71	0,68	0,66
5 mm	22 mm	1,23	1,07	0,97	0,90	0,85	0,81	0,77	0,74	0,71
5 mm	27 mm	1,51	1,31	1,19	1,11	1,04	0,99	0,95	0,91	0,88
5 mm	32 mm	1,74	1,52	1,38	1,28	1,20	1,14	1,09	1,05	1,02
9 mm	27 mm	1,51	1,31	1,19	1,11	1,04	0,99	0,95	0,91	0,88
9 mm	42 mm	2,29	2,00	1,81	1,68	1,58	1,50	1,44	1,38	1,33
9 mm	50 mm	2,66	2,32	2,11	1,96	1,84	1,75	1,67	1,61	1,55

TWO-SPAN BEAM



Top layer lamella	Load in KN/m², q_k	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0
	Panel-thickness	Span length in m								
5 mm	15 mm	1,20	1,04	0,95	0,88	0,83	0,79	0,75	0,72	0,70
5 mm	19 mm	1,52	1,32	1,20	1,12	1,05	1,00	0,95	0,92	0,88
5 mm	22 mm	1,64	1,43	1,30	1,21	1,14	1,08	1,03	0,99	0,96
5 mm	27 mm	2,02	1,76	1,60	1,49	1,40	1,33	1,27	1,22	1,18
5 mm	32 mm	2,33	2,04	1,85	1,72	1,62	1,53	1,47	1,41	1,36
9 mm	27 mm	2,02	1,76	1,60	1,49	1,40	1,33	1,27	1,22	1,18
9 mm	42 mm	3,06	2,67	2,43	2,25	2,12	2,02	1,93	1,85	1,79
9 mm	50 mm	3,56	3,11	2,83	2,63	2,47	2,35	2,24	2,16	2,08

THREE-SPAN BEAM



Top layer lamella	Load in KN/m², q_k	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0
	Panel-thickness	Span length in m								
5 mm	15 mm	1,10	0,96	0,87	0,81	0,76	0,73	0,69	0,67	0,64
5 mm	19 mm	1,40	1,22	1,11	1,03	0,97	0,92	0,88	0,85	0,82
5 mm	22 mm	1,52	1,32	1,20	1,12	1,05	1,00	0,95	0,92	0,89
5 mm	27 mm	1,86	1,63	1,48	1,37	1,29	1,23	1,17	1,13	1,09
5 mm	32 mm	2,15	1,88	1,71	1,59	1,49	1,42	1,35	1,30	1,26
9 mm	27 mm	1,86	1,63	1,48	1,37	1,29	1,23	1,17	1,13	1,09
9 mm	42 mm	2,83	2,47	2,24	2,08	1,96	1,86	1,78	1,71	1,65
9 mm	50 mm	3,29	2,88	2,61	2,42	2,28	2,17	2,07	1,99	1,92

Shear and creep deformation are not taken into account!
Deflection W_{inst} = L/300
Field-specific loading is not considered!
Characteristic load applied over the entire beam length!
Self-weight is not included and must be accounted for separately!

k_{mod} = 0,8	Calculation according to:
γ_m = 1,3	EN 12369-3:2008
KLED: average	EN 1995-1-1
γ_{GQ} = 1,45	EN 13986:2004
NKL: 2	

vita Declaration of Performance

in accordance with Regulation (EU) No. 305/2011 of the European Parliament and of the Council of 9 March 2011

Additional Declarations of Performance can be found in the download section of our website.
www.elka-holzwerke.de

Harmonised technical specification according to DIN EN 13986:2004+A1:2015

Identification mark [1]	SWP/2 S L3 (12-20 mm)		SWP/2 S L3 (>20-30 mm)		SWP/2 S L3 (>30-80 mm)	
	longitudinal	transverse	longitudinal	transverse	longitudinal	transverse
Flexural strength [fm, 0 / fm, 90]:	30,0 N/mm²	5,0 N/mm²	27,0 N/mm²	5,0 N/mm²	20,0 N/mm²	10,0 N/mm²
Flexural rigidity (modulus of elasticity) [Em, 0 / Em, 90]:	10000 N/mm²	650 N/mm²	10000 N/mm²	800 N/mm²	8000 N/mm²	1500 N/mm²
Durability:						
Quality of bonding	SWP/2 according to EN 13354:2008 (after 6 boilings) • 0.4 ≤ fV < 0.8 N/mm² (with wood failure ratio ≥ 40%) • 0.8 ≤ fV < 1.2 N/mm² (with wood failure ratio ≥ 20%) • fV ≥ 1.2 N/mm² (no requirement for wood failure ratio)					
Transverse tensile strength	NPD (2)					
Thickness swelling	NPD (2)					
Moisture resistance	NPD (2)					
Thickness swelling	NPD (2)					
mechanical (i.e. creep resistance over time)	NPD (2)					
biological	NPD (2)					
Formaldehyde emission	E1E05					
Fire behaviour	D-s2,d0 (1)	D-s2,d0	D-s2,d0	D-s2,d0	D-s2,d0	D-s2,d0
Water vapor permeability μ according to EN 13986 (4)	Dry 185, Wet 64		Dry 185, Wet 64		Dry 185, Wet 64	
Airborne sound insulation (4)	NPD (2)		NPD (2)		NPD (2)	
Sound absorption coefficient (4)	0,10 / 0,30		0,10 / 0,30		0,10 / 0,30	
Thermal conductivity (4)	0,11 W/(mK)		0,11 W/(mK)		0,11 W/(mK)	
Bearing strength	NPD (2)		NPD (2)		NPD (2)	
Air permeability	NPD (2)		NPD (2)		NPD (2)	
Strength: according to DIN EN 12369-3:2022-09 for load-bearing applications						
Out-of-plane bending	30,0 N/mm²	5,0 N/mm²	27,0 N/mm²	5,0 N/mm²	20,0 N/mm²	10,0 N/mm²
In-plane bending	25,0 N/mm²	12,0 N/mm²	18,0 N/mm²	12,0 N/mm²	12,0 N/mm²	12,0 N/mm²
Tension	12,0 N/mm²	3,0 N/mm²	9,0 N/mm²	3,0 N/mm²	6,0 N/mm²	3,0 N/mm²
Compression	18,0 N/mm²	12,0 N/mm²	16,0 N/mm²	10,0 N/mm²	10,0 N/mm²	10,0 N/mm²
Out-of-plane shear	4,0 N/mm²	4,0 N/mm²	4,0 N/mm²	4,0 N/mm²	2,5 N/mm²	2,5 N/mm²
In-plane shear	1,0 N/mm²	1,0 N/mm²	1,0 N/mm²	1,0 N/mm²	1,0 N/mm²	1,0 N/mm²
Stiffness (mean value) [2]						
Out-of-plane bending	10000 N/mm²	650 N/mm²	10000 N/mm²	800 N/mm²	8000 N/mm²	1500 N/mm²
In-plane bending	6000 N/mm²	4000 N/mm²	5000 N/mm²	4000 N/mm²	4000 N/mm²	4000 N/mm²
Tension	6000 N/mm²	4000 N/mm²	5000 N/mm²	4000 N/mm²	4000 N/mm²	4000 N/mm²
Compression	6000 N/mm²	4000 N/mm²	3500 N/mm²	2500 N/mm²	2500 N/mm²	2500 N/mm²
Out-of-plane shear	450 N/mm²	450 N/mm²	450 N/mm²	450 N/mm²	450 N/mm²	450 N/mm²
In-plane shear	50 N/mm²	50 N/mm²	50 N/mm²	50 N/mm²	50 N/mm²	50 N/mm²
Thickness-independent properties:						
Mechanical durability, Deformation coefficient (NKL 1 (3))	NPD (2)					
Content of PCP	</= 5 ppm					

Note (1): not assigned
Note (2): NPD = No Performance Determined
Note (3): NKL = Service class according to DIN EN 1995-1-1
Note (4): The product for which this performance is declared consists predominantly of the raw material wood. Therefore, the properties marked with (4) are subject to the variations inherent to the raw material and do not constitute grounds for complaint.
Note (5): Manufacturer's mark on the product edge (grading quality, panel thickness, production date, and name of the inspector)

WELEDA Logistics Campus, Schwäbisch Gmünd
Interior cladding with esb Plus (Photo: MichelGroup)

Prefabricated house by Streif, with esb Plus (Photo: Streif Haus)

Prefabricated wall element for a kindergarten with esb Plus panels (Company Ochs)

Modern timber construction with esb boards from elka

Tiny house, with esb Plus and vita natural wood panels from elka-Holzwerke (Photo: Sandra Allekotte)

The first "QNG-Premium" house in Germany, built by BAUFRITZ, using esb Plus fresh wood panels in spruce from elka-Holzwerke (Photo: Baufritz)

elka strong board, the esb panel, an invention by elka

Proven Tradition, Modern Future

For thousands of years, people have been building with wood. Whether it is a timber-framed house, an alpine cabin, or a modern passive house – wood is one of the oldest building materials in the world and also one of the most innovative. What once arose from practical necessity has evolved into a future-ready building method: modern timber construction combines technological precision with the ecological and aesthetic qualities of a natural material.

Wood is lightweight, strong, and versatile – and it offers an excellent indoor climate. Thanks to industrial prefabrication, entire walls, ceilings, and roofs made of timber elements can now be planned with millimeter precision and assembled in a very short time. This saves time on the construction site and reduces emissions.

One special advantage: wood is renewable. Responsibly harvested structural timber stores CO_2 over the long term, helps protect the climate, and supports environmentally friendly construction. Certified wood-based materials – such as our esb panels – make a valuable contribution to low-emission, healthy, and durable building.

Today, timber construction is not just a technical option – it is an expression of conscious resource use, thoughtful spatial design, and enhanced quality of life.

The esb Panel – Versatile, High-Performance, Healthy

This brochure is designed to introduce you to the esb panel – a modern wood-based material that stands out for its quality, sustainability, and wide range of applications. Whether used in walls, roofs, or ceilings, the esb panel is a true all-rounder in timber construction.

Thanks to its outstanding technical properties, it can fully replace chipboards of classes P3 and P5 as well as OSB boards of classes 2 and 3. This makes it not just an alternative, but a real advancement: low in emissions, stable, more vapor-permeable, and resource-efficient.

In the following chapters, we will show you typical areas of application, proven construction methods, and everything you need to know for planning and implementation.

Our esb panel is more than just a product to me – it represents responsible timber construction that respects both people and nature. We use only fresh, locally sourced wood and avoid anything that could compromise indoor air quality. Residual wood from our sawmill is processed into the panel, helping to store CO_2 long-term. It is active climate protection and healthy living quality you can feel.
That is what we stand for wholeheartedly, with our name as a family-run business.

Larissa Kuntz
Managing Director, elka-Holzwerke

WINNER
German Sustainability Award Companies 2025

elka strong board : esb

The esb Range of Formats

Large format, square-edged

520 cm x 206 [1] cm in
12 / 15 / 18 / 22 / 25 mm
(available from as few as 80 pieces per thickness)

Square-edged format

259,5 cm x 125 [1] cm in
12 / 15 / 18 / 22 / 25 mm
280 / 300 cm x 125 cm in 15 mm [2]

Tongue and groove format

in 12 / 15 / 18 / 22 / 25 / 30 mm

258 cm x 67,5 cm / Covering dimension
205 cm x 62,5 cm / Covering dimension [1]
258 cm x 125 cm / Covering dimension [1]
120 cm x 50 cm (min. dimension)

esbReno attic / renovation board

127,5 cm x 49,5 cm / Covering dimension
Thickness 15 mm, board weight 6 kg
Thickness 22 mm, board weight 9 kg

Material thicknesses / Packaging units

12 mm	75 Pieces	22 mm	40 Pieces
15 mm	60 Pieces	25 mm	36 Pieces
18 mm	49 Pieces	30 mm	30 Pieces

[1] exempt 30 mm
[2] The wall board is only available in esb Plus.

Special dimensions are possible through our modern cutting center – please inquire.

What makes the esb board so special?

Just like with a good cake, it all comes down to the recipe and the ingredients. For esb boards, fresh wood chips from local coniferous trees are used – most of which come directly from our own sawmill, eliminating long transport routes. You will not find recycled wood of unknown origin in our boards. That makes all the difference, and many of our customers appreciate esb for its neutral smell.

By professionals, for professionals

Our specially developed esb board (elka strong board) is a structural wood-based panel classified as P5 according to DIN EN 312:2010. It has excellent technical properties and is suitable for use in humid environments. It is ideal for structural timber construction. The resin-bonded chipboard features a single-layer structure made from fresh sawmill residues.

The esb board, according to its classification, falls under the standard EN 13986 „Wood-based panels for use in construction“ and meets all the requirements for chipboards used for load-bearing and bracing purposes in construction.

Our Raw Materials

Sawmill residues, primarily spruce, sourced from sustainably managed forestry – both from our own sawmill and nearby sawmills. PEFC or FSC certification available upon request.

Our Adhesive

Recycling-friendly and moisture-resistant MUF resin (melamine-urea-formaldehyde resin), using a specially developed process to reduce formaldehyde emissions.

esb
elka strong board

esb Standard:
Formaldehyde content of ≤ 0.05 ppm (E1E05) complies with DIBt health protection report G-160-18-0004.

DIN-Norm EN 717-1

The esb standard board is also available as a handy attic board!

esb Plus
elka strong board

esb Plus:
Specifically suitable for RAL-certified structural timber construction and prefabricated house construction, with a formaldehyde content of ≤ 0.03 ppm.

DIN-Norm EN 717-1

The esb Plus board is also available as a joist!

esb or OSB – what are the differences?

esb instead of OSB – time for a better board!

The esb board is a modern, high-performance alternative to the traditional OSB board. While OSB boards are known for their coarse chip appearance and solid technical properties, the esb board stands out with a variety of additional advantages – both in terms of processing and with regard to sustainability and healthy living environments.

By avoiding raw materials with high emissions, potential allergy triggers are eliminated. This makes the board ideal for interior construction, especially in sensitive living areas.

The esb board also offers clear technical advantages: it has high bending strength in both directions, allowing for better material utilization. The homogeneous surface provides a pleasant feel, simplifies further processing, and produces fewer splinters. esb boards are always delivered sanded, offering optimal conditions for applications such as flooring and tiling. In addition, the esb board has excellent screw and nail pull-out values – even at the edges – and significantly lower swelling compared to OSB.

Last but not least, the esb board protects tools thanks to its homogeneous structure and production using residual material, allowing for longer service life during sawing and milling.

Criteria	esb	OSB
Sustainability & Healthy Living	Fresh, certified spruce wood from a maximum distance of 150 km	Multiple wood types, recycled wood, reclaimed wood
	Low VOCs due to low-resin spruce wood, no unpleasant odors, no recycled wood	High proportion of pine (pine contains terpenes, which can trigger allergies)
	Produced in Germany, Rhineland-Palatinate	International production
Strength	Equal bending strength in both directions, optimal board yield	Optimal bending strength only along the longitudinal axis, higher material waste
	Strong hold thanks to high screw and nail pull-out values, even at the edges!	Lower screw and nail pull-out values compared to esb
Swelling behavior & vapor permeability Further information on page 22	Lower swelling than OSB, especially edge swelling, not direction-dependent	Higher swelling than esb, direction-dependent
	Largely vapor-permeable, esb 22 mm has an s_d-value of 1.76 m, which is important, for example, for top floor ceilings. Less prone to mold!	More vapor-tight, OSB 22 mm has an s_d-value of 4.40 m, problematic for top floor ceilings
Surface	Sanded, homogeneous surface, light, warm wood tone, low risk of splintering	Darker surface, various wood types visible, often unsanded and rough, splinters can come loose more easily
Tool service life	Tool-friendly, longer service life possible Minimum density 620 kg	Shorter service life due to recycled content Density 600 kg

Why we need to talk about indoor air quality

SENTINEL HOLDING INSTITUT

The Sentinel Holding Institute (SHI) is an independent center of expertise for healthy building and living. It develops scientifically based criteria for assessing the health quality of building products, especially regarding emissions and pollutants. Products that meet the strict requirements are listed in the Sentinel database – an important tool for planners, builders, and manufacturers who want to create healthy living environments. SHI works closely with institutes such as the Fraunhofer IBP and also offers training and certifications.

www.sentinel-holding.eu

BLAUER ENGEL – DAS UMWELTZEICHEN

The Blue Angel is Germany's oldest and most well-known environmental label. It is awarded by the Federal Environment Agency and identifies products and services that are environmentally friendly, health-conscious, and sustainable – without compromising on quality and usability. For building products, the Blue Angel considers factors such as formaldehyde emissions, VOCs, recyclability, and resource conservation. For consumers, the label offers reliable guidance when choosing healthy and environmentally responsible products.

www.blauer-engel.de

Healthy building means thinking low-emission

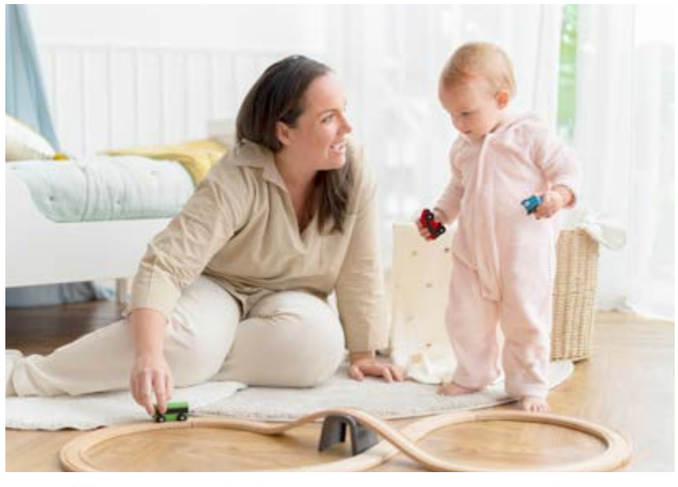
Those who choose pollutant-tested products when building or renovating can significantly improve indoor air quality. Recognized environmental and health labels such as the Blue Angel or the Sentinel Holding Institute offer helpful guidance. They identify products with particularly low emissions – for a healthy and comfortable living environment.

What are VOCs? – And why they affect our indoor air

VOCs (Volatile Organic Compounds – in German: flüchtige organische Verbindungen) are gaseous substances that can evaporate from many everyday materials – such as paints, varnishes, adhesives, furniture, or floor coverings. Building products like wood-based panels or insulation materials can also release VOCs.

These substances affect indoor air quality – and therefore our well-being and health. This is especially important since we spend around 90% of our time indoors – at home, in the office, or in public buildings. Poor indoor air caused by VOCs can lead to headaches, respiratory irritation, concentration problems, or allergies.

elka relies on clean fresh wood, which is produced as residual wood in its own sawmill, to ensure minimal pollutant levels and guarantee the highest standard of healthy living.



We spend 90% of our time indoors. Do not leave indoor air quality to chance – choose healthy building products like the esb board.

...and what the esb board has to do with it

Formaldehyde – a natural but sensitive substance

One of the best-known VOCs is formaldehyde. It occurs naturally, is also produced in the human metabolism – and is naturally present in wood itself. However, at higher concentrations, formaldehyde can pose health risks. That is why its release from building products is strictly regulated.

Low emissions of formaldehyde and VOCs

Low emissions are confirmed by various quality certificates. Our esb boards are free from reclaimed wood, and the sawmill residues come from sustainable forestry. In addition, our esb boards are low in VOCs thanks to the use of spruce residues.

E05 – The emissions standard for wood-based materials

The so-called E1 classification is a Europe-wide standard that limits the maximum formaldehyde emission to 0.1 ppm. Wood-based materials with an E1 rating are considered low-emission and may be used indoors. E05 is the new, stricter classification that has already been in effect in Germany since 2020 and sets a limit of 0.05 ppm formaldehyde. As of August 6, 2026, this limit will be mandatory for all wood-based materials and products made from them placed on the EU market.

esb boards comply with European limit values

The esb boards (elka strong board) demonstrate that low-emission construction is also possible with wood-based materials:

esb PLUS: ≤ 0,03 ppm

esb Standard: ≤ 0,05 ppm

Both variants comply with the EU limit value – and come close to the natural emission level of solid wood. This makes them ideal for healthy living construction projects.

esb Plus VOC measurement protocol Blue Angel (low-emission) RAL UZ-76-2016:

Measurement days:	Day 3	Day 28
Formaldehyde content	-	≤ 0,08 mg/m³
TVOC (C_6-C_{18})	≤ 3 mg/m³	≤ 0,8 mg/m³
TSVOC (C_{16}-C_{22})	-	≤ 0,1 mg/m³
Carcinogenic substances	-	≤ 1 µg/m³
Total VOCs excluding NIK	≤ 10 µg/m³ (Sum)	≤ 0,1 mg/m³ (per individual value)
R-value	-	≤ 1

Awards:

ICO 2 NIC 0 AWA 1 RDS 7 product winner

materialPREIS2018 Die Auszeichnung für besondere Materialien

Certifications:

DGNB NAVIGATOR Registrierungs-Code TW6WK8

DGNB NAVIGATOR Registrierungs-Code 5GAXCD

PEFC PEFC/04-31-0625

CE

1) BLAUER ENGEL DAS UMWELTZEICHEN www.blauer-engel.de/uz76

1) QNG READY

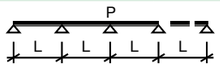
SENTINEL HOLDING INSTITUT

MADE FROM FRESH SPRUCE WOOD – NATURALLY V.O.C.-POOR!

MADE IN GERMANY – PRODUCT FROM GERMANY

1) esb-Plus

esb Load table

Own weight + flooring		0,20						
Live load in kN/m²		1,00	2,00	3,00	3,50	4,00	4,50	5,00
Span distance L of the beams in mm		**Type of load:** 						
6-span	400	12	12	12	15	15	15	15
6-span	450	12	12	15	15	18	18	18
5-span	500	12	15	18	18	18	18	18
4-span	550	15	15	18	18	22	22	22
4-span	600	15	18	22	22	22	22	25
4-span	650	15	18	22	22	25	25	25
3-span	700	18	22	25	25	25	30	30
3-span	750	18	22	25	30	30	30	30
3-span	800	22	25	30	30	30	-	-
3-span	850	22	25	30	30	-	-	-
2-span	900	22	25	30	30	-	-	-
2-span	950	22	25	30	-	-	-	-
2-span	1000	25	30	-	-	-	-	-
1-span	675	22	25	30	30	-	-	-

THICKNESSES:
12, 15, 18, 22, 25, 30 mm

TYPE:
esb P5 on beam ceiling,
uniform load

Calculation basis

w Q inst ≤ L/300	with loads as design values!
w fin ≤ L/200v	k mod = 0,45; NKL 2; KLED: medium
σ md/f md ≤ 1	k def = 3,0; Coefficient Ψ2= 0,3
Per EN 1995-1	E mean per EN 312-5
and EN 312-5	E*I = (E mean / δM)* (1,00m *d³)/12; d = Board thickness; δ M= 1,3

This table serves as a non-binding preliminary sizing guide for the thickness of esb P5 boards for the specified load. It does not replace the structural calculation in individual cases, taking into account all local conditions.

esb Product advantages

Excellent tongue and groove profile

We guarantee a high level of fit accuracy through our partially tapered tongue & groove profile “NF easy.”

- Local, fresh wood – low in VOCs, therefore odor-neutral!
- Minimum raw density 620 kg/m³, Fire protection!
- Equal bending strength in all directions for optimal board yield
- Higher vapor permeability, making it less prone to mold
- Processing and recycling friendly, due to bonding without isocyanates
- Low-splinter processing and sanded, homogeneous surface, easy to paint
- Strong hold thanks to high screw and nail pull-out values
- Low formaldehyde emissions
  esb Plus 0.03 ppm – 70% below the EU standard
  esb Std. 0.05 ppm – 50% below the EU standard

esb Plus Declaration of Performance

in accordance with Regulation (EU) No. 305/2011 of the European Parliament and of the Council of 9 March 2011

Further declarations of performance can be found in the download section of our website
ww.elka-holzwerke.de

HARMONIZED TECHNICAL SPECIFICATION ACCORDING TO DIN EN 13986:2005-03

Identification mark [1]	**P5 esb S 6-10**	**P5 esb S 10-13**	**P5 esb S 13-20**	**P5 esb S 20-25**	**P5 esb S 25-32**
Thickness	> 6 up to 10 mm	> 10 up to 13 mm	13 up to 20 mm	> 20 up to 25 mm	> 25 up to 32 mm
Bending strength	18,0 N/mm²	18,0 N/mm²	16,0 N/mm²	14,0 N/mm²	12,0 N/mm²
Flexural rigidity (Modulus of elasticity)	2550 N/mm²	2550 N/mm²	2400 N/mm²	2150 N/mm²	1900 N/mm²
Bonding quality	NPD (2)				
Perpendicular tensile strength	0,45 N/mm²	0,45 N/mm²	0,45 N/mm²	0,40 N/mm²	0,35 N/mm²
Durability (Thickness swelling)	13 %	11 %	10 %	10 %	10 %
Durability (Moisture resistance Option 2)	0,15 N/mm²	0,15 N/mm²	0,14 N/mm²	0,12 N/mm²	0,11 N/mm²
Formaldehyde emission	E1E05				
Reaction to fire	D-s2,d0 (1)				
Water vapor permeability μ	Dry / Moist = 80/40				
Airborne sound insulation	NPD (2)	NPD (2)	NPD (2)	NPD (2)	NPD (2)
Sound absorption coefficient	0,10 / 0,25	0,10 / 0,25	0,10 / 0,25	0,10 / 0,25	0,10 / 0,25
Thermal conductivity λ	0,12 W/(mk)	0,12 W/(mk)	0,12 W/(mk)	0,12 W/(mk)	0,12 W/(mk)
Strength (thickness) [2]	> 6 up to 13 mm	> 6 up to 13 mm	> 13 up to 20 mm	> 20 up to 25 mm	> 25 up to 32 mm
– Bending	15,0 N/mm²	15,0 N/mm²	13,3 N/mm²	11,7 N/mm²	10,0 N/mm²
– Tension	9,4 N/mm²	9,4 N/mm²	8,5 N/mm²	7,4 N/mm²	6,6 N/mm²
– Compression	12,7 N/mm²	12,7 N/mm²	11,8 N/mm²	10,3 N/mm²	9,8 N/mm²
– Shear perpendicular to panel plane	7,0 N/mm²	7,0 N/mm²	6,5 N/mm²	5,9 N/mm²	5,2 N/mm²
– Shear in panel plane	1,9 N/mm²	1,9 N/mm²	1,7 N/mm²	1,5 N/mm²	1,3 N/mm²
Stiffness (mean value) [2]					
Bending	3500 N/mm²	3500 N/mm²	3300 N/mm²	3000 N/mm²	2600 N/mm²
Tension and compression	2000 N/mm²	2000 N/mm²	1900 N/mm²	1800 N/mm²	1500 N/mm²
Shear perpendicular	960 N/mm²	960 N/mm²	930 N/mm²	860 N/mm²	750 N/mm²
Thickness-independent properties					
Mechanical durability, deformation coefficient (Use Class 1)	kdef = 2,25				
Mechanical durability, deformation coefficient (Use Class 2)	kdef = 3,00				
Load application					
Mechanical durability, creep factor (Use Class 1), all thicknesses		permanent: kmod = 0,30	long: kmod = 0,45	medium: kmod = 0,65	short: kmod = 0,85
Mechanical durability, creep factor (Use Class 2), all thicknesses		permanent: kmod = 0,20	long: kmod = 0,30	medium: kmod = 0,45	short: kmod = 0,60
PCP content	≤ 5 ppm				

		Panel thickness / s_d-value					
	μ-value	**12 mm**	**15 mm**	**18 mm**	**22 mm**	**25 mm**	**30 mm**
dry	80	0,96 m	1,20 m	1,44 m	1,76 m	2,00 m	2,40 m
moist	40	0,48 m	0,60 m	0,72 m	0,88 m	1,00 m	1,20 m

μ-value water vapor diffusion coefficient: s_d-value abbreviation for a characteristic value that indicates the water vapor diffusion-equivalent air layer thickness. In planning – especially in timber construction – the drier μ-value is often used instead.

[1] Identification code of the construction product in accordance with Article 11(4)
[2] in accordance with DIN EN 12369-1:2001

The current declaration of performance available at www.elka-holzwerke.de

Building physics fundamentals

Diffusion, vapor permeability, and airtightness in timber construction

What is diffusion?

Diffusion refers to the physical process in which water vapor molecules move through a material – from an area of higher to lower vapor pressure concentration. This process is direction-independent but typically occurs within a building element from the warmer to the cooler side.

In timber construction, diffusion plays a critical role, as moisture-carrying vapor flows inside components can lead to unwanted condensation, especially when vapor-retarding layers hinder vapor movement.

Vapor permeability of the esb panel – a constructive advantage

The esb panel has a comparatively high level of vapor permeability. This means it can transport trapped moisture in the form of water vapor through the building element over time and release it to the outside.

Advantages of a vapor-permeable construction using esb panels:

- Reduction of moisture-related structural damage (e.g., due to condensation or mold formation)
- Preservation of timber structural integrity through dry cross-sections
- Improvement of indoor climate through balanced humidity levels

Note: The vapor permeability of the esb panel supports moisture behavior that is both biologically and physically favorable for buildings – while maintaining high mechanical stability.

Airtightness – Protection against uncontrolled moisture ingress

While diffusion describes a slow, molecular transport of moisture, airtightness refers to a construction's ability to prevent uncontrolled airflows.

Definitions of terms

Diffusion	Molecular moisture transport through materials as a result of a vapor pressure gradient
Vapor-permeable	Material with a low sd-value that allows water vapor to pass through
Airtightness	Measure of a building element's impermeability to airflows
s_d-value	Equivalent air layer thickness (in meters) that represents the same diffusion resistance as the material in question

These airflows – especially through leaks in the building envelope – can carry significant amounts of moisture into the structure. When this moisture encounters cold building layers, condensation (dew formation) occurs, posing a high potential for damage.

Objectives of airtight construction:

- Prevention of heat loss through convection
- Protection of the structure against moisture-related damage
- Compliance with the requirements of the Building Energy Act (GEG)

Practical rule: Components should be built to be airtight but vapor-permeable – air stays inside, but vapor is allowed to escape slowly.

With the esb panel, a functional airtight layer can be created that meets the requirements of the Building Energy Act (GEG). Proper taping of the joints is necessary. For passive house requirements, additional measures must be taken, such as the use of a vapor retarder. Practical construction examples starting on page 25.

Interaction between airtightness and vapor permeability

A functional and durable timber construction requires a balanced relationship between:

- **Airtightness of the inner layers** to prevent convection, and
- **Vapor permeability of the outer layers** to allow moisture to escape.

This principle makes it possible to safely remove moisture sources (e.g., from the construction process or building use) while effectively protecting the building's thermal envelope.

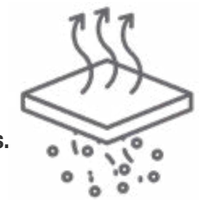
What does the s_d-value indicate?

The s_d-value stands for the water vapor equivalent air layer thickness and is expressed in meters.
It is calculated by multiplying the water vapor diffusion resistance factor [µ] by the material thickness [m].

For comparison:
22 mm thick esb Plus timber construction panels have an s_d-value of 1.76 m;
in contrast, 22 mm OSB panels have an s_d-value of 4.40 m.

See s_d-value table on page 21.

The larger the s_d-value, the more vapor-tight the building material layer is.



Problem area: attic

Building products in the conflict zone between heated and unheated living spaces

esb panels are the better choice for ceiling panels in the attic due to their more favorable vapor permeability.

Vapor-tight panel materials are not a good solution for attic floors, as they can lead to mold formation.

Application tip: Attic conversion

A well-insulated attic significantly reduces energy consumption. Effective insulation helps minimize heat loss, leading to lower energy use for heating and cooling.

However, in addition to proper insulation, the choice of material for ceiling cladding is very important. Due to the specific climatic conditions in unheated attic spaces, we recommend the more vapor-permeable esb panels from elka-Holzwerke.

These panels support moisture-regulating vapor exchange between the interior and the insulation. This reduces the risk of moisture becoming trapped in the insulation, which could otherwise lead to mold growth or other moisture-related issues.

Using esb panels as a top layer in insulated attics is a smart solution for achieving long-term energy savings and protecting your valuable building structure.

Expert assessment
Comparison of esb and OSB panels for top floor ceilings:

„ ...An evaluation of the load-distributing layer itself also reveals that OSB panels show significantly higher moisture content. In contrast to esb panels, wood-destroying fungi can potentially grow on OSB in the worst case. From a building physics perspective, the version using esb panels is therefore more long-term tolerant to errors and preferable to OSB.“

Dipl.-Ing.
Frank-Stefan Meyer,
GEWG Bauphysik GmbH
Trier

Expert in hygrothermal building physics
Expert in sound insulation and acoustics
Building energy consultant, Building biologist (IBN)

Perfect for tight attics – the handy esb Reno!

127.5 cm x 49.5 cm / Cover dimensions
Thickness: 15 mm, Panel weight: 6 kg
Thickness: 22 mm, Panel weight: 9 kg

According to DIN 68800-2, only building products with an s_d-value less than 2 m are permitted for this application.

Example calculation of s_d-value
µ-value (dry) × panel thickness
µ-value esb (dry) 80 | µ-value OSB (dry) 200

esb 15 mm -> s_d 1,20 m	**esb 22 mm -> s_d 1,76 m**
OSB 15 mm -> s_d 3,00 m	**OSB 22 mm -> s_d 4,40 m**

The first choice in healthy wood construction: esb

Project on this page: Holzbau Krings Reinke, Monschau

in the wall **in the roof** **in the ceiling**

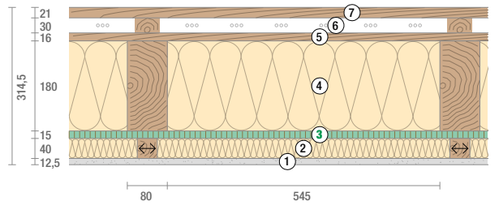
esb construction recommendations __Exterior wall

Do you have questions about your wall construction?
Just send us an email!

vertrieb@elka-holzwerke.de

Ventilated exterior wall – with DWD panel

No foil necessary!



1. Gypsum plasterboard (12,5 mm)
2. Flexible wood fiber insulation (40 mm)
3. **elka esb P5 (15 mm)**
4. Flexible wood fiber insulation (180 mm)
5. DWD board (16 mm)
6. Ventilation cavity (30 mm)
7. Curtain wall (21 mm)

<-> Layers (beams) marked with arrows run perpendicular to the main axis.

Expert assessment

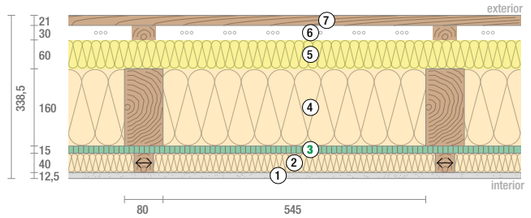
U-value 0,19 W/(m²K)

This construction is not critical in terms of moisture and has proven effective in practice. An esb panel is used on the interior side of the load-bearing structure. It performs several functions at once: it provides bracing, serves as a vapor barrier, and forms the airtight layer – for this, the joints and edge connections must be properly sealed.

The DWD panel on the exterior side further contributes to structural bracing. While this version is not quite as effective in terms of thermal bridging as one using a 60 mm wood fiber insulation panel, it offers a practical and functional solution – especially in serial renovation projects. The exterior cladding can be designed flexibly, for example with battens, Trespa panels, or a brick veneer.

Ventilated exterior wall – with wood fiber insulation panel

No foil necessary!



1. Gypsum plasterboard (12,5 mm)
2. Flexible wood fiber insulation (40 mm)
3. **elka esb P5 (15 mm)**
4. Flexible wood fiber insulation (160 mm)
5. Wood fiber insulation board (60 mm)
6. Ventilation cavity (30 mm)
7. Curtain wall (21 mm)

<-> Layers (beams) marked with arrows run perpendicular to the main axis.

Expert assessment

U-value 0,17 W/(m²K)

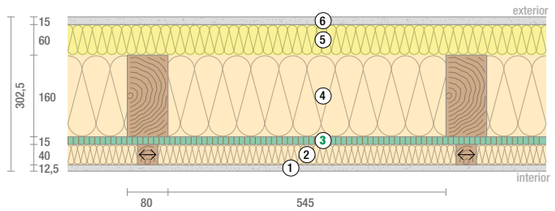
0.15 W/(m²K) with 200 mm timber studs (suitable for Efficiency House 40!)

This design is optimal in terms of moisture control and offers excellent building physics properties. The esb panel, serving as the bracing layer, is placed on the interior side of the load-bearing structure and also functions as a vapor barrier and airtight layer — provided that all joints and edge connections are carefully sealed.

On the exterior, a 60 mm thick wood fiber insulation panel is used, ensuring excellent thermal protection. A major advantage is that the structural timbers are fully enclosed within the insulated area — this minimizes thermal bridging. Additionally, the base connection detail can be effectively resolved with this construction. The outer cladding can be chosen flexibly, such as with battens, Trespa panels, or brick veneer.

Plastered exterior wall

No foil necessary!



1. Gypsum plasterboard (12,5 mm)
2. Flexible wood fiber insulation (40 mm)
3. **elka esb P5 (15 mm)**
4. Flexible wood fiber insulation (160 mm)
5. Wood fiber insulation board (60 mm)
6. Exterior plaster (15 mm)

<-> Layers (beams) marked with arrows run perpendicular to the main axis.

Expert assessment

U-value 0,17 W/(m²K)

0.15 W/(m²K) with 200 mm timber frame (suitable for Efficiency House 40!)

This wall construction is not critical in terms of moisture and has proven itself in practice many times. The esb panel is used as the bracing layer. Since it is placed on the interior side of the load-bearing structure, it also functions as a vapor barrier and forms the airtight layer — provided that the joints and edge connections are carefully sealed.

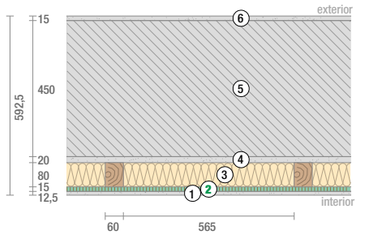
The exterior of the wall is plastered, resulting in a robust, simple, and low-maintenance surface.

The example constructions shown for walls, ceilings, and roofs are illustrative representations. They do not replace case-specific building physics calculations that take all local conditions into account. The examples provided are for informational purposes only and do not constitute a guarantee of specific properties.

esb construction recommendations __Interior wall

Interior insulation system in renovation

No foil necessary!



1 Gypsum plasterboard (12,5 mm)
2 **elka esb P5 (15 mm)**
3 Flexible wood fiber insulation (80 mm)
4 Lime plaster (20 mm)
5 Rubble masonry (450 mm)
6 Exterior plaster (15 mm)

Expert assessment

U-value 0,42 W/(m²K)

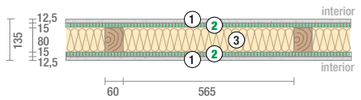
Eligible for funding as a BEG individual measure for historic buildings and other particularly valuable building structures

When using an interior insulation system in renovation, special care is required – especially regarding moisture protection. According to DIN 4108-3, the construction must be verified for moisture performance using a hygrothermal simulation. This simulation checks how much insulation is possible without causing moisture damage.

Key influencing factors include the building's location, its use, the condition of the existing masonry, and the existing plaster layers. The simulation helps determine the maximum allowable insulation thickness – a crucial planning step for safe implementation.

Interior wall

No foil necessary!



1 Gypsum plasterboard (12,5 mm)
2 **elka esb P5 (15 mm)**
3 Flexible wood fiber insulation (80 mm)

U-value 0,42 W/(m²K)

Expert assessment

This interior wall construction in timber frame design impresses with its ecological approach, high stability, and easy handling. The load-bearing timber frame is clad on both sides with esb boards. Thanks to their consistently high density and single-layer structure, these boards are ideally suited for interior finishing.

Their high strength and good surface quality make the wall highly versatile – suitable for both residential and commercial buildings. If needed, the construction can be easily extended, for example with an installation layer, additional insulation materials, or further claddings such as clay plaster – also to improve sound insulation.

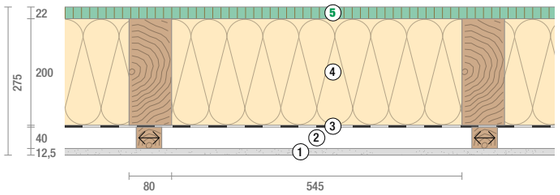
esb construction recommendations __Ceiling

Do you have questions about your wall construction? Just send us an email!

vertrieb@elka-holzwerke.de

Top floor ceiling with cavity insulation only

With vapor barrier



1 Gypsum plasterboard (12,5 mm)
2 Installation layer (40 mm)
3 Vapor barrier sd=100
4 Flexible wood fiber insulation (200 mm)
5 **elka esb P5 (22 mm)**

<-> Layers (beams) marked with arrows run perpendicular to the main axis.

U-value 0,21 W/(m²K)

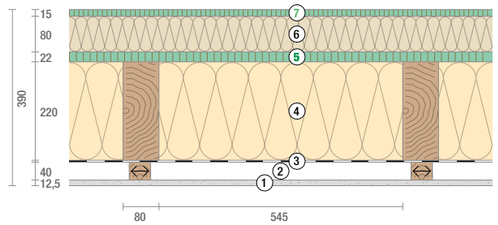
Expert assessment

This design is uncritical in terms of moisture protection and works well in practice. Compared to an OSB board as a load-distributing layer, the esb board proves to be significantly more forgiving – especially when it comes to moisture and handling, further explanations on page 23.

Important: With this solution, the insulation is placed only in the cavity, which leads to slightly higher thermal bridging losses compared to a full-surface covering, such as with an additional 80 mm thick wood fiber insulation board. More building physics details and verifications can be found in the WUFI report on the elka-Holzwerke website: www.elka-holzwerke.de.

Top floor ceiling with cavity insulation and supplementary insulation

With vapor barrier



1 Gypsum plasterboard (12,5 mm)
2 Service cavity (40 mm)
3 Vapor barrier sd=100
4 Flexible wood fiber insulation (220 mm)
5 **elka esb P5 (22 mm)**
6 Wood fiber insulation board (80 mm)
7 **elka esb P5 (15 mm)**

U-value 0,14 W/(m²K)

Expert assessment

eligible for funding as a BEG individual measure

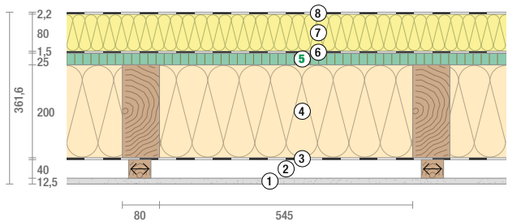
This variant is also uncritical in terms of moisture protection and offers clear advantages in thermal insulation compared to cavity insulation alone. The additional insulation layer – for example, made of wood fiber boards – fully integrates the load-bearing structure into the insulation layer, significantly reducing thermal bridges.

The beams are "within the warm zone." This allows for a funding-eligible construction and often permits the use of slimmer beam cross-sections. This makes the design not only energy-efficient but also economically attractive.

esb setup recommendations __flat roof

Flat roof with cavity insulation

With moisture-variable vapor barrier



1. Gypsum plasterboard (12,5 mm)
2. Service cavity (40 mm)
3. Humidity-variable vapor barrier
4. Flexible wood fiber insulation (200 mm)
5. **elka esb P5 (25 mm)**
6. Sealing membrane
7. EPS 035 (80 mm)
8. Sealing membrane

<-> Layers (beams) marked with arrows run perpendicular to the main axis.

Expert assessment

U-Wert 0,14 W/(m²K)

Eligible for funding as a BEG individual measure

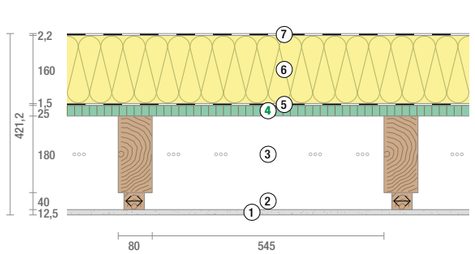
For an unventilated flat roof with cavity insulation, special care is required for moisture protection. According to DIN 4108-3, the construction must be verified through a hygrothermal simulation. This variant is considered standard and should generally be implemented in this way – especially since it is eligible for funding as a BEG individual measure.

The correct structure is crucial: the insulation above the esb board must be dimensioned to prevent moisture damage. Many factors play a role here – such as the location, building use, shading (e.g., from PV modules or a high parapet), roof graveling, or green roofing.

A moisture-variable vapor barrier is essential in this design to allow for drying. In addition to EPS or PIR, alternative insulation materials such as foam glass or cork may also be used.

Flat roof with pure above-rafter insulation

With waterproofing membrane



1. Gypsum plasterboard (12,5 mm)
2. Service cavity (40 mm)
3. Air layer (180 mm)
4. **elka esb P5 (25 mm)**
5. Sealing membrane
6. PIR insulation (160 mm)
7. Sealing membrane

Expert assessment

U-value 0,14 W/(m²K)

Eligible for funding as a BEG individual measure

This construction is considered the optimal solution in terms of moisture performance for flat roofs. With a U-value of 0.14 W/(m²K), it meets the highest energy efficiency requirements. All load-bearing timbers and wood-based materials are located on the warm side of the main insulation – minimizing thermal bridges and ensuring long-term reliability. The airtight layer is positioned on the outside, making the design especially robust and tolerant of errors.

Special loads such as green roofing, gravel layers, or elevated PV systems can also be implemented without difficulty.

esb construction recommendations __pitched roof

Do you have questions about your wall construction?
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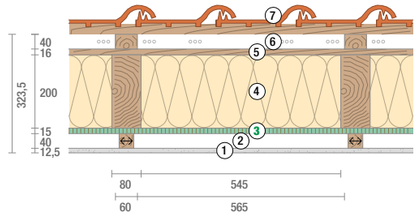
Pitched roof with cavity insulation and DWD board

No foil necessary!



1. Gypsum plasterboard (12,5 mm)
2. Service cavity (40 mm)
3. **elka esb P5 (15 mm)**
4. Flexible wood fiber insulation (200 mm)
5. DWD board (16 mm)
6. Ventilation cavity (40 mm)
7. Interlocking tiles including battens (103 mm)

Expert assessment

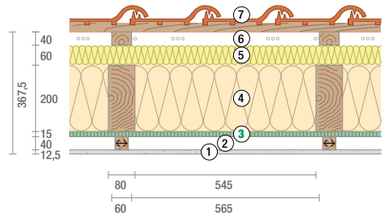
U-value 0,21 W/(m²K)

This roof structure is moisture-safe and open to diffusion on the outside – allowing moisture to escape easily. A DWD board is used on the exterior, which provides greater bracing in addition to sheathing. This makes the setup especially practical when structural requirements demand increased reinforcement.

A reliable, practical solution for long-lasting pitched roof constructions.

Pitched roof with cavity insulation and wood fiber insulation board

No foil necessary!



1. Gypsum plasterboard (12,5 mm)
2. Service cavity (40 mm)
3. **elka esb P5 (15 mm)**
4. Flexible wood fiber insulation (200 mm)
5. Wood fiber subroof board (60 mm)
6. Ventilation cavity (40 mm)
7. Interlocking tiles including battens (103 mm)

Expert assessment

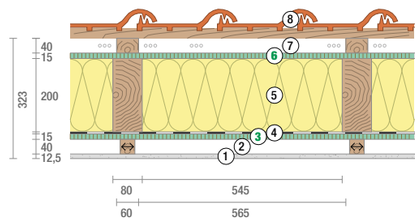
U-value 0,17 W/(m²K)

This design is optimal in terms of moisture protection and features an outwardly diffusion-open structure – allowing moisture to be reliably discharged. The wood fiber insulation board serves as the subroof and also contributes to thermal insulation. This solution is ideal for constructions with high requirements for moisture protection and energy efficiency.

However, if greater bracing is needed, a DWD board should be used instead of the wood fiber board.

Pitched roof with cavity insulation and esb board on the outside

With vapor barrier



1. Gypsum plasterboard (12,5 mm)
2. Service cavity (40 mm)
3. **elka esb P5 (15 mm)**
4. Vapor barrier sd=10
5. Mineral wool WLG035 (200 mm)
6. **elka esb P5 (15 mm)**
7. Ventilation cavity (40 mm)
8. Interlocking tiles including battens (103 mm)

Expert assessment

U-Wert 0,20 W/(m²K)

This variant is technically feasible in terms of moisture, but not ideal. The esb board here serves as the bracing layer on the exterior – however, this should only be used when structural or construction process constraints leave no other option. It is better to install the esb board on the inside and use a soft wood fiber subroof board or a DWD board on the outside.

At least the esb board on the exterior offers more safety than so-called “vapour-permeable” microporous membranes, whose pores can clog under high humidity. However, placing the esb board on the outside leads to greater thermal bridging losses – the tops of the rafters are not within the insulated area.

It is especially important to carefully seal the interior vapor barrier to prevent moisture intrusion by convection. In some cases, this construction may even be critical in terms of moisture performance – depending on the location, usage, roof orientation, or shading (e.g., from PV modules). In such cases, a hygrothermal simulation is essential for moisture protection assessment.

esb setup recommendations __pitched roof

**Do you have questions about your wall construction?
Just send us an email!**

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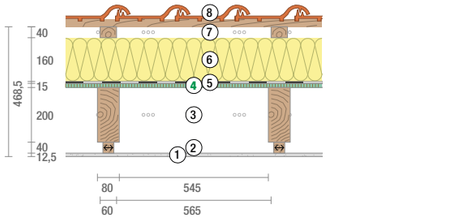
Pitched roof with pure above-rafter insulation

With sub-roof membrane



1. Gypsum plasterboard (12,5 mm)
2. Service cavity (40 mm)
3. Air layer (200 mm)
4. **elka esb P5 (15 mm)**
5. Subroof membrane
6. PIR insulation (160 mm)
7. Ventilation cavity (40 mm)
8. Interlocking tiles including battens (103 mm)

<-> Layers (beams) marked with arrows run perpendicular to the main axis.

Expert assessment

U-value 0,14 W/(m²K)

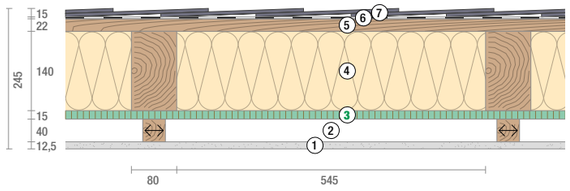
Eligible for funding as a BEG individual measure

This construction is considered particularly safe and free from moisture-related risks. It is eligible for funding under the BEG individual measures and meets high energy efficiency standards. All load-bearing timbers and wood-based materials are located on the warm side of the main insulation, effectively preventing thermal bridges.

The airtight layer runs outside the load-bearing structure, making the design robust and durable. This setup also allows for the use of alternative insulation materials – such as stone wool – depending on requirements and planning. Overall, this variant offers a high-quality, efficient, and future-proof solution for pitched roofs.

Pitched roof with cavity insulation and slate covering – renovation

With sub-roof membrane



1. Gypsum plasterboard (12,5 mm)
2. Service cavity (40 mm)
3. **elka esb P5 (15 mm)**
4. Flexible wood fiber insulation (140 mm)
5. Wood cladding (22 mm)
6. Subroof membrane sd=0,1m
7. Slate covering (15 mm)

<-> Layers (beams) marked with arrows run perpendicular to the main axis.

Expert assessment

U-value 0,28 W/(m²K)

Eligible for funding as a BEG individual measure for listed buildings and other valuable existing structures

This renovation variant is considered critical in terms of moisture performance. Even when a sub-roof membrane with a low sd-value is used, the slate covering itself acts as a highly diffusion-inhibiting layer – with an equivalent sd-value of about 4 to 7 meters across the entire surface. This significantly limits drying to the outside. However, this solution is still considerably less problematic than constructions with bitumen roofing membranes.

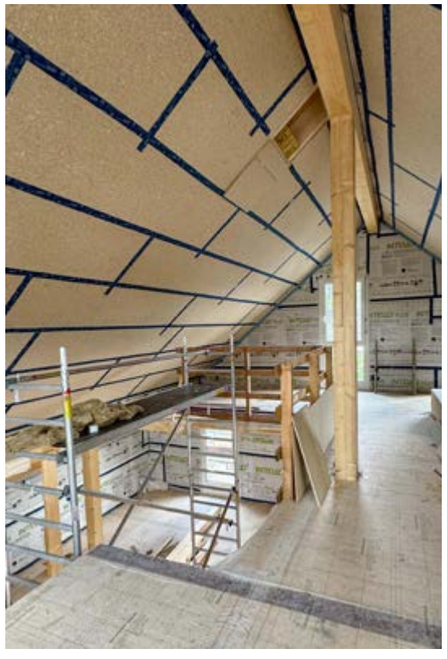
For safe implementation, a hygrothermal simulation is absolutely necessary. This determines the maximum possible insulation thickness in the cavity area – taking into account location, usage, shading (e.g., from PV modules, dormers, or neighboring buildings), and other factors. Depending on the results, the use of a moisture-variable vapor barrier may be necessary to control moisture peaks and prevent structural damage.

Selected projects

Private single-family home in the Eifel // esb-Plus with ClayTec clay plaster

Timber post-and-beam construction with large-area application of ClayTec clay plaster, executed by Holzbau Krings Reinke, Monschau

Inara Suites, guesthouse at Seehotel Wiesler, Titisee // esb-Plus attic expansion



The Inara Suites are a long-term experiment. The Wiesler hotelier family used only sustainable, circular building materials for the project, documented everything, and created a house that is likely unique in this form. The attic was completely clad with esb-Plus wood construction panels. Further information at www.elka-holzwerke.de

Selected projects

Weleda Logistics Campus Schwäbisch Gmünd // ESB panels in interior construction

A flagship project of sustainable construction using wood and clay, opened in 2024 to wide media attention and carefully integrated into the landscape of the Swabian Alb. Over 2,000 m² of ESB panels were used in the interior.

(Photo: Michelgroup)

Zurich Zoo, Elephant House // esb-Plus panels in the roof structure

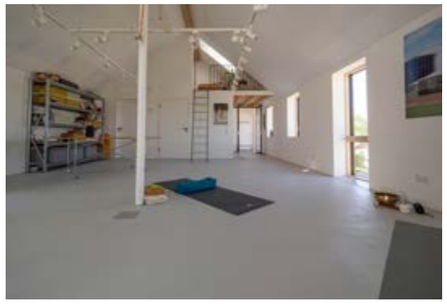
Breathtaking architecture provides the elephants at Zurich Zoo with a spacious, light-filled habitat. The organically designed roof spans approximately 6,000 m² and bridges spans of up to 85 meters. esb-Plus panels were used in the substructure of the roof.

Photo: Sika Schweiz AG, with kind permission of Zurich Zoo

esb panels in application

Private single-family home in the Eifel // esb-Plus in interior construction

Timber frame construction with esb-Plus as visible interior cladding, painted white, executed by Holzbau Krings Reinke, Monschau



Studio house // “Homebricks” modular system made of esb-Plus

The studio of young artist Hannah Rabl is located in Ebersdorf, Austria. It was built using the patented „Homebrick“ interlocking blocks, which are made from esb-Plus panels, assembled on-site, and insulated with materials such as cellulose. The use of screw foundations helps prevent soil sealing.

Strong partners in climate-friendly construction

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In our daily work, we place great value on quality, ecological responsibility, and long-term partnerships. That is why we are especially pleased to collaborate with selected companies that not only come from the same sector – ecological and sustainable construction – but also share our values. Our partner companies stand for innovation, responsibility, and conscious use of natural resources.

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ArgillaTherm® Die Natur-Klimadecke

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www.argillatherm.de

ArgillaTherm develops innovative clay climate systems for surface heating and cooling. The combination of natural materials and modern technology makes their products unique. Clay as a storage medium not only creates a pleasant indoor climate but also helps regulate humidity – all without artificial additives. ArgillaTherm represents an intelligent blend of tradition and technology.

CEMWOOD GmbH

CEMWOOD Mineralisch ummantelte Holzspäne

Glindenberger Weg 13 · D-39126 Magdeburg

www.cemwood.de

CEMWOOD GmbH specializes in producing mineral-coated wood chips used as leveling fill in drywall construction. Their products combine high compressive strength with ecological safety and are especially dimensionally stable and mold-resistant. CEMWOOD represents resource-efficient recycling of residual wood and a well-thought-out circular economy.

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ClayTec is one of the leading manufacturers of clay building materials in Germany. The company brings decades of experience and combines traditional craftsmanship with industrial production. Whether clay plasters, boards, or paints – all products are characterized by their naturalness, sustainability, and building biology quality. ClayTec stands for authentic ecological construction using one of humanity's oldest building materials.

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GUTEX wood fiber board factory

GUTEX

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www.gutex.de

GUTEX produces high-quality insulation materials made from wood fibers – made in Germany. The natural materials provide excellent heat protection in summer, thermal insulation in winter, and a healthy indoor climate. Particularly noteworthy is GUTEX's commitment to energy efficiency and CO_2-neutral production. The company combines technological advancement with ecological responsibility.

Moll Building ecological products GmbH | Pro Clima

pro clima®

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Moll, better known under the brand **Pro Clima**, develops airtight system solutions for modern timber and passive house construction. With innovative vapor retarders, adhesive tapes, and connection systems, Pro Clima sustainably protects the building envelope from moisture damage. Moll stands for precision, research, and the highest building biology standards – for durable, healthy buildings.

STEICO SE

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www.steico.de

STEICO is one of the world's leading providers of wood fiber insulation materials, load-bearing timber construction elements, and system solutions for ecological building. The company combines industrial manufacturing with sustainable forestry and places great importance on the CO_2 balance of its products. STEICO stands for integrated timber construction systems that combine stability, efficiency, and environmental friendliness.

WEM GmbH

WEM® FLÄCHENHEIZUNG UND -KÜHLUNG

Rudolf-Diesel-Straße 37 · D-56220 Urmitz

www.wandheizung.de

WEM GmbH develops clay-based surface heating and cooling systems that offer a healthy living alternative to conventional heating systems. Particularly noteworthy is the combination of energy efficiency, living comfort, and ecological materials. WEM combines technology and nature into a harmonious overall concept for sustainable construction and renovation.

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