

# Construction processes.

Whether in new construction or refurbishment, Leipfinger-Bader offers integrated solutions for sustainable buildings of today and tomorrow.

The Leipfinger-Bader system solutions

Clay block systems	Silvacor, Coriso, Precision brick, Block brick, Unfired brick, Clay brick, Mortar Pad, Mortar, Column formwork, Ring beam formwork, Slab edge element, Roller shutters and venetian blinds
Modular construction	Prefabricated clay block element, Prefabricated clay component Clay block module
Ventilation systems	Decentralised ventilation system with heat recovery Decentralised ventilation exhaust air Hybrid ventilation system
Flooring and heating	Screed replacement tile, Screed design tile Sheet heating system
Slab systems	Timber-earth solid slab Earthen masonry ceiling with extruded earth blocks Clay block suspended ceiling
Timber construction	Wooden roller shutters and venetian blinds Ventilation systems
Clay and earth construction	Clay panel Clay plaster, Clay paint Prefabricated clay components with rammed earth Prefabricated components with clay bricks
Facade systems TONALITY®	Refurbishment solutions Ceramic Facade Ceramic Slat Integration with building technology
Cradle To Cradle	Recycling Brick granules for green roofs

03 <u>Leipfinger-Bader</u> Editorial



"Creating affordable housing and promoting construction are central aspects of our vision. We are committed to implementing innovative concepts that enable people to find affordable housing while simultaneously realizing sustainable and resource-efficient construction projects."

**Thomas Bader** CEO Leipfinger-Bader

Leipfinger-Bader supports its customers in realizing construction projects that meet ESG criteria (Environmental, Social, Governance) by offering sustainable and socially responsible products.

In the environmental sector, the company has modernized its production facilities to reduce energy consumption and increase efficiency. Local clay extraction reduces  $\mathrm{CO}_2$  emissions and strengthens regional economic cycles.

Furthermore, Leipfinger-Bader produces building materials with the aim of reducing  ${\rm CO_2}$  emissions for the construction of buildings.

In the social sector, Leipfinger-Bader is committed to creating jobs in rural areas and promoting sustainable building practices. By using renewable energy sources, such as photovoltaic systems, and reforesting extraction sites, the company demonstrates its commitment to ecological responsibility. As a member of the Bavarian Environmental Pact, Leipfinger-Bader actively promotes environmentally friendly business practices and sets standards in ecological business management.

These measures help meet ESG criteria. Additionally, Leipfinger-Bader's products contribute to construction projects being recognized as sustainable and socially responsible.







for sustainable new construction

## Silvacor

# The solid clay block filled with up to 65% wood

Healthy, ecological living with integrated insulation made from pure softwood fibers offering outstanding thermal insulation. A sustainable, natural, and efficient wall construction material solution for future-oriented building.

- No external thermal insulation composite system required
- Optimal indoor climate in summer and winter
- Effective heat protection
- Exclusively natural raw materials
- Easily recyclable
- Also available as prefabricated elements

## Coriso

# New standards in multi-story residential construction

The Coriso is based on purely natural raw materials. The solution contains no chemical additives, solvents or pollutants, scoring top-notch values in building physics.

- Energy efficiency as a result of integrated thermal insulation
- Optimum sound insulation in multistorey residential buildings
- Healthy living environments thanks to the use of natural materials
- Optimum statics
- Easily recyclable
- Also available as prefabricated elements



KFN 40 with/without QNG

# Innovative and sustainable accessory products



Time savings and reduction of labor costs



### Column formwork

- Less time required due to simple and fast processing
- Can be cut on-site and connected to column formwork

Ring beam formwork

- No need for formwork or brackets for position securing
- Recyclable and ecological, certificate of compliance with disposal provisions
- Coldilli lollilivoik
- Less time required due to simple and fast processing
- Can be filled with concrete to storey height, no lateral support required
- Can be connected to ring beam formwork
- Recyclable and ecological, certificate of compliance with disposal provisions



# Slab edge element

- System solution for thermally insulated slab ends
- Solid clay block formwork
- Ideal plaster base
- No shuttering work
- High level of sound insulation



# Roller shutters and venetian blinds

- High level of sound insulation
- High degree of thermal insulation
- Weather-resistant
- Excellent plaster adhesion
- Clearance certificate for disposal

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Also available as wooden or lightweight construction

## Modular and serial construction

In modular or serial construction, individual modules are pre-fabricated under industrial conditions and assembled onsite, ensuring high efficiency in planning and execution. This significantly shortens construction time and minimizes disruptions in the surrounding area of the construction site.

Upon request, the elements are delivered with integrated system components and installation preparations.

### **Planning and Production**

- High degree of prefabrication in the production hall
- High, consistent execution quality
- Reliable schedule and planning certainty
- Investment security

#### **Assembly**

- Short on-site assembly and expansion time
- Earlier readiness for occupancy
- Low personnel requirements

### **Ecology**

- Reduced construction site traffic
- Energy standard according to GEG 2023: Efficiency House KFN 40 EH (including QNG) can be achieved





Up to 60 % depreciation possibility – QNG 40

# Clay block modules

The future of construction is modular – and it is now.

# Versatile and robust: The advantages of clay block modules

- Durability and robustness
- Fire protection
- Soundproofing
- Thermal insulation
- Sustainability
- Customizable through the type of manufacturing

## The numerous applications of clay block modules

From modern office buildings to comfortable dormitories for students, caregivers, seasonal workers, and service personnel clay block modules adapt to a wide range of living needs.

They are also suitable for the rapid provision of refugee accommodations and as supplementary buildings, such as for nursing homes.



Up to 95% prefabrication





# Plastered exterior facade optional

02

### Attachment points

For efficient and safe on-site assembly

#### 03

### Clay blocks

with integrated thermal insulation

04

## Exterior doors and windows

optionally configurable



# Prefabricated clay block elements

Leipfinger-Bader offers, in addition to prefabricated clay block modules, high-quality prefabricated clay block elements that allow for quick and economical construction. The highest energy standards are achieved in the process.

The prefabricated wall elements for interior and exterior walls are manufactured simply and precisely. Upon request, the elements can be delivered with integrated roller shutters, ventilation systems, and window frames, as well as fully plastered, which further saves trades and costs.

Through audited manufacturing processes, Leipfinger-Bader also offers the highest project security and transparency at all times. KFN 40 eligible for funding with/without QNG

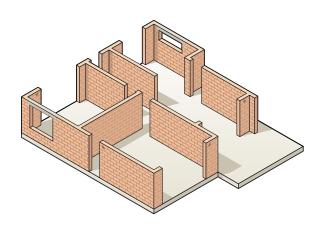


Fig.: Floor plan of a shell construction with prefabricated clay block elements





# 110 residential units in 10 weeks with prefabricated clay block elements

The Werneuchen project, utilizing prefabricated clay block from Leipfinger-Bader, successfully demonstrates the construction of a residential complex completed in just 10 weeks.

This innovative approach addresses the challenges of the current housing shortage and emphasizes energy efficiency, space optimization, and cost-effectiveness. The use of prefabricated clay block elements qualified the building for KfW 40 Plus and resulted in significant time and cost savings.

Additionally, the integration of prefabricated elements with decentralized ventilation technology enabled precise material calculations and a noticeable reduction in construction time, contributing to cost efficiency. Overall, the project illustrates a paradigm shift in construction, demonstrating the feasibility of high-quality, affordable housing, such as offering living space in Werneuchen for less than twelve euros per square meter in rent.

Leipfinger-Bader provided not only the products but also comprehensive planning for the structural framework, sound-proofing, fire protection, and ventilation concept. A major economic success was achieved through the subsequent optimization of the masonry to gain larger living areas.



# Prefabricated clay block elements

Prefabricated walls made of clay bricks combine traditional building materials with modern manufacturing technology in an innovative way.

They enable a fast, environmentally friendly, and efficient construction method that unites the natural advantages of clay – such as moisture regulation, thermal insulation, and durability – with the precision and speed of prefabrication.

These walls represent sustainable building and offer both ecological and economic benefits through shortened construction times, a healthy indoor climate, and high quality assurance.

# Rammed earth prefabricated elements

The rammed earth prefabricated wall combines the advantages of traditional earth construction with modern manufacturing methods, providing an efficient and high-quality alternative to conventional rammed earth walls.

Compared to the traditional method, where walls are constructed directly on-site, prefabricated walls offer significant time and cost savings by eliminating drying times and reducing the need for formwork and scaffolding. Prefabrication also ensures consistent quality and allows for precise planning of the construction process.



Reduced construction time



# Store heat – heat less

To exchange old, stale indoor air with new, fresh air, it must be moved. In so-called natural ventilation, wind and weather-induced pressure differences are used for this purpose. Window ventilation operates on a similar principle.

In mechanical ventilation, the heating energy of the used indoor air (exhaust air) is transferred to the fresh outside air (supply air) using a heat exchanger. This way, fresh air enters the living spaces without losing all the heating energy.

# Quick exhaust for bathroom or kitchen

The exhaust sets, with a maximum capacity of up to 100 m³/h, are perfect for installation in small to medium-sized rooms where a lot of moisture and exhaust air are generated. This makes them ideal for installation in bathrooms and toilets, as well as in kitchens.

The exhaust set not only reliably transports used air and excessive moisture outside but also offers numerous other advantages, such as a run-on timer and an integrated humidity sensor.

# Roller shutter and venetian blinds including ventilation system with heat recovery







Heat recovery up to 93%

#### Solid construction

Our roller shutter in solid construction can be installed with a wall thickness starting from 36.5 cm and features excellent soundproofing and thermal insulation properties.

The decentralized ventilation system is mounted in the EPP installation block located on the side of the box and is connected to a ventilation duct integrated into the insulation.

#### Lightweight construction

The roller shutter in lightweight construction is an attractive alternative to the classic clay block roller shutter due to its low weight. Additionally, the lightweight box without ventilation system is available with a wall thickness starting from 26.0 cm, while still offering excellent thermal insulation properties. The product is weather-resistant, provides high stability, excellent plaster adhesion, and is easily recyclable. The rolling space is not reduced by the ventilation.

#### Wooden construction

Our wooden roller shutter with an integrated ventilation system is now also available for wooden and monolithic construction. The interior of the box consists of an expandable chamber system filled with ecological hemp-jute fibers, making the product ideal for passive houses and climate-friendly residential buildings for KFN 40 QNG Plus. The system is environmentally friendly and energy-efficient in production. The rolling space is not reduced by the ventilation.







# Compact Air Handling Unit: Efficient combination of central and decentralized ventilation

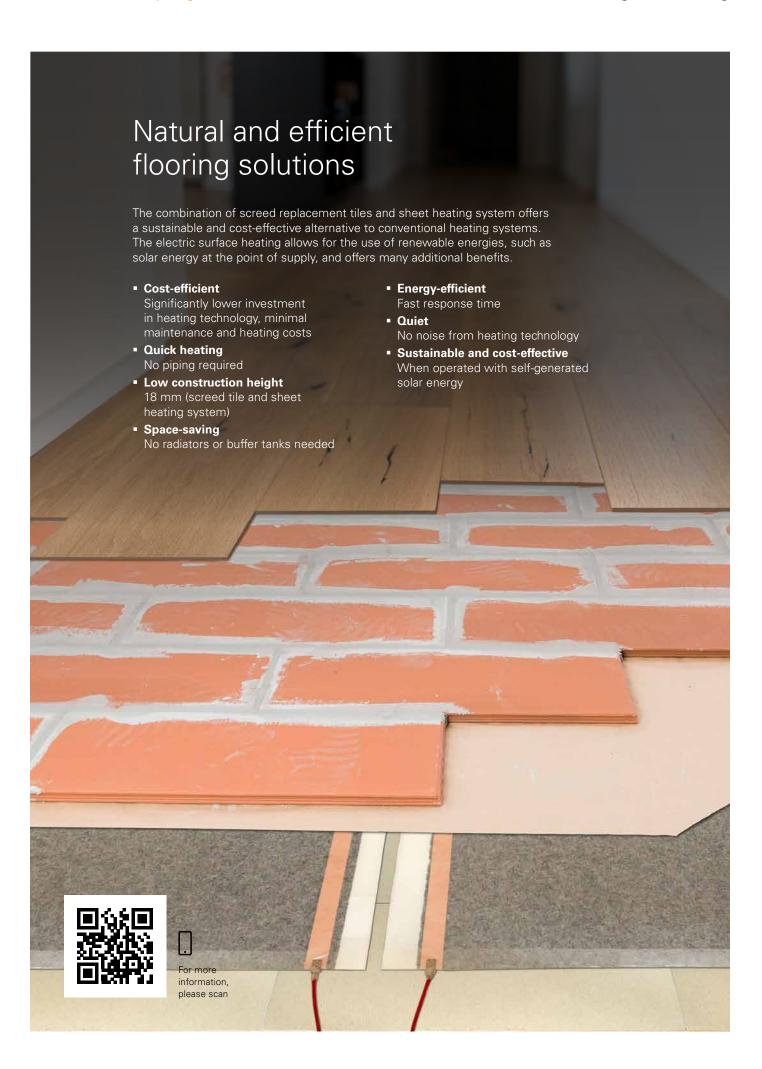
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Innovative copper heat exchanger with 90% heat recovery Leipfinger-Bader's latest ventilation solution combines the advantages of central and decentralized systems into a compact and powerful device. Featuring an revolutionary copper heat exchanger with 1000 times the thermal conductivity of conventional polyethylene heat exchangers, the device is particularly thin and narrow.

This exceptional thermal conductivity enables quick and efficient heat exchange between air streams, significantly shortening the path the air streams must travel to interact.

Even at outdoor temperatures below 0°C, the device maintains a high heat recovery rate (HRR), making it an excellent choice for cold climates. In normal operation, the device achieves an highly effected heat recovery of 90% at 60 m³/h. Additionally, it offers a maximum airflow rate of 125 m³/h, making it suitable for a wide range of applications.

For easy retrofitting in existing buildings, the device can be installed as a surface-mounted unit using two 130 mm core drill holes. This installation flexibility makes it an excellent choice for both renovation projects and new constructions. Experience the future of ventilation technology with our powerful and space-saving solution.



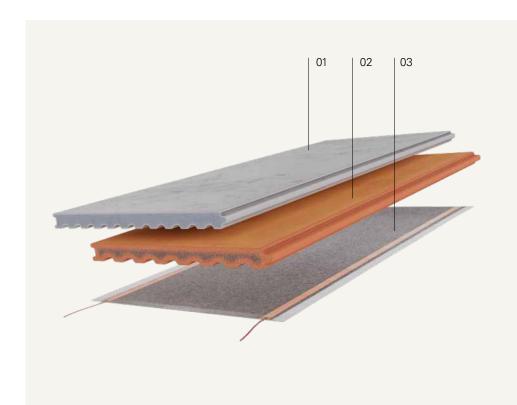


# Screed replacement tile

In many buildings, the installation of screed leads to moisture problems and complaints – thanks to the screed replacement tile, this is now a thing of the past. No more long waiting times of 4 to 6 weeks. Walkable after 24 hours – loadable after 48 hours, without cracks and expansion joints.

# Sheet heating system

The low-voltage underfloor heating system is used for tempering and heating floors indoors. This surface heating provides pleasant radiant heat, warming the floor, walls, and surrounding objects. The lower thermal conductivity of clay ensures that the screed replacement tiles excellently retain the heating warmth.



#### 01

#### Design screed tile

The design screed tile is a versatile alternative to tiles and natural stone, serving as both screed and top layer in one.

#### 02

#### Screed replacement tile

The screed replacement tile offers high flexibility in floor design as an alternative to design screed tile and is suitable for direct bonding, such as with solid wood parquet.

#### 03

### Sheet heating system

Contacted via two parallel electrodes, the heating layer warms up quickly due to the applied voltage. The system is controlled by a room thermostat with additional floor sensors.



Robust and water resistant

### Surface variations







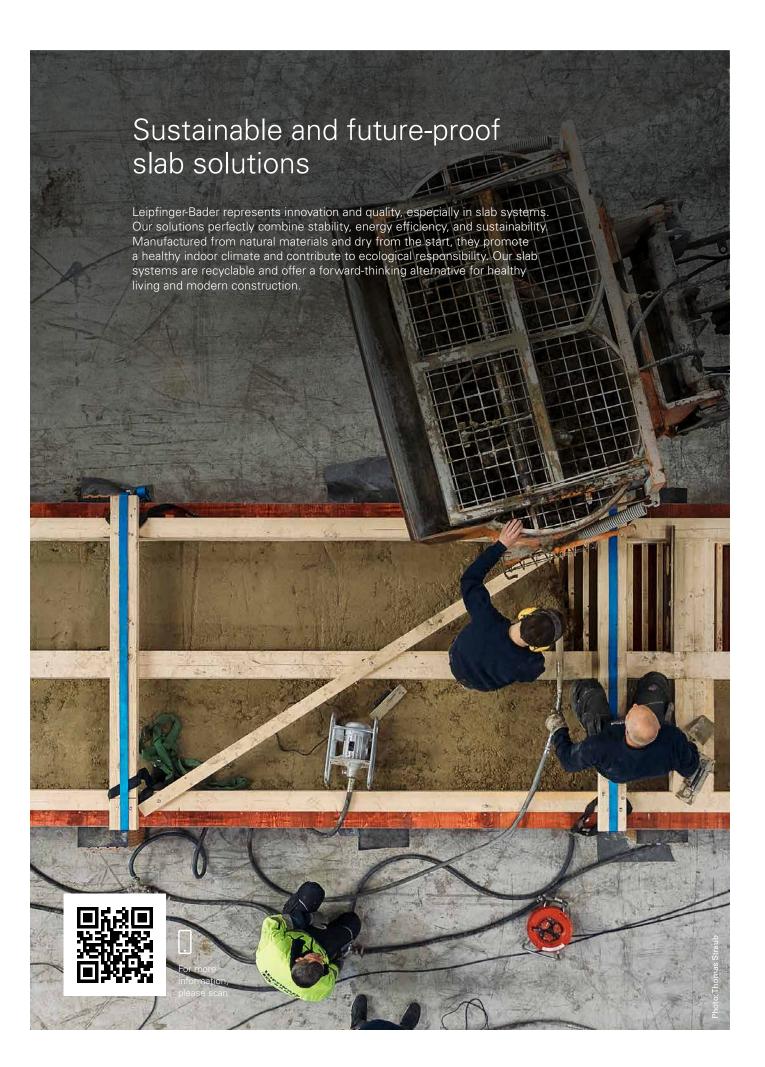








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## Timber-earth solid slab

With a surface density of more than 250 kg/m², the timber-earth solid slab combines the best of both worlds: the thermal mass, sound insulation, and fire protection of solid ceilings with the eco-friendliness and natural ambiance of wood ceilings. Thanks to these qualities, they are suitable for a wide range of applications – from residential buildings to office constructions and schools.

An innovative process allows clay to be cast instead of rammed, enabling a time-and cost-efficient production process. The prefabricated elements are manufactured at Leipfinger-Bader's facilities and can be installed in both wooden and solid structures. Upon request, technical installations or acoustic panels can be integrated into the prefabricated elements.



- Wide applicability
- Installer-friendly
- CO<sub>2</sub> storage
- Time and cost efficient
- Integration of building technology
- Integration of building services
- Recyclable
- High fire protection
- High sound insulation
- Comfort and energy efficiency
- Mass production capable

# Earthen masonry ceiling with extruded earth blocks

As a concrete solution for sustainable architecture, the earthen masonry ceiling with extruded earth blocks was developed. Placed between wooden beams and filled with clay mortar, the earth block offers fire protection, sound insulation, thermal mass, and moisture regulation.

Due to its high strength, the earth block can serve as a secondary support system, allowing for the omission of formwork on the upper side of the beams.

- High surface density: ~100kg/m²
- Sustainable alternative to solid ceilings
- Recyclable through the later separability of materials
- Upcycling by using recycled clay block grinding dust
- Increased living comfort through sound insulation
- High energy efficiency and balanced indoor climate



Available both as prefabricated components and as individual blocks









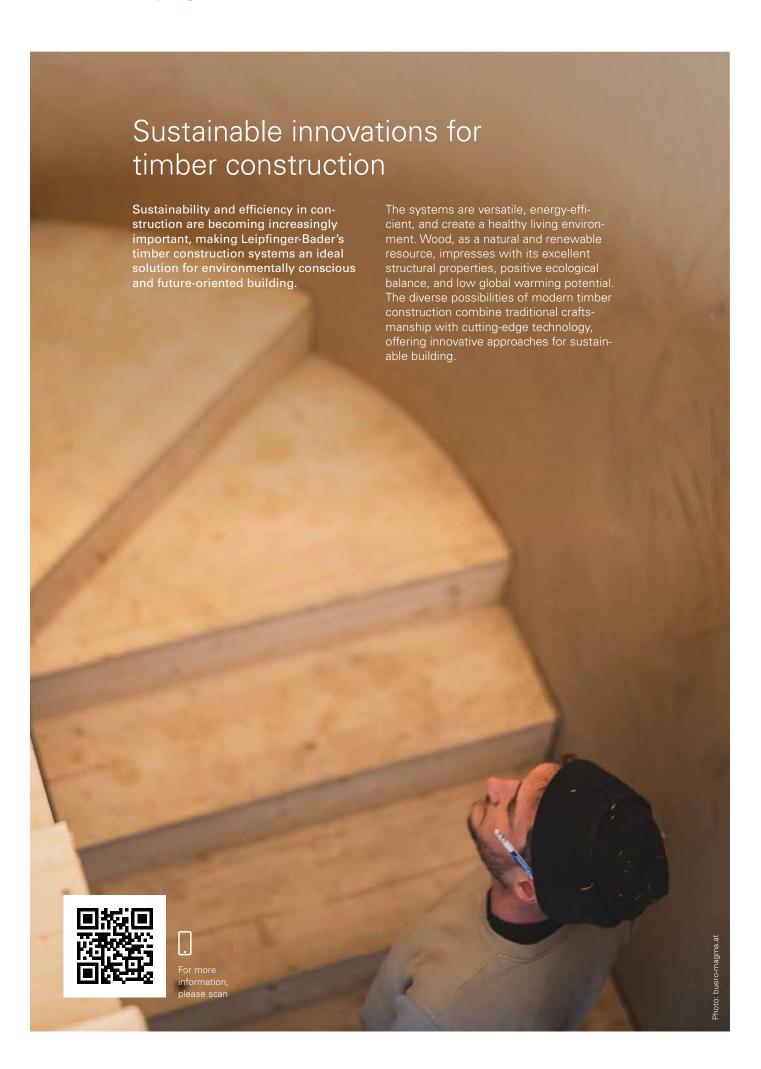
# Clay block suspended ceiling

The suspended clay block ceiling consists of ceiling beams, clay blocks, and infill concrete. These components are delivered individually to the construction site and assembled into a ceiling there. This makes the clay block ceiling extremely versatile, even for complex layouts or very small areas.

With excellent thermal insulation and heat storage capacity, balanced humidity, and optimal sound insulation, a comfortable living environment is created.

Clay block ceilings are the perfect complement – not only for clay block masonry. With their high load-bearing capacity and excellent physical properties that are precisely matched to the walls, they offer not only high value retention but are also particularly sustainable due to their durability.

- as strong as a concrete ceiling
- better indoor climate
- optimal thermal and sound insulation
- highly fire-resistant (>F90)
- more affordable and sustainable
- Ideal for DIY installation and renovation of old buildings
- minimal formwork required
- minimal infill concrete needed
- low construction moisture
- low component weight
- suitable even for the smallest areas
- excellent for complex layouts



# Straw panel

Straw panels are created by compressing loose straw. The plaster base panels are produced by applying pressure, heat and binding agents (ecological adhesive).



- Straw is a renewable resource
- Straw is grown in a resource-efficient manner
- Straw has excellent insulating properties and offers a high level of thermal insulation, making it possible to compensate temperature variations
- Straw is a natural material and does not contain any toxic or harmful substances
- Easy to process
- CO<sub>2</sub>-storing

# Wooden roller shutter and venetian blind

The Leipfinger-Bader wooden box is made entirely from renewable raw materials and filled with a hemp-jute filling. The core structure made of wood fiber boards can be customized according to customer requirements.

This combination offers many ecological advantages, as both materials are recyclable. Additionally, they are durable, longlasting, and possess natural antibacterial properties. The hemp fibers are breathable and temperature-regulating, while the jute adds extra strength.

- CO<sub>2</sub>-storing
   Construction made from bio-fiber boards (QNG ready seal certified)
- Priming/impregnation with special wood oil
- Excellent thermal and sound insulation
- Weather-resistant, permanently dimensionally stable, frost-proof
- GEG-compliant thermal bridge values with equivalence according to DIN 4108-Bbl.2
- Self-supporting, stable modular system
- Available as an installation box
- Also available as a fire protection box according to DIN EN 1363-1
- Optional insect protection







# The natural solution for ecological interior construction

Especially in buildings and facilities where people spend a lot of time, the use of natural and healthy materials is essential.

#### Resource-efficient

Clay is infinitely available and is mined regionally in small clay pits. Short supply routes protect the environment.

### ■ Ecological / Recyclable

Low primary energy input in production. The conditioning and processing of clay require only little energy. Clay is 100% recyclable and compostable. Additionally, clay makes a good garden soil.

#### Fire Protection

Clay panels are classified as a class A1 building material (non-combustible) and are tested according to DIN EN 13501-1.

### Moisture regulation

Clay has a natural moisture-regulating ability, which helps maintain constant humidity levels in the building.

#### Insulation

Clay panels offer good thermal and sound insulation, reduce heating and cooling costs, and are an environmentally friendly alternative to synthetic insulation materials.

#### Healthy indoor climate

Natural materials in clay panels have a positive effect on the indoor climate, absorb air pollutants, and are immune to mold.

#### Durability

Clay removes excess moisture from straw and wood, ensuring long-term preservation. This is particularly beneficial for timber construction and half-timbered houses.

### Thermal stability

Clay has a natural heat and cold storage capacity, which helps maintain a constant indoor temperature, contributing to more comfortable living conditions.



For more information, please scan

# Clay brick

The clay brick for application class II is ideal for load-bearing walls and supports a healthy indoor climate by regulating moisture and providing effective thermal conductivity. Its heat storage capacity ensures comfortable temperatures in every season. Its versatility opens up new design possibilities in clay construction.

- High compressive strength (5.0 N/mm²)
- Made from 100% sustainable raw materials
- Thermal conductivity of 1.0 W/(mK)
- Ecological and fully recyclable, no construction waste upon demolition
- Versatile in use





# Clay panels

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suitable for new construction and renovation Modern and ecological drywall construction for greater sustainability in building. Clay panels are used throughout interior construction in drywall applications.

They can be applied in all areas of interior construction, including cladding of interior walls, wooden and metal frameworks, facing formwork, attic conversion for new construction, renovation, municipal and public buildings, commercial properties, industry, or private homes.

The radiant heat produced by the heated panels is considered particularly effective because it is also transferred to other walls, the floor, and objects in the room. For cooling, ceiling installation is recommended. Clay panels impress with their high thermal mass, as they warm up slowly and cool down just as slowly.

- Healthy and sustainable living
- Can absorb water vapor
- The humidity-regulating effect ensures the best indoor climate
- Low energy consumption in production
- Sound insulating 52–56 dB
- Non-combustible and 100% recyclableraw material
- Prevents fine dust dispersion and mold formation



# Clay plaster

Clay plaster is available in a variety of textures and colors, making it ideal for modern and aesthetic home construction on all standard building substrates.

- Healthy indoor climate through optimal moisture regulation and breathability
- Ecological natural product, VOC-free
- Appealing aesthetics and unique texture
- 100% recyclable
- Heat/cold storage capacity
- Preserves wood
- Vapor permeable

### Universal clay plaster

Basic or final plaster, 2-layer plaster up to 30 mm thick

### Final clay rendering

Final plaster,

1-layer plaster up to 15 mm thick

# Clay paints

Clay paints have several special properties that distinguish them from other wall paints:

#### Naturalness

lay paints are made from natural materials such as clay, sand, and water, and contain no synthetic additives. This makes them particularly eco-friendly and safe for health.

#### Color Intensity

Clay paints have a unique color intensity and a warm, natural, and pleasant appearance.

#### Durability

Clay paints are especially long-lasting and durable.

Effect additives can be integrated into colored clay plasters, allowing the surface to achieve special visual effects. These can give the room unique depth and texture, making it visually more interesting.



Application with standard equipment





# Renovation and modernization solutions

"Together with strong partners, there are solutions to renovate even buildings with external thermal insulation composite systems (ETICS).

- Renovation of ETICS without disposal costs
- Sustainable condensation and rain protection
- Design freedom and material diversity
- Durable and maintenance-free facade solution

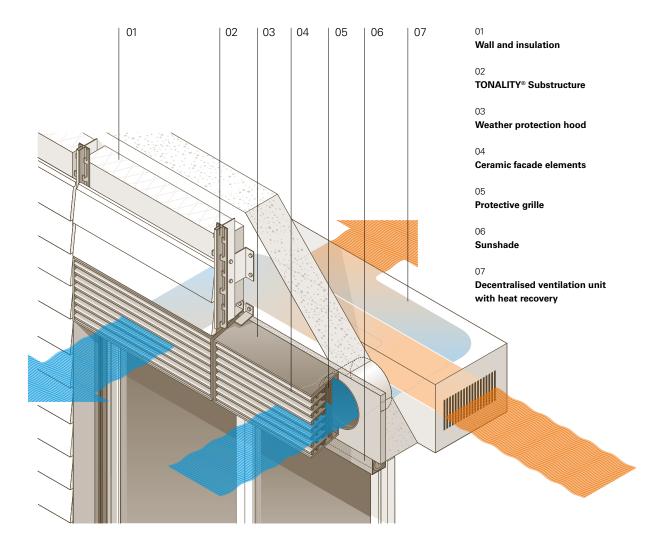
# Renovation of a residential home at Lake Constance

The new facade consists of alternately arranged TONALITY® ceramic and photovoltaic elements. Through an intensive coordination process, the distinctive slate appearance of the ceramic elements was developed and then custom-produced for this project. Since both the structural condition and the technical equipment of the building were outdated, it was comprehensively renovated and expanded, giving the house a unified form and clear architectural language. Visually striking on the facade is the interplay between the photovoltaic modules and the elements of the rear-ventilated facade.

# Decentralized facade-integrated ventilation for public buildings

In refurbishment projects, the integration of ventilation technology is often an economic and technical challenge. Decentralised ventilation systems offer an efficient solution here, as unlike centralised systems, they require almost no ventilation ducting. The units utilise the Coanda effect to optimise the air distribution in the rooms. The ventilation output can be adapted to the actual room usage automatically via air quality sensors as required.

The air flow is generated by quiet and energy efficient EC motors. The customisable facades from TONALITY® allow unlimited design freedom and even conceal the air inlets and outlets.







### Unfired brick

Composed of recycled brick residues and mineral binders, unfired bricks are pressed using a special process and then hardened without energy input. This innovation is the prototype of an unfired wall building material.

- Resource-efficient
- High bulk density and compressive strength
- Optimal sound insulation

# Recycling

Through innovative processes and techniques, Leipfinger-Bader holds a pioneering role in the field of sustainable processing methods for building materials. The goal is to reintegrate the products into the cycle or to develop new building materials from them.

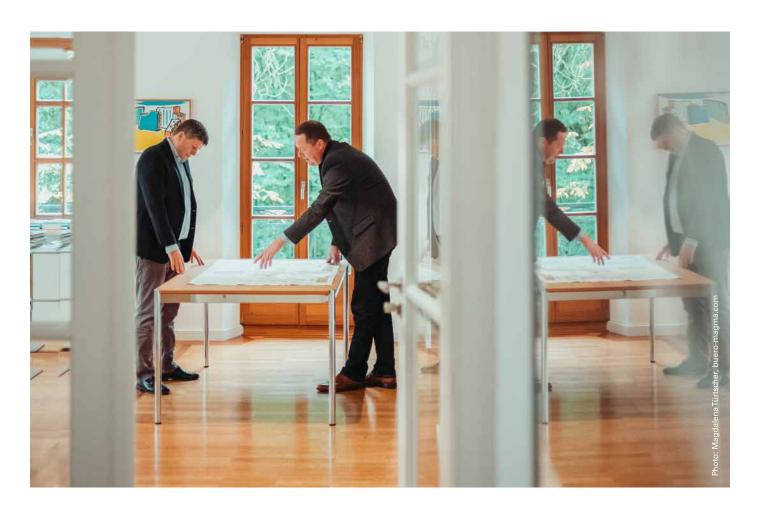
- Promotion of the Circular Economy
- Conservation of natural resources
- Reduction of air, noise, and climatedamaging emissions
- Reduction of the need for backfill and landfill capacities
- Use in so-called R-concrete



By using exclusively natural raw materials, bricks can be easily reused after the recycling process.

# This way, pure brick debris can be used in various ways:

- As a raw material substitute and additive in brick production
- As a surface layer without binders in the form of technical aggregates
- As a substrate in vegetation construction or for green roofing
- As a new generation of insulating material-filled masonry bricks



# We provide you with comprehensive and holistic advice.

Leipfinger-Bader offers comprehensive consulting services for construction experts, focusing on QNG certification and energy consulting.

The offering includes the development of individual solutions, support in planning and cost estimation, as well as assistance in applying for government subsidies.

With a strong focus on sustainability and energy efficiency, Leipfinger-Bader positions itself as an innovative partner, shaping the construction of tomorrow with its expertise and product innovations. Leipfinger-Bader provides not only advice but also practical support to facilitate the implementation of energy-efficient and environmentally friendly projects.

Contact us.









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