



SiBoard

Composite boards and profiles
based on non-organic binder

April 2021





SiBoard

SiBoard is a family of **composite boards** based on our patented **non-organic binder** using various cellulose-containing materials, including typically **non-recyclable** or **hard-to-recycle waste**.

About SiBoard





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About SiBoard

We have developed **SiBoard** technology about 25 years ago.

In 1998 **SiBoard** has received a **golden award** at The International Exhibition of Inventions of Geneva.

At that time **market was not ready** yet to focus on **reuse and recycle** technologies.

Today we come back to **SiBoard** as the market is **going green**, shows social maturity and **environmental responsibility**.

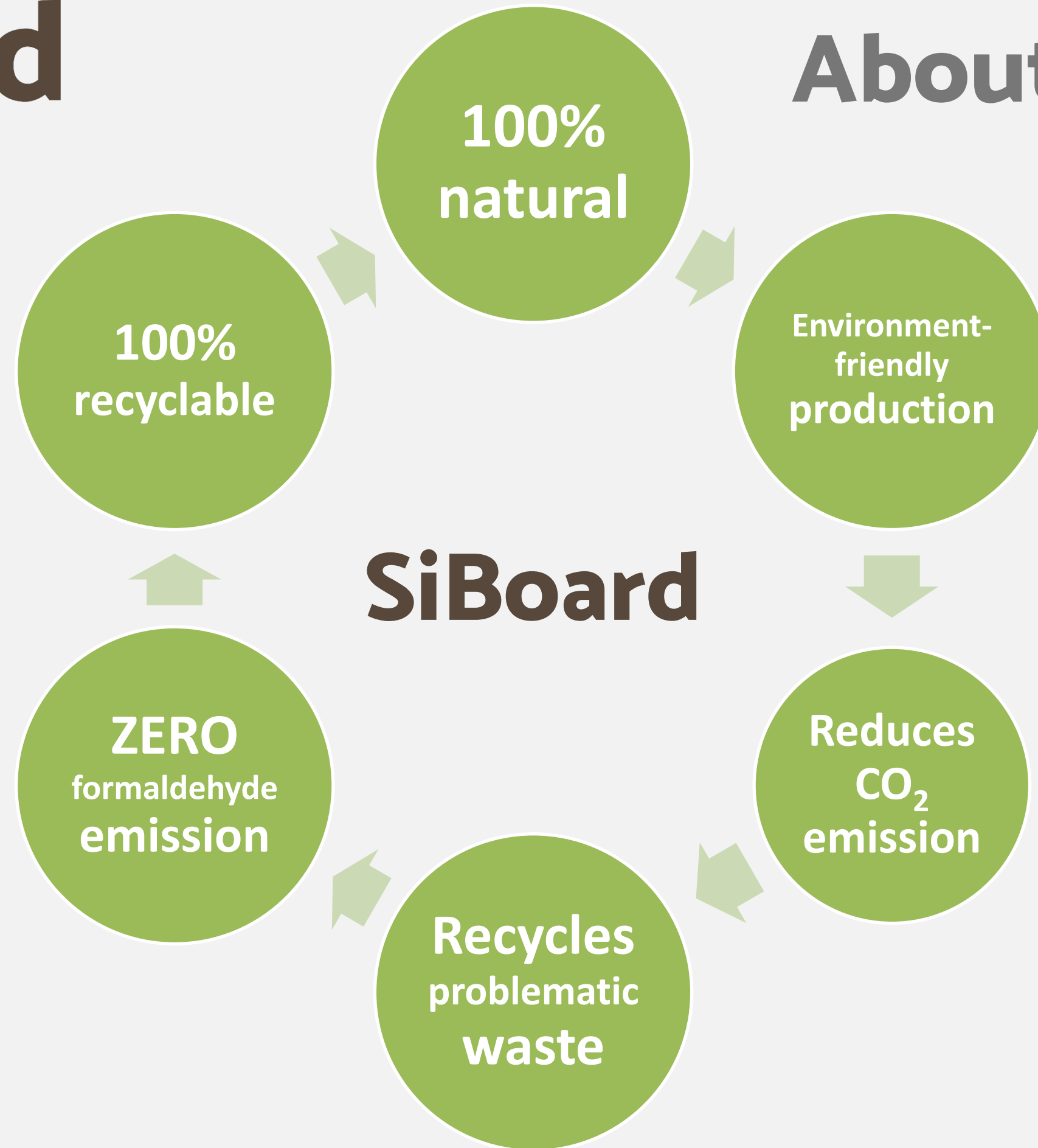




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Our **360° environmental** concept makes **SiBoard** a perfect solution for modern **sustainable** construction focusing on **safety and ecology**

About SiBoard





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About SiBoard

SiBoard technology provides options to produce a variety of **panel, board and 3-D products** while utilizing the following types of materials:

- Any **cellulose-containing materials** including wood, paper, cardboard and hard-to-recycle or problematic waste
- Typically hard-to-recycle **composite materials**
- Non-recyclable or **problematic plastic waste**





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About SiBoard

Wastes that can be recycled in **SiBoard** production:

- 🏠 **Composite materials** that are typically hard-to-recycle (Tetra Pack, Combiblock, etc.) without layering
- 🏠 Waste of **fast food (McDonald's, KFC, Burger King, etc.), coffee-to-go chains**, including laminated disposable paper cups, lids, straws, coffee capsules, used napkins, laminated paper trays, etc.
- 🏠 Those wastes can be used **bulk, unsorted, without preliminary cleaning and drying**





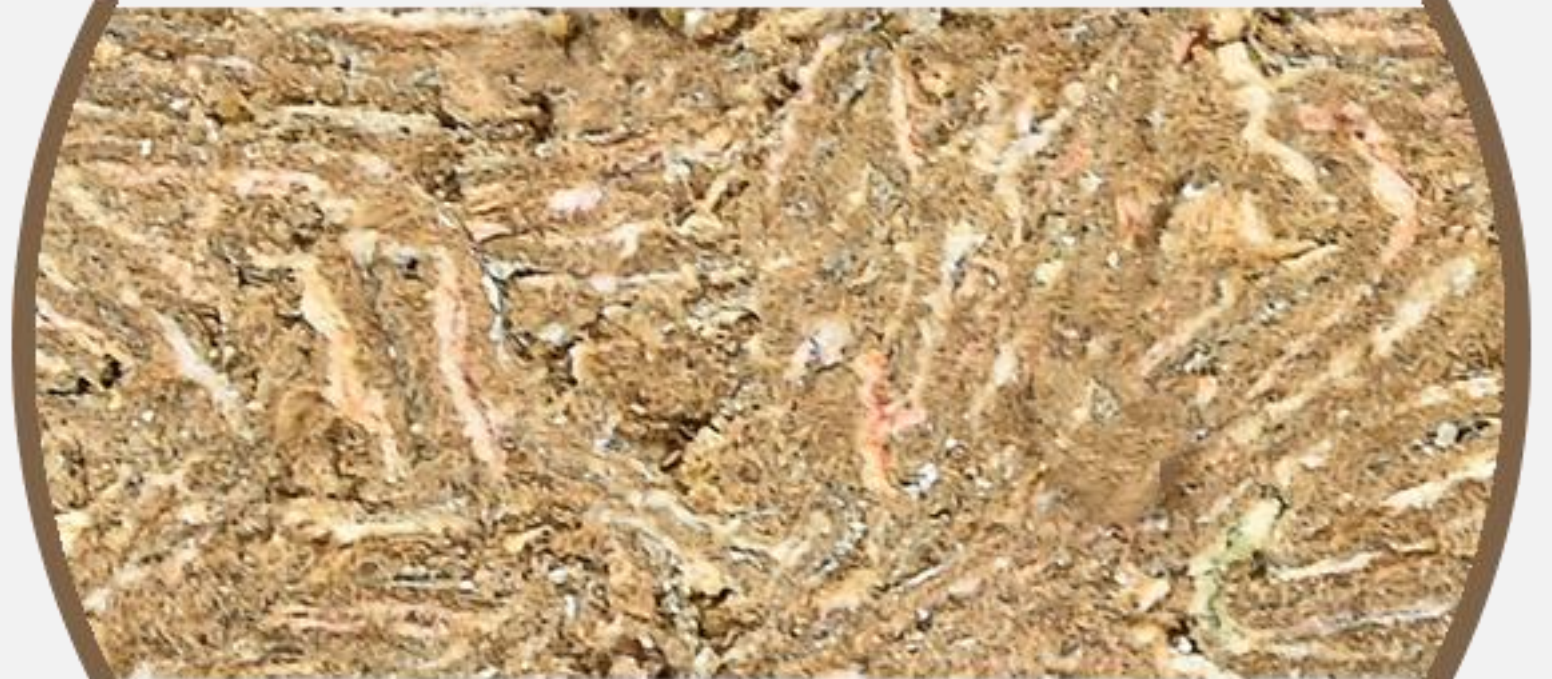
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Raw materials that can be recycled during **SiBoard** production:

- ▲ **Worn and damaged currency banknotes and securities** that are typically cremated
- ▲ **Coir, woodwool**, waste of linen and hemp production, jute, raffia, hay, **POEFB** and **OPF** fibers, etc.

Structural board
of Tetra Pack packaging waste





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Food Packaging Waste

The high temperature of up to 200°C and water vapor pressure of 1.5 MPa create an autoclaving effect that together with **high pH=10** completely **disinfect organics** and saponify fats during the **SiBoard** production process.





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About SiBoard

Core **SiBoard** products include:

- ▲ **Boards of various dimensions and density** covering the range from thin structural boards to lightweight thermal-insulating ones
- ▲ Extruded linear moldings of various sections: H-, T-, U-shaped hollow beams and girders
- ▲ 3D products manufactured using FIM technology (fiber injection molding)





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About SiBoard

SiBoard products are an advanced solution for modern construction:

- 🏠 **Fire-resistant** (A2, S1, D0)
- 🏠 **Zero-emission** (does not contain formaldehyde)
- 🏠 **Weather-resistant** (UV-proof, stable in shape, durable)
- 🏠 Rodents, insects (incl. termites), mold, mildew and fungus resistant
- 🏠 Structural boards (**SSB**) and profiles (**XSB**)
have a density of **800 kg/m³** while insulation boards (**ISB**)
have a density of **120-150 kg/m³** and **$\lambda=0.035-0.04$ W/m^{°K}**



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Product Application

SiBoard applications include a wide area of **construction** solutions and elements:

- ▲ Casing and formwork
- ▲ Walls sheathing
- ▲ Flooring
- ▲ Roof decking
- ▲ Fencing
- ▲ Interior and exterior decoration
- ▲ Furniture production





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Structural Boards

Structural **SiBoard (SSB)**

has various applications including:

- ▲ Wide area of **construction** solutions and elements (casing, walls sheathing, flooring, roof decking, fencing, etc.)
- ▲ **Interior and exterior** decoration (e.g. for the fast food industry)
- ▲ **Furniture** production, including designer furniture (e.g. for the fast food industry)





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Structural Boards

The main area of application for structural **SiBoard** boards and profiles is the **construction industry**.

SSB can effectively replace such traditional materials as particleboard, chipboard, OSB and WWCB.

Combined with extruded profiles and thermal-insulating **SiBoard** panels they can be a base for **mass-market quickly erectable housing**.

Affordability makes **SiBoard** a smart choice for **social projects worldwide** while environmental care and **ecological safety** make it a perfect fit for sustainable **premium construction**.



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Structural Boards

Unlike chipboard and OSB, **SiBoard** is a much safer and **environmentally sustainable option**.

SiBoard production does not require extraction of timber, instead, it can **utilize problematic wastes** amassing all around the planet. Using such throw-away raw materials also allows **significant cost reduction** for the material itself and buildings.

Moreover, **SiBoard** is a much safer option as it is self-extinguishing and has zero formaldehyde emission.





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Technology

We have experimentally mastered **SiBoard** production technology.

Continuous double belt press with hot and cold zones can be used for **SSB** production.

This means it can be produced using **standard equipment** lines for MDF, Chipboard and OSB.

Structural Boards





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Insulation Boards

SiBoard thermal insulation boards (**ISB**) are the **new generation** of construction materials made of cellulose fibers, e.g. **woodwool**.

The current market uses fibrolite-WWCB (wood wool cement board) with magnesite and Portland cement.

The density of such boards exceeds 400 kg/m^3 and thermal conductivity is not low enough to use them as effective insulation material.





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Insulation Boards

Unlike traditional fibrolite, **ISB** has a density of **120-150 kg/m³** and thermal conductivity of **$\lambda=0.035-0.04$ W/m*°K** that cannot be reached with cement binding.

ISB is **equal or better** than mineral wool products in terms of density and insulation, while **SiBoard** is solid, **self-extinguishing**, contains **no formaldehyde** and is **100% recyclable**.





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Insulation Boards

Production of **ISB** requires much less energy compared to mineral wool production.

This significantly **reduces CO₂ emissions**.

At the same time unlike traditional WWCB that have a number of limitations towards raw material quality (humidity, sugar, oil content) **ISB** can utilize woodwool or the **wide range of plant fibers** available (coir, raffia, hay, POEFB and OPF, etc.)





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Insulation Boards

Technology

ISB production can be set up using standard WWCB production lines with magnesite binding or industrial continuous double belt press with heating of working area.

Important note:

SiBoard production line can be a **universal solution** to produce boards of different densities and thickness using **different raw materials**.





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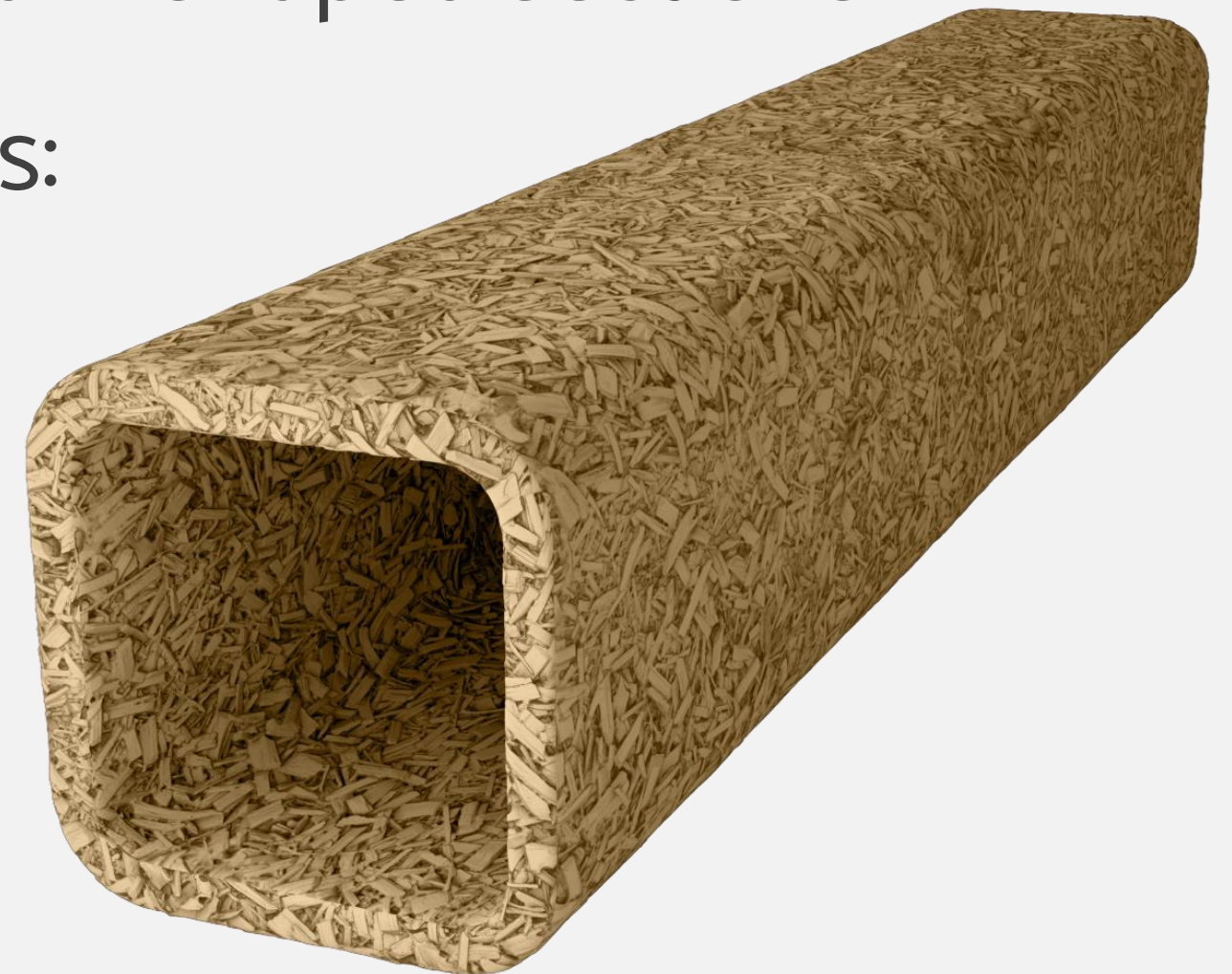
Extruded Profiles

SiBoard product family features **extruded 3D products (3DSB)**, such as pillars and beams that can have a shape of a girder of various sections.

They can be box-section girders or U-, H-, Z- and T-shaped sections.

Unlike existing NFC/WPC products, **3DSB** beams:

- ▲ Are **low-combustible**
- ▲ Have a **high fire-resistance rating**
- ▲ Have **high elastic modulus**
- ▲ Do not accumulate plastic deformation





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Binding Agent

SiBoard is based on our patented **non-organic silicate binder [SiCoat](#)** with the content of **chemically bound water up to 20%** by weight that is also used as fire protecting glue.

SiCoat has a **high viscosity** and has rheologic properties compared to custard.

This allows **even and smooth application** to the surface **without absorption** by cellulose fibers.





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Production

SiBoard production process will have the following key stages:

- 🗑️ **Shredding** waste materials (stripes or chips, fine stripes are preferred)
- 🗑️ **Mixing** shredded material with binder and further forming
- 🗑️ **Hot pressing** using mold or press
- 🗑️ **Exposure** (blow-through)
until reaching the required temperature of 170°C
- 🗑️ **Cooling** the product down to 100°C

The best option is to use **continuous belt press** with hot and cold zones





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Recycling

SiBoard not only allows to recycle problematic waste but it is **100% recyclable** itself.

SiBoard can be **reused**.
After grinding it can be used in the production of new **SiBoard** panels.

No hazardous waste is produced during recycling.





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Environmental Care

SiBoard is a part of **SiTech**, a family of **innovative silicate products** with a wide range of applications – from the construction industry, chemical and aircraft manufacturing solutions to agriculture.

Environmental care is our priority at all the stages of our products' life cycles: production, usage and recycling. Our products and technologies contribute to environmental care and provide multiple innovative solutions for **ecologically responsible operations**.

All **SiTech** products are inspired by nature – they are **safe, wasteless and 100% recyclable**.





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Environmental Care

CO₂ emission reduction

Unlike traditional products and solutions, **SiBoard** does not require extraction of timber and allows using **alternative raw materials**.

SiBoard products can replace existing materials that require high energy consumption during production.





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Contacts

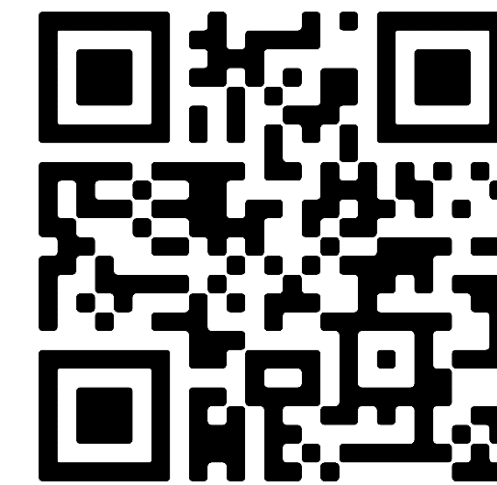
Visit our website to see info about our products and solutions:

<https://si-tech.solutions/siboard>



Visit our YouTube channel for product demo videos:

<https://tinyurl.com/Si-Tech>





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Innovative Construction Solutions

