beSteel

Sustainability at beSteel company.

> **Bringing a positive impact** to the global humanitarian challenges **through the built environment.**

At beSteel, we are determined to create a **positive impact**, striving to make a difference to the environment for **a better and more sustainable planet,** the construction industry and the lives of our partners and colleagues.

We want to rethink the construction sector to build like never before, with new construction methods (design and production) and with more efficient, sustainable and circular buildings.

By integrating cutting-edge technologies and sustainable materials, we aspire to transform traditional construction practices by setting new standards for the environment. Let's create a healthy planet for you, your kids and their future kids.

02 THE SOLUTION

Unsustainability of the construction sector.

Did you know that the construction industry is **responsible for around 39% of global carbon emissions.** And construction activities account for **around 50% of the world's raw materials consumption?**

Construction activities are **responsible for the destruction of natural habitats and loss of biodiversity** through deforestation, land-use change, soil erosion and extraction of row materials.

DECARBONIZING THE CONSTRUCTION INDUSTRY

Light steel frame is one of the most effective construction methods for helping the construction sector reduce its carbon emissions, and **the best way to meet the European Union's target of cutting waste production by 30% by 2030.**

THREE MAIN SOLUTIONS

- The use of correct materials in the right place and in optimized quantities.
- The use of digitalized design.
- The off-site production.

03 ADVANTAGES

Our first driving point in everything we do.

At beSteel, building sustainably is our core. That's why we work with lightweight steel frame. Lightweight steel frame not only offer less polluting solutions but also a safer, more efficient site.

Thanks to its excellent strength-to-weight ratio, the amount of material required to build the same surface is significantly reduced.

For example, a standard house today is equivalent to approximately four car frames.

Moreover, steel's ability to be reused and re-melted makes it an almost infinitely recyclable material. Not to mention the vast stock of steel already extracted on the planet, ready to be repurposed.

It is just waiting for one thing: to build the future.

Advantages of steel frame

STRENGTH AND EFFICIENCY

Lightweight steel offers an exceptional strength-to-weight ratio, ensuring the same structural integrity with fewer materials. This enhances the efficiency of construction projects while reducing overall resource consumption.

RECYCLABILITY

With a recycling rate of 90%, steel is one of the most recyclable materials. Unlike treated wood, steel does not release carbon when burned, further enhancing its environmental benefits.

DESIGNED FOR DECONSTRUCTION

Our lightweight steel structures are designed to be easily disassembled, minimizing waste through a dry construction method. This approach promotes sustainability and reduces the total lifecycle cost of materials.

ENVIRONMENTAL IMPACT

Lightweight steel frameworks significantly reduce the carbon footprint of the construction industry. The adoption of these solutions could decrease carbon emissions by 44% by 2050, optimizing resource use and minimizing waste.

Advantages of offsite construction

WASTE REDUCTION

With precise planning and production in a controlled environment, off-site manufacturing minimizes errors and waste, both in the factory and on the construction site. Fewer unnecessary materials, less waste.

LESS TRANSPORT, FEWER EMISSIONS

Only the necessary, ready-to-use components are transported to the site, reducing vehicle trips and associated emissions.

FASTER CONSTRUCTION

Off-site manufacturing speeds up timelines by 20 to 40%, minimizing disruptions to the environment and neighbours while optimizing efficiency.

REDUCED ON-SITE LABOR

With 60% fewer personnel requirements, off-site construction provides less crowded and safer construction sites.

04 LIFE CYCLE ASSESSMENT

Steel frame Lifestyle analysis

LIFE CYCLE ASSESMENT - LCA

In collaboration with **Bouwen met Staal, the Dutch federation of steel frame builders**, a comprehensive study has assessed the environmental impact of steel structures.
The analysis **covered both heavy and light steel**. While this does not exactly correspond to beSteel structures, a dedicated study on light steel alone is not yet possible due to the novelty of this construction method in Europe.

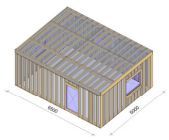
LCA: **1.39 kg CO_2 per 1 kg of steel** or about 11.12 kg CO_2/m^2 of steel frame.

COMPARAISON - ENVIRONMENTAL COST INDICATOR - ECI

The **Environmental Cost Indicator (ECI)** is a standardized metric used to assess the environmental impact of construction materials and processes.
It quantifies the total environmental burden in monetary terms, considering factors such as carbon emissions, resource depletion, pollution, and energy consumption

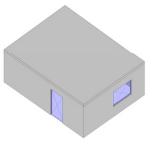
A lower ECI score indicates a more sustainable material or process.

CROSS-LAMINATED TIMBER (WOOD)



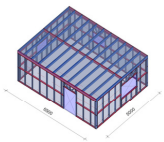
€1.78/m²

TRADITIONAL BRICKWORK HOUSE



€2.88/m²

LIGHTWEIGHT STEEL FRAME STRUCTURE



€1.17 /m²

REUSE AND RECYCLING OF STEEL STRUCTURES:

- **Up to 80% of a building's materials can be reused** at the end of its life.
- Currently, **25% of steel structures are reused** without any loss of quality.
- At the end of its cycle, **95% of steel is recycled**, limiting waste to just 5%.

Let’s take a look through a real life example.

A STUDY OF ALTERNATIVES FOR THE DESIGN OF SUSTAINABLE LOW-INCOME HOUSING IN BRAZIL

The objective of this study was to analyse and compare the environmental impact of three different buildings in Brazil, built with different construction systems: Reinforced concrete, masonry and steel frame.

THE RESULT

We can see from the results of this study that **the steel frame building has the lowest embodied GWP compared to the other buildings with traditional building methods.** GWP is measured in kg CO2 eq/m2.

417.73 kg CO2 eq/m2	**391.06** kg CO2 eq/m2	**246.23** kg CO2 eq/m2
GWP OF REINFORCED CONCRETE	GWP OF MASONRY	GWP OF STEEL FRAME

HOW MUCH CO2 DOES BESTEEL AVOID?

Additionally, we took the average number of the carbon saving from this study and another one made in Egypt
(126.49 kg C02-eq/m²) and multiplied it with the total number of square meters of our projects per year.

And the result is that beSteel can save up almost 60 000 tonnes CO2 from today to 2031!

05 CIRCULARITY

A circular method.

CRADLE TO CRADLE CERTIFICATION

The Cradle to Cradle Certified® program is a multi-attribute standard used globally for designing products for a **healthy, equitable and sustainable future.**

beSteel was analyzed in 2019 and **we received Bronze.**

This means that steel structures are **100% recyclable** and offer a solution that can be dismantled without compromising quality.

TRADITIONAL CONSTRUCTION OR LIGHT STEEL CONSTRUCTION? THE OBVIOUS ANSWER.

It may come as a surprise to you, but it takes more steel (reinforcement) to build reinforced concrete than steel-frame.

Cold bending of sections improves steel's performance and load-bearing capacity. This results in a solution that's efficient in terms of raw material use, and environmentally friendly thanks to its ease of disassembly and recycling at end-of-life.

06 SUSTAINABILITY IS PRIORITY

On the road to carbon neutrality.

XCARB: TOWARDS CARBON NEUTRAL STEEL

ArcelorMittal launched two initiatives under the name xCarb™ to reach carbon neutrality for all constructions by 2050.

XCarb™ Green Steel Certificates:
- Supports ArcelorMittal's decarbonization initiatives
- Guarantees CO_2 reduction investments
- Production sites: Liège, Bremen, Ghent (for beSteel projects)

XCarb™ Recycled & Renewably Produced:
- Made in Spain with an electric arc furnace powered by 100% renewable energy
- 90% recycled materials used

Impact: Save up to 2110 kg CO_2 per ton of steel (vs. 2570 kg CO_2 standard).

ArcelorMittal
XCarb®
Towards carbon neutral steel

STEGRA: GREEN STEEL REVOLUTION

Stegra is building an integrated, digitalized, and circular factory in Boden, Sweden.

The facility will produce green steel, **reducing CO_2 emissions by up to 95% compared to traditional steelmaking.**

By replacing coal with green hydrogen and using renewable electricity, Stegra aims to produce **5 million tonnes of green steel** annually by 2030.

Stegra

07 BUILDUP

Simplify your building experience.

BESTEEL IS A PROUD MEMBER OF THE BUILDUP GROUP

BUILDUP IS 3 BRANDS TODAY AND OFFERS:

Tailor-made prefabricated construction solutions ranging from lightweight steel frame with **beSteel** to energy-efficient renovations with **Retrofitt** and modular buildings with **Kitt**, with a focus on architectural freedom, industrialisation, digitisation and BIM.

BUILDUP'S MISSION:

Bringing a positive impact to the global humanitarian challenges through the built environment.

ULTRA FAST CONSTRUCTION

Off-site production and assembly, avoiding delays on site thanks to controlled conditions for fast, precise on-site assembly.

SUSTAINABLE AND LIGHTWEIGHT

4x time lighter than wooden construction methods. A hybrid module made of light steel helps to reduce the CO2 impact of the construction sector.

360° EXPERTISE AND DIGITAL FOLLOW-UP

Production of lightweight steel structures and complete monitoring. So that your project meets the most strict technical and stability requirements, all in-house.

CONTACT US

sales@be-steel.eu
www.be-steel.eu

Niewlandlaan 39 (B224)
3200 Aarschot
Belgium

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