Driving innovation in the construction industry

THE BRICK THAT COULD TRANSFORM THE WAY THAT BUILDINGS ARE CONSTRUCTED

An interview with

MARCO CITRO (BIOBUILDINGBLOCK)

In recent years, leaders across multiple industries have led the charge for greater sustainability to slow the effects of climate change and protect our eco-system. In the automotive industry we have seen a shift towards electric powered cars. In fashion we have seen upcycled designs make headlines at major fashion weeks around the world. However, one industry where change has been less forthcoming has been construction. The construction industry is a massive consumer of raw materials and natural resources, and it generates an estimated 39% of the world's carbon emissions according to the World Green Building Council.

With a courageous green vision for a more sustainable construction industry, Marco Citro founded BioBuildingBlock in early 2020. Since then, he has filed four patents, including the innovative Bio-Brick BioBuildingBlock which has the potential to transform the way that buildings of the future are constructed. We spoke with Marco to find out more.

What is a Bio-Brick and how can it be used?

BioBuildingBlock is an innovative Bio-Brick made from wood and metal that can house natural materials such as wood or cork shavings and sheep or rock wool, offering thermal and acoustic insulation properties. These Bio-Bricks can be used for the construction of a variety of green structures, from single-family homes and luxury villas, to commercial properties. Thanks to the mechanical properties it is possible to develop multi-storey buildings.

The Bio-Bricks can be used for the construction of green buildings everywhere, independently from climate characteristics of the environment as the Bio-Bricks are able to naturally manage the control of humidity of inner spaces thanks to the natural materials used for their production. Its anti-seismic properties allow it to be used for the construction of green buildings in high-seismic areas too.

BioBuildingBlock enables a fast and high quality construction process, ideal for smart buildings as well as recreational spaces and touristic villages or luxury resorts. Bio-Bricks can also be used for the fast construction of polyclinic structures in case of health emergencies or in more remote areas where it can enable a quality health service to be offered.

What environmental benefits does it provide?

BioBuildingBlock has enormous respect for nature and ensures that any wood used in its product is derived from controlled and certified cuts of trees according to the Forest Stewardship Council (FSC) and the Programme for the Endorsement of Forest Certification (PEFC). Furthermore, each Bio-Brick guarantees a reduction of approximately 10 kilogrammes of CO2 from the environment as it will be stored in its raw materials instead. This means a reduction of about 24 tons of CO2 for a single-family house of about 100 squares meters.

All of the Bio-Brick's components are natural and reusable, developed with shavings from processed raw wood, cellulose flakes from paper recycling, and recycled sheep's wool, for example. These resources aid in reducing energy wastage and enhance the circular economy in respect of the natural environment.

What are the benefits to construction companies?

The BioBricks can be customised to fit ducts, pipes, raceways, and boxes for electrical sockets, a process that can be developed in the structure's initial design phase – making the assembly phase efficient and straightforward. This means that erecting walls via traditional construction methods aren't necessary to install water, heating, and electrical systems throughout. Using these BioBricks enables a rapid and high-quality construction process for green buildings, reducing the amount of labour needed for the build, with no wastage production, and using materials that can be reused again and again, inspiring a circular economy which maximises the sustainability value.

Many newbuilds suffer from poor insulation or soundproofing. How does the Bio-Brick combat these challenges?

BioBuildingBlock can house natural materials with specific properties that can differ for acoustic or thermal insulation. For example, wood shavings are good for thermal or acoustic insulation while cork shavings are very good for both thermal and acoustic insulation. Sheep wool is very good for thermal insulation but less so for acoustic while rock wool is very good for acoustic insulation and less so for thermal purposes.

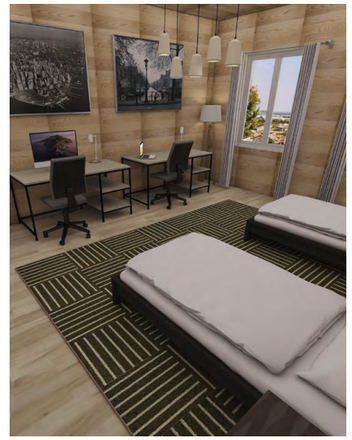
To overcome all these differences of insulation performance, BBB has developed a new natural insulation material with enhanced acoustic and thermal insulation of the Bio-Brick. This material is subject to a new patent under evaluation for approval. In any case, all the natural materials mentioned above can already share very good efficiency in thermal and acoustic insulation of the Bio-Brick. Obviously, to further increase the insulation properties of the Bio-Bricks walls, it is possible to add other insulation panels – both internally and externally – according to the customer's needs.

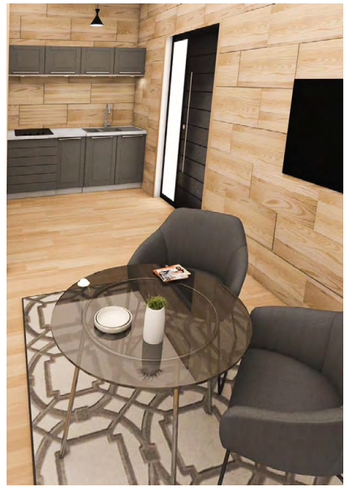
In what other ways does the Bio-Brick outperform traditional products?

BioBuildingBlock has different properties to outperform traditional products. The steel bars housed in the BioBrick can strictly connect contiguous bricks creating a reinforced wooden wall that has better structural characteristics which allow the wall to also perform the load-bearing function. In the event of an earthquake, the structure guarantees greater resistance and is able to better dissipate the energy of the seismic waves. In the event of catastrophic events, such as tornadoes or hurricanes, the reinforced wooden walls can withstand winds of up to 250 km/h, preserving the structural properties of the building. The bio-brick is able to withstand high compressive forces and this guarantees the possibility of constructing multi-storey buildings. The customisation of Bio-Bricks allows a rapid execution phase of the building construction project: this innovative feature is not found in current construction systems. The all-natural materials allow greater transpiration of the internal environments, increasing the living comfort.

What are the main goals for BioBuildingBlock in the coming years?

Our main goal is to become the new reference in green building for our most important values that are part of the DNA of the innovative start-up BBB such as sustainability and innovation. For environmental sustainability we want to implement CO2-free production processes to contribute to the reduction of CO2 in the environment and also continue to use new natural materials obtained from recycling in a circular economy perspective.
Innovation will always be the core of the development of our start-up thanks to the arrival of new patents and continuing research and development also in partnership with university centres of excellence. The attention to the service we want to offer to our customers is another very important goal for us and for which we will make use of the new enabling technologies. The patent for BioBuildingBlock is already approved in Europe and the USA so we aim to develop our business in these markets as soon as possible because the business model is easy to scale up even if BBB's market share may initially be very small. In order to grow successfully we are looking for strong partners to develop the foreign business as well.





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