



MODULAR CONSTRUCTIVE MODEL ECO FRIENDLY

**High Construction
Energy saving
Anti-seismic**

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1. WHO WE ARE

[SB Bio Building](#) It is a company that operates internationally in the construction and infrastructure sector, in products and innovative technologies to high professional standards and competitiveness.

One of the main fields of operation are:

- The realization of modular housing "Steel Frame" mono and multi-family buildings receptive for the hospitality industry, commercial buildings, social housing, based on the constructive model [BeMODE®](#);

The company operates through its own technical and commercial structure and uses a network of qualified production partners.

Constant research enables us to develop cutting-edge and competitive solutions.

The coaching staff consists of:

- Technical professionals (architects and engineers);
- Commercial Technicians;
- Technical operators.

All our design and implementation phases are controlled and certified in compliance with the current technical regulations. Where necessary uses outdoor facilities certified

SB Bio Building adopted a "[Ethical code](#)" which is a public declaration of the company to pursue the highest standards of ethical conduct.

2. MODEL CONSTRUCTION

[BeMODE®](#) It falls within the concept of "Industrialized Building" modular system "dry", lightweight, high-energy performances, acoustic and seismic.

One of the main strengths, compared to prefabricated systems, is that [BeMODE®](#) He did not design constraints, leaving space to the design and architecture. The same applies with regard to the plant, heating - cooling - mechanical ventilation etc., who is left total freedom of choice to the designer.

[BeMODE®](#), Reaffirming the concept of "Industrialized Building", using computerized design systems; the architectural design is reworked by the department that deals with structural calculation that converts it into an executive for the carpentry department, attaching the constructional details of each component, which is individually numbered, and the table assembly of the whole project.

The project [BeMODE®](#) is oriented to the realization of eco-friendly housing with high energy savings with very rapid construction times which allow to reduce construction costs and resulting in a more immediate availability of the building which, in the case of a building for commercial use, means the first to bring in income assets.

[BeMODE®](#) It uses a "sandwich construction dry or SR Structure Coating system" for years in use worldwide and known in Germany for example the term "Trockenbau", in England and France with the term "Structure - Envelop"

The main constructional elements of [BeMODE®](#) They are of modular structures in buffered with steel sandwich panels which guarantee the thermo-acoustic insulation of walls and floors.

All the electrical and thermo-hydraulic systems and are external to the walls and ceiling places and brought down the outside of the walls to allow, if necessary, of minimally invasive maintenance.

Normally the heating and cooling systems are heat pump to ensure a high energy saving and can be, depending on the needs of our client, air-to-air - underfloor - radiators, always guaranteeing an optimal welfare standards.

All exterior doors are normally made of PVC with dual-chamber windows, tilt and turn and micro-ventilation with a high degree of thermal and acoustic insulation.

[BeMODE®](#), Depending on the needs of the customer, or can be built on concrete stalls or "Very large screw" and the entire bearing structure is assembled in work "dry" exclusively by means of bolts allowing production times about three times lower than the traditional construction system "brick and mortar".

2.1. Why Seismic

[BeMODE®](#) It turns out to be suitable to build in seismic areas because the entire structure is made of steel, which as is known is a material that responds perfectly to the most stringent construction requirements for the construction in seismic areas. The steel structures provide the ability to absorb the seismic energy, using the high reserves of typical plastics material, through the use of decidedly less burdensome constructional details than those that would be necessary to provide in a reinforced concrete structure.

Everywhere in the world, where they are present seismic risks, the steel is used in construction as a guarantee of security and protection of people, thanks to its mechanical and performance characteristics.

In the USA and Japan, earthquake-prone countries even higher than Italy's, earthquakes similar to the Eagle would have caused only a few minor damage.

Recall that in these countries the construction in general and those antisismiche in particular, are made mainly with steel structure.

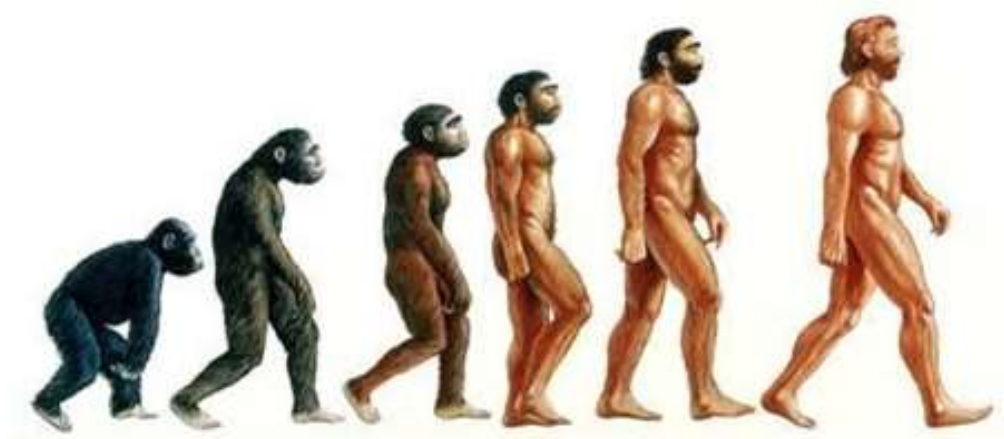
2.2. Why [BeMODE®](#)

[BeMODE®](#) thanks to the constructive concept of " Industrialized Building ", offers in addition to the technological advantages and reduction of worksite inefficiencies a series of advantages such as:

- A control and planning of the construction process, thanks to which it is possible to reduce costs and construction times, even in adverse climatic and logistic conditions;
- High environmental comfort with energy low costs, passive house;
- Thanks to the lightness of the structure of the foundation works, equal to m2, are significantly reduced or even eliminated if the building is resting on Very large screw, becoming as a sort of "stilt";
- From the point of view installations, passing these to the ceiling, allow rapid execution and ease of maintenance if it were necessary;
- Ability to design expecting to make future changes to the structure;
- No constraint on the choice of materials for interior and exterior curtain walls, partition walls and flooring;
- Its lightness allows elevations in the historical centers where there is the difficulty of access for lorries ;.
- Almost completely recyclable and can even be removed if you wanted to move it to another site.

In a nutshell **BeMODE®** is:

Darwin: the evolution of man



BeMODE®: the evolution of the house



3. DESCRIPTION OF THE PROJECT

3.1. Bearing structure **BeMODE®**

The supporting structure is made according to the project **BeMODE®** that comes to life by the study of the structures and was conducted according to the methods of "Construction Science" assuming the elastic and isotropic materials. The research of the stress parameters was carried out according to the load which may be deemed more onerous making use of automatic calculation systems for the structural analysis. The sections of the resistance tests were performed according to the method of Limit States following the methods contained in the euro-codes and NTC2008.

The structure in elevation and the horizontal elements form a steel frame consists of the following elements:

Corner Abutments and curb elements, beam elements, node element that allow connection between curbs and corner pillars.

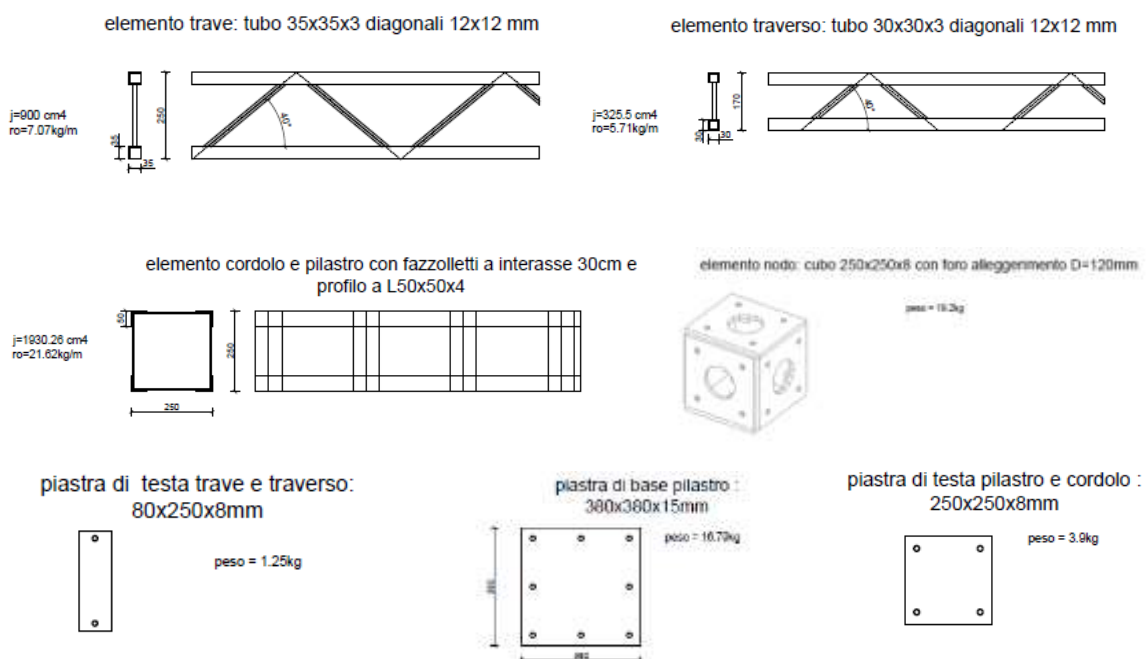
The node turns out to be a cube whose faces are perforated so as to allow the connection between the pillar and curb elements by bolting.

The floors are constituted by beam elements placed at a distance equal to 600mm or 900mm.

The transverse elements, which are positioned transversely to the beams by passing in the middle, have the function to distribute the load on the same beams.

The beam elements are connected to the curbs by means of bolting, while the beam elements and those sideways are assembled together by means of appropriate brackets fixed by means of self-tapping screws holding.

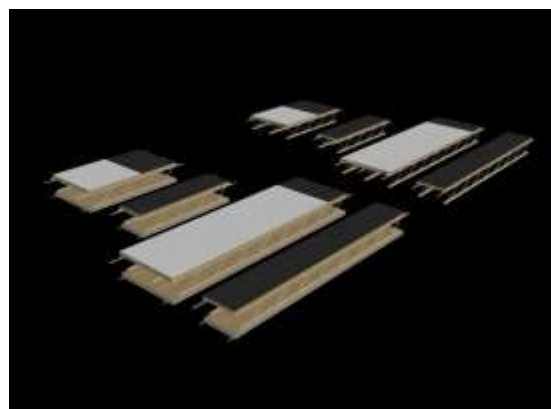
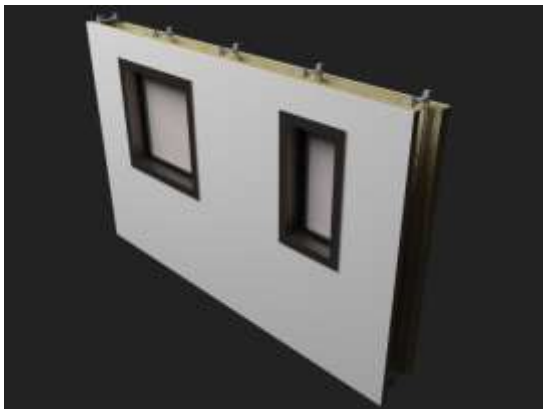
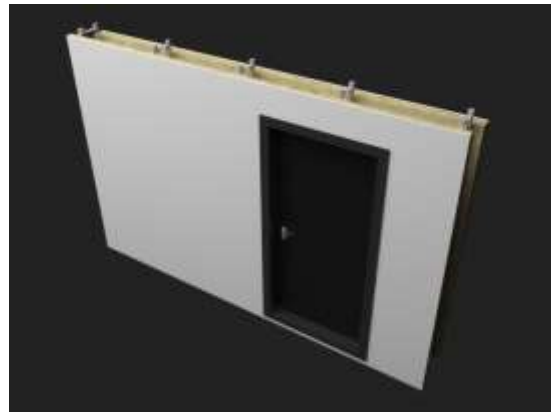
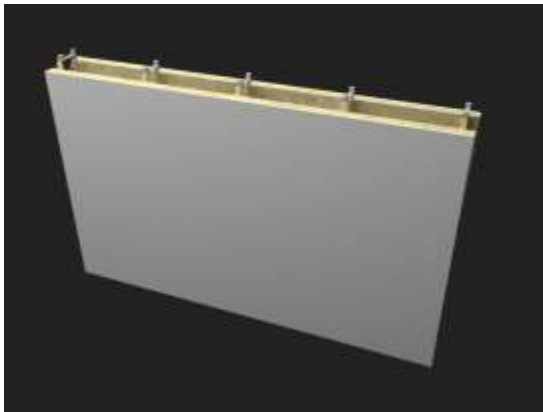
The thickness of the horizontal load-bearing structure that vertical and 250mm.



3.2. Panelized Building SB

It is insulated structural panels that can measure about 13.6 cm or 23.6 cm made with structural profile thickness of 8/10 and 2kg / m - Aquapanel Panel - gypsum fibre Panel - 1 or 2 of glass wool panels from 95 mm .

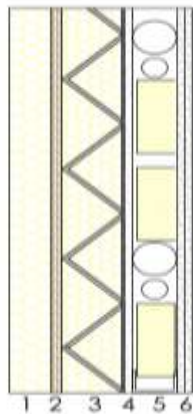
Here are some examples:



3.3. Foundation works



3.4. Bearing structure



- ① Cappotto esterno in lana di roccia spessore 40 mm completo di finitura esterna
- ② Lattina OSB sp. 18 mm
- ③ Intersopelina d'aria creata da struttura tralicciata sp. 300/350 mm, riempita con materassino in lana di roccia densità 70/80 kg/m³ sp. 100 mm
- ④ Lattina acustica fonoassorbente e antiriflesso sp. 17,5 mm (R_w coefficiente 33 dB) perforata secondo le direttive fornite al momento opportuno
- ⑤ Copertura impianti ricavata da controsoffitto interno realizzato con struttura metallica autoportante H 75 mm (con opportuno rivestimento estetico). L'intersopelina creata dovrà essere realizzata con materassino in lana di roccia densità 70 kg/m³ spessore 40 mm.
- ⑥ Doppia lattina in cartongesso di struttura sp. 12,5 + 12,5 mm (OTI 25 mm) oppure singola lattina con fessure sp. 12,5 mm

Indice del potere fonoisolante stimato:

R_w = 56 dB

Indice di riduzione sonora (R_w) in dB (A) con correzione per la curva di riferimento di peso (R_w)

Valore di riferimento **Classificazione utile**

> 54 dB Nessuna parete
 > 51 dB Parete con finestre e vetri quasi oscurati
 > 48 dB Parete e vetri parzialmente oscurati
 > 45 dB Parete e vetri parzialmente oscurati

Nota: il valore di potere fonoisolante stimato, essendo determinato per il caso di riferimento, può variare in funzione delle caratteristiche costruttive e dei materiali utilizzati.

Altri elementi dell'edificio possono avere un'attenuazione del livello sonoro inferiore o vari elementi deboli coesistere con la parete, offrendo attenuazione che rispettivamente aumentano o diminuiscono l'isolamento. È opportuno, in questi casi, verificare gli effetti dell'isolamento e adottare ogni misura necessaria.

3.5. Structure attic / roof

Progetto di isolamento acustico di solaio a secco in tralicci metallici

- ① Pavimento in legno/ceramica completa di sottopavimento acustico, con spessore variabile da 100 mm a seconda della soluzione.
- ② Sottorivestimento in legno massiccio con taglio libero in quest'ordine (non necessario sp. 10/15/20/25/30/35/40 mm).
- ③ Manto acustico autoportante, tipo "acustico" spessore 10/15/20 mm.
- ④ Lattina OSB sp. 18 mm.
- ⑤ Intersopelina d'aria creata da struttura tralicciata, riempita con materassino in lana di roccia densità 70/80 kg/m³ sp. 100 mm.
- ⑥ Lattina acustica fonoassorbente e antiriflesso sp. 17,5 mm (R_w coefficiente 33 dB) perforata secondo le direttive fornite al momento opportuno.
- ⑦ Intersopelina d'aria con controsoffitto interno realizzato con struttura metallica autoportante H 75 mm (con opportuno rivestimento estetico).
- ⑧ Lattina in cartongesso di struttura sp. 12,5 mm.

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4. TECHNICAL DATA STRUCTURE

4.1. Temperature range Features and humidity of the components

All components comply with the EEC directive 30/05/2018 n. 2018/844 / FU (Data for the values in Italian climate zone E)

- Thickness mm **458**
- Thermal transmittance **0,091** W / m²K.
- Permeance **9,910** 10¹² Kg / sm²PA
- periodic transmittance **0,004** W / m²K
- attenuation factor **0,039**
- Offset heat wave - **17.9** h



4.2. Acoustic characteristics casing wall and floor

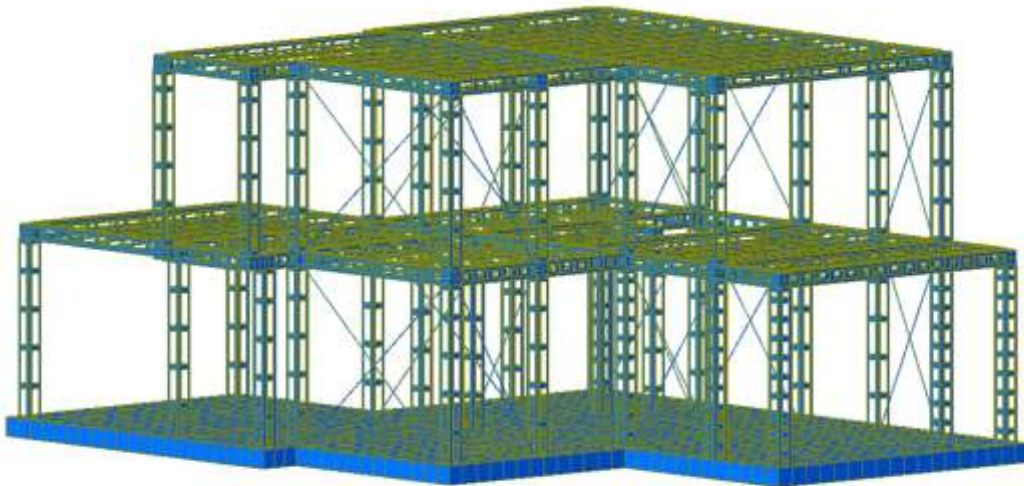
The wall and ceiling enclosure comply with Directive 2002/49 / EC of the European Parliament and of the Council of 25 June 2002.

- phono Index estimated absorbency 55 dB wall "The value could suffer the variations of 2/3 dB"
- phono Index estimated absorbency 51dB floor



4.3. Critical seismic

- The self-supporting skeleton in S235JR / S275JR 360- Fe / Fe 430 for which we consider only the loads of yield are made in thicknesses of 4/6 mm.
- The structural pattern can be commuted with isostatic elements (bracing) or box-resistant to bending moment.
- The plates solidarized to the bolts jigs are typically 25x30 cm - thickness 10 mm bolted with 4 tie rods
- The dimensions of the columns are particularly slender because it ensures, in the element cable, the transfer of efforts between concrete and steel, with the steel that geometry for working under the most favorable conditions to resist tension loads and the concrete. that participates in compression at each deformation simply sliding friction.



Project earthquake simulation facility

5. ASSEMBLY

The assembly of the structure [BeMODE®](#) Cleaning takes place using only bolts and screws.

The assembly steps are:

1. Leveling the ground.
2. Preparation of the audience or the plinths / Very large screw.
3. Mounting supporting structure in galvanized steel anchored to the foundation plinths in ca.
4. Installation of exterior and interior wall panels.
5. Blowing of the insulation material.
6. Installation of technological systems.
7. Installation of the exterior and interior.
8. external and internal finishing.
9. Testing.
10. Delivery.

[BeMODE®](#) it allows you to deliver the property finished in about 2-3 months since commencement of work; the delivery time may vary depending on the number of floors and m².

6. SUSTAINABILITY

With regard to the concept of sustainability and recyclability [BeMODE®](#) it turns out to be a winning solution in fact you chose the steel as a supporting construction element, which turns out to be one of the most reused materials both for the same purpose or for other purposes.

The steel used as construction material appears as a definition of circular economy. After the useful life of the work in which a steel element, in fact, it can be traced in the foundry to assume any other function is inserted. In the world this property is briefly referred to as the upcycling, To create a distinction with the materials which are subject to loss of property and employees in lower-tier applications (down-cycling). There are also some cases in which the material at the end of life was reinstated in other applications.

[BeMODE®](#) it uses the best technologies available for thermal insulation. Such materials are heat- and acoustic thanks to their macroscopic structure capable of incorporating a large amount of air, isolate from heat, withstand high temperatures

and reduce noise. So acoustic comfort, thermal insulation, high drainage and fire protection capacity are the main features of the materials used.

[BeMODE®](#) it guarantees an excellent climate and acoustic comfort in the respect of eco-sustainability and energy saving.

One aspect that characterizes [BeMODE®](#) it is that this is an absolutely simple structure to change, and to maintain and all the materials of which it is made can be recycled for new uses.

The "recyclability" of [BeMODE®](#) it is a real element of eco-sustainability which is opposed to the traditional constructive model in "brick and mortar" which requires demolition and landfilling of materials, with a negative impact on the environment.

7. CONTACTS

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