



FIXCEL®  
STEEL MODULE

&

PRINCIPLES OF  
MODULAR BUILDING

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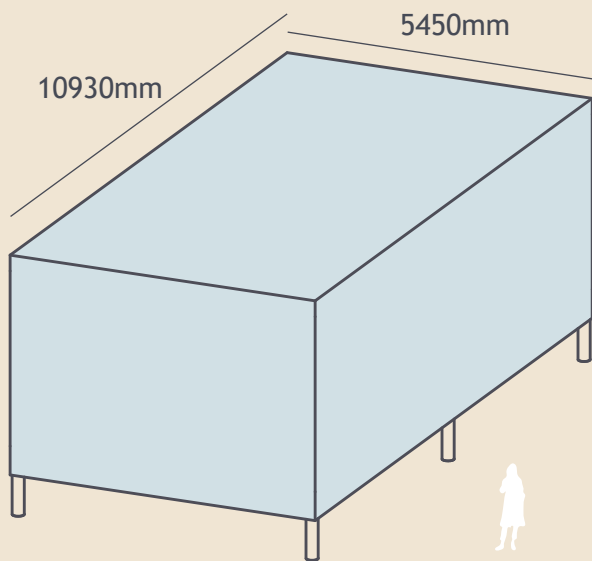
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## MODULE

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FIXCEL® modules are manufactured using a patented steel cell structure in a weather-protected environment at a factory in Hämeenlinna.

The pre-fabrication of the module is a refined process that eliminates the risks and errors typically occurring at the construction site. The steel frame is light, which enables the modules to be easily transported from factory to building site. The structural system guarantees a long lifespan for the building in addition to physical resilience, good indoor air quality, modularity and portability.

## PROPORTION & MEASUREMENTS

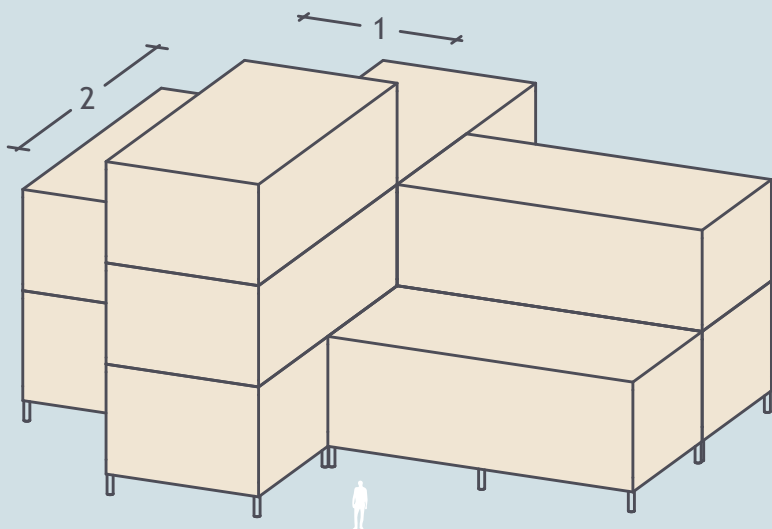
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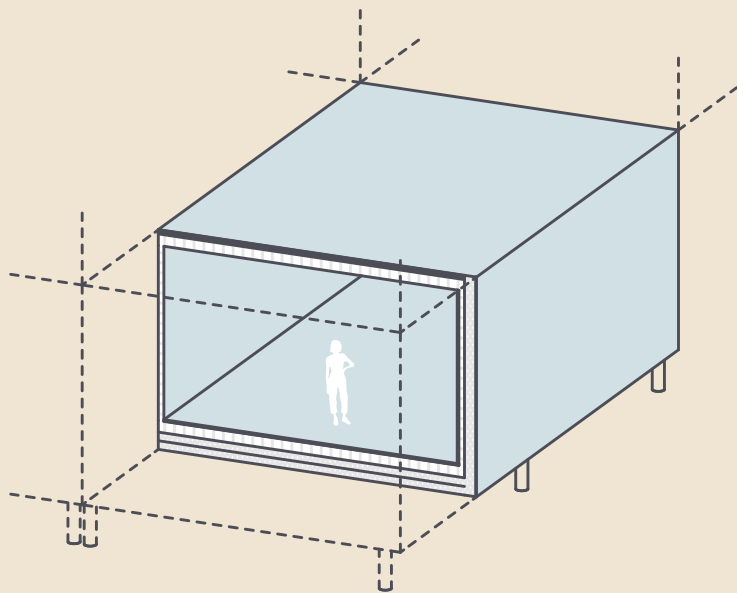
The FIXCEL® steel cell module is dimensioned according to a 1:2 principle. This enables the design of a compact building mass and gives the designer more flexible starting points for placing and orienting the modules. With standard dimensions, it is also possible to optimize the costs of planning and construction. The standardization also enables the recycling of modules between different projects and functions.

The standard module is 55sqm, proportioned based off of the size of a standard classroom. While the width of the module is fixed and defined by a number of factors, the limitations of road transport being the primary one, the length can be adjusted more freely.

The long side of the module is loadbearing, which is why modules are primarily placed right on top of each other, loadbearing wall on top of a loadbearing wall.

The dimensions of the module can also be customized where necessary.







## STRUCTURE

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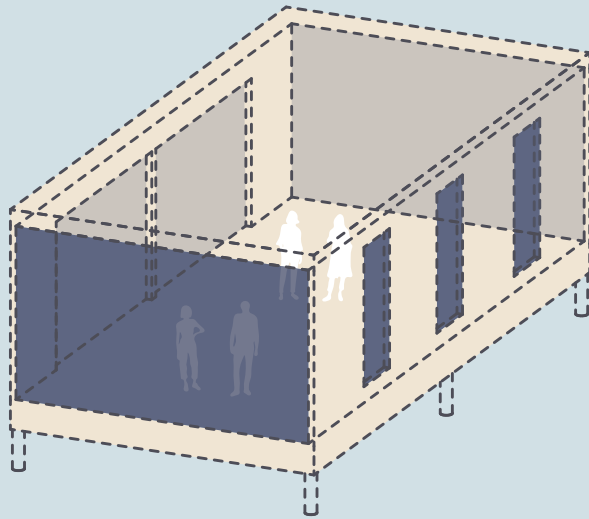
The FIXCEL® steel cell structure is a Finnish innovation. The walls (100mm thick), floor and ceiling plate (200mm thick) of the modules consist of strip steel. The thin strip steel is molded into a U-form and riveted together to form a plate of defined size and form, without glue or welding. The cell structure is mold- and chemical-free and stands on a cross-ventilated pile foundation. The modular structure is rigid and self-supporting which means that interior and exterior surfaces can be finalized in factory conditions and transported to site without the risk of structural damage. The modules leave the factory with fixed furniture, lighting fixtures and wall cladding installed.

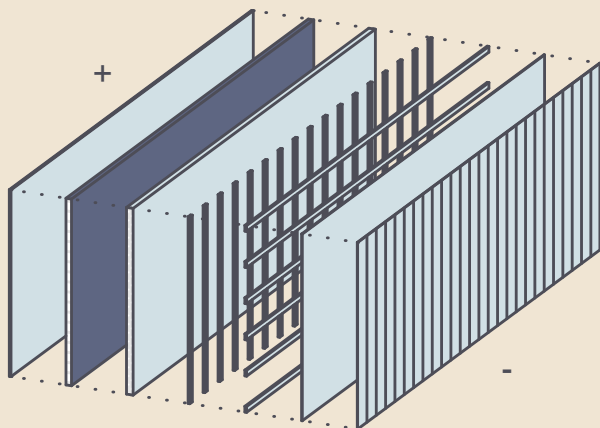
## OPENINGS

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The weight of the steel cell module is directed and distributed into the ground via its long sides. Thus, the short side wall can be opened without additional support. It is also possible to open the long sides, as long as sufficient support is arranged for the structures, for example with columns, short walls and beams. As a rule the long side can be opened up to 70% without additional support.

The module is lifted into place on site by crane from two points symmetrically placed on top of each long side.





## EXTERIOR WALL & CLADDING

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Cladding and façade options for the modules are varied. Wooden paneling, plaster coating and different types of plate and tile systems; ceramic, brick, steel or composite, can easily be applied.

Full brick walls are not common in modular building, as the weight of the bricks easily create an imbalance when the module is moved and lifted. Additionally, the bricks have no loadbearing function in this context as the modules are “self-bearing”.

Exterior cladding can either be pre-installed onto a certain module at the factory or installed fully at the construction site when the modules are in their final positions. The latter technique enabling a more time-consuming, but visually more pleasing seamless look.

A cladding system, which can be pre-installed onto each module in the factory, but still presents as seamless as the modules are installed at site would be ideal and yet to be researched further.

## DESING POINTERS

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- Module size and dimensions are determined by their connection to other modules as well as logistics.
- 1st rule of prefab - producing as many parts of the building in factory conditions as possible minimizes the risks of mishaps on site and shortens installation time.  
Think for example: How to divide trusses or other roofing elements into smaller sections for transport?
- Modules can make up an entire building or just parts of it. For example, in a case where the program calls for both large, permanent halls and smaller, more flexible spaces, modules can provide the agility needed, while permanent parts can be made in situ.



