



*WHERE INNOVATION
MEETS SUSTAINABILITY*

EC3 Building Panels

EC3 panels are produced using our patented technology. The outer skins (siding material) are composed of fiber-reinforced Magnesium Oxide (MgO) board. PUR foam injected between the boards, creates a strong structural core with excellent adhesion. When enhanced structural strength is required, additional reinforcements can be included before the foaming process.

About the outer skins

MgO is a naturally occurring mineral. When processed as a cement, it has exceptional ability to block heat and is non-combustible. MgO cement has none of the harmful effects of Portland cement.

About the inner core

Our blend of closed cell PUR is a rigid foam that provides an optimum combination of excellent mechanical and physical properties. It provides 2x the insulation value compared to polystyrene (EPS) foam.



Using the patented EC3 building panels enables you to construct one of the most continuously insulated structural building envelopes on the market today.



FAST AND EASY

Construction time is cut in half when building with EC3 panels. And because they are lightweight, they can be handled and installed with just 3-4 workers.

EC3 panels are easy to install. They are connected using MgO splines. GFRP (glass fiber reinforced polyester) profiles can be used depending on structural design.

Produced in our state-of-the-art factory, panels can be customized, which reduces prep time and waste on the jobsite. Or they can be re-sized onsite... the choice is yours.

USES

EC3 panels can be used in loadbearing applications and are suitable for use in all aspects of the building envelope:

- External and internal walls
- Slabs • Floors • Roofs

In luxury buildings, EC3 panels are used to build the envelope, with plaster board installed on the interior.

When building small houses and more affordable construction, it is possible to build the entire structure using only EC3 panels.

From high-end private homes and multi-family projects to hospitality and commercial buildings – Constructing with EC3 panels will help you to realize your goal of building a stronger, safer and more energy-efficient structure



Because of their light weight, EC3 panels are the perfect solution for building additional levels on existing structures.



SUSTAINABILITY

Architects, builders and owners are increasingly aware of the need for sustainable building materials.

At GRH we take our commitment to sustainability seriously.

EC3 panels are made with EU sourced raw products and are produced with the use of very little water or electricity.

Construction with EC3s greatly reduces or eliminates the use of cement and steel. It also reduces construction site waste by 80%. At the end-of-life, EC3 panels are recyclable.

Structures built with EC3 panels need a minimum of energy for heating or cooling.

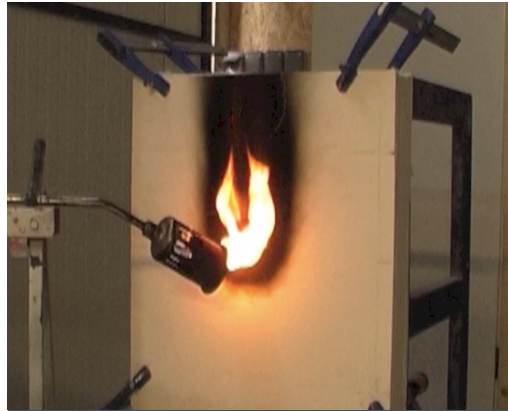
This all results in a 50 – 60% reduction in carbon footprint when compared to traditional construction.

A FEW OF THE ADVANTAGES...



STRONG

EC3 panels offer exceptional mechanical characteristics and are suitable for use as load bearing elements. Multiple levels can be built without the need for additional framing or supports.



RESISTANT

EC3 panels are fire resistant, in fact they are non-combustible. They are also resistant to rot, fungus, and pest infestations.



U-VALUE

EC3 panels provide excellent thermal insulation, but it doesn't stop there. The panels are also airtight and have no thermal bridging – providing a superior u-value!

BENEFITS OF USING EC3 PANELS



In general

- Sustainable building material
- Lower carbon footprint throughout the life of the building
- Superior insulation
- Equivalent U-values can be achieved with thinner walls allowing more living space in the home
- Roof trusses can be eliminated, allowing more living space beneath the roof.



Architects / Designers

- Flexibility of design style
- Can be used in commercial and residential applications
- Compatible with other forms of construction
- It's easier to create full CAD assembly drawings
- Our architects and engineers are available to assist you



Builders

- Shorter construction time
- Reduced labor costs
- Less waste and onsite errors
- Light and easy to work with
- Lighter foundation requirements
- No specialized tools needed
- Cost estimations become simple and accurate

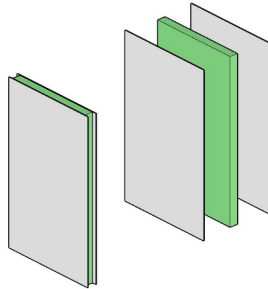


Owners / Residents

- Cut energy bills in half
- Superior fire rating – EC3 are panels non-combustible
- Lower maintenance costs
- Resists mold and infestations
- Eliminates drafts and cold spots
- Healthier living environment with less dust and no VOCs
- Better sound insulation

EC3 Panel Technology

EC3 Panels - Structural and Insulated



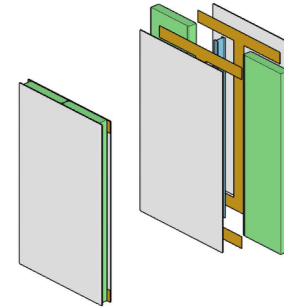
Magnesium oxide (MgO) boards

Both EC3 and EC3-I panels are produced with outer substrates made of MgO. The outer boards are specially reinforced for structural integrity.

Reinforced with biaxial fiber

To increase loadbearing capacity, additional layers of fiber, placed at specific angles, and resin are applied to the MgO

EC3-I Panel – Designed for extra strength



Polyurethane rigid foam (PUR)

Our blend of closed cell PUR is injected and sandwiched between the MgO boards. This provides a better and more reliable primary bonding. The foam core is strong, solid, and consistent throughout the panel.

EC3-I for high concentrated loads

Reinforced with GFRP profiles which are lightweight and very strong (pound for pound stronger than steel). Provides exceptional structural strength and stiffness for areas of high concentrated loads.

EC3 Panel Connections

A polyurethane sealant is applied to all interior edges of the panels in order to prevent air leaks and thermal bridging.

Top and bottom

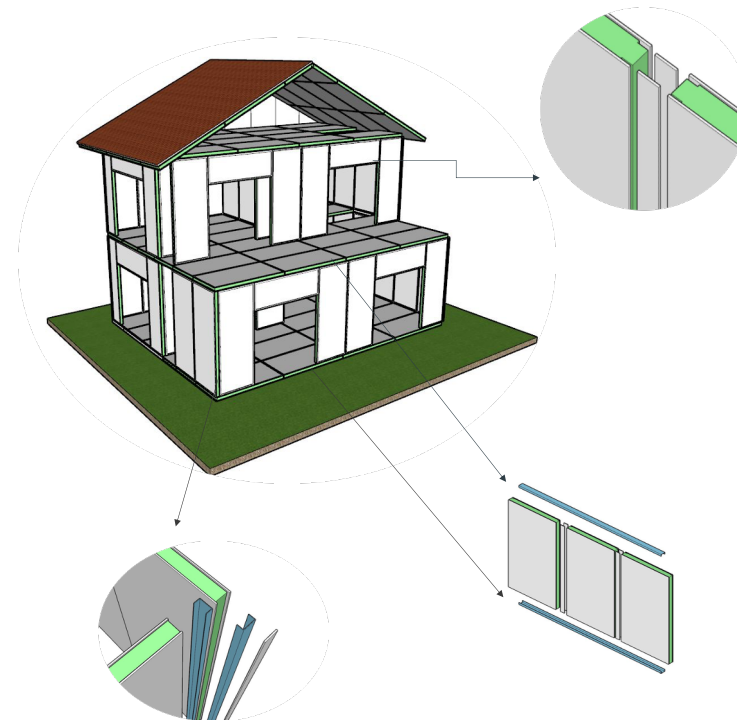
EC3 panels are secured with stainless steel screws to GFRP U-beams that have been bolted along the full perimeter of the foundation and along the lines of any interior walls. The panels are also secured along the top edge to GFRP U-beams that run the length of the walls.

Panel to panel

EC3 Panels are manufactured with a gap between the outer skins and the foam. Polyurethane sealant is applied and the MgO splines are inserted into this gap. The panels are then screwed through the outer skin to the spline using stainless steel screws. GFRP H-beams are used in place of splines where more load resistance is required.

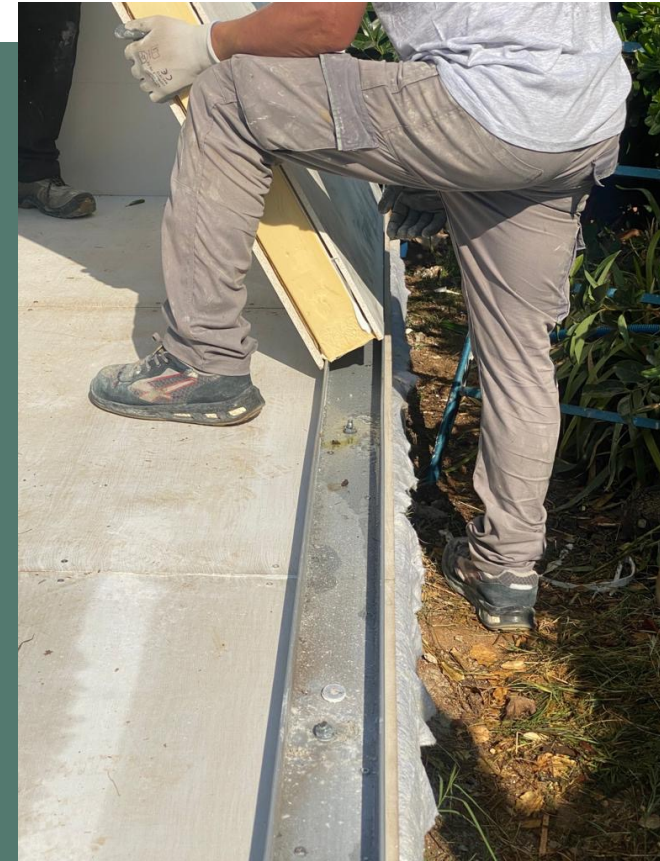
Corner connections

After the application of polyurethane sealant, a GFRP U-beam is inserted in the gap of one wall edge. A second U-beam is screwed to the abutting wall. The second panel is placed so that the U-beam is inserted in the gap. The whole assembly is then screwed together using stainless steel screws. A finishing cap is placed over the exposed edge of the GFRP.

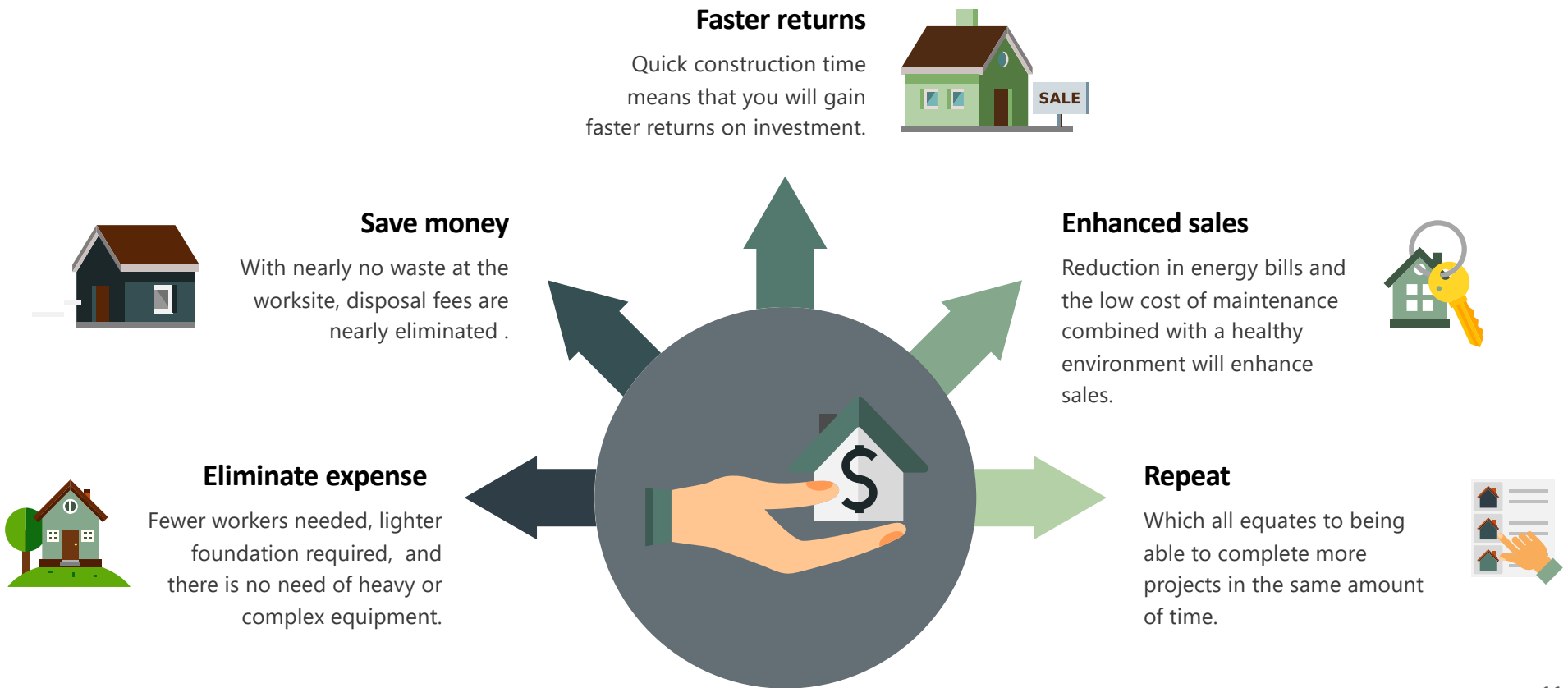


Technical Characteristics

Parameters		EC3 Panels	EC3-I Panels
Size	Length	2.4 - 3 m	2.4 - 3 m
	Width	1.22 m	1.22 m
	Thickness	120 - 170 mm	121 - 171 mm
	Weight	22-24 kg	23 - 25 kg
Insulation	Thermal resistance	0.22 W/m ² K - 0.15 W/m ² K	0.21 W/m ² K - 0.14 W/m ² K
Fire Resistance	MgO outer skin	A1 (non-combustible)	A1 (non-combustible)
	EC3 Panel	B - s1, d0 - best in class	B - s1, d0 - best in class
Load Bearing	Bending moment	3.87 - 5.27 kN.m/m	6.97 - 7.49 kN.m/m
	Shear strength	12.67 - 19 kN/m	18.8 - 29.48 kN/m
	Racking strength	24.74 kN/m	35.16 kN/m



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