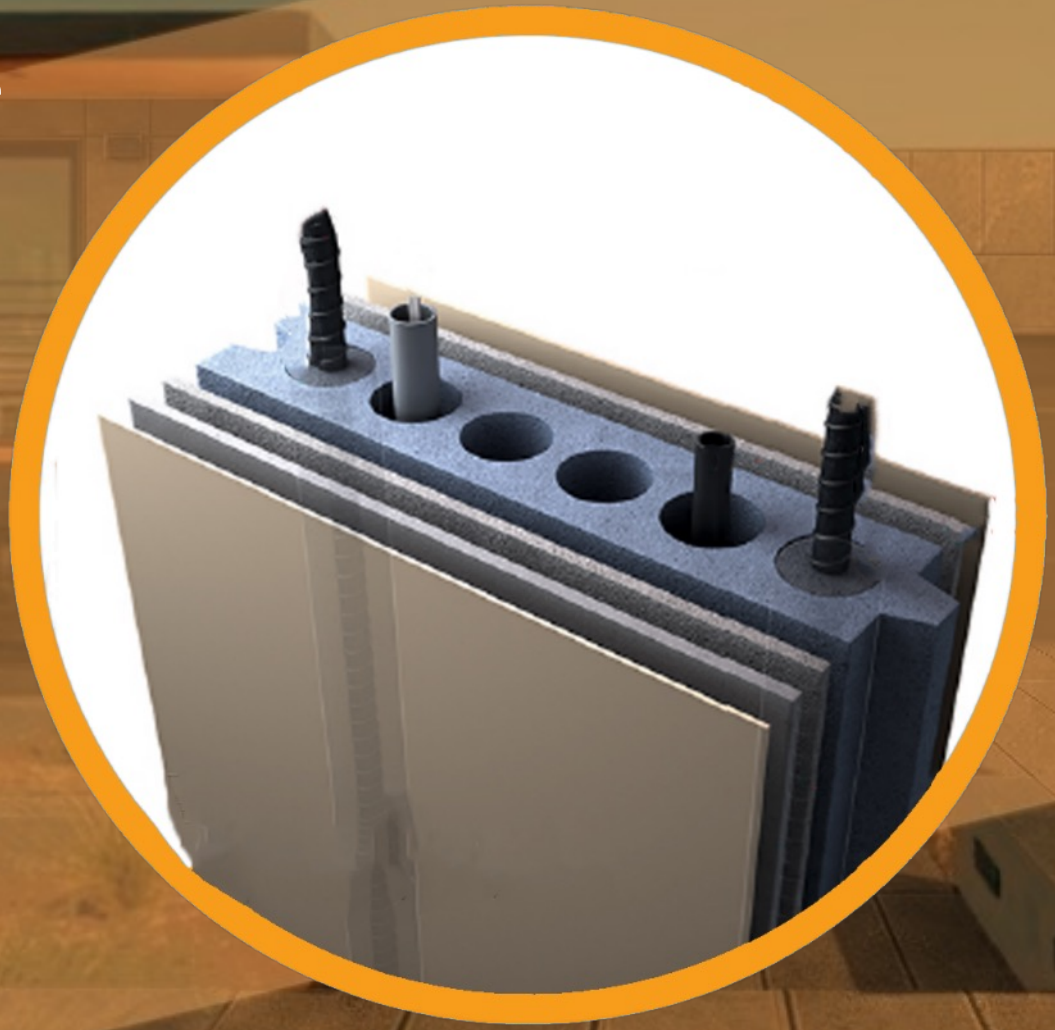
ECO CORE WALL PANEL

ECO CORE PANELS are manufactured using recycled waste from the burning coal to produce power

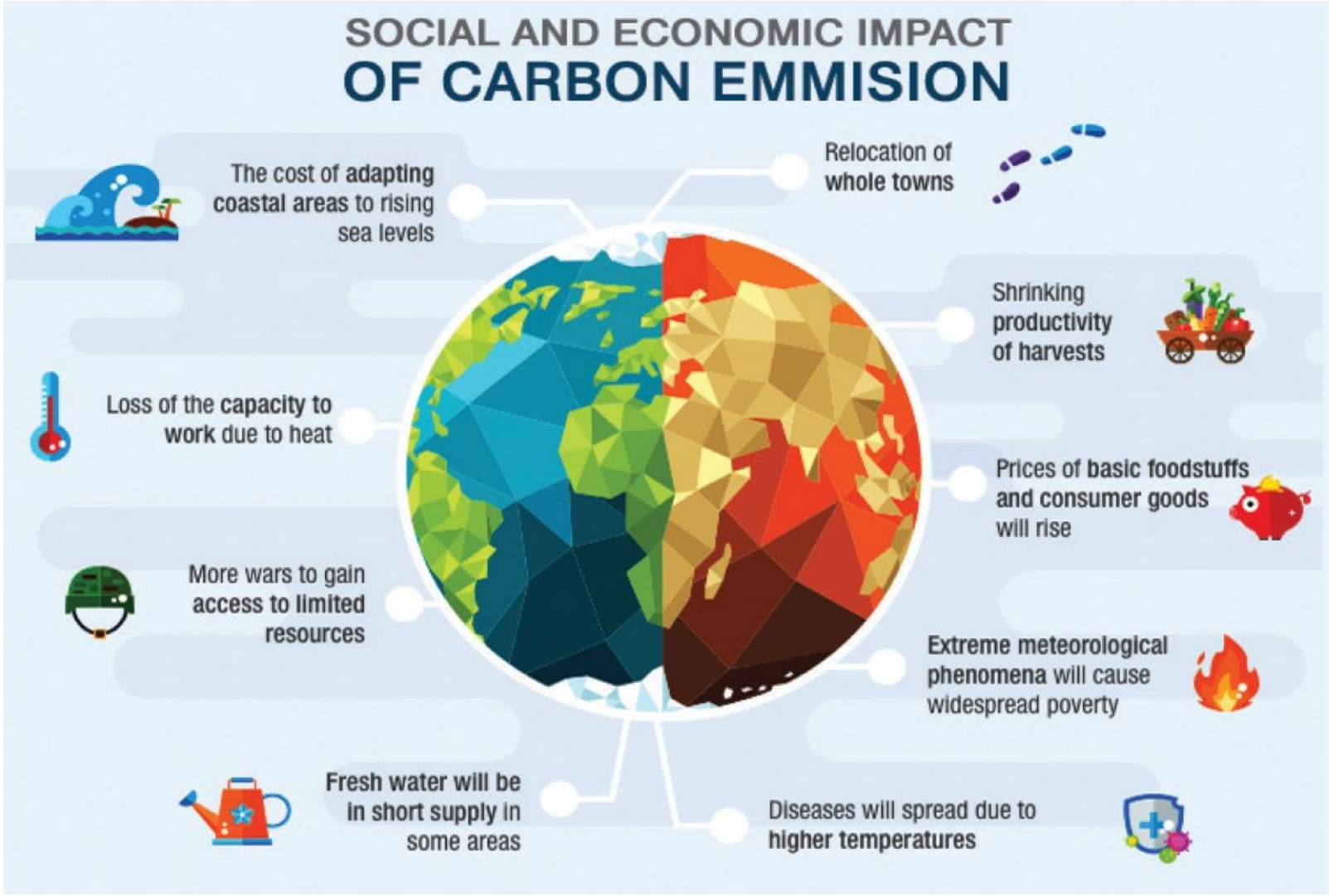


- **Minimize Virgin Aggregates**
- **Optimize Waste Materials**
- **Maximize Value & Build Sustainability**

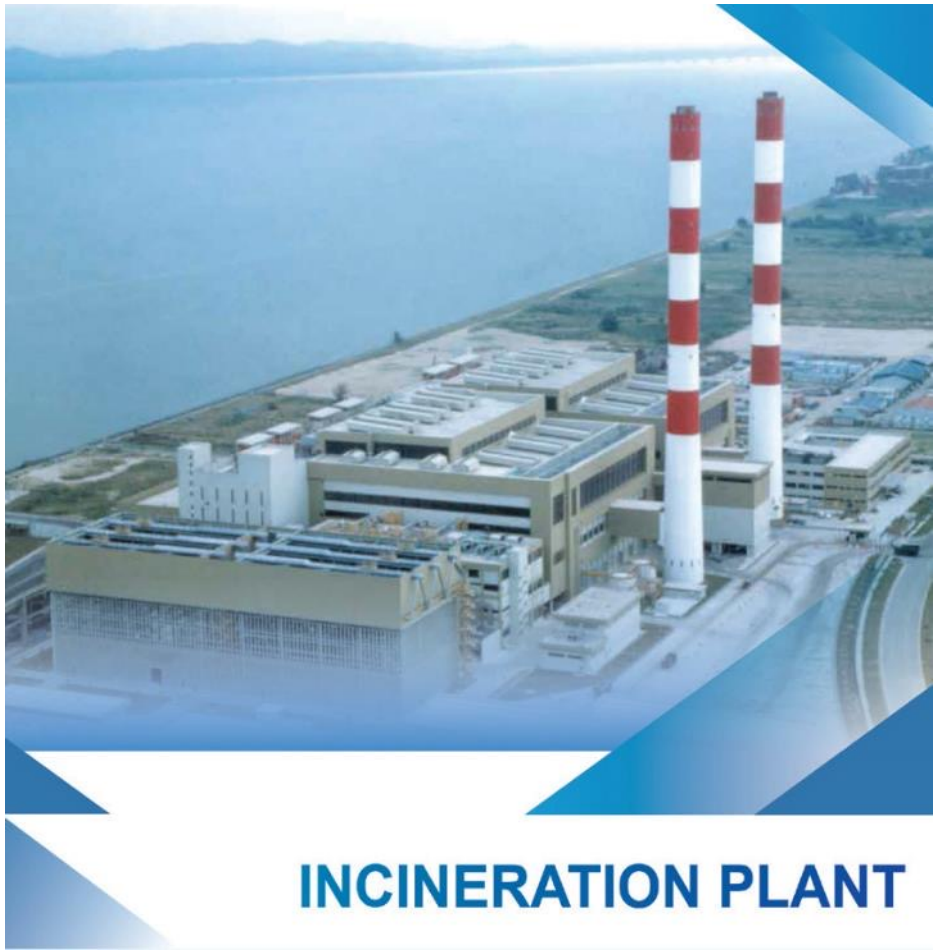
ZERO WASTE PLAN

GREEN SUSTAINABLE PLAN

Rapid construction is the highest contributor of carbon footprint because concrete is the primary component in these built environments (8% global CO2 emission 2019).
Our panels are in line with a solution that will reduce this impact holistically and will have significant outcome for the reduction of carbon emission.



ZERO WASTE PLAN



Around the world we are consistently been looking into sustainability solutions, for water, food or even sand and aggregates for concrete.
On the other hand, the dilemma of limited landfill and growing volume are serious concerns. These are problems we are working to solve every day.

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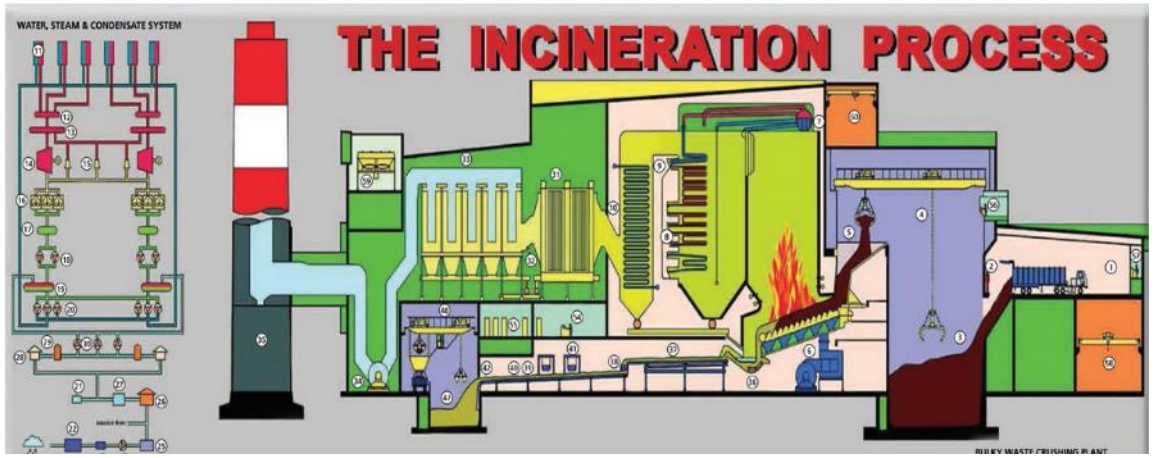
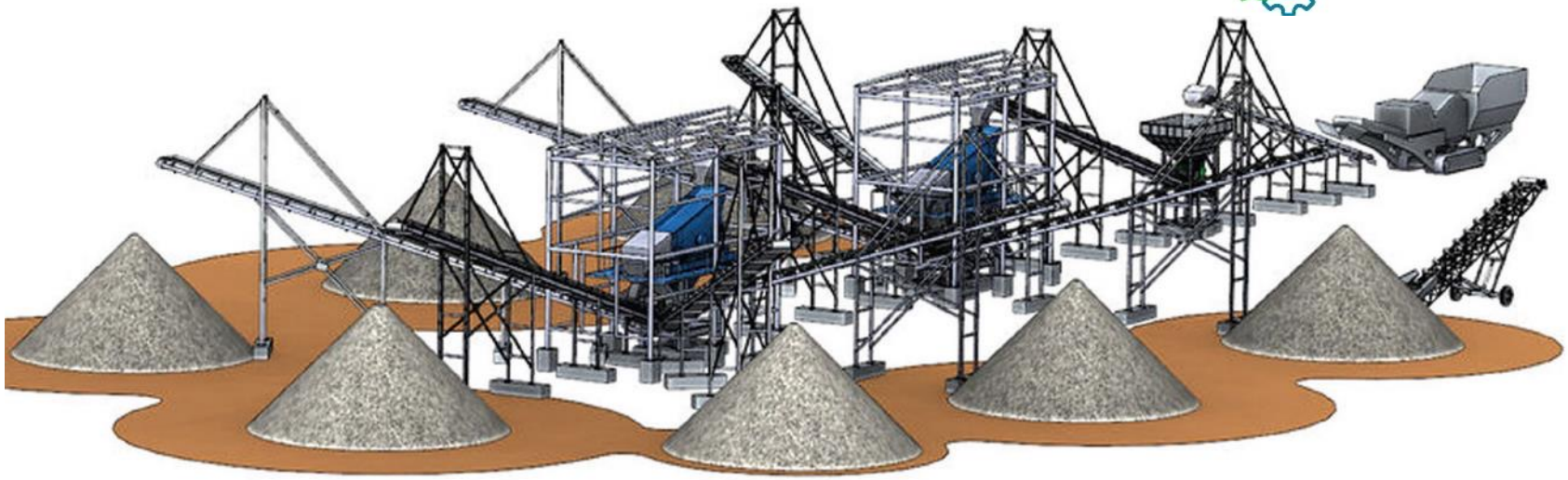


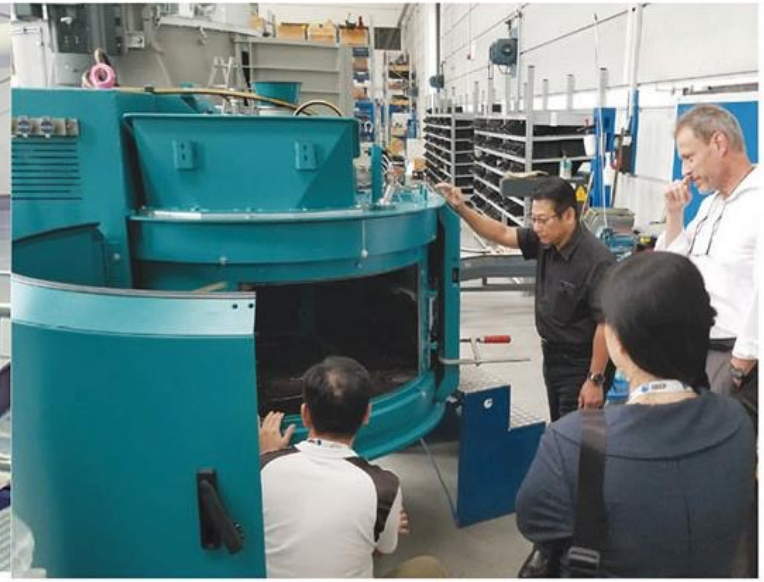
RECYCLING

Converting waste as replacement materials for BUILDING and other industries where a cement alternative is required is the focus and Philosophy with our building system and product development process.

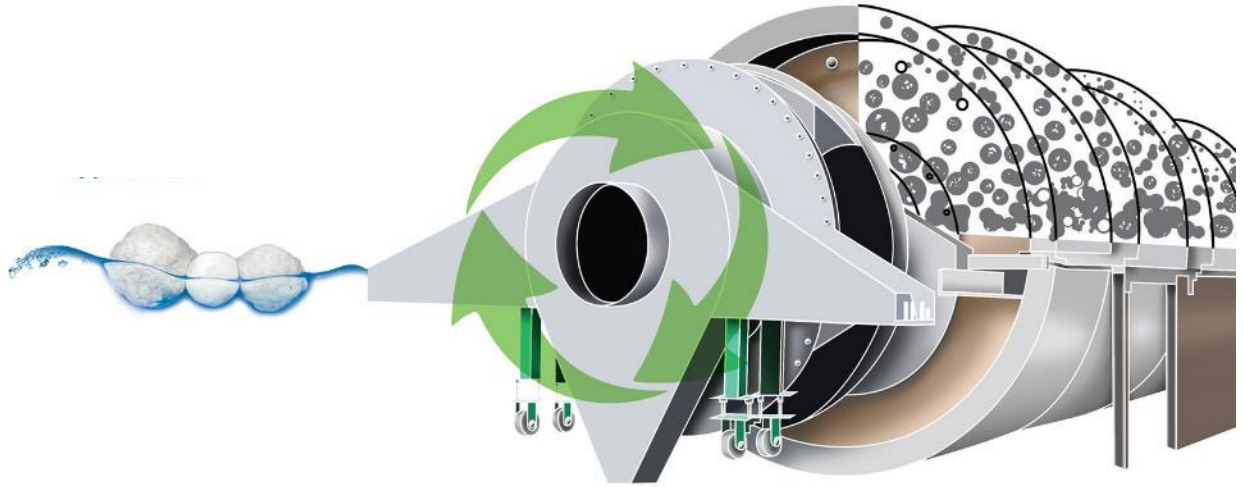
VARIOUS TYPE OF WASTE MATERIALS



PROCESS



We have been working with innovative manufactures to customize high tech and energy efficient equipment of low carbon emission.
Recovering different kind of waste materials using state of the art technology to produce Lightweight Green Aggregates and composites for various industry applications.



OUR PANELS ARE THE SOLUTION

We have the technology to convert Waste to produce Lightweight Green Aggregate to use in Lightweight Green Concrete

WASTE

Lightweight Green Concrete

Lightweight Green Aggregate

The Benefits

- Saving in Construction Cost and Time
- Saving in Handling & Transportation Cost
- Saving in Foundation Cost
- More Durable Structures
- Higher Earthquake Resistance
- Longer Building Service Life
- Bigger Space Savings between Columns
- Lintel & Stiffened Joint Cost Savings
- Lower Crane Capacity
- Energy Savings Benefit
- Built Sustainable Environments
- Cyclonic Rated

The Benefits

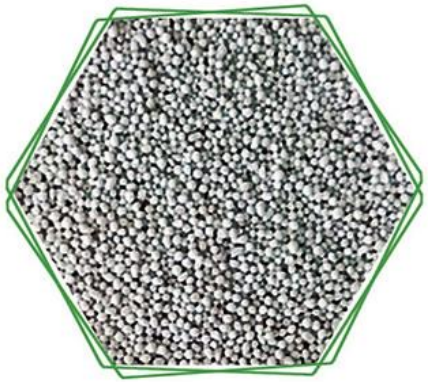
- Extra Lightweight and Strong
- 100% Biodegradable and Recyclable
- Environmentally Friendly
- Lower Carbon Footprint
- Economic & Competitive
- No Hazards to Health
- Non Combustible
- High Resistance to Fire
- Good Thermal Insulation
- High Acoustic Insulation
- Low Water Absorption

SPECIFICATION OF AGGREGATES

Green Aggregates produced from recycled and natural materials

0.1 - 0.3 mm

0.25 - 0.5 mm



0.5 - 1 mm

1 - 2 mm

2 - 4 mm

4 - 8 mm

8 - 16 mm

Structured Green Aggregates

WHAT IS LIGHTWEIGHT GREEN AGGREGATE?

Lightweight Green Aggregates are granules or pellets of Lightweight materials that have many applications. They can either be mined from natural sources or manufactured using minerals or waste materials.

1 m^3 of Normal Weight Concrete

Cement	Fine Aggregate **(Sand)**
Water	Coarse Aggregate **(Granite)**

Density 2400 kg/m^3

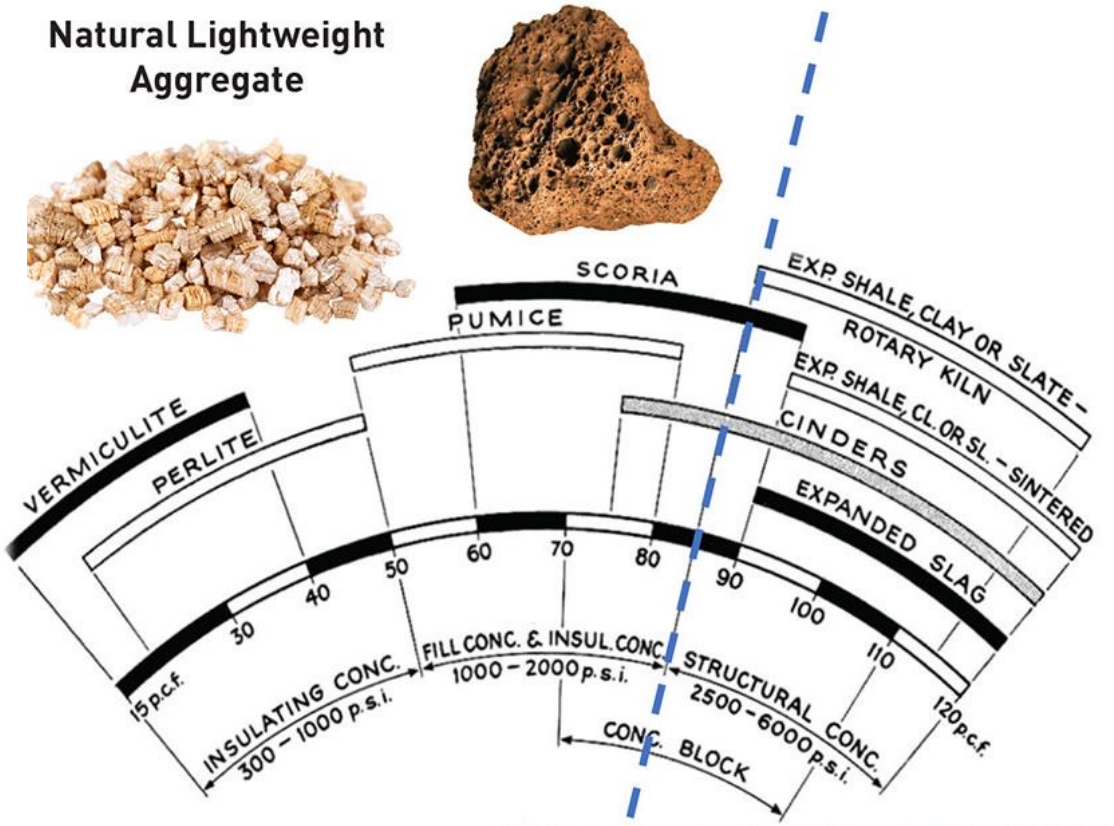
Partially or fully replaced

1 m^3 of Lightweight Concrete

Cement	Fine Aggregate **(LWA)**
Water	Coarse Aggregate **(LWA)**

Density 800 to 2000 kg/m^3 for structural application
&
Density below 800 kg/m^3 for non-structural application

Natural Lightweight Aggregate

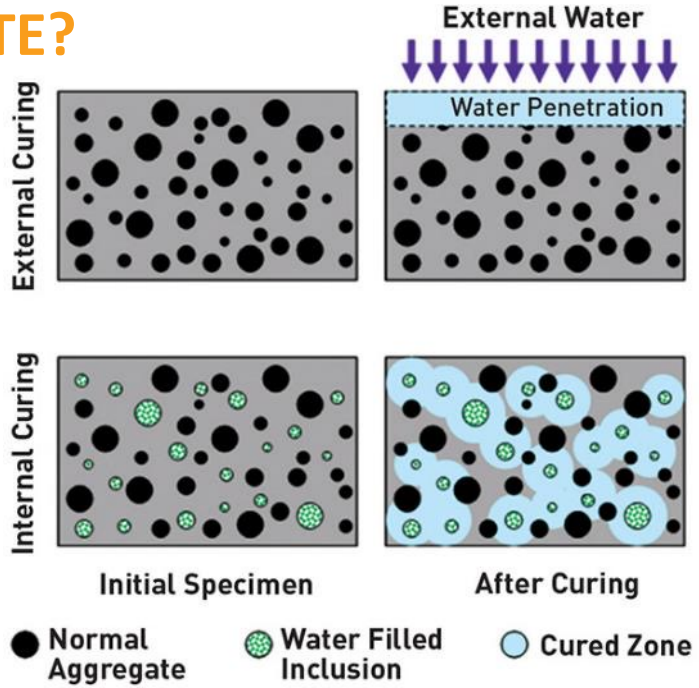


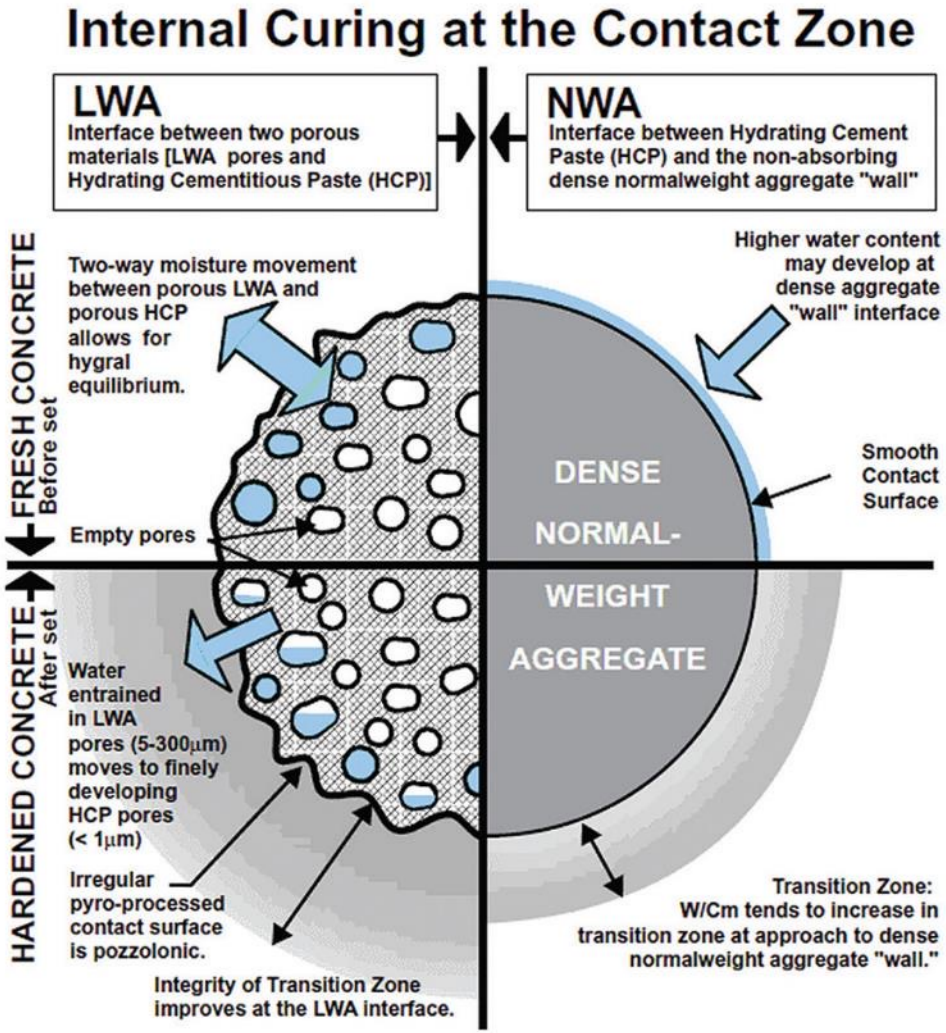
Manufactured Lightweight Aggregate

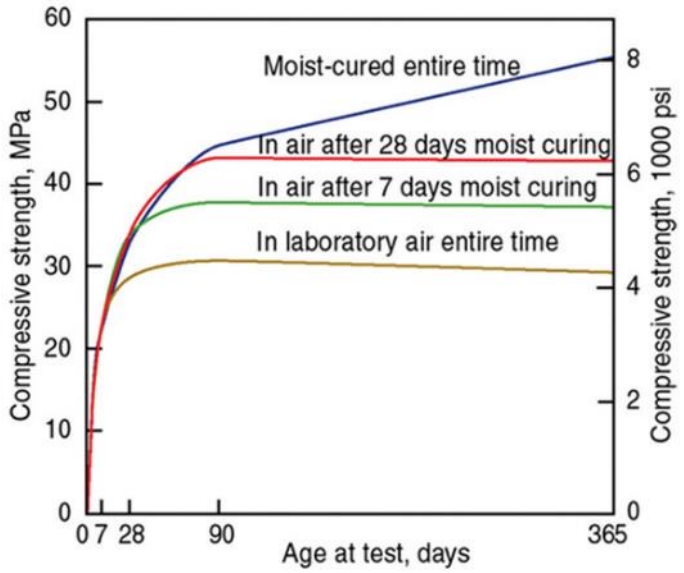
100% ECO FRIENDLY

WHAT IS LIGHTWEIGHT GREEN AGGREGATE?

Our Lightweight composite cement replacement aggregate is produced by replacing the heavy aggregates with lightweight fully sustainable aggregates.







R&D

The technology of Aggregates

The technology of our panels are in consistent collaboration with the Institute of Higher Learnings from some reputable universities in Australia, Singapore and Indonesia to advance the field of building material for the construction industry.

Our new formulations and customization yield many new products that offers cost-effective and high-quality solutions. Furthermore, we are also in consistent contact with professional manufacturers in Australia, China, and Indonesia to keep a breast of the technology and break new frontiers.

Our advance R&D works and dedicated professional scientists and engineers continuously keep developing new suitable green products for the future. In line with the world GO GREEN PLAN.

APPLICATIONS for use- Replacement of cement using our sustainable composite compounds.

Thermal Insulation (Roof, Floors, Fire Doors)

Heat Resistant Plaster & Dry Mortar

Heat Resistant Paint & Wallpapers

PPVC & PBU Precast

Lightweight Building Materials

Lightweight Ready-mix, Concrete & Industrialized Building System (IBS)

Floating Concrete & Structure

Lightweight Building Materials

APPLICATIONS for use- Replacement of cement using our sustainable composite compounds.

Polymer Concrete for Furniture, Bathrooms, & Kitchen Countertops

Geotechnical Application (Retaining Wall, Soil Stability & Foundation)

Wastewater Treatment

Automotive Body Composite

Hydroponic Media

Filtration Media

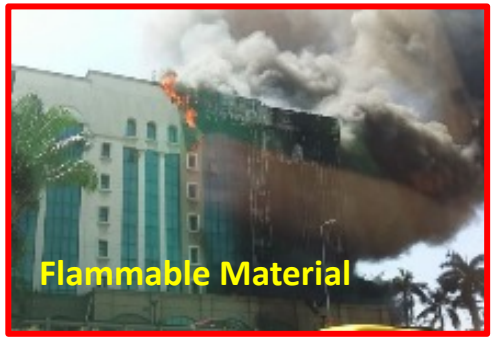
Decoration Materials

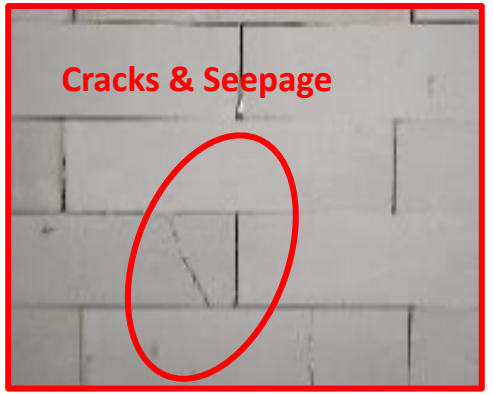
OTHER PANEL MATERIALS

Professional Builders are always **PARANOID** about Wall Panel Quality. Many kinds of blocks & wall panels in the market now pose a lot of **issues & risks**.

They use cheap low-quality materials that's potentially **dangerous & hazardous** without knowing the risk of the negative side effects in our environment.

1. Spider & Joint Cracks
2. Water Absorption/Seepage
3. Fungus & Mold
4. High risk of Flammable Materials
5. Low Heat & Sound Insulation
6. Toxic Fumes
7. Corrosive Materials
8. Debonding
9. Deflection/ Uneven Surface
10. Airbore Diseases





OTHER PANEL MATERIALS

LOW STRENGTH

WAVY / INCONSISTENT

LOW QUALITY

CEMENT WALL PANELS

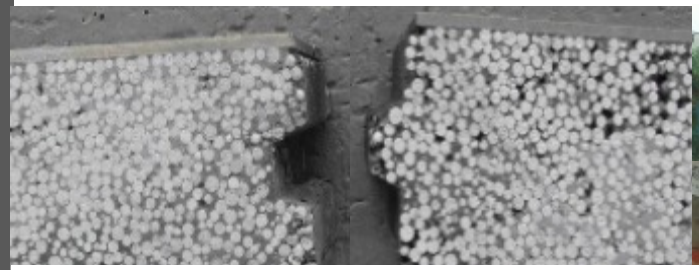
POROUS

CORROSION

LOW STRENGTH

SEEPAGE

AAC BLOCKS OR ALC PANELS



INCONSISTENT QUALITY

TOXIC FUME

DEBONDING

LOW STRENGTH

EPS BOARD SANDWICH OR MGO PANELS

WATER SEEPAGE

MOULD / FUNGUS

LOW STRENGTH

CORRODE

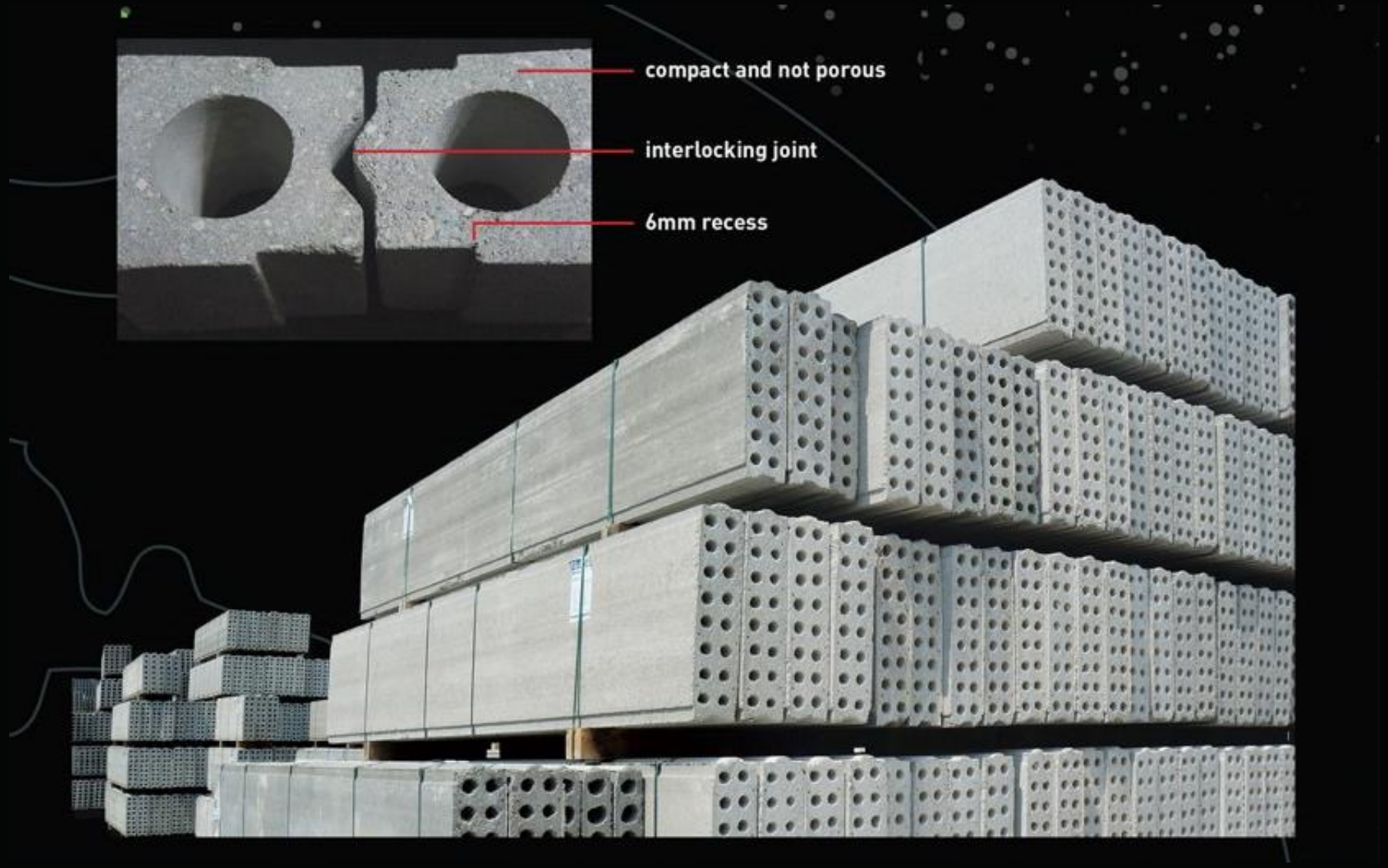
DRYWALL OR GYPSUM BOARD

ECO CORE PANELS OUTLINE

Content : Lightweight Green Aggregate
Characteristic : Extra Light, Solid, Strong
Performance : Lighter Than Other Hollow-Core Wall Panels
High Fire Resistance
Low Water Absorption
High Sound Insulation
Better Compressive Strength
Green & Environmentally Friendly
Economic & Competitive
Skin Coat Finishing Only

ECO CORE PANEL TYPE

Green aggregates make wall panels LIGHT, SOLID, and STRONG



ECO CORE PANEL TYPES

2.5ER

Thickness: 75 – 200mm
Nominal Weight : 58 – 115 kg/m2
Fire rating : 2 – 4 Hours
Sound Insulation : STC 39 – 48
Nominal Density : 900 kg/m3
Water Absorption : 15%
Compressive Strength : >5Mpa

10ER

Thickness: 75 – 200mm
Nominal Weight : 84 – 166 kg/m2
Fire rating : 2 – 4 Hours
Sound Insulation : STC 41 – 50
Nominal Density : 1,300 kg/m3
Water Absorption : 14%
Compressive Strength : >15Mpa

20ER

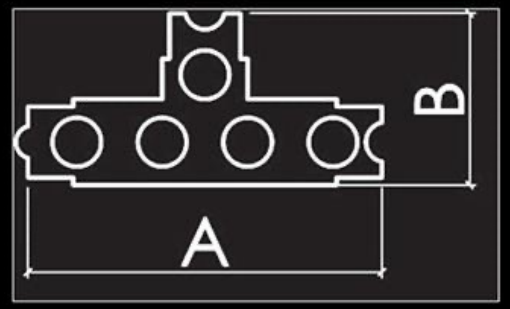
Thickness: 75 – 200mm
Nominal Weight : 93 – 204 kg/m2
Fire rating : 2 – 4 Hours
Sound Insulation : STC 45 – 54
Nominal Density : 1,600 kg/m3
Water Absorption : 11%
Compressive Strength : >25Mpa

49ER

Thickness: 75 – 200mm
Nominal Weight : 128 – 281 kg/m2
Fire rating : 1 – 4 Hours
Sound Insulation : STC 47 – 58
Nominal Density : 2,200 kg/m3
Water Absorption : 6%
Compressive Strength : >40Mpa

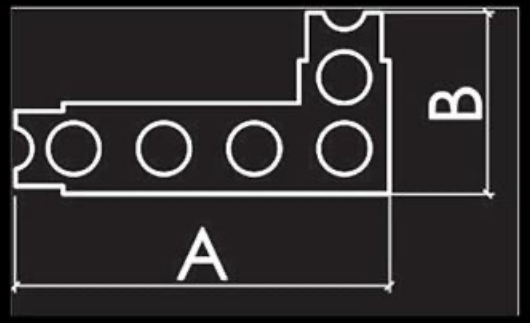
ECO CORE PANEL TYPE

T-Joint



Thickness available	**Dimension**
75mm, Ø 40mm	: A = 290mm : B = 143mm
90mm, Ø 58mm	: A = 290mm : B = 185mm
100mm, Ø 64mm	: A = 290mm : B = 195mm
150mm, Ø 40mm	: A = 290mm : B = 270mm
200mm, Ø 64mm	: A = 290mm : B = 350mm

L-Joint



Thickness available	Dimension
75mm, Ø 40mm	: A = 290mm : B = 143mm
90mm, Ø 58mm	: A = 290mm : B = 185mm
100mm, Ø 64mm	: A = 290mm : B = 195mm
150mm, Ø 40mm	: A = 290mm : B = 270mm
200mm, Ø 64mm	: A = 290mm : B = 350mm

ECO CORE PANEL TYPES

Customized

Width	: 600mm, 300mm, 200mm, 100mm
Thickness available	: 200mm, Ø 64mm
	150mm, Ø 40mm
	100mm, Ø 64mm
	100mm, Ø 40mm
	90mm, Ø 58mm
	75mm, Ø 40mm

Note : *Solid Panels Available (Except 75mm)*
Customized Panels Available

Other Special Customization Available

Width: 100mm, 200mm, and 300mm
Numbers of Tensile Wire : 8 – 12 nos
Solid Panels
M&E Recess
Groove Lines
Noise Barrier Panel
Anti Blast Design with Rebar and Grouting
Stiffener Panel with Rebar and Grouting

Standard (49ER) Max Panel Height

200mm Solid	: max 6.0m (with wire)
150mm Solid	: max 6.0m (with hire)
100mm Solid	: max 6.0m (with wire)
200mm, Ø 64mm	: max 6.0m (with wire)
150mm, Ø 40mm	: max 6.0m (with wire)
100mm, Ø 64mm	: max 5.2m (with wire)
100mm, Ø 40mm	: max 6.0m (with wire)
90mm, Ø 58mm	: max 4.5m (with wire)
75mm, Ø 40mm	: max 3.3m

Note : Panel above 3.3m will wired for safety & impact strength

2.5ER & 10ER & 20ER Max Panel Height

2.5ER 100mm, Ø 64mm	: Max 5.2m (with wire)
2.5ER 100mm, Ø 40mm	: Max 6.0m (with wire)
10ER 100mm, Ø 64mm	: Max 5.2m (with wire)
10ER 100mm, Ø 40mm	: Max 6.0m (with wire)
20ER 100mm, Ø 64mm	: Max 5.2m (with wire)
20ER 100mm, Ø 40mm	: Max 6.0m (with wire)

Reinforcement	: Tensile Strength
Tensile Wire	min. 600 MPa (Ø3, Ø4.5, Ø5.0)

Recess Design : Depth 6mm x width 40mm

ECO CORE PANEL TYPES

Concrete Dry Density (kg/m3)

Light Panel (2.5ER)
Nominal Weight : 58 – 166 kg/m2
Nominal Density : 900 kg/m3

Light Panel (10ER)
Nominal Weight : 84 – 166 kg/m2
Nominal Density : 1,300 kg/m3

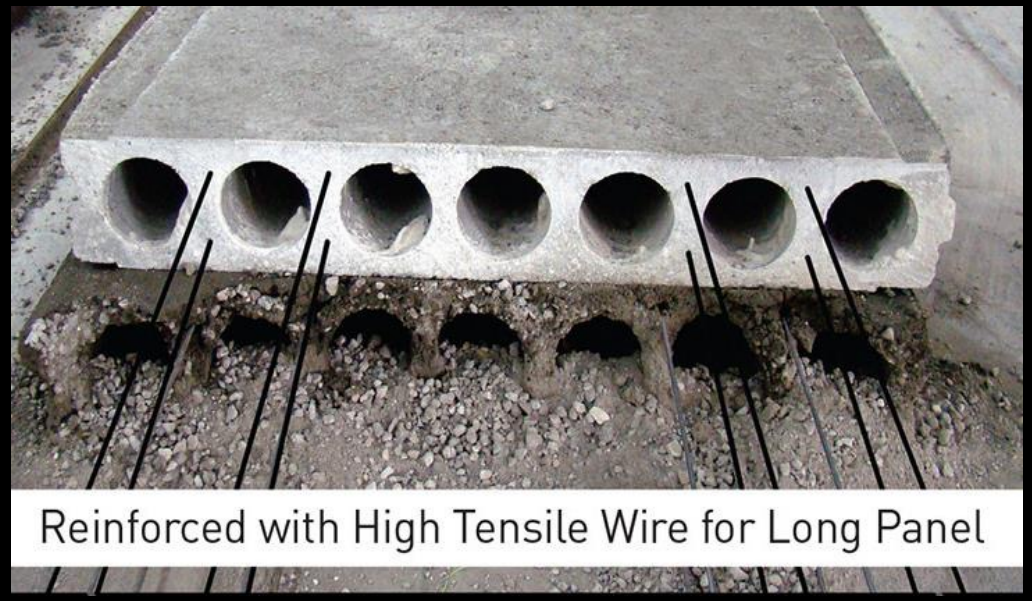
Light Panel (20ER)
Nominal Weight : 93 – 204 kg/m2
Nominal Density : 1,600 kg/m3

Light Panel (49ER)
Nominal Weight : 128 – 281 kg/m2
Nominal Density : 2,200 kg/m3

FULL WALL PANEL INSTALLATIONS

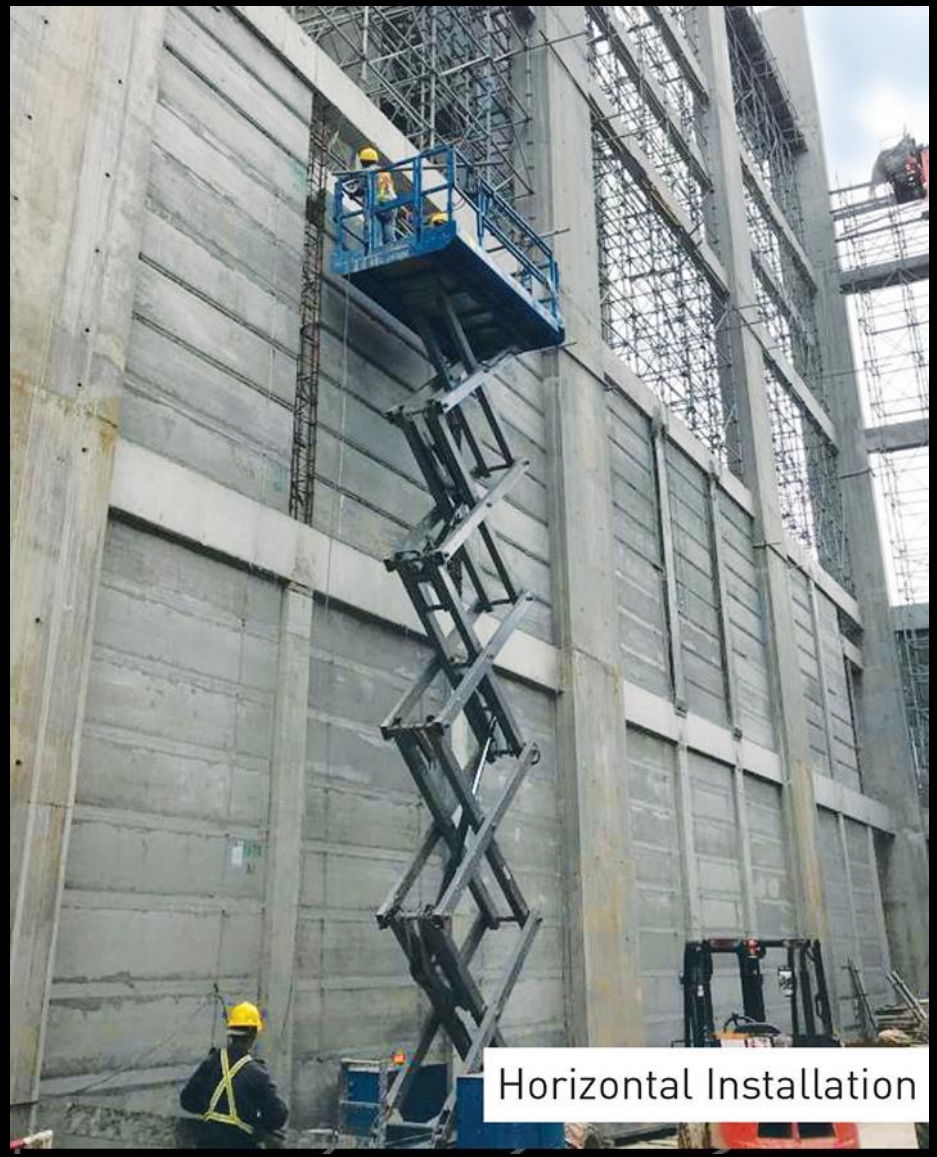
PANEL APPLICATIONS & TYPES

Vertical Installation



Reinforced with High Tensile Wire for Long Panel

PANEL APPLICATIONS & TYPES



Horizontal Installation

Customized with Rebar & Grout

PANEL EXTRUDER MACHINE

Innovative remote location panel production

The precast wall panel extruder machine is designed to manufacture the wall panels with eco cores or as a solid panel. The wall panels can be used as internal and external walls in all types of building applications. The Non-structural panels can be used in any frame construction buildings.

Our extrusion machines can produce panels in any remote locations, saves huge transport and logistic costs. Plus we can introduce local waste materials with our unique mix to produce building panels at low cost and reduce CO2 emissions significantly.

ECO CORE TECHNICAL DATA

SINGAPORE TUV TEST DATA (THICKNESS: 100mm)

Item no.	Testing Standard	Testing Item	Result
1	BS 476 Part 22:1987	Fireproof	132 min
2	ASTM E413-04	Sound Insulation	36dB
3	BS EN 772-1:2000	Compressive Strength	5.56 Mpa
4	CT-21752/THC	Thermal Conductivity	0.1739 w/m°k
5	CT-21752/THC	Thermal Resistance	0.5712 m2°K/W
6	BS 5234: Part 2:1992 or SS 492:2001	Stiffness	passed
7	BS 5234: Part 2:1992 or SS 492:2001	Surface Damage by Small Hard Body Impact	tested
8	BS 5234: Part 2:1992 or SS 492:2001	Surface Damage by Soft Body Impact	passed
9	BS 5234: Part 2:1992 or SS 492:2001	Perforation by Small Hard Body Impact	passed
10	BS 5234: Part 2:1992 or SS 492:2001	Resistance to Structural Damage by Large Soft Body	passed
11	BS 5234: Part 2:1992 or SS 492:2001	Door Slamming	passed
12	BS 5234: Part 2:1992 or SS 492:2001	Criwd Pressure	3 Kn/m
13	BS 5234: Part 2:1992 or SS 492:2001	Light weight anchorage-pull out	100N
14	BS 5234: Part 2:1992 or SS 492:2001	Light weight anchorage-pull down	250N
15	BS 5234: Part 2:1992 or SS 492:2001	Heavy weight anchorage-wash basin	1500N
16	BS 5234: Part 2:1992 or SS 492:2001	Heavy weight anchorage-wash cupboard	4000N

SIPOD GREEN PANEL ASTM TEST DATA (Thickness: 90mm)

Item No.	Testing Standard	Testing Item	Result
1	ASTM C39/C39M-12a	Compressive Strength	4.4 Mpa
2	ASTM C1609/C1609/C1609M-12	Flexural Strength	0.492 Mpa
3	GB/T 9978.8-2008	Fireproof	180 Minutes
4	GB 50121-2005	Sound Insulation	51 dBv

Australia Green Mark 2021 for New & Existing Buildings

BCA GREEN MARK

			Requirements	New Potential Higher Scoring using ECO CORE Products				
				Aggregate	2.5ER	10ER	20ER	49ER
1	 ENERGY EFFICIENCY		Reduced Heat Gain (ETTV)	✓	✓	✓	✓	✓
2	 HEALTH & WELLBEING	HW 1.2	HW 1.2 Material Emissions	✓	✓	✓	✓	✓
		HW 2.3	Sound				✓	✓
3	 RESILIENCE	RE 1.1 b	Resources	✓	✓	✓	✓	✓
		RE 1.2b	Urban Heat Island Mitigation	✓				
4	 WHOLE LIFE CARBON	CN 1.1	Whole Life Carbon Calculation	✓	✓	✓	✓	✓
		CN 1.2	Embodied Carbon	✓	✓	✓	✓	✓
		CN 1.3	2030 Transition Plan	✓	✓	✓	✓	✓
		CN 2.1	Sustainable Construction	✓	✓	✓	✓	✓
		CN 2.2	Sustainable Products & Finishes	✓	✓	✓	✓	✓
		CN 3.2	Fit out Products	✓	✓	✓	✓	✓
5	 MAINTAINABILITY	General	BIM model	✓	✓	✓	✓	✓
		1.5	Design Factor - Masonry & Lightweight Concrete Panel	✓	✓	✓	✓	✓
		1.5.1	Reduce risk of Water ingress and Efflorescence formation	✓	✓	✓	✓	✓
		1.5.2	Reduce risk of façade flaking/peeling/cracking /blistering	✓	✓	✓	✓	✓
		2.5	Basement and Car Park					

Green Building Council Australia
Member 2020–2021

	Applicable GBI Credits	Criteria	New Potential Higher Scoring using ECO CORE Products				
			Aggregate	2.5ER	10ER	20ER	49ER
1	**Energy Efficiency**	EE					
	Mininum Energy Efficiency Performance		✓	✓	✓	✓	✓
2	**Indoor Environmental Quality**	EQ					
	Indoor Air Pollutants		✓	✓	✓	✓	✓
	Mould Prevention		✓	✓	✓	✓	✓
	Internal Noise Levels / Sound Insulation		✓	✓	✓	✓	✓
	IQA Before & During Occupancy		✓	✓	✓	✓	✓
3	**Sustainable Planning & Management**	SM					
	Sustainable Construction		✓	✓	✓	✓	✓
	Qlassic - Quality Assessment System for Building		✓	✓	✓	✓	✓
	IBS - Industrialised Building System		✓	✓	✓	✓	✓
4	**Materials & Resources**	MR					
	Material Reuse & Selection		✓	✓	✓	✓	✓
	Recycled Content Materials		✓	✓	✓	✓	✓
	Regional Materials		✓	✓	✓	✓	✓
	Material Manufacture & Ingredients		✓	✓	✓	✓	✓
	Storage & Collection of Recyclables		✓	✓	✓	✓	✓
	Construction Waste Management		✓	✓	✓	✓	✓

ECO CORE PANEL PROPERTIES

SOUND RESISTANT

LIGHTWEIGHT

IMPACT RESISTANT

ECO-FRIENDLY

COST EFFECTIVE

WATER RESISTANT

DIMENSIONAL ACCURACY

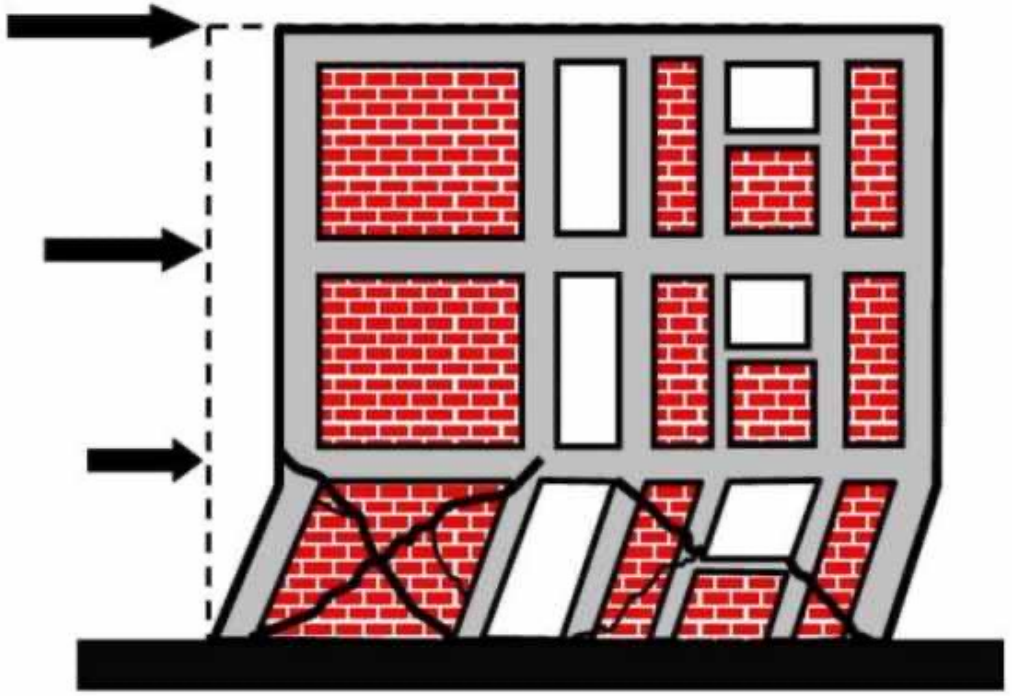
GOOD WORKABILITY

DURABLE

FIRE RESISTANT

THERMAL COMFORT & ENERGY SAVING

BUILDING SAFETY



Block Joints Weak Thin Layer

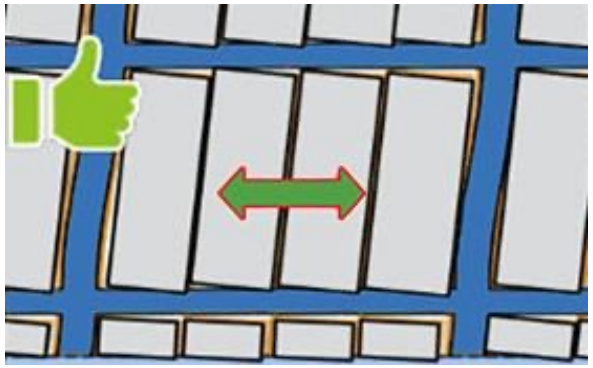
The numerous horizontal mortar joints in brick wall create weak planes that are vulnerable to failure during seismic loading. The top and bottom of the brick wall are also not mechanically connected to the structures providing very little shear resistance against seismic loading.

BUILDING SAFETY

Wire Reinforced Panel Joints
Solid, strong, Full Contact
Minimize Seismic Impact

Wall Panel Systems with internal wire installed.

In our wall panels, there are no horizontal weak planes. The top and bottom of the wall panels are also mechanically connected with brackets or dowels providing the necessary shear resistance to withstand seismic loading.

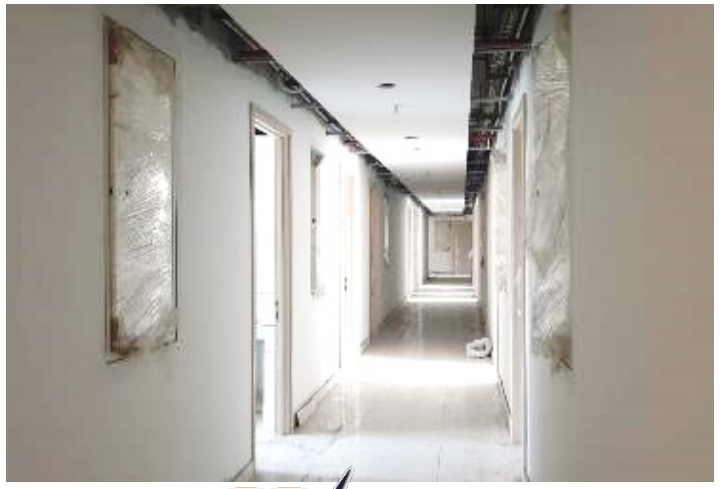


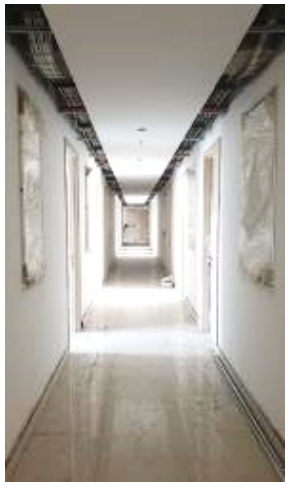
BUILDING SAFETY

SUPERIORITY IN BUILDING PERFORMANCE

SIPOD panels are Superior, Strong & Customizable.

Tensile Wire 600 Mpa
For Better Bending Strength & Safety

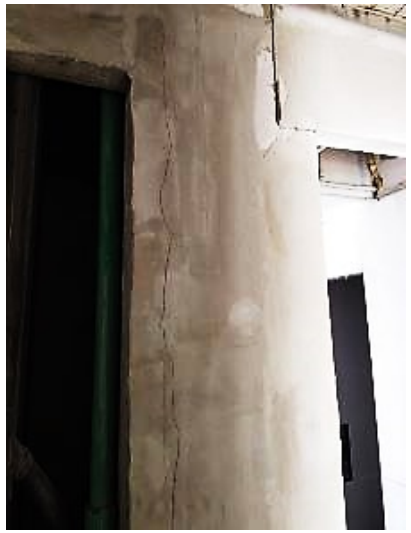




Other Panel: Corner Fungus & Cracking During Construction

VS

Other Panel Cracking Before & After Skimcoat Due to Door-Slamming



SIPOD PRECAST – PPVC & IBS APPROVED

✓ 50 Cycles Heat/Rain Test

✓ Water Capillary Test

✓ Fire Rating & Wall Integrity Test

PPVC, PBU, Bedroom, Toilet, & Service Duct Applications

AFFORDABLE HOUSING APPLICATION

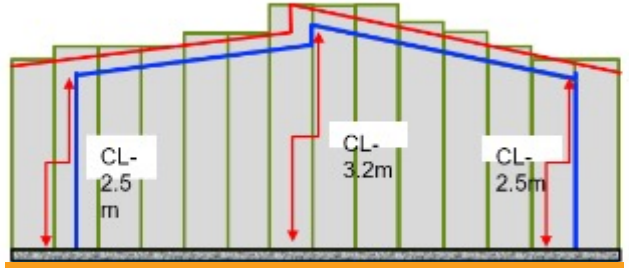
- Mono Pitch Roofing
- Light Roof Structure
- Higher Ceiling Height
- Bigger Internal Space
- Lower Wall Height
- More Economical to Build
- More Competitive Pricing
- More Appealing to Buyers

AFFORDABLE HOUSING APPLICATION

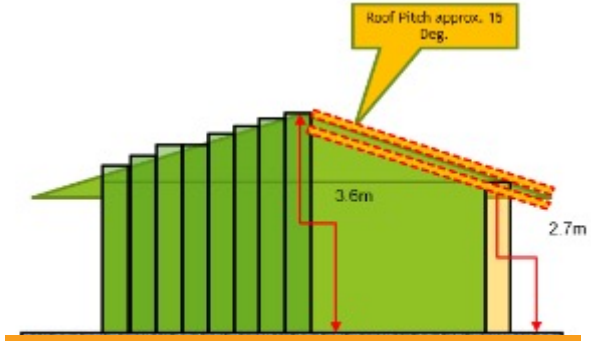
Multiple Room Configuration

Semi-D: Low-cost Housing w/ Pitched Roof / Flat False Ceiling Partition Wall Between Unit to use JOE Panel & Duplicate for Terrace Layout

Typical Terrace Façade can duplicate the front entrance design



Concept Roofing Design as Photo with stagger roof profile for modern look



Gable end/ corner unit can have similar treatment

OVERSEAS TRAINING CENTRE FOR HOLLOW CORE WALL INSTALLATION

DOWEL BAR & STOPPER CAP METHOD

Use trolley to move panel

Alignment & Adjustment

Bottom Gap (±25mm)
Top Gap (±25mm)
Using Wooden Wedges

INSERTION T10 DOWEL BAR ON THE BEAM & SLAB

Easily cut by Makita to make any opening for M&E, etc.

Apply JOE JOINT Bonding Adhesive

EASE OF INSTALLATION

Manual Installation

*** 2.7m High Wall**

*** Hand Trolley for easy movement of panels**

*** 2-5 Min/Panel**

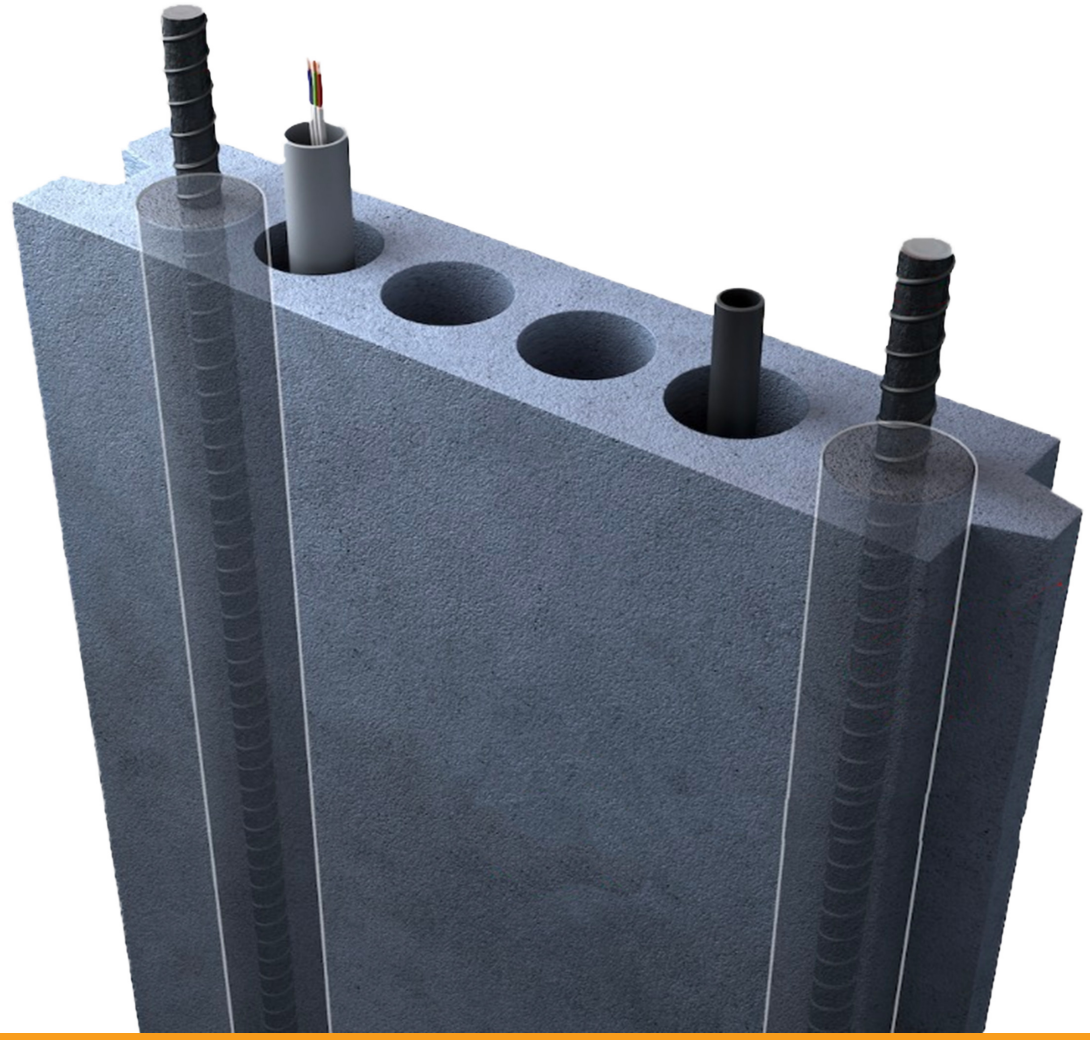
*** 2-3 Man Installation**

Click below to play the videos

Manual Installation

- **5.2- 6 M High Wall**
- **Forklift + 1 Pt. Load**
- **3 Man Installation**
- **5 Min / Panel**
- **Stacker/Forklift**
- **with Extender Arm**

COMPARISON OF ALL TYPES OF WALL PANELS



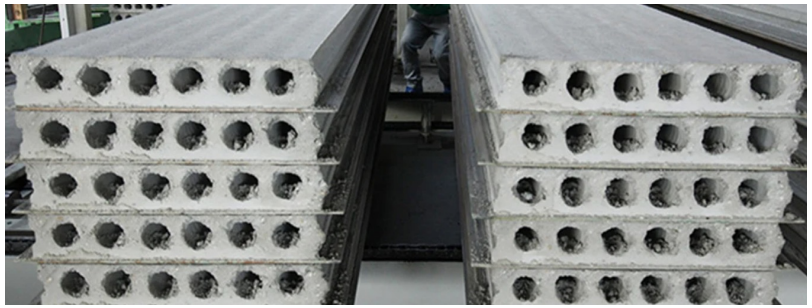
OTHER CONCRETE WALL PANELS

STRENGTH

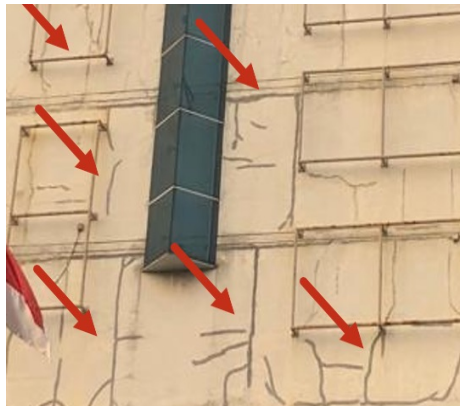
- Cement Based
- Efficient Panel System

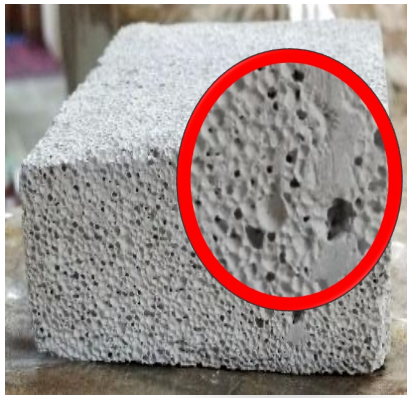
WEAKNESS

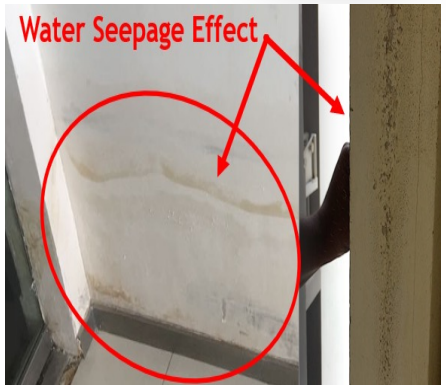
- No recess for Joint Treatments
- Less Compact
- More Porous
- Thinner Core Cover
- Limited Height, Range, Thickness
- Less Customization
- Lower Compressive Strength
  Lower Concrete Grade
- High Water Absorption 15% - 17%
- Lower Sound Insulation
- Deflection/ Uneven Surfaces



ACC BLOCK / ALC PANEL







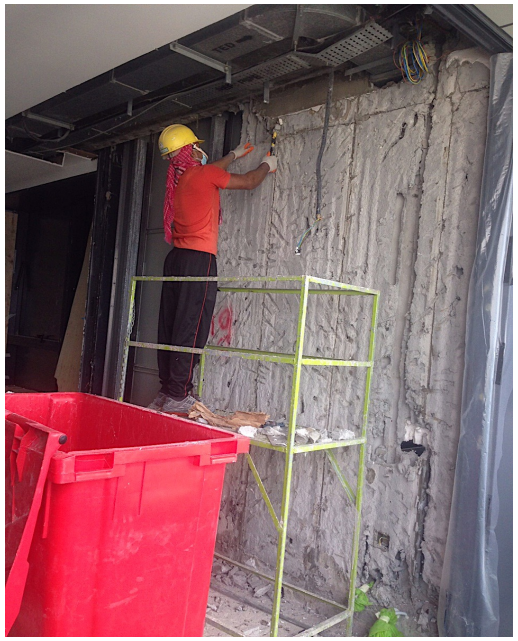
STRENGTH

- Lighter
- Slightly Faster to Install

WEAKNESS

- Foam Concrete: < 5 Mpa
- Contains : Gypsum & Lime
- Not Cement Based
- High Water Absorption
- Very Porous (Low Water Capillary)
- Low Sound Insulation
- Easy to Break during M&E
- Unable to Take Load
- High Potential for Spider Crack (Shrinkage)
- Weakens under Moisture & Seepage
- Need Full Waterproofing
- High Wastage

MGO PANEL



STRENGTH

Lighter
Slightly Faster to Install

WEAKNESS

Low Strength
High Water Absorption
Cracking of External Plastering
Spalling of plastering
Risk of falling plaster
Corrosion of steel dowel & brackets
High Cost of Repair for Cracking
Need to Dismantle for Repairs
Not Reusable after Damage

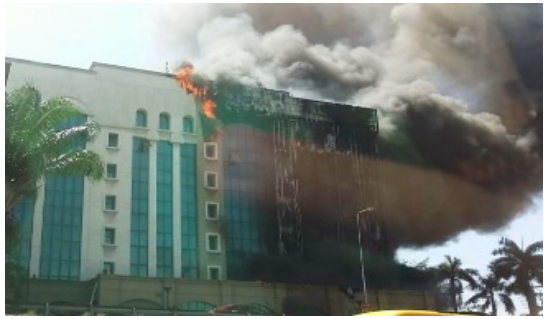
EPS SANDWICH BLOCKS / PANELS

STRENGTH

Lighter
Slightly Faster to Install

WEAKNESS

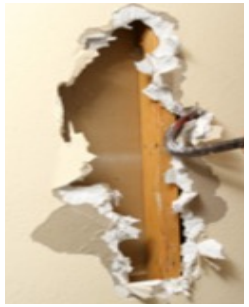
Non Concrete: < 5 Mpa
Contains :Expanded Polystyrene Beads
Delaminating / Debonding Risk
No recess for Joint Treatment
Easy cracking at joints
High Fire Risk as EPS melts at >130 C
Emit Black Toxic Fumes (Combustion)
Inconsistency of EPS Content & Quality
Glue Problem Leads to Debonding Issues
Need Full Waterproofing
High Wastage



DRYWALL / GYPSUM BOARD







STRENGTH

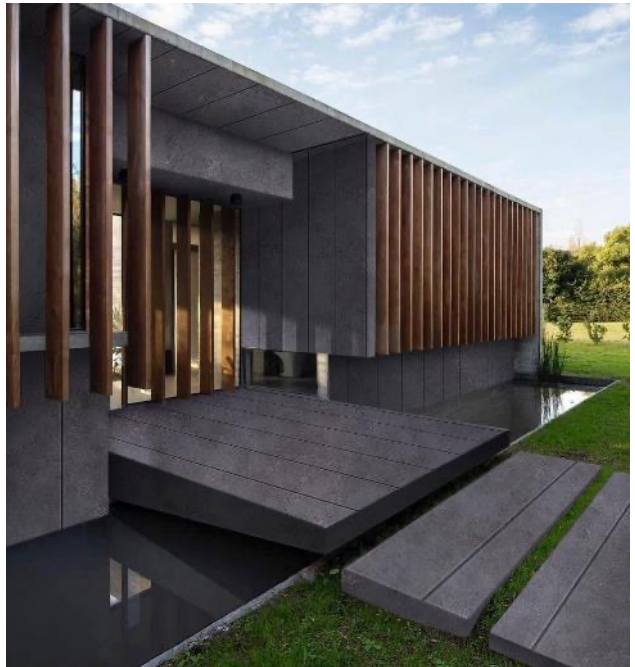
Lighter
Slightly Faster to Install

WEAKNESS

Lowest Strength Material
Unusual Odor
Easy to Break
No Hanging Heavy Objects
Not Reusable
Attracts Mold & Fungus
Sulfur & Other Corrosive Chemicals
High Water Absorption
Low Moisture Resistant Properties
Expensive Setup & System
Unusable for Wet Areas
High Wastage

ECO CORE GREEN WALL PANEL

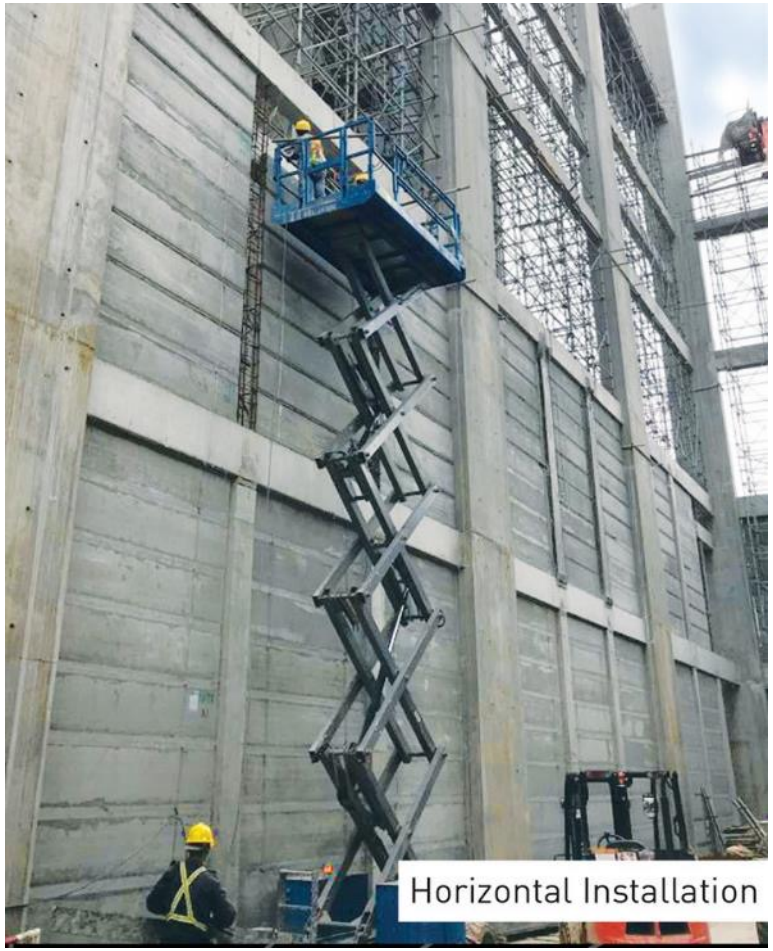
Residential applications



STRENGTH

- High Grade Composite Cement Replacement Technology
- High Strength
- Lowest Water Absorption <6.4%
- Highest Point Load up to 1.2 Ton
- Airtightness Certified TUV
- Water Tightness Certified
- High Sound Insulation Up to 52STC
- Full Customization up to 8M
- Easy To Install
- Less Installation Manpower
- Super Flat
- Skimcoat Only Finishing
- SGBC Certified Leader (4-Ticks)
- Stiffener & Lintel Savings
- Waterproofing on Joints Only
- Tensile Wire for Added Security/Strength
- Option for Superlight & Strong

Commercial applications



WALL MATERIAL COMPARISONS

	PROPERTIES	COMPARISON FOR 100MM THICK WALL MATERIALS									
		49ER	**Other Panel**	**Red Brick**	**20ER**	**AAC Block**	**ALC/GIP Panel**	**SANDWICH PANEL (EPS)**	**10ER**	**Dry Wall / Gypsum Board**	**2.5ER**
TEST REPORTS	Nominal Density (kg/m3)	2200	2200	1760	1600	550	800	720	1300	10	900
	Weight (kg/m2)- 100mm thickness	135	145	160	96	80	80	72	85	100 (Frame & Insulation)	65
	Maximum Height without lintel (mm)	8000*	3300	3000	6000*	3000	6000	3000	6000*	2400	6000*
	Compressive Strength (MPa) Cube	49	25	2 - 4	-	4.5	4.5	-	-	NA	-
	Compressive Strength (MPa) Section	42-59	15	2.5	20	2.5 - 5	5 - 7	4	11 - 17	NA	3 - 7
	Water Absorption (Percentage)	6% (24-hr immersed)	5% (30-min immersed)[2]	15 - 25%	11% (24-hr immersed)	35 - 60%	35 - 60%	20%	13% (24-hr immersed)	Not Usable (Dry Areas Only)	15% (24 -hr immersed)
	Water Absorption (Capillary) $g/m^2s^{0.5}$ (10 Min Absorption)	24	NA	NA	NA	130	190	45	NA	Not Usable (Dry Areas Only)	NA
	Air Tightness Certified	Yes	No	No	Yes	No	No	No	Yes	No	Yes
	Thermal Coductivity (W/K.m) - 100mm (Lower is Better)	0.74	NA	1.15	0.44	0.15 - 0.25	0.15 - 0.25	0.26	0.54	0.17	0.23
	Fire Rating (Hours)	1 - 4	1 - 2 (needs infill)	1 - 2	2 - 4	3 - 4	2 - 4	1 - 4	2 - 4	1 - 2 (needs infill)	2 - 4
	Sound Transmission Class (STC)	49 - 58	37 - 41	37 - 42	45 - 54	35 - 40 (11dB Drop after 3-6 Mos)[1]	40 - 46 (11dB Drop after 3-6 Mos.)[1]	41	41 -50	35 - 52 (Rock Wool) (Requires Insulation)	39 - 48

WALL MATERIAL COMPARISONS

	PROPERTIES	COMPARISON FOR 100MM THICK WALL MATERIALS									
		49ER	Other Panel	Red Brick	20ER	AAC Block	ALC/GIP Panel	SANDWICH PANEL (EPS)	10ER	Dry Wall / Gypsum Board	2.5ER
PERFORMANCES	Buildability (Labour Saving Index))	0.85#	0.85#	Demerits	0.85#	0.10	0.85#	0.85#	0.85#	1.00	0.85#
	Productivity (m^2/manday)	20	18	6	22	12	18	18	24	23	25
	Use of Green Recycled Material	Yes	No	No	Yes	No	No	No	Yes	No	Yes
	Use of Flammable Material	No	No	No	No	No	No	Yes	No	No	No
	Heavyweight Anchorage (4000N) Strength & Robustness	Severe Duty (Highest)	Severe Duty (Highest)	Pass (chemical & mechanical fixing)	Severe Duty (Highest)	Pass (chemical fixing)	Pass (chemical fixing)	Medium - Severe Duty	Severe Duty (Highest)	Pass (mechanical fixing-special bolt)	Severe Duty (Highest)
	Customised Height Available	Yes (8M)	No	No	Yes (6M)	No	Yes (3M or 6M only)	No	Yes (6M)	No	Yes (6M)
	Customised Thickness Available	75 - 200	75, 100	130 - 230	75 - 200	100-200	75-200	100-200	75 - 200	75-150	75- 200
	Wire Reinforcement (safety & strength) (Earthquake, Vibration, Movement, Impact)	High tensile wire (600 Mpa) 3-5mm dia	No	No	High tensile wire (600 Mpa) 3-5mm dia	No	BRC Mesh	BRC Mesh	High tensile wire (600 Mpa) 3-5mm dia	Metal Stud	High tensile wire (600 Mpa) 3-5mm dia
	Crack Resistance Accessories		Wire or Fiber Mesh	-		Wire or Fiber Mesh	Wire or Fiber Mesh	Fiber Mesh		-	
	Stopper Cap for Hollow Insert	Yes	No	No	Yes	No	No	No	Yes	No	Yes
	Joint Recess for Stronger Joints	Yes	No	No	Yes	No	No	No	Yes	No	Yes
	Product Structure	Strong & Compact	Low Strength, More Sand, Less Cement	Compact, Low Strength	Strong & Compact & Lightweight	Porous, Full of Capillary, Low Strength, Potential Fungus/Molding Growth	Porous, Full of Capillary, Low Strength, Potential Fungus/Molding Growth	Porous, Low Strength, Easy to Debond, Weak Glue Adhesive	Strong & Compact & Lightweight	Fragile, Easy to Break, Lowest Strength	Strong & Compact & Lightweight
	Production Process	Extrusion Flat Surface, Compact, Special Customised Machine	Extrusion on Conveyor, Potential Uneven Wavy Surface	Moulding, Potential Uneven Wavy Plate Surface	Extrusion Flat Surface, Compact, Special Customised Machine	Moulding, Potential Uneven Wavy Plate Surface	Moulding, Potential Uneven Wavy Plate Surface	Moulding, Potential Uneven Wavy Surface	Extrusion Flat Surface, Compact, Special Customised Machine	Extrusion on Metal Roller, Potential Uneven Surface, Thin & Brittle	Extrusion Flat Surface, Compact, Special Customised Machine
	Finishing Application (mm)	Thin Skimcoat	Plaster + Skimcoat	Plaster + Skimcoat	Thin Skimcoat	Plaster + Skimcoat	Plaster + Skimcoat	Plaster + Skimcoat	Thin Skimcoat	Putty	Thin Skimcoat

WALL MATERIAL COMPARISONS

	PROPERTIES	COMPARISON FOR 100MM THICK WALL MATERIALS									
		49ER	Other Panel	Red Brick	20ER	AAC Block	ALC/GIP Panel	SANDWICH PANEL (EPS)	10ER	Dry Wall / Gypsum Board	2.5ER
COST SAVINGS	Plaster Material & Labor Savings	-	15-25 mm (3 Layers)	15-25 mm (3 Layers)	-	15-25 mm (3 Layers)	-	15-25 mm (3 Layers)	-	-	-
	Skimcoat Material & Labor Savings (Due to Flatness & Waving)	1 - 5mm (1 Layer)	5 - 15mm (1 Layer)	5 - 20mm (1 - 2 Layer)	1 - 5mm (1 Layer)	5 - 10mm (1 -2 Layer)	5 - 10mm (1 - 2 Layer)	10 mm (2 - 3 Layers)	1 - 5mm (1 Layer)	Rockwool & Putty	1 - 5mm (1 Layer)
	Total Weight (kg/m2) (After Finishing)	155	185	260	115	140	140	122	105	105	85
	Lintel Savings	Up to 8M	Every 3M	Every 3M	Up to 6M	Every 3M	Every 3M	Every 3M	Up to 6M	Every 3M	Up to 6M
	Stiffener Savings	Up to 8M	Every 3M	Every 3M	Up to 6M	Every 3M	Every 3M	Every 3M	Up to 6M	Every 3M	Up to 6M
	M&E Services Savings (MEP - Indonesia)	Services can be run through hollow core	Services can be run through hollow core	Require surface hacking	Services can be run through hollow core	Require surface hacking	Surface hacking (Max depth of 30mm)	Surface hacking (Max depth of 30mm)	Services can be run through hollow core	By fitting services before closing up	Services can be run through hollow core
	Wall Fixing	L-bracket + Sleeve Anchor / H10 Dowel Bar	Bracket / H10 Dowel Bar	Wall Tie	L-bracket + Sleeve Anchor / H10 Dowel Bar	Wall Tie	Wall Panel Bracket	Wall Panel Bracket	L-bracket + Sleeve Anchor / H10 Dowel Bar	Metal Stud & Drive Pins	L-bracket + Sleeve Anchor / H10 Dowel Bar
	Site Houskeeeping & Wastage	Minimum Wastage (3 - 5%)	More Wastage (12 - 15%)	More Wet Works & High Wastage	Minimum Wastage (3 - 5%)	More Wet Works & High Wastage	More Wastage (12 - 15%)	More Wastage (12 - 15%)	Minimum Wastage (3 - 5%)	More Wastage (12 - 15%)	Minimum Wastage (3 - 5%)
	External Waterproofing	Joints Only	Full Surface Waterproofing	Full Surface Waterproofing	Joints Only	Full Surface Waterproofing	Full Surface Waterproofing	Full Surface Waterproofing	Joints Only	Not Usable (Dry Areas Only)	Joints Only
	Additional Scaffolding / Work Platform Savings	-	-	Needs Scaffolding / Work Platform	-	Needs Scaffolding / Work Platform	Needs Scaffolding / Work Platform	-	-	Needs Scaffolding / Work Platform	-

FOOTNOTE:

* - Varies as per thickness

\# - Skimcoat Finishing

NA - Not Available

REFERENCES:

(1) Quoted the report by Lightweight Concrete Journal, that the moisture of AAC wall lab test at 45% moisture content when the wall is just built. In time to come, the moisture will drop to 3.5%. The ratio of 45% and 3.5%will result in what I said 11dB drop of sound insulation.

(2) Panels and other materials which show a water absorption test should directly be connected to the length of time the test sample was submersed under water. The relationship between these two factors are important and directly related until maximum value is reached.

ECO CORE 49ER PANEL COMPARISON

Specification	49ER Panel	Other Hollow Core Panels	AAC Blocks / ALC Panel	Normal Drywall Gypsum Board
Compressive Strength	49 MPA	15-25 MPA	2.5 MPA	1.0 - 2.5 MPA
Fire Rating (Hours)	1-4	1 2 (With Condition) **A. Solid Infill** **B. Other Aggregates**	2-4	1
Water Absorption (%)	6.4% **(24 Hours)**	5.0% **(30 Minutes)**	35-60%	Not Applicable in Wet Areas
Sound Insulation	45-53	37-46	41	35-47 **(Glass/Rock Wool)**
Sound Barrier & Cinema Insulation	★★★	★	★	Need Insulation
Mounting Unit (Point Load) KG	Solid – 1200 Hollow - 400	Solid – 400 Hollow - 200	Loose <100 KG **(need chemical)**	✖
Customized Height	Max 8.0M	Max 3.3M	Max 6M	High Wastage
Customized Thickness	70-200 mm	75, 100 mm	70-200 mm	75-150 mm
Customized Solid & No. of Hollows	★★★	★	✖	✖
Customized Wires (Safety + Strength)	Ø 2.7–5.0 mm Tensile Wire (600 MPA)	✖	BRC Mesh	Metal Stud
Low Carbon Footprint	★	✖	✖	✖

ECO CORE 20ER PANEL COMPARISON

SPECIFICATION	20ER PANEL	AAC/ALC Block Panel
Compressive Strength	20 MPA	2.5 MPA
Fire Rating (Hours)	2-4	2-4
Water Absorption (%) @ 24Hr	11.3%	35-60%
Sound Insulation	47	41
No Plastering – Super Flat (Dry Density ± 10%)	**Skimcoat Only** **Total: 94 KG/M2**	**15-25mm Thick Plaster** **Total: 120-145KG/M2**
Mounting Unit (Point Load) KG	High Load (>400KG) **Mechanical/Chemical**	Low Load <100 KG **(need chemical)**
Customized Height	Max 6M	Max 6M
Customized Thickness	75-200 mm	100-200 mm
Customized Solid & No. of Hollows	★	✖
Customized Wires (Safety + Strength)	Ø 2.7–5.0 mm Tensile Wire (600 MPA)	BRC Mesh & Some Without
Low Water Permeability for External Wall & Wet Areas	★	✖
Low Carbon Footprint	★	✖

ECO CORE 10ER PANEL COMPARISON

SPECIFICATION	10ER PANEL	AAC /ALC Block Panel
Compressive Strength	>10 MPA	2.5 MPA
Fire Rating (Hours)	2-4	2-4
Water Absorption (%) @ 24Hr	14.6%	35-60%
Sound Insulation	43-45	41
No Plastering – Super Flat (Dry Density ± 10%)	**Skimcoat Only** **Total: 92 KG/M2**	**15-25mm Thick Plaster** **Total: 120-145KG/M2**
Mounting Unit (Point Load) KG	High Load (>400KG) **Mechanical/Chemical**	Low Load <100 KG **(need chemical)**
Customized Height	Max 6M	Max 6M
Customized Thickness	75-200 mm	100-200 mm
Customized Solid & No. of Hollows	★	✖
Customized Wires (Safety + Strength)	Ø 2.7–5.0 mm Tensile Wire (600 MPA)	BRC Mesh & Some Without
Low Water Permeability for External Wall & Wet Areas	★	✖
Low Carbon Footprint	★	✖

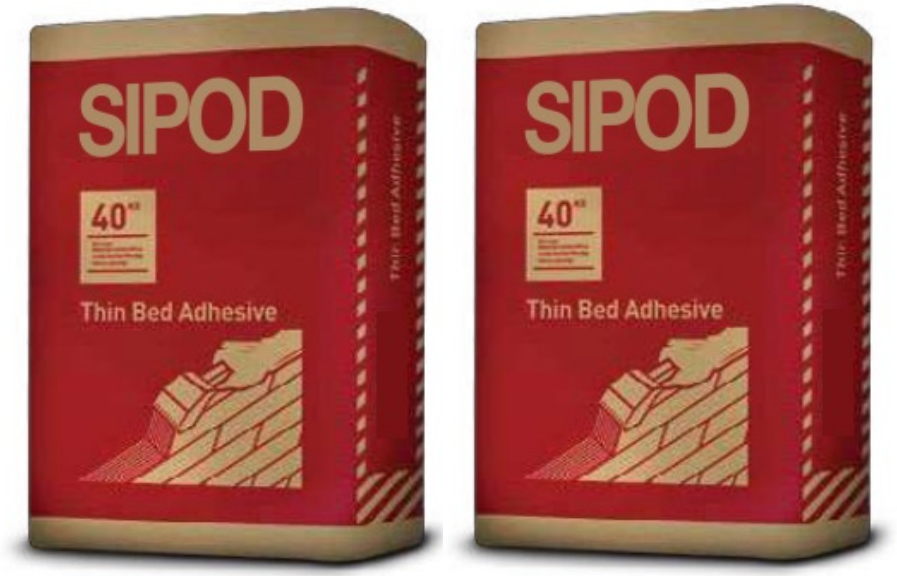
ECO CORE 2.5ER PANEL COMPARISON

SPECIFICATION	2.5ER PANEL	Normal Drywall/ Gypsum Board
Compressive Strength	>2.5 MPA	1 MPA
Fire Rating (Hours)	2-4	1-2
Water Absorption (%) @ 24Hr	14.9%	Not Applicable in Wet Areas
Sound Insulation	41-43	35-55 **(Glass Wool)**
No Plastering – Super Flat (Dry Density ± 10%)	**Skimcoat Only Total: 64 KG/M2**	**Layers + Stud + Frame Total: 54 KG/M2**
Mounting Unit (Point Load) KG	High Load (>400KG) **Mechanical/Chemical**	Very Low Load Capacity
Customized Height	Max 6M	High Wastage
Customized Thickness	75-200 mm	75-150mm
Customized Solid & No. of Hollows	★	Needs Air Gap & Dual Layer
Customized Wires (Safety + Strength)	Ø 2.7–5.0 mm Tensile Wire (600 MPA)	Metal Stud
Low Water Permeability for External Wall & Wet Area	★	✖
Low Carbon Footprint	★	✖

ECO CORE PANEL FEATURES

FEATURES	49ER	20ER	10ER	2.5ER
Zero Waste Manufacturer	★	★	★	★
M&E – Less Chasing & Grouting	★	★	★	★
PPVC / IBB / PBU Component	★★★ Dry & Wet Areas	★ Dry Areas	★ Dry Areas	★ Dry Areas
Super Flat – No Plastering (Skimcoat Only) Dry Density Weight (± 10%)	1-3 mm (2 Sides) 135 KG/M2	1-3 mm (2 Sides) 94 KG/M2	1-3 mm (2 Sides) 84 KG/M2	1-3 mm (2 Sides) 65 KG/M2
Less Wastage	★	★	★	★
Less Lintel & Stiffener for Long Span or High Wall	★	★	★	★
Air Tightness - Airborne Disease	★	-	-	-
Water Tightness/Less Water Proofing	★	★	★	★
Low Water Capillary Action	★★★	★★	★	★
Faster Installation Speed (Productivity)	★	★★	★★★	★★★
Structural Cost Savings	★	★★	★★★	★★★

ACCESSORIES



SIPOD Thin Bed Adhesive

SIPOD Thin Bed Adhesive is a high quality sustainable cementitious adhesive specially formulated and recommended for bonding SIPOD products such as blocks, panels and lintels. Backed by extensive testing and historical performance, the use of SIPOD adhesive ensures optimum performance or the completed assembly, including strength and fire rating.

TECHNICAL DATA	
Packaging	40 kg
Colour	Light Grey / Off White
Mixing Ratio	13 – 14 Liters of clean water / 40 kg bag
Pot Life	1-2 hours
Open Time	15 – 30 minutes
Coverage	Approx. 20m2 / 40kg bag for 100m blockwork (Estimated based on 2mm thick bedding for 100m blocks)
Min. Flexural Strength	0.44 Mpa
Fire Rating	Up to 4 hours when used with SIPOD blocks
Fire Hazard	Non-flammable
Toxicity	Nil

ACCESSORIES

SIPOD RENDER & SKIMCOAT

SIPOD Render is recommended for external rendering of an external wall, it can also be applied to wall where a thicker plastering is needed, such as wall thickening for tiling purposes.

SIPOD Skim Coat Base and Skim Coat Finish are applied as two-coat system and designed for internal wall applications to give a smooth finish.

ACCESSORIES

RENDER & SKIMCOAT

TECHNICAL DATA			
	RENDER	SKIMCOAT BASE	SKIMCOAT FINISH
Packaging	40kg bag	40kg bag	25kg bag
Colour	Grey	Grey	Grey
Mixing Ratio	7 – 8 litres water / 40kg bag	11 – 12 litres water / 40kg bag	11 – 12 litres water / 25kg bag
Pot Life	1 hour	2 hours	3 hours
Coat Thickness	10 – 12mm	2 – 4mm	1 – 2mm
Coverage Approx.	1.6kg / m2 / mm thickness 2.5m2 / 40kg bat at 10mm thickness	1.4kg / m2 / mm thickness 10m2 / 40kg bag at 3mm thickness	1.2kg / m2 / mm thickness 20m2 / 25kg bag at 1mm thickness
Binder	OPC / Hydrated Lime	OPC	OPC
Max. Aggregate Size	Graded sand 2.5mm max	Graded limestone powder / sand 1.0mm	Limestone powder 0.5mm
Additives	Water soluble additives to improve workability, water retention, durability and adhesion	Water soluble polymers to improve workability, water retention, durability and adhesion	Water soluble polymers to improve workability, water retention, durability and adhesion
Fire Hazard	Non-flammable	Non-flammable	Non-flammable
Toxicity	Nil	Nil	Nil

ACCESSORIES & TOOLS

150mm
Notched Trowel

100mm
Notched Trowel

Rubber Mallet

Sanding Float

Mixing Container

Stirrer

Standard Masonry
Trowel

Tungsten Carbide
Tipped Saw

Spirit Level

ACCESSORIES & TOOLS

ST 1 – Control Joint Tie

Wall Trencher

Hand Drill

ST 2 – Column / Beam Soffit Tie

ST 6 – Horizontal Wall Panel Tie

Fiber Mesh
150mm x 50m

ST 8 – Vertical Wall Panel Tie

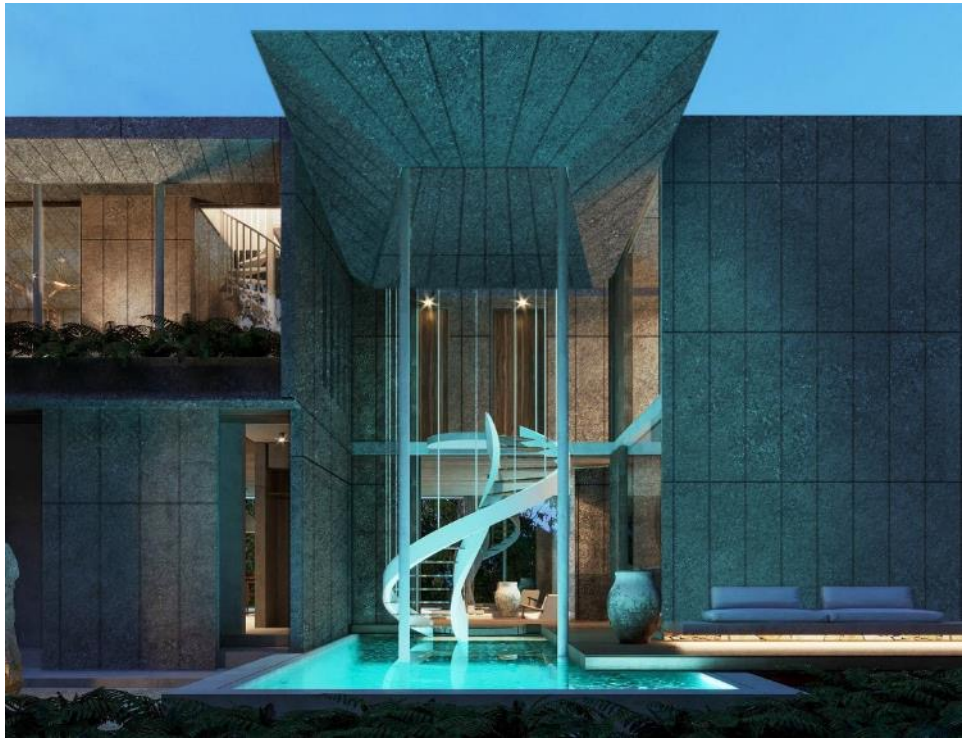
ACCESSORIES & TOOLS

Anchor Selections

Light Duty	Medium Duty	Heavy Duty
1) Nylon Anchor 8mm x 50mm 	1) Nylon Anchor 100mm x 50mm / 60mm / 100mm 	1) Injection Mortar 
Approx. load Up to 10 kg	Approx. load Up to 50 kg	Approx. load Up to 150 kg
Applications: - Coat Hook - Light Fitting - Small Mirror - Painting - On/off switch - Meter Box	Applications: - LCD / Plasma TV - Shelf - Satellite Disc - Meter Box - Towel Rail - Curtain Rod/Rail - Kitchen Cabinets - Window Frame - Air-con Compressor - Door Frame - Clothes Dryer - Sink/Urinal/Basin - Pipe Bracket	Applications: - Heavy DB - Fire Hose Reel - Signboard - Sink / Urinal / Basin - Cantilever Support - Awning / Window Shade

OVERALL CONSTRUCTION

With ECO CORE panels you will build faster, more cost effective, sustainably & stronger with higher overall performance for fire, sound, insulation and waterproofing.



ECO SHELL CONSTRUCTION

THANK YOU