FULL CATALOGUE

Energy-Efficient & Quake-Resistant Building System
Rapid-Build Prefab Homes
High-Performance Thermal Insulation
Ultralight Architectural Facades
Infrastructure-Grade Floating Structures
EPS Geofoam Solutions

www.b-panel.com | www.b-foam.com
PT. BETON ELEMENINDO PUTRA

About Us

PT. Beton Elemenindo Putra was established on 2006. We are a division from Beton Works, one of Indonesia’s largest and most trusted of concrete-based construction material manufacturer federation. Our main product is the b-panel®/b-deck® modular wall and floor system, which allow rapid construction of earthquake-resistant, intensively-insulated buildings.

As Fire-Retardant Expanded Polystyrene (EPS) was chosen to be the insulation layer within b-panel®/b-deck®, PT. Beton Elemenindo Putra is the only EPS manufacturer in Indonesia with a core focus in building technology instead of packaging and decoration. As such, we strives to develop next-generation applications for our b-foam® EPS beyond its traditional usages, such as ultralight architectural facades, geotechnical solution, and floating structures.

PT. Beton Elemenindo Putra is a grand experiment in socially and ecologically responsible business in Indonesia – that growing a business does not have to be at the expense of the environment, or be an accessory to socially-menacing industries.

We recycle 100% of our post production waste, and as much municipal post-consumer polystyrene waste as we can absorb. Our factory boiler runs exclusively on biofuel since 2010. We choose not to serve coal mining operation and tobacco-related projects, and in every project that employ our stuffs, a significant and permanent carbon footprint reduction – either through reduced thermal leakage, enhanced structural efficiency, reduced embodied energy, or all of the above.

History and Achievements

2007 PT. Beton Elemenindo Putra begun operations
2009 First export of b-panel® (To India and Malaysia)
One week after a major earthquake which killed approximately 1000, b-panel® technology was featured at Kompas newspaper frontpage, and subsequently was included in Kompas’ top 50 most prominent innovations
2010 Invested in Integrated EPS recycling system
Inaugural Partner-Installer General Meeting
Started real estate new product development with the largest property developer in Bandung
2011 Conversion to fully biomass-fired boiler
2012 Launched 2nd generation b-panel® and carbon-graphite EPS b-panel Neo®
First b-foam Geofoam-Grade® project
Won 2012 Singapore Environmental Achievement Award – Regional (ASEAN) Category Merit Award
b-panel® Asia-Pacific Representative Office located in Singapore opened
2013 b-panel® was included in Green Building Council Indonesia’s Green Listing for sustainable building material.
With a total of 14 qualifying aspects, higher than any other products listed
First b-foam® Floating Structure project
First b-foam® Ultralight Façade project
Won 2103 Sustainable Business Award Indonesia, for best SME Category
2014 Improved b-deck®: without need of formwork or vertical shotcreting
Introducing b-panel® Mortar Mix
2015 b-foam® Floating Structures won 2015 Archinesia Building Material Awards, Innovations Category
Largest b-foam Geofoam-Grade® installation to date, at Cikampek-Paliman (Cipali) toll road project (overpass abutment fills)
Largest b-foam® Floating Structure installation to date, 300m-long water purification floating facility in Batam
2016 First b-panel®/b-deck® project in Brunei Darussalam and the Philippines
First overseas b-foam® floating structure project, a two-story floating restaurant in Mines Lake, Kuala Lumpur
The first floating bridge in Indonesia, erected utilizing b-foam® Floating Structure technology
b-panel® is a concrete sandwich panel building system, insulated with b-foam® fire-retardant Expanded Polystyrene (EPS) layer. It offers excellent thermal & acoustic insulation, and exceptional typhoon & earthquake resistance.

b-panel® has excellent strength-to-weight ratio, due to hundreds of continuously-linked micro-columns within its concrete layers, whereas its ultra-light EPS layer is less than 1/100 density of concrete.

8 Benefits of b-panel®

1. Superior insulation against heat and humidity
2. Acoustic barrier (STC 42 minimum, b-coustic® : STC 45)
3. Light-weight: 95 - 145 kg/m².
4. Rigid - monolithic structure (all walls act as one unit), highly resistant against break-ins, earthquake, and typhoon.
5. Safe during fire - fire test at National Building Material Testing Center, Cileuruy: b-panel® 120 minutes @1000°C (BS 476 Part 22 Equivalent) b-deck® 160/180/160 minutes @1000°C w/loading.
6. Cost savings:
   - Modular cutting list, eliminates waste at sites
   - Reduced A/C consumption up to 40%.
7. Rapid and material-efficient installation with modular cutting list system
8. Environmentally responsible:
   - Reduced CO₂ emission from A/C consumption
   - Mindful production process

Technical Specifications

Panel sizes:
- Modular cutting list (panels delivered cut to size and shape according to your drawings).
- Can be ordered in typical modules 1.2 x 3.0 m up to 6.0 m length.

b-foam® Expanded Polystyrene (EPS):
- Fire-Retardant (FR)
- Density: 12 kg/m³ (b-panel Neo®: 15 kg/m³ carbon-graphite EPS blend)

Wiremesh:
- Non-galvanized Ø3mm vertical, galvanized Ø2.5mm horizontal, U-50 minimum,
- Connector: galvanized Ø3mm
- Spacing: 7.5 x 8 cm

Plaster thickness and concrete strength:
- Structural applications: K-225; 3 cm x 2
- Non-structural / partition applications: K-150; 2 cm x 2

In our effort to continuously improve our products, specifications may change from time to time.
Why choose b-panel® / b-deck®?

Home is the most significant and longest-term investment in our life. What we desire in a dwelling is a place which insulates us from ambient heat and humidity, sun intensity, shields us from outside noise, and for earthquake and typhoon-prone areas; protects us during these natural disasters.

We constantly test and prove what we claim

b-panel® thermal testing facility Batujejar

b-panel® earthquake test at PUSLITBANGKIM Cileunyi (Indonesia earthquake zone-6 simulation)
A new way of constructing - rapid, efficient, and superior end product
- No need for heavy equipment
- Smaller teams, faster completion
- Minimized material waste with cutting list modules

**b-panel®**

1. **Rebar & panel installation**
   Install rebar on foundation beams, floor slabs, columns and beams, where the panels are to be installed. For steel structures, the rebar are welded onto the steel beams and columns. Tie the panel onto the rebar using tie wire.

2. **Wiremesh reinforcement installation**
   Install cross braces on each corners of door and window openings. Mount U-mesh around the perimeter of door and window openings, and L-mesh for wall corner.

3. **Support braces and M/E installation**
   Install supports, and perform alignment for the panels, so they are installed straight and each plane is perpendicular to each other. Installation of M/E lines by melting part of EPS using heat gun.

4. **Plastering**
   Apply plastering of concrete on both side of the panels using shotcrete method. Afterwards, install guidance and then continue to layer 2 and finishing by skim coat.

**b-deck®**

1. **Support installation**
   Install the support using wood rafters, bamboo, scaffolding, or hollow pipe along transverse direction of joist (minor beam) every 1 – 1.5 m.

2. **Module installation**
   Set up b-deck® module according to cutting list drawing.

3. **Joist rebar installation**
   Install the rebar (refer to b-deck® load table) using b-deck® joist spacer. Ensure rebar protrude through main beam at 40D depth.

4. **Concrete Casting**
   Set up b-deck® spacer every 1 m, and place the wire-mesh top of the spacer. Install additional formwork to ensure main beams are cast properly.
Panel Products

WALL APPLICATIONS

**b-panel®**
ENERGY EFFICIENT & FLAME RESISTANT BUILDING SYSTEM

**b-panel Neo®**
ENERGY EFFICIENT & FLAME RESISTANT PERFORMANCE BUILDING SYSTEM

**b-coustic+®**
SIMULTANEOUS THERMAL AND ACOUSTIC RATING BUILDING SYSTEM

**Versatile** - for load bearing wall, partition wall with high hang load requirement, exterior wall
- Thermal insulation: Fire-Retarding (FR) b-foam® EPS 0.037 W/M.K (b-panel Neo® carbon-graphite EPS 0.035 W/M.K)
- Maximum span up to 6 meters without additional columns
- Hang load capacity: approx. 60 Kg per point
- Approx. 145 kg/m² finished, for ANY wall thickness (10-30 cm)
- b-coustic+: additional acoustic 8 db improvements between 500-1000 Hz layer for maximum quietness

**eco-lite**
Lightweight EPS foam concrete wall panel with fiber cement boards on both sides.
Can be used for exterior walls or room partitions
- Lighter than lightweight bricks and red bricks
- Ready to paint no need for plastering and skimcoat: competitive cost & rapid installation
- Hollow cores ready for electrical/plumbing installation (type 100)
- Panel dimension (cm): 60 x 240, 60 x 300; Thickness: 60 mm (EL-60); 100 mm (EL-100)
- Weight: 65 Kg/m² (EL-60); 77 Kg/m² (EL-100); Surface finish: FCB 4.5 mm
- Produced by PT Beton Elementindo Perkasa

**b-wall®**
INSULATED ECONOMIC WALL SOLUTION FOR NON-STRUCTURAL APPLICATION, SUITABLE FOR ROOM PARTITION AND AQUAPANEL PREFAB HOMES
- Thickness: 60 mm; Insulation: b-foam® Fire Retardant (FR) EPS 12 Kg/m³
- Reinforcement: Lightweight steel U36 and U60; Hanging Load: 40 Kg on reinforcement;
  Weight: < 20 Kg/m²; Finish: 2 x Fiber Cement ready to paint; Details: tongue and groove

**Double Panel**
Applications: Main structures, retaining wall, lot boundary/party walls.
Available final thickness: 20, 22, 24 cm
- Especially designed for high-load main structures, basement wall, and
  high security wall
- Total thickness starts at 20 cm

**b-deck®**
THERMALLY INSULATED FLOOR & ROOF DECK

Available thickness: 10, 15, & 20 cm
- Shield against sunlight and ambient outside temperature
- Complete thermal insulation, no thermal bridges
- Rapid installation without formwork
- Weight: 125-220 kg/m²
- Maximum span: 8 metres (FP-20)

**Stair Module**
- Maximum span: 6 metres.
- Can be customized according to angle, number and size of steps
  according to your design

www.b-panel.com
### Technical Information

<table>
<thead>
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#### Compressive and Shear Strength Comparison

![Graph showing compressive and shear strength comparison](image)

**Sources:**
- PT. Beton Elemensindo Putra R&D, ITB Civil Engineering Lab
- M. Z. Kobar and M. H. Nasab "Mechanical Properties of 3D Wall Panels Under Shear and Flexural Loading"

#### Weight Comparison

![Graph showing weight comparison](image)

**Sources:**
- PT. Beton Elemensindo Putra R&D

#### Thermal Conductivity Comparison

**Lower is Better**

![Graph showing thermal conductivity comparison](image)

**Sources:**
- PT. Beton Elemensindo Putra R&D, ITB Physics Lab
- A Lime-Based Technology (Ronald E. Barnett, P.E., 2005)
- plastics.org.nz

#### Acoustic Performance Comparison (Wall Thickness = 10 cm)

**Higher is Better**

![Graph showing acoustic performance comparison](image)

**Sources:**
- PT. Beton Elemensindo Putra R&D, ITB Physics Lab
- MHE International (ASTM E90 Test)
- Dracolita.co.uk Science & Engineering Encyclopedia
- *23 EPS Density*
- **With 12.5mm plaster on both sides**

www.b-panel.com
b-panel® / b-deck®
Applications

Mission-Critical Facilities
Key public service facilities, such as schools, government buildings, place of worships, hospitals, and communication infrastructures have to survive the most severe typhoon, earthquakes, so that they can continue to function, as well as to provide shelter for earthquake victims and refugees.

Secondly, many of these facilities, for example communication shelters, house sensitive electronic equipment that has to be cooled and protected from humidity, and thus requiring 24 hours A/C. b-panel® ensure the lowest A/C energy consumption.

Rapid Solution for Factories and Warehouses*
For urgent need to build a simple but massive building, such as factories and warehouses, b-panel® is highly compatible, due to its modular cutting list system which enables rapid and efficient deployment.

b-panel® can be ordered up to 6 meter tall without joint. This significantly expedites erection process as compared to conventional methods (laying bricks or lightweight bricks). b-panel® can be connected directly to WF steel trusses.

Excellent thermal insulation characteristic of b-panel® make it especially beneficial for low-temperature application, such as beverage, chocolate, or ice factories/warehouses, as well as meat and seafood processing plants.

Mining* and Plantation Housing Solution
Due to the usually remote location and limited roads, construction of housing facility for mining and plantation housing has to be done rapidly, with minimal waste, and not dependent on heavy machineries.

b-panel® is specifically designed for this application, in which each panels are produced in large quantities with the correct sizes and shapes for rapid installation, lightweight for ease of transportation and handling by manual labors.

Swallow Bird Solution
Swallows prefer places with stable temperature and humidity. Swallow bird houses constructed with b-panel® increases the well-being and comfort of the swallows, thus increasing the nesting yield all year.

Echo characteristic of b-panel® has been observed to be preferred by most swallows. We offer economical b-Lite® panels for this application.

*As our philosophy, PT B.E. Putra does not serve projects related to coal mining operation and tobacco industry.
Thermally-Insulated Roof Deck

Sun intensity penetrating through roof deck is a main factor contributing to uncomfortably hot room. Ordinary roof deck absorbs solar heat all day and transmits it to the inside rooms well after the sun is down, thus causing the room to stay hot in the evening.

b-foam® EPS layer within b-deck® roof deck effectively prevents solar heat transmission to transfer to the ceiling. Upgrading to b-panel Neo® carbon-graphite insulation improves thermal insulation further.

Acoustic Insulation

b-panel® reduces noise intrusion from outside as well as from across other room in the building. b-panel® has been tested and proven to have better sound suppression performance compared to other wall materials of similar thickness.

For the most challenging noise situations, for example: nearby airport runway, close proximity to noisy nightlife, and music room, our b-acoustic® is the answer. Must be combined with higher acoustic grade windows and door seals to achieve desired noise suppression level.

Rigid Monolithic Typhoon and Quake-Resistant Structures

b-panel® functions as monolithic structure for single story dwelling with maximum wall span of 5 m. Neither main columns nor minor columns are needed, affording rapid construction. Ideal to be combined with lightweight steel roof truss.

One important characteristic of b-panel® is in the event of severe earthquake or typhoon, no dangerous wall chunks can fall, as wall surfaces are secured by steel reinforcements in all locations.

Alternative to Double Bricks/Double Lightweight Bricks

Luxury hotels demand higher acoustic performance walls for their guest rooms. One special scenario in many resort-type hotels is thick (>20cm) acoustic walls made of double layer of bricks or lightweight bricks.

b-panel® thick wall solution is a special version of our system, with superior erection speed and acoustic insulation compared to double lightweight brick wall, as well as cost optimization/value engineering to make it competitive in the market. Beside superior acoustic insulation (STC-value), this solution posses excellent thermal insulation properties.
b-panel® / b-deck®
Projects

Sport Jakar Saka Stadion Bandung
Oceanic Research Center Negara, Bali
Maya House Gallery Bandung
Telkom University Lab Build Legian, Bali
Sri Utama International School Kuala Lumpur

Masjid Al-Makmur Apartments Manado, North Sulawesi
Sunway Iskandar Marketing Office Johor, Malaysia
Hotel Aston Jember, East Java
Sky Diving Center Batujajar Bandung
Hotel Samika Kuta, Bali

Panakukang Town Center Makassar, South Sulawesi
National Narcotics Board (BNN) Sukabumi, West Java
Dipagai Regency Civil Service Papua
Ruko Excellent Naibire, Papua
Nurdin Fikri Grand Mosque Lembang

Warehouse (Chocolate) Denpasar, Bali
Performing Art Center Soreang, Bandung Regency
Shelter MCS INDOSAT Jatiluhur, West Java
Chocolate Factory Citra, Tangerang
Aq-Sitiq Mosque Subang, West Java

Office Tower Serang
Bonito Fresh Market Jakarta
Café Seriabadi Bandung
Hotel Mawar Bandung
Wine Processing Plant Pelaga, Bali

Pension House Palawan, The Philippines
Eco Camp Lahara Dago, Bandung
Escape Shopping Complex Delhi, India
Hotel Miyana Medan, North Sumatra
Stella Hotel Johor, Malaysia

Inferno Shopping Plaza Bogor
Bandung Alliance Int’l School Kota Boro Parahyangan
Ultra Jaya Factory Bandung
KutaBIX Hotel Bali
Animale Medium School Bandung
Commitment to Environment

In our genuine quest to be a significant contributor in solving climate change, we take pride in ensuring an end-to-end, environmentaly responsible production process for b-panel®/b-deck®

Awards

www.b-panel.com
Using b-panel®/b-deck® to support Greenship Environmentally-Friendly Building assessment by Green Building Council Indonesia

The use of b-panel®/b-deck®, when holistically combined with other design elements and building material selections, (such as: not building on vegetation area, using thermally insulated window glass, solar water heating, and systematic waste water treatment system), will ensure a commendable Greenship rating. The following are some of the criteria and details on how b-panel® fulfills these criteria:

**EEC 1/EEC P2: Energy-Efficiency Measures**
The use of b-panel® will reduce the thermal leak and air-conditioning load, and therefore improve the Overall Thermal Transfer Value (OTTV) of the building. Rating potential: Max. 5-20 points

**MRC 2: Environment Friendly Materials**
b-foam® EPS utilized for b-panel® has at least 15% recycled content from processing waste of previous projects. Rating potential: 3 points

**MRC 5: Prefab Material**
The use of b-panel® enables total prefabrication method and thus significantly reducing project waste. Rating potential: 3 points

**IHC 6: Thermal Comfort**
Thermal insulation layer of b-panel® helps reduce heat intrusion to the interior of building, while the low moisture absorption of b-foam® EPS ensures stable humidity level of the building. Rating potential: 1 point

**IHC 7: Acoustic Level**
"Mass and Damper" sandwich construction of b-panel® offers lower sound intrusion while keeping wall weight in check. Rating potential: 1 point

**MRC 6: Regional Material**
All raw materials for b-panel® manufacturing are sourced within Indonesian territory*, and within 1000 km from the factory. Rating potential: 2 points

("Exception is carbon-graphite EPS used in b-panel Neo®")

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**Modular Cutting List Service at No Extra Charge**

1. Drawings received from client
2. Cutting list generation
3. Panel Production
4. Panel Shipping
5. Panel arrival & Storage
6. Panel Installation

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www.b-panel.com
b-panel® Partner - Installer Program

Why becoming a b-panel® Partner Installer?

• A building system with many advantages
• Large specific segments:
  - Hot and/or noisy areas
  - Earthquake-prone regions
• As a pioneer of this system, competition is limited
• As a b-panel® Partner-Installer, you get special prices on the panels, which means double margins for you (material and installation)
• Profitable business

www.b-panel.com
**b-mesh®**

Overall specifications:
- U-50 minimum tensile strength
- 6 m max length, 1.2m wide, also special size order

**QUIK - BONE®**

Instant reinforcements for minor columns and joist beams
- Factory-assembled and welded with state-of-the-art machinery.
- Better assurance compared to manual assembly, consistent dimensional accuracy.
- Save time in assembling reinforcements.
- Pre-bent stirrup ends allow easier connection with other structural members.
- Competitive pricing.
- Available in many popular minor columns.

Overall specifications:
- Main reinforcement: U-48 tensile strength.
- Stirrup: U-50 tensile strength.
- Stirrup ends: +3 cm bend for easier connection.

**b-panel® MIX**

More efficient b-panel® wall construction and better quality control. 50 Kg packs consist of Portland cement, quality sand, and fiber additive.

Available in M-225 type for structural plastering and partition wall plastering, as well as B-300 type for casting minor columns and floor joists.

- Convenient: just add water and mix.
- Economical: prevent purchasing too much of mix material (standardized dosage and spread capacity).
- Safeguard quality of installation: plaster material composition is precisely packed according to b-panel®'s standard operating procedure.
- Better project cost control: since the plaster mix has been prepacked, material cost can be monitored more readily.

**Portable Mortar Sprayer**

Lightweight yet durable. Connect to air compressor (min. 3 hp for one unit, 5-7 hp for 2 units). Suitable for small projects. Higher productivity vs manual hand plastering.

**Mini Render Machines**

Portable, yet productive investment for ensuring highly efficient plastering of b-panel® due to continuous spraying capability. For medium to large-size projects. Connect to 220 V electricity.

**Reinforcements Installation**

Consists of cartridge ring pliers and twister tools, these kits are essential for faster and more productive installations. Consumables are economical metal rings and twisted wires.

[www.b-panel.com](http://www.b-panel.com)
**b-panel® / b-deck®**

**Load Table**

**Wind resistance load table (b-panel®, b-panel Neo®)**

<table>
<thead>
<tr>
<th>Desired wall thickness</th>
<th>Panel Thickness</th>
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<th>2.20</th>
<th>2.40</th>
<th>2.60</th>
<th>3.00</th>
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<td>419</td>
<td>350</td>
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<td>252</td>
<td>194</td>
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<td>122</td>
<td>110</td>
<td>100</td>
<td>91</td>
<td>83</td>
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<tr>
<td>12 cm</td>
<td>6 cm</td>
<td>613</td>
<td>505</td>
<td>423</td>
<td>358</td>
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<td>267</td>
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<td>121</td>
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<td>8 cm</td>
<td>718</td>
<td>591</td>
<td>455</td>
<td>420</td>
<td>365</td>
<td>313</td>
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<td>141</td>
<td>129</td>
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Max axial force: 4 ton per linear meter

**Load Table - Floor Panel**

**FP-10, FP-10X**

**FP-15, FP-20**

www.b-panel.com
Typhoon & Earthquake - Resistant Prefabricated Homes

Your car is constructed from factory-made quality components. Why not your house?

Why do we put up with living in a house made of bricks (a technology from Egyptian Pharaoh since the Great Pyramid project)? It’s a deadly time bomb in an earthquake.

Now, we have the choice of building with an earthquake-safe system that provides superior thermal insulation that saves A/C electricity consumption significantly.

- b-panel®: structurally optimized exo-skeleton monocoque
- Earthquake, typhoon, and break-in resistant
- Rapid construction without formwork and structural columns, shell completion in 2 weeks (Type 36 & 56)
- Thermal insulation on all wall surface for up to 40% A/C energy savings (thermally-insulated roof with b-deck®)
- Modular set shipped complete, including all panels and steel mesh reinforcements—ready for delivery within 72 hours from ordering

Type 36
- 2 bed rooms/1 bathroom
- Living room
- Dining room+kitchen
- Carport

Type 56
- 2 bed rooms/1 bathroom
- Living room
- Dining room+kitchen
- Carport

Type 108
- 2-story design
- 3 bed rooms/2 bathroom
- Living room
- Dining room+kitchen
- Family room (2nd floor)
- Carport

Construction options:
- Panels + steel reinforcements
- Panels + b-deck® insulated roof + steel reinforcement
- Any of the above + b-panel® mix mortar set

Technical specifications:
- Wall height: 3 m
- Wall thickness: 10 cm

www.b-panel.com/homes
Rapid-Build Partition Wall Panel

Eco-Lite® Panel is a lightweight EPS foam concrete wall panel with fiber cement boards on both sides. Can be used for exterior walls or room partitions.

Eco-Lite® Benefits
- Lighter than lightweight bricks and red bricks
- Ready to paint surface, no need for plastering and skimcoat
- Competitive cost
- Rapid installation
- Hollow cores ready for electrical/plumbing installation (type 100)
- Produced by PT. Beton Elemenindo Perkasa (BEP)

<table>
<thead>
<tr>
<th>Panel Dimension (cm)</th>
<th>60 x 240, 60 x 300</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thickness (mm)</td>
<td>60 (EL-60)</td>
</tr>
<tr>
<td></td>
<td>100 (EL-100)</td>
</tr>
<tr>
<td>Weight (Kg/m²)</td>
<td>55 ± 10% (EL-60)</td>
</tr>
<tr>
<td></td>
<td>85 ± 10% (EL-100)</td>
</tr>
<tr>
<td>Surface Finish</td>
<td>FCB 4.5 mm</td>
</tr>
</tbody>
</table>
b-facade®

Reinforced concrete K-350
b-foam® EPS foam insulation

b-facade Neo®

Reinforced concrete K-350
b-foam Neo® carbon-graphite EPS foam insulation

b-facade® Benefits
- 25-35% lighter than conventional concrete facade panel
- Structural and foundation savings
- Better quake resistance
- Lower tower crane load capacity requirement
- Manufactured using state-of-the-art tilting table system
- Extensive thermal insulation to save A/C cost and reduces building carbon foot-print
- Minimum R-value
  - b-facade®: 1.07 m²·K/W
  - b-facade Neo®: 1.15 m²·K/W
- b-facade Neo® uses German technology carbon-graphite EPS Foam

Average temperature (30 minutes test)

Hotel Aston Primera - Bandung
Paramount Bed Factory - Bekasi
Ra Residence - Jakarta

www.beton.co.id
Ultralight Architectural Facades & Canopies

-b-foam®
ULTRALIGHT ARCHITECTURAL FACADE

- Ultralight, less than 1/20 of conventional precast facades
- Reduces building loads and improves earthquake safety
- Computerized CNC cutting machine capable of forming unique designs
- Delivered pre-finished ready to paint
- Rapid installation without the need of heavy machineries.

Technical Specifications

<table>
<thead>
<tr>
<th>Core</th>
<th>Fire-Retardant (FR), construction-grade EPS (expanded polystyrene) foam</th>
</tr>
</thead>
<tbody>
<tr>
<td>Casing</td>
<td>Durable cementitious coating with fiber mesh reinforcement</td>
</tr>
<tr>
<td>Finish</td>
<td>Ready to paint, or special order finish</td>
</tr>
</tbody>
</table>

www.b-foam.com/facade
Benefits:
- Ultra-long life – does not decay/ degrade, chemically and dimensionally stable - 30 year load rating warranty
- Superior safety factor – impossible to leak and sink
- High buoyancy
- Environmentally responsible production - recycled blend, CFC-free, factory pre-cut modules

Technical Specifications:
- Construction-grade expanded polystyrene (EPS) core
- Casing: heavy-duty, marine-grade polymer
- Max Load: 5 Ton/m²

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>b-foam® EPS Parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water absorption</td>
<td>&lt; 1% (vol/vol) after 30 months, &lt; 5% after 15 years (below grade)²</td>
</tr>
<tr>
<td>Service life</td>
<td>Ultra-long (&gt; 50 years), 30 years rated buoyancy warranty</td>
</tr>
<tr>
<td>Dimensional stability</td>
<td>+/- 2% (ASTM Test Method D2126)</td>
</tr>
<tr>
<td>Environmental compatibility &amp; chemical stability</td>
<td>Does not contain hazardous pollutants - Cadmium, Mercury, Lead, Chromium Hexavalent Inert - does not leach chemical into water</td>
</tr>
<tr>
<td>Damaging agents</td>
<td>- Direct UV exposure</td>
</tr>
<tr>
<td></td>
<td>- Various liquid hydrocarbon (solvent, gasoline)</td>
</tr>
<tr>
<td></td>
<td>- Temperature &gt; 80°C</td>
</tr>
</tbody>
</table>
SCALABLE FLOATING STRUCTURES SOLUTIONS

commercial space, restaurant, recreation facilities, and jetties

Jatiluhur Floating Restaurant - Purwakarta, West Java
Floating Jetty, Palu Bay - Central Sulawesi

Floating Bridge - Cilacap - Central Java
Lembang Floating Market - Bandung

Kahayan Floating Cafe - Palangkaraya, Central Borneo
Floating Water Treatment Platform - PT ATB, Batam Island

Floating Performing Art Stage
Aston Sentul Lake Resort, Bogor, West Java
Floating Library
Tambak Lorok - Semarang

Mines Floating Restaurant
Kuala Lumpur, Malaysia

www.b-foam.com/floating
Why select b-foam® Geofoam-Grade® EPS for your geotechnical problems?

- Produced at own plant, for strict control of raw material quality, production process, uniform density, and blocking dimensional accuracy.
- High production rate and buffer capacity, to cater large infrastructure project needs.
- Internal technical team with competent civil and geotechnical backgrounds, to help ensure the success of your project.
- Strict adherence to ASTM D6817-07 International EPS geofoam standard

Benefits:

- Very light (Specific mass is 1/50 or just 2% of soil), thus significantly reduces soil settlement and slope failures
- Very high compressive strength compared to its weight, thus can be used for heavy load application
- Super-long service life. Does not decay (non-biodegradable) and does not oxidize in air, water, and most other natural elements.
- Save time (save cost). Super-light EPS blocks reduces logistical challenges and increase equipment utilization.
- Precise dimension ensure ease of installation, and does not depend on weather as much.

Technical Specifications:

- Fire Retardant (FR), b-foam® GG EPS (Expanded Polystyrene)
- Available types: GG 12, 15, 19, 22, and 29 (up to 75 kPa @ 1% strain)
- Adheres to ASTM D6817-07 (US standard)

<table>
<thead>
<tr>
<th>Type</th>
<th>GG12</th>
<th>GG15</th>
<th>GG19</th>
<th>GG22</th>
<th>GG 29</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density, min. Kg/m³(lb/ft³)</td>
<td>11.2 (0.70)</td>
<td>14.4 (0.90)</td>
<td>18.4 (1.15)</td>
<td>21.6 (1.35)</td>
<td>28.8 (1.80)</td>
</tr>
<tr>
<td>Compressive Resistance, min. kPa (psi) at 1%</td>
<td>15 (2.2)</td>
<td>25 (3.6)</td>
<td>40 (5.8)</td>
<td>50 (7.3)</td>
<td>75 (10.9)</td>
</tr>
<tr>
<td>Compressive Resistance, min. kPa (psi) at 5%</td>
<td>35 (5.1)</td>
<td>55 (8.0)</td>
<td>90 (13.1)</td>
<td>115 (16.7)</td>
<td>170 (24.7)</td>
</tr>
<tr>
<td>Compressive Resistance, min. kPa (psi) at 1%</td>
<td>40 (5.8)</td>
<td>70 (10.2)</td>
<td>110 (16.0)</td>
<td>135 (19.6)</td>
<td>200 (29.0)</td>
</tr>
<tr>
<td>Flexural Strength, min. kPa (psi)</td>
<td>69 (10.0)</td>
<td>172 (25.0)</td>
<td>207 (30.0)</td>
<td>275 (40.0)</td>
<td>345 (50.0)</td>
</tr>
<tr>
<td>CBR values*%</td>
<td>3.1</td>
<td>3.8</td>
<td>4.8</td>
<td>5.3</td>
<td>6.8</td>
</tr>
</tbody>
</table>

* Syracuse University EPS Geofoam Design Parameters research (Huang and Negussey)

www.b-foam.com/geofoam

Infrastructures
- Retaining walls
- Road construction / widening
- Overpass abutments / ramps

Building Construction
- Landscaping
- Tribune seats
- Raised floors
Ultralight Rigid Fill

Bridge Abutment
Cikampek - Palimanan Toll Road

Lightweight Fill Wayang Windu
Star Energy Geothermal

Tribune Seats
Bandung Alliance Intercultural School
Kota Baru Parahyangan, Bandung

Tribune Seats, Sport Jabar
Arcamanik - Bandung

Raised Floor Golden Tulip Hotel
Pontianak - West Borneo

Lightweight Backfill - Patuha
Takenaka Dobuku

Foundation
Universitas Pertahanan - Sentul

Retaining Wall
Citra Green Dago - Bandung

Raised Floor NPJTI 1
TJ Priok - Jakarta

Raised Planter Floor
Sommerset Apartments - Jakarta Selatan

Raised Floor
Tarakan Hospital, Jakarta

Raised Floor and Thermal Insulated Wall
Yoga Air pools, Bali

Lightweight Fill, Retaining Wall
Budi Asih Residence - Bandung

Raised Floor
Lexington Appartments, Jakarta

Raised Floor
IFC Building Sudirman - Jakarta

www.b-foam.com/geofoam
New Innovations

Rapid-Build, Earthquake-Resistant Prefabricated and Extensive Insulated Homes

Type 45

Available in 3 packets:
1. Shell (Material Only)
2. Shell Installation
3. Turn Key
   M/E : LED lights, out bouw switch
   Floor : Epoxy
   Finishing : Compound and paint
   Toilet : Squat
   Door & Window : Aluminium
   Ceiling : Flat/sloping ceiling based on roof

Specifications
- Wall : b-wall® panel 60 mm
- Structure : Galvalume AZ-150, G550
- Roof : Spanroof & thermal insulated b-foam® Fire Retardant (FR) 40 mm
- Sills : Lightweight steel

www.b-panel.com/litehomes

ROAD BARRIER

Benefits:
- For roadway use
- Lightweight (adjustable between 25 - 100kg), easy transportation & installation
- Appearance of solid concrete, deter breaching by motorists

www.b-foam.com
b-panel® Partner-Installer Locations

**Jakarta & West Java**
PT. Sinar Graha Paramita
Mutiara Taman Palem Blok C-19 No. 32
Cengkareng – Jakarta Barat 11730
Phone: 021 – 543 55901 / 543 56288
Email: sgp.jakarta@b-panel.com

**Bali**
ecoSmart - Green Building Centre
Jl. Sunset Road II 2X
Kuta, Bali 80361
Email: eco.bali@b-panel.com

**Padang**
CV Hendri Wijaya Pheri
Jl. Nipah No 10 Padang 25137
Sumatra Barat
Email: hendri.padang@b-panel.com

**Lombok**
Falcon Developments
Jl. Adi Sucipto Pentokoen Central City
No.3 A Rembige Ampeiken 83111, Lombok
Email: info.lombok@b-panel.com

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52-2, Jalan Awan Hijau
Taman Overseas Union Garden (OUG) 58200
Kuala Lumpur
Phone: +603 7971 6117
Email: info.malaysia@b-panel.com

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Buildscape Sdn Bhd
No. 9 Lorong Perdana 8, Luyang Perdana
Jalan Penampang, 88300
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Email: info.sabah@b-panel.com

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Jalan Selayun Jerudong Serikin
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**The Philippines**
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---

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Innovation Category 2015

Sustainable Business Awards
2013 Indonesia Winner - Best SME

Merit Winner - Regional (ASEAN) Category
2012 Singapore Environmental Achievement Award

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