EPS SOLUTIONS
PAKISTAN (PVT) LTD.

SMART PANEL

BUILDING THE FUTURE

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Introduction

EPS Solutions Pakistan (Pvt) Ltd. stands as a pioneer for being the first entity to locally manufacture and introduce EPS Smart Panel Technology to Pakistan's construction sector. The company has been established in the "Special Economic Zone" becoming a part of a new wave of projects coming into Pakistan. The project aims to revolutionize the construction industry of Pakistan and is paving the way for introduction of newer construction materials while deploying the latest construction technologies to improve both the quality and efficiency of the construction sector in line with those being followed internationally.

What Is EPS?

EPS (Expanded Polystyrene) Smart Panel is composed of an exterior surface and interior core filling, to form a non-load bearing light-weight composite wall panel. The exterior surface on both sides are calcium silicate boards / cement boards and the middle core is filled with EPS beads, cement, flyash etc. EPS is a versatile durable material that offers excellent insulation properties.

Smart Panel Advantages

- Lightweight Economy
- Huge Time Saving
- Energy-Saving Eco-Friendly
- Waterproof Wetproof
- Sound Insulation
- Fireproof (Class A1)
- Heat Insulation & Preservation
- Anti-Pressure Anti-Quake
- Non-Toxic Asbestos-Free

Easy Construction & High Efficiency

The wall material is completely dry work, fabricated construction. The walls can be arbitrarily cut as per required specifications. The walls can be easily transported, stacked and no mortar batch filling is required which largely shortens the construction period.

Eco-Friendly & Energy Saving

Smart Panels are 100% free of harmful and A grade radioactive substances. They are reusable and have no construction waste. The panels have better heat insulation ratings and better energy saving properties than other construction materials.

Fireproof

EPS is classified as 'non-combustible' when tested in accordance with GB8624: Grade A1. Fire resistance rating is up to 240 minutes against high temperatures of around 1000 degree Celsius; Exposure of more than 04 hours for fire resistance test, Smart panels do not emit any toxic gases.

Smart Panel Thickness (mm)	Fire Resistance
100mm	≥ 4.0 Hours
150mm	≥ 5.0 Hours

High Strength & Durability with Impact Resistance

Smart Panels when tightly joined together through tongue & groove, maintain an excellent integrity of partitions. They are anti-pressure, anti-quake and have an impact strength 1.5 times stronger than a conventional block wall.

Sound/Acoustic Insulation

Smart Panels offer excellent sound insulation, sound absorption and noise reduction functions. Sound insulation is ensured up to 40dB with 90mm thickness of the smart panels, which is 2 to 3 times higher than a traditional brick wall.

Product Type	Thickness (mm)	Sound Insulation (dB)
Smart Panel	100	≥ 45
	150	≥ 50
Hollow Block	200	≥ 40
Brick	225	≥ 50
Solid Block	200	≥ 50

Moisture-proof & Waterproof

Smart Panels consist of two medium density 4/4.5/5mm thick reinforced fiber / calcium slilcate boards with a light weight inner core composed of portland cement and EPS beads which make it weather proof. Non-permeablilty is ensured even after 02 days of continous water spray on the panel's surface.

Light Weight, High Strength

Bulk density of a single Smart Panel is 600-700 Kg/Cu.m which is 1/5th - 1/7th of the traditional block wall. Specific gravity is smaller than 01, greatly reducing the building structure & foundation cost. It carries high compressive and flexural strength which makes it suitable for ultra-high and large span walls.

Heat Insulation & Warm Preservation

The thermal conductivity of a Smart Panel is 08 times better than that of a block wall. This reduces the consumption of air-conditioning and central heating. Raw materials of smart panels are primarily formed from environment friendly and energy saving heat insulating materials which make them more accustomed to adjust with different seasons.

Description	Smart Panels Thickness (mm)	
	100	150
Heat Conductivity (W/m.K)	0.19	0.19
Heat Transmission (Sqm.K/W)	1.025	1.480
Thermal Storage (W/Sqm.K)	2.391	2.332
Thermal Inertia	2.035	3.044

Increases a Building's Useable Area

Smart Panels are thinner than standard block walls. For every 10m - 12m extended wall, a smart panel is able to increase 01 Sq.m useable area in comparison to plastered block walls, increasing the area by 5% to 10%. Constructing a 100 Sq.m apartment or shopping mall with smart panels partition increases 05-10 Sq.m of usable area.

Smart Panel Thickness (mm)	Block Wall Thickness (Incl. 20 mm Plaster on Both Sides)
100mm	140mm
150mm	190mm

Fast Construction

The construction speed is 10 times faster than traditional block walls, providing a smooth surface to receive a skimmed coat. On average, an experienced labourer can install over 25 - 30 Sq.m of panels per day which makes construction multiple times quicker than traditional block work. Both sides of smart panels are smooth and flat on which plastering is not required. Skim coat and surface decoration can be applied immediately.

Seismic Resistance

Smart Panel's tongue and groove shape help to hold the panels stable and tight. Its precast assembly involves fixation of panels with channel, steel clip and reinforced steel bars make impact resistance 1.5 times better than a block wall. It creates an earthquake proof performance which can withstand seismic impact up to 08 Richter scale.

Walls can be Slotted, Wired, Nailed, Hanged, Painted & Pasted

The maximum single hanging force of a single smart panel is 50 Kg. The panel will remain smooth without any dust and can be further finished with paint, ceramic tiles, wall paper and multiple other options.

Smart Panel Applications

Commercial Uses

- High-Rise Buildings / Apartments
- Luxury Hotels
- Shopping Malls
- Restaurants
- Schools
- Hospitals
- Airports
- Factory Warehouses

Residential Uses

- Houses
- Prefabricated Structures
- Apartments & Villas
- Kitchens
- Bathrooms

Comparison of Various Construction Materials

DESCRIPTION / PROPERTIES	 SMART PANEL	 HOLLOW BLOCK	 BRICK	 SOLID BLOCK
Size	2440mm x 610mm x 100/150mm	400mm x 200mm x 200mm	225mm x 75mm x 113mm	400mm x 200mm x 200mm
Density	600 – 700 Kg/Cu.m	1200 - 1300 Kg/Cu.m	1500 - 1800 Kg/Cu.m	1800 - 2100 Kg/Cu.m
Weight	a) 100 mm = 70 Kg/Sq.m b) 150 mm = 100 Kg/Sq.m	250 Kg/Sq.m	180-210 Kg/Sq.m	360-420 Kg/Sq.m
Thermal Conductivity (w/mk)	0.20	0.25	0.77	0.26
Water Absorption (%)	≤9	≤12	≤12-20	≤9
Sound / Acoustic Insulation Rating	≥45 dB	≥40 dB	≥50 dB	≥50 dB
Fire Rating	>04 Hours	>02 Hours	01 – 04 Hours	>04 Hours
Usable Area	100mm & 150mm	200mm	175mm	200mm

Comparison of Rate of Progress Between Smart Panels & Other Block Walls

Wall Type	Construction Method	Large & High Spans	Embedment of Services	Doors & Windows Installation	Reconstruction & Redecoration
BLOCK WALL	Block Connection, Plaster Works, Construction Speed Slower	When wall height exceeds 3.5 Meters, tie beam and stiffener columns are required	Installation of Services cannot be started until the curing period is finished, hence there is heavy work load and more time consuming	Pouring of Lintels is required, which takes time	Walls are connected with columns and beams, difficult to reconstruct. High composite cost and intangible cost for dismantling work.
SMART PANEL	Tongue & Grove Jointing System, Dry Work, No need for Plastering, hence Construction Speed is Faster	No Extra Structure Required	Simultaneous Installation of Services Simple and Light Workload	Direct Fixing of Panels	Not affected by columns and beams, easy to arrange & reconstruct, short completion time

Smart Panel Raw Materials

Smart Panels Contributing Towards A Sustainable Environment

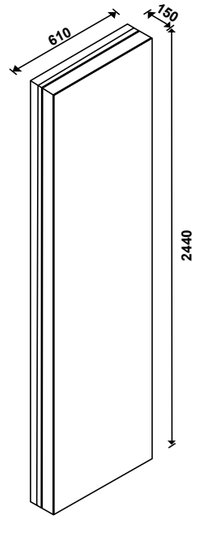
Using Smart Panels actively contributes to a better environment during the entire working life cycle of the building. Smart Panels offer substantial environmental advantages through energy saving and greenhouse gas emission reduction and are therefore ideally suited to the creation of environment-friendly new building projects.

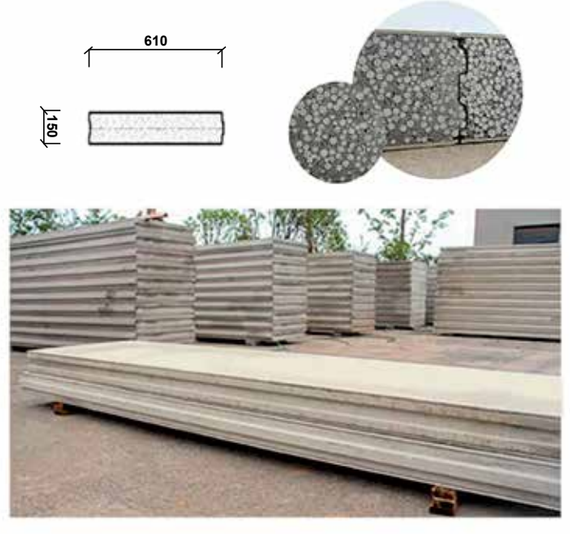
They are easy to handle, safe, non-hazardous and have proven constant insulation properties for the life time of the building in which they are used. Smart Panels don't contain or use any ozone depleting chemicals at any stage of their life cycle. From manufacturing, to application, to recycling and final disposal of Smart Panels, they offer exceptional eco-credentials. All manufacturing processes comply with current international environmental regulations.

Product Range

Sr. No	Thickness (mm)	Length (mm)	Width (mm)	Density (Kg/Cu.m)	Application	Appearance
1	100	2440	610	600-700	Non-Load Bearing Walls For Houses & Buildings	With Face Board, Calcium Silicate/Cement Board as Face Panel 100% Non-Asbestos Calcium Silicate Panel
2	150	2440	610	600-700		

More options of 90mm, 120mm & 180mm customised sizes are available on order.





Technical Specifications

Sr. No	Description / Properties	Measuring Unit	Thickness (100mm &150mm)
1	Surface Density	Kg/Sq.m	60 - 90
2	Flexural Strength	A multiple of Panel Dead Weight	≥4
3	Compressive Strength	MPA	≥3
4	Impact Strength	Sand Bag Impact / Time	≥5
5	Moisture Content	%	≤9
6	Dry Shrinkage	Mm/m	≤0.5
7	Softening Coefficient	-	≥0.8
8	Anchorage Load	N	≥1000
9	Thermal Conductivity	W/(m.k)	0.2
10	Combustion Performance	Grade	Grade A Non-Combustibility
11	Fire Rated Partition	Hour	> 04 Hours
12	Acoustic Performance	dB	≥45 dB
13	Inner Radiation Index	-	≤1
14	Outer Radiation Index	-	≤1
15	Radioactivity Limit	-	≤1

Current Projects

Sukh Chayn Residence, F-10 Islamabad
High Rise Luxury Apartment Complex

Philosophy of the Design

Sukh Chayn Residence is nestled in the heart of Islamabad, Sector F-10 opposite F-9 Park. Designed by one of the most renowned architects of Pakistan Mr. Shahid Abdullah (ASA); Sukh Chayn Residence was conceptualized as a marriage between nature and the built environment. Following the highest International Standards, Sukh Chayn Residence has employed the use of EPS Smart Panels. By installing Smart Panels Sukh Chayn Residence has maintained ecofriendly credentials, while offering better heat and sound insulation, high strength and seismic resistant structure in comparison to going for the traditional use of brick masanory walls.

SUKH CHAYN
RESIDENCE

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