THE SOLUTION MATERIAL THAT YOU ARE SEEKING FOR

www.zenonpanel.com

Earthquake resistant insulated structural system
Hassle-free insulated wall and slab solution

Rapid changes in building materials
came against the block walls
The goal is cheaper, more durable
and more practical...

panel
What is Zenon Panel?

Zenon Panel system was applied for the first time in the 1970s in U.S.A; the production technology was improved in Europe in the 80s. The use of modern building system technology rapidly increased all over the world. Zenon Panel has double layer of steel wire mesh connected by continuous diagonal wires, and an E.P.S - insulation board inserted between two layers (expanded polystyrene). Zenon Panel has rigidity and tensile strength with 3D steel wire mesh system. Each 1m² panel has 200 connection nodes. Each node is welded with electronic control. The function of E.P.S core is sound and thermal insulation.

Zenon panel dimensions: Net width of panel is 121cm, with 2 overlap meshes the total width is 142 cm. The panel is produced in desired lengths depending to the need.

Application places

At construction site Zenon Panel is assembled and both sides of panel is plastered to generate insulated wall. Also reinforced concrete is poured on panel to generate insulated slab. Zenon Panel can be used as wall system in concrete frame, steel and prefabricated structures. There is no usage or size limit.

- Low rise building system
- Roofs or last floors
- Interior or exterior wall
- Special projects
- مشاريع خاصة

Special cage system that provides strength and rigidity.
200 nodes per 1 m²
400 welding per 1 m²

SAE 1006 - Minimum 650 N/mm² tensile strength,
2.5 - 3.5 mm, diameter, low carbon dip galvanized steel wire

Continuous diagonals connecting wires among the panel on every 10 cm spans.

16 kg/m³ DIN B1 fire-proof class, not contain carcinogenic substances, E.P.S insulation material.

Both sides are plastered with cement based mortar at wall application.

Patent protected Zenon Panel steel truss has 100 diagonal connecting wire and 400 welding per m².
Zenon Panel building system is used in the U.S., Canada and in many different countries since the 1990s, it is used for the rapid construction of low-rise structures such as housing or villas.

**Zenon Panel (Low-Rise Structures)**

هياكل الإنشائية للطابق الواحد

**Single storey building with Zenon Panel. It is fast to build, permanent and comfortable.**

**All kinds of architectural concepts can be implemented with Zenon Panel in low cost**

**Panels are cut and fixed according to the project dimensions; provides save of material and labor**

**After the installation, Zenon Panel walls are plastered, concrete is poured on Zenon Panel slab**
Thanks to steel reinforcement of panel, there is no need to columns or beams for single floor houses.

Provides up to 70% lightness than alternative structure types, so it is stronger and more stable.

Up to 8.4 richter seismic loads are tested on Zenon Panel wall. Perfect performance is certificated.

It is enough to place the roof ridges with 60cm spacings. It reduces formwork and labor costs up to 75%.

Original architectural designs can be applied easily.
The construction of a 3-storey villa with Zenon Panel. Panels are assembled and plastered.

On load bearing structural Zenon Panel walls, horizontal beam sections are built.

No need to special mastership.

After concrete is poured on the slab, upper floor wall and slab panels are mounted.

Safe against earthquakes.

Walls are plastered with cement-based mortar. Reinforced concrete is poured on entire slabs.

Fast construction.

Zenon Panel wall can be coated with all kind of materials such as stone, marble or wood.

Provides design freedom.
Especially for fast constructing housing projects, Zenon Panel is the most practical solution.

Approximately, 5-experienced workers can make the assembly of 100 m² one floor house in 5 days.

Zenon Panel submit perfect-insulated houses that you will not feel cold in winter and hot in summer.

Lightweight building system Zenon Panel provides high percentage savings in the basement costs.

Solve the thermal and sound insulation issue with single structural material Zenon Panel.
Zenon panel factory and dealer network provides technical support for all projects

The implementation of assembly specifications and guidelines is very important

A village primary school construction in Turkey. All is done by Zenon Panel building system

The cost of Zenon Panel structures are at least 20% lower than reinforced concrete structures

Arche, dome and amorphous designs can easily be implemented with Zenon Panel
High quality heat and sound insulation, comfortable and permanent roof floors

Durable, lightweight concrete-based roof floor solution

Zenon Panel minimizes formwork and reinforcement labour

Resistant to earthquake and severe wind loads
Also masonry block walls can be preferred instead of Zenon Panel walls

Necessary additional reinforcement is tied on Zenon Panels. 5-8 cm concrete is poured

Zenon panel serve as three tasks 1 - Formwork 2 - Thermal insulation 3 - Reinforcement

Saves formwork costs

EPS of panel that coincide over the wall lines is emptied. By this way beam sections are created

No need to special mastsership

The upper floor loads transmitted directly to the masonry walls. So beam costs are eliminated
Without generating additional costs and loss of time, you can apply originally designed structures

The panels are easily cut to the desired size and are easily tied to each other

After pouring the concrete, the surface can be covered with any kind of material for waterproofing

At large-span roof applications, after laying the beam panels at axis lines, floor panels are placed

It is enough to place roof ridges with 60 cm spacings before pouring the concrete
To construct large-span roofs with Zenon Panel is more cost-effective and more comfortable

Get rid of the Formwork material and labor loads! Low formwork and labor costs

Zenon Panel is a sought solution material for hassle-free wide-span vault roofs

The application is very practical with Zenon Panel horizontal beam system

Zenon Panel is the solution address of all 3D ideas that can be imagined
Thanks to Zenon Panel's high thermal and sound insulation capability and safety property against seismic loads, it is the ideal interior and exterior wall system.

**ZENON PANEL**

(WALL SYSTEM APPLICATIONS)

تطبيقات أنظمة الجدران

The reinforced concrete frame structure is coated with panels, there is no need to block wall

The panels are anchored to the carcass. Both surfaces are plastered by cement-based mortar

Zenon Panel can be shaped into unlimited forms and desired aesthetic facade is obtained

Zenon Panel provides excellent thermal insulation, with it’s EPS insulation board
There is no need to lintel or beams, it is extremely practical for all solutions

Thanks to the steel truss and 3 cm plaster layers on either side, Zenon Panel wall is very stable

The seismic performance Zenon Panel wall which is anchored with 20 cm intervals, is very high

If requested, the panels can be produced in custom sizes, the facades are covered very quickly

Panels are applied outside of the carcase, so 25 cm space is gained on every linear meter
Up to 70% lighter than block wall

7.5 - 10.5 cm EPS is placed within Zenon Panel so there is no need for additional thermal insulation

Does not require lintel or beams, door and window installation is very practical

If a building is coated with panels without thermal bridge, it is insulated in real terms

Electrical and plumbing pipes, can be easily installed between the mesh and EPS
Thanks to the light weightness of the panels, horizontal and vertical transport is very easy.

Windows can be opened in any desired size and position.

Panels are anchored to the frame and by its steel truss system it strengthens columns and beams.

With its steel truss system, Zenon Panel wall is resistant to impacts.

<table>
<thead>
<tr>
<th>Thickness (cm)</th>
<th>Thermal Conductivity (W/mK)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPS 8.5 cm</td>
<td>0.027 W/mK</td>
</tr>
<tr>
<td>24 cm</td>
<td>0.292 W/mK</td>
</tr>
<tr>
<td>27 cm</td>
<td>0.150 W/mK</td>
</tr>
<tr>
<td>55 cm</td>
<td>0.170 W/mK</td>
</tr>
<tr>
<td>90 cm</td>
<td>0.330 W/mK</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Thickness (cm)</th>
<th>Weight (kg/m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zenon Panel</td>
<td>240</td>
</tr>
<tr>
<td>Concrete block 20 cm</td>
<td>340</td>
</tr>
<tr>
<td>Brick 20 cm</td>
<td>280</td>
</tr>
<tr>
<td>Double brick 30 cm</td>
<td>600</td>
</tr>
</tbody>
</table>

- Fast
- Economic
- Safe against earthquakes
- Saving the cost of lintels and beams
- Connection meshes (dimensions in cm)
- The connection details of two panels by overlap meshes or straight meshes
- Angular junction of two panels by corner meshes
Reinforcement of door and window spacings by straight mesh and "U" mesh

Plastering application

Zenon Panel can be plastered by hand or machine. Importantly, compressive strength of plaster should be 12 MPa or higher.

To avoid the corrosion of galvanized steel truss, mortar should not contain corrosive substances such as lime. The thickness of the plaster should be about 3 cm on both surfaces.

In traditional block wall application 2 cm plaster is applied both sides. When we sum the amount of adhesive mortar used in the time of installing blocks and the amount of the mortar that is used for plastering into account, it will be seen that the total amount of mortar used for traditional block wall is higher than Zenon Panel wall’s mortar.

For 1 m³ of mortar, 1m³ 0-4 mm particle size of sand, 300 kg portland cement and 200 liters of water should be mixed.

After plaster applied to the surface of the panel, it should let to dry one day, the next day the other surface of panel can be plastered.

With the application of first layer spraying mortar the space between EPS and mesh is closed.

Application with palstering machine

After the completion of coarse plaster, the plaster should be watered periodically and plaster should be drawn intermittently with nail tip as seen in the right photo. This enables easy adhesion of the thin plaster and prevents shrinkage cracks.
**Tests and Certification**

The Technical Approval Certification process that is managed by Turkish Construction Technical Scientific Research committee (ITBAK) is member of EOTA, tested Zenon Panel due to the European Quality Standards.

- **Thermal insulation capacity**
  - Thermal conductivity coefficient at 23°C - 50% relative humidity conditions:
    - 10 cm panel: $u_{wall} < 0.65$ W/m².K - $u_{roof} < 0.65$ W/m².K
    - 11 cm panel: $u_{wall} < 0.57$ W/m².K - $u_{roof} < 0.57$ W/m².K
    - 13 cm panel: $u_{wall} < 0.48$ W/m².K - $u_{roof} < 0.49$ W/m².K

- **Sound insulation capacity**
  - Due to EN ISO 10140-2:2010 standards acoustic insulation capacity:
    - 10 cm panel > 38.7 (-2.7, -4.5) dB
    - 11 cm panel > 38.7 (-2.7, -4.5) dB
    - 13 cm panel > 38.7 (-2.7, -4.5) dB

- **Resistance to the fire**
  - Zenon Panel wall is placed to an oven which reaches to 800°C at 15th minute and reaches up to 1000°C temperature. By this test resistance capacity of Zenon Panel to the fire was tested. In accordance with regulations on the protection of buildings from fire, Zenon Panel can be used as interior or exterior wall.

  Fire resistance class = E90 - E160 (EN 13501-2)

- **Impact resistance**
  - By its steel truss reinforcement system, Zenon Panel wall performs excellent resistance against impacts. The hits at specified speeds defined by the standards, are applied to the 3 m x 4.5 m sized Zenon Panel wall, and as result even the slightest crack did not emerge.

  Impact resistance class: E5 (TS EN 14019)

- **Resistance to wind loads**
  - According to the EN 12179 standards, dimensions of 4.5 m x 6 m Zenon Panel wall placed on wind turbines and Zenon Panel wall performed extraordinary resistance against positive and negative wind pressure. Maximum load capacity of laboratory 200 km/h wind load is applied on Zenon Panel wall and it showed excellent performance.

- **Water vapor diffusion**
  - Water vapor diffusion resistance coefficient $\mu = 33.36$

- **Ballistic test**
  - **Bullet proof wall** - Zenon Panel wall does not pass any kind of pistol bullets by it's high cement dosage double plaster layers.
    - In the test done by the Turkish special operations troops, many kinds of the rifles are tried with the most effective distance and angle, and successful results were obtained.
Load bearing test

Zenon Panel was reinforced with 6 mm diameter mesh and 10 cm C30 concrete was poured over the panel. Up to 39 tons of linear vibratory live load is applied to the test slab. Thanks to the special steel truss of Zenon Panel system, slap absorbed this enormous load and demonstrated superior performance.

Please visit our website for the video.

PRODUCTION TECHNOLOGY & INVESTMENT

There is no handwork in the mass production of Zenon Panel. The panels are produced in context of quality control processes. All stages of production is performed in a full automated production line consisting of synchronous units.

Our Istanbul factory is based on 8,000 m² of industrial land, our full automated production line is capable of producing 1,500,000 m² Zenon Panel per year.

Investment

Also we produce Zenon Panel production lines. Zenon Panel production lines are designed for mass housing projects in Asia, Africa and the Middle East with innovative technology and equipment.

We offer Zenon Panel production lines and Zenon Panel construction technology know-how to the attention of investors. To get rid of all the shipping and customs charges produce Zenon Panel in your region.

Please contact us for the production investments.

الاستثمار

و حسن أيضا نصنع خطوط إنتاج لوحات زيون. خط تصنيع لوحات زيون مصمم للمشاريع الإسكانية في مناطق آسيا وأفريقيا و الشرق الأوسط

بتقنية حديثة ومعدات متقدمة

نحن نعرض مشاريع خطوط إنتاج لوحات زيون مع معرفة استخدام و تشغيل تقنية البناء بلوحة زيون الحائزة على اهتمام المستثمرين

للتفاوض من تكاليف الشحن والجمارك و إنتاج لوحات زيون في منطقتك

يرجى الاتصال بنا في مجال الاستثمارات في الإنتاج
ITIMAT ENGINEERING
ZENON PANEL CONSTRUCTION TECHNOLOGIES
IND. TRD. LTD. CO.

Address: Fevzipaşa Mah. Söğüt Cad. No: 41
Debeşmenköy Silivri İstanbul Türkiye
Tel: +90 212 884 34 92  Fax: +90 212 884 34 93
info@zenonpanel.com

www.zenonpanel.com