

# Ultra-Lightweight Concrete Wall Panel

## Moisture Insulation

## Heat & Sound Insulation

### Manual of Specifications of Innovative Ultra-Lightweight Concrete Wall Panel:

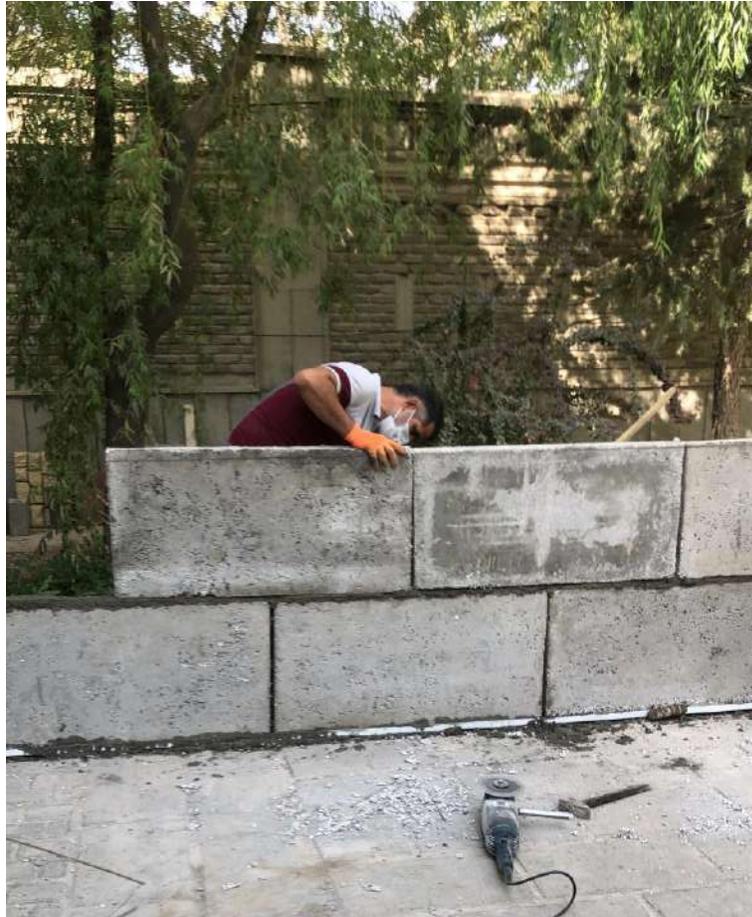
As we need to lighten and improve the performance of the building against earthquakes and also increase the speed of execution and more efficient productivity of manpower in construction workshops, making new materials with new methods and machinery, is among the necessities of engineering and construction management. One of these new methods is the invention, design and making of a kind of wall concrete panel with ultra-lightweight concrete technology with high strength by me, which can be one of the best-selling and most important products in the construction industry. These panels can be used in surrounding walls and interior partitions. In addition, their easy transportation with high installation speed has considerably reduced the time and execution costs. The designed ultra-lightweight concrete panels have national and international patents and approvals. The special capabilities of this high-quality product, which leads to reduction in execution costs, are of attention of constructors of private and public buildings and even special institutes.

### Specifications of Lightweight Concrete Panels

The specific weight of concrete uses in these panels is 500 kg/m<sup>3</sup> they are very suitable insulation for sound, heat and cold.

No.	Dimensions of Panel (cm)			Specific Weight (kg)	Remarks
	Length	Width	Thickness		
1	100	5	7	16-17 kg	Used in interior walls
2	100	50	12	28-29 kg	Used for surrounding walls

The concrete used in this product is ultra-lightweight and high-resistance concrete (compressive strength of 90-100 kg/cm<sup>2</sup>) in order to be able to bear the load on interior walls.



### **The Advantages of Ultra-Lightweight Concrete Wall Panel**

- Very low weight of the product: The weight of each m<sup>2</sup> of this panel for the interior wall with the thickness of 7 cm is equal to 35 kg. The use of these wall panels significantly reduces the dead load of the building, because the most important way to prevent damage and loss caused by earthquakes is to reduce the weight of the structure and one of the most important methods of lightening the structure is to reduce the weight of the walls, which will be achieved by using lightweight panel in the surrounding and interior walls.
- Increasing the execution speed: Considering the large dimensions of this product and its low weight, in addition to reducing manpower and time to transport the product and its special mortar to the floors (compared to the traditional type of mortars and materials, while a few of these lightweight materials easily create a complete wall and there is no need to transport heavy materials such as sand and cement in comparison with transitional method)
- Easy Execution: It is very easy to transport and carry these panels due to their low specific weight and lightweight.
- Reduction of execution costs: Due to increased speed and easy execution (reduction of manpower, reduction of time for using manpower, reduction of time for using of lifting devices, reduction of manpower during execution of project as a result of using use of this product and

its special mortar and lack of the need to transfer sand by spending a lot of time and money to make mortar, reducing the cost of materials waste, reducing the cost of moving material).

- Reduction of construction cost: Due to the reduction of dead loads on the building and the possibility of saving in the structure of building (according to the existing regulations in the national regulations of building, by reducing the dead load on the building, the amount of rebar and concrete used in the structure will be decreased and we will have a structure which is more resistant against earthquake).
- Reduction in the amount of mortar because of using the standard seams between the product.
- Possibility to eliminate the gypsum and soil under the plastering layer and the possibility of plastering independently
- Possibility of using different coatings on this surface, including plastering, ceramics or gypsum sheets
- Possibility of installing screws and bearing the weight of kitchen cabinets and... .
- These panels are resistant against moisture and you will see no destruction in comparison with lightweight gypsum panels (this product can be used in wet spaces such as bathrooms and toilets)
- It is possible to cut some part of the product to pass water and electricity pipes without destroying the wall due to the integrity and type of concrete used in the product (in case of using traditional materials such as blocks and clay sheets, material waste will remain in the site after cutting).
- It is possible to manually cut the panels or use a milling machine; however, the cutting operation is very easy and is also possible with a saw.
- Proper sound insulation due to using materials with good porosity
- Heat insulation (due to the heat-resistant polymer materials used in these panels, they slowly transfer heat to the adjacent space)
- It is possible to use these panels in special projects with high coefficient of importance such as clinics and hospitals with special details
- Low thickness along with the insulation property of the product, has resulting in more appropriate using of the space and less occupation of the area of the building by the wall.
- Resistance of the product against lateral forces, especially during earthquakes, and creating a more integrated surface and no cracks in the product considering the specific type of concrete.
- Providing a clean place with no splashing or waste of traditional mortar due to using the special mortar (special adhesive).
- It is possible to combine these panels with different execution methods and different types of structures with different applications
- Proper for all regions and climates, even humid climates
- No materials, which are harmful for human health, are uses in these panels
- The product is resistance against fire because of using suitable cementitious materials and minerals

- It is possible to use different types of wall pastes, especially their light types and reduce the amount of iron used in the building
- Considering the big size of this product, the waste of materials is less and cut materials can be used under the window and on the top of the walls with similar sizes and regular dimensions.
- High durability of product
- The product has high mechanical strength such as high bending and compressive strength
- Mortice and tenon joint is used in vertical joints to firmly connect the parts together, while the mortice and tenon joint in horizontal joints has been eliminated due to inefficiency and the special mortar is used to firmly connect the parts together (it is possible to use rebar in the horizontal joints of the product).
- It is possible to store the material in construction workshop because they need smaller spaces in comparison with conventional cement blocks
- It is possible to creating a completely hygienic environment in the wall and there will be no negative space and empty space between the walls



### **Execution of the Product**

1. First, the area under the wall should be free from any materials and should be thoroughly cleaned.
2. Wet with water the space under the wall, which is completely smooth and proper
3. The adhesive mortar used between the panels is a specially invented dry mortar, which is combined with the amount of water stated on the product bags and in the required amount and mixed using a mixer and evenly applied as a thin layer in the specified place under the wall with the width equal to that of the wall
4. Place the first row of blocks next to each other and try to spread the mortar evenly as a thin layer in horizontal joints.
5. A steel diagonal holder presented with the product is used to connect two adjacent panels, and after placing the two panels together, this holder is pounded approximately 45 degrees from the edge of the panel to the adjacent panel.
6. Place the special mortar on the first row and then use a piece with the half of the length of panel such that the vertical joints are not in one direction and the integrity of the wall is maintained and continue these stages until completion of wall. The last row should be fastened to the ceiling, so you can use the cut parts of the remaining panels to fix it.
7. At the end stage and after finishing the wall, the sealing tapes can be used. Then spread a thin layer of special mortar with a width of 6 cm from each side of the seam on the horizontal and vertical seams, and then use the sealing tape with the second layer of mortar and using a trowel.

### **Special Materials**

There are three products regarding the mentioned wall, which can be recommended to the employers based on the type and importance of the projects:

- Innovative special dry mortar (panel adhesive)
- Steel diagonal holders
- Sealing tape

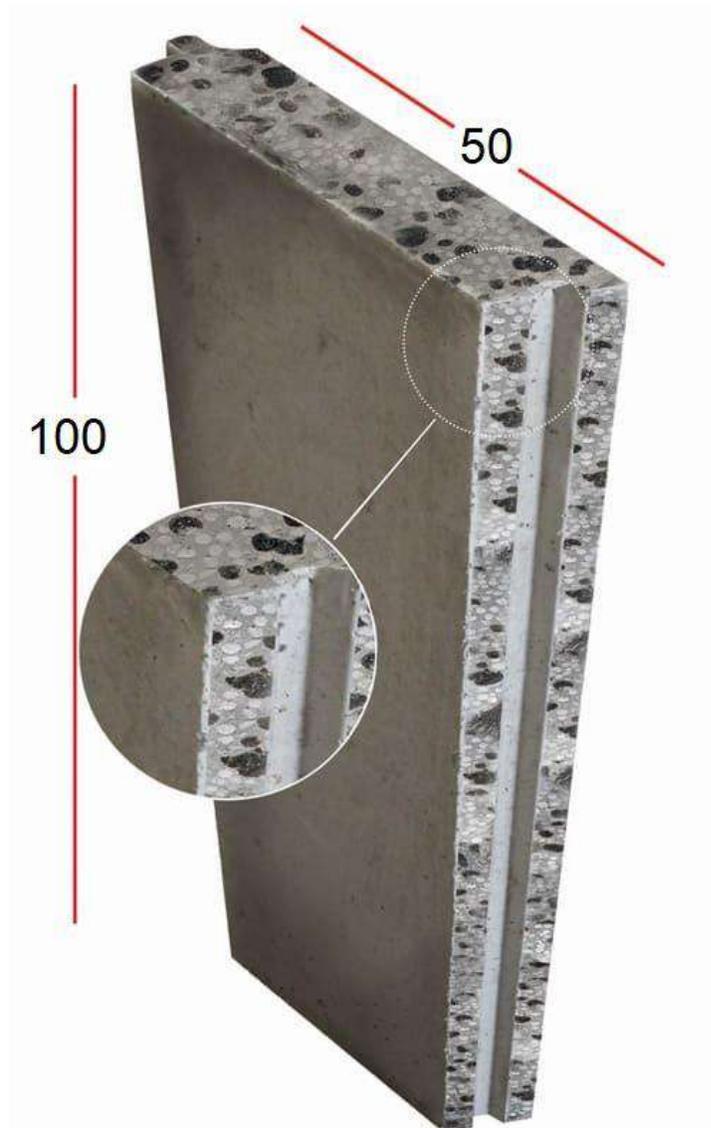
### **Special & Innovative Dry Mortar (Panel Adhesive)**

Innovative dry mortar, which has been made after a lot of research and new laboratory methods, is a completely viscous and high-strength mortar, and at the same time, it has a reasonable price, is economically feasible for use, and is used to connect panels. This special mortar can be prepared by adding water only (the amount of water required is written on the mortar bags) and there is no need to mix it with other materials such as sand or cement.

It is easy to work with this special mortar and it provides proper execution speed with minimal manpower and will save time. Also, the clean workplace after execution and not dirt on walls around is among other advantage of this mortar. Due to the high curing speed of the product, it is possible to build a wall with a high speed. It is necessary to use this product in horizontal and vertical joints and the traditional mortars are not recommended for this purpose.

### **Diagonal Steel Holders**

This type of holder connects two adjacent panels that are pounded d approximately 45 degrees and with a length of 25 cm from the edges of the panels. If you use rebar, you will not need to use this product. Sealing Tape: The sealing tape can be used on the horizontal and vertical joints. This tape prevents cracking. It is recommended to use this product not only for these wall panels but also on wall pastes in order to prevent cracking of gypsum on the wall.



## International honors and approvals



**Award certificate - Brussels Innova 2008**

**Prize of the Technical University of Cluj Napoca (Romania)**

*Was given to:*

**Davoud Beheshtizadeh & Samad Somi & Ebrahim Asadi & Behzad Beheshtizadeh & Reza Allahyari & Jafar Aghazadeh & Mohammad Amin Pour Arki**

Iran, Islamic Republic Of

*For the invention:*

**DESIGN AND PRODUCTION OF ULTRA LIGHT WEIGHT POLYMERIC BRICK**



Brussels, November 15th, 2008

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INVENTORS - INVENTIONS - INNOVATION  
AND PROSPERITY



# DIPLOMA

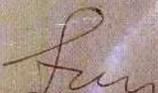
This document is to certify that during  
the International Forum of Graduates connected  
to the GENIUS-EUROPE International Inventions  
Fair out of 33 items from 28 countries

**Mr. Davoud Beheshtizadeh**

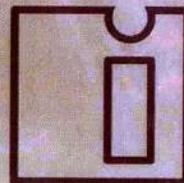
Design and Production of Structural Ultra Light weight Concrete

is awarded this DIPLOMA for the  
successful participation.

On the 9<sup>th</sup> day of September in the year of 2009  
Budapest, Hungary

  
Dr. Szántay Csaba  
MAFE President

  
Dr. Vedres András  
IFIA President



# DIPLÔME

**G**inventions  
Geneva

## SALON INTERNATIONAL DES INVENTIONS GENÈVE

Après examen, le Jury International a décidé

de remettre à: **Davoud Beheshtizadeh**

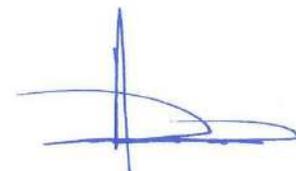
pour l'invention: **Ultra high strength usign nano technology**



MÉDAILLE D'OR  
GOLD MEDAL  
GOLDMEDAILLE

Genève, le 17 avril 2015

  
Le Président du Jury: David Tajji

  
Le Président du Salon: Jean-Luc Vincent

KOREA INVENTION PROMOTION ASSOCIATION

# SPECIAL PRIZE

presented to

DAVOUD BEHESHTIZADEH [ARBITA CONSTRUCTION GROUP]

from

I.R. IRAN

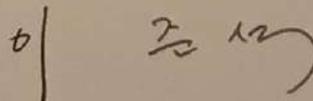
for excellent efforts in creating invention(s)

THE LIGHT CONCRETE RESIN PANELS FOR INTERNAL AND EXTERNAL WALLS

exhibited at the Invention & New Product Exhibition

“INPEX” 2017 Pittsburgh, USA

June 13<sup>th</sup> - 15<sup>th</sup>, 2017



Dr. Lee, Joon-seok  
President

Korea Invention Promotion Association



Korea Invention Promotion Association

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# Award of Merit



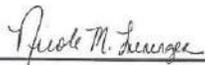
*Presented To*

**Davoud Beheshtizadeh**



*For The Display Of*

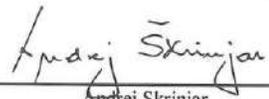
**The light concrete resin panels for internal & external walls**



Nicole M. Lininger  
Trade Show Director



At INPEX 2017  
June 13-15, 2017, Pittsburgh, PA, USA



Andrej Skrinjar  
International Jury Co-Chairman