

**NEW AND REVOLUTIONARY MODULAR BUILDING AND CONSTRUCTION
TECHNIQUE ALTERNATIVE TO CLASSIC GRC TECHNIQUE**

PROJECT PRESENTATION



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GreGRC System (Greeng Glas fibre Reinforced Ceramic)



EXPECTATIONS OF PEOPLE FROM THE HOUSES AND BUILDINGS THAT SUSTAIN LIVES

1

It is physically sound, not affected by natural conditions. A dry, moisture-free life can be maintained inside

2

Easy and economical in winter conditions, being heated with the least energy possible, not transferring outside cold to inside

3

Being cool in summer conditions, being economical, being able to be cooled with the least energy possible, not transferring the outside heat to inside.

4

The material to be built is easy to find, its features meet the above expectations, and it is economical.

5

Creating an ideal atmosphere in terms of ph, allergens, moisture balance, radioactivity and toxicology.

6

It is suitable for the "building biology" theories that have been developed in recent years.

EXPECTATIONS OF BUILDING MATERIALS USED BY MODERN CONSTRUCTION INDUSTRY TO RESPOND TO THE ABOVE EXPECTATIONS

1 Ideal physical strength properties

Vital values suitable for human health

4

2 As high as possible insulation values

It does not cause any problems for the environment when recycled

5

3 Lower costs

To be sustainable

6

There is no material + technique combination in the market today to meet the above six expectations.



Combinations closest to these criteria necessarily is preferred.



Therefore, many problems are necessarily ignored in terms of environmental and living conditions.



PROBLEM

Especially in recent years
practical, fast, stylish, easy in the industry
applied and total cost

The economic considering GRC
(Glassfibre Reinforced Concrete), that is, glass fiber
reinforced concrete applications have become quite
common. This system offers great advantages to its
users, especially in multiple constructions with the
same appearance, aesthetic constructions that require
special design, and technical constructions with
application difficulties.

SOLUTION OF THE
PROBLEM APPLIED
TO BEST METHOD
AND TECHNICAL
PRECAST
" GRC "

DISADVANTAGES OF THE CLASSIC GRC SYSTEM

It consists only of the shell that provides an architectural view. The shell thickness of at least 1.5 - 2 cm. In the classical GRC (precast) system, the shell thickness of the modular parts must be at least 1.5 - 2 cm. The density of this shell is 2400kg / M3.



The produced shell can be transported with steel construction and can be mounted in its place. It is not possible to carry the shell produced in the classical GRC system in any other way and to mount it to the building.



Steel construction defeats time, rusts, is heavy, difficult to build and expensive. The construction is made of painted or galvanized profiles and angles. Even if the welding places are protected with paint, they can rust over time.



DISADVANTAGES OF THE CLASSIC GRC SYSTEM

The necessity of creating a wall behind the outer shell that creates the image. The outer shell is not a wall. It is created only for the architectural appearance of the building. Therefore, there is an obligation to build a separate wall just behind the shell to form the structure. Therefore, it creates twice as much load on the



Extra space (M2) loss. Apart from the shell, the wall that is also created causes extra space loss. This is a factor that negatively affects the cost in regions where the cost of land is high. It also restricts the user's space forever.



Requires extra isolation. Classical GRC technique is not an isolation solution. For this reason, the building must be insulated against atmospheric conditions with conventional products that are harmful to the environment and have a high carbon footprint. This costs extra



DISADVANTAGES OF THE CLASSIC GRC SYSTEM

Its raw material is concrete with chemical additives. The pH value of the concrete mixture used in the classical GRC system is around 12 - 12.5. So it is quite alkaline. And this value is well above the comfort limit in terms of human health.

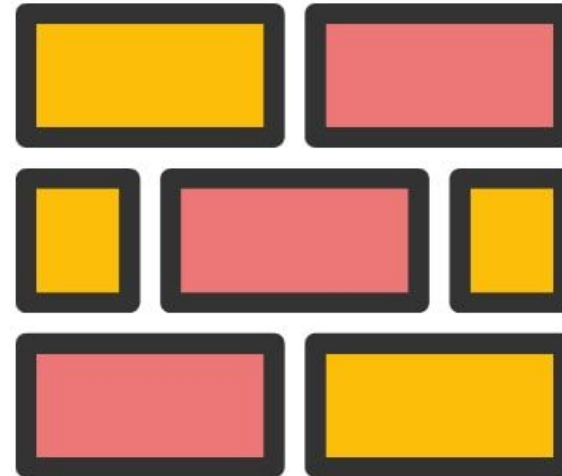


IDEAL SOLUTION WHAT?

THE NEW AND REVOLUTIONARY GREGRGRC TECHNIQUE (Greeng Glas Fiber Reinforced Ceramic) MEETS THE 6 EXPECTATIONS OF THE CONSTRUCTION INDUSTRY ABOVE.



Environmentally friendly
instead of concrete
brand new material:
SUPER CERAMIC



An environmentally friendly material with a very low carbon footprint that will eliminate the disadvantages of concrete and preserve the advantages of the classic GRC system. Clay + natural pozzolanes = Super Ceramic

INSTEAD OF CEMENT (CONCRETE) IN THE PROJECT NEW MATERIAL TO USE

- 100% ecological clay + natural pozzolana origin Green Ceramic (GreCer), whose R&D studies have been finalized.

1

Clay + Natural pozzolana origin non-porous, very hard, environmentally friendly, resistant to all kinds of natural conditions, 1600 - 1800 kg / M3 density shell (surface) material

- 100% ecological clay + natural pozzolan origin Green Poren (GrePor), where we have finalized our R&D studies.

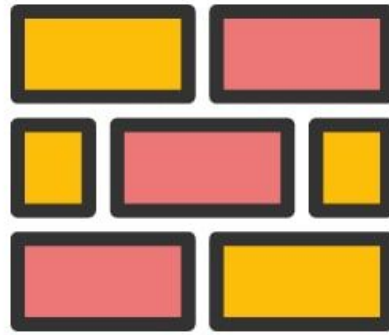
2

Clay + Natural pozzolana based foam wall forming material with super insulating ability, 60 - 200kg / M3 density, 0.020 - 0.045 W / mK insulation coefficient shell.

THE MAIN FEATURE THAT MAKES OUR MATERIAL "SPECIAL AND UNRIVALED IN THE FIELD"

Since both materials (GreCer and GrePor) have the same origins, they can be applied in layers in the same process. In other words, a single product with excellent properties can be obtained by applying an extremely hard surface of the desired thickness and a second layer of the desired thickness with an extremely light, excellent heat and sound insulation ability.

Since both materials come from the same origin, they are molecularly and chemically linked and show the properties of a single layer. They do not tend to be separated from each other by time, climatic conditions, mechanical and chemical effects and have an infinite life.



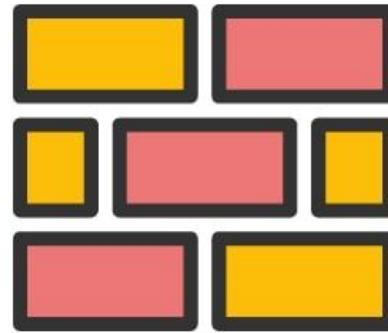
HOW IS THE GreGRC MODULAR WALL FORMED ..?

The outer shell that forms the wall surface (GreCer)

With dimensions of 60 x 100 x 30 cm, the side surfaces are 3 - 4 mm, the front main surface is 5 - 6 mm thick, very hard and resistant to all weather conditions, the material can be easily colored (therefore it does not require additional paint) Our GreCer material = Only 4.5 kg

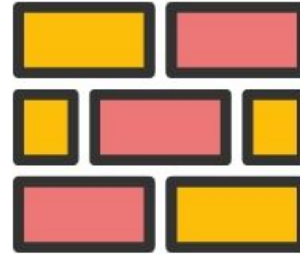


HOW IS THE GreGRC MODULAR WALL FORMED ..?



Mineral foam forming the wall block (GrePor)

GrePor material with dimensions of 130 x 100 x 20 cm: 0.040W / mK thermal conductivity coefficient, 140 kg / M3 density, 280 - 300 kPa pressure resistant block = Only 35 kg



HOW IS THE GreGRC MODULAR WALL FORMED ...

Very thin (3 - 6 mm) and very hard shell (GreCer) + Mineral foam (GrePor) that fills its back and molecularly bonds to the shell in the same process + gypsum plaster or similar application to be applied on the inner surface of the wall as a thin layer

With this feature, with our GrePor + GreCer material, it is possible to make extremely stylish, very light and economical modular panels with very large sizes, desired shapes, and no need for heat sound insulation and paint.

THE NEW AND REVOLUTIONARY GRC APPLICATION WHERE
BOTH MATERIALS ARE USED IN THE SAME PROCESS: GreGRC

GreCer + Grepor = 6 times lightweight, fully self-insulated, resistant to very severe earthquakes, very low carbon footprint, extremely economical, candidate to significantly reduce global carbon emissions, the new and revolutionary GRC system:

GreGRC

"GLASS FIBRE REINFORCED CERAMiC"

ADVANTAGES OF OUR GreCer MATERIAL USED IN THE EXTERIOR SHELL THAT MAKES THE SURFACE

1

It is a 100% natural and ecological clay-based material.

It is not affected by moisture and water. Raw materials can easily be found all over the world. Its carbon footprint is almost zero and meets the ecologically sustainable criteria.

2

Excessive thickness and excess material are not required to obtain physical strength

The GreCER shell thickness we envision for GreGRC is around 3 - 5mm depending on the application.

3

Its specific weight is around 1600 kg. This means 1/3 less weight.

The specific weight of the concrete used in the classical GRC system is around 2400 kg. 33% heavier than our material

ADVANTAGES OF OUR GreCer MATERIAL USED IN THE EXTERIOR SHELL THAT MAKES THE SURFACE

4

It has an extraordinary flexibility.

While 40x40cm x15mm classical GRC plate can stretch 5mm under pressure, 40cmx40cm x 5mm GreGRC plate can stretch 30mm under pressure.

5

The pH value is in the range of 7 - 7.5, it is neutral and most suitable for nature.

necessary, the environment can be adjusted to be acidic or basic using stabilizing materials.

6

There is no synthetic, toxic or non-natural substance in its structure.

When it turns into a waste state, it automatically becomes a part of nature. With this feature, it is a candidate to be the only material in the world that can fully meet the "ecological" and "green" concepts.

ADVANTAGES OF OUR GrePor MATERIAL FOR INSULATION AND WALL FORMING, COMBINED WITH EXTERIOR SURFACE SHELL

1

It does not require oven, temperature or technological equipment in its production.

It is simply mixed and applied. It hardens between 4 hours and 12 - 14 hours depending on atmospheric conditions. The carbon footprint is almost zero.

2

It allows for on-site application.

It is simply mixed and applied. It hardens between 4 hours and 12 - 14 hours depending on atmospheric conditions. The carbon footprint is almost zero.

3

In terms of density;

With the additives mixed into it by the user, it can be adjusted by the user from 60kg / M3 to 600kg / M3 depending on demand.

ADVANTAGES OF OUR GrePor MATERIAL FOR INSULATION AND WALL FORMING, COMBINED WITH EXTERIOR SURFACE SHELL

4

In terms of physical resistance;

Depending on the density of the material to be obtained, it is possible to provide physical resistance from 100 kPascals to 4.5 Mpascals.

5

In terms of heat insulation;

Provides insulation properties from 0.030W / mK to 0.14W / mK depending on the material density to be obtained.

6

Adjustable moisture and air permeability

Water resistance and air permeability can be adjusted as desired by the additives mixed into it by the user.

BENEFITS AND BENEFITS OF THE NEW GreGRC TECHNIQUE UNDER THE LIGHT OF THE ABOVE EXPLANATIONS

1

TRL level 6. The goal of reaching TRL 8-9 level in a very short time

The application and development plan prepared with our successful material R&D project, The goal of reaching the industrial stage in a very short time.

2

Exact use of classical GRC machine park and systems

All machines used in the classical GRC system can be used with minor changes. Innovation in the system consists of the materials used and new application techniques.

3

Huge modular parts of much larger size can be produced.

It will allow the production of very large and complex shaped (convex, concave, elliptical, geometric, formless) modular construction panels and parts.

BENEFITS AND BENEFITS OF THE NEW GreGRC TECHNIQUE UNDER THE LIGHT OF THE ABOVE EXPLANATIONS

4

In addition, the need to create interior walls will be eliminated.

Since the modular parts also function as walls, there will be no need to create an additional interior wall.

5

In addition, there is no need for isolation application.

The foam layer applied to the back of the hard shell acts as both a wall and an excellent insulation. Therefore, buildings built with GreGRC do not need insulation. They can be heated and cooled with very low energy.

6

Extraordinary economy & Very low carbon footprint

In addition, the absence of an insulation requirement provides great economy. There is no need to use synthetic materials with very high carbon footprint. In this way, and considering very low energy consumption, it provides extraordinary energy savings and economy in total.

BENEFITS AND BENEFITS OF THE NEW GreGRC TECHNIQUE UNDER THE LIGHT OF THE ABOVE EXPLANATIONS

7

In the GreGRC technique, the application is not made on the basis of shell formation. The ceramic foam layer, which will serve as a shell + inner wall, is applied together. Thus, GreCer and GrePor, which come from the same root as material, are molecularly and chemically linked together to form a single structure.

No steel construction is required for self-supporting modular panels and their assembly to the building.

8

The foam applied inside the shell creates an extremely durable, sound and heat-proof structure (wall). This structure is self-supporting. It is extremely flexible and light. Installation to the building is done by methods that do not create a thermal bridge, by directly screwing the column or table to the concrete, and it is an extremely simple technique. It provides great economy from time and labor.

BENEFITS AND BENEFITS OF THE NEW GreGRC TECHNIQUE UNDER THE LIGHT OF THE ABOVE EXPLANATIONS

9

6 times lighter buildings

By using the materials used in the GreGRC system in building carriers and floor interfaces (our next connected project), 6 times lighter, very high, self-insulated, very low energy, comfortable and healthy buildings and structures can be built.

10

It is resistant to even very severe earthquakes.

Thanks to its extraordinary flexibility and lightness, buildings built with GreGRC will be able to survive even large-scale earthquakes without any damage. This feature has strategic importance in regions with high earthquake risk.

OPEN TO NEW TECHNIQUES AND
APPLICATIONS, MATERIALS,
CAN BE DEVELOPED A
FLEXIBLE PROJECT
AND STRUCTURE



The project is designed and planned in a way that is open to all kinds of new materials, techniques and applications when necessary. For example; If necessary, materials such as natural jute, linen, hemp, cotton fibers, straw, marsh reed, pike, reed can be used instead of glass fiber to further reduce the carbon footprint. Studies on these are also carried out in parallel.



RESULT



With the GreGRC technique, whose features are described above, it will be possible to build much more economical, more comfortable, much more robust and safe buildings in the near future. In this way, much larger masses will be able to easily access the standards that are considered luxury today and cannot be reached by the lower income group. With all its features, it is a candidate to be the only construction technique in the world that can fully meet the concept of "ecological" and "green".

For more information: You can visit our website at www.greenginovation.com.



MARKET FIGURES AND SIZE

WORLD ANNUAL CONSTRUCTION INDUSTRY MARKET SIZE

World annual construction industry market size =
It is around 1.7 - 2.0 Trillion dollars



Approximately 40% of this figure is directly related
to the material we have developed.



The material we have developed has superior properties
than all other materials and is much more economical in
total.



GRC (PRECAST) INDUSTRY MARKET FIGURES

92.14 billion US dollars in 2020



95.76 billion US dollars in 2021



It is foreseen to be 139 billion US dollars in 2028.



WHY IS THE SHARE OF THE GRC SECTOR WITH MANY ADVANTAGES IN THE 2 TRILLION DOLLAR GLOBAL CONSTRUCTION INDUSTRY MARKET IS SO LOW

Although the product has many advantages over conventional concrete, the cost of machinery and molds required for production is extremely high. Therefore, it is anticipated that high initial investment will hinder and inhibit overall market growth to some extent.



THE NEW AND REVOLUTIONARY GREGRC TECHNIQUE AND WE DEVELOPED CAN THE MATERIAL CHANGE THIS CONDITION ..?

Undoubtedly yes ... GreGRC technique, which eliminates the problems that users are hesitant about and offers many new and very attractive advantages, as we explained above, is practical, solution-oriented application techniques, the extraordinary economy brought by the material used and its problem-solving features. We predict that it will peak its share with an extraordinary acceleration.





This project is necessary for our world. It is very difficult for us to sustain such a big project alone. To complete the scientific aspect, we need official and semi-official institutions, media support for promotion, and financial resources to finance our work.

We are looking for Universities and Research Institutes, Non-Governmental Organizations, Environment and research foundations, funds and companies with strong infrastructure to carry the project to the market.

For more information, you can visit our website www.greenginnovation.com Or you can contact us at blntgrkn@gmail.com

