



Sustainable and 100% Ecological Construction, Insulation and Industrial Materials of The Future





Who Are We?

We are a young but very successful R&D company established to ensure that clay, which has been tried for thousands of years, and which we see as the sustainable, construction and industrial raw material of the future, is used as a "GREEN" raw material in the industry and to eliminate the need for baking.

Our company believes that the idea that "every natural and traditional solution is the best solution" needs a new interpretation in today's conditions. Because: Science has developed geometrically, especially in the last few decades, opening new windows to humanity in every field. For this reason, we think that there may be "much better solutions" in the content of traditional natural solutions that we know as the "best solution" and abandon. Based on this idea, we focused on producing "new solutions" from "natural solutions" to meet today's expectations. Based on our past experiences, we transformed clay, which is an ancient construction material, into "an excellent insulation material from an ordinary building material" by adding porosity, lightness and strength.

The purpose here is; is to reach sustainable solutions that can meet the expectations of the rapidly increasing world population.

It is unacceptable that sustainable solutions are expensive, hard-to-reach solutions. Although these types of solutions, which are tried to be applied with names such as "passive house" and "green house" today, can be applied on a micro scale, they are far from meeting the needs of very large masses.

With our R & D studies, our company has focused on the potential of meeting the needs of large masses as "economically, ecologically and sustainably".

People have met their need for shelter by using natural materials for thousands of years. With the increase in population, increasing demand and changing expectations, natural materials have been moved away, and materials with high carbon footprints have replaced natural materials.

Human history is the greatest natural laboratory for everything humans consume. The results have been achieved over thousands of years. These ancient results clearly show that; "Every step away from natural solutions turns into a step that brings the world closer to disaster". The fact that such choices are not sustainable is evident from the destruction they cause on nature and environmental disasters. Our project aims to offer sustainable natural construction materials to the service of humanity with new and functional forms by using the legacy of humanity and scientific technologies.

Clay and natural pozzolans are a sustainable industrial raw material because the hard earth crust moves over the semi-liquid magma. As these huge moving plates compress each other, some parts of them rise. Wind, rain, snow, glaciers, cold and hot rising erode these parts. Streams carry these eroded materials and deposit them in pit areas. This formation is called "sedimentation".

We call "clay" the parts of this incredible mixture that go through complex natural processes and fit the definition of clay. Some sediments show other chemical and physical properties. Some of these sediments are also called "natural pozzolans". Natural pozzolans and Clay are therefore very diverse and versatile...

Numerous physical and chemical events that have been going on for millions of years in nature constantly cause new pozzolan and clay formations. This cycle is one that will con-

tinue as long as the world exists. In this way, nature has given people constantly renewed, non-polluting, sustainable industrial raw materials.

Elimination of the firing process by modifying the clay with various natural pozzolans, and the ceramic properties of the new material that hardens under atmospheric conditions. Pure clay is the least common type of clay in nature. It has special uses. It has high economic value. Clay types that are common in the world and found almost everywhere are generally mixed with other minerals and have low economic value with various properties. This type of clay was targeted in our research.

The fact that our past knowledge has shaped our R&D studies and the elimination of the firing process by mixing and modifying this type of clay with natural pozzolans gives clay new, diverse and revolutionary capabilities and uses.

In fact, clay, which is a very talented raw material that has been used for thousands of years and meets the sustainability criteria, has very quickly left its place to synthetic origin, practical use raw materials with the industrial revolution. One of the most important reasons for this is the cooking process, which reaches 1000 degrees Celsius.

The cooking process involves the use of high-cost energy, oven and cooking equipment, and a three-stage production process.

The elimination of the grinding process by modifying the clay with natural pozzolans eliminates the need for energy, oven and baking equipment, and reduces the three-stage production steps to one.



In addition, the porous structure that we have added to the clay as a result of our R & D studies also enables the clay to be used as an insulation material.

All these revolutionary innovations and the fact that clay is a very suitable raw material for sustainability criteria make it "the sustainable construction, insulation and industrial raw material of the future".

When we look at our work on this subject, it can be easily said that we have taken a very important distance and that we will soon give a new identity to the material we have developed.

When our invention is evaluated in terms of environment and ecology; It can already be foreseen that its widespread use will contribute to reducing carbon emissions on a very

large scale, and that it will turn into a low-carbon footprint material with its new features, thus becoming widespread and preferred. Because we believe that there is no alternative raw material that can meet the sustainability criteria in nature as much as the material we develop.

Our project is a very important and comprehensive project for the environment and economy globally. The world needs this project in order to prevent the negativities related to the climate change we are experiencing and to reduce the carbon footprint of the sector. The energy savings to be achieved by the widespread use of our material is very high. In the medium and long term, it will contribute greatly to the solution of environmental problems in many areas from carbon emissions to environmental pollution.

What Do We Want To Do?

THE MAIN PROBLEMS WE FOCUS ON SOLUTION

Exceptional energy loss caused by uninsulated buildings:

Today, 90% of the buildings in the world are uninsulated and built from standard, poor quality materials.

1/3 of the energy produced in the world is used for heating and cooling buildings.

Energy production alone is responsible for 40% of the world's carbon emissions.

A standard insulated structure is compared to a non-insulated structure; It consumes 10 times less energy in heating and cooling.

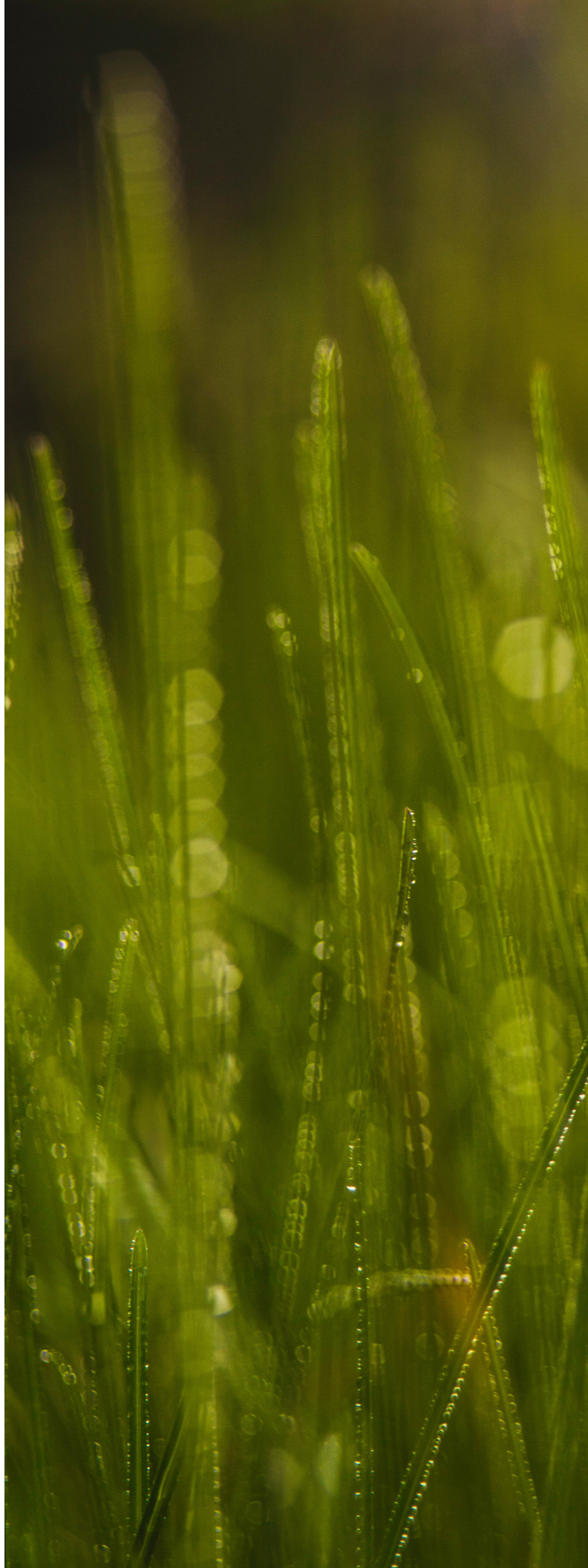
A perfectly insulated structure can be heated and cooled with 15 times less energy.

According to these figures, solving the insulation problem of buildings has the potential to reduce total energy consumption by 25%.

This means a 10% reduction in carbon emissions in total.

While the annual energy requirement for heating and cooling a building is 30-60 kWh/m² in Germany, where the building standards are based on scientific foundations, it is 250-350 kWh/m² in Turkey, a developing country where the standards are not fully implemented.

Germany is much colder in terms of climate and its gross national product is 9 times higher than Turkey.



The picture is much worse in underdeveloped or underdeveloped countries.

This is how the picture is around the world, except for a handful of developed countries.

This is a huge paradox.

Unhealthy and environmentally hostile synthetic insulation materials:

The problems created by these materials last for decades in the buildings they are used, and for centuries in nature after they become waste. The sustainable nature-friendly materials we have developed are an excellent alternative in this regard.

As an alternative to the classical construction materials that are insufficient in solving problems and cause problems, new generation construction materials focused on problem solving and bearing these characteristics, and new techniques in which these materials will be used are possible.

The construction industry does not leave its carbon footprint only while building the building. After leaving the building to the user, it continues to leave this carbon footprint throughout the life of the building, depending on the material and technique used. This totals to incredible numbers.

We are working to ensure that the sustainable main material we have developed is used as a problem solver in other industries as well.

In conclusion:

The main target we focus on; We can summarize it as "CONTRIBUTING TO THE SOLUTION OF THE ENVIRONMENTAL RISKS THAT THE WORLD IS FACING BY DEVELOPING NEW, SUSTAINABLE AND ECO-FRIENDLY INDUSTRIAL RAW MATERIALS AND TECHNIQUES TO USE THESE RAW MATERIALS".

THE RESULT WE WANT TO ACHIEVE

Even though the problem seems huge and unsolvable, the root of the problem in the construction sector is hidden in the solution of the problem from the very beginning, that is, while the building is being built, similarly in the raw material and production stages of the product in other sectors. Extremely economical, healthy, comfortable buildings that require less energy and that low-income groups can easily access will be built." At the same time, the materials we have developed can be used as problem solvers in other industries.

A NEW MATERIAL DEVELOPED AS A RESULT OF OUR R & D WORKS WITH CLAY + NATURAL PUZZOLAN ORIGINAL, WITHOUT COOKING, DISPLAYING CERAMIC PROPERTIES WHEN CURING

The material we call GreCer is a Clay + Natural Pozzolan based geopolymer and has two forms:

Non-Porous Clay + Natural Pozzolan (GreCer)

100% ecological, non-porous, very hard, resistant to all kinds of natural conditions, not affected by water, A1 class fireproof, 1600 - 2200 kg/M3 density building material. As Greeng Innovation, we would like to inform you about our material, which we have developed as a result of long R&D studies, which we call SUPER CERAMIC, which consists of modified 100% clay and natural pozzolans. During our R&D studies, standard clay was modified without changing its nature and natural pozzolans were added to its structure in small amounts. In this way, by providing appropriate proportions and conditions, the clay is provided to harden and set, just like cement, WITHOUT THE REQUIREMENT OF

COOKING. Thus, costs such as baking, long waiting times and labor, which constitute almost 50% of the cost in ceramic production, have been eliminated. The CARBON FOOTPRINTS of the products produced by this method have been reduced at extraordinary rates. Our experience in the ceramic industry for many years and our long researches have enabled us to achieve this result. Our material can be applied without firing, that is, by using 0 energy, in the desired hardness, desired waterproofing properties, colored or in its own natural color, as in ceramics. As a result of these studies, detailed studies were also carried out on the application forms. As a result of these studies, we have made traditional ceramic production techniques usable in the production stages of the product we have developed. In other words, while producing with our material, casting, spinning, wheel and pressing techniques can be used as in traditional ceramics. Likewise, when casting technique is used, corrections after molding, additions and deletions can be made in the product.

A New Insulation Material Porous, Very Light and Excellent Insulation Values (GrePor)

GrePor It is a superior, new generation and unique insulation and construction material obtained by poring our GreCer material described above with the techniques we have developed.

Features of our GrePor material

- + It does not need oven, temperature, autoclave or technological equipment in its production. It is mixed and applied simply, under atmospheric conditions for 4 hours in hot weather, It hardens by itself between 12 - 14 hours in cold weather.
- + Allows on-site application. It provides the





opportunity to apply special forms with trowel, spatula and similar tools by simply mixing the material directly at the place of use, pouring it into molds with the desired properties, spreading it on the floor, spraying.

+ In terms of density, physical resistance; It can be adjusted by the user from 60kg/M³ to 600kg/M³ optionally with the additives mixed in by the user.

+ In terms of physical resistance; Depending on the material density to be obtained, from 100 kPascal to 4.5 Mpascal physical resistance is possible.

+ In terms of heat insulation; It provides isolation from 0.030W/mK to 0.14W/mK depending on the material density to be obtained.

+ The pore size can also be adjusted simply

by the user as desired with nano - small - medium - large - very large additives mixed into it.

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

+ It can carry all kinds of commissioned agents in the content of any form without destroying and preserving the agent's property. Thanks to this feature, it has very special usage areas.

+ Our material can be colored in the desired color with natural color pigments. It carries this color in its structure forever.

+ It is possible to use several different densities and forms of our material in the same production stages. In this way, it is possible to produce without any size limitation, the out-

er surface of which is extremely hard and the desired stone, brick, designed pattern appearance, resistant to all kinds of atmospheric conditions, the interior is extremely light and porous, does not require plaster, paint, coating. Thanks to this feature, it is possible to manufacture very large panel walls and similar products.

+ It can be used in extraordinary harmony with sustainable and carbon footprint 0 materials such as straw, pike, marsh reed, bamboo. It reflects the historical and proven superior insulation properties of these natural and sustainable resources in its structure.

+ With the new techniques we have developed, it is possible to project the screed concrete between the floors in classical reinforced concrete buildings, in the form of our material with a density of 350kg/M3. This feature provides incredible lightness to buildings and huge savings in iron used in construction.

In this way, it is possible to construct very high and very light buildings that are extremely resistant to earthquakes.

+ It seems possible to use some special forms of our material in beams, columns and other carriers of buildings after a good scientific study and process. As a result of these studies, our material will likely revolutionize classical construction techniques in the future.

+ Our material has the potential to be used in many areas of the industry with its superior properties listed above. With its superior features, it is a candidate to solve many problems that have not been solved until today, with almost zero environmental footprint.

These two main forms are used in the techniques and materials we have developed.

FEATURES MAKING OUR MATERIAL "SPECIAL AND UNRIVALED"

Since both materials (GreCer and GrePor) have the same origin, 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 thin surface of the desired thickness and a second layer of the desired thickness, which is extremely light and has excellent heat and sound insulation ability, under this surface. With this feature, it is molecularly and chemically linked to each other and has separate physical properties, but shows a single material feature. This feature gives our material the chance to solve many problems with a single product and there is no other alternative in its field. Layers with two different physical properties do not tend to separate from each other with time, climatic conditions, mechanical and chemical effects, and they have an eternal life. We turned the first phase of this big project, which we started in 2015, into an official project with the R & D support of KOSGEB, which was established in 2019 to support SMEs in Turkey, and started to implement it. In the first phase of the project, which resulted in success, the physical properties of the main material to be used throughout the project were studied, its different forms were developed, in which sectors it could be used, what could be changed globally when used, the role it would play in ecological balance and carbon emissions were examined, samples, prototypes, pre-production samples were realized. applications have been made.

Based on the results we achieved in our project, 6 new sustainable, 100% ecological, carbon footprint very low usage areas and projects that will radically change the rules in many areas have emerged. Considering the capabilities of our material; As projects progress, many new uses and techniques will emerge.

As a result;

The sum of our materials and projects we have developed is a very important and comprehensive project for the environment and the economy in a global sense. The energy savings that will be provided by the widespread use of our material are huge in total. In the medium and long term, it will contribute greatly to the solution of environmental problems in many areas, including carbon emissions and environmental pollution.

WHY IS THE MATERIAL WE DEVELOPED "THE INDUSTRY AND CONSTRUCTION MATERIAL OF THE FUTURE"..?

- It is completely ecological, it is a natural material and it does not harm the environment in the production and application stages. It does not cause environmental pollution.
- Petroleum is indestructible and non-toxic like synthetic substances. When it is turned into waste, it mixes with nature and turns into a part of nature again in a very short time.
- It can be used economically in many areas instead of synthetic resins such as polyester and epoxy.
- It can be used in all areas where synthetic-based toxic insulation materials such as Polyurethane, which requires great energy to produce and cannot be destroyed in nature, are used.
- It can be used in all areas where synthetic-based toxic insulation materials, whose production is very energy-intensive, whose carbon footprint is very high and cannot be destroyed in nature, cannot be used (their use is limited due to their low temperature resistance).
- Its raw material is much more economical than conventional raw materials and is abundant all over the world.
- Its carbon footprint is almost zero. Energy consumption is very low in its production and especially in its application.
- It does not need oven, temperature, autoclave or technological equipment in its production. It is simply mixed and applied, self-hardening in atmospheric conditions for 4 hours in hot weather and 12- 14 hours in the coldest weather.
- It allows on-site application. It provides the opportunity to apply special forms with trowel, spatula and similar tools by simply mixing the material directly at the place of use, pouring it into molds with the desired properties, spreading it on the floor, spraying.
- In terms of density, physical resistance; It can be adjusted by the user from 60kg/ M3 to 2200kg/M3 optionally with the additives mixed in by the user.
- In terms of physical resistance; Depending on the material density to be obtained, it is possible to provide physical resistance from 200 kPascal to 16 Mpas- cal.
- In terms of heat insulation; It provides isolation from 0.030W/mK to 0.14W/mK depending on the material density to be obtained.
- It can be used with all traditional building materials, it contains the superior properties of these materials.
- The pore size can also be adjusted as desired by the user as nano - small - medium - large - very large with additives mixed into it.
- Water resistance and air permeability can be adjusted by the user as desired with the additives mixed into it.
 - It can carry all kinds of commissioned agents in the content of every form without destroying and preserving the agent's property. Thanks to this feature, it has very special usage areas.

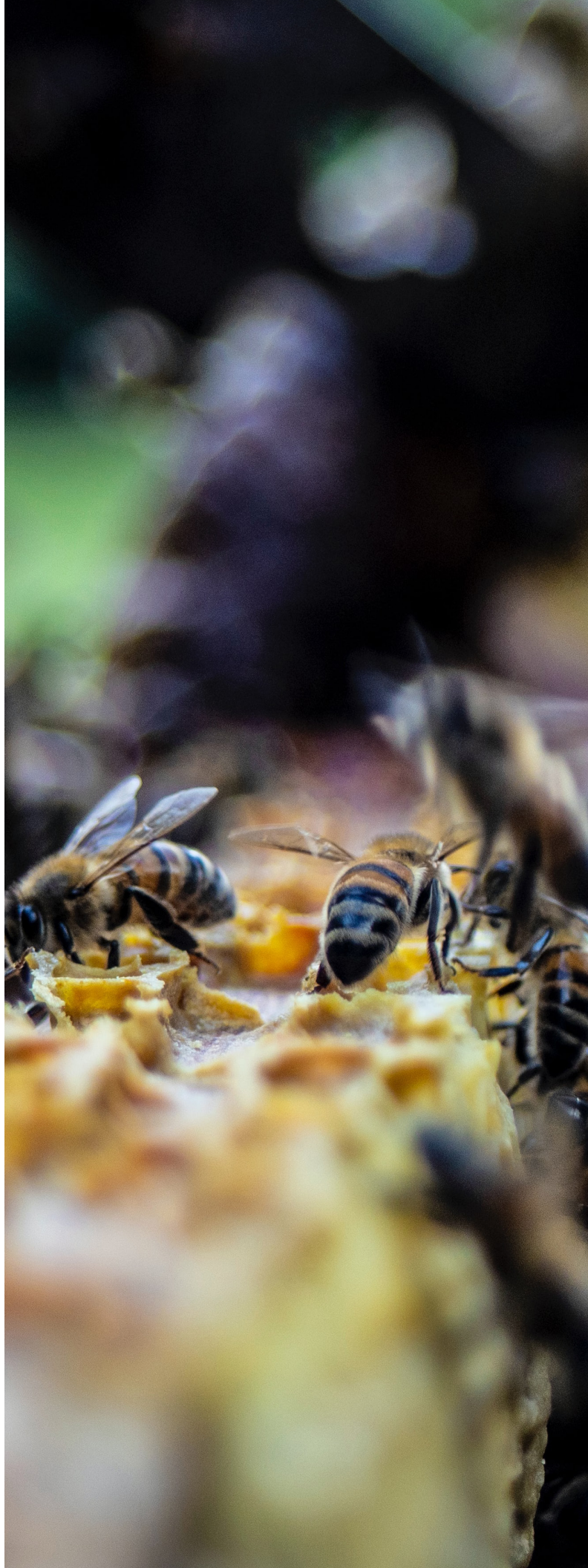
- Our material can be colored in the desired color with natural color pigments. It carries this color in its structure forever.

- It is possible to use several different densities and forms of our material in the same production stages. In this way, it is possible to produce without any size limitation, the outer surface of which is extremely hard and the desired stone, brick, designed pattern appearance, resistant to all kinds of atmospheric conditions, the interior is extremely light and porous, does not require plaster, paint, coating.

- It can be used in extraordinary harmony with sustainable and carbon footprint 0 materials such as straw, pike, swamp reed, bamboo. It reflects the historical and proven superior insulation properties of these natural and sustainable resources in its structure.

- With the new techniques we have developed, it is possible to project the screed concrete between floors in classical reinforced concrete buildings with the 350kg/ M3 density form of our material. This feature provides incredible lightness to buildings and huge savings in iron used in construction.

It seems possible to use some special forms of our material in beams, columns and other carriers of buildings after a good scientific study and process. In this way, it is possible to construct very high and very light buildings that are extremely resistant to earthquakes. As a result of these studies, our material will likely revolutionize classical construction techniques in the future.





BRANCHES OF INDUSTRY WHERE THE MATERIAL WE DEVELOPED CAN BE USED

- MANY AREAS OF CONSTRUCTION AND BUILDING INDUSTRY
- CERAMIC INDUSTRY
- EVERY AREA WHERE POLYURETHANE FOAM IS USED
- ALL AREAS WHERE POLYURETHANE FOAM CANNOT BE USED WITH ITS FLAMMABLE AND RIGID FEATURE
- ARTISTIC OBJECT PRODUCTION, GIFT AND ORNAMENTAL INDUSTRY
- ARCHITECTURAL PIECES, HISTORICAL WORKS RESTORATIONS
- IN THE AUTOMOTIVE INDUSTRY WITH ITS INSULATION OF VEHICLES WITH ITS IMPACT ABSORBENT FEATURE AND ITS FLAMMABLE FEATURE
- AS A SPECIFIC MATERIAL IN THE BALLISTICS INDUSTRY

In the light of the above and the allegations, we think that our project can be widely included in the Horizon 2020 Program Green Deal Call. Considering some of the features that we did not share in this report and on our website during our studies, we think that our material is the closest candidate to be the "construction, insulation and industrial material of the future" among the materials that are studied innovatively in the world. At the same time, we think that it will become an important strategic industry material that our country will have in a very short time if the necessary support is provided.

R&D Studies We Carried Out And Turned Into Products



**New Construction Materials With
Superior Features**

INSULATION AND CONSTRUCTION MATERIALS OF THE FUTURE

As Greeng Innovation, we have developed unique products that are candidates to be "INSULATION AND CONSTRUCTION MATERIALS OF THE FUTURE", which you can examine below, based on the results of our project "The use of ecological and sustainable new materials in construction and other industries", which we have been continuing since 2015 and concluded in 2021.

WHAT ARE THE FEATURES THAT MAKES THE PRODUCTS WE DEVELOP UNIQUE?

During our professional studies and R & D activities, we have seen the following topics stand out in the demands of the building materials market:

1. The material to be used should be easy to work with and should not require extra labor.
2. The material should be very light.
3. The material should be maximum resistant to natural conditions, time, mechanical effects, water and humidity.
4. The material should be economical and easily accessible.
5. In addition to all these, this material should provide excellent heat, sound and moisture insulation.

Yapı sektörü malzeme üreticileri yukarıda They have not yet put on the market a material that can offer the listed features together. They did not need it. Because you will need a very serious R&D process, knowledge and finance to produce this type of product. Companies producing on a global and national scale do not have a problem of

not being able to sell the standard products they produce. On the contrary, they put on the market products that provide some of the above-mentioned features and require separate applications, and make huge profits from these products. This method and way of thinking makes access to such products extremely expensive and leads to the neglect of quality and energy savings in standard building constructions. Therefore, unhealthy structures that consume 1/3 of the energy produced on a global scale in heating and cooling have become the fate of our planet. More than 90% of the buildings in the world are uninsulated buildings.

In the light of this determination, when we started R&D studies, "Can we combine the above 5 items in a single material..?" We focused on the question. Our main goal in our work has been to keep the sustainability and carbon footprint at the lowest level. We chose the materials to be used from natural materials based on our experience. It was a long, tiring process. We faced dozens of insurmountable problems such as financial problems, commercial lobbies, regulations arranged according to standard materials, test methods arranged according to standard materials, etc. We learned that; "You cannot push aside an existing system with a trillion-dollar turnover and impose a new system easily"

Therefore, as a result of our R&D studies, we have developed superior products that can solve the above-mentioned five basic problems in a single material by combining "OUR MATERIAL, THAT CAN BE THE CONSTRUCTION AND INDUSTRIAL RAW MATERIALS OF THE FUTURE", with the superior aspects of traditional materials, as well as its plain form.

SUPERIOR NEW CONSTRUCTION MATERIALS COMBINED WITH OUR MATERIAL

DECORATIVE HEAT & SOUND INSULATION, INSULATION PLATES (GrePor)

“NO HEAT AND SOUND BRIDGES” (GreCer + OSB + GrePor + Recycled polyester felt)

Size: 62.5 x 122.5 cm - 92.5 x 182.5 cm - 124.5 x 260 cm

Thickness: 45 - 55 - 65 mm

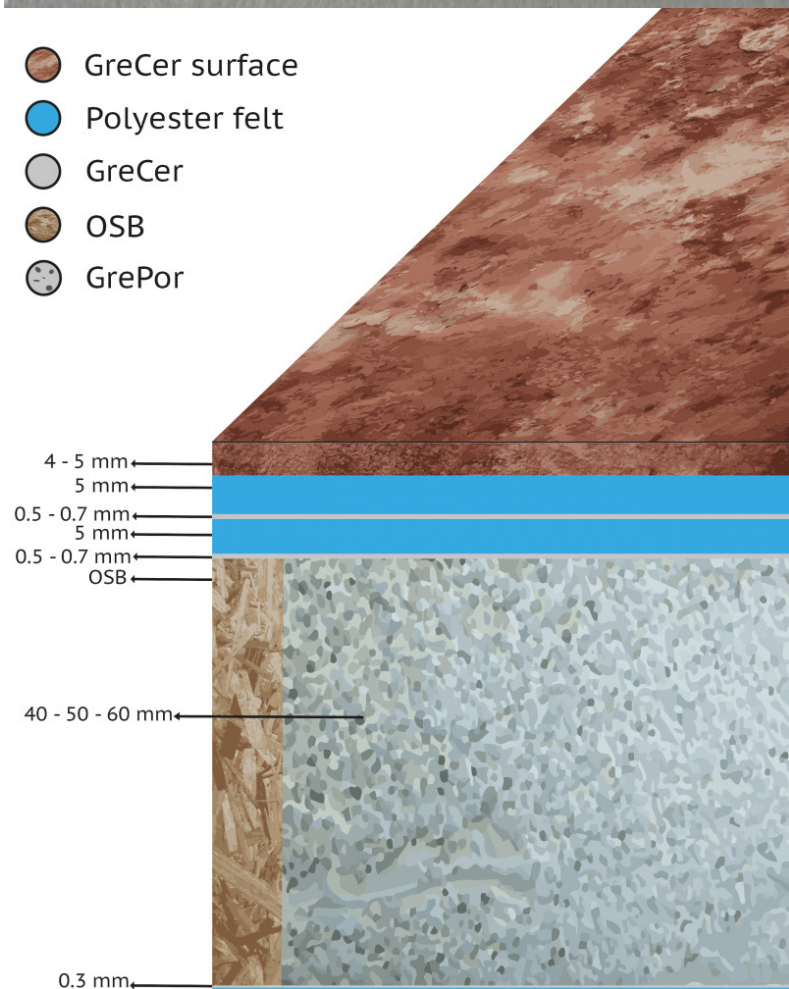
A decorative GreCer layer on the surface of our GrePor material with a density of 100 kg/m³ and a heat transmission coefficient of 38 W/mK, which is protected against mechanical effects with a frame made of OSB strips, and Pol. Felt + Pol. It is protected against external atmospheric and mechanical effects by an application in the form of a felt + GreCer layer between them. GreCer surface + Pol. applied to the OSB frame and surface. Felt layers provide stability, extra sound absorption and heat insulation capacity, extraordinary strength and flexibility to the product. At the same time, the felts that overlap the OSB frame prevent thermal bridges that may occur between the plates.

The uncoated felt surface on the back of the product ensures that the product can be applied to the wall very firmly with ceramic adhesives.

If desired, extra dowels can be applied on large sized plates.



-  GreCer surface
-  Polyester felt
-  GreCer
-  OSB
-  GrePor





DECORATIVE HEAT & SOUND INSULATION, INSULATION PLATES

**“NO HEAT AND SOUND BRIDGES”
(GreCer + OSB + Stone wool plate + Recycled polyester felt)**

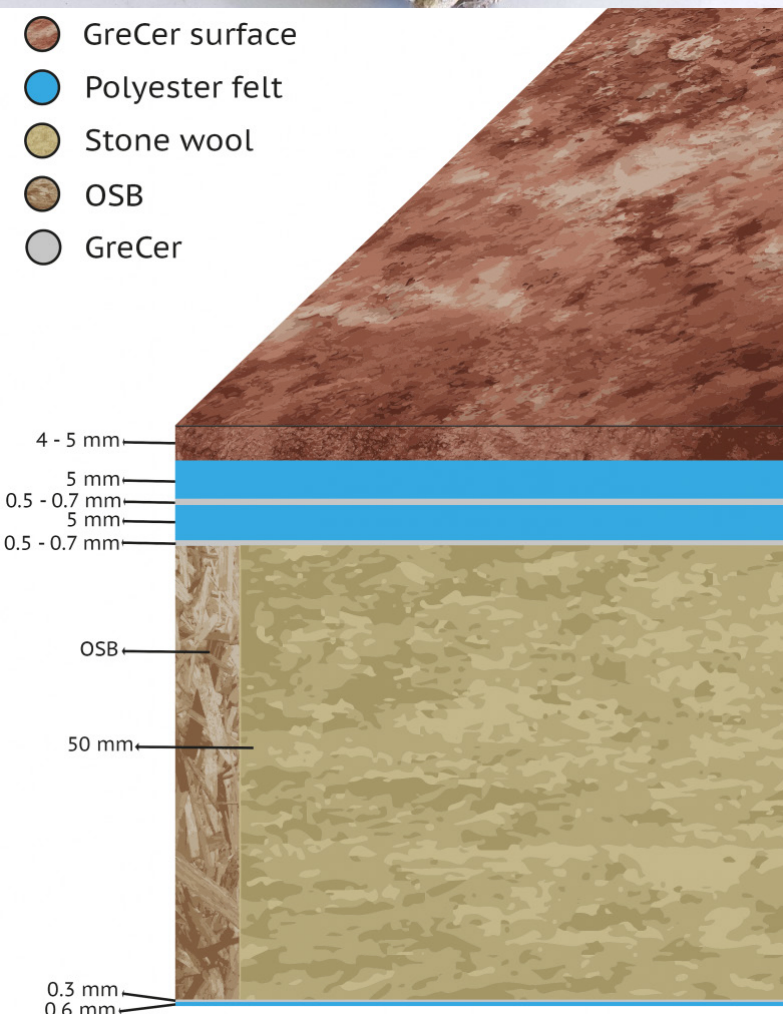
Size: 62.5 x 122.5 cm - 92.5 x 182.5 cm - 124.5 x 260 cm

Thickness: 47 - 57 - 67 mm

Decorative GreCer layer on the surface of Stone wool plates with a density of 100 kg/m³ and a heat transmission coefficient of 34 W/mK, protected against mechanical effects with a frame made of OSB strips, Pol. Felt + Pol. It is protected against external atmospheric and mechanical effects by an application in the form of a felt + GreCer layer between them. GreCer surface + Pol. applied to the OSB frame and surface. Felt layers provide stability, extra sound absorption and heat insulation capacity, extraordinary strength and flexibility to the product. At the same time, the felts that overlap the OSB frame prevent thermal bridges that may occur between the plates.

The uncoated felt surface on the back of the product ensures that the product can be applied to the wall very firmly with ceramic adhesives.

If desired, extra dowels can be applied on large sized plates.



SOUND AND THERMAL INSULATION DECORATIVE WALL CREATION PAN- ELS





**“NO HEAT AND SOUND BRIDGES”
(GreCer + Recycled polyester felt +
OSB)**

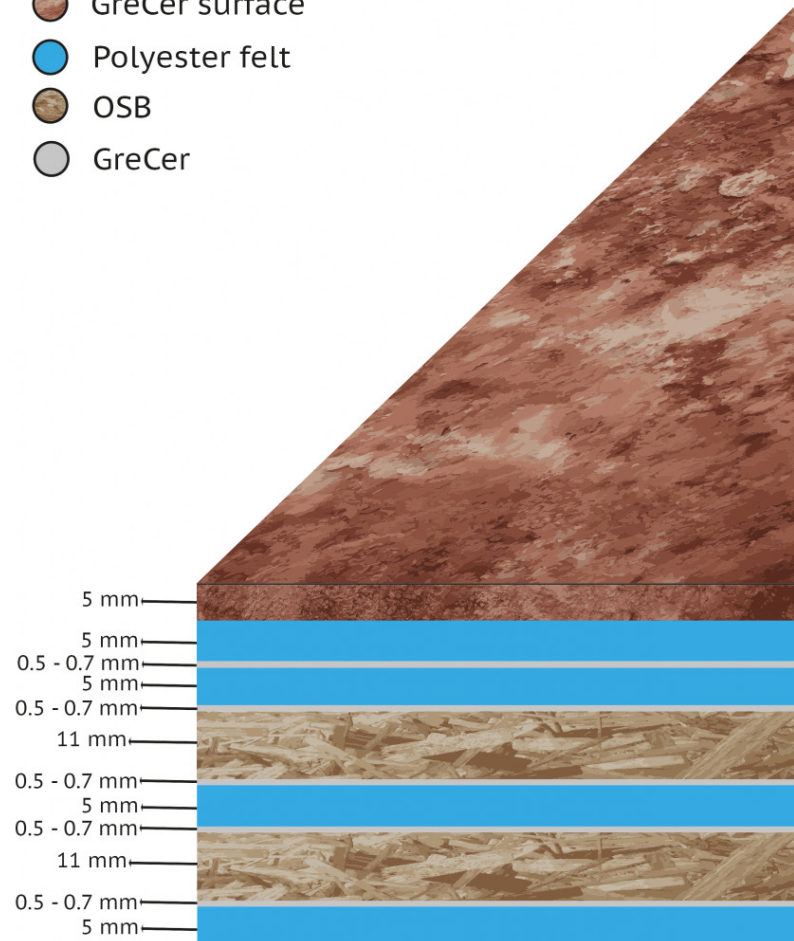
Size: 122 x 260 cm

Thickness: 50mm

This product, which consists of decorative GreCer surface layer + Polyester Felt + Poly-ester Felt + OSB + Polyester Felt + OSB + Pol-yster Felt layers on the surface, is a unique product with its low thickness, high carrier property and extraordinary durability and flexibility. With a total felt thickness of 20 mm, it provides outstanding sound absorption and heat insulation. The exterior surfaces of the buildings created with these panels do not require plaster, paint, whitewash or wall covering. It is recommended to plaster the interior surfaces with gypsum plaster with a thickness of at least 5 mm after the assembly work is completed. With these panels, structures with high sound and heat insulation can be created without using construction on the exterior walls of Tiny House, prefabricated and normal buildings, or by making exterior wall applications on simple metal and wood- en construction. With its practical structure, uninterrupted walls can be created by add- ing them side by side with simple methods.



-  GreCer surface
-  Polyester felt
-  OSB
-  GreCer





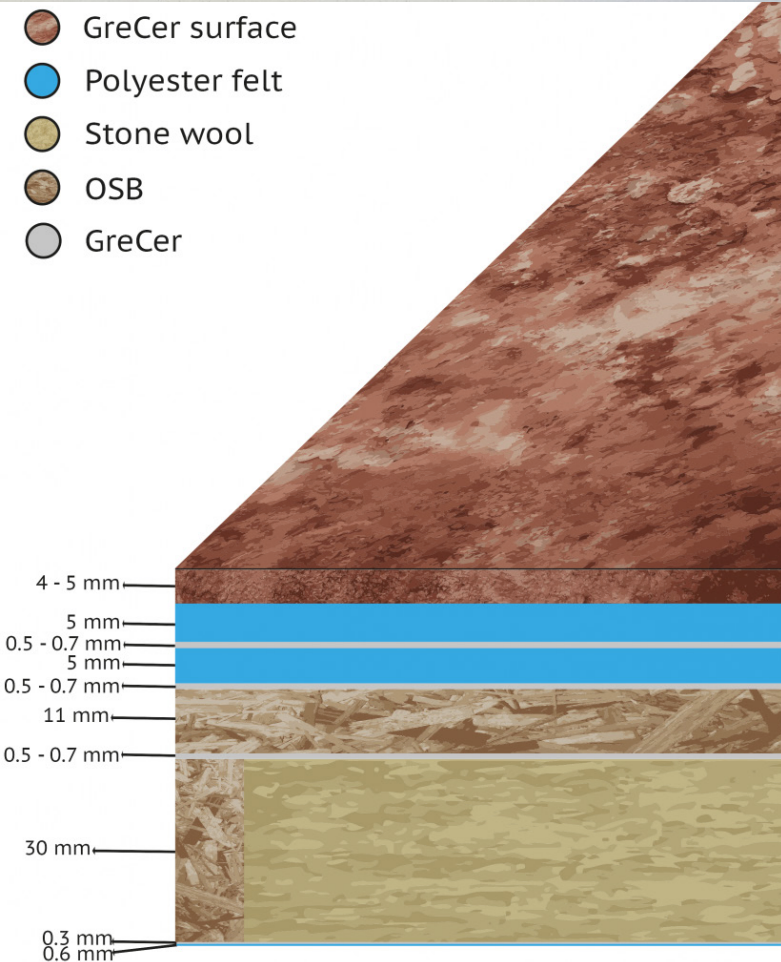
FULLY INSULATED DECORATIVE WALL CREATION PANELS

(GreCer + Recycled polyester felt + Stone wool + OSB)

Size: 124.5 x 260 cm

Thickness: 58 - 68 mm

Decorative GreCer layer on the surface + Polyester Felt + Polyester Felt + OSB plate + OSB strips protected against mechanical effects with a density of 100 kg/m³ and a heat transmission coefficient of 34 W/mK 3 or 4 cm Rock wool plate + GreCer layer + Polyester Felt This product, consisting of layers, is an unrivaled product that is fully insulated against heat, sound and humidity with its extraordinary lightness, extraordinary durability and flexibility. This product is designed for normal winter and summer conditions. The OSB plate applied to the front of the rock wool plates gives this product extra bearing and extraordinary durability. The exterior surfaces of the buildings created with these panels do not require plaster, paint, whitewash or wall covering. It is recommended to plaster the interior surfaces with gypsum plaster with a thickness of at least 5 mm after the assembly work is completed. With these wonderfully designed panels, uninterrupted walls can be created by simply mounting the ceiling and floor, and easily adding panels side by side without using steel or wooden construction.



FULLY INSULATED DECORATIVE WALL FORMING PANELS AGAINST HEAVY WINTER AND SUMMER CONDITIONS

(GreCer + Recycled polyester felt + Stone wool + OSB)

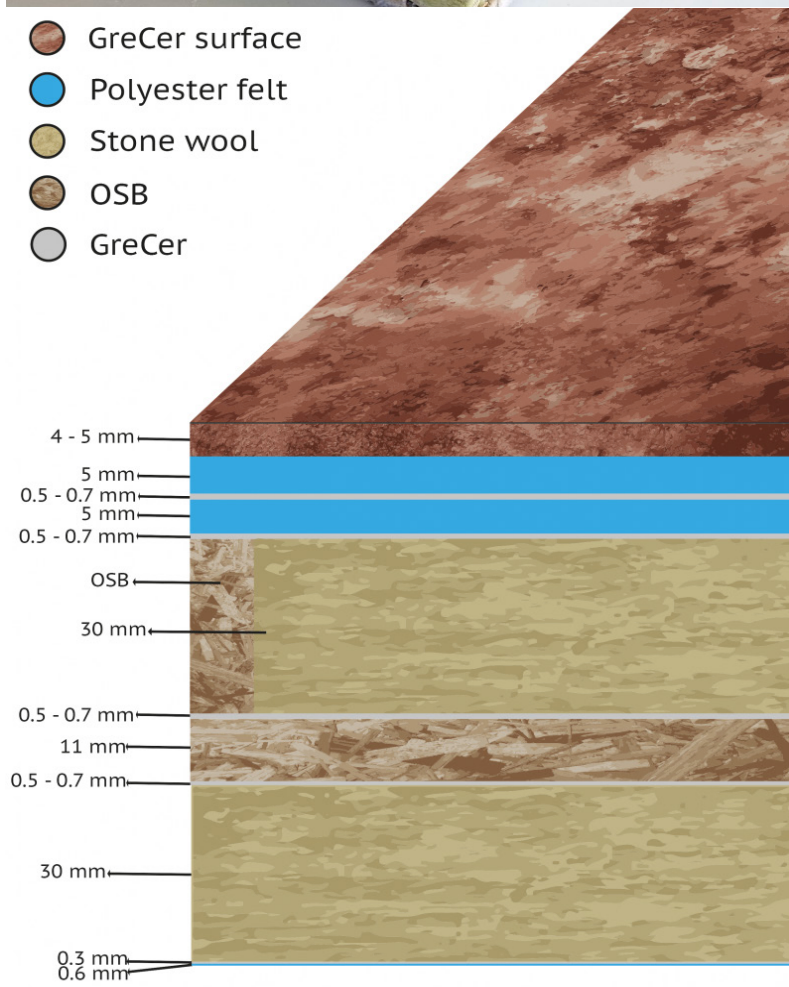
Size: 122.5 x 260 cm

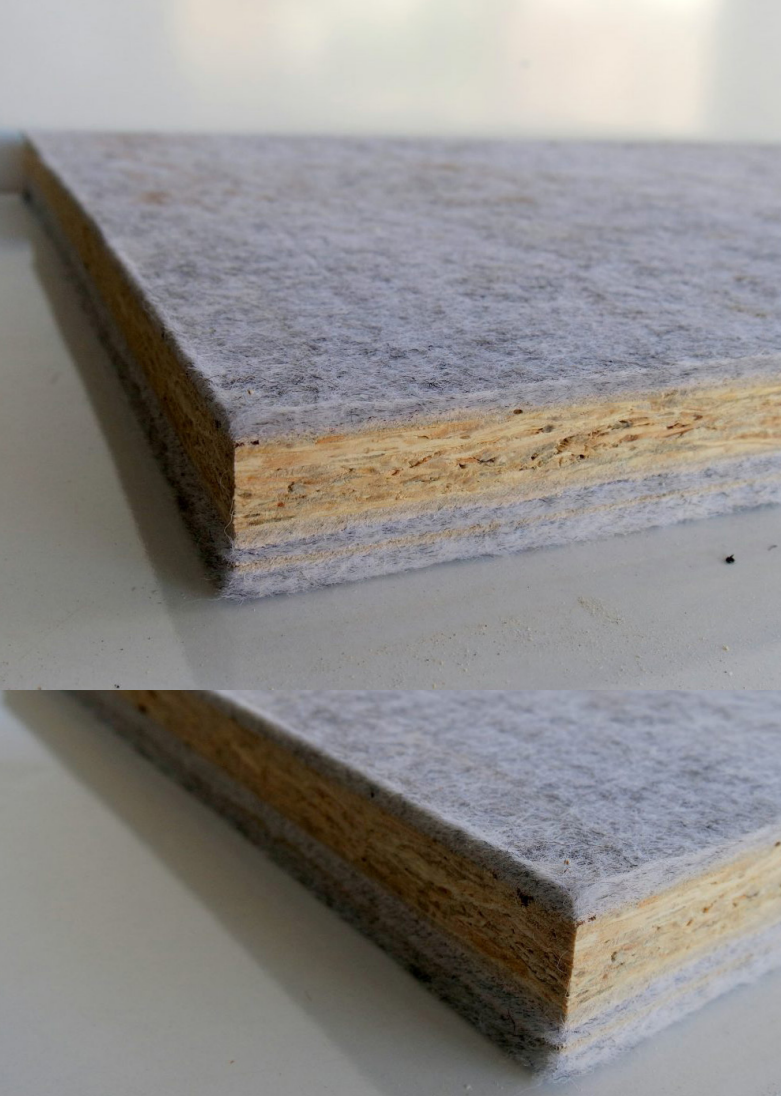
Thickness: 82mm

3 cm Rock wool plate with a density of 100 kg/m³ and a heat transmission coefficient of 34 W/mK, protected against mechanical effects by a frame consisting of decorative GreCer layer + Polyester Felt + Polyester Felt + OSB strips + Pol. This product, which consists of Felt + 3 cm rock wool plate + Polyester Felt layers, is an unrivaled product that is fully insulated against heat, sound and humidity with its extraordinary lightness, extraordinary durability and flexibility. This product is especially designed against severe winter and summer conditions. The exterior surfaces of the buildings created with these panels do not require plaster, paint, whitewash or wall covering. It is recommended to plaster the interior surfaces with gypsum plaster with a thickness of at least 5 mm after the assembly work is completed. With these wonderfully designed panels, uninterrupted walls can be created by simply mounting the ceiling and floor, and easily adding panels side by side without using steel or wooden construction.



-  GreCer surface
-  Polyester felt
-  Stone wool
-  OSB
-  GreCer





FLOOR, WALL, CEILING SOUND INSULATION BARRIERS

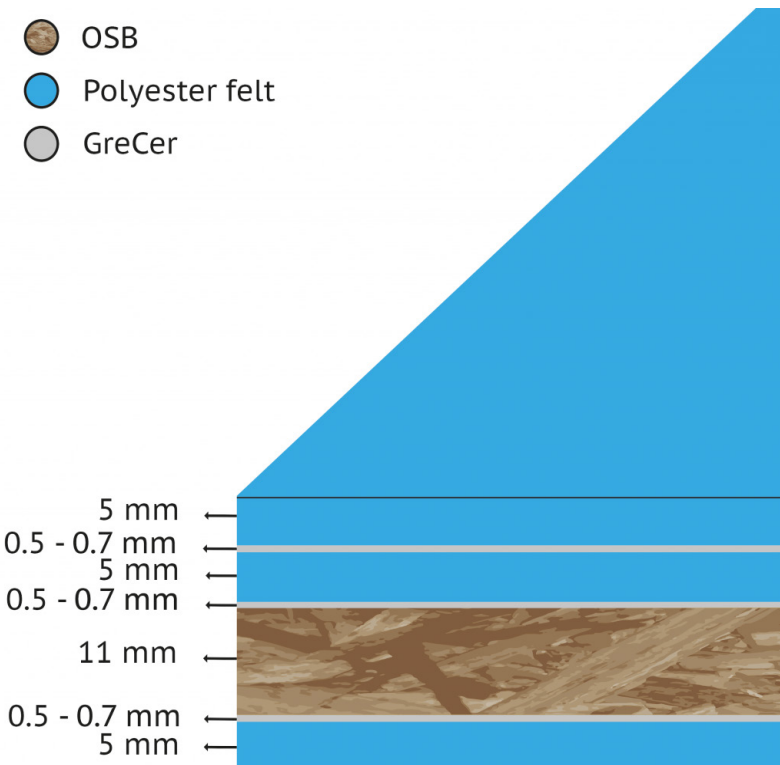
(GreCer + Recycled polyester felt + OSB)

Size: 122 x 260 cm

Thickness: 22mm

Pol. Felt + Pol. Felt + OSB plate + Pol. Felt lined up, this product is an excellent sound insulation material with its sound absorption feature of 42 - 45 decibels. Lower and upper Pol. Felt surfaces are in the form of bare felt. In this way, both surfaces have a very high adhesion ability to the application area. It is applied to screed, concrete floor, wall or ceiling surfaces with the help of ceramic adhesive or ceramic adhesive + dowel.

15mm Pol. Felt also functions as a good thermal insulation barrier with its 11 mm OSB content. It provides significant energy savings. All kinds of parquet, floor, wall covering materials or plaster applications can be perfectly applied to the bare felt surface.



DECORATIVE ACOUSTIC SOUND INSULATION PLATES AND PANELS




(GreCer + Recycled polyester felt)

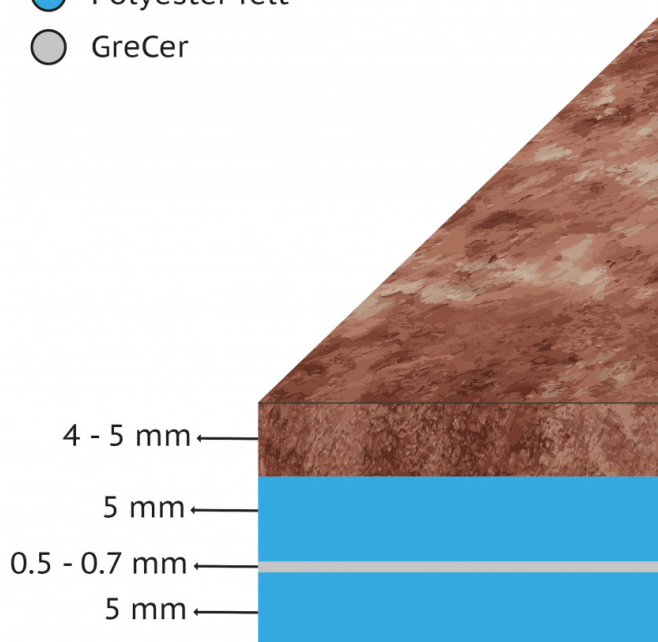
Size: 60 x 120 cm - 90 x 180 cm - 122 x 260 cm




Thickness: 16 and 21 mm

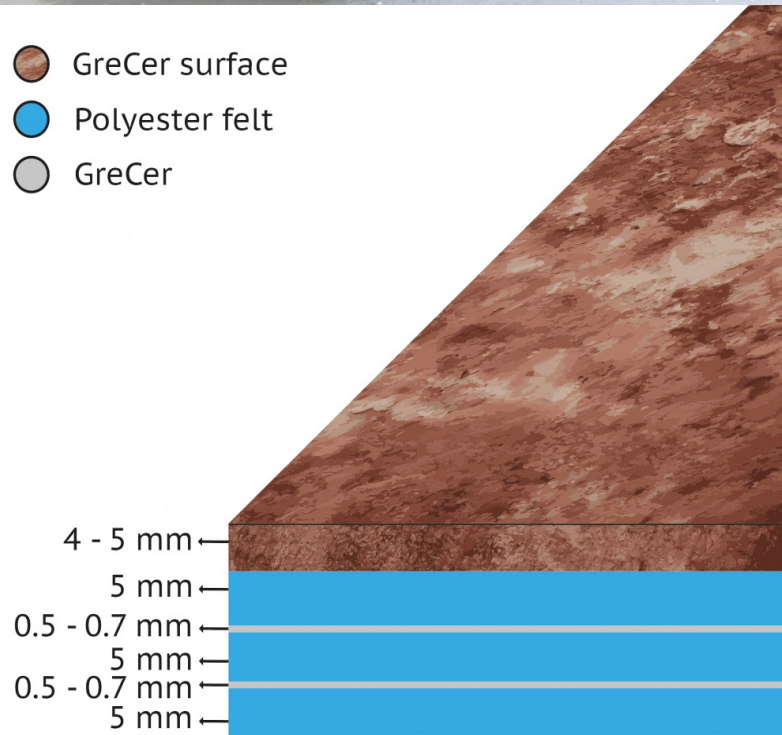
Decorative GreCer surface with GreCer layer between them + Pol. Felt + Pol. Decorative GreCer surface + Pol. Felt + Pol. This product, which is produced in 2 different thicknesses with Felt + Pol. Felt arrangement, is an excellent sound insulation material with its sound absorption feature of 42 - 45 decibels. Sub Pol. The felt surface is in the form of bare felt. In this way, the surface to be applied to the wall or ceiling has a very high adhesion ability. It is applied to interior, exterior wall or ceiling surfaces with the help of ceramic adhesive or ceramic adhesive + dowel.

10 and 15 mm Pol. It also acts as a good thermal insulation barrier with its felt content. It provides significant energy savings.

-  GreCer surface
-  Polyester felt
-  GreCer



-  GreCer surface
-  Polyester felt
-  GreCer





TECHNICAL FEATURES MAKING OUR PRODUCTS UNIQUE:

GreCer developed by our company with its unique combining feature:

As a binder in all our products, a material with the commercial name GreCer, developed by our company, of clay + pozzolan origin, 100% ecological and natural, sustainable, close to zero carbon footprint, extraordinary adherence and does not lose this feature. The mechanical and physical capabilities of our GreCer material are unrivaled in its field.

GrePor developed by our company with its unique isolation and physical features:

Our GrePor material, which is the porous form of the GreCer material developed by our company transfers its 60 kg/m³ - 450 kg/m³ density, 0.030 - 0.12 W/mK heat transmission coefficient, 200 k pascal - 8 M pascal pressure resistance, and other capabilities and unique features to the products in which

it is used.

Other best materials known and used by the industry;

In the products we developed, other sustainable standard construction and insulation materials, which the industry is accustomed to, were also used. The superior properties of these materials have been added to the performance of our products, and their weaknesses have been eliminated by GreCer and the design of the products. For example, by covering the recycled polyester felt with GreCer surface, and hiding it between layers with GreCer, we have removed it from being flammable and added its extraordinary sound and heat insulation feature and flexibility to the products. Likewise, we use the superior mechanical properties of OSB plates to add carrier properties to the products, and hide the OSB surfaces from the contact surfaces, thus eliminating their flammability.

COMPONENTS USED IN THE PRODUCTS WE DEVELOP

Our new material, which is the result of our R & D studies, forms the main and essential basis of the superior building material products we have developed.

The material we developed is based on Clay + Natural Pozzolan and has two forms:

1 - Non-porous, Clay + Natural Pozzolan (GreCer)

We have developed a sustainable, highly adhesive, very low carbon footprint and 100% ecological, non-porous, very hard, resistant to all kinds of natural conditions, water-proof, A1 class fireproof building material with a density of 1600 - 2000 kg/M3.

2 -Clay with porosity + Natural Pozzolan (GrePor), which has the same properties and is also an insulating material itself

We have developed a sustainable, very low carbon footprint and 100% ecological, porous, resistant to all kinds of natural conditions, water-proof, A1 class fireproof, 80 - 300 kg/M3 density, 0.035 - 0.060 W/mK insulation coefficient porous insulation material.

In the techniques and products we developed, these two main forms were used in combination with plain or standard products.

THE FEATURE MAKING OUR MATERIAL "SUPERIOR AND UNRIVALED IN THE FIELD"

Since both materials (GreCer and GrePor) are of the same origin, 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, which is extremely light and has excellent heat and

sound insulation ability, under this surface. With this feature, the whole structure is molecularly and chemically linked to each other and shows separate physical properties but a single material feature. They do not tend to separate from each other with time, climatic conditions, mechanical and chemical effects and they have an eternal life.

Here, the traditional insulation materials in the market, which can show negative properties when applied alone, are transformed into brand new products with superior features and excellent insulation materials by eliminating all their negative aspects with these materials and techniques we have developed.

Our non-porous and hard material, which we have developed, called GreCer, gives these products features such as being unaffected by water, moisture, physical effects, incombustibility, and preserving their physical form.

Our porous and GrePor material is; With its lightness, high insulation coefficient and non-flammability properties, it gives unique properties to the materials it is used with.

OTHER STANDARD MATERIALS WE USE IN PRODUCTS WE DEVELOP

STONE WOOL

İçeriği volkanik kayaç olan taş yünü yapı malThe ground is a light building material consisting of fibers obtained by melting volcanic rocks at high temperatures. It is used as a standard for insulation in buildings and exterior applications. At this point, stone wool, which has a very functional feature in terms of both sound insulation and thermal insulation, is frequently preferred because it has an effective potential in terms of insulation, although it has some negative features.

Technical specifications:

Its density is between 60 kg/m³ - 160 kg/m³.

The thermal conductivity coefficient (λ) is between 0.036 W/mK and 0.040 W/mK.

Thanks to its inorganic structure, it does not produce bacteria.

Its dimensions do not change when exposed to heat and humidity.

Class A1 fireproof,

5 cm thick rock wool has a sound absorption coefficient of (α) = 0.79 at 500 Hz and a sound reduction value of 40.1* dB.

OSB - Oriented Strand Boards

The wood chips on the outer layers of the boards are laid in the direction of the long axis of the board, the chips on the middle layer are laid vertically on the chips on the outer layer.

In order to obtain multi-layered board, the chips are pressed with the help of bonding glue and OSB boards are obtained. OSB particle boards have a certain production method and thickness. Wood chips, sawdust, etc. It is no longer manufactured from materials such as its raw material is pine wood.

OSB -2 technical features:

Density: 620kg/m³

Thermal conductivity coefficient (λ) is between 0.08 W/mK and 0.10 W/mK

Bending resistance: 310 N/m²

Tensile strength: 319 M/m²

It is not affected by harmful insects. Likewise, it is not damaged by microorganisms such as mold and fungus.

Although the sound insulation coefficient of OSB plates is not measured in the laboratory environment, it is known that the wood, which

is the raw material, is a good sound insulation material.

POLYESTER FIBER AND FELT

Polyester fiber and felt are heat and sound insulation materials in which the fibers obtained from the recycling of Polyethylene Terephthalate, which does not contain chemical additives, are blended and compressed with the nonwoven needling method to bring them to an applicable thickness.

Physical properties of polyester fiber:

Thermal conductivity coefficient (λ) is between 0.032 W/mK and 0.039 W/mK

Sound absorption value is 35 decibels

Tensile strength 4.5-5.5 g/denier

Elongation percentage at break 15-25%

Specific gravity 1.38 g/cm³

Under normal conditions, humidity is 0.4%

Resistant to acids, resistant to bases.

Resistant to oxidizing and reducing substances.

It is not affected by moths and harmful insects. Likewise, it is not damaged by microorganisms such as mold and fungus.

WHAT ARE THE FEATURES MAKING THE CONSTRUCTION MATERIALS WE HAVE DEVELOPED SUPERIOR..?

The biggest feature and innovation of these products is that our "clay-based" ecological material, which we developed and believed to be the "construction and industry material of the future", is the basis and binder of the products. It combines very high adhesion strength and physical strength into a single structure, and transfers its non-flammability, physical durability, insulation, and decorative properties to the products we develop.

At the same time, thanks to the technique we have developed and applied to all our products, there is no "HEAT BRIDGE" in any of our products. No matter how good the material is, insulation will be inefficient if it contains thermal bridges.

With these features, our products are unique in their field and have no rivals.

If we take a look at the superior features of other standard components;

Stone wool is a very good insulation material, it is light, it does not burn, it does not contain mold and bacteria. However, it is delicate, resistant to pressure, physical effects, humidity and water. It is almost impossible to use alone and it needs extra applications to eliminate these negative features. Failure to comply with these standards requires the process to lose its feature over time and be repeated.

Polyester felt alone means nothing in the building materials industry. But in other sectors, especially in the textile sector, its usage area is very common. It is not natural, flammable, and when thrown into nature, it continues to exist as a waste that pollutes the environment for hundreds of years. Therefore, it should not be thrown into the nature as waste. However, Polyester fiber, especially when it is made into felt, has a density of 120 kg/m³, a heat transmission coefficient of 0.034 W/mK, a breaking strength of 4.5-5.5 g/denier, an elongation at break of 15-25%, a sound absorption coefficient of 35 decibels. and it turns into a material with very superior physical values, which can be easily produced in desired thicknesses. Moreover, the raw material used is recycled, that is, it is a waste that is prevented from being released into the nature as waste. In this way, we prevent these wastes from being released to nature and hide them on the walls, floors and ceilings of a building throughout its life, as well as providing "multi-functional" and "energy saving throughout the life of the building"...

The contribution of such a use to the protec-

tion of nature and ecosystem should not be underestimated.

OSB, that is, oriented wood chipboard, is the most durable, most economical, easy-to-process building material in its class. It is flammable, even fire trigger, when used alone, it is weak against direct water contact. However, when its negative aspects are hidden, it transfers its superior physical features to the structure of which it is a part.

Here, in our new products, we have developed superior building materials by highlighting only the good features of the above traditional products and hiding all their bad and weak aspects in the inner structure of the product with the materials and techniques we have developed.

For example, we added the near-perfect sound and heat insulation properties of stone wool to our products.

By preventing polyester waste from being thrown into the nature, we added the physical superior aspects of the produced felt, sound absorption and insulation properties to the products we developed, and by hiding it in the material, we transformed it from a waste that harms nature into a useful material that provides energy saving, extraordinary durability and incredible sound insulation.

By hiding the OSB plates on the inside and side parts of the products, we brought the product strength, carrier, lightness and other positive features within the structure of OSB.

In summary: We developed new building materials in different combinations with rock wool + polyester felt + OSB + the material we developed, GreCer - GrePor. We have given these materials superior sound and heat insulation values and mechanical durability. We almost covered it with an armor. We have made it fireproof, unaffected by water, moisture and physical effects.

In light of the results obtained:

- The products we have developed show excellent performance in terms of total cost, sound and heat insulation.
- The products we have developed are very light compared to their counterparts. In this way, it requires less carrier system and significantly reduces the building cost.
- The carbon footprints of the products we have developed are very low and provide energy savings and superior comfort to the user throughout their lifetime.
- The products we have developed have exceptional bending, impact and rupture strength and are lightweight. The walls made of these materials do not carry the risk of collapse or collapse even in very severe earthquakes.
- The products we have developed transform a synthetic waste, namely polyester waste, which can harm the ecological system for centuries when released into nature, into new products with superior features, ecological, and providing accessible comfort to people in their living spaces.

In addition, our products;

- It provides real energy savings during the production phase and throughout the life of the material.
- It is a natural part of the building construction with its real and perfect heat and sound insulation feature without thermal bridges. In addition, there is no need for sound and heat insulation.
- Designed for sustainable and practical production, application and use
- Does not contain toxic substances, is truly

environmentally friendly

- The overall cost is very economical. It also provides access to comfortable living spaces for low-income large masses.
- The total energy savings it will provide are incredible. When used widely, it is a candidate to have a major role in reducing global carbon emissions.

ADVANTAGES OF OUR PRODUCTS TO YOU

- Our products carry the best features of the standard products on the market and bring them to the fore. He hides his weaknesses in his structure. Conclusion: A combination of only good features...
- With a team of two, you can finish a wall in two hours, where many workers and craftsmen of different specialties will struggle for days at different times.
- Our products are extremely stylish and natural looking. For example; Stone textured surfaces are indistinguishable from reality.
- The width and height of our products, that is, the area they cover, is 50% more than standard wall panels. In this way, the need for assembly construction is much lower.
- Our products are installed and your job is done... Also, you don't need external applications such as insulation, plaster, coating, paint etc. You will save significantly on labor, heating and cooling costs.
- Even if a building built with our products is right next to a large airport, you won't hear any planes take off or land. Outside noises can no longer accompany a piece of music you are listening to...



The assembly of the panels to each other is very simple and practical. Does not require expertise. A talented person can finish a small cottage with a few friends at the end of a weekend, celebrate the work he has done in this cottage with a party on Sunday evening...

WHAT CAN YOU DO WITH OUR PRODUCTS..?

- Is your house cold in winter and hot in summer? Are your fuel bills too high..? Don't you think about standard isolation ideas..? Then take a good look at our external insulation products. All the question marks in your mind will be removed.
- Parties, fights, cheerful laughter in your neighbor are heard as if they are in your house..? Check out our decorative, stylish, fireproof and practical sound insulation barriers. Do not place a time bomb in your home with flammable and expensive synthetic sound insulation products...
- You can do a lot with yourself and a few friends with a simple planning. A mountain hut, a soundproof hut for your noisy generator, a hobby hut for your garden and all the simple additions you can think

of are waiting for your skilled hands...

- Architects, Civil engineers... You can freely project and design any kind of building without limitation of size and shape. First of all, you should take a look at the Gre-GRC section.
- Are you going to build from scratch? Our permanent, ecological solutions are at your disposal. Your architect or civil engineer will agree with you when they examine our products.

We say:

Life is a matter of choice; You can also choose products that seem to be cheaper, but will cost much more in total. With the repairs and renewals you will make throughout the life of the building, you will constantly pay the price of these choices...

Again we say:

Life is a matter of choice; You can also choose products that seem to be cheaper, but will cost much more in total. With this choice, you leave a dirty, problematic and unsustainable world to your children.

R&D Studies We Carried Out And Turned Into Products



A Touch of The Greeng To The Straw Panels

STRAW PANEL SURFACE COATING R & D PRELIMINARY WORK RESULTS

The results of the preliminary R&D studies we have carried out on “increasing the physical strength, heat & sound insulation values and protection from atmospheric effects” of straw panels are given below:

1 - As a preliminary study, it was understood that the samples sent from Germany would not be enough, and 4 Straw panels produced in Turkey and having the same characteristics were taken and preliminary tests were carried out on the pieces obtained from these panels.

2 - First of all, a large number of adherence studies were carried out with the material we developed on the samples and other standard coating materials available in the market, cement-based binders, lime, sand and aggregates of different particle sizes.

3 - Satisfactory adherence values could not be obtained except for the material we developed and a kind of chemical compound mixture. Since the cost of the chemical composition mixture other than our material is high, it was thought that it would not be rational to use it.

4 - It has been seen that the classical plaster application based on cement + lime + chemical additives can be applied on Straw panels with a number of additional processes. However, the additional processes applied also require workmanship in different areas of expertise (specific plaster + paint, coating, etc.). When such an application is not made by experts, it is inevitable that the panels will absorb moisture from the cracks formed, swelling, tendency to change size and deterioration of integrity.

5 - The density of facade cladding made with a mixture of cement + lime + various chemicals is 1800kg/M³. Considering that a Saman panel is 3.36 M² and a minimum of 1 cm thick plaster will be applied; 3.36 M² x 18 kg (1 M² 1 cm thick plaster weight) = 60 kg plus weight. Assuming that a minimum of 1 cm of gypsum plaster is applied on the other surface (indoor), this application will create 47 kg plus weight per panel. In other words, standard applications will create a minimum 107 kg plus weight per panel for the building.

6 - It has been evaluated that the facade coatings made with a mixture of cement + lime + various chemicals will not have a very long life in the stress tests we have done and the moisture permeability of these materials will damage the paper coating that holds the straw panel together, the dimensional change that will be brought by moisture will break the bonds forming the adherence over time and the protective coating will fall from place to place.

7 - Facade coatings made with a mixture of cement + lime + various chemicals do not have any positive features to add to the building in terms of sound, heat insulation, lightness, economy and time saving, apart from physical opinions.

8 - It has been understood that the plain form of our material, which we developed and named GreCer, which can be used as clay plaster, is an excellent alternative for the protection of straw panels against atmospheric and mechanical effects. For detailed information: <https://greenginnovation.com/greplast/>

9 - A simple plaster application with 220 -250 gr/M² weighted jute fabric and the material we developed with a thickness of 2-3 mm on the inner surface and 4-5 mm on the out-

er surface is sufficient to protect the panels against water, fire and all kinds of mechanical effects.

10 - However, it has been evaluated that even if an application is made with the material we have developed in Article 9, it will not give the product an extraordinary feature other than protection against atmospheric conditions and mechanical effects, and this will not be sufficient. Although it outperforms many materials with its 0.99W/mK heat transmission coefficient, Saman panel is not a sound and heat insulation material on its own. Therefore, the need for insulation will arise in the buildings where it is used.

11 - That's why we used a technique we developed as a result of our R & D studies, together with the clay-based material we developed and some traditional products on the market. The result is a new product with excellent features. As the details of this product will be explained below; it has been evaluated that it will be the most perfect and ecological product in the construction industry market at the moment, and it will not have a competitor.

COMPONENTS USED AND FEATURES OF THE COMPONENTS

GENERAL PHYSICAL PROPERTIES OF STRAW PANEL USED IN OUR WORKS

Straw panel size : 120 cm x 280 cm = 3.36 M2
Straw panel weight: (22 kg/M2) 73.92 kg
Straw Panel thickness: 60 mm
Material used: Straw compressed under the influence of temperature, paper protective layer on the surface
Heat transfer coefficient: 100W/mK
Sound transmission coefficient: 25 - 30 decibels (depending on the straw density)

INFORMATION ABOUT THE CLAY-BASED COMBINER (GreCer) USED IN OUR WORK AND DEVELOPED BY OUR COMPANY

Technical classification: Geopolymer Clay + Natural Pozzolans (GreCer)

100% ecological, non-porous, very hard, resistant to all kinds of natural conditions, not affected by water, A1 class fireproof, 1600 - 2200 kg/M3 density building material.

Advantages of our GreCer material:

- It is a clay-based 100% natural and ecological material. It is not affected by moisture and water.
- In order to achieve physical strength, excessive thickness and excessive material are not required, the GreCER shell thickness we foresee for GreGRC is around 5mm maximum.
- There is no excessive volume contraction and application difficulties. The average size change after drying is 2%.
- It has an extraordinary flexibility. While the 40cmx40cmx15mm concrete slab can flex by 5mm against weight and impact, the 40cmx40cmx5mm GreCer plate can flex 30mm against weight and impact.
- Synthetic polymers or additives are not necessarily used to increase its durability.
- Considering the features and composition it contains, it can easily be said that the carbon footprint is almost zero.
- The pH value is in the range of 7 - 7.5, neutral and most suitable for nature. It can be adjusted as acidic or basic if necessary.
- There is no need for any process, effort or time period to transform the GreCer material into nature. Therefore, the concept of recycling does not apply to our product.

Since there is no synthetic, toxic or unnatural substance in its structure, it becomes a part of nature when it turns into waste. For detailed information, you can refer to www.greenginnovation.com.

OTHER COMPONENTS USED IN OUR WORKS AND THEIR TECHNICAL SPECIFICATIONS

OSB (Oriented Strand Boards)

The wood chips on the outer layers of the boards are laid in the direction of the long axis of the board, the chips on the middle layer are laid vertically on the chips on the outer layer. In order to obtain multi-layered board, the chips are pressed with the help of bonding glue and OSB boards are obtained. OSB particle boards have a certain production method and thickness. Wood chips, sawdust, etc. It is no longer manufactured from materials such as Its raw material is pine wood.

OSB Technical Specifications:

- Density: 620kg/m³
- Thermal conductivity coefficient (λ) is between 0.08 W/mK and 0.10 W/mK
- Bending resistance: 310 N/m²
- Tensile strength: 319 M/m²
- It is not affected by harmful insects. Likewise, it is not damaged by microorganisms such as mold and fungus.
- Although the sound insulation coefficient of OSB plates is not measured in the laboratory environment, it is known that the wood, which is the raw material, is a good sound insulation material.

RECYCLED POLYESTER FIBER AND FELT

Polyester fiber felt is a heat and sound insulation material in which the fibers obtained from the recycling of Polyethylene Terephthalate, which does not contain chemical additives, are blended and compressed with the non-woven needling method and brought to

an applicable thickness.

Physical Properties of Polyester Fiber

- Thermal conductivity coefficient (λ) is between 0.032 W/mK and 0.039 W/mK
- Sound absorption value is 35 decibels
- Tensile strength 4.5-5.5 g/denier Percentage of elongation at break 15-25% Specific gravity 1.38 g/cm³ Under normal conditions, humidity 0.4%
- Resistant to acids, resistant to bases. Resistant to oxidizing and reducing substances. -It is not affected by moths and harmful insects. Likewise, it is not damaged by microorganisms such as mold and fungus.

SAMPLE DIMENSIONS OF STRAW PANEL WITH R & D STUDIES (4 pcs)

1. SAMPLE:

Straw panel size: 32cm x 21cm = 672 cm²

Resulting size: 34.8 x 23.7

Sample weight: (22 kg/M²) 3100 g

Sample thickness: 60 mm

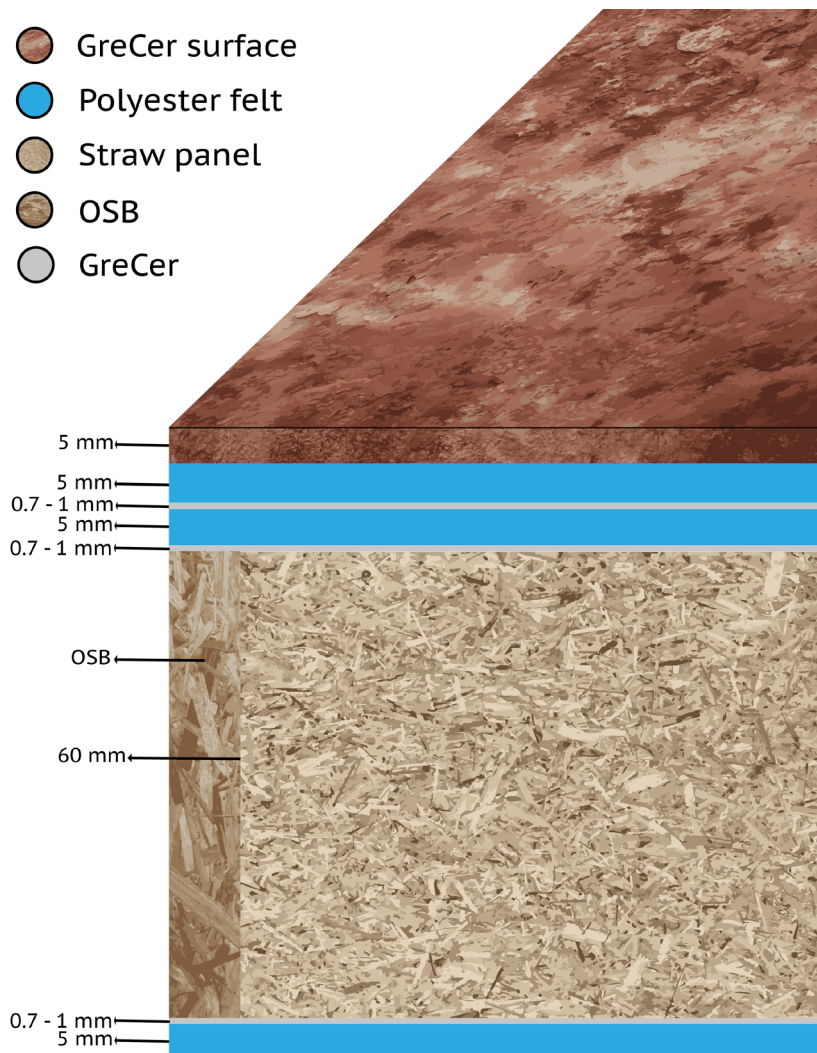
Obtained thickness: 80 mm

Materials Used:

Recycled polyester felt: 5 mm, 500 gr/M²

GreCer: As a binder between layers with a thickness of 0.7 - 1.0 mm

OSB: To increase strength in side walls, create structure and develop a very easy assembly technique



2. SAMPLE:

Straw panel size: 32cm x 21cm = 672 cm²

Resulting size: 34.8 x 23.7

Sample weight: (22 kg/M²) 3200 g

Sample thickness: 60 mm

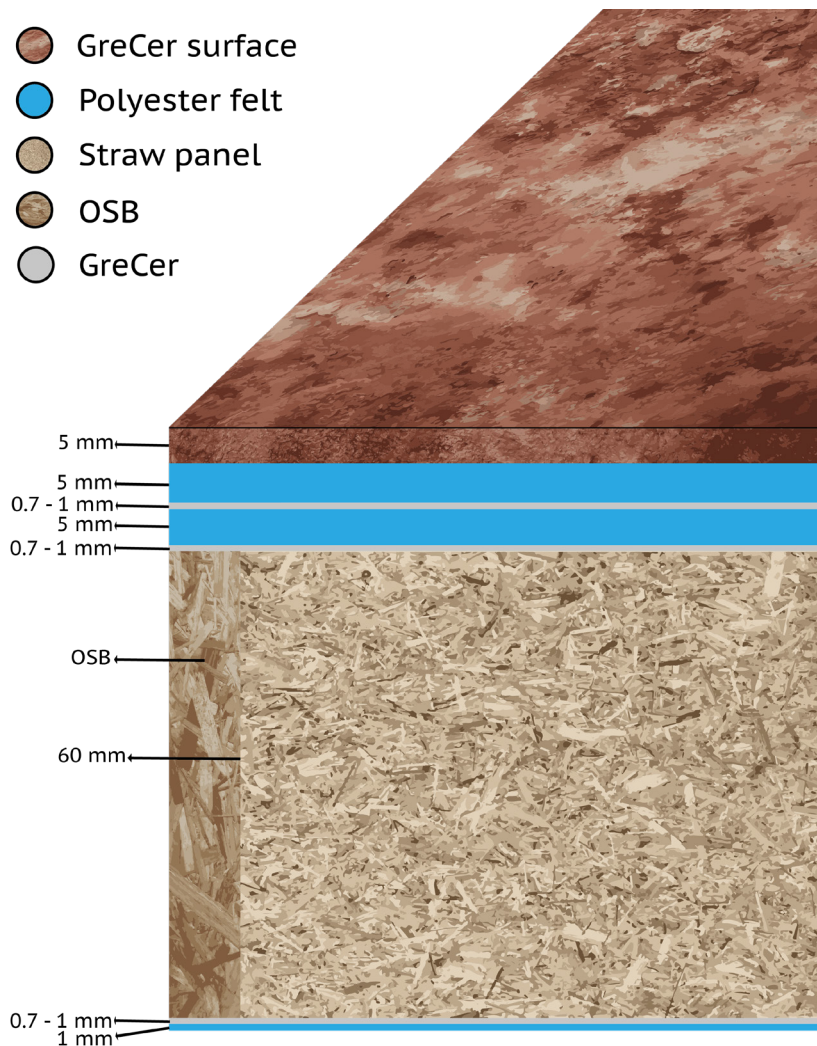
Obtained thickness: 80 mm

Materials Used:

Recycled polyester felt: 5 mm, 500 gr/M²

GreCer: As a binder between layers with a thickness of 0.7 - 1.0 mm

OSB: To increase strength in side walls, create structure and develop a very easy assembly technique



3. SAMPLE:

Straw panel size: 32 cm x 21 cm = 672 cm²

Resulting size: 34.8 x 23.7

Sample weight: (22 kg/M²) 3420 g

Sample thickness: 60 mm

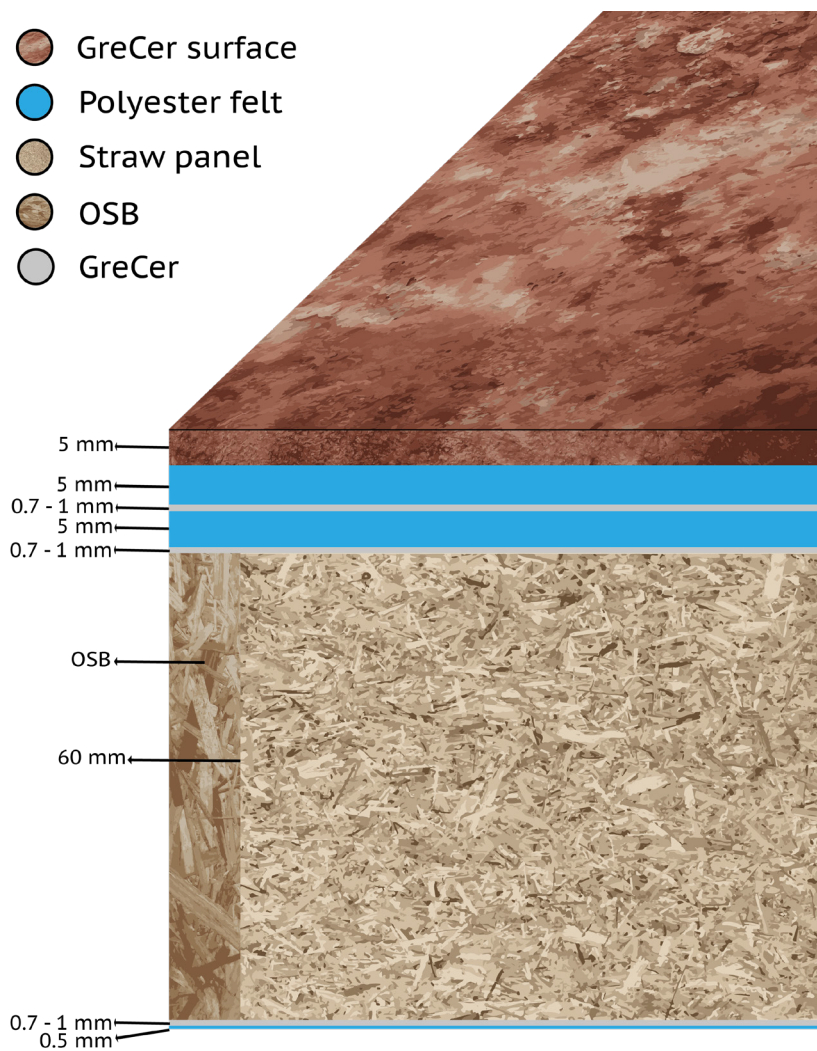
Obtained thickness: 75 mm

Materials Used:

Recycled polyester felt: 5 mm, 500 gr/M²

GreCer: As a binder between layers with a thickness of 0.7 - 1.0 mm

OSB: To increase strength in side walls, create structure and develop a very easy assembly technique



4. SAMPLE:

Straw panel size: 32 cm x 21 cm = 672 cm²

Resulting size: 34.8 x 23.7

Sample weight: (22 kg/M²) 3300 g

Sample thickness: 60 mm

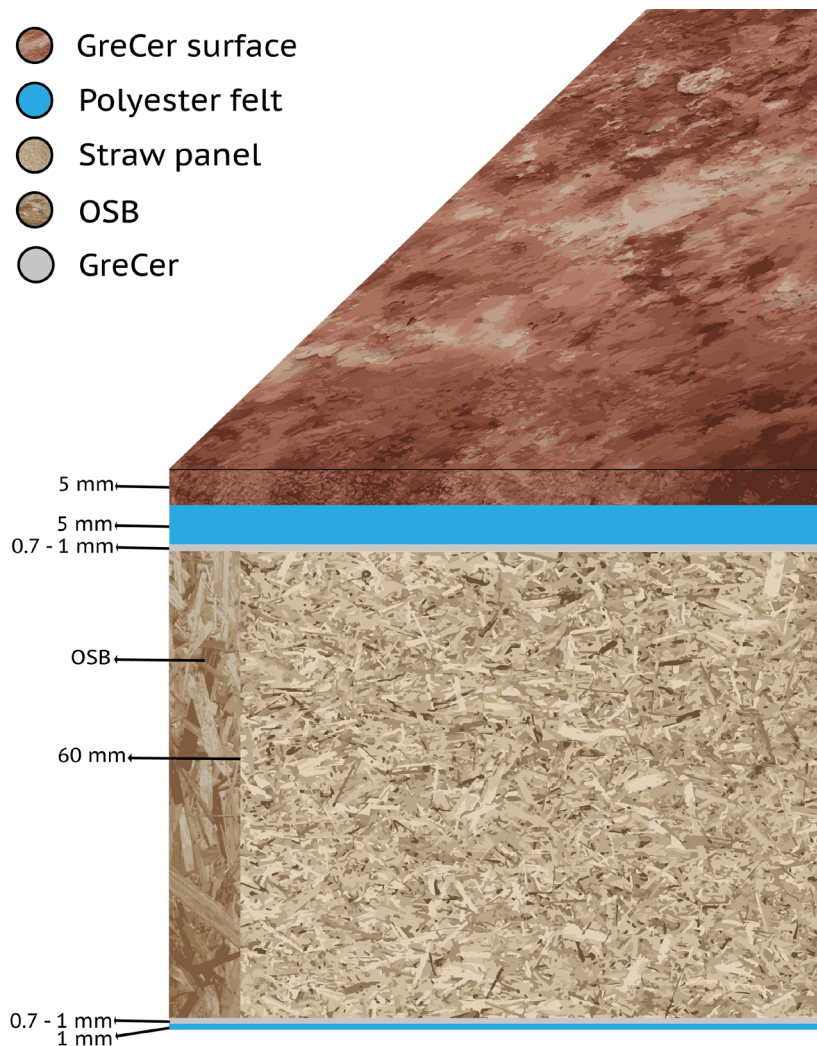
Obtained thickness: 70 mm

Materials Used:

Recycled polyester felt: 5 mm, 500 gr/M²

GreCer: As a binder between layers with a thickness of 0.7 - 1.0 mm

OSB: To increase strength in side walls, create structure and develop a very easy assembly technique



EVALUATION OF R & D STUDIES

Based on the results obtained as a result of the preliminary studies, 4 different models were made and product samples were made. In the light of the results, it was concluded that the most ideal combination is Example 1. After the unofficial physical and mechanical tests are carried out by us, the results of the product are evaluated as follows:

A - The straw panel is insulated against all atmospheric and mechanical effects until the end of its life, so that none of its surfaces are affected. The desired color and texture, pattern, designed figure etc. can be applied to the surface. visualizations are available. After the application, it does not require plaster, paint or coating throughout the life of the building.

B - The 5 mm GreCer layer on the surface is very hard, resistant to all kinds of atmospheric conditions, and has extraordinary flexible physical properties as it clings to the polyester felt underneath. When exposed to heavy mechanical effects, polyester felt does not disintegrate due to its extraordinary 25% stretching feature, and it stretches together with the felt and returns to its original state.

C - The new product includes three 5 mm thick heat and sound barriers. In this way, 42 decibel sound and 0.033W/mK heat conduction insulation properties are provided to the product, originating from three layers of 1.5 cm thick polyester felt.

According to our calculations, the general insulation values of the panel will be in the range of 55 - 60 decibel sound and 0.055 - 0.060 W/mK heat insulation values after this application. We think that with a good study, the heat transfer coefficient can be pulled to the range of 0.050 - 0.055 W/mK. In this case, for the first time in the world, a material that has the characteristics of an insulating material will have the function of forming a simple wall. Thanks to the technique we have developed, there is no thermal bridge in the prod-

uct I designed. In this way, heat & sound is kept inside & outside at maximum efficiency with a simple application technique.

D - With the OSB frame we have created around the panel, the assembly of the panels will be very simple and very fast. As a result of our designs, the panels will be physically connected to each other with their lego-like structures, and they will turn into a single structure with the sealing materials to be applied between the panels. Mounting to ceiling, floor and each other will be done simply by cross screwing OSB plates to each other.

E - Thanks to the OSB frame we have created around the panel, Straw panels can be simply combined side by side to form a wall without a wooden frame. Thanks to this feature, it will provide great time and material savings in building construction.

F - The resulting product is completely safe in terms of fire safety. GreCer on the surface and between the layers is non-combustible and resistant to flame for a very long time. Materials such as polyester felt, OSB, straw panel in the material composition are insulated against fire hazard with GreCer. Even if there is a fire in the environment, these materials will not come into contact with the flame. In the unofficial combustion tests we conducted, the panel samples were heavily exposed to the flame for a long time, and no risk was detected.

G - The added weight that our application brings to the Saman panel while creating a wall is extremely low compared to other alternatives. Standard 1 cm thick cement, lime-based traditional plaster and 1 cm thick gypsum plaster to be applied on the other side and a plate of straw panel will weigh 181 kg. However, the weight of the Straw panel on which our material and technique is applied will be around 130 kg.

H - Considering the advantage of very fast application, elimination of extra labor, very

fast assembly and construction features, and the heat & sound insulation it will provide, it is extremely economical in total.

I - It is possible to make very stylish, aesthetic and high added value products by adding the desired colors and patterns to the surface while the product is being produced. Since the product to be produced will be unrivaled in the market, it will easily find a place in the market with a high profit rate.

J - As a result of the process applied to the straw panel, it can now be cut vertically or horizontally, diagonally. The problem of scattering of the cut part of the panel is eliminated.

K - In addition to the natural and sustainable materials in its nature-friendly composition, the product CAN REVIEW SUPERIOR, ECOLOGICAL, REVIEW, REVIEW, A SYNTHETIC WASTE THAT CAN DAMAGE THE ECOLOGICAL SYSTEM FOR CENTURIES WHEN LEFT INTO NATURE, THAT IS SUPERIOR, ECOLOGICAL, IN LIFE AREAS. In addition, polyester waste, which can take hundreds of years to disappear in nature, is usefully hidden on the walls of the building throughout the life of the building. Plus, it will provide great energy savings by insulating heat and sound throughout the life of the building.

L - The cost of an application to be made using only clay plaster and jute with a thickness of 3 mm on the inner side and 5 mm on the outer side is approximately 10 Euros for a panel. The panel thickness to be obtained is 68 mm. The thermal conductivity coefficient of this panel will be 0.10 - 11 W/mK, and the sound insulation value will be around 32 - 35 decibels. The total weight of the panel after plastering will be around 128 Kg.

M - The material cost calculated for an improved panel, the details of which are explained in Example 1, and which, in our opin-

ion, is the most ideal wall-forming material and does not require heat & sound insulation, is around 28 Euros. The panel thickness to be obtained is 82 mm. The thermal conductivity coefficient of this panel will be 0.55 - 60 W/mK, and the sound insulation value will be around 45 - 55 decibels. The total weight of the panel to be obtained will be around 130 kg. This cost calculation has been calculated considering the bulk purchases of materials on an industrial basis.

N - If desired, wool felt can be used instead of polyester fiber felt. It does not change the results and the product becomes 100% natural. However, using polyester waste for the product is a huge plus for the environment. The use of wool will increase the cost somewhat.

O - Study results and derivatives are protected by patent number 2022/014365.

In our opinion, Saman panel has many problems with its standard features and it has not come to the place it deserves in the market because of these negative features. However, the product, which is obtained by using different materials, has become much more attractive and superior to all wall forming materials on the market with the superior features we have gained. In the world market, it currently has no competitors in this form. With the features we have brought, the product has a huge sales potential, especially in the US construction industry.

SAMPLE 1 STRAW PANEL CROSS SECTIONS



C10

R&D Studies We Carried Out And Turned Into Products



GreGRC



GreGRC

COMPARISON OF OUR NEW AND REVOLUTIONARY GREGRC SYSTEM WITH THE CLASSIC GRC SYSTEM

GRC (Glassfibre Reinforced Concrete), which is practical, quick, aesthetic, easy to use, and inexpensive when considering the whole cost, has gained popularity, especially in recent years, in the construction industry. This approach has several benefits for users, especially in situations when there are several similar-looking constructions, the aesthetics call for specialised design, or the technical constructions present challenges for on-site implementation. We are interested in all forms of construction technology, so when we looked at the GRC approach's specifics, we discovered that it has some insoluble issues and that these issues are present even when the technique is being applied. Because despite the benefits it provides, the challenges it entails are manageable.

The benefits of using GRC include:

High strength-to-weight ratio: GRC is much stronger than traditional concrete, yet it is also lighter in weight. This makes it ideal for use in construction projects where weight is a concern, such as high-rise buildings and bridge decks.

Durability: GRC is highly resistant to weathering and erosion, making it a great choice for outdoor structures and buildings in coastal or acidic environments.

Versatility: GRC can be formed into a wide range of shapes and sizes, making it suitable for many different types of construction projects. It can also be used to create lightweight architectural features such as cornices and balustrades.



Speed of construction: GRC can be cast and cured quickly, which allows for faster construction times and reduced labor costs.

Cost-effective: GRC is typically less expensive than other types of reinforced concrete and precast concrete, making it a cost-effective option for many construction projects.

Aesthetics: GRC can be pigmented, stained and textured to achieve a wide range of architectural finishes, making it a popular choice for decorative and architectural applications.

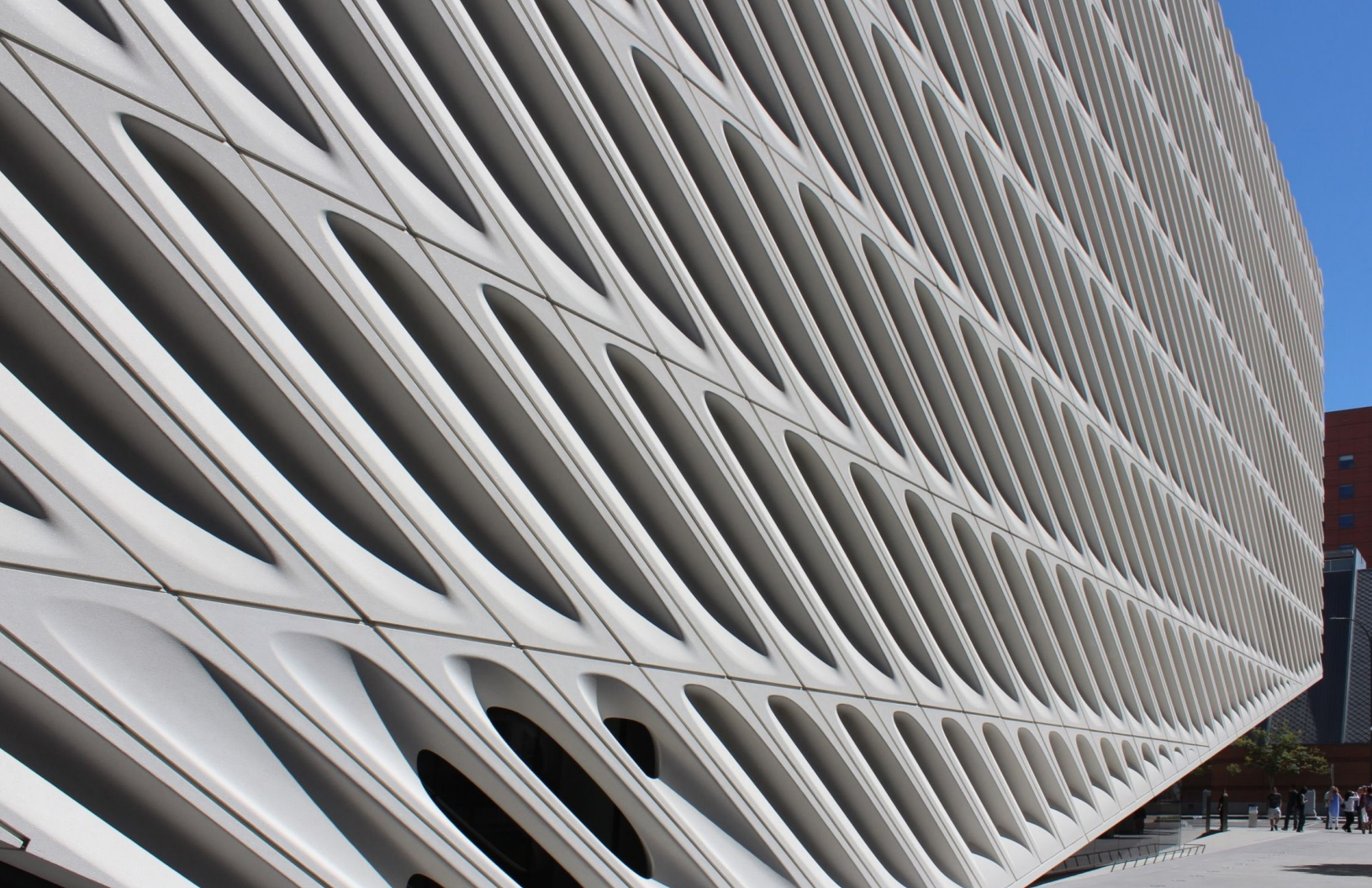
Lower labor costs: GRC can be cast in thin sections, reducing the amount of labor required to form and place it. This can result in lower labor costs.

Although the GRC technique has advantages, it also has disadvantages. For example;

- It is manufactured in the shape of a shell, and in order for the shell to carry itself and be fastened to the building, it needs a carrier steel construction. With another method, it cannot be installed to the building adequately.
- Despite being lighter than the conventional approach, a wall must be built from the shell's inside. The benefits of its lightweight are so diminished.
- Isolation is still a problem that hasn't been entirely addressed. The market's supply of insulating materials places restrictions on manufacturers. The best strategy they can use is to mount iron bars on the shell's back and secure a stone wool blanket to the bars. This approach does not offer a long-lasting solution to the isolation issue. Since they are put on the iron bars and are attached to stone wool mattresses, they are not connected to the shell. This application quickly ceases to function, and the stone wool loses its attach-

ment to the bars and piles up at the bottom, especially in areas with harsh winters and strong winds. Stone wool that has been applied more than once loses all of its insulating qualities if it picks up moisture via a crack or crevice. Stone wool finds it exceedingly challenging to return this water, and because to their heavy weight, they lose the iron rods to which they are fastened and run the risk of collapsing to the wall's base.

- A particular thickness must be maintained for the shell that forms the main image. Up until recently, the GRC precast building system's most effective shell thickness was somewhere around 2 cm. New processes, cement kinds, and additives have been used as a result of the industry's rapid development. The aforementioned advancements could enable a shell thickness reduction to 1.3 to 1.5 cm. Given that the glass fibre, cement, and sand mixture employed in this process weighs between 2200 and 2400 Kg per M3, it is clear that even this thickness will put a significant strain on the building. Because additional walls must be built for inner rooms behind the shell. The typical weight of a m2 plus the carrier construction, insulation, and inner wall that must be built weighs between 250 and 350 kg.
- It is normal to have some losses from the total construction area given that the outer shell and the inside walls must be built together. This is a major drawback, especially where land is expensive.
- The primary raw material used in the GRC construction method is cement. Concrete is a type of mixture that is used to create the primary structure that has a pH value of between 12 and 12.5. It is therefore quite alkaline. Furthermore, this figure is significantly higher than what is safe for human health.



The GRC system's benefits and drawbacks can change depending on the application kinds, application areas, and production circumstances. However, the above-mentioned general and fundamental benefits and drawbacks apply.

ADVANTAGES OF THE NEW GRC TECHNIQUE TO BE CREATED USING GreCER AND GrePOR:

Only the shell is not built using the GreGRC method, unlike the traditional GRC approach. A very thin insulation layer formed of porous clay that will act as an inner wall is also created at the same time as the shell. As a result, internal walls are not required in structures constructed using the GRC system. The wall is finished when the created panel or modular wall is installed in its location. Additionally,

interior walls and insulation are not required. It is now feasible to create architectural projects with highly complex shapes and very tall buildings that are extraordinarily light, fashionable, fully insulated, and considerably more resilient thanks to this ground-breaking invention of the GreGRC system. Our GreGRC system will be utilised securely in place of the conventional GRC system in the very near future, giving architects complete freedom.

The advantages of our GreCer material are as follows when we look more closely at the characteristics of GreCer and GrePor materials utilised in the GreGRC technique:

- It is made entirely of natural clay and is environmentally friendly. Moisture and water do not impact it,

- The GreCER shell thickness for GreGRC that we anticipate is around 5mm, therefore it is not essential to employ excessive thickness and surplus material to obtain physical strength.
- There are no problems with application and excessive volume constriction. After drying, there is an average 02% size change.
- It is extraordinarily adaptable. When subjected to weight and stress, 40cmx40cmx15mm GRC plates can stretch by 5mm, whereas 40cmx40cmx5mm GreGRC plates can stretch by 30mm.
- It is not always necessary to utilise synthetic polymers or additives to boost its endurance.
- Given its beneficial attributes, it is simple to conclude that its carbon impact is almost nil.
- Ph values between 7 and 7.5 are neutral and ideal for nature. If necessary, it can be set up to be acidic or basic.
- GreCer material does not require any special conversion procedures, efforts, or time constraints. As a result, our product does not qualify as recyclable. It automatically returns to nature when it decomposes because it has no synthetic, harmful, or unnatural materials.

Advantages of our GrePor material:

- It is entirely ecological and natural. Environmental damage is not caused during the stages of production and application. It doesn't pollute the environment.
- Despite other harmful and non-ecological treatments, it mixes with nature when it is turned into waste and quickly returns to being a part of nature.
- It can be utilised everywhere harmful in-

sulation with a synthetic foundation is used, which requires a lot of energy to produce and cannot be decomposed naturally.

- It can be utilised anywhere harmful synthetic insulation materials cannot be used because they have a very high carbon footprint and cannot be decomposed naturally because of their non-flammability (the areas of use of these materials are limited due to their low temperature resistance).
- Its raw material is readily accessible and affordable enough to compete with traditional raw resources.
- Nearly no carbon footprint is left. Its creation, and especially its use, consume extremely little energy.
- It can be produced without the use of an autoclave, oven, or other technological tools. Simply mix and apply. It naturally hardens under atmospheric conditions in 4 hours in hot weather and 12-14 hours in the coldest weather.
- On-site application is possible. It enables the material to be mixed right where it will be used, poured into moulds with the necessary qualities, spread out on the floor, sprayed, and applied with trowels, spatulas, and other equipment designed for the purpose.
- Physical resistance can be modified by the user from 60 kg per cubic metre to 600 kg per cubic metre on demand by adding additives to it.
- Regarding physical resistance, it is feasible to offer physical resistance ranging from 100 kPascals to 4.5 Mpascals, depending on the density of the material to be obtained.
- Insulation offers insulation qualities ranging

from 0.030 W/m K to 0.14 W/m K, depending on the desired material density.

- The user can easily arrange the pore size by mixing the additives into nano-small-medium-large-large-very-large.
- With the addition of certain additives, the user can modify the material's water resistance and air permeability as needed.
- It can carry all assigned agents in all of their contents without compromising the agent's qualities. It has highly unique usage areas as a result of this characteristic.
- Our material can be used in a variety of densities and shapes during the same production phases. In this way, creations with the desired stone, brick, specified pattern, resistance to all types of atmospheric conditions, incredibly light and porous inside, without any size limitations, and without the need for plaster, paint, or coating, can be created. This characteristic enables the production of extremely large panel walls and related items.
- Can be used in exceptional harmony with eco-friendly and low-carbon materials including straw, pike, marsh reed, and bamboo. This is an indication of the historically established higher insulating qualities of natural and sustainable materials used in its construction.
- With the new methods we have created, it is now possible to project the 350 kg/M3 density form of our material into the spaces between the floors of traditional reinforced concrete structures. This feature makes structures extraordinarily light and reduces the quantity of iron used in construction. This makes it possible to construct incredibly tall, light, and earthquake-resistant buildings.
- After a thorough scientific investigation

and procedure, it becomes likely that some unique forms of our material could be employed in beams, columns, and other carriers of buildings. These results indicate that our material will most likely alter traditional construction methods in the future.

With its aforementioned excellent features, GrePor has a lot of potential uses in the sector. It can potentially solve numerous problems that have remained unanswered up to this point with nearly no environmental impact thanks to its better features.

GREGRC (GLASSFIBRE REINFORCED CERAMIC) TECHNOLOGY ADVANTAGES OVER GRC SYSTEM

The "Gre" in the head part, when read as the term GreGRC, stands for Greeng Innovation. The "GRC" in the previous sentence refers to Glassfibre Reinforced Ceramic, which is a raw material that will usher in a new age in the construction industry. It is not the existing GRC (Glassfibre Reinforced Concrete) construction process.

Regarding the benefits of our novel technique; unavoidably, a new building method and material that outperforms the union of the two materials mentioned above will be developed.

Using the improved GreGRC materials and technology indicated above:

- It will enable the manufacturing of very large and intricately designed modular building panels and components (convex, concave, elliptical, geometric, formless). Additionally, there is no need to construct an internal wall because the panels or modular components serve as walls as well.
- The application in the GreGRC method is

not based on shell creation. Together, the ceramic foam layer and inner wall are applied to create the shell. As a result, GreCer and GrePor, which share a root with the substance, combine to create a single structure.

- Because of the feature mentioned above, the shell can support itself and be put on a building without a steel frame. A very strong, soundproof, and heat-proof construction is produced by the foam used inside the shell. Self-supporting, incredibly adaptable, and light, this structure. By directly nailing the column or table to the concrete, a manner that does not create a heat bridge, it is assembled to the building. This is a very straightforward process. Time and work are saved.

- GreGRC buildings will be so flexible that they can withstand even large-scale earthquakes without suffering any harm.

- Given GrePor's weight of 130-140kg/m³ and 30-50kg/M² (depending on thickness) and GreCer's exceptional lightness of 5mm, it is clear that static calculation techniques in construction technology will undergo a major transformation. Buildings that are extremely light and tall can be constructed in this method, significantly exceeding current restrictions.

- Cranes or other similar machines are not required in many applications because the panel or modular sections are so lightweight. A panel or modular portion can be moved and put together by hand with ease by a group of two or three individuals.

- Buildings constructed using the GreGRC system won't require any further insulation applications because of GrePor's great insulation feature. Since the system is perfectly isolated, the builders won't use isolation or applications that are insufficient or incomplete due to expensive costs and additional labour. Build-

ings
c o n -
s t r u c t -
e d u s i n g
t h e G r e G R C
m e t h o d c a n b e
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i n t h i s w a y . G i v e n t h e
w i d e s p r e a d a d o p t i o n o f
t h i s m e t h o d , i t i s a l r e a d y a n t i c i p a t e d
t h a t s i g n i f i c a n t w o r l d w i d e e n e r g y
s a v i n g s w o u l d b e a c h i e v e d . B e c a u s e
h e a t i n g a n d c o o l i n g b u i l d i n g s a c c o u n t s
f o r 1 / 3 o f a l l e n e r g y c o n s u m p t i o n g l o b a l l y .
A d d i t i o n a l l y , l e s s t h a n 9 0 % o f a l l s t r u c t u r e s
w o r l d w i d e h a v e i n s u l a t i o n .

Future building projects will be able to be built using the GreGRC material and technique we have created, which will result in structures that are considerably more durable, comfortable, and safe. By doing this, far bigger populations will be able to easily attain the standards that are currently thought of as luxurious and out of the grasp of the lower income group.

R&D Studies We Carried Out And Turned Into Products

GrePan



GrePan

CLAY WALL PANELS AND CLAY WALL CLADDING MATERIALS THAT DO NOT REQUIRE PLASTER, PAINT, COATING, AND ARE NOT AFFECTED BY WATER AND ALL NATURAL CONDITIONS

As explained in detail in the GreCer section, our material, which is produced by adding natural pozzolans to clay, can be used without firing like raw clay, but it has physically baked clay properties. Therefore, it has an extraordinary economy and energy saving in its structure. Clay wall panels and clay wall coverings produced with GreCer are eternally lasting against water, humidity and all natural conditions. Although they provide insulation against water, they have ideal breathing abilities and have the ability to completely balance the humidity in the environment. In this way, you can create environments with the ideal and healthiest moisture balance with our products. It is 100% Ecological. Its contents, depending on the type and characteristics of the product, consist of completely natural materials such as natural clay, ground brick and tile waste, pike, reed, straw, swamp sedge, sawdust, wood fibers and natural pozzolans. The dyes used are oxide dyes and are obtained from nature.

The surfaces of all the products we design are in the image of stone, marble, brick and designed artistic design. In addition, it does not require workmanship and applications such as plaster, paint, coating. Our rich, elegant, natural-looking product range, which does not lose its properties in all natural conditions, opens up new horizons for architects and housing designers.

Modular wall cladding materials, wall cladding bricks, wall cladding stones, mythological figured borders, natural stone - brick-like thin

decoration panels, architectural pieces produced with Gene GreCer offer extraordinary features to users. Extraordinary lightness (in special products) and incombustibility are at the forefront of these features. In this way, the unnecessary load on the buildings will be eliminated and fire safety will be ensured. With these features, the products produced from our material constitute a brand new alternative to the decoration products of polyurethane and polyester origin in a very short time.

Thanks to the superior features of our products, it has eliminated all the negative aspects of the standard clay panels available in the market so far and has proven that a system that offers sustainable and long-term healthy solutions in the construction materials market is possible.

The superior properties of our material prevent unnecessary use of natural resources, energy and human labor, and eliminate extra secondary and tertiary applications.

COMPARISON OF OUR CLAY PLATE, PANEL AND DECORATIVE WALL CLADDING MATERIALS WITH CLASSIC PRODUCTS

Standard clay slabs in the natural building materials market have many negative features as well as positive ones. Since there is no method or innovation to improve these negative features, these negative features have been ignored and the positive features they contain have come to the fore. If we list the mentioned negative features;

- 1 - Hypersensitivity to moisture and water,
- 2 - It also requires many troublesome and expensive applications to improve this feature,
- 3 - Inability to achieve the desired hardness,

4 - Using excessive thickness and excess material to obtain physical strength,

5 - Fragility and application difficulties,

6 - Mandatory use of synthetic polymers to increase durability,

7 - Labor is expensive and difficult.

Our clay slabs have all the positive features of the standard clay slabs in the natural building materials market, such as breathing, balancing the humidity in the environment, 100% natural material, not containing toxic substances, and 100% recycling.

Thanks to the careful R & D studies we have done, our clay slabs have been purified from all the negative features of standard clay slabs in the natural building materials market. During our R & D studies, standard clay has been modified without changing its nature in any way. Natural pozzolans have been added to its structure, which will change the molecular structure of the clay in small amounts. By providing appropriate proportions and conditions, the clay has been ensured to harden and set like fired ceramic, **WITHOUT THE REQUIREMENT OF COOKING**, just like cement. In this way, the following extraordinary properties have been obtained.

General features of our SUPER CERAMIC clay slabs:

- 1 - Absolutely not affected by humidity and water,
- 2 - Thanks to this feature, it does not require many troublesome and expensive post-application processes,
- 3 - It can be produced in the desired hardness,
- 4 - It is not necessary to use excessive thickness and excess material to obtain physical strength,
- 5 - No fragility and application difficulties,
- 6 - Synthetic polymers or additives are not necessarily used to increase its durability,
- 7 - Its labor is not expensive and difficult,
- 8 - Considering the positive features it contains, it can be easily said that the carbon footprint is almost zero.

In addition to all these general features:

- 1 - Surface appearance can be given in all kinds of colors and textures such as stone, marble, geometric patterns, designed surfaces.
- 2 - Does not require plaster, paint or coating. If desired, colors can be made much more vivid with a simple and natural application.
- 3 - The front surface can be produced as hard and non-porous, and the back surface can be produced as porous. The buildings where these plates are applied do not require heat, sound and moisture insulation.
- 4 - Ph 7 - 7.5 pH is neutral (can be made acid-

ic or basic if desired).

- 5 - It is not affected even by the worst weather conditions, it has an eternal life.
- 6 - All kinds of constructions, carriers, pipes etc. can be placed inside during production.
- 8 - Hardness, flexibility, moisture and vapor permeability can be adjusted as desired.
- 9 - It can be easily screwed to the wall, construction. screw holes can simply be fabric-fitted.
- 10 - Stone, marble or designed surfaces can be used as a much thinner (5-6 mm), hard and light wall covering in the form of large and modular panels.

SUPER CERAMIC DECORATIVE WALL COVERING MATERIALS

Our material, explained in detail above, has also produced very successful results in the production of wall covering materials used indoors and outdoors. The materials produced have ceramic properties. The fact that our material does not need to be cooked allows some extra features to be added to it during production. Features such as wide color options, simultaneous use of different materials, and production speed can be given as examples.

In summary:

By using it in almost every area where ceramic paste is used, it eliminates costly production steps (ceramics are re-fired at each production stage) such as firing, glazing, etc. Significant cost savings are achieved by using micronized quartz mine waste, which is called cyclone dust and has no economic value, as a filler in quartz processing plants.

Extremely resistant to water and climate conditions, self-hardening, no need to cook, can

be molded, can be produced from block material, can be shaped by pressing, can be shaped by hand, can be colored by adding paint to the dough, can be glazed with epoxy or water-based special varnishes as in ceramics, but does not need to be fired. A new production method has been created. In this respect, our invention creates a great advantage with the energy savings in the production technique and the minimum need for workmanship and machinery.

The biggest cost in ceramic production is the processes such as overhauling the product many times, waiting for a long time to dry, needing large spaces for this work, then letting the product dry again with workmanship during the firing, coloring and glazing stages, then arranging it in kilns and firing it etc. Considering that each baking period (only cooking time) is 1 day, it needs high amounts of heat energy, and other workmanship is considered, it is seen how important our invention is.

Another advantage of our invention is that it eliminates the furnace system, which is one of the biggest costs. Ceramic kilns are extremely complex and expensive equipment to operate and maintain.

In all production methods mentioned and to be mentioned, no cooking process is required, hardening takes place in an atmospheric environment and takes place between 2 hours and 1 day depending on the season and temperature. In the winter months when the temperature is low, a firing of 30-40C can be optionally recommended to shorten the hardening time.

With minor changes in the formulation, the material can be used as casting clay, pressing clay, potter's wheel paste for hand shaping, etc., just like in ceramics. can be converted into such forms.



SAMPLES FROM OUR MODULAR WALL COVERS



R&D Studies We Carried Out And Turned Into Products



GreNatur



GreNatur

100% ECOLOGICAL CONSTRUCTION MATERIALS PRODUCED USING ONLY GRE CER AND PIKE, REED, STRAW, BOW REED, WOOD FIBERS AND NATURAL PUZOLANS

As explained in detail in the GreCer section, our material, which is produced by adding natural pozzolans to clay, can be used without firing like raw clay, but it has physically baked clay properties. Therefore, it has an extraordinary economy and energy saving in its structure. Clay wall panels and clay wall coverings produced with GreCer are eternally lasting against water, humidity and all natural conditions. Although they provide insulation against water, they have ideal breathing abilities and have the ability to completely balance the humidity in the environment. In this way, you can create environments with the ideal and healthiest moisture balance with our products. It is 100% Ecological. Its contents consist of completely natural sustainable materials such as natural clay, pike, reed, straw, swamp reed, sawdust, wood fibers and natural pozzolans, depending on the type and characteristics of the product. The dyes used are oxide dyes and are obtained from nature.

The surfaces of all the products we design are in the image of stone, marble, brick and designed artistic design. In addition, it does not require workmanship and applications such as plaster, paint, coating. Our rich, elegant, natural-looking product range, which does not lose its properties in all natural conditions, opens new horizons for architects and housing designers and offers extraordinary features to users. At the beginning of these features are extraordinary easy application, very high sound, heat insulation values and non-flammability. Thanks to these features, all the negative features of natural and sustainable construction materials have been eliminated and abandoned natural resources have been brought back into the economy. With these features, the products produced from our material will create a brand new alternative in the ecological construction materials and classical construction materials market in a very short time.

Our products have proven that a system that offers sustainable and long-term healthy solutions is possible in the construction materials market, thanks to their superior properties.

The superior properties of our material prevent unnecessary use of natural resources, energy and human labor, and eliminate extra secondary and tertiary applications.

SAMPLES FROM OUR WORK



R&D Studies We Carried Out And Turned Into Products



GrePlast



GrePlast

CLAY PLASTER UNAFFECTED BY WATER, HUMIDITY AND OTHER NATURAL CONDITIONS

As explained in detail in the GreCer section, our material, which is produced by adding natural pozzolans to clay, can be used without firing like raw clay, but it has physically baked clay properties. Therefore, it has an extraordinary economy and energy saving in its structure. Clay plaster produced with GreCer has an eternal life against water, humidity and all natural conditions. Although they provide insulation against water, they have ideal breathing abilities and have the ability to completely balance the humidity in the environment. In this way, you can create environments with the ideal and healthiest moisture balance with our products. It is 100% Ecological. Its contents, depending on the type and characteristics of the product, consist of completely natural materials such as natural clay, ground brick and tile waste, straw, glass fiber in some special products and natural pozzolans. The dyes used are oxide dyes and are obtained from nature.

By applying our product in 3 mm thickness to standard clay panels or walls that are not resistant to water and humidity, it is possible to obtain a structure that is resistant to all natural conditions and is not affected by water and moisture.

Some of our clay plaster types can also be used as masonry mortar or repair mortar. Our material is such a strong binder that, unfortunately, the walls built with our material cannot be dismantled after the hardening period.

Thanks to the superior features of our products, it has eliminated all the negative aspects of the standard clay plasters available in the market so

far and has proven that a system that offers sustainable and long-term healthy solutions in the construction materials market is possible.

The superior properties of our material prevent unnecessary use of natural resources, energy and human labor, and eliminate extra secondary and tertiary applications.

COMPARISON OF SUPER CERAMIC CLAY PLASTER WITH STANDARD CLAY PLASTERS ON THE MARKET

Another modified type of clay material that we developed as Greeng Innovation has been developed as natural clay plaster. Standard clay plasters in the natural building materials market have many negative features as well as positive ones. The absence of any method or innovation to improve these negative features has allowed these negative features to be ignored and the positive features included to come to the fore.

If we list these negative features;

- 1 - Hypersensitivity to moisture and water,
- 2 - It also requires many troublesome and expensive applications to improve this feature,
- 3 - Inability to achieve the desired hardness,
- 4 - Using excessive thickness and excess material to obtain physical strength,
- 5 - Mandatory use of mesh, structural reinforcements, synthetic polymers or lime to increase durability,

The clay plaster we have developed, on the other hand, has all the positive features of the standard clay plasters in the natural building materials market, such as breathing, balancing the humidity in the environment, 100%

natural material, not containing toxic substances, and 100% recycling.

Thanks to the careful R & D studies we have done, our clay plasters have been purified from all the negative features of the standard clay plasters in the natural building materials market. During our R & D studies, standard clay has been modified without changing its nature in any way. Natural pozzolans that will change the molecular structure of the clay in small proportions and the properties required by the plaster technique have been added to its structure. By providing appropriate proportions and conditions, the clay has been ensured to harden and set like fired ceramic, **WITHOUT THE REQUIREMENT OF COOKING**, just like cement. In this way, the following extraordinary properties have been obtained.

General features of SUPER CERAMIC clay plaster:

- 1 - Absolutely not affected by humidity and water,
- 2 - Thanks to this feature, it does not require many troublesome and expensive extra applications,
- 3 - It can be prepared and applied in the desired hardness,
- 4 - It is not necessary to use excessive thickness and excess material to obtain physical strength
- 5 - There is no excessive volume contraction and application difficulties. The average size change after drying is 2%
- 6 - Synthetic polymers or additives are not necessarily used to increase its durability,
- 7 - Its workmanship is the same as standard

plaster applications,

8 - Considering the positive features it contains, it can be easily said that the carbon footprint is almost zero.

9 - It can be used easily by adjusting its consistency with water.

10 - The application with an average thickness of 3 mm protects the standard clay plates, which are easily affected by atmospheric conditions in the market, from all kinds of atmospheric conditions.

11 - The unstable tissue underneath is protected from water and moisture forever, without losing its properties, thanks to this plaster.

12 - With its natural structure consisting of clay, it creates a molecular bond with the underlying raw clay tissue.

13 - Plaster can be used in color, with other granulated natural materials (quartz-marble-basalt-granite-ground baked ceramics-washed sand etc.) by giving a surface texture.

14 - The desired shape and texture can be given to the surface with the textured roller.

15 - It does not require any special skills or training for the application. It has the same features as classical plaster applications.

16 - In large-scale applications, it can be applied industrially by spraying with a very simple method.

17 - When walls made of bale straw, walls made of swamp reeds, walls made of raw adobe and walls made of similar natural materials are plastered with our material, all kinds of negative features they have disappear forever. These walls are forever protect-

ed from insect damage and nests, deterioration caused by moisture such as mold and fungus, decay, oxidation caused by oxygen in the air, and molecular degradation. Since they are insulated from external influences thanks to our material, only the positive features in their structures come to the fore.

18 - With a technique that can be applied with a very simple technique, screwing and doweling operations that can carry heavy materials on walls made of this type of natural material become possible.

19 - Ph value is in the range of 7 - 7.5, it is neutral and most suitable for nature. It can be adjusted as acidic or basic if necessary.

20 - There is no need for any process, effort or time frame to transform our material. Therefore, the concept of recycling does not apply to our product. Since there is no synthetic, toxic or unnatural substance in its structure, it becomes a part of nature when it turns into waste.

SOME APPLICATION SAMPLES OF OUR MATERIAL



R&D Studies We Carried Out And Turned Into Products



GreFoam

GreFoam

ZERO HEAT BRIDGE, STABLE AND HIGH ADDITIONAL CLAY BASED, 100% ECOLOGICAL WALL KNITTING, INSULATION FILLER - REPAIR FOAM

GreFoam is an enhanced variant of our GrePor product. It is a product specially developed for building insulated wall blocks that do not lose their volume with mechanical effect, mounting insulated wall panels, repairing insulation layers and filling in between insulation layers. Our product, which is a first in its category, has permanently solved an important problem that cannot be solved in insulation applications with its unique features.

Disadvantages of masonry and repair mortars available in the market:

1 - There is no product with natural ingredients in the form of foam that does not create a thermal bridge in this area. Therefore, all of the existing products transfer the heat from the outside to the interior by creating a thermal bridge. This transfer increases proportionally as the thickness of the jointing mortar used between two insulation blocks or layers increases.

2 - Due to this negative effect, significant losses occur in the thermal insulation values of the

thermal insulation materials used.

3 - Thermal insulation blocks or panels generally have porous surfaces and a special texture. Therefore, manufacturers add various chemical binders of synthetic origin to the bonding products used for these materials to increase adherence and add flexibility.

4 - Densities of standard products in the market generally vary between 1400kg/M3 and 1900kg/M3. Therefore, they are heavy and create an extra static load on the building.

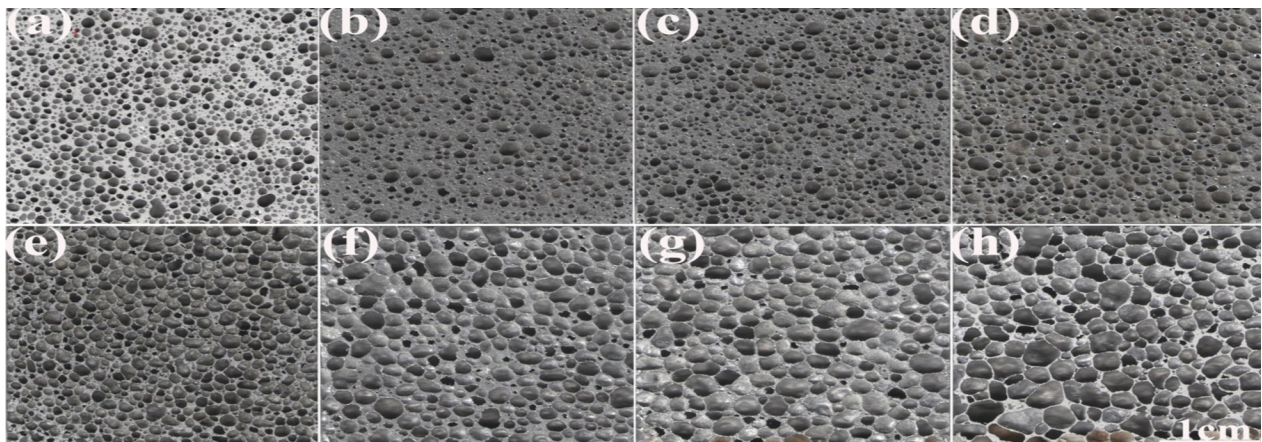
Outstanding features and advantages of our product:

1 - It is in the insulation material class with a weight of around 1 - 250kg/M3 and a thermal insulation coefficient of 0.055 - 0.060Wm/K. Therefore, it does not create a significant thermal bridge.

2 - In this way, it allows you to get full efficiency from thermal insulation materials, which are very costly.

3 - Its content is 100% ecological and clay-based, as in our other products. It does not contain any synthetic or harmful content.

4 - In addition to being very light, it does not create an extra static load on the building due to its application as a thin layer and significantly lightens the building.





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