

Graphenano

SMART MATERIALS



graphenanosmartmaterials.com

Build different.





Build different.

Graphenano Smart Materials is the world's first manufacturer of **additives with graphene technology for concrete**. In Graphenano we create state-of-the-art solutions with the aim of significantly improving the mechanical performance, quality and efficiency of raw materials for the construction sector.





GRAPHENANO GROUP



Graphenano is the leading group in the production of graphene on an industrial scale. Its manufacturing system allows it to be supplied in different forms such as nanofibers, nanospheres and graphene oxide.

The Graphenano group was born in 2012 after years of research and in close collaboration with different Spanish universities. Since its creation, it has explored the possibilities and applications of graphene (I + A) with the aim of responding to all the business opportunities that arise based on the revolutionary properties of this new material.

Graphenano Smart Materials is dedicated to the development and application of graphene additives for advanced building materials that greatly improve mechanical performance, durability and resistance against external attacks, as well as the performance of the necessary raw materials.



Higher resistance



Lightweight



Higher strength



Higher conductivity



Higher elasticity



Longer durability

Graphenano Smart Materials products, graphene it acts as a molecular mesh that gives structural support to buildings.

GRAPHENANO SMART MATERIALS

WHAT IS THE GRAPHENE?

It's nanomaterial

Smaller size than or equal to one millionth of a millimeter.

It's bidimensional

It only presents two dimensions because it is only one- atom-wide (10^{-9} mm).

It's pure carbon

As *graphite** and diamonds. Carbon atoms are tightly hold together on an even surface, as it were a honeycomb.

* *Graphite* is composed of many graphene sheets, stacked up one over the other.

Principal graphene properties



Resistant

200 times stronger than steel



Flexible

Up to 20% without damage



Biocompatible

Medical field applied



Conductive

Electrical & thermal conductivity



Bidimensional

100.000 times thinner than human hair



Environmentally friendly

Sustainable & biodegradable




Transparent

98% transparency similar to glass




Lightweight

1 m² weight less than 1g



Graphene is a next-generation carbon nanomaterial that combines a large number of properties that cannot be found together in any other compound. Its incorporation to Graphenano Smart Materials additives allows to improve exponentially the technical characteristics and the performance of the concretes, in comparison with the rest of existing products in the market.



Strenght & Resistance

Its high resistance to traction and wear make graphene the perfect aggregate for concrete.

Bacteriostaic effect

Graphene prevents the growth of bacteria on its surface, making it ideal for the manufacture of sanitary ware or any other application exposed to moisture.

Increase in the useful life of concretes

Graphenano Smart Materials products improve all the characteristics that affect the durability of concretes and ensure their good behavior over time, making them practically invulnerable against possible attacks from agents.



Ecological and VOC-free

Graphene additives reduce the cement demand necessary for the same use and characteristic resistance by up to 30%. This translates into an optimization of natural resources and a reduction of CO2 emissions into the atmosphere from the extraction, handling, production and transport of raw materials.

Elasticity & flexibility

The presence of cracks and fissures during the useful life of concrete reduces the mechanical capacities of the structures. The great flexibility of graphene makes Graphenano Smart Materials additives a structural reinforcing element.

Lower maintenance for infrastructure

With graphene additives, conventional concrete becomes a high-performance and quality concrete. Increasing its useful life and improving its resistance to external aggressions means a drastic reduction in maintenance costs and repairs for pathologies.

Increased thermal conductivity

Increases the conductive property of concrete and mortar.

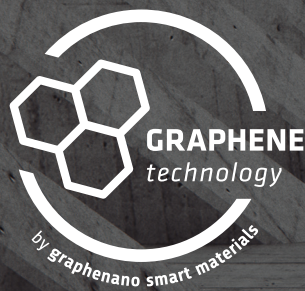
Graphene improves concrete properties



**NANOTECHNOLOGY
GRAPHENE**

Smart**ADDITIVES**

GRAPHENE CONCRETE





+ Ecological and efficient: reduction of CO₂ emissions

+ 50% more protection against chlorides and sulfates

+ 60% improvement against carbonation

+ Up to 60% improvement in protection of submerged hydraulic concretes



Solid
MECHANIC



The image shown does not belong to the final package.

HIGH MECHANICAL PERFORMANCE

Product Description:

Solid MECHANIC is a range of additives designed with breakthrough graphene technology for use in concretes in plants or ready-mixed concrete. It is indicated for high performance concretes improving quality, strength and surface finish.

Presentation:

Mechanic Graphene PLASTICIZER y **FLUID** sold in bulk, in 1050 kg containers and 210 kg drums.

¿How does graphene additives improve concrete??

- + **Increased resistance**
- + **Great water-reducer power**
- + **Decreased porosity**
- + **Optimization of raw materials**

Mechanic Graphene
FLUID ULTRA

Mechanic Graphene
FLUID BASIC

Mechanic Graphene
FLUID PREMIUM

Mechanic Graphene
SUPERPLASTICIZER

Mechanic Graphene
FLUID PLUS

Mechanic Graphene
PLASTICIZER

CONDUCTIVITY POWER



Solid CONDUCTIVITY

Product Description:

New superplasticizer additive family generation based on graphene and PCE nanoparticles combination chain, for self-leveling mortars with better conductive properties and high durability performance.

Presentation:

The Solid CONDUCTIVITY family sold in bulk, 1000 kg containers and 200 kg drums.

¿How does graphene additives improve concrete?

- + **Increased thermal conductivity**
- + **Increased resistance**
- + **Great water reducing power**
- + **Improved durability**
- + **Optimization of raw materials**



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Graphene Fluid
CONDUCTIVITY G500

Graphene Fluid
CONDUCTIVITY G400

Graphene Fluid
CONDUCTIVITY G200

Graphene Plasticizer
CONDUCTIVITY G20

Graphene Plasticizer
CONDUCTIVITY G10

Graphene Plasticizer
CONDUCTIVITY G5



Solid
PRECAST



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Precast Graphene *FLUID*

Hyperplasticising/water-reducing additive.

Precast Graphene *FINISH*

Demoulding agent.

HIGH STRENGTH & WORKABILITY

Product Description:

Solid PRECAST is a line of additives designed with the innovative graphene technology for the prefabricated world. These additives improve the quality and the productive process, reducing the costs and increasing to the maximum the efficiency of the concretes..

Presentation:

Precast Graphene *FLUID* is sold in bulk, in 1050 kg containers and 210 kg drums..

Precast Graphene *FINISH* is sold in bulk, 1000 kg containers and 200 kg drums.

¿How does graphene additives improve concrete?

- + **Increases initial and final resistances**
- + **Great hyperplastic water-reducing power**
- + **Reduced porosity**
- + **Increased impermeability**
- + **High workability**

EXTREME SHIELD

Product Description:

Solid HARD is a line of additives designed with the innovative graphene technology for concretes exposed to extreme aggressions. Indicated for highly durable concretes with reduced permeability..

Presentation:

Hard Graphene DURABILITY & RETRACTION sold in bulk, 1000 kg containers and 200 kg drums.

Hard Graphene INHIBITOR is sold in bulk, in 1100 kg containers and in 220 kg drums.

¿How does graphene additives improve concrete?

- + **Enhanced waterproofing**
- + **Increased protection against chlorides**
- + **Improved protection against carbonation**
- + **Reduced porosity**



Solid
HARD



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Hard Graphene DURABILITY
High activity multifunctional additive.

Hard Graphene RETRACTION
Drying shrink reducing additive.

Hard Graphene INHIBITOR
Corrosion Inhibitor Additive.



Solid
SUPPORT



The image shown does not belong to the final package.

Support Graphene AIR IN
Air Inclusion Agent.

Support Graphene SET
Chloride-free antifreeze agent.

Support Graphene SET-R
Retardant agent that regulates the setting of the concrete..

Support Graphene COMPACT
Viscosity modulating agent for self-compacting concrete.

ADVANCED COMPLEMENTARY AGENTS

Product Description:

Solid SUPPORT is a range of complementary products for the adjustment and modification of the lines of **Smart Additives**.

Presentation:

Support Graphene AIR IN & COMPACT are presented in bulk, in 1000 kg containers and in 200 kg drums.

Support Graphene SET are presented in bulk, in 1000 kg containers and in 200 kg drums..

Support Graphene SET-R are presented in bulk, in 1100 kg containers and in 220 kg drums.

¿How does graphene additives improve concrete?

- + **Improvement of the matrix**
- + **Consistency maintenance**
- + **Increased curing**
- + **Improved workability**

SEMI-DRY CONCRETE

Product Description:

Solid DRY is a line of additives designed with the innovative graphene technology for the manufacture of semi-dry concrete..

Presentation:

Dry Graphene WATER-REPELLENT are presented in bulk, in 1000 kg containers and in 1 and 25 kg bottles..

Dry Graphene PLASTICIZER are presented in bulk, in 1000 kg containers and in 25 kg bottles

¿How does graphene additives improve concrete?

- + **Improved parts durability**
- + **Increased impermeability**
- + **Reduction of absorption**
- + **Improves resistance to freeze-thaw cycles**
- + **Water-repellent properties**



Solid
DRY



The image shown does not belong to the final package.

Dry Graphene WATER-REPELLENT

Liquid water-repellent for dry consistency prefabrication.

Dry Graphene PLASTICIZER

Plasticising additive for dry-consistency prefabricated products.



Solid
GUNITE



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Gunite Graphene *EU*

Non alkaline and alkali free liquid accelerant.

Gunite Graphene *FLUID*

Superplasticising/water-reducing additive.

GUNITE CONCRETE

Product Description:

Solid GUNITE is a line of additives designed with the innovative technology of graphene for the manufacture of sprayed concrete.

Presentation:

Gunite Graphene *EU* is presented in bulk, in 1363 kg containers and 250 kg drums

Gunite Graphene *FLUID* is presented in bulk, in 1050 kg containers and 210 kg drums

¿How does graphene additives improve concrete?

- + Increased work rates
- + Improvement of the initial and final resistances
- + Improved durability
- + Increased thickness per layer

HIGH STRUCTURAL REINFORCEMENT



Solid
FIBER

Product Description:

Solid FIBER is a line of fibers for replacement or reduction of reinforcement in fresh concrete. Compatible with the whole range of **Smart Additives**.

Presentation:

Fiber Graphene PVA is presented in boxes of 15 kg.

Fiber Graphene MACRO is presented in bags of 4 and 6 kg, and in bags of 150 kg..

Fiber Graphene MICRO is presented in 600 g and 1 kg bags, and in 250 kg bags.



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Fiber Graphene PVA

Structural synthetic fibre for the reinforcement of very high resistance concretes.

Fiber Graphene MACRO

Alkali-resistant monofilament polypropylene fibre for structural reinforcement.

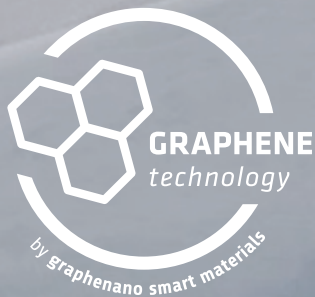
Fiber Graphene MICRO

Monofilament polypropylene fibre for cracking and fire resistance.

SmartCOVER μ

GRAPHENE FINISHING

Micro mortar coating with graphene technology





CLASSIC System

Graphene micromorter ideal for innovative and sustainable floors, walls and other surfaces. It guarantees maximum resistance and toughness without neglecting the design.



ECO System

Efficient graphene micromorter for long transports, ready and ready to use. Same characteristics and application as the Classic system but with greater ease of installation.



AQUA System

Graphene micromorter perfect for walls and floors in bathrooms, kitchens and outdoors. Specially prepared to withstand loads of chlorine and salt.



AQUA PLUS System

Graphene micromorter with high hydrophobic protection, perfect in humid areas and environments in direct contact with water such as bathtubs, showers, swimming pools, saunas, etc. Specially prepared to withstand abundant loads of chlorine and salt maintained in direct and prolonged contact.



HARD System

Graphene micromorter for high pedestrian traffic, ideal for floors, walls and other surfaces of shopping centers, bars, restaurants, party venues, cinemas, etc. It guarantees great resistance to wear, abrasion and protection from stains without neglecting the design.



INDUSTRIAL System

Graphene micromorter for industrial floors with high traffic, ideal for floors in warehouses, warehouses, factories, etc. It guarantees great resistance to wear and abrasion, eliminates dust, facilitates cleaning and removes stains without neglecting the design.

Colours

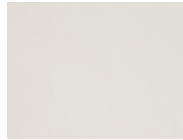
The SmartCOVER pigmentation system allows it to be purchased in a wide variety of solid and homogeneous colors, as well as matte, gloss



White



Pale white 1



Pale white 2



Ivory



Grey pearl



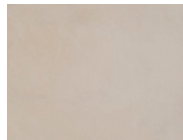
Tin grey



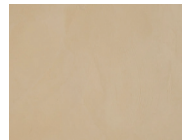
Slate



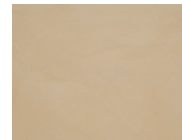
Anthracite



Stone



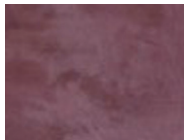
Sand



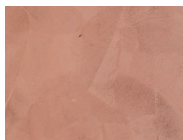
Grey pearl



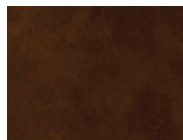
Silver



Wine



Clay



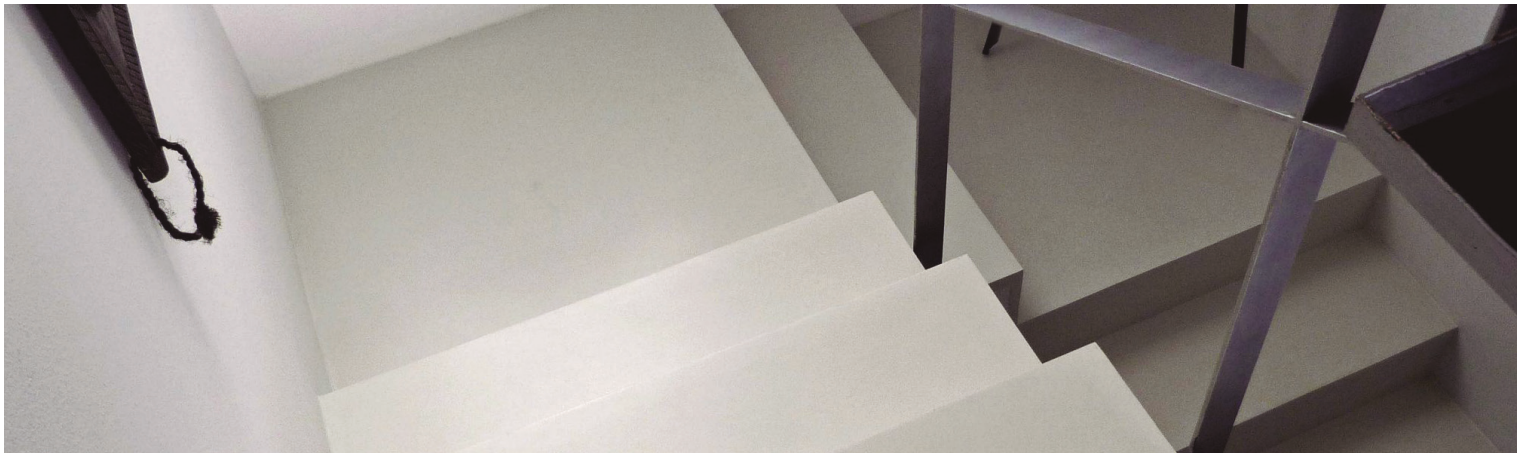
Argila



Chocolate

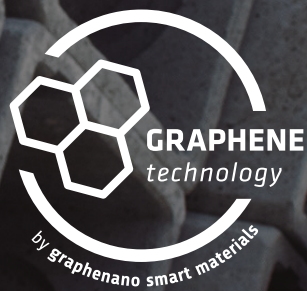
Textures

SmartCOVER can present textures that mimic natural stone, space stone, slate, etc., that are waterproof and that are applied to facades and exterior walls with the intention of giving them a rustic appearance. Likewise, it can present smooth and uniform textures, equally waterproof and hygienic, ideal for interiors in which it is intended to achieve a clean and elegant style.



Smart**CONCRETE**

GRAPHENE ADDITIVE





Lightened concretes with structural resistance

Lightweight standard concrete.

Only with water, cement, graphene additives and light aggregates, eg. perlite, pumis, etc. Fine aggregates such as sand and gravel are not required.

Density

1400-1600 kg / m³

Relation a / c

0,46

K Value

> 0,33 W / mK

Resistance to compression

25 a 45 N / mm²

Consistency

> 93 cm

Noise Protection

> 53 dB



Concrete with high performance desert sand

Designed concrete with dessert sand.

Only with water, cement, additives with graphene and desert sand. Fine aggregates such as sand and gravel are not required

Standard Concrete

Density

2400 - 2500 kg / m³

Strength compression

35 a 40 N / mm²

Cement %

270 - 280 kg / m³

High Performance Concrete

Density

2400 - 2500 kg / m³

Strength compression

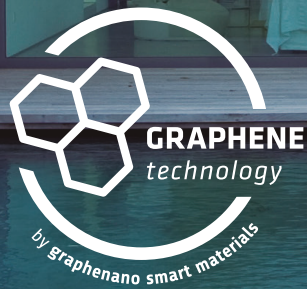
+ 90 N / mm²

Cement %

360 - 380 kg / m³

Smart **MASTER BASE**

GRAPHENE ADDITIVE





Graphene additives for solutions in construction products

Water-based graphene nanodispersions for integration in manufacturing processes of additives for concrete and construction products.

These solutions are specially designed for manufacturers of products in the construction sector, and can in any case be configured and adapted to the manufacturing processes and requirements of each manufacturer.

This technology provides improvements in mechanical performance, durable performance and maximum efficiency.

- + **Improvement in mechanical performance.**
- + **Durable performance improvement.**
- + **Maximum efficiency of polymers and technologies in which it is used.**

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 **Made in
Spain**

