



Build different.

www.graphenanosmartmaterials.com

Graphenano
SMART MATERIALS





Build different.

Graphenano Group is a world leader in the production of graphene on an industrial scale. Its exclusive manufacturing system allows us to supply graphene in different formats such as nanofibers, nanospheres, and graphene oxide. The only company in the world with medical-grade graphene.


Unique dispersion and functionalization system.

The Graphenano group is the result of years of research and close collaboration with various Spanish universities. Since its inception in 2012, Graphenano has explored the opportunities and applications of graphene (R&D) with one goal: to provide solutions for every business opportunity that arises from the revolutionary properties offered by this new material.


Graphenano Smart Materials is a global pioneer in the manufacture of products with graphene technology for advanced construction materials such as additives for concrete, ultra-light structural concrete, conductive improvement additives for concrete and mortars, micro-mortars with high technical performance, high decorative power and low thickness, and corrugated composite bars with graphene.

It was founded in 2015 as a subsidiary of the Graphenano group, the only company that produces graphene adapted to an industrial scale.





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 into Graphenano Smart Materials additives allows for exponential improvement of the technical characteristics and performance of concrete, compared to other products on the market.



Hardness and strength

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

Bacteriostatic effect

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

Increased service life of concrete

Graphenano Smart Materials products improve all the characteristics that affect the durability of concrete and ensure its good performance over time, making it practically invulnerable to possible attacks from external agents.



Eco-friendly and VOC-free

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

Elasticity and flexibility

The presence of cracks and fissures during the service life of concrete diminishes the mechanical capabilities of structures. The great flexibility of graphene makes Graphenano Smart Materials additives a structural reinforcement element.

Lower maintenance of infrastructures

With graphene additives, conventional concrete becomes high-performance, high-quality concrete. The increase in its service life and the improvement in its resistance to external attacks results in a drastic reduction in maintenance costs and repairs of pathologies.

Graphene improves the properties of concrete



**GRAPHENE
NANOTECHNOLOGY**



INDEX



**We want to be YOUR
PREFERRED PARTNER**

**+ Concrete additives line.
for plants and precast.**

Pages 12 to 21

+ Additive for radiant floors

Pages 22 to 25

+ Decorative micro-mortar line

Pages 26 to 41

**+ Corrugated rebar line of
graphene composite.**

Pages 42 to 61

A photograph of a construction site showing workers in blue and yellow clothing pouring concrete. Several vertical rebar rods are visible, and a grid of rebar is laid out on the ground. The scene is overlaid with a semi-transparent blue filter.

**OUR
TECHNOLOGY**

What does the sector need?



+ Reduce high costs of essential raw materials.



+ Reduce the high impact of CO2 emissions



+ Improvement of concrete quality

**Our technology,
a triple mechanism**



+ Physical reaction: mechanical and lasting improvement.



+ Chemical reaction: mechanical improvement



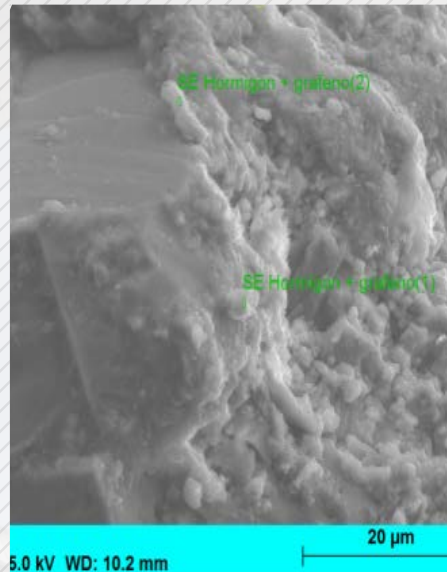
+ Dispersion power: water reduction.



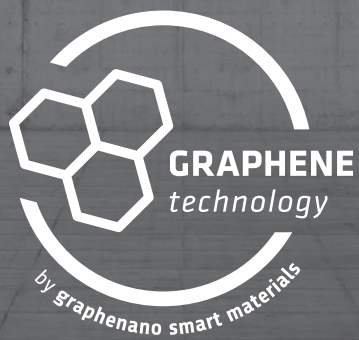
**GRAPHENANO
IN CONSTRUCTION**

SmartADDITIVES are multifunctional additives where graphene technology is incorporated, which, when added to concrete and mortars, allow for substantial improvements in mechanical performance, durability, and thermal conductivity.

These improvements have a physico-chemical basis and are produced by the properties that graphene transfers to the concrete. When added to the fresh mix, during cement hydration, graphene reacts with the free lime in the cement, chemically bonding to its structure, transferring its great mechanical performance to the cement, densifying the cementitious matrix and making it more resistant. In other words, this graphene technology is capable of significantly optimizing the amount of cement while maintaining the same required performance standards.



SMART ADDITIVES



HIGH MECHANICAL PERFORMANCE



MECHANIC

Product description:

MECHANIC is a line of additives designed with innovative graphene technology for use in plant concrete or ready-mix concrete. Intended for high-performance concretes, improving their quality, strength, and surface finish.

Format:

Mechanic Graphene PLASTICIZER and **FLUID** are available in bulk, in 1050 kg containers and 210 kg drums.

How does concrete improve thanks to graphene additives?

- + **Increased strength**
- + **Great water-reducing power**
- + **Decreased porosity**
- + **Optimization of raw materials**

Mechanic Graphene SUPERPLASTICIZER

Mid-range superplasticizer/water reducer.

Mechanic Graphene PLASTICIZER

Medium-high and mid-range plasticizer / water reducer.

Mechanic Graphene FLUID ULTRA

Very high-range superplasticizer/water reducer.

Mechanic Graphene FLUID PREMIUM

High-range superplasticizer / water reducer.

Mechanic Graphene FLUID PLUS

Mid-range superplasticizer / water reducer

Mechanic Graphene FLUID BASIC

Superplasticizer/water reducer

Mechanic Graphene FLUID CONDUCTIVITY G300

High-range superplasticizer/water reducer for improved thermal conductivity



PRECAST

HIGH STRENGTH & WORKABILITY

Product description:

PRECAST is a line of additives designed with innovative graphene technology for the precast world. These additives improve quality and the production process, reducing costs and maximizing the efficiency of concrete.

Format:

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

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

How does concrete improve thanks to graphene additives?

- + **Increases initial and final strengths**
- + **Great hyperplasticizer water-reducing power**
- + **Decreased porosity**
- + **Increased impermeability**
- + **Great workability**

Precast Graphene FLUID

Hyperplasticizer/water reducer additive.

Precast Graphene FINISH

Release agent.

EXTREME SHIELD



HARD

Product description:

HARD is a line of additives designed with innovative graphene technology for concrete exposed to extreme aggressions. Suitable for highly durable concrete with reduced permeability.

Format:

Hard Graphene DURABILITY and **RETRACTION** are available in bulk, in 1000 kg containers and 200 kg drums.

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

How does concrete improve thanks to graphene additives?

- + **Increased impermeability**
- + **Increased protection against chlorides**
- + **Improved protection against carbonation**
- + **Decreased porosity**

Hard Graphene DURABILITY PREMIUM

High-activity multifunctional additive.

Hard Graphene RETRACTION

Shrinkage-reducing additive for drying.

Hard Graphene INHIBITOR

Corrosion-inhibiting additive.



SUPPORT

ADVANCED COMPLEMENTARY AGENTS

Product description:

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

Format:

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

Support Graphene SET is available in bulk, in 1200 kg containers and 250 kg drums.

Support Graphene SET-R is available in bulk, in 1100 kg containers and 220 kg drums.

Support Graphene AIR IN

Air-entraining agent.

Support Graphene SET

Chloride-free antifreeze agent.

Support Graphene SET-R

Retarding agent that allows regulation of concrete setting.

Support Graphene COMPACT

Viscosity-modulating agent for self-compacting concrete

Support Graphene CLAYS

Additive for inhibiting clays in aggregates

How does concrete improve thanks to graphene additives?

- + **Matrix improvement**
- + **Consistency maintenance**
- + **Increased curing**
- + **Improved workability**

SEMI-DRY CONCRETE



DRY

Product description:

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

Format:

Dry Graphene WATER-REPELLENT is available in bulk, in 1000 kg containers and 1 and 25 kg jerrycans.

Dry Graphene PLASTICIZER is available in bulk, in 1000 kg containers and 25 kg jerrycans.

How does concrete improve thanks to graphene additives?

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

Dry Graphene FLUID PREMIUM

Plasticizer for semi-dry precast with high activity and very high water-reducing power.

Dry Graphene PLASTICIZER

Plasticizing additive for dry consistency precast.

Dry Graphene WATERPROOF PREMIUM

Premium mass water-repellent.

Dry Graphene WATERPROOF

Mass water-repellent.



GUNITE

GUNITE CONCRETE

Product description:

GUNITE is a line of additives designed with innovative graphene technology for the production of shotcrete.

Format:

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

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

How does concrete improve thanks to graphene additives?

- + Increased work rates
- +Improved initial and final strengths
- +Improved durability
- +Increase in thicknesses per layer

Gunite Graphene *EU*

Non-alkaline liquid accelerator, free of alkalis.

Gunite Graphene *FLUID*

Superplasticizer/water-reducing additive.

HIGH STRUCTURAL REINFORCEMENT



FIBER

Product description:

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

Format:

Fiber Graphene PVA is available in 15 kg boxes.

Fiber Graphene MACRO is available in 4 and 6 kg bags, and in 150 kg sacks.

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

Fiber Graphene PVA

Structural synthetic fiber for the reinforcement of very high-strength concretes.

Fiber Graphene MACRO

Alkali-resistant monofilament polypropylene fiber for structural reinforcement.

Fiber Graphene MICRO

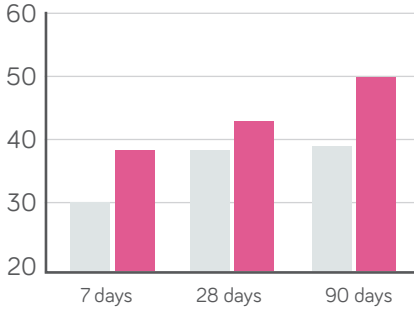
Monofilament polypropylene fiber for cracking and fire resistance.

PERFORMANCE OF GRAPHENE TECHNOLOGY

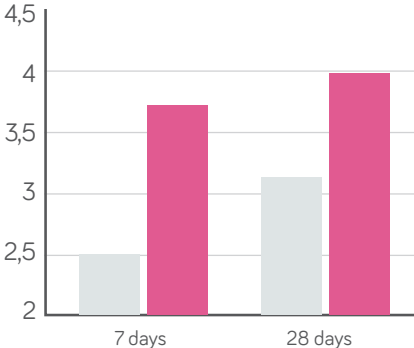
Ref. VS Mechanic Graphene Fluid PREMIUM

■ Ref. ■ Mechanic Graphene Fluid PREMIUM

Evolution of compressive strengths (MPa)



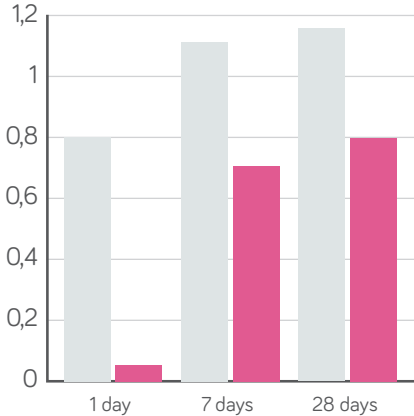
Evolution of flexural strengths (MPa)



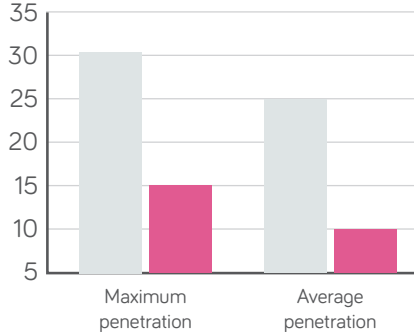
Ref. VS Hard Graphene Durability PREMIUM

■ Ref. ■ Hard Graphene Durability PREMIUM

Water absorption by capillarity



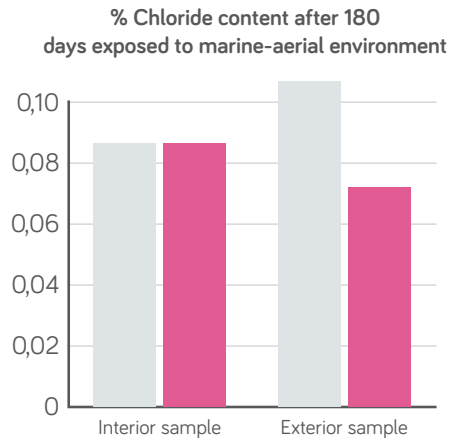
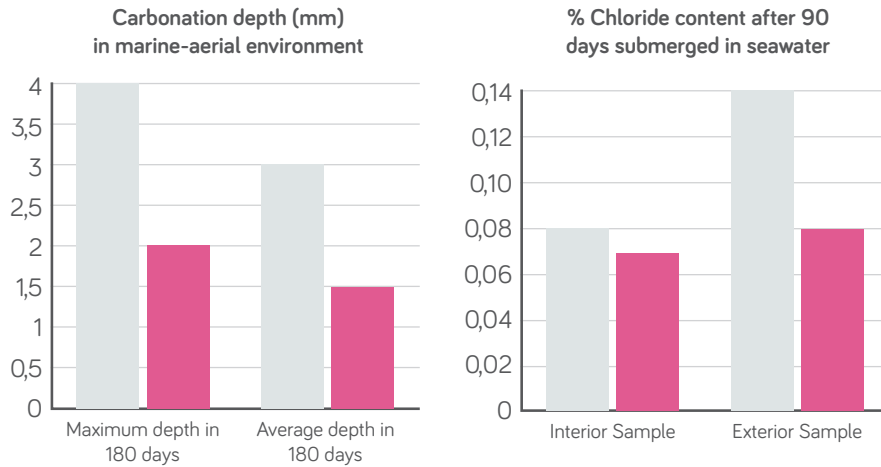
Water penetration under pressure (mm)





Ref. VS Hard Graphene Durability PREMIUM

■ Ref. ■ Hard Graphene Durability PREMIUM



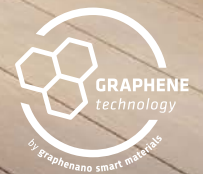


**CONDUCTIVE
ADDITIVE**



FloorGraphene

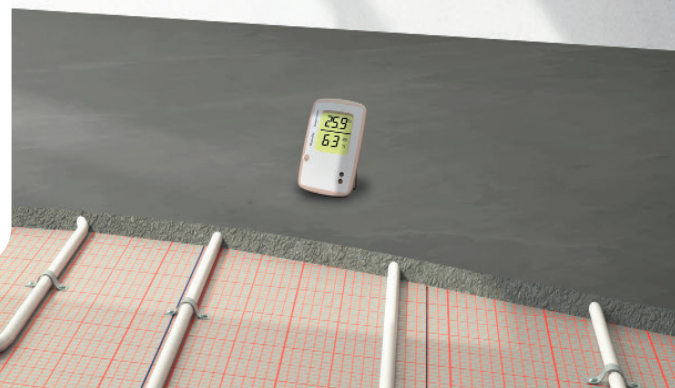
Smart**ADDITIVES**
GRAPHENE CONCRETE



What is FloorGraphene?

Floor Graphene Conductivity is a high-activity graphene-based additive that improves thermal conductivity of concretes and self-levelling mortars.

This product has been designed by the Graphenano Group's I+D team specially to cover a growing need in the construction industry, which is energy improvement and the search for energy efficiency.



Alternative to Anhydrite



How to use FloorGraphene?

Floor Graphene Conductivity has been designed to be dispensed directly into the mouth of the truck to simplify and facilitate its application on site. Floor Graphene Conductivity should always be shaken vigorously before use.

It must be mixed long enough to ensure complete homogenization of the product throughout the mass. Between 5 and 10 min. The recommended dosage is 1,5kg per m³ of concrete. These dosages are indicative, it is recommended to carry out previous tests to determine the optimum dosage for each intended application.



Economic and environmental savings

Properties and advantages FloorGraphene

Floor Graphene Conductivity Properties

- Improvement of thermal conductivity
- Improved compressive strength
- Improved flexural strength
- Improved durability
- No change in consistency or appearance of fresh concrete

Advantages of Floor Graphene Conductivity over other alternatives

- Improvement of thermal conductivity
- Improved compressive strength
- Improved flexural strength
- Improved durability





**DECORATIVE
MICROMORTAR**

SmartCOVER

GRAPHENE FINISHING



What is a Microcement conventional and its characteristics?

Microcement is a composite material made from cement, resins, additives, and mineral pigments with which different shades can be achieved. Thanks to its handcrafted application, it achieves an exclusive finish with low thickness and great aesthetic appearance.

Given its possibilities for application both indoors and outdoors, it is an ideal product for decorating walls and floors, but also for furniture to which you want to give a contemporary style.

Recommended uses:

- Walls
- Exterior and interior floors
- Bathroom and restroom walls and floors



Characteristics of the systems

CONVENTIONAL microcement:

- Its application does not generate dust, noise, debris, or dirt.
- It adheres properly to mortar, ceramic, fiber cement, stoneware, wood, terrazzo, plaster, drywall, and many more. This means it is not necessary to remove the old material.
- Its thickness of 2 to 3 mm does not affect the structural load of the building, nor is it necessary to trim doors.
- Easy maintenance, as it can be cleaned with water and neutral soap.
- Does not withstand negative humidity
- Tends to crack and fissure.
- Poor aging and high wear.
- Possible waterproofing and humidity problems.

SmartCOVER vs Conventional Microcement

SmartCOVER is a newly formulated product that includes an improvement in the mechanical and environmental characteristics of micromortar thanks to the incorporation of graphene additive in some components.

This micromortar guarantees continuous floors and walls of high quality and design with a wide variety of colors and textures, creating spaces with a clean and pleasant aesthetic.

SmartCover micromortar provides:

- High hardness and resistance to heavy impacts
- Resistance to heavy pedestrian traffic
- Waterproofing
- Bacteriostatic effect
- Flexibility

The R&D&I department of Graphenano Smart Materials is at the forefront of all micromortar manufacturing processes, cooperating with the largest chemical companies and maintaining a very high level of demand to achieve the evolution of its products and solve the essential problems of conventional microcements, thus being able to guarantee their application, finishes, and expand their recommended uses

Recommended uses:

- Exterior and interior walls
- Exterior and interior floors
- Floors with high pedestrian traffic (Lobbies, shopping centers, stores, restaurants, supermarkets...)
- Bathroom walls, restrooms, shower trays, bathtubs, saunas...
- Facades
- Pools
- Terraces, roofs

Advantages of SmartCOVER over conventional Microcement:

- Does not crack or fissure
- Does not require expansion joints
- Suitable for positive and negative humidity
- Bacteriostatic
- Maximum hardness to impacts and scratching
- Less aging and more durability
- Waterproof
- High flexibility



ADVANTAGES OF GRAPHENE



SmartCOVER has the same properties and advantages as traditional micro-mortar in terms of quality and design, as well as a series of technical improvements that are only possible thanks to the incorporation of graphene in its specific composition.

Graphene gives SmartCOVER micro-mortar significant properties, making it a product with unprecedented technical performance for the construction industry. Thanks to graphene, SmartCOVER micro-mortar is more resistant and has bacteriostatic and waterproof properties.



Greater resistance



Impact resistance



Water resistance



Bacteriostatic effect



Elasticity



Thermal conductivity



High durability



Better workability

SYSTEM SMARTCOVER

All systems are made up of a cementitious composite material that contains polymers, fibers, additives, resins, and pigments. The HARD system is reinforced with graphene. Each system has specific properties that are used depending on the type of surface.



CLASSIC System

Micromortar,
Ideal for walls and other demanding surfaces. Guarantees maximum strength and hardness..



ECO System

Micro-mortar in powder form suitable for decorative applications such as walls, fireplaces, furniture, tables, and much more..



HARD System

Micro-mortar with graphene for large volumes of public traffic, designed for shopping centers, bars, restaurants, cinemas, and much more. Guarantees high resistance to wear, abrasion, and dirt, taking into account the individual needs of the design..



Products & features



Primers:

The MONO PRIMER is a water-based sealing and consolidating primer. Primer in aqueous solution based on acrylic emulsions without organic solvent and free of bituminous products. Low water absorption, forms a surface film.

The PRIMER GRIP: Water-based sealing and consolidating primer. Low water absorption. Primer Grip gives mixtures with hydraulic binders elasticity, adhesion, resistance to alkalis and UV rays, allowing numerous applications.

The TWO-COMPONENT PRIMER is a self-leveling epoxy coating with two components for pigmentation (optionally transparent) for the protection of surfaces and concrete floors. It can be applied without the need to add fillers on slightly damp surfaces or with residual moisture. Waterproof to water, but permeable to water vapor, which allows it to breathe through the substrate to eliminate possible water accumulations and therefore blistering.



- SmartCOVER - PRIMER Mono (5kg): Single-component primer for porous surfaces.

Not suitable for negative moisture, only for positive. Dilutable 1:3. Yield per container 50m².



- SmartCOVER - PRIMER Grip (5kg): Single-component primer for NON-porous surfaces that incorporates fine aggregates.

Not suitable for negative moisture, only for positive. Not dilutable. Yield per container 10m²



- SmartCOVER - PRIMER BICOMPONENTE 2C (20kg): Two-component primer to add aggregate for extreme cases.

Suitable for any surface and type of moisture. Dilutable 10%. Yield per container 20m².

Leveling compounds:



- **SmartCOVER - SUPPORT (20kg):**
Leveling mortar.
Can be applied fresh on fresh.
Consumption 1.5kg per m² and layer.

Leveling mortar for substrates formulated with micronized quartz that provides excellent workability and hardness. Product to be used before the installation of any micronized material.

Description:
Cement-based paste for coating floors and walls.

Advantages:
Good fluidity and workability.
Base Support thickness per layer from 0.5 to 0.6 mm.
Easy cleaning, with a damp cloth and neutral detergent. Provides great hardness and resistance to the substrate.



Formats: Rolls of 50 m x 1 m wide

- **SmartCOVER - FIBERMET (roll 50m²)**
160gr mesh.

Fiberglass mesh used as reinforcement for SmartCOVER systems.

The 3.5x3.8 mm mesh. 160 gr/m² offers special reinforcement for all types of plaster work, being most commonly used for interior walls on surfaces and specific points to considerably reduce the risk of cracking. It is also placed over other materials; microcements, polystyrene boards, continuous floors, marble, and many more.

Properties:
High mechanical strength and elongation at break.
Unalterable by alkalis.
Light and flexible.

Base-Layer Micro-mortars:

Ready-to-use micro-mortars. Cement-based with quartz of controlled granulometry to provide high resistance with single-coat finishes, without stuccoed watermarks, in the French style.

- High adhesion.
- Excellent workability and hardness thanks to graphene technology.
- 100% ecological and natural.
- Reduced content of soluble salts.
- High water vapor permeability.



Ready to use



Easy application



High mechanical properties



Protection against UV rays



Excellent finish



Rain resistant / Suitable for positive moisture



High resistance to freeze-thaw



Mold-resistant and bacteriostatic



Eco-friendly and free of chemical substances



Fire inert



Suitable for exterior and interior



Breathable

- SmartCOVER - ECO - BASE (20kg). Single-component powder micromortar - BASE. Mix with water on site. Knead until homogeneous and leave to desired consistency. Consumption 1kg/m² and layer.

- SmartCOVER - CLASSIC - Ready to use - BASE (20kg) Ready-to-use single-component BASE. Not suitable for negative moisture, but suitable for positive moisture. Consumption 500g per m² and layer.

- SmartCOVER - HARD - Ready to use - BASE (19kg + 1kg) Ready-to-use two-component BASE (19kg part A + 1kg part B). Suitable for all types of surfaces and moisture. Consumption 1kg per m² and layer.



Thin-Layer Micromortars:

Ready-to-use micromortar. Cement-based with quartz of controlled granulometry to provide high resistance with single-coat finishes without stuccoed watermarks, in the French style.

- High adhesion.
- Excellent workability and hardness thanks to graphene technology.
- No sanding required due to its spectacular calibration.
- 100% ecological and natural.
- Reduced content of soluble salts.
- High water vapor permeability.



• **SmartCOVER - ECO - FINE** (15kg). Single-component powder micromortar - FINE. Mix with water on site. Knead until homogeneous and leave to desired consistency. Consumption 0.5 kg/m² and layer. Also available: SmartCOVER ECO MEDIUM (Single-component).

• **SmartCOVER - CLASSIC - Ready to use - FINE** (15kg). Ready-to-use single-component FINE. Not suitable for negative moisture, but suitable for positive moisture. Consumption 250g per m² and layer. Also available: CLASSIC - Ready to use - MEDIUM (Single-component).

• **SmartCOVER - HARD - Ready to use - FINE** (14kg+1kg). Ready-to-use two-component FINE (14kg part A + 1kg part B). Suitable for all types of surfaces and moisture. Consumption 500g per m² and layer. Also available: HARD - Ready to use Medium (Two-component).





Finishing varnishes:

- SmartCOVER - Finish Aqua Plus (5L). Varnish Single-component water-based polysiloxane, special for pools and facades. Yield per container 50m².

SmartCOVER FINISH AQUA PLUS is a high-quality coating sealer. It is a water-based nanotechnology resin specially formulated to facilitate penetration and leave the minimum superficial plastic film to protect against moisture, condensation, and water stains, without losing breathability and aesthetic enhancement. Sealing of coatings and floors for both interior and exterior. Especially designed for humid areas and facades.



- SmartCOVER - Finish - TWO-ECO (3:1) (4L). Two-component water-based varnish (4L part A + 1L part B + 1L of water added on site). Not suitable for pools. Scratch-resistant, UV protection, and aliphatic. Consumption 100m² per kit.

SmartCOVER Finish TWO-ECO is a water-based resin varnish specially developed for varnishing floors and coatings indoors and outdoors. Varnish of acrylic and aliphatic nature. It is mainly used for the decorative finishing of walkable floors (HIGH RESISTANCE AND HIGH TRAFFIC FOR FLOORS). Recommended for finishing new floors or refurbishing floors of: troweled concrete, self-leveling, microcements, and stamped concrete.



Pigments / Colors

SmartCOVER provides finishes oriented to any decorative style, making possible original and innovative spaces with modern aesthetics, with high-quality surfaces that are completely continuous and jointless.

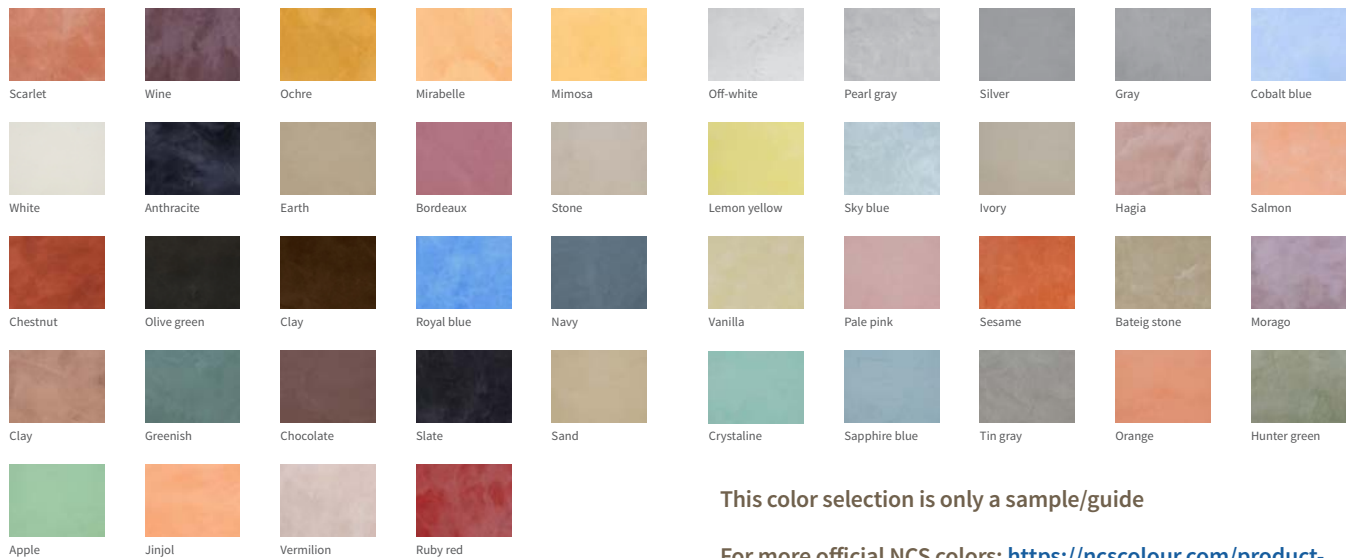
SmartCOVER can feature textures that imitate natural stone, space stone, slate, etc., which are waterproof and can be applied to facades and exterior walls to give them a rustic appearance. Likewise, it can have smooth and uniform textures, also waterproof and hygienic, ideal for interiors where a clean and elegant style is desired.

The SmartCOVER pigmentation system allows it to be acquired in a wide variety of solid and homogeneous colors, as well as in matte, gloss, or satin finishes.



- SmartCOVER - PIGMENT. The 44 colors referenced in our samples and catalogs are available. Presented in single-dose format per bucket.

- SmartCOVER - SPECIAL NCS COLOR CHART: Any color from the NCS color chart can be made. Always on request. Presented in single-dose format per bucket.



This color selection is only a sample/guide

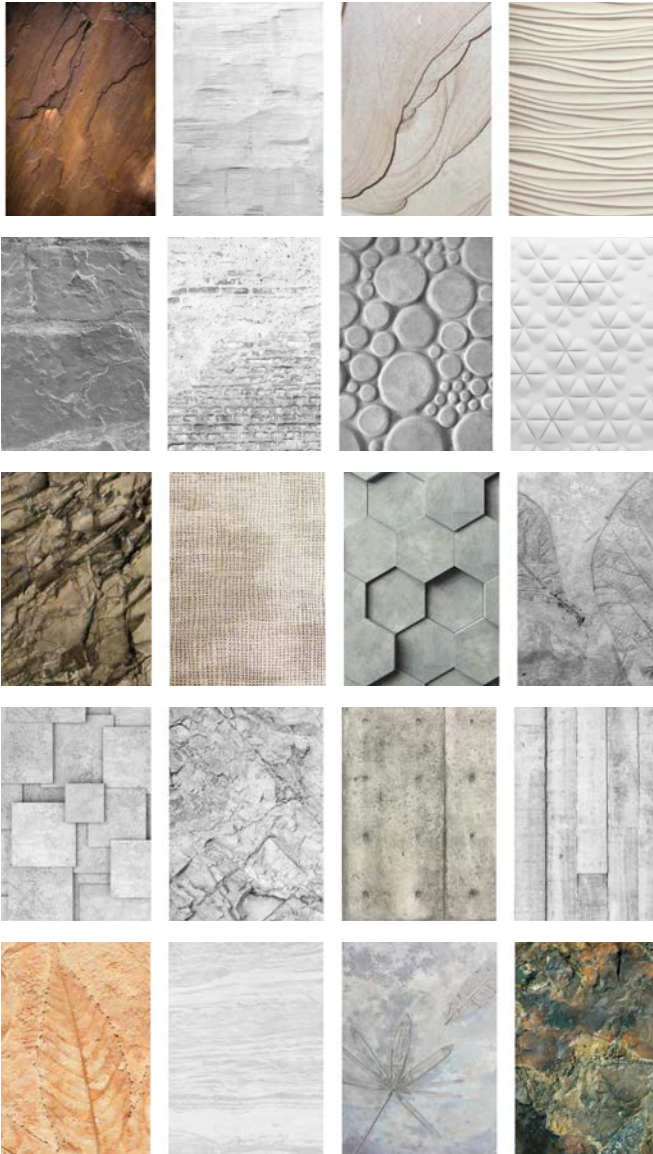
For more official NCS colors: <https://ncscolour.com/product-category/shop/colour-samples/>

***NOTE:** The color sample in this catalog may vary from the actual work.

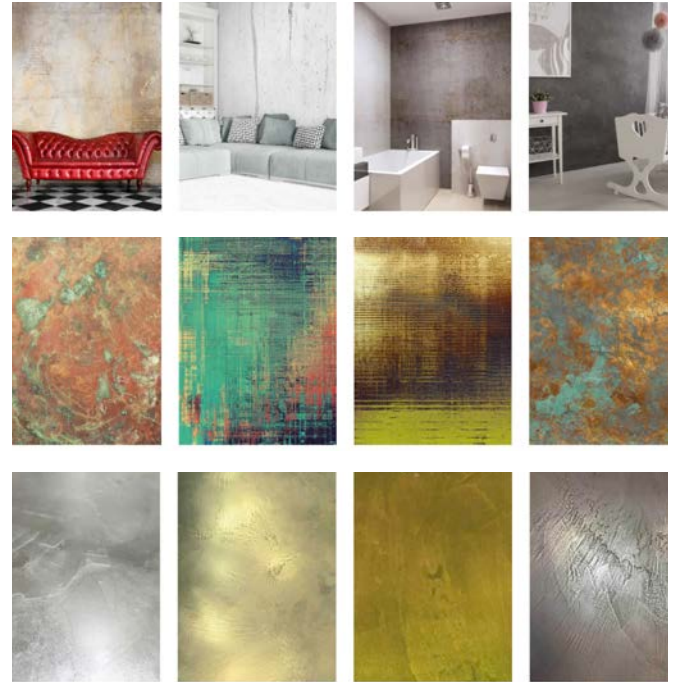
Finishes

A material for the creation of continuous flooring and cladding, without joints and very quick to apply.
Metallic finishes, microcement, glazes, and pigmentation to customize the color.

• 3D Textures



• Metallic Glazes / Oxides



Finishes: Glossy / Satin / Matte / Extra-Matte



Slip resistance:

- C1
- C2
- C3

Application Guide:

It is very important to note that in the new SmartCOVER 2.0 system we no longer sell closed or articulated systems. All our products are compatible with each other, and it is the client who must decide what is needed on each occasion and for each purpose, always with our advice, training, and prior assistance.

These application systems are recommendations and can never be taken as defined systems or constructive solutions since each application or project has its own characteristics and peculiarities, and therefore the same constructive solution will not always be chosen for a floor, wall, facade, or pool.

System for floors:

1. Optional: application of a primer layer.
2. Optional: Substrate leveling with SmartCOVER - Support.
3. SmartCOVER FIBERMET: Mesh to be placed over the substrate before applying the first base coat. It is placed by stretching it over the surface and spraying it with a little surface water.
4. SmartCOVER - Ready to use HARD – BASE or MEDIUM: BASE or MEDIUM bicomponent micromortar ready to use. Apply the number of coats as desired or needed. Layer thickness always according to the aggregate size.
5. SmartCOVER - Ready to use HARD – MEDIUM or FINE: MEDIUM or FINE bicomponent micromortar ready to use. Apply the desired number of coats. Layer thickness always according to the aggregate size.
6. SmartCOVER - Finish - Two -ECO (3 : 1 + 1): Two-component water-based varnish for finishing and protection. Apply 2 coats, allowing 24 hours to dry between coats for maximum hardness.

System for walls:

1. SmartCOVER FIBERMET: Mesh to be placed over the substrate before applying the first base coat. It is installed by stretching it over the surface and spraying it with a little surface water.
2. SmartCOVER - Ready to use CLASSIC – BASE or MEDIUM: BASE or MEDIUM single-component ready-to-use micro-mortar. Apply the desired or required number of coats. The thickness of the layer should always match the size of the aggregate.
3. SmartCOVER - Ready to use CLASSIC – MEDIUM or FINE: MEDIUM or FINE single-component ready-to-use micro-mortar. Apply the desired number of coats. The thickness of the layer should always match the size of the aggregate.
4. SmartCOVER - Finish - Two -ECO (3 : 1 + 1): Two-component water-based varnish for finishing and protection. Apply 2 coats, allowing 24 hours to dry between coats for maximum hardness.

System for facades:

1. SmartCOVER FIBERMET: Mesh to be placed over the substrate before applying the first base coat. It is installed by stretching it over the surface and spraying it with a little surface water.
2. SmartCOVER - ECO – BASE OR MEDIUM: BASE or MEDIUM single-component powder micro-mortar. Apply the desired number of coats. The thickness of the layer should always match the size of the aggregate.
3. SmartCOVER - ECO – MEDIUM or FINE: MEDIUM or FINE single-component powder micro-mortar. Apply the desired number of coats. The thickness of the layer should always match the size of the aggregate.
4. SmartCOVER - Finish Aqua: Single-component water-based varnish. Apply 2 coats.





GraphenBar®
FiberGlass Graphene Bars
Barras de refuerzo de grafeno con fibra de vidrio y resina (G-FRP), diseñadas para sustituir el acero en estructuras de hormigón armado. Cuenta con alta resistencia mecánica, ligereza y estabilidad dieléctrica. Ideal para pilotes, traveses, depuradoras, estructuras cercanas a equipos sensibles y obras donde se busca instalación rápida y larga vida útil.

Artículo
GraphenBar
6mm (m)
Lote: GRB0625007
Cantidad: 260 m

GraphenBar
Smart Materials
Dir. Guillermo Chica
C/da Vitoria Bar. 615 - 30510 Yaldir (Murcia)
Tel: +34 968 108 102
www.graphenbar.com





GraphenBar®
FiberGlass Graphene Bars
Barras de refuerzo de grafeno con fibra de vidrio y resina (G-FRP), diseñadas para sustituir el acero en estructuras de hormigón armado. Cuenta con alta resistencia mecánica, ligereza y estabilidad dieléctrica. Ideal para pilotes, traveses, depuradoras, estructuras cercanas a equipos sensibles y obras donde se busca instalación rápida y larga vida útil.

Artículo
GraphenBar
6mm (m)
Lote: GRB0625007
Cantidad: 260 m

GraphenBar
Smart Materials
Dir. Guillermo Chica
C/da Vitoria Bar. 615 - 30510 Yaldir (Murcia)
Tel: +34 968 108 102
www.graphenbar.com





Graphene Reinforcement Rebars

The **GraphenBar®** rebars are **epoxy resin reinforcements with graphene and fiberglass (G-FRP)** designed to replace traditional steel in concrete applications, offering an alternative for residential and commercial projects.

Thanks to their manufacturing by **pultrusion** with high-performance fiberglass and specialized resins, they offer high tensile strength, durability, and corrosion resistance.

Their light weight, physical and chemical properties simplify transport, handling, and installation, reducing labor costs and increasing productivity. Ideal for foundations, slabs, terraces, patios, prefabricated elements, etc.

GraphenBar® withstands all weather conditions for long-lasting performance and no need for maintenance.

Lightweight, durable, and non-conductive reinforcement for reinforced concrete in demanding infrastructures.

 Made in
Spain



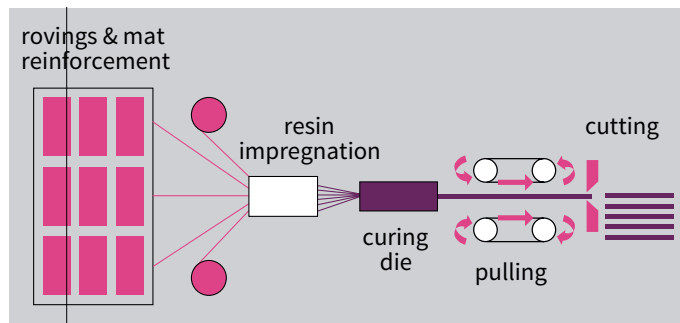
Graphenano 
SMART MATERIALS



PULTRUSION PROCESS

Pultrusion is a continuous process for manufacturing composite profiles reinforced with graphene and with fiberglass. The process consists of pulling multiple fiberglass filaments through a resin bath with graphene and then into a temperature-controlled metal mold, in order to produce structural profiles of various shapes.

Pultruded profiles are used in **multiple applications**: industrial, energy, housing, and consumer goods. The global composites market for pultrusion exceeds 250,000 tons, with annual growth above 20%.



GRAPHENE PULTRUSION

Graphenano Composites works with **graphene, fiberglass, and epoxy resin.**

Our fiberglass is a good thermal insulator, capable of withstanding high temperatures. Meanwhile our resin infused with graphene provides more characteristics to the final composite, such as greater tensile, compressive, and interlaminar strength, flexibility, and anti-corrosive properties.

In the **pultrusion process**, the fiberglass impregnated with our graphene resin undergoes low-temperature pulling operations, so that the polymerization process guarantees the best quality.

Among its **advantages** over other processes are:

- High stiffness compared to pultrusion without graphene.
- Versatility of shapes, depending on the geometry of the mold.
- Custom cutting of profiles. Possibility of obtaining large lengths.
- High speed and continuity of production.
- Good surface finish.

ADVANTAGES OF GRAPHENBAR PROFILES vs STEEL

In a comprehensive analysis of an industrial platform, it has been shown that G-FRP parts have a lower environmental impact compared to the same parts made of steel:

- **Lower material weight**
- **Lower energy consumption** for transport
- **Lower environmental impact** across many categories, including global warming gases, air and water acidification, eutrophication, ozone layer depletion and smog formation.

An independent evaluation determined that the finished composite parts present life cycle analysis profiles that show advantages compared to steel and aluminum alternatives strength/weight ratio.

Lighter



Up to 70% weight reduction compared to steel

Resistant



High tensile and compressive strength

Inherent thermal and electrical insulators



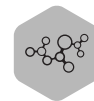
Non conductivity

Cost effective



Lower cost thanks to its easy handling and lower weight

Great chemical resistance

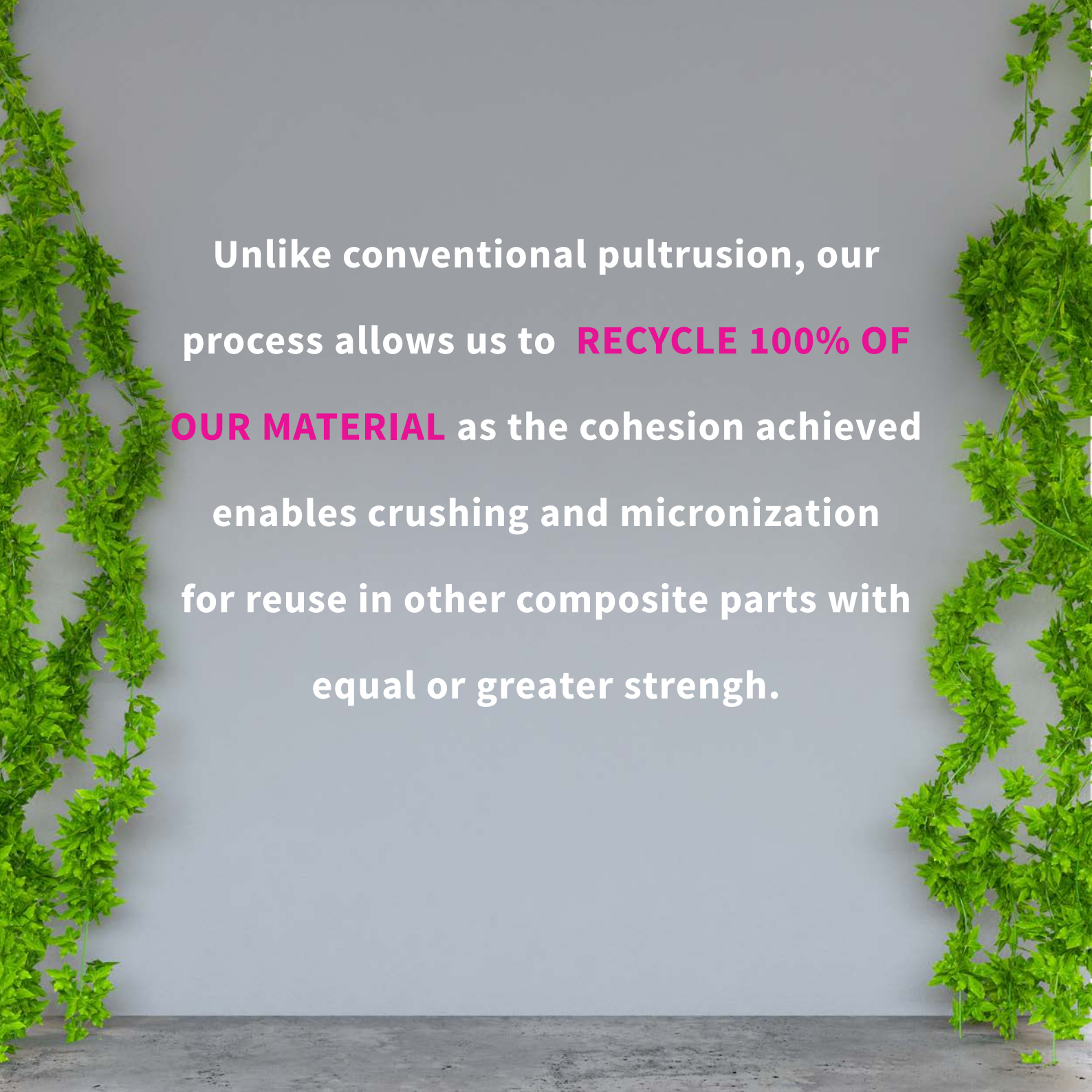


Resistant to chemicals and immune to corrosion

No interference electrical



Non magnetic



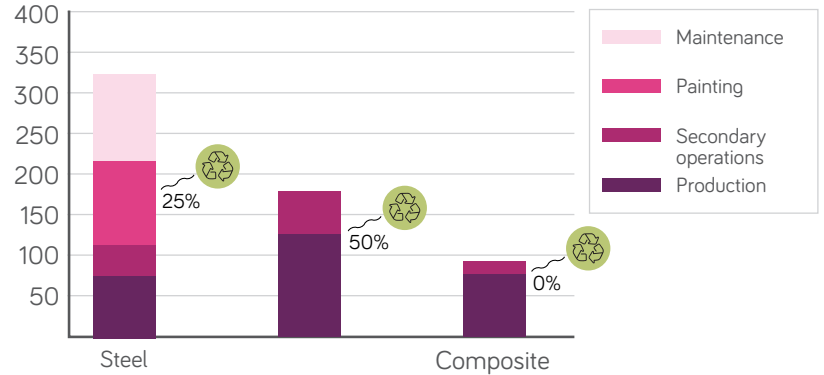
Unlike conventional pultrusion, our process allows us to **RECYCLE 100% OF OUR MATERIAL** as the cohesion achieved enables crushing and micronization for reuse in other composite parts with equal or greater strength.

SUSTAINABILITY

The following results come from a preliminary or abbreviated life cycle assessment (LCA) that examined some specific pultruded parts.

In both case studies, the data are based on the aggregation of various types of pultruded structural components for outdoor applications, such as decks and platforms.

Composites have a lower energy impact even without recycled content.



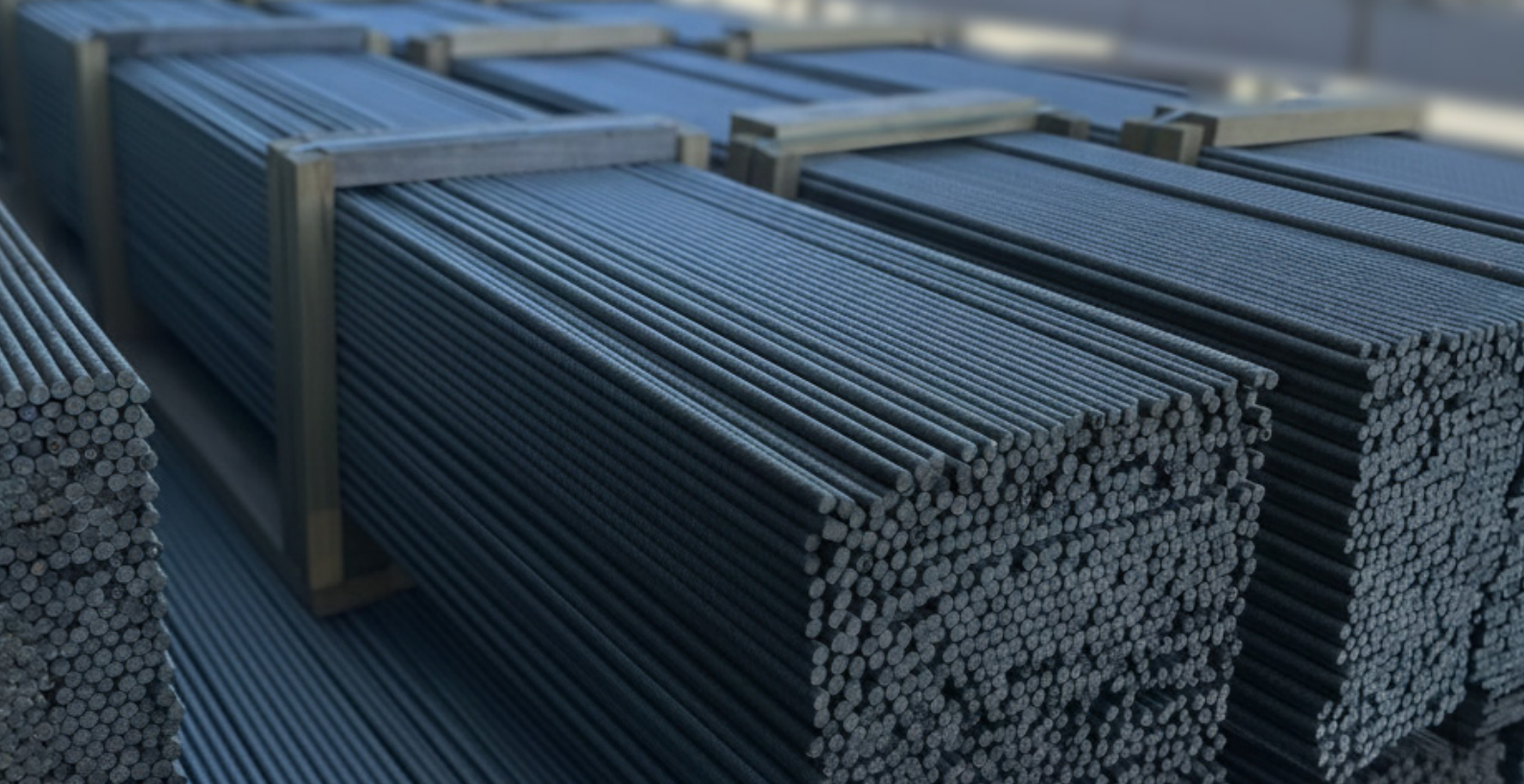
CASE STUDY NO. 1: STEEL VS. COMPOSITE

The steel grid is 3.5 times heavier than the composite grid.

| Energy used in Steel parts | | |
|----------------------------|----------|-----------------------|
| | MJ / Kg | Criteria |
| Primary Steel Production | 262 | 5% recycled |
| Secondary operation | 4 to 6 | Hot/cold section roll |
| On-site installation | 0 to 35 | Blasting and painting |
| “Use” maintenance phase | 30 to 35 | Blasting and painting |
| Totals 90 to 106 | | |

| Energy used in Composite parts | | |
|--------------------------------|---------|-----------------------|
| | MJ / Kg | Criteria |
| Primary raw material | 0-74 | Glass and resin min. |
| Secondary operation | to 6 | Comp. Part Mfg |
| On-site installation | 0 | Blasting and painting |
| “Use” maintenance phase | 0 | Blasting and painting |
| Totals 74 to 80 | | |

The higher specific strength of composite materials allows for more efficient energy use per component.



graphenbar COMPOSITE REBARS

The graphene, epoxy resin, and fiberglass reinforcement rods from **Graphenano Smart Materials** offer a superior alternative to traditional steel for a multitude of projects. Designed with high tensile strength, compression, durability, and corrosion resistance, **GraphenBar®** redefines concrete reinforcement. Its lightweight, rustproof design simplifies transport, storage, handling, and installation, reducing labor costs and increasing productivity. Ideal for foundations, driveways, pool decks, patios, concrete slabs, precast elements, etc., **GraphenBar®** withstands all weather conditions ensuring long-lasting, maintenance-free performance.

Choose GraphenBar® for projects that require strength, ease of use, and durability

Reliable performance designed for professionals

GraphenBar® offers professionals an alternative to steel without rust or corrosion, guaranteeing full performance in any climate with no risk of material deterioration, especially in saline environments. Lightweight yet robust, it allows for faster and safer installations, reducing labor time and effort. Designed to meet the demands of the most challenging and hard-to-access worksites, **GraphenBar®** provides a durable solution, being the only alternative to steel.

Meets and exceeds standards

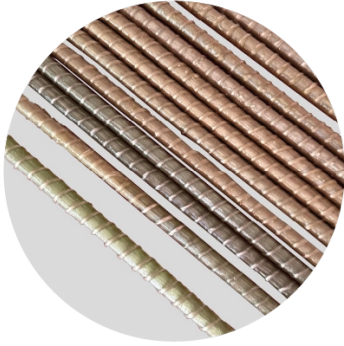
GraphenBar® is designed to meet or exceed key industry standards, codes, and specifications, providing contractors and professionals with confidence in its performance, safety, and compliance. Designed to achieve optimal results in all construction projects, **GraphenBar®** facilitates an optimized approval process to simplify permit processing and reduce delays in compliance checks.

Applications



- Driveways
- Sidewalks
- Pool decks
- Basements
- Basement walls
- Footings
- Concrete masonry
- ICF construction
- Warehouse floors
- Agricultural slabs
- Loading docks
- Architectural
- Prefabricated
- Truck platforms
- Prestressed concrete slabs
- Stair openings
- Elevator shafts
- Step crack repair
- Existing masonry rehabilitation
- Exterior walls
- Parking slabs
- Pillars, pilings, etc.

Reduces labor time and effort
Does not rust and has high strength



GRAPHENBAR® FIBERGLASS EPOXY

Product description:

Graphene reinforcement bars with fiberglass (G-FRP) and epoxy resin, designed to replace steel in reinforced concrete structures. They combine high mechanical strength, lightness, and dielectric stability, ideal for bridges, docks, water treatment plants, structures near sensitive equipment, and works where quick installation and long service life are desired.

Diameters:

6, 9, 10, 12, 14, 16, 18, 20 mm.

other sizes available upon request, maximum 32mm equivalent to 40mm of steel. Equivalency table p. 14

Use of our graphene composite rods

Our structural graphene composite rods **are manufactured in accordance with Eurocode requirements and Annex 2R for composite materials**, guaranteeing the highest standards of mechanical strength, durability, and safety.

Currently, the rods are marketed under a responsible declaration certificate, which allows their use in any type of conventional construction (housing, industrial buildings, unique buildings, precast, etc.), fully complying with the applicable structural regulations.

The only temporary limitation is their use in public civil works (infrastructures such as bridges, tunnels, roads, or dams), since in this area it is required to have the specific CE marking, a process currently underway.

In summary:

- Suitable and safe for all types of private and conventional constructions.
- Certified under a responsible declaration certificate according to European regulations.
- Limited only in public civil works until the final CE certification is obtained.





graphenbar
COMPOSITE REBARS

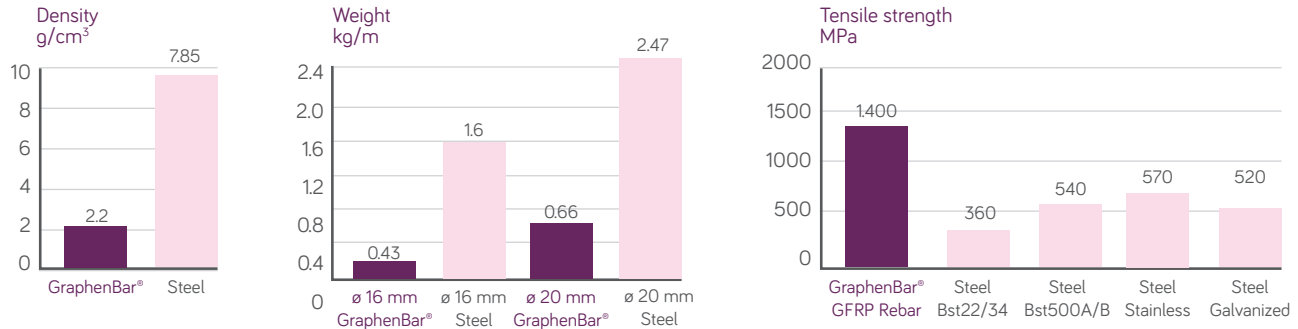
**More than double the interlaminar
strength
compared to rods made of
pultrusion without graphene**



graphenbar
COMPOSITE REBARS

Lightness, strength, and sustainability,
**The only smart alternative
to steel**

Technical data bars GraphenBar®



G-FRP reinforcement **Graphenbar®** have only about 27% of the weight of steel reinforcement bars. This allows for lighter structures with maximum stability and lower dead weight, as well as much easier handling at construction sites.

G-FRP reinforcement **Graphenbar®** have a tensile strength three to four times greater than conventional reinforcement bars made of unalloyed steel and stainless steel.

| METRIC | | #6 | #9 | #10 | #12 | #14 | #16 | #18 | #20 |
|----------------------|------|-------|-------|-------|-------|-------|-------|-------|-------|
| Minimum Tensile Load | kN | 33 | 54 | 74 | 132 | 167 | 202 | 244 | 285 |
| Cross Sectional Area | mm² | 28 | 64 | 78 | 113 | 154 | 201 | 254 | 314 |
| Weight | kg/m | 0,065 | 0,246 | 0,181 | 0,260 | 0,354 | 0,462 | 0,585 | 0,723 |

- Tensile strength
 - >1000 MPa
 - >145 ksi
- Modulus of Elasticity (Young's Modulus)
 - >60 GPa
 - >8702 ksi
- Ultimate deformation
 - >1.7%
- Transverse shear strength
 - >220 MPa
 - >31.9 ksi
- Bond Strength to Concrete
 - 24 MPa Minimum**
 - 3100 Psi Minimum**
- Flexural strength (straight part)
 - >980 MPa
- Flexural strength (straight part)
 - >700 MPa
- Bending strength (bent area with minimum radius: Bar diameter 4x)
 - 58 GPa**
- Glass transition temperature (T_g)
 - 130 and 140 °C**

Packing, handling and storage

GraphenBar® is weather resistant, although exposure to UV rays may cause discoloration, fading, or surface chalking. These effects are purely aesthetic and do not affect its performance. For prolonged exposure to sunlight, it is recommended to use a protective cover. **The product can be ordered with a UV protection additive at an additional cost.**

When handling and installing, use a fine-toothed saw, a carbide-grit blade saw, a grinder, or a diamond blade to cut; it is not necessary to seal the ends. Place the spacers properly for adequate concrete coverage and use standard tying methods.

Ensure that the concrete cover exceeds twice the diameter of the bar to prevent thermal cracking and follow general guidelines on reinforcement practices.

| FRP Ø (mm) | STEEL Ø (mm) | kg/m FRP | kg/m steel | FRP truck (20t) | steel truck (20t) |
|------------|--------------|----------|------------|-----------------|-------------------|
| #6 | 8 | 0,065 | 0,395 | 207.546 | 50.686 |
| #9 | 12 | 0,146 | 0,888 | 136.687 | 22.527 |
| #10 | 14 | 0,181 | 1,208 | 110.716 | 16.551 |
| #12 | 16 | 0,260 | 1,578 | 76.886 | 12.672 |
| #14 | 20 | 0,354 | 2,466 | 56.488 | 8.110 |
| #16 | 22 | 0,462 | 2,984 | 43.249 | 6.702 |
| #18 | 24 | 0,585 | 3,551 | 34.172 | 5.632 |
| #20 | 26 | 0,723 | 4,168 | 27.679 | 4.799 |

**A single GraphenBar® truck
equals six steel trucks**



graphenbar
COMPOSITE REBARS

Does not rust
Guaranteed structural safety

Graphenano 
High-Quality GFRP Rebar
Production Line





 **graphenbar**
COMPOSITE REBARS

Frequently Asked Questions

Performance

How does the strength of GraphenBar® compare to steel?

GraphenBar® has a tensile strength greater than 1000 MPa (145 ksi), compared to steel, GraphenBar® can withstand more than 3 times the tensile load of steel before failure.

How does the modulus of elasticity of GraphenBar® compare to steel?

GraphenBar® has a tensile modulus greater than 67 GPa (9427 ksi), compared to steel, the GFRP rebar is more flexible, better absorbing energy in an earthquake due to its improvement and its density.

How does the strain of GraphenBar® compare to steel?

GraphenBar® has a tensile strain between 1.5% and 2.5%.

What is the resistance of GraphenBar® to alkaline environments?

GraphenBar® has been tested according to ISO and ASTM standards for durability criteria, both retain +90% of the final tensile capacity after 2210 hours of

direct exposure to an alkali solution with a pH level of 13 at 60 degrees Celsius, compared to steel, GFRP rebar is much more resistant than the highest grade of stainless steel.

What is the maximum operating temperature of GraphenBar®?

GraphenBar® and other G-FRP bars that comply with ISO and ASTM standards, which have a glass transition temperature of more than 130 degrees Celsius, can be in direct contact with heat up to 110 degrees Celsius without losing strength. GraphenBar® at 400 degrees Celsius will lose its tensile strength from 1500 MPa to approximately 700 MPa, which is still higher than steel rebar at room temperature. IN CASE OF FIRE, THE TEMPERATURE IS NOT TRANSMITTED THROUGH THE METALLIC STRUCTURE, WHICH CAN DEFORM AS IN STEEL.

What is the minimum operating temperature of GraphenBar®?

GraphenBar® was tested according to ISO standards at -40 degrees Celsius, and the effect was zero and in some cases performance increases.

Operation

What sizes of graphene fiberglass rods are available?

Graphene fiberglass rods are available in standard sizes from 6mm to 20mm. We have other sizes available upon request.

How are graphene fiberglass rods cut on site?

Use a fine-toothed saw, a high-speed grinder, and a carborundum or diamond disc

Is it necessary to use a respirator when cutting the rod?

No, but it is recommended to use a dust mask. Please refer to our Safe Use Instruction Sheet for more information

Is it possible to get splinters when handling graphene fiberglass rods?

It is recommended to use protective gloves as a safety measure to avoid cuts and scrapes, especially on the cut ends.

What tie wire should I use for graphene fiberglass rods?

Use standard steel wire or plastic-coated wire for traditional rod tying methods. In non-magnetic applications, nylon ties prevent any electrical interference.

How do you tie GFRP rebar?

Tie the G-FRP rebar with stainless steel or nylon wire, you can also use a cable tie, and also fiberglass reinforced tapes. If corrosion or electromagnetic fields are not a concern, you can also use wires.

Can we bend Graphenbar in the workshop or on site?

GraphenBar® is manufactured with an epoxy thermoset matrix, it cannot be bent GraphenBar® after the curing cycle, all bends must be made at the MST rebar plants. Minor adjustments to bends are possible due to the inherent flexibility of the rebar

Frequently Asked Questions

Environment

Can we store GraphenBar® under exposure to sunlight?

Yes, but it is not recommended if it is more than 3 months.

GraphenBar® is made of a very high-quality thermoset matrix that withstands UV radiation, due to cost competitiveness. UV protection can be requested as an extra.

Can we store GraphenBar® under rain and snow?

Absolutely, GraphenBar® can be stored under rain and snow without any problem, as the material cannot corrode and does not absorb water, although it is always recommended.

What is the end of life of GraphenBar® like?

GraphenBar® is made of fiberglass that is 100% recyclable and epoxy resin with graphene, when it is in concrete, the material can be crushed with the concrete without needing to remove it after +100 years and can be part of the next recycled concrete, making the concrete much stronger.

Can you cure concrete with seawater?

Yes, if GraphenBar® is being used, the concrete can be cured with seawater due to its non-corrosive nature. This could lead to the preservation of huge amounts of fresh water.

Price

How does the price of GraphenBar® compare to steel rebar and stainless steel rebar?

GraphenBar® is much lower than the cost of stainless steel.

The price of GraphenBar® is lower than steel rebar, and if you consider all the savings due to labor costs, corrosion protection additives, cover concrete, and transportation, the cost is much lower than that of steel rebar.

Why does using GraphenBar® reduce the project cost?

Engineers are always taking into account all the associated costs of the project and its long-term maintenance. Some of these factors can be eliminated or reduced when considering the use of GraphenBar®.

- Installation time
- Transport
- Handling and cutting
- corrosion inhibitors
- Absence of short, medium, and long-term maintenance.

Engineering

Can we replace the GRP rebar in a ONE to ONE ratio with steel rebar?

GraphenBar® is three times stronger and more flexible than steel rebar. It behaves in a linearly elastic manner up to failure, which means there is no yield point to determine, but the material can withstand significantly higher loads. Engineers must follow the codes and standards for G-FRP rebar, not for steel. In most cases where serviceability does not govern the design and it is based on the Ultimate Limit State (ULS), you can simply substitute steel with high modulus GraphenBar®.

If serviceability governs the design, then it is recommended to carry out proper engineering to ensure that all deflections are controlled. We recommend redesign of parts using Graphenbar® specifications, to reduce material usage by optimizing the properties of graphene.

Can we use Graphenbar rebar in active seismic regions (earthquakes)?

YES, GraphenBar® bars can be used as reinforcement in concrete subjected to seismic loading conditions. GraphenBar® is capable of withstanding reverse voltage-compression cycles without failure. The high deformation exhibited by the GFRP material allows the GFRP-reinforced building to properly dissipate seismic energy. Currently, more than 100 bridges and structures are reinforced with GFRP rebar in seismic regions. Although it has not been part of the code, there is no limit as to why GraphenBar® cannot be used in seismic regions.



graphic



Transversely unbeatable
Up to 2.5 times more interlaminar strength
than conventional FRP bars

 **graphenbar**
COMPOSITE REBARS

GRAPHENBAR DIFFERENCES and other FRP BARS

Superior interlaminar resistance



Conventional FRP
Irregular Fracture.



Graphenbar Clean cut. High
structural cohesion.



**2X interlayer strength
vs. standard FRP**

The FRP rod without graphene exhibits an irregular break, with multiple fractured filaments and unstable deformation that compromises its integrity and durability. In contrast, **GraphenBar® FiberGlass Epoxy** breaks in a clean and controlled manner, with aligned fibers and a more cohesive structure, ensuring safer and more predictable behavior.

Graphenano Smart Materials
info@graphenanosmartmaterials.com

Carretera de Villena km 0.5
30510 Yecla (Murcia), Spain
t. (+34) 965 108 102

www.graphenanosmartmaterials.com

