
Graphenano
COMPOSITES
Composite
with graphene
technology


GTA
Spano

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The increasingly sophisticated new technologies have led to a global change, where information multiplies geometrically and communications eliminate time and distance. **Graphenano Composites** is the link between the present and the future, renewing challenges and incorporating the advantages of graphene in composite materials. We improve the properties of strength, resistance, lightness, flexibility, conductivity, impermeability, insulation, and greater durability, we provide a range of applications and products to cover your needs..

A new generation of composites that opens the doors to an era of applications.


Graphenano
MEDICAL CARE
Graphenano
DENTAL
Graphenano
ENERGY
Graphenano
COMPOSITES
Graphenano
nanotechnologies
Graphenano
ADDITIVE
Graphenano
SMART MATERIALS
Graphenano
LEATHER
Graphenano
SENSORS

COMPANY / PROFILE

Graphenano Composites belongs to the **Graphenano group**, a world leader in graphene manufacturing and in developing and launching applications with nanomaterials. Focused on various sectors such as Dental, Medical, Cosmetic, Construction, and Composites. Our headquarters in Yecla (Spain) and subsidiaries in Germany and Brazil reaffirm our global commitment.

Since its foundation in 2012, **Graphenano** has firmly established itself as a leader in the field of advanced nanotechnology. With a focus on technological excellence, we excel in the development of pioneering technologies, in the rapidly evolving field of nanotechnology. Our collaboration with prestigious institutions and universities at the international level, as well as various Technological Institutes (ITC, ICMOL), underscores our commitment to the research and development of graphene and its revolutionary applications.

OUR FACILITIES

Graphenano Composites In constant development, with advancements in technologies and greater diversification of products. This facilitates the inclusion of new graphene manufacturing lines in our facilities, allowing for a quick and efficient adaptation to all production demands, while also meeting our clients' storage and distribution needs.

INNOVATION AND ENVIRONMENT

Ecological Commitment

At **Graphenano Composites**, sustainability is a daily practice. Through collaboration efforts with leading companies, we have implemented innovative green technologies that significantly **reduce CO2 emissions**, moving towards carbon neutrality. Our graphene products not only improve thermal and electrical conductivity and bactericidal properties as well as enhancement of strength, hardness, flexibility, and durability of materials.

This approach demonstrates our commitment to the environment and to global sustainability goals.

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GRAPHENE MAIN PROPERTIES

Graphene is a carbon nanomaterial that possesses a unique combination of properties not found together in any other compound. Its variants are nanomaterials with unparalleled stiffness and strength, such us primarily due to the strength of the carbon-carbon (covalent) atomic bonds

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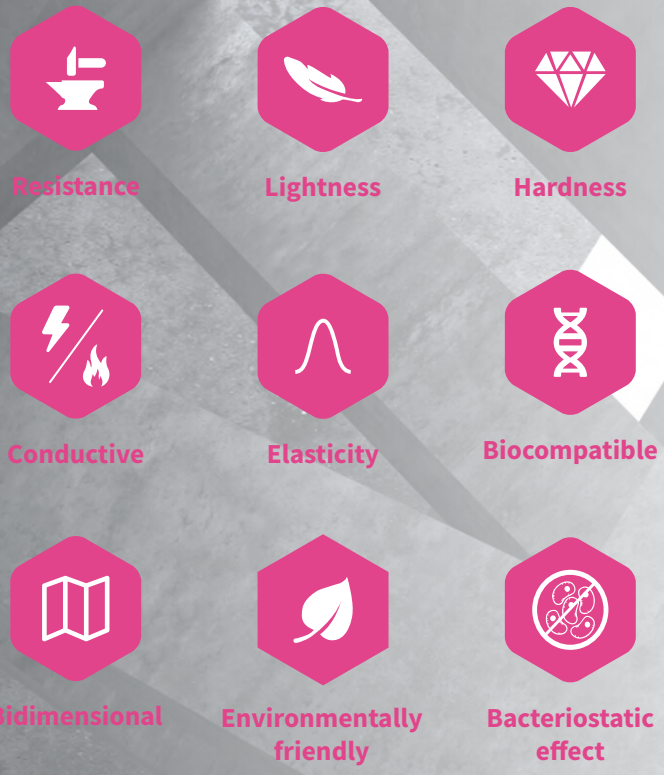
- Carbon atoms are held together on a flat surface, resembling a honeycomb. Elements based on carbon bonds; **graphene have the highest modulus of measurement and strength in a material to date**..
- Steel typically breaks at 500 MPa. while graphene which is **200 times stronger than steel ,exhibits significantly higher strength.**



¿WHAT IS GRAPHENE?

Is the strongest nanotechnological material known, with a strength 200 times superior to steel and a hardness greater than diamond, yet its thickness ranges between 1 and 10 carbon atoms. Being so thin, it is considered a two-dimensional material, the only one capable of remaining stable even at the thickness of a single atom.

It has incredible mechanical, electronic, chemical, magnetic, and optical properties. Moreover, being pure carbon, it is abundant in nature and eco-friendly. It is practically transparent, elastic, serving as an excellent thermal and electrical conductor, so dense that not even helium gas can pass through it. It exhibits many other qualities, such as high electron mobility or its bactericidal nature, the best-known electrical conductivity, the best heat transfer, the highest modulus and strength, and other "exotic" properties.

Improved properties in the composite

Thansfering exceptional graphene´s key charactheristics to the resins

Polyester, vinyl ester, epoxy, and new-generation pre-impregnated materials each with special properties due to the incorporation of graphene complete the most advanced product line on the market, achieved through their utilization. Products become lighter, more resistant, durable, cost-effective, and environmentally more sustainable.

POLIGRAPH RESINS

The **Poligraph Orthophthalic 140 PLUS** and **LV90** resin triples the flexural modulus of current resins, with over than 10,000 MPa, and doubles the tensile modulus, with over than 6,000 MPa. It is designed for use with fiberglass, injection, or pultrusion processes.

The Poligraph Isophthalic **ISO 70 PLUS** resin doubles the flexural modulus of other resins, with over than 9,000 MPa, and more than doubles the tensile modulus, with over than 6,000 MPa. Similarly, it is designed for use with fiberglass and pultrusion processes..

		WITHOUT GRAPHENE		WITH GRAPHENE	
		Flexural Modulus (MPa)	Tensile Modulus (MPa)	Flexural Modulus (MPa)	Tensile Modulus (MPa)
RESIN	Isophthalic Poligraph	3.700	3.700	**9.124**	**5.190**
RESIN	Orthophthalic Poligraph	4.000	3.600	**10.171**	**6.280**
PULTRUSION	Isophtalic Pultrusion	18.500	8.200	**64.120**	**22.200**
PULTRUSION	Orthophtalic Pultrusion	19.000	8.800	**56.888**	**22.700**

[1] TEST REPORT CERTIFICATE **TUV**

The Poligraph resin, utilized in pultrusion with fiberglass, distinguishes itself by yielding exceptionally strong and durable component achieving a **flexural modulus** of over than **64,120 MPa** and a tensile modulus of 22,200 MPa. By employing this resin, it becomes feasible to diminish the material required per piece, rendering it a more cost-effective and sustainable choice.

Manual RTM Pultrusión

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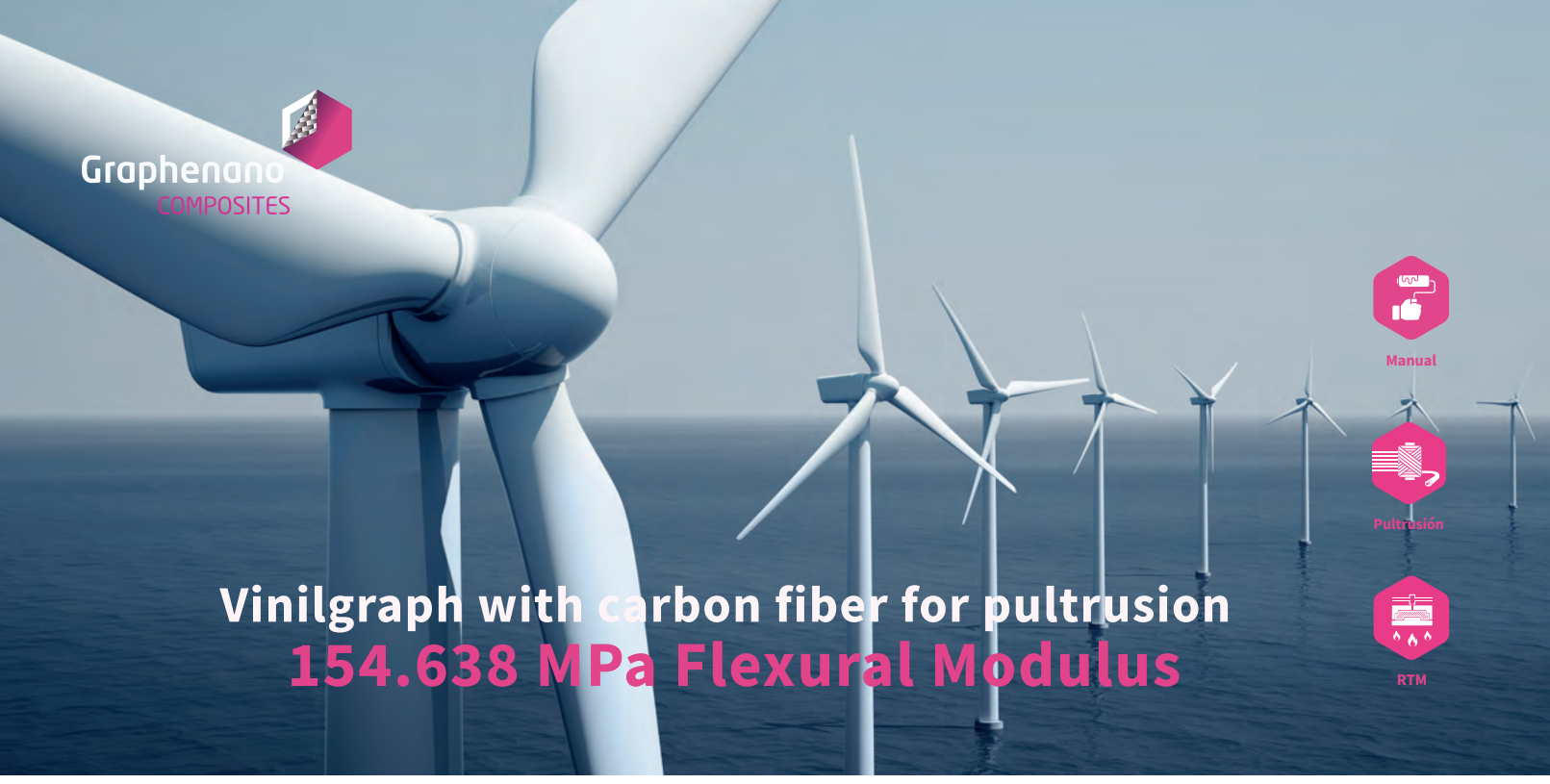
triples the flexural modulus
with more than 10,000 MPa

APPLICATIONS

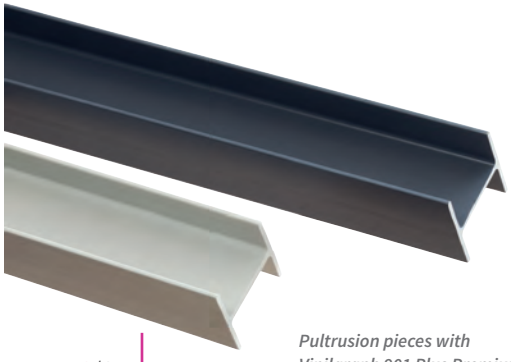
Railway · Marine · Automotion · Aviation · Signage · Sport equipment · Moto · Bicycle · Cisterns



VINILGRAPH 901 PLUS PREMIUM RESIN

The **vinylester epoxy resin with graphene** from Graphenano Composites stands out as the most advanced innovation in the composite materials market. Thanks to its enhanced properties and efficiency in use, it positions itself as a competitive and sustainable option for various industrial sectors, including automotive, naval, aerospace, civil engineering, among others.

The **Vinilgraph 901 Plus Premium** resin offers excellent resistance to corrosion from various agents such as organic and inorganic acids, alkalis, oxidizing chemicals, saline solutions, etc. Aditionally, it significantly enhances mechanical strength, including tensile and fleruxal properties, when combined with reinforcements such as fibreglass or carbon fiber.



Pultrusion pieces with Vinilgraph 901 Plus Premium

	WITHOUT GRAPHENE		WITH GRAPHENE	
	Flexural Modulus (MPa)	Tensile Modulus (MPa)	Flexural Modulus (MPa)	Tensile Modulus (MPa)
Vinilgraph 901 Plus Premium	4.000	3.600	**8.265**	**6.070**
Vinilgraph + carbonfiber pultrusion *	118.000	18.200	154.638	**26.300**

Carbon fiber content 60%

[1] TEST REPORT CERTIFICATE **TUV**

Vinilgraph 901 Plus Premium is our spectacular vinyl ester resin, with a **flexural modulus of 8.265 MPa** and a **tensile modulus of 6.070 MPa**. It is a resin with a **higher calorific value (17.500 J/g)**, comparable to phenolic resins, and outstanding resistance to a wide range of chemicals, which, along with its long durability in wet or aquatic environments, it is ideally suited for the most extreme conditions.

When **vinyl ester is combined with carbon fiber in pultrusion**, incredible results are achieved: a **flexural modulus of 154,638 MPa** and a **tensile modulus of 26,300 MPa**, with just **60% carbon fiber content**. This significant enhancement in mechanical properties, achieved at an unprecedented cost, positions our product as the optimal solution for propelling the pultrusion sector into a new era, potentially replacing traditional materials like steel.

CHARACTERISTICS

High Flexural Modulus (Greater than 8,265 MPa)
Exceptional strength and stiffness, superior even to epoxy resins. High durability in wet or aquatic environments.

Superior Heating Value (15.000 W·h·m·K)
Fire resistance comparable to phenolic resins.

High thermal conductivity
Efficient heat dissipation.

Low Exothermic Point
Safe and efficient curing.

Sustainability and Material Efficiency
Reduction in the amount of material required.

Excellent resistance to Hydrolysis
High durability in humid or aquatic environments

Properties of Bacteriostatic/Bactericidal Agents
Inhibits or kills bacteria.

High Chemical Resistance
Maximum resistance to a wide range of chemicals.

Doubling the Strength with Fiberglass in Pultrusion
Increases the elastic modulus to 66,874 MPa, double that of a common commercial resin of 30,000 MPa (approx.)

Comparative Cost-Efficiency
Although more expensive than polyester resins, it can halve the size of parts, competing with cheaper resins by offering far superior mechanical, chemical and thermal properties.

APPLICATIONS

Superior Heating Value
High Chemical Resistance!

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Manual

Pultrusión

RTM

EPOXY RESINS

Epoxigraph resins are formulated using low-viscosity epoxy resins to facilitate the impregnation of glass and carbon fibers, resulting in high adhesive power and exceptional chemical and mechanical resistance.

Additionally, these resins exhibit high resistance to moisture and extreme temperature

APPLICATIONS

Railway · Marine · Automotion · Aviation · Signage

Sport equipment · Moto · Bicycle · Cisterns

	WITHOUT GRAPHENE		WITH GRAPHENE	
	Flexural Modulus (MPa)	Tensile Modulus (MPa)	Flexural Modulus (MPa)	Tensile Modulus (MPa)
Epoxygraph 560 Epoxygraph 70	2.800	2.100	**5.064**	**4.240**


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can be stored
between 0ºC and 7º

PRE-IMPREGNATED

The Carbon and Glass Vinilgraph pre-impregnated materials represent the cutting edge in fiberglass and carbon fiber reinforcements, featuring with an innovative Vinilgraph epoxy resin impregnation technique.

They **can be stored at temperatures between 0 and 7 degrees Celsius**, something completely impossible with other pre-impregnated materials that have to be stored between -25 and -17 degrees Celsius. This allows us to achieve significant energy savings and a product that is much more environmentally friendly.

CarbonVinilgraph is much more economical than a carbon fiber epoxy pre-impregnated material, **has less water absorption**, and provides maximum resistance to external chemical agents. Our **CarbonVinilgraph reduces bubbles much better, so in most processes, the use of an autoclave is not necessary**, significantly reducing production costs. In composites of 10 layers of carbon fiber prepeg, **flexural modulus of 46.000 megapascals** are achieved, similar to prepeg with epoxy resin, highlighting a **30% improvement in the maximum strength the material can withstand in flexion**.

We also have fiberglass pre-impregnated materials that allow us to reach, in composites of 10 layers, **flexural modulus of 24.000 megapascals,** surpassing the values of epoxy resins used in standard prepeg.

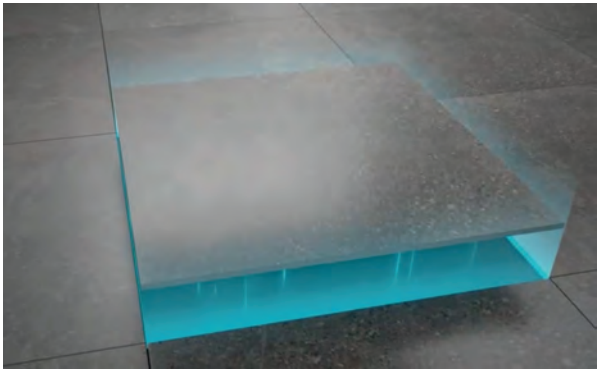
APPLICATIONS

¿WHAT IS MAGNEGRAPH?

Magnegraph is a magnetic composite system based on graphene in two components for adhesion through magnetism of parts. The *plug & play magnetic system allows for easy coupling of ceramic, wood, glass, marble, stone, etc. It can transform any surface with decorative coatings in a much easier and faster way.

The application of Magnegraph is easy: apply part A on the surfaces to be joined, and part B on the pieces to be magnetized. Its innovative design and efficient installation process make it an ideal solution to optimize processes and reducing costs in manufacturing and construction projects.

CHARACTERISTICS



ADVANTAGES

- Wall and Floor, easy apply with a roller or a machine
- Claddings materials, ceramic, wood, glass, ...
- Easier to replace. Smart assembly
- 5 Times faster, no need for drying.
- Cleaner & sustainable, it doesn´t make rubble.

IT HAS BEEN DESIGNED AND MANUFACTURED BY GRAPHENANO COMPOSITES FOR GMS

GLOBAL
MAGNETIC SYSTEM

www.graphenanocomposites.com

Creating ambiances
Plug and Play!

SPECIAL RESINS

REINFORGRAPH VINILGRAPH

Reinforgraph, our variant of vinilgraph is specially designed to **reinforce of ceramic pieces, natural and synthetic stone,** sognificantly enhancing their mechanical properties. The graphene epoxy vinyl ester resin is an innovative composite material that combines the unique properties of **epoxy vinyl ester resins** with the additional benefits of **graphene**. This resin offers medium viscosity and reactivity, making it suitable for a variety of industrial and engineering applications.

Thanks to the incorporation of graphene, this material demostrates **increased mechanical and chemical resistance**, making it an ideal choice for applications requiring durability and exceptional performance. Aditionally, it presents excellent adhesion to a wide variety of substrates, making it versatile for use in various industries

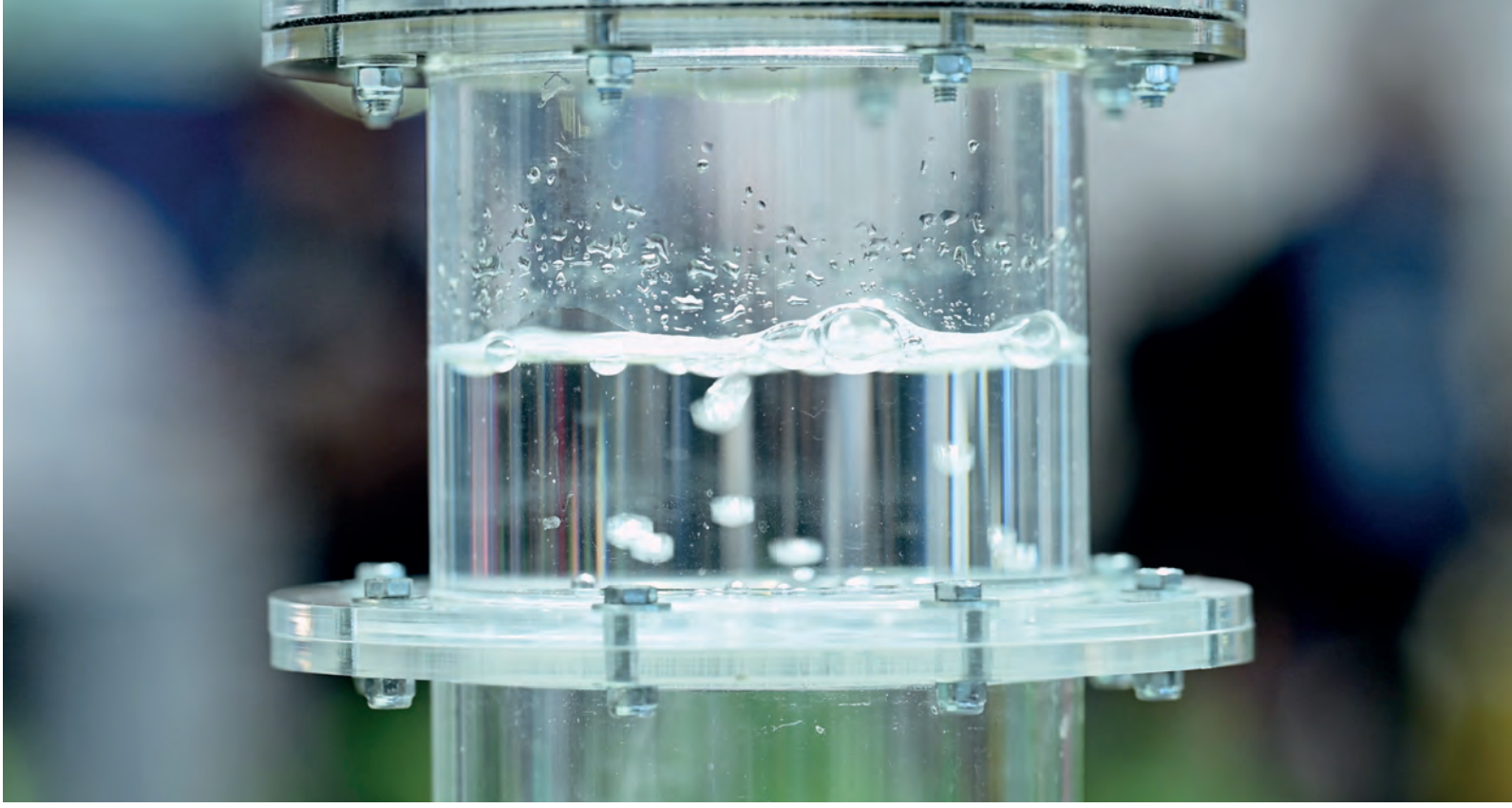
ECO VINILGRAPH RESIN

Vinilgraph ECO stands out as a recyclable alternative, offering remarkable mechanical properties and its ability to resist chemical agents. With a **flexural modulus of 9.700 MPa**, this resin provides a durable and environmentally friendly solution for waid range of applications

VINILGRAPH CONDUCTIVITY

Vinilgraph Conductivity, with high electrical conductivity, is ideal for finishes requiring enhanced conductivity to prevent the accumulation of static electricity. Moreover, it exhibits mechanical and chemical properties comparable to those of a vinyl ester resin.

Resistance **Lightness** **Hardness** **Conductive**



GRAPHENE MEMBRANE HYDROGEN GENERATION

The **metal-free graphene membrane** revolutionizes efficiency in hydrogen generation. Thanks to its innovative design, these membranes significantly reduce the manufacturing and maintenance costs of electrolyzers. The key lies in the exceptional durability and conductivity of graphene, which extends the lifespan of the membranes beyond traditional ones, thereby **decreasing the frequency of replacements and repairs.** This advancement not only offers an economical solution but also contributes to sustainability by eliminating the need for costly and difficult-to-extract metals. By adopting graphene membranes, we move towards a future of cleaner, more efficient, and accessible hydrogen production.

CELL COMPOSITE BATTERY

We introduce the revolutionary **World's First Metal-Free Battery**, a pioneering innovation in the field of sustainable energy. This unique battery stands out for its exclusive **use of recycled composite materials**, marking a milestone in green technology. With the capability to surpass ***10.000 charge cycles***, it sets a new standard for durability and performance. Its ***impressive charge time of 7C***, ***equivalent to just eight minutes***, redefines efficiency expectations, offering a quick and convenient solution for contemporary energy needs.

Similarly, its composition from eco-friendly composite materials not only minimizes environmental impact but also promotes the circular economy, reaffirming our commitment to the planet. This battery is not just a technological advancement; it is a step towards a more sustainable and responsible future.

WEIGHT REDUCTION POUCH = INCREASE DENSITY 30%

- Fewer material, less weight, more density = direct product cost reduction due to the materials employed.

COST REDUCTION

- The elimination of the collectors for the cathode and anode reduces weight considerably, increasing the density proportionally.

MORE INCREASE ECO-FREINDLY AND SAFE

- **NO FIRE**
- **NO EXPLOSION**
- By renouncing the commonly used metals such as copper and aluminium, it is much more eco-friendly.
- It improves thermal conductivity which helps to be safer and more efficient.

LESS COMPLEX PRODUCTS

- It simplifies and increases the productive capacity of the electrodes, making it possible to use higher depositing speeds.
- Anode and cathode drying energy reduction.
- Simplified anode and cathode manufacturing machinery and processes.

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GRAPHENE INSIDE

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