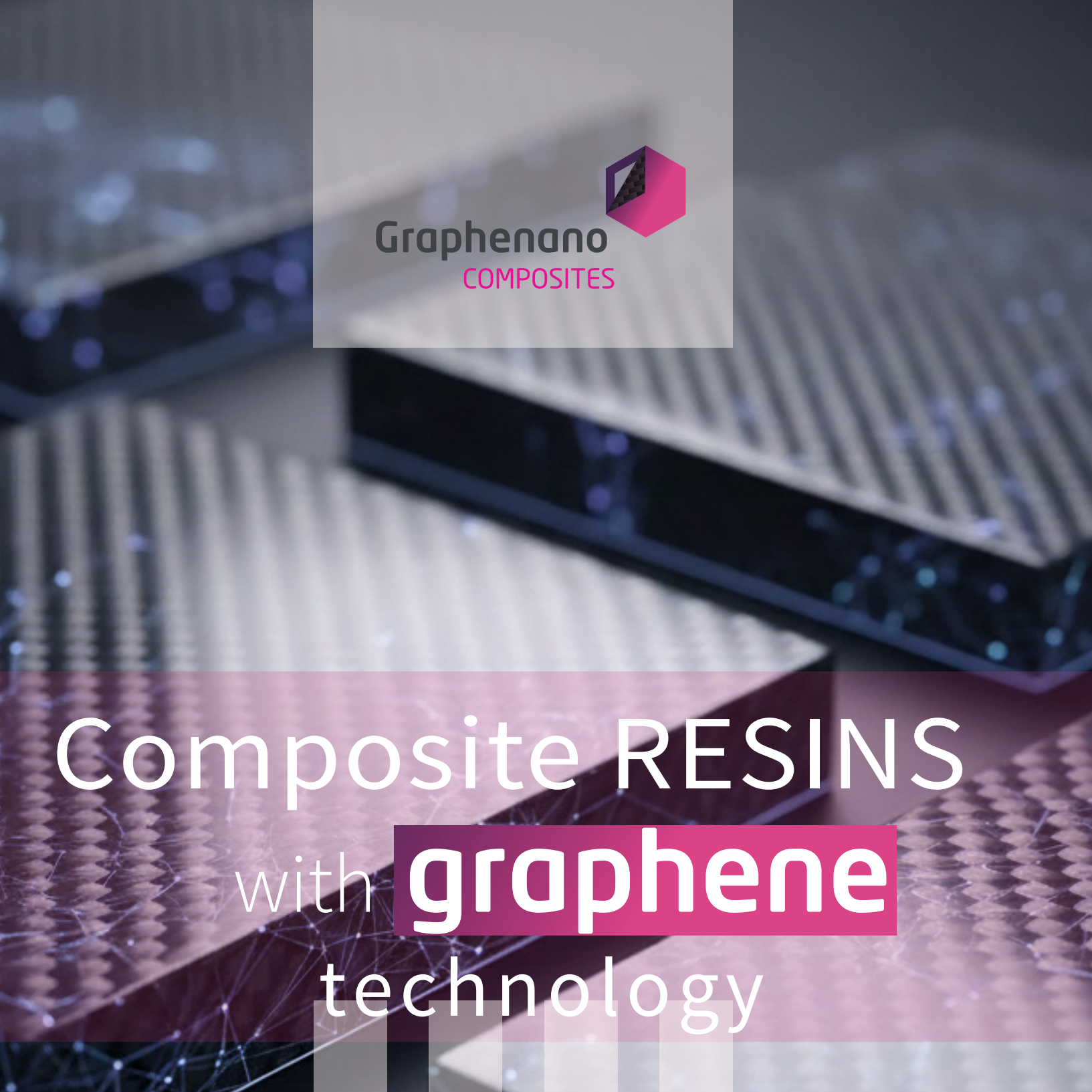

Graphenano
COMPOSITES
Composite RESINS
with graphene
technology


GTA
SPANIA GTA
Spano

INDEX

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 and Universities, 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 materials 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.

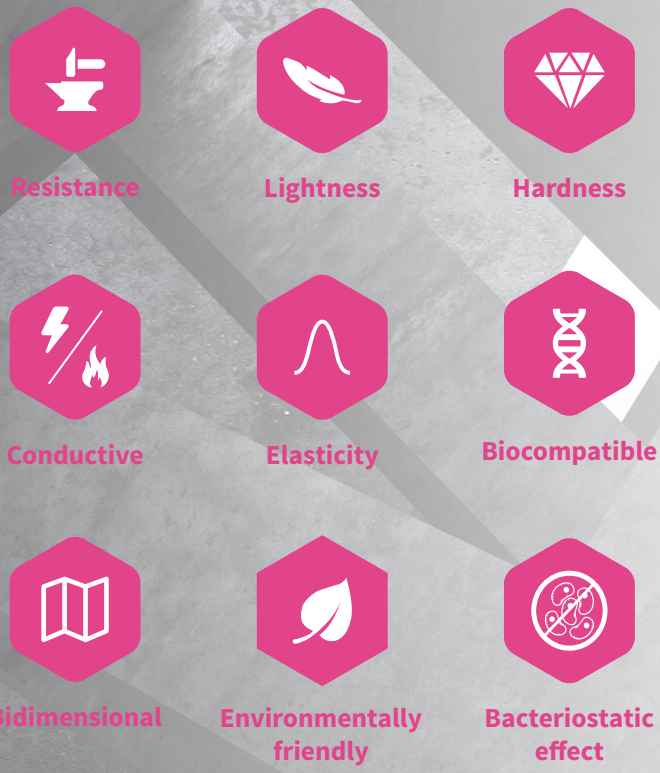

Graphenano
COMPOSITES

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

.

- 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?

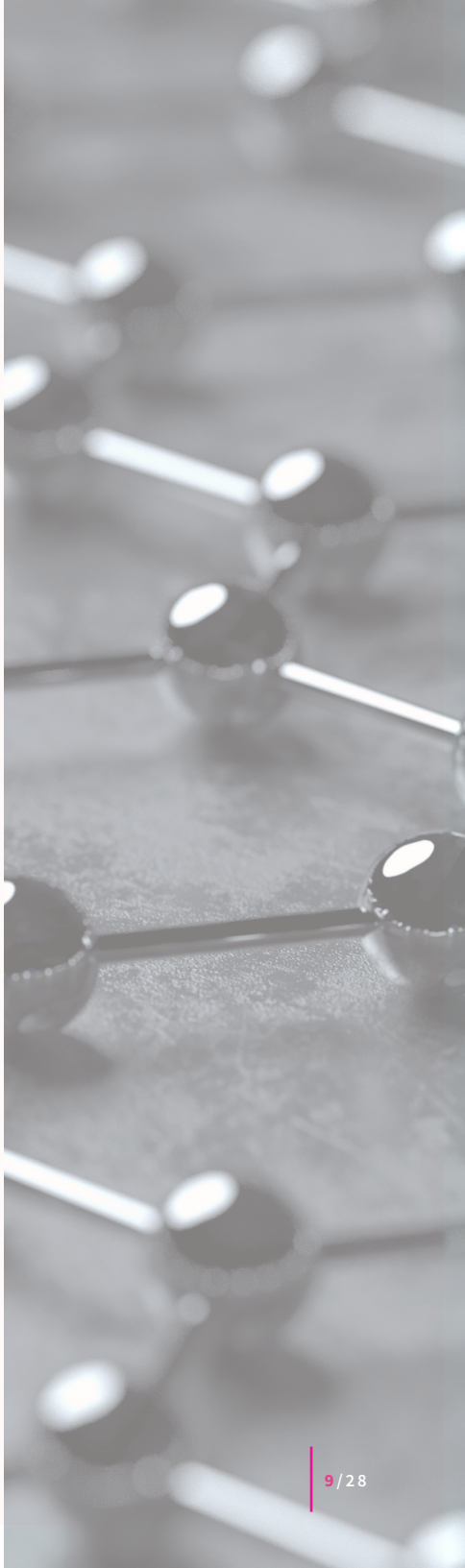
Is the strongest nanotechnological material known, with a strength 200 times superior to steel and a hardness greater than diamond, yet its thickness ranges between 1 and 10 carbon atoms. Being so thin, it is considered a two-dimensional material, the only one capable of remaining stable even at the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



POLYESTER

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	**9.000**	**6.500**
RESIN	Orthophthalic Poligraph	4.000	3.600	**10.000**	**6.500**
PULTRUSION	Isophtalic Pultrusion	32.000	13.000	**64.000**	**22.000**
PULTRUSION	Orthophtalic Pultrusion	24.000	11.000	**57.000**	**23.000**

[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.

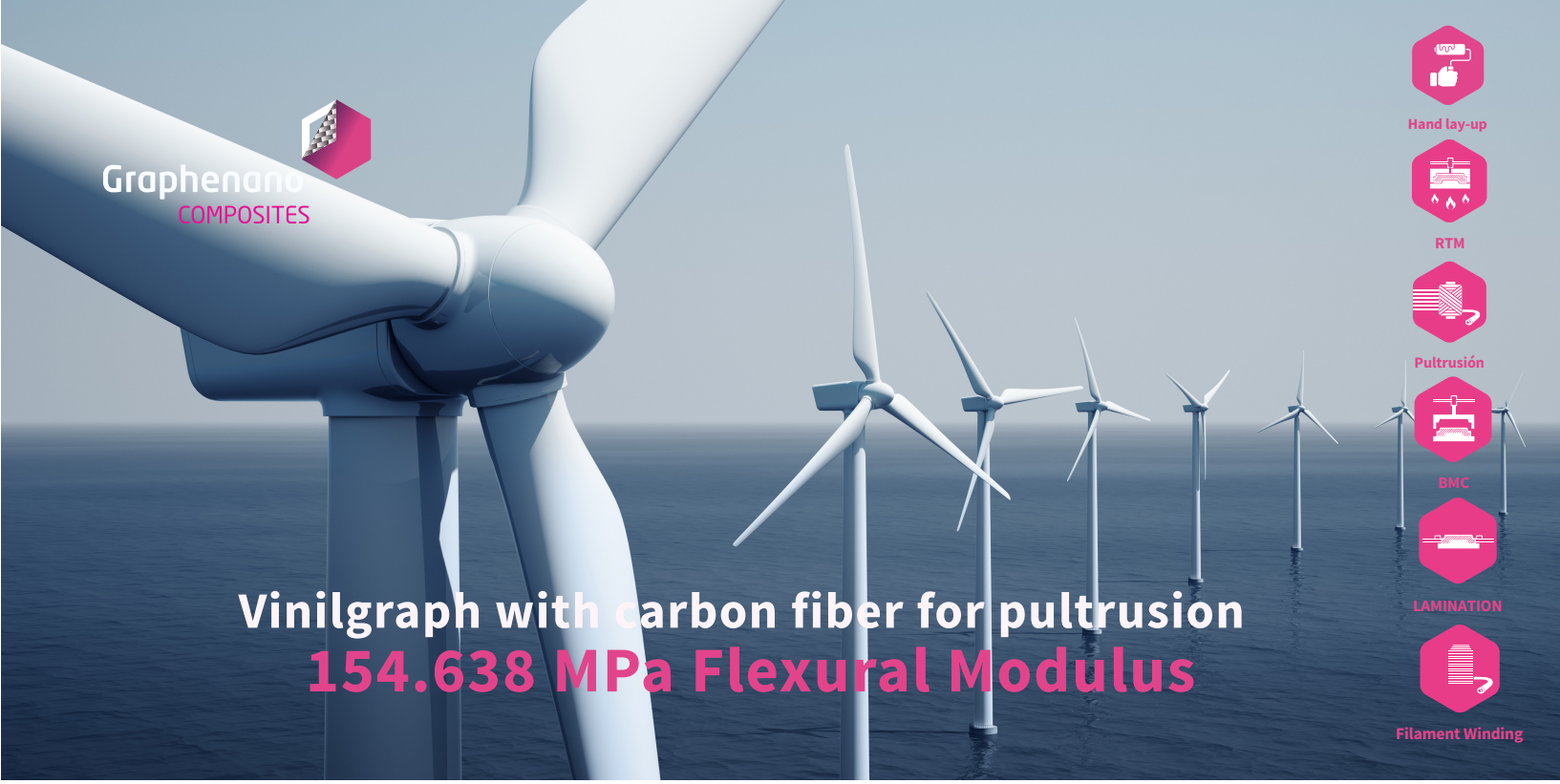
Hand lay-up **RTM** **Pultrusion** **BMC** **Lamination** **Filament winding**

Graphenano
COMPOSITES

triples the flexural modulus
with more than 10,000 MPa

APPLICATIONS

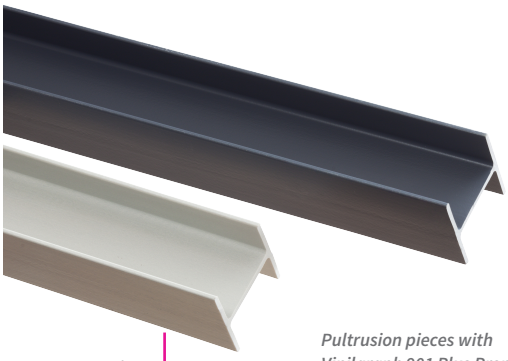
Railway · Marine · Automotion · Aviation · Signage · Sport equipment · Moto · Bicycle · Cisterns · Storage · Pools



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	8.500	6.000
Vinilgraph + carbonfiber pultrusion *	118.000	18.200	155.000	26.000

Carbon fiber content 60%

[1] TEST REPORT CERTIFICATE **TUV**

VINYLESTER

Vinilgraph 901 Plus Premium is our spectacular vinyl ester resin, with a **flexural modulus of 8.500 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 155.000 MPa** and a **tensile modulus of 26.000 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 8,500 MPa)
Exceptional strength and stiffness, superior even to epoxy resins. High durability in wet or aquatic environments.

Superior Heating Value
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!

www.graphenanocomposites.com

GEL COAT

GEL COAT RESINS

Graphene-enhanced high modulus **GELCOATS** offer superior mechanical performance, durability, and resistance to environmental factors. Designed for advanced composite applications, they provide exceptional protection, improved adhesion, and reduced weight, ensuring long-lasting and high-performance results.

CHARACTERISTICS

Enhanced Mechanical Strength – Increases hardness and impact resistance, reducing the risk of cracks and surface damage.

Lower Brittleness – Its high elastic modulus allows it to absorb stresses more effectively without breaking, preventing microcracks.

Improved Abrasion Resistance – Withstands wear caused by friction and continuous contact, increasing durability.

Superior Chemical Resistance – Enhances resistance to acids, solvents, and corrosive agents, making it ideal for harsh environments.

Reduced Permeability – Decreases moisture and external agent absorption, protecting the material's internal structure.

Better Thermal Stability – Resists temperature fluctuations without deformation or loss of properties.

Higher Adhesion – Integrates better with the composite substrate, preventing delamination and detachment.

Lower Weight – Maintains rigidity with lower density, contributing to overall weight reduction of the structure.

Increased UV Resistance – Protects against aging and yellowing due to sun exposure.

Reduced Shrinkage – Minimizes contraction during curing, improving the dimensional accuracy of parts.

Greater Durability – The combination of these properties ensures a longer service life with lower maintenance requirements.

APPLICATIONS

	WITHOUT GRAPHENE		WITH GRAPHENE	
	Flexural Modulus (MPa)	Tensile Modulus (MPa)	Flexural Modulus (MPa)	Tensile Modulus (MPa)
GelGraph ISO NPG Airless	3.000	3.000	**6.200**	**4.500**
GelGraph ISO NPG Moulds	3.000	3.000	**7.500**	**6.000**

Graphenano
COMPOSITES

Hand lay-up

Pultrusión

RTM

EPOXY

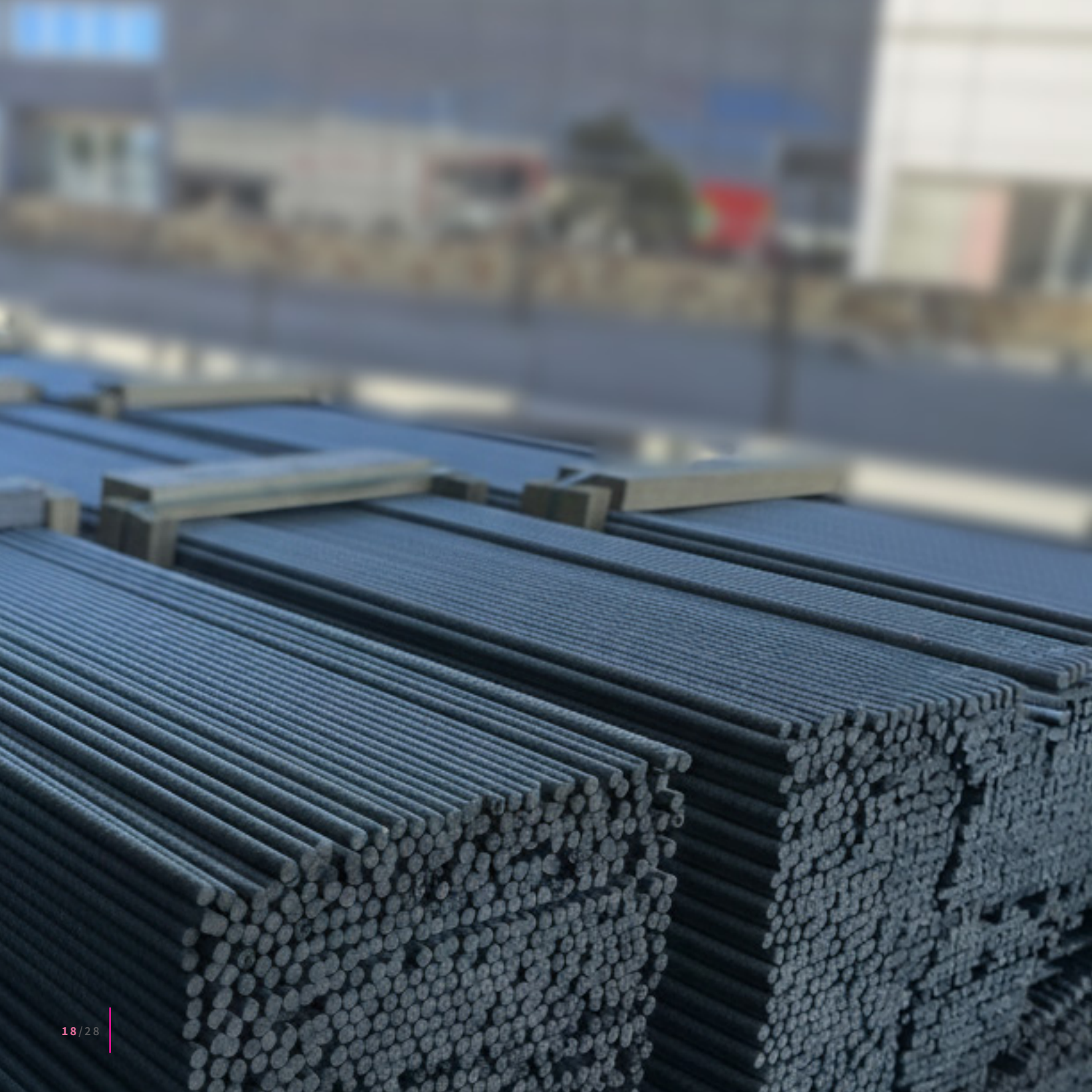
EPOXY RESINS

Epoxigraph resins are formulated using 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

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



EPOXY REBARS

EPOXY RESINS

Epoxigraph REBARS An epoxy resin with graphene designed for manufacturers of GFRP rebars who need stable process, efficient impregnation and mechanical performance and durability in demanding environments (including aggressive environments typical of infrastructure).

- **Efficient fiber impregnation and wetting**
  Reduced risk of defects, improved manufacturing stability
- **Optimized fiber-matrix adhesion**
  More compact and reliable reinforcement
- **Balance between reactivity and processing window**
  More predictable online production

CHARACTERISTICS

The formulation of the **EPOXYGRAPH REBARS** SYSTEM allows for optimal processability and stability in both open and closed mold processes. It features a long service life, low emissions, and outstanding mechanical properties in the final product. Its compatibility with multiple reinforcements (fiberglass, carbon, etc.) enables the manufacture of FRP with excellent physicochemical properties, making the resulting bars ideal for concrete infrastructure, marine environments, and highly corrosive settings.

	WITH GRAPHENE	
	Flexural Modulus (MPa)	Tensile Modulus (MPa)
Epoxygraph Rebars	5.500	3.500

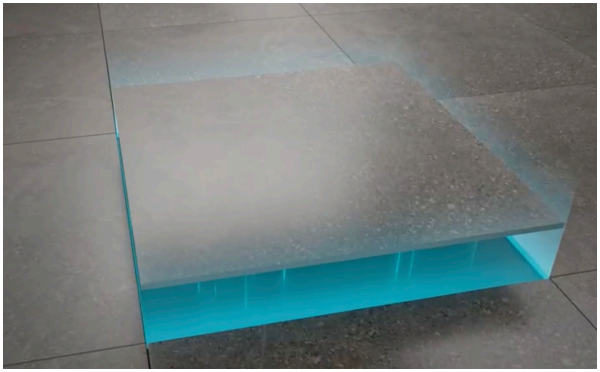
MAGNETIC PAINT

¿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 bubble.

MANUFACTURED BY GRAPHENANO COMPOSITES

Creating ambiances
Plug and Play!

SPECIAL RESINS

REINFORGRAPH VINILGRAPH

Reinforgraph, our variant of vinilgraph and expoxygraph is specially designed to **reinforce of ceramic pieces, natural and synthetic stone,** significantly enhancing their mechanical properties. The graphene epoxy vinyl ester resin is an innovative composite material that combines the unique properties of **epoxy and vinyl ester resins** with the additional benefits of **graphene**. These resins 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

MAGNETIC VINILGRAPH RESIN

Vinilgraph MAGNETIC is our graphene-reinforced magnetic vinylester resin, specially developed for pultrusion processes and other advanced composite technologies. This unique formulation combines the mechanical and chemical performance of a high-performance vinylester matrix with magnetizable properties integrated into the resin itself, opening up new design and engineering possibilities.

Thanks to its ability to be magnetized by external magnetic fields, **Vinilgraph MAGNETIC** enables the development of innovative structural and functional solutions, facilitating non-mechanical fastening systems, intelligent assemblies, and high-value-added technical applications. Its versatility makes it a disruptive alternative to traditional solutions based on steel or other metals, especially in demanding sectors such as defense, security, technical industries, and advanced infrastructure.

With **Vinilgraph MAGNETIC**, composites not only provide structure: they also interact.

HIGH PERFORMANCE RESINS WITH HALOGEN-FREE FLAME RETARDANT

In our quest to lead innovation in composite materials, we offer the option of formulating our Poligraph, Vinilgraph, and Epoxigraph lines with ammonium polyphosphate additives. This combination allows us to obtain ultra-resistant components with the highest fire safety profile.

Intumescent Protection: When exposed to fire, the additive acts as an "acid donor," forming a carbonaceous foam that acts as a heat shield, protecting the internal structure of the material from temperature increases.

The incorporation of these halogen-free additives provides critical properties for demanding industrial applications:

• UL 94-V0 Classification: The use of ammonium polyphosphate allows the epoxy, vinyl, and polygraph resins to achieve UL 94-V0 classification, guaranteeing self-extinguishing flames.

• Smoke and Toxicity Control (FST): This is an essential solution for transportation (rail and aviation), where compliance with strict regulations such as EN 45545-2 and FAR 25853 is required due to its excellent results in low smoke density and zero gas toxicity.

• Synergistic Effect: By combining our resins with alumina trihydrate (ATH), synergistic effects are achieved that enhance the Limiting Oxygen Index (LOI) and overall fire resistance.

Optimization for Polyester, Vinylester, and Epoxy Resins

Our systems maintain the exceptional mechanical properties of graphene, adding the technical benefits of the additive:

• Lightweight and Efficient: They enable the production of lightweight components with low solids content, optimizing the final part weight without sacrificing protection.

• Stability and Processability: The additive is colorless, non-hygroscopic, and completely insoluble in organic solvents, ensuring that it does not interfere with the reactivity or viscosity of our Poligraph, Vinilgraph, and Epoxigraph resins during molding or pultrusion.

• Chemical Resistance: It integrates perfectly into our vinylester resins (such as Vinilgraph 901 Plus Premium), maintaining their superior resistance to corrosion and chemical attack.

Next-Generation Composite Materials

Composites made with our additive-enhanced resins offer unparalleled durability:

• Moisture Resistance: Due to its extremely low water solubility, the flame retardant does not leach, ensuring permanent protection even in aquatic or high-humidity environments, where our resins already excel in their low water absorption.

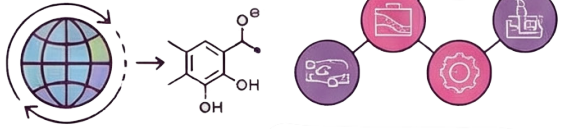
• Sustainable Commitment: We offer an environmentally friendly alternative to traditional halogenated flame retardants. Ammonium polyphosphate is biodegradable, naturally decomposing into phosphate and ammonia.

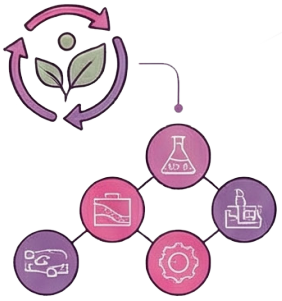
FIRE RETARDANT VERSIONS

APPLICATIONS

Recommended Applications: Thanks to this technology, our resins are ideal for manufacturing composite parts for critical infrastructure, the railway, naval, aviation and automotive sectors, where the mechanical strength of graphene and fire-resistant safety are non-negotiable.

ECO-FRIENDLY & BIODEGRADABLE
As a sustainable alternative to toxic hologenated retardants, ammonium polyphosphate naturally as composes into phosphate and ammonia.



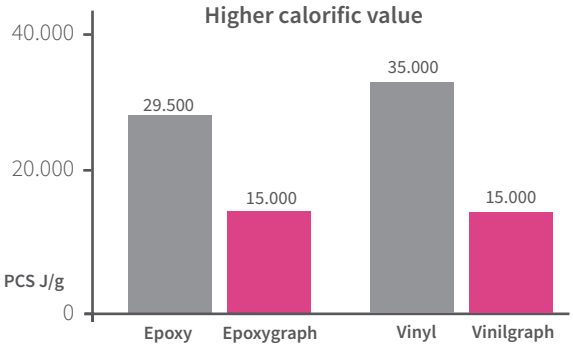


SPECIFIC INDUSTRY
Specifically optimized for Vinilgraph 901 Plus premium to maintain superior corrosin resistance in harsh chemical environments.

RAILWAY	Compliance with EN 45545-2
AVIATION	FAR 25 853 compliance and weight reduction
NAVAL/ MARINE	Non-leaching protection in aquatic environments
AUTOMOTIVE	Mechanical strength and passanger safety
INFRA-STRUCTURE	Long-term durability and fire safe materials

UL 94-V0 CERTIFIED PROTECTION

Ammonium polyphosphate ensures Poligraph, Vinilgraph & Epoxygraph resins achieve self-exthinguising properties



LIST OF PRODUCTS

		RESIN CHARACTERISTICS	MANUFACTURING SYSTEM							
			Hand Lay-up	Pultrusion	Lamination	RTM	Filament Winding	Infusion	BMC/SMC	Airless
POLYESTER	Poligraph 140 Plus Premium	Medium-low viscosity orthophthalic polyester resin with graphene	●	●					●	
	Poligraph 140 LV Plus Premium	Low viscosity orthophthalic Polyester resin with graphene	◎	●	●	●	●	◎	◎	◎
	Poligraph 140 TA	Orthophthalic polyester resin with graphene			●	●	●			
	Poligraph 90 LV	Polyester resin Low viscosity with graphene				●	●	●	◎	●
	Poligraph 70 Plus Premium	Low viscosity orthophthalic polyester resin with graphene	●	●					●	
	Poligraph 70 LV Plus Premium	Very-low viscosity isophthalic polyester resin with graphene	◎	●	●	●	●	◎	◎	
VINYLESTER	Vinilgraph 901 Plus Premium	Medium viscosity Epoxy Vinyl ester resin with graphen	●	●					●	
	Vinilgraph 901 LV Plus Premium	Low viscosity epoxy Vinylester resin with graphene	◎	●	●	●	●	◎	◎	
	Vinilgraph Rebars	Vinylester resin with graphene for rebars production		●		●	●	●		
	Vinilgraph Magnetic	Magnetic vinilgraph resin with graphene	●	●	●	●	●			
EPOXY	Epoxygraph Ceramic	Ceramic reforcement epoxy resin with graphene	●		●					
	Epoxygraph Rebars	Epoxy resin with graphene for rebars production	◎	●	●		●			
GELCOAT	Gelgraph Airless	Gel-coat isophthalic NPG polyester with graphene	●		●					●
	Gelgraph Moulds	Gel-coat isophthalic NPG polyester with graphene	●		◎					

Recomended ● / Possible use ◎

Graphenano
COMPOSITES

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GRAPHENE INSIDE

Graphenano Group:

Graphenano nanotechnologies

EUROPEAN REBAR COUNCIL
Built to Last. Engineered for the Future.

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