Graphenano
SMART MATERIALS

PRODUCT CATALOGUE
2027 EDITION · EN

GFRP REINFORCEMENT FOR STRUCTURAL CONCRETE

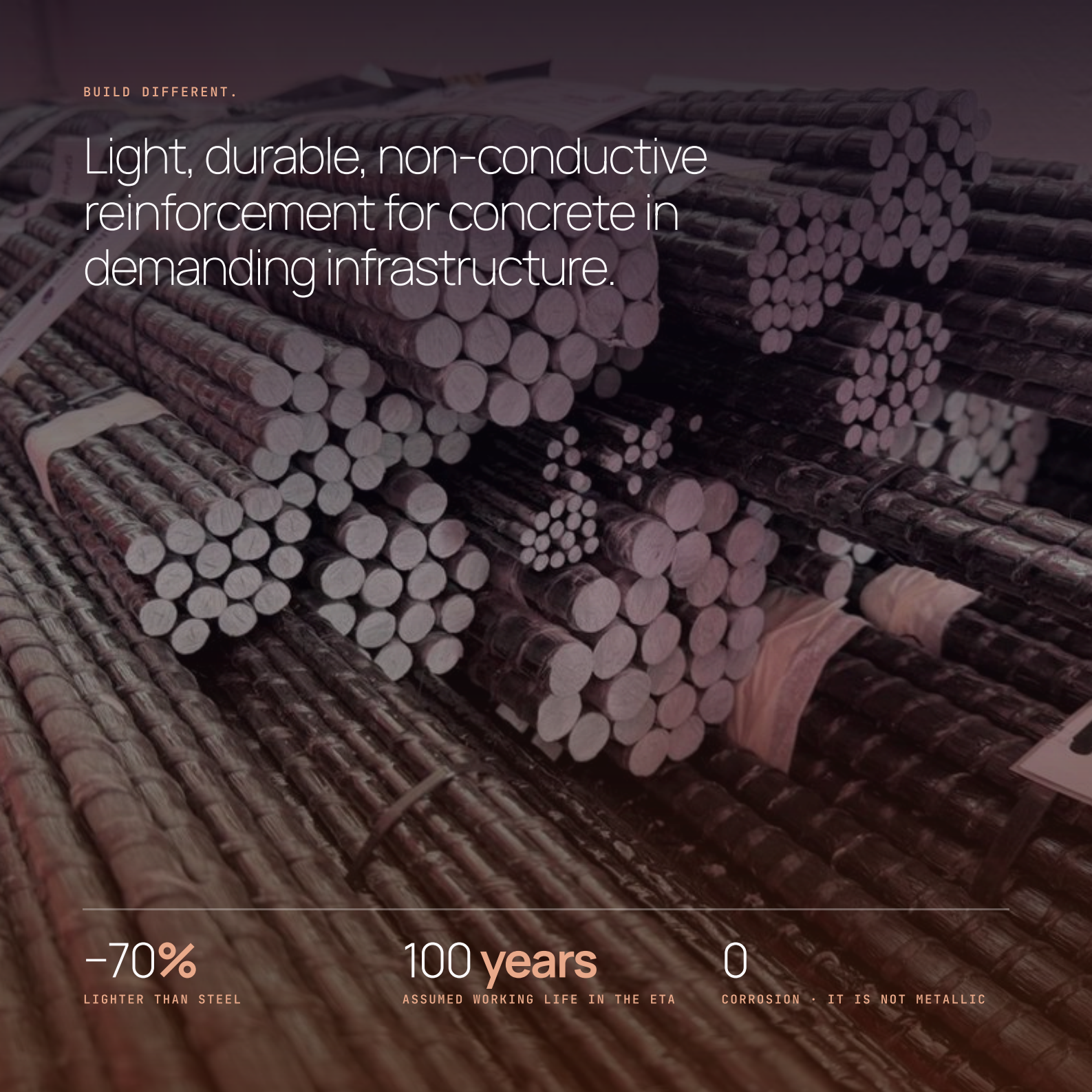
GraphenBar®

Graphene, glass fibre and epoxy resin bars for reinforcing concrete.



EUROPEAN TECHNICAL ASSESSMENT	NOTIFIED BODY	AVCP SYSTEM	MARKING
ETA 26/0130	TSÚS no. 1301	System 1+	CE · 1301

www.graphenanosmartmaterials.com



BUILD DIFFERENT.

Light, durable, non-conductive reinforcement for concrete in demanding infrastructure.

−70%
LIGHTER THAN STEEL

100 years
ASSUMED WORKING LIFE IN THE ETA

0
CORROSION · IT IS NOT METALLIC

GRAPHENBAR®

A GFRP reinforcement assessed in Europe.

GraphenBar® bars are reinforcement made of epoxy resin with graphene and glass fibre (GFRP), designed to replace steel in reinforced concrete applications.

They are produced by pultrusion from high-performance glass fibres and resins formulated with our own graphene, made in Yecla. Hence their tensile strength, their durability and their immunity to corrosion.

Their low weight simplifies transport, handling and placing, and cuts labour time.

Intended use

To reinforce load-bearing and non-load-bearing elements of monolithic and precast concrete structures. Mainly in parts of buildings exposed to a high risk of corrosion, in structures with requirements for protection against electromagnetic influences and in structures where cutting of the reinforced element is foreseen.

The bars are used where there is **full bond** between bar and concrete along the whole length.

TEXT OF ETA 26/0130

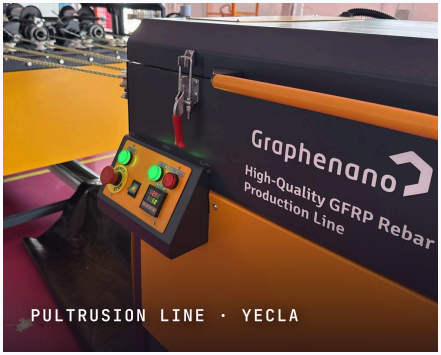
Assumed working life

The provisions of the European Technical Assessment are based on an assumed working life of **100 years**, provided the product is properly installed, used and maintained. The assumed working life **cannot be interpreted as a guarantee given by the manufacturer**, but is a means of choosing the right product in relation to the expected economically reasonable working life of the works.

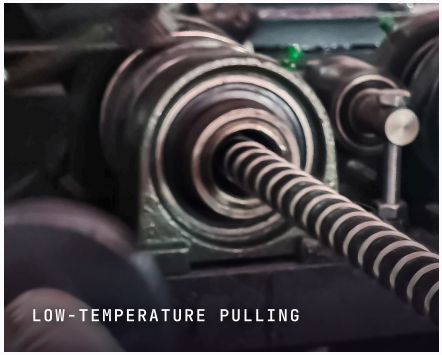
PROCESS

Pultrusion with graphene.

A continuous process: many glass-fibre filaments are pulled through a bath of graphene-loaded resin and then through a temperature-controlled metal die. The bar comes out cured, calibrated and ready to be cut to length.



PULTRUSION LINE · YECLA


LOW-TEMPERATURE PULLING


CUTTING TO LENGTH AND PACKING

01
Rovings and mat
Glass-fibre reinforcement

02
Impregnation
Graphene-loaded resin

03
Curing die
Controlled temperature

04
Pulling
Low temperature

05
Cutting
To length, with no limit on length

What graphene brings

Glass fibre is a good thermal insulator and withstands high temperatures. Graphene-doped resin gives the composite greater tensile and interlaminar strength, flexibility and anti-corrosive properties.

Advantages of the process

- High stiffness compared with pultrusion without graphene.
- Cutting to length and long lengths.
- High speed and continuity of production.

COMPARISON

Nine reasons to **change reinforcement**.



Lighter

Up to 70 % less weight than steel.



Strong

High characteristic tensile strength.



Insulating

No appreciable electrical or thermal conductivity.



Less costly

Lower handling, transport and placing costs.



Chemically stable

Resistant to chemicals and immune to corrosion.



No interference

Transparent to electromagnetic signals.



Non-magnetic

Suitable where metal cannot be used.



It does not rust

No coatings and no corrosion inhibitors.



Smaller footprint

Less weight and less energy used in transport.

A full assessment of an industrial platform showed that GFRP parts have a lower environmental impact than the same parts in steel: less material weight, less energy used in transport and less impact on greenhouse gases, acidification, eutrophication, ozone depletion and smog. **These are sector figures for pultruded profiles, not a study specific to GraphenBar®.**

LIFE CYCLE

74 to 80 MJ against **315 to 371 MJ** per part.

Life-cycle assessment of pultruded parts shows embodied energy far below that of the equivalent steel part: no blasting, no painting and no maintenance in the use phase. These are sector figures for generic pultruded profiles, not an LCA of the GraphenBar® product.

CASE STUDY · 3.5 KG STEEL PART

Primary steel	262
Secondary operation	4–6
Field installation	0–35
Maintenance in use	30–35

315–371 MJ

CASE STUDY · 1.0 KG COMPOSITE PART

Primary raw material	0–74
Secondary operation	≤6
Field installation	0
Maintenance in use	0

74–80 MJ

Thanks to the cohesion our graphene provides, and unlike conventional pultrusion, we can **recover the material**: it is ground, micronised and used again in other composite parts.

PERFORMANCE

Designed for **professionals**.

GraphenBar® offers an alternative to steel with no rust and no corrosion, performing in any climate and with no risk of material deterioration. Light but robust, it allows faster, safer installation and cuts labour time.

Assessment and production control

It is made under **factory production control (FPC)** and assessed in accordance with **EAD 260023-00-0301**. Structural design is the responsibility of the project engineer.







APPLICATIONS

- Driveways
- Pavements and urban works
- Pool decks
- Basements and basement walls
- Footings
- Concrete masonry
- ICF construction
- Warehouse floors
- Agricultural slabs
- Loading docks
- Architectural elements
- Precast units
- Truck platforms
- Stair shafts
- Lift shafts
- Crack repair
- Masonry rehabilitation
- External walls
- Car-park slabs
- Columns and piling

PRODUCT

GraphenBar® Fiberglass Epoxy.



Product description

Graphene reinforcing bars with glass fibre (GFRP) and epoxy resin, designed to replace steel in reinforced concrete structures. They combine mechanical strength, light weight and dielectric stability.

Suitable for buildings, precast units and ground slabs, in aggressive environments, in structures close to sensitive equipment and in works where fast installation and long working life are sought.

DIAMETERS

6 · 8 · 10 · 12 · 14 · 16 · 18 · 20 mm

Other sizes on request, **not covered by the European Technical Assessment**. Equivalence table on page 18.

Use of our graphene composite bars

The bars are made under factory production control and assessed in accordance with EAD 260023-00-0301. **Structural design is the responsibility of the project engineer**, who must apply the codes and guidelines in force for this material.

The performances of the product are those stated in the Declaration of Performance. Their use on each site must be agreed with the project supervision team.

BEHAVIOUR AT FAILURE

Transversally **solid**.

FRP bar without graphene fails irregularly, with many fractured filaments and unstable deformation that compromises its integrity.

GraphenBar® fails cleanly and in a controlled way, with aligned fibres and a more cohesive structure: safer, more predictable behaviour.

INTERLAMINAR SHEAR STRENGTH

up to 54.7 MPa

Mean test value (EN ISO 14130).



YOU FEEL IT ON SITE

One lorry of GraphenBar® equals **six of steel**.

At around 27 % of the weight of steel, every 20 t lorry carries far more metres of reinforcement. Fewer loads, less craneage and less handling labour. Cutting produces no spark.

×6

LORRIES OF STEEL EQUAL ONE OF GRAPHENBAR®

−70%

LIGHTER THAN STEEL

0

CORROSION MAINTENANCE OVER THE WHOLE WORKING LIFE

The low weight allows lighter structures, with less dead load and far simpler handling on site. The steel equivalence table on page 18 gives the metres per 20 t lorry for each diameter.



NEW BUILD AND REFURBISHMENT

It does not rust. It does not conduct. It is not heavy.

Where moisture degrades steel and where the weight of the reinforcement shapes the job, GraphenBar® changes the approach.

REGULATION (EU) NO 305/2011

Assessed, certified and **CE marked**.

CE
1301

GraphenBar® holds a European Technical Assessment, a certificate of constancy of performance issued by a notified body under system 1+ —the most demanding in the Regulation— and a manufacturer's Declaration of Performance. With all three documents, the bar is placed on the market **CE marked across the European market** as structural reinforcement.

ASSESSMENT

ETA 26/0130

version 01 · 3 Nov 2026

CERTIFICATE

1301-CPR-2719

TSÚS no. 1301 · 5 Nov 2026

DECLARATION

DoP GRB001

version 01 · 5 Nov 2026

ETA 26/0130 · EAD 260023-00-0301

One European document, valid across **the whole Union**.

The **European Technical Assessment ETA 26/0130**, version 01 of 3 November 2026, was issued by TSÚS as technical assessment body in accordance with EAD 260023-00-0301, the European assessment document for FRP bars for the reinforcement of structural elements.

The **certificate of constancy of performance no. 1301-CPR-2719**, of 5 November 2026, is issued by TSÚS as **notified body no. 1301** under **system 1+**, the most demanding in Regulation (EU) 305/2011.

What system 1+ requires

- Product type testing by the technical assessment body.
- Permanent, auditable factory production control.
- Initial inspection of the plant by the notified body.
- Continuous surveillance and **audit testing of samples taken at the plant**.

That last point is what sets system 1+ apart from systems 1 and 2+.

For the works, GraphenBar® stops being “an alternative material”: it is **structural reinforcement assessed in Europe**, with a public document that engineers, contractors and authorities can check. Design remains the responsibility of the project engineer.



Notifikovaná osoba č. 1301

TECHNICKÝ A SKÚŠOBNÝ ÚSTAV STAVEBNÝ, n. o.
BUILDING TESTING AND RESEARCH INSTITUTE
Studená 3, 821 04 Bratislava, Slovenská republika

Certificate of constancy of performance

1301 – CPR – 2719

In compliance with Regulation (EU) No 305/2011 of the European Parliament and of the Council of 9 March 2011 (the Construction Products Regulation or CPR), this certificate applies to the construction product

Glass Fiber Reinforced Polymer (GFRP) rebar
GraphenBar

is intended to be used as reinforcement of construction works and elements made of reinforced concrete (beams, columns, panels, slabs and other structural elements) and as post-installed rebars.

Placed on the market under the name of

Graphenano Smart Materials sl
Ctra. de Villena, km 0,5, 30510 Yecla, Murcia
Spain

and produced in the manufacturing plant

Graphenano Smart Materials sl
Ctra. de Villena, km 0,5, 30510 Yecla, Murcia
Spain

This certificate attests that all provisions concerning the assessment and verification of constancy of performance described in the

ETA 26/0130 – version 01, issued on 03/11/2026

and

EAD 260023-00-0301

under system 1+ for the performance set out in the ETA are applied and that the factory production control conducted by the manufacturer is assessed to ensure the

constancy of performance of the construction product.

This certificate was first issued on 5 November 2026 and will remain valid as long as neither the ETA, the EAD, the construction product, the AVCP methods nor the manufacturing conditions in the plant are modified significantly, unless suspended or withdrawn by the notified product certification body.

Bratislava, 5 November 2026

Dipl. Ing. Daša Kozáková
Head of Notified Body 1301

198591

CERTIFICATE OF CONSTANCY OF PERFORMANCE

No. 1301-CPR-2719 · TSÚS, notified body no. 1301 · Bratislava, 5 November 2026 · system 1+.

Download at graphenanosmartmaterials.com/certificados

DOP NO. GRB001 · PRODUCT TYPE GRB-GFRP-06/20

The declaration signed by the **manufacturer**.



Graphenano SMART MATERIALS

DOP NO. GRB001 CE

REGULATION (EU) NO 305/2011 · ANNEX III

Declaration of Performance

PRODUCT
GraphenBar
GRB-GFRP-06/20

EUROPEAN TECHNICAL ASSESSMENT	EUROPEAN ASSESSMENT DOCUMENT	NOTIFIED BODY	AVCP
ETA 26/0130	EAD 260023-00-0301	TSÚS - No. 1301	System 1+

1	Unique identification code of the product-type	PRODUCT-TYPE CODE: GRB-GFRP-06/20 PRODUCT: GraphenBar - straight glass fibre reinforced polymer (GFRP) bar NOMINAL DIAMETERS: Ø6 · Ø8 · Ø10 · Ø12 · Ø14 · Ø16 · Ø18 · Ø20 mm
2	Intended use/s	Reinforcement of works and of reinforced concrete elements (beams, columns, panels, slabs and other structural elements) and post-installed reinforcement, according to clause 2.1 of ETA 26/0130. Assumed working life: 100 years.
3	Manufacturer	MANUFACTURER AND PLANT: Graphenano Smart Materials, S.L. · Ctra. de Villena, km 0,5 · 30510 Yecla (Murcia) · Spain CONTACT: info@graphenanosmartmaterials.com · (+34) 965 108 102
4	Authorised representative	Not applicable.
5	System/s of assessment and verification of constancy of performance (AVCP)	System 1+ (Commission Decision 97/597/EC).
6	European Technical Assessment	EUROPEAN ASSESSMENT DOCUMENT: EAD 260023-00-0301 EUROPEAN TECHNICAL ASSESSMENT: ETA 26/0130, version 01, of 03/11/2026 TECHNICAL ASSESSMENT BODY: Technický a skúšobný ústav stavebný, n. o. (TSÚS), Bratislava NOTIFIED BODY: TSÚS - No. 1301 - certificate of constancy of performance No. 1301-CPR-2719, of 05/11/2026

Graphenano SMART MATERIALS — Graphenano Smart Materials, S.L. · Ctra. de Villena, km 0,5 · 30510 Yecla (Murcia) · Spain · info@graphenanosmartmaterials.com · (+34) 965 108 102 — DoP No. GRB001 Page 1 / 3

CE 1301

DECLARATION OF PERFORMANCE

DoP no. GRB001, version 01, of 5 November 2026 · Annex III to Regulation (EU) No 305/2011, as amended by Delegated Regulation (EU) No 574/2014.

Download at graphenanosmartmaterials.com /declaracion-de-prestaciones

The Declaration of Performance is the document by which **the manufacturer assumes, under its sole responsibility**, that the product achieves the declared performances. It is the piece that completes the Regulation: with the ETA, the notified body's certificate and this declaration, GraphenBar® **carries the CE marking** and can be placed on the market as structural reinforcement throughout the European market.

It sets out the product type, the intended use, the manufacturer, the system of assessment and verification, the applicable technical specification, the bodies involved and, above all, **the table of declared performances, characteristic by characteristic**.

What the specifier will find

- The performances per diameter, from 6 to 20 mm.
- The test method for each characteristic.
- The characteristics not determined (NPD), declared as such.
- The assumed working life and its scope.

Where to obtain it

The declaration is supplied with the product and published at the address given, in accordance with Article 7 of Regulation (EU) 305/2011 and Delegated Regulation (EU) No 157/2014. Each revision is published under its own number and **earlier versions remain accessible**.

BY DIAMETER

Choose the diameter. The table does the **rest**.

METRIC	#6	#8	#10	#12	#14	#16	#18	#20
Characteristic tensile load kN	27.3	48.8	74.3	102.0	142.3	176.8	223.2	252.6
Effective cross-sectional area A_{eff} mm^2	30.29	52.14	88.17	121.09	173.38	220.83	268.14	326.80
Mass kg/m	0.058	0.102	0.167	0.237	0.337	0.424	0.526	0.625

Selection data per diameter. The European Technical Assessment covers these eight diameters. The full performances, characteristic by characteristic, are given in the Declaration of Performance.

DENSITY · G/CM³

1.96 GraphenBar®

7.85 Steel

MASS Ø20 · KG/M

0.63 GraphenBar®

2.47 Steel

TENSILE · MPA

up to 935 GraphenBar®

540 B500 steel

GraphenBar® bars weigh around 27 % of what steel bars weigh, which allows lighter structures and simpler handling on site. Their characteristic tensile strength is higher than that of conventional non-alloy and stainless steel reinforcing bars. The capacity of each element depends on the structural design and on the reinforcement arrangement.

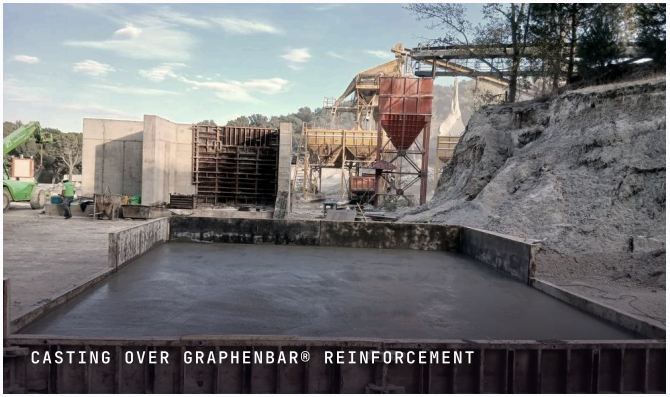
PLACING

Tied, cut and cast the **same way**.

The bar arrives on site in light bundles, is handled by hand, is cut without sparks and is tied using the usual methods. There is no learning curve for the crew.


LIGHT BUNDLES · MOVED BY HAND


GROUND-SLAB REINFORCEMENT ON SITE


CASTING OVER GRAPHENBAR® REINFORCEMENT


RIBBED SURFACE · BOND TO CONCRETE

Cut with a fine-tooth saw, an angle grinder or a diamond blade; no end sealing. Tie with steel wire, plastic-coated wire or nylon cable ties. **Cover and reinforcement arrangement are set by the project engineer.**

HANDLING

Packing, handling and **storage**.

Weather and sunlight

GraphenBar® is weather resistant, although exposure to UV light may cause discolouration or surface chalking. These are cosmetic effects and do not affect performance. For prolonged exposure to the sun a protective cover is recommended; the product can be ordered with a UV protection additive at extra cost.

Rain and snow

It can be stored in rain and snow without problem: the material does not corrode and its water absorption is very low, checked batch by batch.

Cutting and tying

Use a fine-tooth saw, a carbide-grit saw, an angle grinder or a diamond blade. The ends do not need sealing. A dust mask and protective gloves are recommended.

For tying, use standard or plastic-coated steel wire. In non-magnetic applications, nylon cable ties avoid any electrical interference.

Concrete cover and reinforcement arrangement are set by the project engineer, in accordance with the structural design of each job and with the technical documentation of the product.

Bent bars

GraphenBar® is made with a thermoset epoxy matrix: it cannot be bent after the curing cycle. Bent bars **are not part of the assessed performances**; ask our technical department about availability. Minor adjustments are possible thanks to the inherent flexibility of the bar.

HOW TO COMPARE

Steel is bought by weight. GraphenBar is not.

Two bars that reinforce the same do not weigh the same: ours weighs around seven times less. That is why comparing prices per tonne says nothing. What gets tied and cast is metres, and one tonne of GraphenBar® yields seven times more metres than one tonne of the steel it replaces.

×7
MORE METRES PER TONNE

9,804 m
FROM 1 T OF GRAPHENBAR Ø8

1,126 m
FROM 1 T OF THE Ø12 STEEL IT REPLACES



The kilo measures haulage. The metre measures reinforcement.

The valid comparison is not the price per tonne, but the price per metre of equivalent reinforcement.

Metres yielded by one tonne of each material, diameter by diameter. GraphenBar® mass per DoP no. GRB001; steel mass, nominal ($\pi/4 \cdot d^2 \cdot 7{,}850$ kg/m³).
Indicative equivalences: replacement of reinforcement is verified by the project engineer, especially where deflection or cracking governs.

ENGINEERING QUESTIONS

Performance.

How does the strength compare with steel?

GraphenBar® has a characteristic tensile strength of 772.8 to 935.2 MPa (112 to 136 ksi) depending on diameter, higher than that of ordinary steel reinforcing bars. The capacity of a given element depends on the structural design and on the reinforcement arrangement.

And the modulus of elasticity?

From 39.5 to 43.7 GPa (5,733 to 6,340 ksi) depending on diameter. Being lower than that of steel, the bar is more flexible, which **the project engineer must take into account when calculating deflections**.

What is the ultimate strain?

From 1.8 to 2.2 % depending on diameter.

How resistant is it to an alkaline environment?

GraphenBar® retains between 72.0 % and 90.5 % of its tensile capacity, depending on diameter, after 3,000 hours of direct exposure to an alkaline solution of pH 13 at 60 °C.

Maximum service temperature?

The declared glass transition temperature is 109.1 °C and the declared maximum service temperature ranges from 70.5 to 86.9 °C depending on diameter. **Reaction to fire is not an assessed characteristic** of the product.



HELICAL RIBBING · BOND TO CONCRETE

ENGINEERING QUESTIONS

Handling on **site**.

What sizes are available?

Diameters of 6, 8, 10, 12, 14, 16, 18 and 20 mm. Other sizes to order, not covered by the European Technical Assessment.

How is it cut on site?

Fine-tooth saw, or high-speed angle grinder with a carborundum or diamond disc. The ends do not need sealing.

Is a respirator needed when cutting?

No, but a dust mask is recommended. See the Instructions for Safe Use sheet.

Can it splinter when handled?

Protective gloves are recommended to avoid cuts and scratches, especially at cut ends.

Which tying wire is used?

Standard or plastic-coated steel wire for traditional methods. In non-magnetic applications, nylon cable ties avoid electrical interference.

Can it be bent on site?

No. The thermoset epoxy matrix prevents bending after curing. Bent bars are not part of the assessed performances; ask our technical department about availability.



COIL AND STRAIGHT BAR · HANDLING ON SITE

ENGINEERING QUESTIONS

Environment and **cost**.

Can it be stored in the sun?

Yes, although no more than three months is recommended. The thermoset matrix withstands UV radiation. UV protection can be ordered at extra cost.

What happens at the end of its working life?

Glass fibre is recyclable and, when the bar is in concrete, the material can be crushed with the concrete and become part of recycled concrete. The assumed working life is 100 years according to the technical assessment; **this does not constitute a manufacturer's guarantee**.

Can the concrete be cured with seawater?

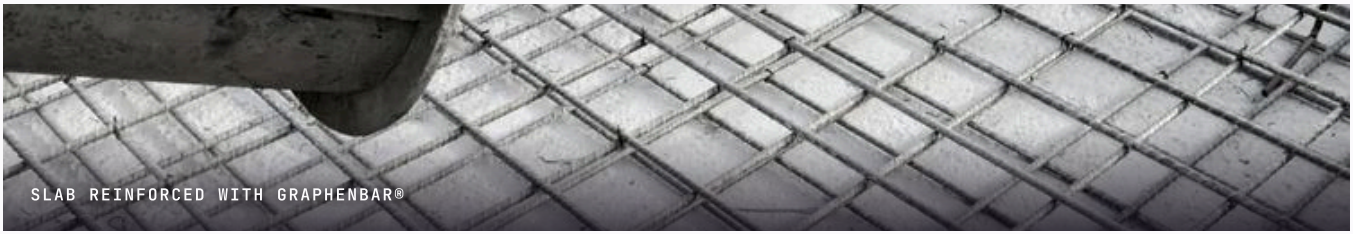
Yes. As the reinforcement cannot corrode, the concrete can be cured with seawater, which saves fresh water.

How does the price compare with steel?

Far below stainless steel. Against conventional reinforcing steel, once savings in labour, corrosion inhibitors, cover and transport are counted, the total project cost goes down.

Why does it cut the project cost?

- Installation time
- Transport
- Handling and cutting
- Corrosion inhibitors
- No corrosion maintenance in the short, medium or long term



SLAB REINFORCED WITH GRAPHENBAR®

ENGINEERING QUESTIONS

Design and **replacement**.

Can steel be replaced one for one?

GraphenBar® has a characteristic tensile strength higher than that of ordinary reinforcing steel and a lower modulus of elasticity. It behaves linearly elastic up to failure, so there is no yield point to determine.

In most cases where design is governed by the ultimate limit state (ULS) and not by serviceability, it can be substituted directly. **Where deflection governs, redesign is recommended** using the GFRP specifications, to make sure deformations stay under control, often optimising section and material use.

Engineers must follow the codes and guidelines in force for GFRP bars, not those for steel.

Does it work in seismic zones?

Seismic behaviour **is not an assessed characteristic** of the product, so its use in seismic zones must be justified by the project engineer.

Bridges and structures reinforced with GFRP bars exist in seismic regions; that experience refers to GFRP bars in general and not to the GraphenBar® product in particular.

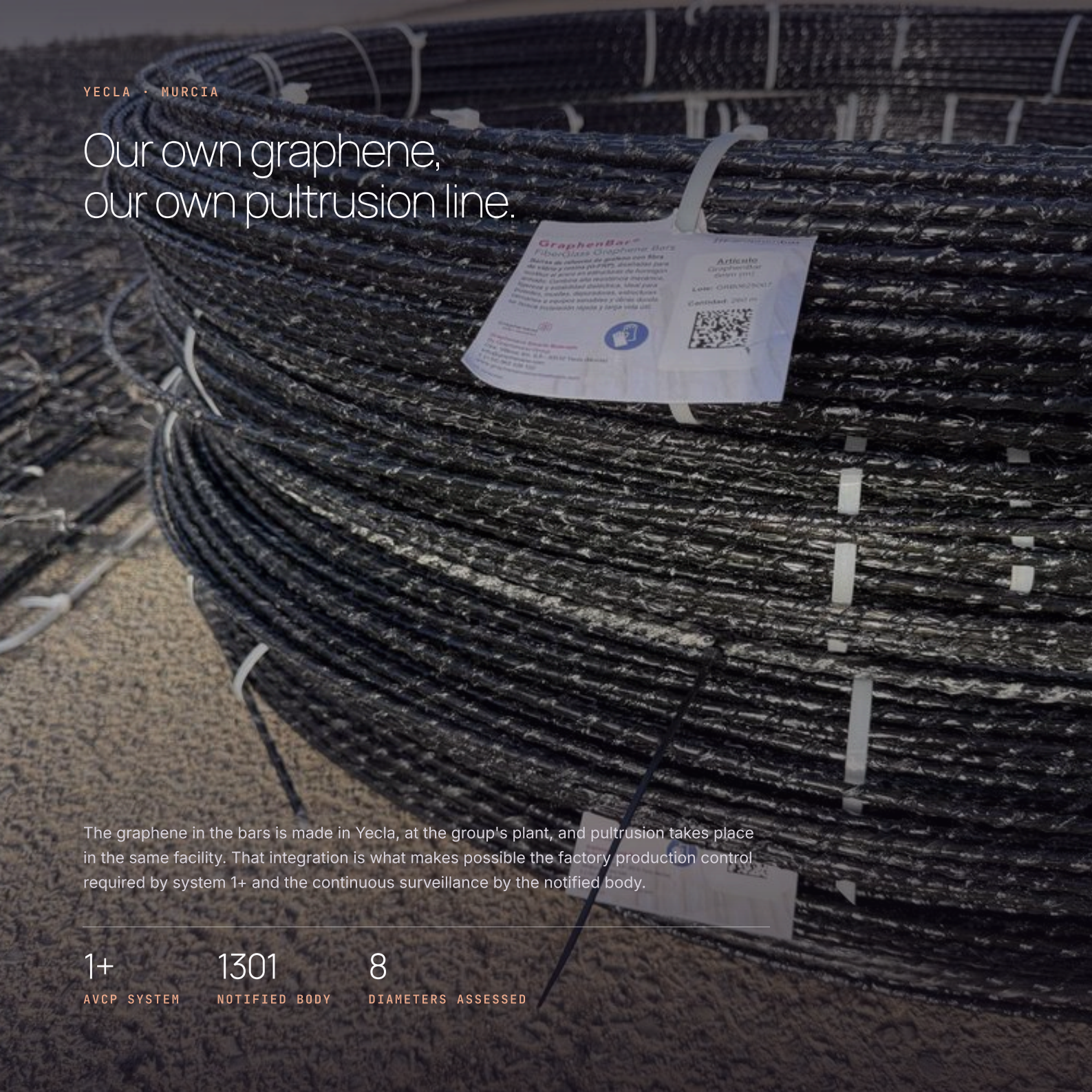
In the United States GFRP reinforcement has been used for years in public works exposed to aggressive environments —bridge decks, retaining walls, marine structures— for its immunity to corrosion: it has its own design codes (AASHTO and ACI 440) and some state transportation departments already require it in those environments.

Design is the project engineer's job

The European Technical Assessment declares the performances of the product. It does not replace the design: sizing, cover and reinforcement arrangement are the responsibility of the engineer who signs off the works.



CAGES AND REINFORCEMENT ASSEMBLED IN THE PLANT



YECLA · MURCIA

Our own graphene, our own pultrusion line.

The graphene in the bars is made in Yecla, at the group's plant, and pultrusion takes place in the same facility. That integration is what makes possible the factory production control required by system 1+ and the continuous surveillance by the notified body.

1+	1301	8
AVCP SYSTEM	NOTIFIED BODY	DIAMETERS ASSESSED

Graphenano
SMART MATERIALS

GRAPHENANO SMARTMATERIALS

SmartADDITIVES · FloorGraphene
SmartCOVER · GraphenBar

COMPANY CERTIFICATIONS OF GRAPHENANO SMARTMATERIALS

AENOR GESTIÓN DE LA CALIDAD ISO 9001

AENOR GESTIÓN AMBIENTAL ISO 14001

AENOR SEGURIDAD Y SALUD EN EL TRABAJO ISO 45001

Company management systems certified by AENOR. They do not constitute product certification.

CONTACT

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www.graphenanosmartmaterials.com

Technical documentation, certificate and declaration of performance at graphenanosmartmaterials.com/descargas

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Ed. 01