GFRP Bar

QUANTOM
Structural Systems

QUANTOM® Bar

Unsurpassed properties:

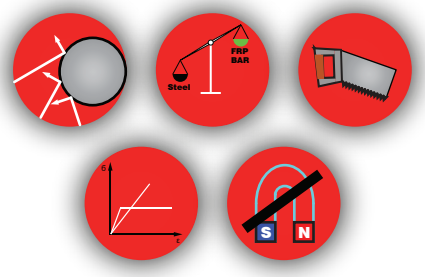
Quantom®Bar is a sand-blasted reinforcing bar made of corrosion resistant glass fibers that are bound by a epoxy resin. The high quality components and the unique manufacturing process results in an outstanding material.

Certifide worldwilde

Our products has been extensively tested according to the most important intrnational codes and guidlines and has been certified.

Quantom®Bar is

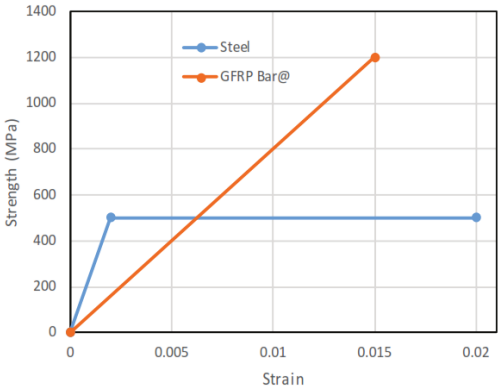
- highly durable
- much stronger than steel
- corrosion resistant
- not magnetic or magnetisable
- not electrically or thermally conductive
- easily machinable
- significantly lighter than steel.



GFRP Bar vs. Steel: direct comparison

Material properties Straight bars	Reinforcing steel	GFRP Bar
Characteristic yield strength f_{yk} (N/mm²)	500	≥1000
Design yield strength f_{yk} (N/mm²)	435	≥445
Tension Modulus of elasticity E (N/mm²)	200,000	~60000
Concrete cover	As per local standards	d+10cm

Stress-Strain Diagram

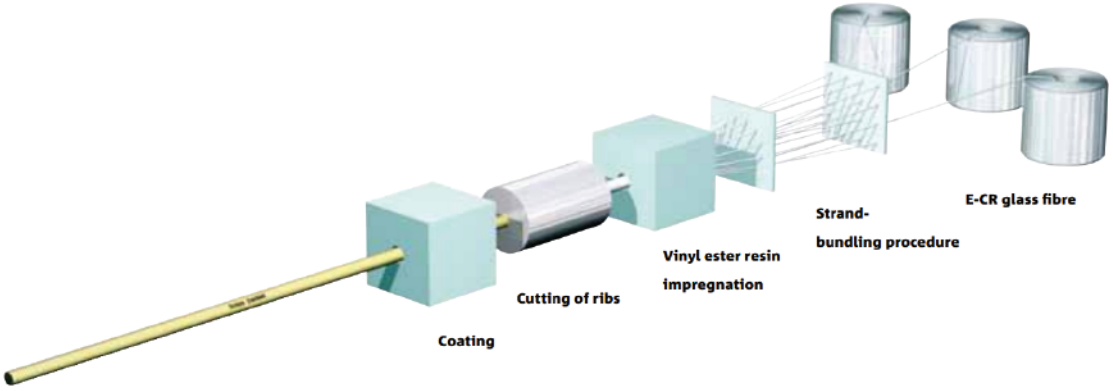


Version 2017

For decades, steel rebar has been commonly used as the reinforcement in concrete construction. despite its strength, steel is not the ideal solution for reinforcement especially in corrosive and electro-magnetically sensitive environments. in these cases, our innovative product, Quantom®Bar presents advanced possibilities and unique solutions.

The manufacturing process

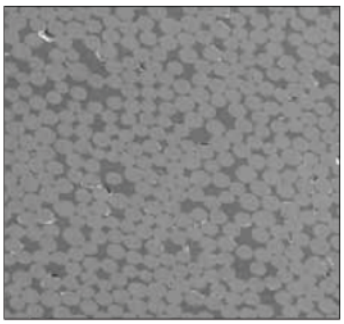
The feature which makes Quantom®Bar special is a two-part manufacturing process optimized to meet the requirements of reinforcing bars. In step one, the pultrusion, high strength glass fibers, bundled as densely as possible, are pulled through a closed chamber where they are impregnated with synthetic resin. In the second step, the profiling, the ribs are cut into the hardened bars. The bars are then given a final coating. the result: a reinforcing material with unique structural, physical and chemical characteristics.



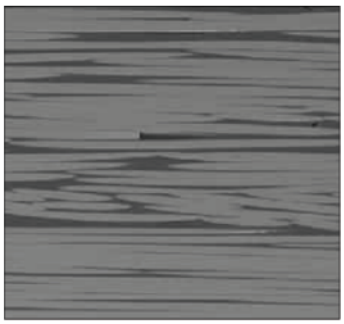
Long lasting high-strength

The high fiber content of Quantom®Bar (approx. 80% by volume)and the parallel alignment of the fibers result in maximum strength and stiffness of the material.The epoxy resin is diffusion tight. Every glass fiber is completely surrounded by resin. This means maximum durability in concrete (up to 100 years).

Cross section



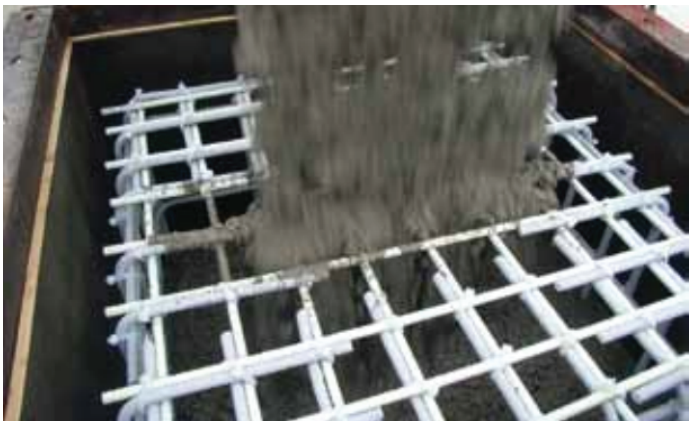
Longitudinal section



Transformers and reactors in power plants, switchyards and industrial facilities (Steel mills, aluminum smelters etc.) operate with high electric currents. Inductive currents are generated within the reinforcing steel if it is located too close to these coils. this can result in the heating up of the rebars and a loss of their strength. To avoid this, steel reinforced concrete elements must not be located within the magnetic clearance contour of these coils. Quantom®Bar does not conduct electro-magnetic currents. Therefore, Quantom®Bar reinforced foundations,walls and ceilings can be built near transformer coils and reactors. As a result, enclosures for these coils can be much smaller without hindering the performance of these machines. This significantly reduces construction and operating costs.

Quantom®Bar does not conduct electric currents. It is, therefore, ideally suited for installations in

- enclosures and foundations of transformers and reactors.
- Switchyards
- Steel mills
- Aluminum smelters
- industrial facilities



Transformer foundation Peiner Träger Ltd., Peine, Germany

Floor slab in rectifier area Qatar Aluminum, Qatar

Research laboratories for nanotechnology, solid state physics and similar fields of research are highly sensitive environments. This is also true for scanning electron microscopy, magnetic spin tomography and magnet resonance tomography. Due to its conductivity, reinforcing steel can affect the functionality and precision of these devices. The installation of Quantom®Bar creates a completely non-metallic and non-magnetic research environment.

Quantom®Bar is electromagnetically nonconductive and therefore ideally suited for installation in

- Hospitals (MRI)
- Nano-Technology centers
- Laboratories for solid-state physics
- Industrial floors of driverless transport systems

Foundation block at the IBM Nanotech-Center in Zurich, Switzerland

Max-Planck Institute for Solid State Research in Stutgart, Germany

Replacement of the carriageway slab ,Péage de Tain, France

The most frequent cause of damage in reinforced concrete buildings is the corrosion of the steel reinforcement. This is especially true of facade components, buildings in coastal areas, bridges and parking garages exposed to de-icing salts, as well as swimming pools, waste water treatment plants and many other industrial facilities. As Quantom®Bar does not rust, the risk of corrosion damage is eliminated resulting in the significant reduction in repair and maintenance costs. Also, the service life of the building is greatly extended- an important contribution to sustainable construction.

As it is corrosion resistant and resistant to acids and bases, Quantom®Bar is ideal for the installation in aggressive environments, such as

- Shoreline reinforcements and quay walls
- Facade elements
- Parking garages (even without coatings)
- Industrial floors
- Swimming pools
- Waste water treatment plants
- Harbours
- Dams

Precast concrete elements for costal defense project blackpool, UK

Facade pilasters Guthirt School Zug, Switzerland

Reinforced concrete pipe for waste water transmittion, Tehran, Iran

Infrastructures often have to be repaired or replaced because the steel reinforcement within them has corroded destroying the concrete microstructure. This particularly applies to bridges exposed to de-icing salts. when Quantom®Bar is installed, corrosion problems are eliminated.
New high speed rail links and streetcar lines are usually built using ballasted rail slabs. The continuous rails serve as an electrical medium for the signal transmission. The reinforcing steel in the rail slabs must be intricately grounded to allow the undisturbed transmission of these signals. When Quantom®Bar is installed, these grounding measures are unnecessary as the bar does not conduct electric currents. It may even be installed in close proximity to the induction coils used to operate rail switches.

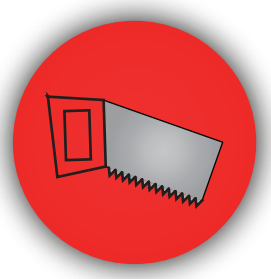
Quantom®Bar does not corrode and does not conduct electric currents. It is therefore the perfect reinforcing material for

- Bridge decks
- Bridge caps
- Barriers walls on bridges
- Sound barriers
- Ballasted rail slabs
- Air fields

Floor slab railway depot Basel, Switzerland

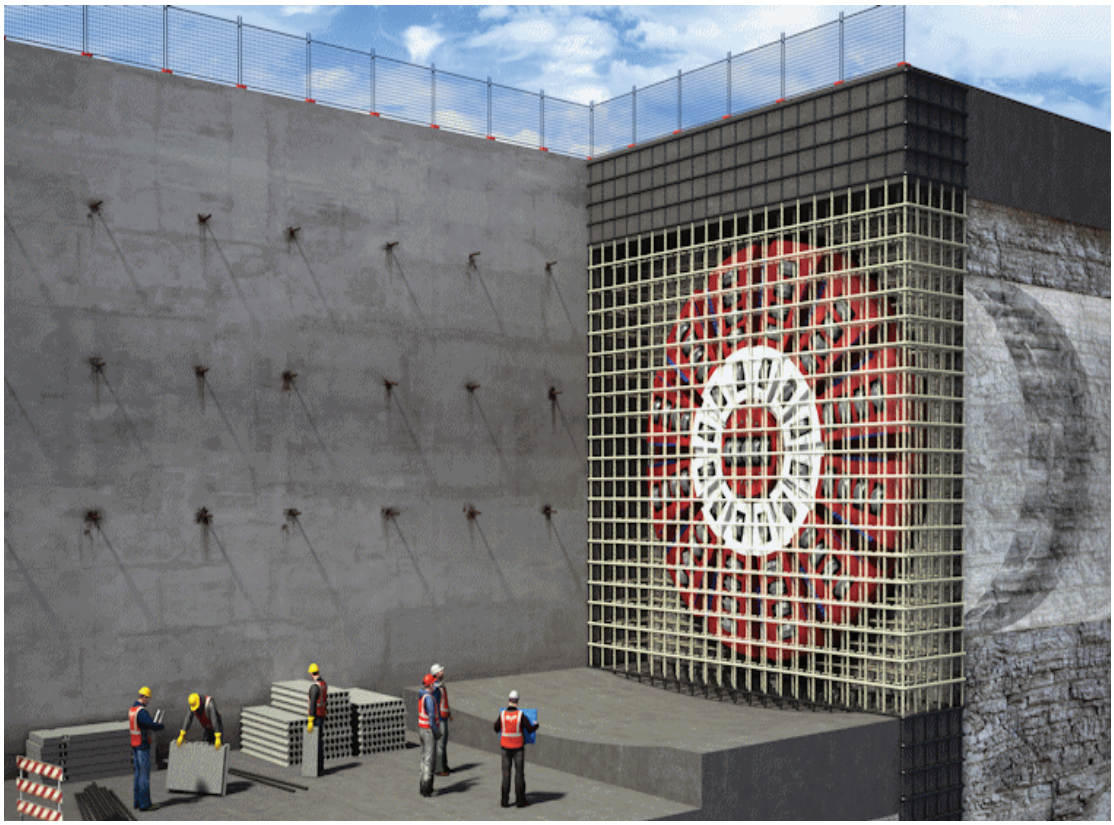
Bridge deck Weightman Bridge, City of Niagara Falls, USA

Inner city tunnels for subways, sewers and other infrastructures facilities are usually built using a tunnel boring machine (TBM). Steel reinforcement presents a problem as the TBM cannot drill through the steel reinforced shaft walls. When the walls have to be opened up manually, the soil behind these walls has to be stabilized. The Installation of Quantom®Bar in the penetration area of the TBM makes all these measures unnecessary. The TBM drives and cuts directly through the head wall. Construction time and costs are greatly reduced and job site saftey is also significantly improved.



Because it is easily machined Quantom®Bar is ideally suited for components which need to be cut or drilled through.

- soft-eyes in shaft walls at tunneling projects
- diaphragm walls
- drilled pile walls
- form-work anchors
- temporary concrete buildings



An schematic view of a soft eye being drilled and the retaining wall is reinforced with Quantom®Bar