

FRP PRODUCTS &  
SOLUTIONS

# GFRP

PRODUCTS



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BOSE FIBRIL INFRA

# GFRP REBARS



## Stronger on the disruption, than steel analogues

Fiberglass rebar "Bose Fibril Infra" is characterized by high tensile strength, parameters which are higher in 2-3 times than metal bars with the same diameter. Bose Fibril Infra -composites guarantees a tensile strength of 1000 Mpa (on selected diameter) which allows to replace steel products with a composite smaller diameter without loss of performance.



## 9 times lighter than steel analogues

The density of the components of fiberglass composite reinforcement does not exceed 1.9 tons per 1 cubic meter, which is at least 3-4 times less than the density of steel reinforcement. The reinforced concrete structure with similar strengths is 9 times heavier than the composite reinforcement structure



## Cheaper than steel analogues

The price of fiberglass reinforcement often becomes the decisive actor when choosing between composite and metal products. When recalculating on metal rebars with the same strength characteristics, the saving can reach upto 40%!

# TABLE OF SUBSTITUTION

By Tensile strength



## Metal Rebar

Weight (per 12 meter bar)	Diameter
2.75kg	6
4.74kg	8
7.40kg	10
10.65kg	12
14.52kg	14
18.93kg	16
24.00kg	18
35.76kg	22
46.22kg	25
58.02kg	28
75.79kg	32

(=) Equal ultimate stress  
 \*These are approx. values



## V S Fiberglass Rebar (FRP)

Weight (per 12 meter bar)	Diameter
0.46kg	4.5
0.57kg	6
0.57kg	7
1.23kg	8
1.65kg	10
2.48kg	12
3.24kg	14
4.87kg	16
6.28kg	18
8.08kg	20
9.80kg	22

# GFRP REBARS



## Double Lifetime compared with steel analogues

Fiberglass reinforcement "Bose Fibril Infra" has excellent chemicals properties which make them 100% anti-corrosive and alkaline resistant. This guarantees a long service life at least 80 years. The period of operation of a concrete structure with steel reinforcement is 2-3 times less than with a composite one in aggressive environment.

## APPLICATIONS



Ground slabs (All types),  
RCC roads



Concrete coverings, Platforms,  
Paths, Parking lots, Bridges & roads



Columns, compound walls, non  
structural walls



Swimming pools, Reservoirs,  
Canals



Septic tanks, Water tanks, ETP  
Tanks



Secondary reinforcement  
(on selected structures)



Pre-cast panels



Embankments, piers,  
slabs to strengthen the coastal strip



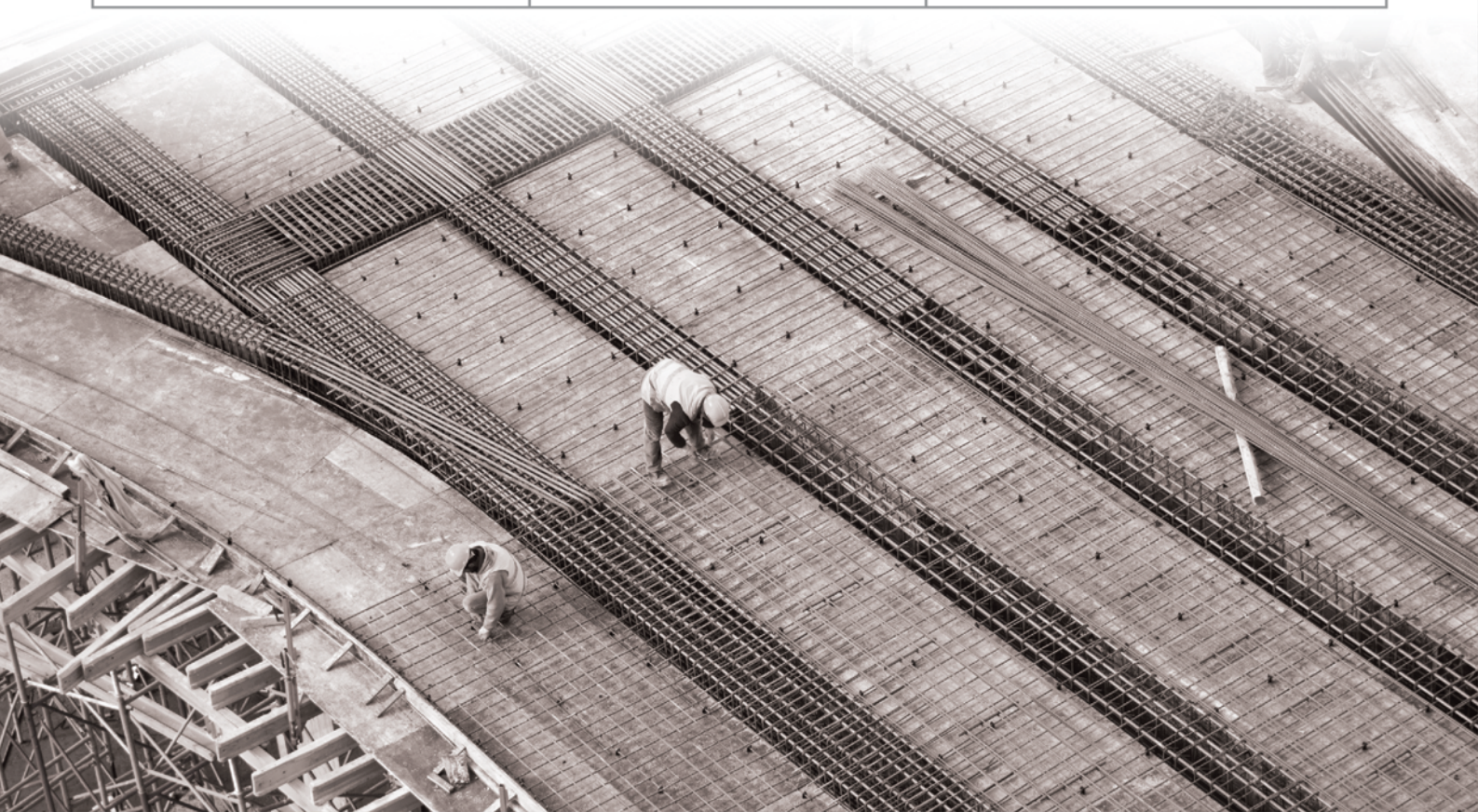
foundations of houses up to 3  
floors (tape, base plates, piles)

# GFRP PROPERTIES



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Material	Steel	GRP
Tensile Strength [MPa]/ N/mm <sup>2</sup>	500	1000+
Shear strength	120	170
Bond strength Mpa/ N/mm <sup>2</sup>	14*	12.5
Compression (MPa) N/mm <sup>2</sup> )	500	450
Modulus of Elasticity [Gpa]	160-200	65
Elongation [%]	25	4
Durability	Terms are prescribed in special building codes	Not less than 80 years
Density [ton/m <sup>3</sup> ]	7.8	1.9
Corrosion resistance to aggressive environment	Appearance of rust products	Stainless material preserving properties even in alkaline concrete environment
Ecological compatibility	Ecologically friendly material	Does not emit harmful and toxic substances during storage and use
Electrical conductivity	Electrically conductive material	Dielectric



# ADVANTAGES OF GFRP

in comparison with traditional metal rebars



## Strength

Composite reinforcement has strength characteristics 2-3 times superior characteristics of steel reinforcement British standard for breaking.



## Durability

The coefficient of temperature expansion of composite reinforcement is close to the coefficient of thermal expansion of concrete, so that in the concrete structure there are no associated micro deformations, micro cracks and the overall durability of the structure is substantially increased.



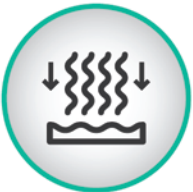
## Chemical resistance

Composite reinforcement has great chemical resistance in various aggressive environments, it is not susceptible to corrosion, which also positively affects the durability.



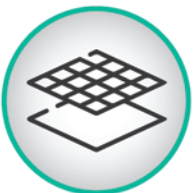
## Light weight

Fiberglass reinforcement with comparable strength characteristics is lighter than steel reinforcement in 9 times.



## Low thermal conductivity

Due to low thermal conductivity, "temperature bridges" are not formed in the structures, which reduces the thermal loss to 34% and, accordingly, the conditioning costs of the building



## Easy installation

Reinforcing bars can be cut from the bay of any given length, fasten with plastic clips, special fasteners-clamps or just a binding wire.



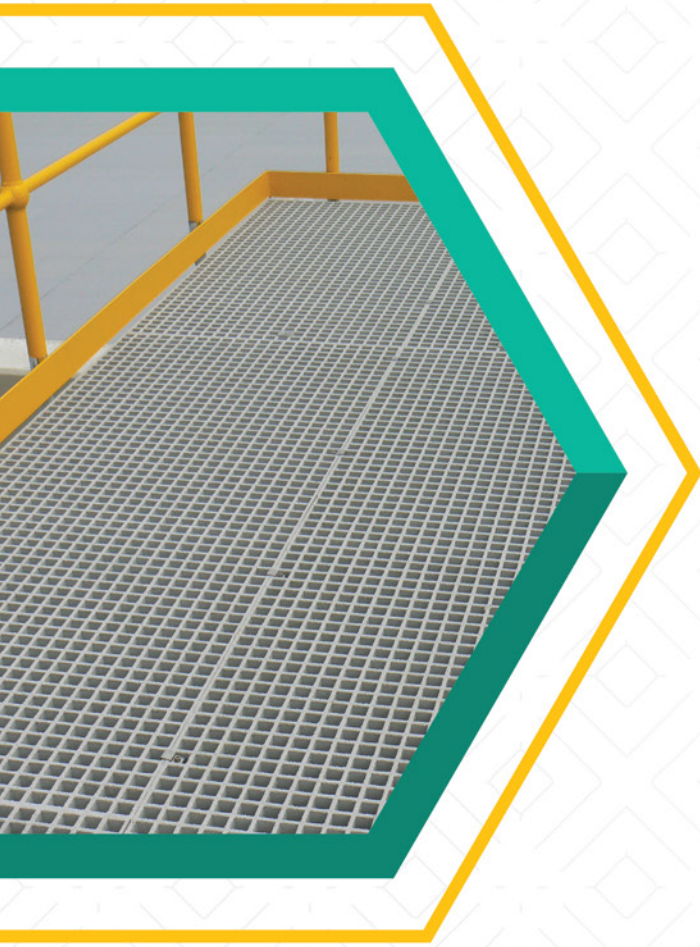
## Easy transportation and storage

You can fold the armature into coils, which allows you to use even cars for transportation and save significantly at the same time.



## Custom

Unlike steel GFRP bars can be provided in custom length which can help in reducing cost as no overlapping is required and time, labour is saved.



# Our Service

FRP Gratings

FRP Manhole Covers

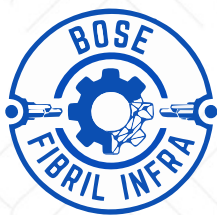
FRP Handrails

FRP Tanks

FRP Profiles

FRP Doors

FRP Light Poles



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## **FRP PRODUCTS & SOLUTIONS**

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