

# High Performance Composite Rebar



## TerraGrate Rebar (Reinforcing Bar)

is used in reinforced concrete and masonry structures and is a light, strong and durable alternative to steel reinforcement. Because TerraGrate Rebar is a Fibre Reinforced Polymer (FRP) composite it can be manufactured to unique standards and is the product of choice where specific performance characteristics are required.

### **Non-corrosive, non-conductive, high-tensile strength**

TerraGrate Rebar is non-corrosive so totally eliminates spalling when concrete is exposed to moisture making it ideal for saltwater environments. FRP Rebar is chemical resistant and not affected by acid or alkali.

FRP Rebar does not interfere with signals, conduct electricity or generate stray current and can be used in electrically sensitive environments such as signals or data stations and MRI facilities.

Composite Rebar eliminates the risks of stray currents which can massively heating up traditional steel reinforcing, weakening the steel and compromising the structures. Furthermore, FRP Rebar maintains strength, even at high temperatures.

### **Light, strong and stable**

TerraGrate Rebar is five times lighter and twice the tensile strength of its steel equivalents and is highly resistant to fatigue. TerraGrate Rebar has the same thermal expansion coefficient as concrete which ensures they work in unison while the specially designed TerraGrate Rebar fluted surface creates a super strong bond between the two materials

### **Easy to transport and handle**

TerraGrate Rebar can be cut to size on site with common hand tools. Composite Rebar is the perfect reinforcement solution for environments exposed to water, salt, humidity, high voltage currents and magnetic fields.

# High Performance Composite Rebar

## Physical and Mechanical Properties

Diameter (mm)	Bolt ultimate load (KN)	Cross Section (mm <sup>2</sup> )	Ultimate tensile strength (MPa)	Weight (g/m)	Modulus of elasticity (GPa)	Ultimate shear strength (Mpa)	Elongation at break (%)
4	12.6	12.6	1000	25			
5	19.6	19.6	1000	40			
6	28.3	28.3	1000	55			
7	38.5	38.5	1000	80			
8	50.3	50.3	1000	105			
10	71	78.5	900	165			
12	97	113	850	240			
14	107	133	800	280			
16	142	177	800	370			
18	185	227	800	460	45	>150	2.5
20	230	284	800	560			
22	275	346	800	700			
25	340	452	750	950			
28	430	573	750	1220			
30	500	661	750	1350			
32	570	755	750	1550			
36	725	962	750	2040			
40	837	1195	700	2540			

- Design Tensile and Modulus Properties ... per ASTM D7205-06
- Material Certs & Traceability: Available for any production lot, traceable by bar marks showing the bar diameter, stock order and production date.
- Glass Fibre Content...>= 78% by weight
- Transverse Shear Strength .... > 150MPa
- Moisture Absorption <=0.01 %, per ASTM D570
- Handling and Placement
  - Follow guidelines in ACI440.5-08 "Specification for Construction with FRP Barsff.
  - In general, field handling and placement is the same as for epoxy or galvanized steel bars.
  - Do not shear FRP rebars. When field cutting of FRP rebars is necessary, use a fine blade saw, grinder, carborundum or diamond blade. When cutting FRP rebars, please observe all relevant local OH & regulations. Appropriate PPE should be worn at all time including but not limited to eye & ear protection, dust masks and gloves.
  - Sealing the ends of FRP bars is not necessary.
  - Support chairs are required at two-thirds the spacing of steel rebar.
  - Plastic coated tie wire is the preferred option for most projects. When completely non-ferrous reinforcing, i.e., no steel is required in the concrete, nylon zip ties (available from local building materials centres) or plastic bar clips are recommended. (Don't forget to use non-metallic form ties in formwork).
  - It is possible, especially in precast applications, for GFRP bars to "float" during vibrating. Care should be exercised to adequately secure GFRP in the formwork.