

GFRP vs Steel Rebar

Traditional building materials have their place. But for harsh, corrosive environments, GFRP is a smart choice. Here's how GFRP compares to several traditional options.

	Aslan 100 GFRP Rebar	Steel A615 Grade 60
Corrosion Resistance	Resists a broad range of chemicals and is unaffected by moisture or immersion in water.	Subject to oxidation and corrosion. Requires some form of protection in corrosive environments.
Strength	Tensile strengths vary by size and range from 80 ksi to 130 ksi. GFRP bars remain linear and elastic up to failure.	Homogeneous material. Yield strength (F _y) = 60 ksi, with permanent deformation above this stress.
Weight	Weighs 75% less than steel.	Could require lifting equipment to move and place.
Electrical Conductivity	No electrical conduction and is an excellent insulator.	Conducts electricity.
Thermal Properties	Excellent insulator with no thermal conductivity. Thermal conductivity = 3.5 BTU in. / (hr. ft ² °F) Longitudinal Coefficient of Thermal Expansion = 5-6 (in./in./°F) 10 ⁻⁶	Conducts heat. Thermal conductivity = 416 BTU in/ (hr. ft ² °F) Coefficient of Thermal Expansion = 7 (in./in./°F) 10 ⁻⁶
Modulus of Elasticity	6.7 x 10 ⁶ psi	29 x 10 ⁶ psi
Cost	Lower installation costs, less maintenance and longer product life allow for a lower lifecycle cost.	Lower initial material cost.
EMI/RFI Transparency	Transparent to radio waves and EMI/RFI transmissions. Used for radar and antennae enclosures and supports, and MRI rooms.	Can interfere with EMI/RFI transmissions.
Fabrication	Can be field cut using simple carpenter's tools with carbon or diamond tip blades. No torches or welding required. Light weight allows easier transport and installation.	Often requires welding and cutting torches.

Compare the numbers ...

Property	FRP Composites - Pultruded GFRP	Steel - A615 Grade 60
Density (lb/ft. ³)	120	490
Tensile Strength (ksi)	80-130	60
Tensile Modulus (x 10 ⁶ psi)	6.7	29
Thermal Conductivity BTU in. / (hr ft ² °F)	3.5	416
Thermal Expansion (x 10 ⁻⁶ in./in./°F)	5 to 6	7

