

SANFIELD GFRP BARS



Sanfield [India] Limited.

 MAURER

GFRP BAR

INTRODUCTION

Reinforced concrete is a common building material for construction of facilities and structures. While concrete has high compressive strength, it has limited tensile strength. To overcome these tensile limitations, reinforcing bars (rebar) are used in the tension side of concrete structures. Steel rebar has historically been used as an effective and cost efficient concrete reinforcement, However, steel rebar is very susceptible to oxidation (rust) when exposed to chlorides, ions etc, Examples of such exposure include coastal areas, salt contaminated aggregates used in the concrete mixture and sites where aggressive chemicals and ground conditions exist. In cold climates, treating snow with salt is another cause of accelerated deterioration of concrete bridge decks. When corrosion of steel rebar occurs, the resulting corrosion products have a volume 2 to 5 times larger than the original steel reinforcement. The concrete cannot physically sustain the high internal tensile stresses developed from this volume increase, it eventually may crack and spall causing further deterioration of the steel .The combination of ongoing deterioration and loss of reinforcement properties ultimately requires potentially significant and high cost repairs and possibly the endangerment of the structure itself. Glass Fibre Reinforced Polymer (GFRP) bars have been developed as an alternative to steel reinforcement for various structural concrete applications. Due to their non-corrosive nature, they are particularly suited for harsh environments where steel reinforcement is prone to corrosion

BENEFITS OF GFRP

The benefits of GFRP rebar are as follows:

Corrosion resistance -when bonded in concrete it does not react to salt, chemical products or the alkali in concrete. As GFRP is not manufactured from steel, it does not rust.

- Superior tensile strength -GFRP rebar produced by the pultrusion process offers a tensile strength up to twice that of normal structural steel (based on area).
- Thermal expansion -GFRP rebar offers a level of thermal expansion comparable to that of concrete due to its 80% silica content.
- Electric and magnetic neutrality -as GFRP rebar does not contain any metals, it will not cause interference with strong magnetic fields or when operating sensitive electronic equipment or instruments.
- Thermal insulation -GFRP rebar does not create a thermal bridge within structures.
- Lightweight -GFRP rebar is a quarter the weight of steel rebar of equivalent strength. It offers significant savings in transportation and installation.

GFRP use as structural reinforcement may offer life-cycle cost benefits for certain structures as maintenance to repair corroded reinforcement is not necessary. Technical studies on a number of concrete structures, from five to eight years old and constructed with GFRP reinforcement, have shown that there is no degradation of the GFRP from the alkaline environment.

STRUCTURES WHERE GFRP IS RECOMMENDED

- Reinforced concrete exposed to corrosive environments -car parking structures, bridge decks, parapets, curbs, retaining walls, foundations, roads and slabs.
- Structures built in or close proximity to sea water (Figures 8,9) -quays, retaining wall, piers, jetties, boat ramps, caissons, decks, piles, bulkheads, floating structures, canals, roads and buildings, offshore platforms, swimming pools and aquariums.
- Applications subjected to other corrosive agents -wastewater treatment plants, petrochemical plants, pulp/paper mills, liquid gas plants, pipelines/tanks for fossil fuel, cooling towers, chimneys, mining operations of various types, nuclear power plants

GFRP Bolt Series



Product Part No.	Diameter (mm)	Bolt Ultimate load(KN)	Thread ultimate load(kN)		Cross section (mm ²)	Ultimate tensile strength	Torsion (Nm)	Weight (g/m)	Modulus of elasticity (GPa)	Ultimate shear strength (MPa)	Blending strength (Mpa)	Elongation at break (%)	Antistatic value
			Steel	FRP									
SIL60-16-ER	16	165	/	45	165	1000	50	350	50	150	650	2.5	3x10 ⁸
SIL60-18-ER	18	214	/	50	214	1000	60	460					
SIL60-20-ER	20	269	80	60	269	1000	80	560					
SIL60-22-ER	22	330	100	60	330	1000	100	690					
SIL60-24-ER	24	360	150	70	398	900	120	860					
SIL60-25-ER	25	390	180	70	434	900	140	930					
SIL60-27-ER	27	435	200	80	511	850	150	1050					
SIL60-28-ER	28	470	200	80	552	850	160	1200					
SIL60-30-ER	30	540	220	80	638	850	200	1350					
SIL60-32-ER	32	620	250	90	731	850	250	1550					
SIL60-38-ER	38	890	420	100	1046	850	/	2250					
SIL60-40-ER	40	930	420	100	1164	800	/	2480					
SIL60-51-ER	51	1540	/	/	1924	800	/	4100					

SIL60-ER GFRP Anchor Bolt Series (Epoxy Resin)

SIL60 Standard GFRP Polyester Anchor Bolt Series.

Product Part No.	Diameter (mm)	Bolt Ultimate load(KN)	Thread ultimate load(kN)		Cross section (mm ²)	Ultimate tensile strength	Torsion (Nm)	Weight (g/m)	Modulus of elasticity (GPa)	Ultimate shear strength (MPa)	Blending strength (Mpa)	Elongation at break (%)	Antistatic value
			Steel	FRP									
SIL60-16	16	132	/		165	800	35	350	45	150	400	25	3x10 ⁸
SIL60-18	18	171	/	50	214	800	45	460					
SIL60-20	20	215	80		269	800	60	560					
SIL60-22	22	264	100	60	330	800	60	690					
SIL60-24	24	318	150		398	800	100	860					
SIL60-25	25	347	180	70	434	800	120	930					
SIL60-27	27	409	200		511	800	130	1050					
SIL60-28	28	442	200	80	552	800	130	1200					
SIL60-30	30	510	220		638	800	180	1350					
SIL60-32	32	585	250	90	731	800	230	1550					
SIL60-38	38	837	420		1046	800	/	2250					
SIL60-40	40	873	420	100	1164	750	/	2480					
SIL60-51	51	1443	/		1924	750	/	4100					

High Performance GFRP Polyester Reber SP Series.



SIL61-SP High Performance GRP Polyester Reber SP Series.

Product Part No.	Diameter (mm)	Bolt Ultimate load (KN)	Cross section (mm)	Ultimate tensile strength (MPa)	Weight (g/m)	Modulus of elasticity (GPa)	Ultimate shear strength (MPa)	Elongation at break (%)
SIL61-16-SP	16	186	177	1050	390	55	170	2.5
SIL61-18-SP	18	238	227	1050	500			
SIL61-20-SP	20	298	234	1050	610			
SIL61-22-SP	22	363	346	1050	740			
SIL61-24-SP	24	463	415	1050	890			
SIL61-25-SP	25	475	452	1050	970			
SIL61-28-SP	28	544	573	950	1230			
SIL61-30-SP	30	627	660	950	1420			
SIL61-32-SP	32	717	755	950	1620			
SIL61-34-SP	35	770	855	900	1840			
SIL61-36-SP	36	866	962	900	2070			
SIL61-38-SP	38	968	1075	900	2320			
SIL61-40-SP	40	1016	1195	850	2570			
SIL61-45-SP	45	1292	1520	850	3270			
SIL61-50-SP	50	1603	1886	850	4055			
SIL61-54-SP	54	1765	2206	800	4750			



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