

R&D Materials – preliminary data sheet

Thermoformable carbon fiber rebar

Carbon fiber reinforced thermoplastics for concrete reinforcement

We offer carbon fiber reinforced thermoplastic (CFRTP) rebars for the reinforcement of concrete structures. Our advantages compared to common steel solutions are higher strength and superior corrosion resistance, leading to reduced cross-sections and life-cycle cost.

The benefits compared to materials, comprising thermoset resin and glass fibers (GFRP), are a higher stiffness and the possibility of thermoforming, e. g. to stirrups or other complex reinforcement cages.

Additionally the thermoplastic matrix can be processed in a much faster and economical way than thermoset matrix systems. Our CFRTP rebars are based on our SIGRAFIL® 50k carbon fibers and technical thermoplastic polymers to achieve an economical solution. Further cost improvements due to thermoplastic matrix are in development stage.



↑ CFRTP rebar with same force at break as depicted steel solution

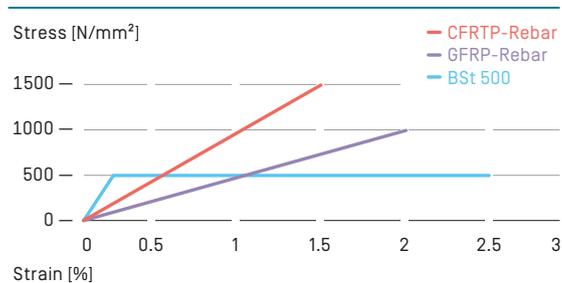


↑ CFRTP reinforcement cage

Material data of CFRTP rebars in comparison to steel and GFRP benchmark systems

Properties	Units	CFRTP rebar	Comparison to BSt 500	Comparison to GFRP
Effective diameter	mm	4.5	8	5.5
Mass per meter	kg/m	0.02	0.40	0.06
Force at yield/break	kN	24	25	25
Effective tensile strength	N/mm ²	1500	500	1050
Elongation at break	%	1.5	> 2.5	1.8
Effective Young's modulus	N/mm ²	100,000	210,000	60,000

Stress-strain diagram



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