
MASTER CTS

ASATEEN GROUP

CONTROLLED TECHNICAL EDITION

MASTER BAR (GFRP)

DF-01 Technical Data Sheet

Controlled technical reference for product identity, performance data, application guidance, packaging, and referenced standards.

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Product Identity and Technical Overview

Controlled technical identity, basis, and opening description.

2. Product Identity

Field	Approved source-supported entry
Document Type	DF-01 Technical Data Sheet
Product Name	MASTER BAR
Designation	GFRP
System / Division	MASTER CTS (Construction Technology Systems)
Material Class	Glass Fiber Reinforced Polymer reinforcement system

3. Technical Overview

MASTER BAR (GFRP) is an engineered Glass Fiber Reinforced Polymer reinforcement system developed and deployed by MASTER CTS for high-performance reinforcement across residential, infrastructure, industrial, and agricultural applications. The approved source states that the system is 100% rustproof, ultra-lightweight, non-magnetic, non-conductive, and designed for aggressive environments, with longitudinal thermal expansion behavior close to concrete and an expected service life exceeding 100 years.

4. Product Description

The product is presented in the approved source as a reinforcement system supplied as straight bars, coils, mesh grids, and custom fabricated shapes. The source positions the system for chloride, chemical, marine, soft-eye, and electromagnetically sensitive applications where corrosion resistance, weight reduction, or non-conductive behavior is required.

5. Composition / Material Basis

Field	Approved source-supported entry
Material Basis	Glass Fiber Reinforced Polymer (GFRP)
Reinforcement Logic	Solid round GFRP bar-based reinforcement for concrete applications
Form Availability	Straight rebar, coiled rebar, mesh grid, and custom shapes
Fabrication Restriction	On-site cold bending is not permitted; bends must be pre-ordered as custom shapes

Key Technical Properties

Table-first property summary and available product configurations.

6. Key Technical Properties

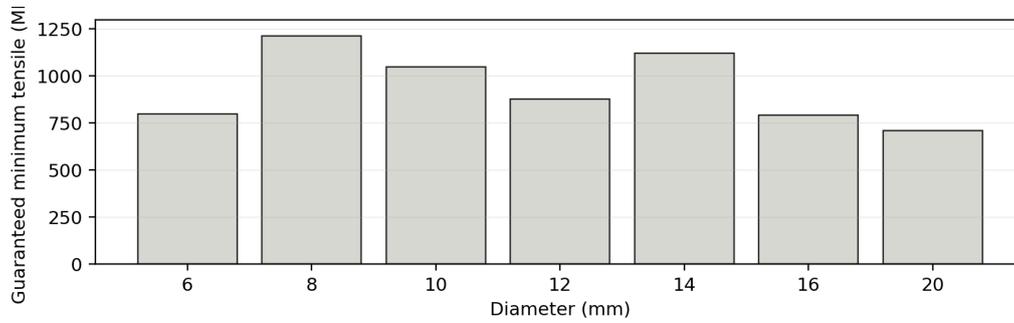
Property	Reported value / description	Unit / basis
Tested average tensile strength (reported maximum)	Up to 1839.3	MPa
Guaranteed minimum tensile strength (listed straight bars)	711 to 1212	MPa
Modulus grade thresholds	Grade I ≥ 40 ; Grade II ≥ 50 ; Grade III ≥ 60	GPa
Density	2.1	g/cm ³
Weight efficiency	5 to 7 times lighter than traditional steel	Source statement
Corrosion resistance	100% rustproof	Source statement
Chemical resistance	Resistant to saltwater, acids, bitumen, and de-icing chemicals	Source statement
Electromagnetic behavior	Non-magnetic and non-conductive	Source statement
Longitudinal CTE	6.0 to 10.0	$\times 10^{-6} / C$
Expected service life	Exceeding 100 years / validated 100+ year design life	Source statement

Configuration	Length / dimension	Available diameters (mm)	Special notes
Straight rebar	Up to 12 meters	4, 6, 7, 8, 10, 12, 14, 16, 18, 20	Other diameters available on request
Coiled rebar	50 meters per coil	4, 6, 7, 8, 10	Optimized for continuous reinforcement
Mesh grid	2 x 5 meters	6, 8	Designed for slab and surface reinforcement
Custom shapes	Per specification	Varies	L-, U-, O-shapes and custom bends

Performance Characteristics

Primary listed performance dataset for straight bars.

7. Performance Characteristics



Diameter (mm)	Weight (kg/m)	Length per 1 ton (m)	Bars per 1 ton (12m)	Guaranteed min. tensile (MPa)
6	0.055	18,182	1,515	800
8	0.099	10,101	842	1212
10	0.155	6,452	538	1049
12	0.222	4,505	375	877
14	0.295	3,390	282	1123
16	0.385	2,597	216	793
20	0.587	1,704	142	711

Modulus grade note: Grade I minimum modulus 40 GPa; Grade II minimum modulus 50 GPa; Grade III minimum modulus 60 GPa.

Performance Characteristics

Reported tensile evaluation summary and thermal expansion comparison.

Diameter (mm)	Tested avg. tensile (MPa)	Tested modulus (MPa)	Modulus grade
6	—	—	—
8	1839.3	72,521	Grade III
10	1592.3	79,391	Grade III
12	1331.0	51,197	Grade I
14	1704.7	89,034	Grade III
16	1204.0	52,724	Grade II
20	1078.7	52,945	Grade II

Material	Longitudinal CTE (x 10 ⁻⁶ / C)	Similarity to concrete	Variance (difference)
Concrete (benchmark)	9.0 to 12.0 (Avg. ~10.0)	100% baseline	0%
MASTER BAR (GFRP)	6.0 to 10.0	Up to 100% match	0% to 40% lower
Carbon steel	~11.7	~85% match	17% to 30% higher

The approved source also states that a February 2022 University of Baghdad technical report evaluated tensile performance using Gulf, Canadian, and American references for tested diameters.

Application Areas and Usage Guidance

Sector coverage and source-stated handling / installation controls.

8. Application Areas

Application area	Source-stated scope	Technical basis stated in source
Precast concrete elements	Pipe, girder, road barriers, railway sleepers, facade elements	Smaller diameters and optimized designs; lower cost and shorter construction periods
Road and rail infrastructure	Bridge decks, abutments, tunnels, highway reinforcement, ramps	Resistance to chloride-induced corrosion; non-conductive behavior in signaling areas
Buildings (residential & commercial)	Slender walls, exposed concrete, foundations, facades	Supports slender walls, slimmer floors, and wide spans
Tunneling and civil engineering	TBM soft-eye, bored piles, micro-pile foundations, diaphragm walls	Machinability / soft-eye behavior enables easy TBM boring
Industry & specialized facilities	Industrial flooring, chemical plants, MRI rooms, substations	Suitability for heavily loaded, corrosive, magnetic, or electrically sensitive environments
Water and marine	Quay walls, port facilities, jetties, sea walls, desalination plants	Total protection against chlorides; eliminates need for cathodic protection systems
Agriculture & livestock	Poultry farm flooring, manure storage tanks, silage bunkers, greenhouse foundations	Immune to biological acids in aggressive manure / disinfectant environments

9. Application Method / Usage Guidance

Control point	Source-supported guidance
Storage	Outdoor-durable. For exposure >3 months, protective cover is recommended. Store on timber dunnage to prevent permanent deformation.
Lifting	Use nylon slings. Do not use bare steel chains.
General handling	Maintain standard tying methods and chair spacing according to project design.
Bending	Cannot be cold-bent on-site. All bends must be pre-ordered as custom shapes.
Cutting	Use a fine-blade saw or high-speed grinder. Do not use bolt cutters.

Packaging, Standards, and Notes

Final controlled evidence blocks and document limitations.

10. Packaging

Field	Source-supported entry
Standard bundles	10, 20, or 30 bars
Coils	Available for 4 mm to 10 mm
Custom shapes	Per specification / pre-ordered

11. Storage / Handling

Storage and handling guidance is limited to outdoor exposure control, timber dunnage support, nylon-sling lifting, standard tying / chair spacing, no on-site cold bending, and cutting by fine-blade saw or high-speed grinder.

12. Referenced Test Methods / Standards

Reference	Source treatment in this DF-01
COSQC / Iraqi National Standard / Technical Requirement No. 10	Presented only as a source-stated Iraq compliance reference
GSO 2488/2015	Presented as a Gulf reference used in the source for minimum tensile requirements and grade classification
CSA S807-10	Presented as a Canadian reference used in the source for minimum tensile requirements and grade classification
ASTM D7957/D7957M-17	Presented as an American specification referenced in the source
ACI 440-6 M-08	Presented as an American bar-material / tensile reference cited in the source
ACI 440.11-22	Presented as a USA code reference listed in the source

13. Notes / Controlled Limitations

- This sheet contains only values and statements supported by the approved technical source set used for this DF-01.
- Shelf life is not stated in the approved source set and is therefore not included as a quantitative value.
- Referenced standards are reproduced only in the manner stated by the approved source set and are not presented here as a standalone certification dossier.
- Project references, benchmark examples, maps, icons, infographics, and environmental graphics are outside the controlled DF-01 evidence scope for this sheet.

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