

জিপিএইচ ইস্পাতের কোয়ান্টাম টেকনোলজির

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GPH ispat is the first in Bangladesh to produce 600-grade rebar using state-of-the-art Quantum Electric Arc Furnace technology while maintaining the highest standards.

Similarities and differences of GPH QUANTUM B600C-R & B600D-R Rebars with BDS ISO 6935-2:2021, ASTM A615/A615M-20, and ASTM A706/A706M-22 Standards:

Compare with GPH QUANTUM B600C-R			Compare with GPH QUANTUM B600D-R			
BDS ISO 6935-2:2021	GPH QUANTUM	ASTM A615/A615M-20	Properties	BDS ISO 6935-2:2021	GPH QUANTUM	ASTM A706/A706M-22
B600C-R	B600C-R	80(550)	Grade	B600D-R	B600D-R	80(550)
600 to --- (80,000 psi to --)	600 to 675 (87,000 psi to 98,000 psi)	550 to --- (80,000 psi to --)	Yield strength (MPa) (Min to Max)	600 to 720 (87,000 psi to 104,000 psi)	600 to 675 (87,000 psi to 98,000 psi)	550 to 675 (80,000 psi to 98,000 psi)
690 Mpa (100,000 psi)	690 Mpa (100,000 psi)	690 Mpa (100,000 psi)	Tensile strength (MPa) (Min)	750 Mpa (108,000 psi)	750 Mpa (108,000 psi)	690 Mpa (100,000 psi)
1.15	1.15	1.10	T/Y Ratio (Min)	1.25	1.25	1.25
7%	8%	N/A	Elongation at Max. Force	8%	8%	7%
10%	14%	N/A	Total Elongation (G.L:5D)	10%	14%	N/A
N/A	12%	12%	Total Elongation (G.L:200mm)	N/A	12%	12%
S ≤ 0.070% P ≤ 0.070%	C ≤ 0.29% Si ≤ 0.30% Mn ≤ 1.15% S ≤ 0.035% P ≤ 0.030%	P ≤ 0.060%	Product Analysis	C ≤ 0.40% Si ≤ 0.60% Mn ≤ 1.88% S ≤ 0.048% P ≤ 0.048%	C ≤ 0.33% Si ≤ 0.30% Mn ≤ 1.30% S ≤ 0.035% P ≤ 0.030%	C ≤ 0.33% Si ≤ 0.55% Mn ≤ 1.56% S ≤ 0.053% P ≤ 0.043%
Non-Weldable	Weldable	Non-Weldable	Weldability	Non-Weldable	Weldable	Weldable

- GPH QUANTUM B600C-R/B600D-R contains much less sulfur and phosphorus than BDS ISO and ASTM standards to maintain consistent rod quality.

- Bangladesh's only high strength rebar GPH QUANTUM B600C-R/B600D-R approved to BSTI production standards.

- GPH's Quantum Electric Arc Furnace technology is capable of producing any high quality rebar with following all the physical and chemical properties as per domestic and international production standards.

Welding and Bending Guidelines for Rebars

Mandrel

When bending rebars, it is essential to use a mandrel with the correct diameter. Otherwise, in some cases, micro-cracks may appear on the surface of the bent portion of the rebar.

Bending Guidelines for 600 Grade Rebars

BNBC 2020 (Chapter: 8.1.2.2) (For Site Work)	
Rebar Diameter (mm)	Minimum Bending Mandrel Diameter on Site (mm)
8	32
10	60
12	72
16	96
20	120
25	150
28	224
32	256

Can 600 Grade Rebars Be Welded?

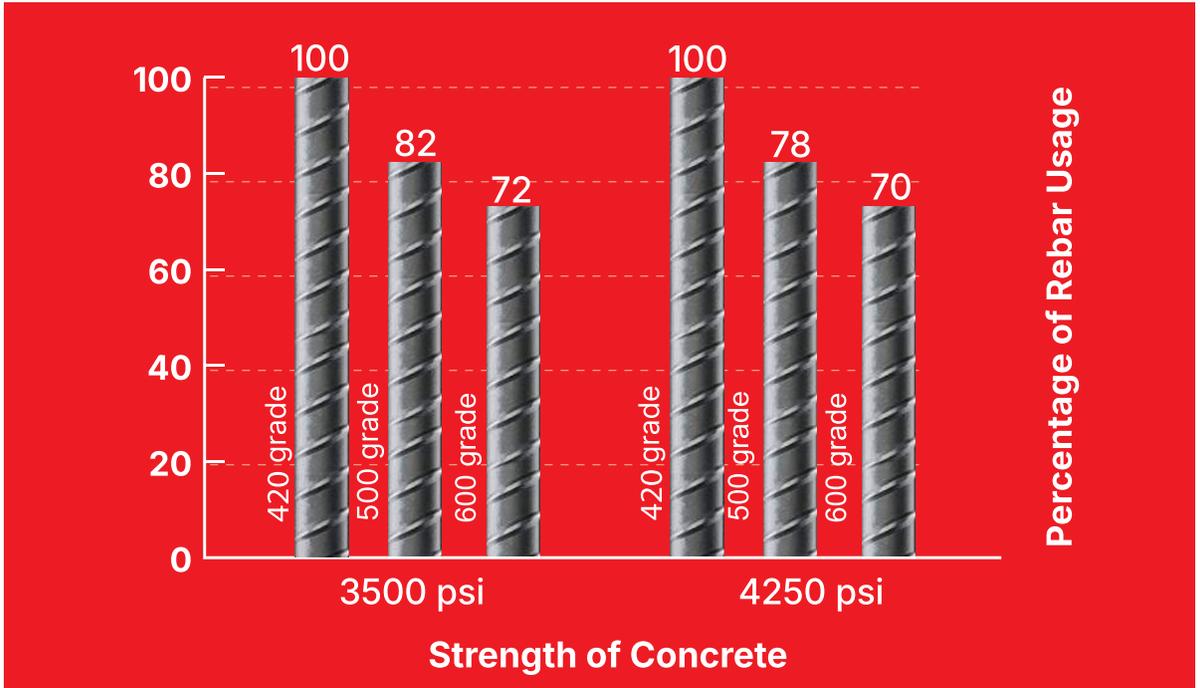
The weldability of rebars generally depends on their Carbon Equivalent (CE) value. According to BDS ISO 6935-2:2021, the most weldable rebar grade, B500DWR, has a Carbon Equivalent (CE) value of 0.61. In comparison, during the production process, the Carbon Equivalent (CE) values of GPH QUANTUM B600C-R and B600D-R are kept below the maximum limit specified in the welding code (AWS D1.4). Due to this unique characteristic, GPH QUANTUM B600C-R and B600D-R rebars can be welded in compliance with AWS D1.4 standards. Compliance with building code guidelines is mandatory for any rebar welding.

Welding guidelines as per ACI318-25 (For any grade of Rebar)

1. Clause-18.2.8.1, Welded Splices are not permitted in Special Moment Frames or in Special Structural Walls including Coupling Beams.
2. Clause-18.2.8.2, Welding of stirrups, Ties, Inserts or Others similar elements to longitudinal reinforcement required by design shall not be permitted.

Additional Advantages of GPH QUANTUM B600C-R and B600D-R

According to joint research conducted by BUET and GPH ispat, using B600C-R and B600D-R in construction results in up to 17% savings in rebar compared to 500 grade, and up to **30% savings** compared to 420 grade.



Increased Floor Space

By reducing the column section size in construction, more floor space can be achieved.



Assurance of Strong Casting

Reducing rebar congestion in columns ensures better quality, which enhances the durability and strength of the structure.



More Cost-Effective

Using comparatively less rebar reduces material, labor, and construction time, thereby lowering overall construction costs.



Suitable for Earthquake Resilience

Research by BUET shows that beam-column joints made with 600-grade rebars have significantly higher cyclic loading resistance compared to 420 and 500 grades. Therefore, 600-grade rebars are more suitable for constructing earthquake-resistant buildings.



Environment Friendly

Reduced handling of construction materials decreases fuel consumption, water requirements, and environmental pollution.



Weldable

GPH QUANTUM B600C-R and B600D-R rebars are suitable for welding.

GPH ispat in Mega Projects



Padma Multipurpose Bridge

A groundbreaking step in facilitating seamless connectivity between Southern Bangladesh and the rest of the country.



Dhaka Metro Rail

We take pride in using world-class GPH Quantum Steel to ensure quality in the construction of Bangladesh's first metro rail.



Dhaka Elevated Expressway

GPH ispat is honored to be one of the main rebar suppliers for the Dhaka Elevated Expressway project.



Karnaphuli Tunnel

A marvel of engineering, setting a new milestone in effortless connectivity between Cox's Bazar, the deep-sea port, and the rest of the country.

Comparative cost analysis of 600 and 500 Grade Rebar for a 10-story standard residential building

Building Type: Residential
 Construction Area: 5,472 sft/per floor
 Concrete strength: 3,500 psi

Soil Site Class: SD
 Seismic Zone: 2
 Seismic Force Resisting System: SMF

Cost Saving Using GPH 600 Grade: 12.4%

		Particulars	Unit	500 Grade	600 Grade
Assumption		Savings of rebar by using GPH 600	%	12.4%	
		Rebar Requirement	MT	215.00	188.34
		Rebar Rate	BDT/MT	85,000.00	87,500.00
		Transport Rate	BDT/MT	2,000.00	2,000.00
		Cutting & Bending (Manual/Contractor)	BDT/MT	5,000.00	5,000.00
		Wastage in general	%	3.5%	3.5%
		Misuse in general	%	1.5%	1.5%
Savings Using 600 Grade					
With GPH 600		Rebar Cost	BDT	18,275,000.00	16,479,750.00
		Transport Cost	BDT	430,000.00	376,680.00
		Cutting & Bending (Manual/Contractor)	BDT	1,075,000.00	941,700.00
		Wastage Cost (Deducting Scrap Value)	BDT	319,812.50	288,395.63
		Rebar Misuse cost	BDT	274,125.00	247,196.25
		Total Cost	BDT	20,373,937.50	18,333,721.88

Total Savings 2,040,215.63 Tk.

Per Ton Probable Savings or Rebar Cost Reduced 10,832.62 Tk./MT

Effective Rebar Rate Compared to 500 Grade 76,667.38 Tk./MT

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