Department of Materials and Metallurgical Engineering (MME)
Bangladesh University of Engineering and Technology (BUET)

Client: Engr. Md. Tanjidul Islam
Sr. Manager, Quality Control
GPH Ispat Limited
Crown Chamber
325 Asadgonj, Chattogram 4000

Client's Ref: Nil; 22/04/2025
BRTC Ref: 1103-51054/MME/2024-25; 29/04/2025
Sample Condition: Not Sealed

10 May 2025
MME 0915/2024-2025

pjdlizu1dcee

TEST OF DEFORMED M.S. REBAR (Test Method BDS ISO 6935-2 2021)

Frog Mark/ Identification	Sample No	Bar Designation/ Nominal Diameter, d	Actual Diameter	Mass per Unit Length	Average Unit Weight	Upper Yield Load	Upper Yield Strength, R_{eH}	Average Upper Yield Strength	Tensile Load	Tensile Strength, R_m	Average Tensile Strength	R_m/R_{eH}	Elongation after Fracture (G.L. 5d)	Average Elongation after Facture, A	Elongation at Maximum Force, A_{gt}	Bend Test (Separate Sample)
		mm	mm	kg/m	kg/m	kN	MPa	MPa (psi)	kN	MPa	MPa (psi)		%	%	%	
GPH QUANTUM B600 D-R 10	1	10	9.96	0.612	0.611	50.82	647	646 (93,500)	65.24	831	830 (1,20,500)	1.28	20	18	14	Satisfactory
	2	10	9.94	0.609		50.88	648		65.33	832		1.28	18		12	Satisfactory
	3	10	9.96	0.612		50.60	644		64.95	827		1.28	16		9	Satisfactory

Test Performed by

10/05/2025

Dr. Md. Moniruzzaman
Professor

Countersigned by

Rashed 10 MAY 2025

Dr. H. M. Mamun Al Rashed
Professor and Head

Weight Requirements and Nominal Cross-Sectional Area for Steel Rebar (As Per BDS ISO 6935-2 2021 Table 2)

Bar Designation Number/Nominal Bar Diameter, mm	6	8	10	12	16	20	25	28	32	40
Nominal Mass per Unit Length, kg/m	0.222	0.395	0.617	0.888	1.58	2.47	3.85	4.83	6.31	9.86
Permissible Variation of Nominal Mass per Unit Length, %	±8	±6	±6	±6	±5	±5	±4	±4	±4	±4
Nominal Cross-Sectional Area, mm^2	28.3	50.3	78.5	113	201	314	491	616	804	1257

Minimum Tensile Requirements for Steel Rebar (As Per BDS ISO 6935-2 2021 Table 6)

Steel Grade	Upper Yield Strength R_{eH} MPa		R_m/R_{eH}	Ductility Properties A %	A_{gt} %
	Minimum	Maximum	Minimum	Minimum	Minimum
B400C-R / B400CWR	400	—	1.25	14	7
B500C-R / B500CWR	500	—			
B600C-R	600	—		10	
B400D/WR	400	1.3 x R_{eH} (min.)	1.25	17	9
B420D/WR	420			16	
B500D/WR	500			13	
B600D-R	600	1.2 x R_{eH} (min.)		10	

Please Note: The client supplied the sample and the result given herewith corresponds to the sample tested only. The Department of Materials and Metallurgical Engineering of BUET takes no responsibility regarding the misidentification, if any, of the sample.

020729

Department of Materials and Metallurgical Engineering (MME)
Bangladesh University of Engineering and Technology (BUET)

Client: Engr. Md. Tanjidul Islam
Sr. Manager, Quality Control
GPH Ispat Limited
Crown Chamber
325 Asadgonj, Chattogram 4000

Client's Ref: Nil; 22/04/2025
BRTC Ref: 1103-51055/MME/2024-25; 29/04/2025
Sample Condition: Not Sealed

10 May 2025
MME 0916/2024-2025

l9deipu54c66

TEST OF DEFORMED M.S. REBAR (Test Method BDS ISO 6935-2 2021)

Frog Mark/ Identification	Sample No.	Bar Designation/ Nominal Diameter, d	Actual Diameter	Mass per Unit Length	Average Unit Weight	Upper Yield Load	Upper Yield Strength, R_{eH}	Average Upper Yield Strength	Tensile Load	Tensile Strength, R_m	Average Tensile Strength	R_m/R_{eH}	Elongation after Fracture (G.L. 5d)	Average Elongation after Facture, A	Elongation at Maximum Force, A_{gt}	Bend Test (Separate Sample)
		mm	mm	kg/m	kg/m	kN	MPa	MPa (psi)	kN	MPa	MPa (psi)		%	%	%	
GPH QUANTUM B600 D-R 12	1	12	11.98	0.884	0.886	71.16	629	634 (92,000)	89.89	795	798 (1,15,500)	1.26	22	21	13	Satisfactory
	2	12	11.99	0.886		72.17	638		90.70	802		1.26	20		12	Satisfactory
	3	12	11.99	0.886		71.67	634		90.12	797		1.26	21		12	Satisfactory

Test Performed by

Dr. Md. Moniruzzaman
Professor

Countersigned by

10 MAY 2025

Dr. H. M. Mamun Al Rashed
Professor and Head

Weight Requirements and Nominal Cross-Sectional Area for Steel Rebar (As Per BDS ISO 6935-2 2021 Table 2)

Bar Designation Number/Nominal Bar Diameter, mm	6	8	10	12	16	20	25	28	32	40
Nominal Mass per Unit Length, kg/m	0.222	0.395	0.617	0.888	1.58	2.47	3.85	4.84	6.31	9.86
Permissible Variation of Nominal Mass per Unit Length, %	±8	±6	±6	±6	±5	±5	±4	±4	±4	±4
Nominal Cross-Sectional Area, mm²	28.3	50.3	78.5	113	201	314	491	616	804	1257

Minimum Tensile Requirements for Steel Rebar (As Per BDS ISO 6935-2 2021 Table 6)

Steel Grade	Upper Yield Strength R_{eH} MPa		Ductility Properties R_m/R_{eH}	A %	A_{gt} %
	Minimum	Maximum	Minimum	Minimum	Minimum
B400C/B /B400C/WB	400	—	1.15	14	7
B500C/B /B500C/WB	500	—		10	
B600C/B	600	—			
B400D/WB	400	1.3 × R_{eH} (max.)	1.25	17	9
B450D/WB	450			16	
B500D/WB	500			15	
B600D/B	600	1.2 × R_{eH} (max.)		10	

Please Note: The client supplied the sample and the result given herewith corresponds to the sample tested only. The Department of Materials and Metallurgical Engineering of BUET takes no responsibility regarding the misidentification, if any, of the sample.

Department of MME, Old Academic Building, 1st Floor, BUET, Dhaka 1000 +880 1741 362 504 +880 2 5516 7228-57 Ext 7629 brtcmme@mme.buet.ac.bd

Department of Materials and Metallurgical Engineering (MME)
Bangladesh University of Engineering and Technology (BUET)

Client: Engr. Md. Tanjidul Islam
Sr. Manager, Quality Control
GPH Ispat Limited
Crown Chamber
325 Asadgonj, Chattogram 4000

Client's Ref: Nil; 22/04/2025
BRTC Ref: 1103-51056/MME/2024-25; 29/04/2025
Sample Condition: Not Sealed

10 May 2025
MME 0917/2024-2025

eq23izux7cdd

TEST OF DEFORMED M.S. REBAR (Test Method BDS ISO 6935-2 2021)

Frog Mark/ Identification	Sample No.	Bar Designation/ Nominal Diameter, d	Actual Diameter	Mass per Unit Length	Average Unit Weight	Upper Yield Load	Upper Yield Strength, R_{eH}	Average Upper Yield Strength	Tensile Load	Tensile Strength, R_m	Average Tensile Strength	R_m/R_{eH}	Elongation after Fracture (G.L. 5d)	Average Elongation after Facture, A	Elongation at Maximum Force, A_{gt}	Bend Test (Separate Sample)
		mm	mm	kg/m	kg/m	kN	MPa	MPa (psi)	kN	MPa	MPa (psi)		%	%	%	
GPH QUANTUM B600 D-R 16	1	16	15.98	1.575	1.576	126.34	628	632 (91,500)	166.32	827	829 (1,20,000)	1.32	18	18	11	Satisfactory
	2	16	15.99	1.576		126.60	630		166.67	829		1.32	19		12	Satisfactory
	3	16	15.99	1.577		128.10	637		166.92	830		1.30	17		11	Satisfactory

Test Performed by

10/05/2025

Dr. Md. Moniruzzaman
Professor

Countersigned by

10 MAY 2025

Dr. H. M. Mamun Al Rashed
Professor and Head

Weight Requirements and Nominal Cross-Sectional Area for Steel Rebar (As Per BDS ISO 6935-2 2021 Table 3)

Bar Designation Number/Nominal Bar Diameter, mm	6	8	10	12	16	20	25	28	32	40
Nominal Mass per Unit Length, kg/m	0.222	0.395	0.617	0.888	1.58	2.47	3.85	4.84	6.31	9.86
Permissible Variation of Nominal Mass per Unit Length, %	±8	±8	±6	±6	±5	±5	±4	±4	±4	±4
Nominal Cross-Sectional Area, mm²	28.3	50.3	78.5	113	201	314	491	616	804	1257

Minimum Tensile Requirements for Steel Rebar (As Per BDS ISO 6935-2 2021 Table 6)

Steel Grade	Upper Yield Strength R_{eH} MPa		R_m/R_{eH}	Ductility Properties A %	A_{gt} %
	Minimum	Maximum	Minimum	Minimum	Minimum
B400C-H / B400C-WR	400	—	1.15	14	7
B500C-H / B500C-WR	500	—		10	
Fe600C-H	600	—			
B400D-WR	400	1.3 × R_{eH} (min.)	1.25	17	8
B420D-WR	420			15	
B500D-WR	500			12	
B600D-R	600	1.2 × R_{eH} (min.)		10	

Please Note: The client supplied the sample and the result given herewith corresponds to the sample tested only. The Department of Materials and Metallurgical Engineering of BUET takes no responsibility regarding the misidentification, if any, of the sample.

020724

Client: Engr. Md. Tanjidul Islam
Sr. Manager, Quality Control
GPH Ispat Limited
Crown Chamber
325 Asadgonj, Chattogram 4000

Client's Ref: Nil; 22/04/2025
BRTC Ref: 1103-51058/MME/2024-25; 29/04/2025
Sample Condition: Not Sealed

10 May 2025
MME 0918/2024-2025

rvdgugud0ckk

TEST OF DEFORMED M.S. REBAR (Test Method BDS ISO 6935-2 2021)

Frog Mark/ Identification	Sample No.	Bar Designation/ Nominal Diameter, d	Actual Diameter	Mass per Unit Length	Average Unit Weight	Upper Yield Load	Upper Yield Strength, R_{eH}	Average Upper Yield Strength	Tensile Load	Tensile Strength, R_m	Average Tensile Strength	R_{eH}/R_m	Elongation after Fracture (G.L. 5d)	Average Elongation after Facture, A	Elongation at Maximum Force, A_{gt}	Bend Test (Separate Sample)
		mm	mm	kg/m	kg/m	kN	MPa	MPa (psi)	kN	MPa	MPa (psi)		%	%	%	
GPH QUANTUM B600 D-R 20	1	20	19.97	2.458	2.457	193.76	617	618 (89,500)	245.26	781	782 (1,13,500)	1.27	21	21	14	Satisfactory
	2	20	19.97	2.458		194.18	618		245.89	783		1.27	19		13	Satisfactory
	3	20	19.95	2.454		194.28	618		245.35	781		1.26	24		14	Satisfactory

Test Performed by

10/05/2025

Dr. Md. Moniruzzaman
Professor

Countersigned by

Rashed 10 MAY 2025

Dr. H. M. Mamun Al Rashed
Professor and Head

Weight Requirements and Nominal Cross-Sectional Area for Steel Rebar (As Per BDS ISO 6935-2 2021 Table 2)

Bar Designation Number/Nominal Bar Diameter, mm	6	8	10	12	16	20	25	28	32	40
Nominal Mass per Unit Length, kg/m	0.222	0.395	0.617	0.888	1.58	2.47	3.85	4.84	6.31	9.86
Permissible Variation of Nominal Mass per Unit Length, %	±8	±8	±6	±6	±5	±5	±4	±4	±4	±4
Nominal Cross-Sectional Area, mm^2	28.3	50.3	78.5	113	201	314	491	616	804	1257

Minimum Tensile Requirements for Steel Rebar (As Per BDS ISO 6935-2 2021 Table 6)

Steel Grade	Upper Yield Strength R_{eH} MPa		Ductility Properties R_{eH}/R_m	A %	A_{gt} %
	Minimum	Maximum	Maximum	Minimum	Minimum
B400C-R / B400CWR	400	—	1.35	14	7
B500C-R / B500CWR	500	—		12	
B600C-R	600	—		10	
B400DWR	400	1.3 x R_{eH} (min.)	1.25	17	8
B420DWR	420			16	
B500DWR	500			15	
B600D-R	600	1.2 x R_{eH} (min.)		10	

Please Note: The client supplied the sample and the result given herewith corresponds to the sample tested only. The Department of Materials and Metallurgical Engineering of BUET takes no responsibility regarding the misidentification, if any, of the sample.

020727

Client: Engr. Md. Tanjidul Islam
Sr. Manager, Quality Control
GPH Ispat Limited
Crown Chamber
325 Asadgonj, Chattogram 4000

Client's Ref: Nil; 22/04/2025
BRTC Ref: 1103-51059/MME/2024-25; 29/04/2025
Sample Condition: Not Sealed

10 May 2025
MME 0919/2024-2025

x0deanug6cvv

TEST OF DEFORMED M.S. REBAR (Test Method BDS ISO 6935-2 2021)

Frog Mark/ Identification	Sample No.	Bar Designation/ Nominal Diameter, d	Actual Diameter	Mass per Unit Length	Average Unit Weight	Upper Yield Load	Upper Yield Strength, R_{eH}	Average Upper Yield Strength	Tensile Load	Tensile Strength, R_m	Average Tensile Strength	R_m/R_{eH}	Elongation after Fracture (G.L. 5d)	Average Elongation after Facture, A	Elongation at Maximum Force, A_{gt}	Bend Test (Separate Sample)
		mm	mm	kg/m	kg/m	kN	MPa	MPa (psi)	kN	MPa	MPa (psi)		%	%	%	
GPH QUANTUM B600 D-R 25	1	25	24.96	3.842	3.841	315.70	643	644 (93,500)	401.10	817	817 (1,18,500)	1.27	18	17	10	Satisfactory
	2	25	24.96	3.841		317.57	647		401.66	818		1.26	16		10	Satisfactory
	3	25	24.96	3.842		315.39	643		400.30	815		1.27	17		9	Satisfactory

Test Performed by

10/05/2025

Dr. Md. Moniruzzaman
Professor

Countersigned by

Rashed 10 MAY 2025

Dr. H. M. Maman Al Rashed
Professor and Head

Weight Requirements and Nominal Cross-Sectional Area for Steel Rebar (As Per BDS ISO 6935-2 2021 Table 2)

Bar Designation Number/Nominal Bar Diameter, mm	6	8	10	12	16	20	25	28	32	40
Nominal Mass per Unit Length, kg/m	0.222	0.395	0.617	0.888	1.58	2.47	3.85	4.84	6.31	9.86
Permissible Variation of Nominal Mass per Unit Length, %	±8	±8	±6	±6	±5	±5	±4	±4	±4	±4
Nominal Cross-Sectional Area, mm^2	28.3	50.3	78.5	113	201	314	491	616	804	1257

Minimum Tensile Requirements for Steel Rebar (As Per BDS ISO 6935-2 2021 Table 6)

Steel Grade	Upper Yield Strength R_{eH} MPa		Ductility Properties R_m/R_{eH}	A %	A_{gt} %
	Minimum	Maximum	Minimum	Minimum	Minimum
B400C-R / B400CWR	400	—	1.13	14	7
B500C-R / B500CWR	500	—			
B600C-R	600	—		10	
B400DWR	400	1.3 x R_{eH} (min.)	1.25	17	8
B420DWR	420			16	
B500DWR	500			12	
B600D-R	600	1.2 x R_{eH} (min.)		10	

Please Note: The client supplied the sample and the result given herewith corresponds to the sample tested only. The Department of Materials and Metallurgical Engineering of BUET takes no responsibility regarding the misidentification, if any, of the sample.

Client: Engr. Md. Tanjidul Islam
Sr. Manager, Quality Control
GPH Ispat Limited
Crown Chamber
325 Asadgonj, Chattogram 4000

Client's Ref: Nil; 22/04/2025
BRTC Ref: 1103-51060/MME/2024-25; 29/04/2025
Sample Condition: Not Sealed

10 May 2025
MME 0920/2024-2025

9dq4u2uzycll

TEST OF DEFORMED M.S. REBAR (Test Method BDS ISO 6935-2 2021)

Frog Mark/ Identification	Sample No.	Bar Designation/ Nominal Diameter, d	Actual Diameter	Mass per Unit Length	Average Unit Weight	Upper Yield Load	Upper Yield Strength, R_{eH}	Average Upper Yield Strength	Tensile Load	Tensile Strength, R_m	Average Tensile Strength	R_m/R_{eH}	Elongation after Fracture (G.L. 5d)	Average Elongation after Facture, A	Elongation at Maximum Force, A_{gt}	Bend Test (Separate Sample)
		mm	mm	kg/m	kg/m	kN	MPa	MPa (psi)	kN	MPa	MPa (psi)		%	%	%	
GPH QUANTUM B600 D-R 32	1	32	31.91	6.279	6.312	506.35	630	637 (92,500)	638.69	794	803 (1,16,500)	1.26	18	18	13	Satisfactory
	2	32	32.02	6.320		514.80	640		648.31	806		1.26	16		10	Satisfactory
	3	32	32.05	6.335		515.05	640		650.66	809		1.26	20		11	Satisfactory

Test Performed by

Dr. Md. Moniruzzaman
Professor

Countersigned by

10 MAY 2025

Dr. H. M. Mamun Al Rashed
Professor and Head

Weight Requirements and Nominal Cross-Sectional Area for Steel Rebar (As Per BDS ISO 6935-2 2021 Table 2)

Bar Designation Number/Nominal Bar Diameter, mm	6	8	10	12	16	20	25	28	32	40
Nominal Mass per Unit Length, kg/m	0.222	0.395	0.617	0.888	1.58	2.47	3.85	4.84	6.31	9.86
Permissible Variation of Nominal Mass per Unit Length, %	±8	±8	±6	±6	±5	±5	±4	±4	±4	±4
Nominal Cross-Sectional Area, mm^2	28.3	50.3	78.5	113	201	314	491	616	804	1257

Minimum Tensile Requirements for Steel Rebar (As Per BDS ISO 6935-2 2021 Table 6)

Steel Grade	Upper Yield Strength R_{eH} MPa		R_m/R_{eH}	Ductility Properties A %	A_{gt} %
	Minimum	Maximum	Minimum	Minimum	Minimum
B400C-S / B400CWR	400	—	1.13	14	7
B500C-S / B500CWR	500	—			
B600C-S	600	—		12	
B400D/WR	400	1.3 x R_{eH} (min.)	1.25	17	8
B420D/WR	420			16	
B500D/WR	500			13	
B600D-R	600	1.2 x R_{eH} (min.)		10	

Please Note: The client supplied the sample and the result given herewith corresponds to the sample tested only. The Department of Materials and Metallurgical Engineering of BUET takes no responsibility regarding the misidentification, if any, of the sample.

Client: Engr. Md. Tanjidul Islam
Sr. Manager, Quality Control
GPH Ispat Limited
Crown Chamber
325 Asadgonj, Chattogram 4000

Client's Ref: Nil; 22/04/2025
BRTC Ref: 1103-51036/MME/2024-25; 29/04/2025
Sample Condition: Not Sealed

14 May 2025
MME 0906/2024-2025

weqnb7u5pc77

TEST OF DEFORMED M.S. REBAR (Test Method BDS ISO 6935-2 2021)

Frog Mark/ Identification	Sample No.	Bar Designation/ Nominal Diameter, d	Actual Diameter	Mass per Unit Length	Average Unit Weight	Upper Yield Load	Upper Yield Strength, R_{eH}	Average Upper Yield Strength	Tensile Load	Tensile Strength, R_m	Average Tensile Strength	R_m/R_{eH}	Elongation after Fracture (G.L. 5d)	Average Elongation after Facture, A	Elongation at Maximum Force, A_{gt}	Bend Test (Separate Sample)	Rebend Test (Separate Sample)
		mm	mm	kg/m	kg/m	kN	MPa	MPa (psi)	kN	MPa	MPa (psi)		%	%	%		
GPH B500 DWR 8	1	8	7.92	0.386	0.386	27.60	549	548 (79,500)	36.50	726	725 (1,05,000)	1.32	24	25	10	Satisfactory	Satisfactory
	2	8	7.91	0.386		27.19	541		36.10	718		1.33	26		11	Satisfactory	Satisfactory
	3	8	7.91	0.386		27.91	555		36.68	730		1.31	26		9	Satisfactory	Satisfactory

Test Performed by

mrahman 14.05.25

Mr. Md. Miftaur Rahman
Assistant Professor

Countersigned by

HRashed 14 MAY 2025

Dr. H. M. Mamun Al Rashed
Professor and Head

Weight Requirements and Nominal Cross-Sectional Area for Steel Rebar (As Per BDS ISO 6935-2 2021 Table 2)

Bar Designation Number/Nominal Bar Diameter, mm	6	8	10	12	16	20	25	28	32	40
Nominal Mass per Unit Length, kg/m	0.222	0.395	0.617	0.888	1.58	2.47	3.85	4.84	6.31	9.86
Permissible Variation of Nominal Mass per Unit Length, %	±8	±6	±6	±6	±5	±5	±4	±4	±4	±4
Nominal Cross-Sectional Area, mm²	28.3	50.3	78.5	113	201	314	491	616	804	1257

Minimum Tensile Requirements for Steel Rebar (As Per BDS ISO 6935-2 2021 Table 6)

Steel Grade	Upper Yield Strength R_{eH}, MPa		R_m/R_{eH}	Elongation Properties A, %	A_{gt}, %
	Minimum	Maximum	Minimum	Minimum	Minimum
B400C-R / B400C-WR	400	—	1.15	14	7
B500C-R / B500C-WR	500	—			
B600C-R	600	—		10	
B400DWR	400	1.3 x R_{eH} (min.)	1.25	17	8
B420DWR	420			16	
B500DWR	500			15	
B600DWR	600	1.2 x R_{eH} (min.)		10	

Please Note: The client supplied the sample and the result given herewith corresponds to the sample tested only. The Department of Materials and Metallurgical Engineering of BUET takes no responsibility regarding the manufacturer, if any, of the sample.

020744

Client: Engr. Md. Tanjidul Islam
Sr. Manager, Quality Control
GPH Ispat Limited
Crown Chamber
325 Asadgonj, Chattogram 4000

Client's Ref: Nil; 22/04/2025
BRTC Ref: 1103-51039/MME/2024-25; 29/04/2025
Sample Condition: Not Sealed

14 May 2025
MME 0907/2024-2025

Qrpwtjuxpcvv

TEST OF DEFORMED M.S. REBAR (Test Method BDS ISO 6935-2 2021)

Frog Mark/ Identification	Sample No.	Bar Designation/ Nominal Diameter, d	Actual Diameter	Mass per Unit Length	Average Unit Weight	Upper Yield Load	Upper Yield Strength, R_{eH}	Average Upper Yield Strength	Tensile Load	Tensile Strength, R_m	Average Tensile Strength	R_m/R_{eH}	Elongation after Fracture (G.L. 5d)	Average Elongation after Facture, A	Elongation at Maximum Force, A_{gt}	Bend Test	Rebend Test
		mm	mm	kg/m	kg/m	kN	MPa	MPa (psi)	kN	MPa	MPa (psi)		%	%	%	(Separate Sample)	(Separate Sample)
GPH QUANTUM B500 DWR 10	1	10	9.96	0.611	0.613	42.30	539	535 (77,500)	55.68	709	700 (1,01,500)	1.32	24	25	11	Satisfactory	Satisfactory
	2	10	10.00	0.617		42.05	535		53.89	686		1.28	29		10	Satisfactory	Satisfactory
	3	10	9.94	0.609		41.81	532		55.43	706		1.33	21		11	Satisfactory	Satisfactory

Test Performed by

mrahman 14.05.25

Mr. Md. Miftaur Rahman
Assistant Professor

Countersigned by

HRashed 14 MAY 2025

Dr. H. M. Mamun Al Rashed
Professor and Head

Weight Requirements and Nominal Cross-Sectional Area for Steel Rebar (As Per BDS ISO 6935-2 2021 Table 2)

Bar Designation Number/Nominal Bar Diameter, mm	6	8	10	12	16	20	25	28	32	40
Nominal Mass per Unit Length, kg/m	0.222	0.395	0.617	0.888	1.58	2.47	3.85	4.84	6.31	9.86
Permissible Variation of Nominal Mass per Unit Length, %	±8	±8	±6	±6	±5	±5	±5	±5	±5	±4
Nominal Cross-Sectional Area, mm²	28.3	50.3	78.5	113	201	314	491	616	804	1257

Minimum Tensile Requirements for Steel Rebar (As Per BDS ISO 6935-2 2021 Table 4)

Steel Grade	Upper Yield Strength R_{eH} MPa		Ductility Properties R_m/R_{eH}	A %	A_{gt} %
	Minimum	Minimum	Minimum	Minimum	Minimum
B400C-R / B400CWR	400	—	1.15	14	7
B500C-R / B500CWR	500	—			
B600C-R	600	—		10	
B400D/ER	400	1.3 x R_{eH} (min.)	1.25	17	8
B420D/ER	420			16	
B500D/ER	500			12	
B600D-R	600	1.1 x R_{eH} (min.)		10	

Please Note: The client supplied the sample and the result given herewith corresponds to the sample tested only. The Department of Materials and Metallurgical Engineering of BUET takes no responsibility regarding the misidentification, if any, of the sample.

Department of MME, Old Academic Building, 1st Floor, BUET, Dhaka 1000 +880 1741 362 504 +880 2 5516 7228-57 Ext 7629 brtcmme@mme.buet.ac.bd

Client: Engr. Md. Tanjidul Islam
Sr. Manager, Quality Control
GPH Ispat Limited
Crown Chamber
325 Asadgonj, Chattogram 4000

Client's Ref: Nil; 22/04/2025
BRTC Ref: 1103-51042/MME/2024-25; 29/04/2025
Sample Condition: Not Sealed

14 May 2025
MME 0908/2024-2025

qxpqhvuq9cee

TEST OF DEFORMED M.S. REBAR (Test Method BDS ISO 6935-2 2021)

Frog Mark/ Identification	Sample No.	Bar Designation/ Nominal Diameter, d	Actual Diameter	Mass per Unit Length	Average Unit Weight	Upper Yield Load	Upper Yield Strength, R_{eH}	Average Upper Yield Strength	Tensile Load	Tensile Strength, R_m	Average Tensile Strength	R_{eH}/R_{eH}	Elongation after Fracture (G.L. 5d)	Average Elongation after Facture, A	Elongation at Maximum Force, A_{gt}	Bend Test (Separate Sample)	Rebend Test (Separate Sample)
		mm	mm	kg/m	kg/m	kN	MPa	MPa (psi)	kN	MPa	MPa (psi)		%	%	%		
GPH QUANTUM B500 DWR 12	1	12	11.92	0.876	0.875	63.68	563	551 (80,000)	80.23	709	699 (1,01,500)	1.26	25	21	10	Satisfactory	Satisfactory
	2	12	11.92	0.876		62.10	549		78.60	695		1.27	16		9	Satisfactory	Satisfactory
	3	12	11.90	0.874		61.21	541		78.22	692		1.28	21		13	Satisfactory	Satisfactory

Test Performed by

Mr. Md. Miftaur Rahman
Assistant Professor

Countersigned by

Dr. H. M. Mamun Al Rashed
Professor and Head

Weight Requirements and Nominal Cross-Sectional Area for Steel Rebar (As Per BDS ISO 6935-2 2021 Table 2)

Bar Designation Number/Nominal Bar Diameter, mm	6	8	10	12	16	20	25	28	32	40
Nominal Mass per Unit Length, kg/m	0.222	0.395	0.617	0.888	1.58	2.47	3.85	4.84	6.31	9.86
Permissible Variation of Nominal Mass per Unit Length, %	±8	±8	±6	±6	±5	±5	±5	±5	±5	±5
Nominal Cross-Sectional Area, mm²	28.3	50.3	78.5	113	201	314	491	616	804	1257

Minimum Tensile Requirements for Steel Rebar (As Per BDS ISO 6935-2 2021 Table 6)

Steel Grade	Upper Yield Strength R_{eH} MPa		R_{eH}/R_{eH}	Ductility Properties A %	Ductility Properties A_{gt} %
	Minimum	Maximum	Minimum	Minimum	Minimum
B400C-R / B400CWR	400	—	1.15	14	7
B500C-R / B500CWR	500	—			
B600C-R	600	—		10	
B400DWR	400		1.25	17	8
B450DWR	450	1.3 x R_{eH} (min.)		16	
B500DWR	500			13	
B600D-R	600	1.2 x R_{eH} (min.)		10	

Please Note: The client supplied the sample and the results given herewith corresponds to the sample tested only. The Department of Materials and Metallurgical Engineering of BUET takes no responsibility regarding the misidentification, if any, of the sample.

Department of MME, Old Academic Building, 1st Floor, BUET, Dhaka 1000 +880 1741 362 504 +880 2 5516 7228-57 Ext 7629 brtcmme@mme.buet.ac.bd

Client: Engr. Md. Tanjidul Islam
Sr. Manager, Quality Control
GPH Ispat Limited
Crown Chamber
325 Asadgonj, Chattogram 4000

Client's Ref: Nil; 22/04/2025
BRTC Ref: 1103-51043/MME/2024-25; 29/04/2025
Sample Condition: Not Sealed

14 May 2025
MME 0909/2024-2025

nx7pc4u0kc66

TEST OF DEFORMED M.S. REBAR (Test Method BDS ISO 6935-2 2021)

Frog Mark/ Identification	Sample No.	Bar Designation/ Nominal Diameter, d	Actual Diameter	Mass per Unit Length	Average Unit Weight	Upper Yield Load	Upper Yield Strength, R_{eH}	Average Upper Yield Strength	Tensile Load	Tensile Strength, R_m	Average Tensile Strength	R_{eH}/R_m	Elongation after Fracture (G.L. 5d)	Average Elongation after Facture, A	Elongation at Maximum Force, A_{gt}	Bend Test (Separate Sample)	Rebend Test (Separate Sample)
		mm	mm	kg/m	kg/m	kN	MPa	MPa (psi)	kN	MPa	MPa (psi)		%	%	%		
GPH QUANTUM B500 DWR 16	1	16	15.95	1.569	1.569	107.18	533	535 (77,000)	144.10	717	717 (1,04,000)	1.34	20	22	13	Satisfactory	Satisfactory
	2	16	15.95	1.568		107.61	535		144.04	716		1.34	23		14	Satisfactory	Satisfactory
	3	16	15.95	1.568		107.73	536		144.47	719		1.34	23		12	Satisfactory	Satisfactory

Test Performed by

mrahman 14.05.25

Mr. Md. Miftaur Rahman
Assistant Professor

Countersigned by

HRashed 14 MAY 2025

Dr. H. M. Mamun Al Rashed
Professor and Head

Weight Requirements and Nominal Cross-Sectional Area for Steel Rebar (As Per BDS ISO 6935-2 2021 Table 2)

Bar Designation Number/Nominal Bar Diameter, mm	6	8	10	12	16	20	25	28	32	40
Nominal Mass per Unit Length, kg/m	0.222	0.395	0.617	0.888	1.58	2.47	3.85	4.84	6.31	9.86
Permissible Variation of Nominal Mass per Unit Length, %	±6	±5	±5	±5	±5	±4	±4	±4	±4	±4
Nominal Cross-Sectional Area, mm²	28.3	50.3	78.5	113	201	314	491	616	804	1257

Minimum Tensile Requirements for Steel Rebar (As Per BDS ISO 6935-2 2021 Table 6)

Steel Grade	Upper Yield Strength R_{eH} MPa		R_m/R_{eH}	Ductility Properties A %	A_{gt} %
	Minimum	Maximum	Minimum	Minimum	Minimum
B400C-R / B400CWR	400	—	1.15	14	7
B500C-R / B500CWR	500	—			
B600C-R	600	—		10	
B400DWR	400	1.3 × R_{eH} (min.)	1.25	17	8
B420DWR	420			16	
B500DWR	500			13	
B600D-R	600	1.2 × R_{eH} (min.)		10	

Please Note: The client supplied the sample and the result given herewith corresponse to the sample tested only. The Department of Materials and Metallurgical Engineering of BUET takes no responsibility regarding the misidentification, if any, of the sample.

020745

Client: Engr. Md. Tanjidul Islam
Sr. Manager, Quality Control
GPH Ispat Limited
Crown Chamber
325 Asadgonj, Chattogram 4000

Client's Ref: Nil; 22/04/2025
BRTC Ref: 1103-51046/MME/2024-25; 29/04/2025
Sample Condition: Not Sealed

14 May 2025
MME 0910/2024-2025

2g92hku40cjj

TEST OF DEFORMED M.S. REBAR (Test Method BDS ISO 6935-2 2021)

Freg Mark/ Identification	Sample No.	Bar Designation/ Nominal Diameter, d	Actual Diameter	Mass per Unit Length	Average Unit Weight	Upper Yield Load	Upper Yield Strength, R_{eH}	Average Upper Yield Strength	Tensile Load	Tensile Strength, R_m	Average Tensile Strength	R_m/R_{eH}	Elongation after Fracture (G.L. 5d)	Average Elongation after Facture, A	Elongation at Maximum Force, A_{gt}	Bend Test (Separate Sample)	Rebend Test (Separate Sample)
		mm	mm	kg/m	kg/m	kN	MPa	MPa (psi)	kN	MPa	MPa (psi)		%	%	%		
GPH QUANTUM B500 DWR 20	1	20	19.96	2.457	2.459	171.65	546	546 (79,000)	221.22	704	704 (1,02,000)	1.29	20	20	15	Satisfactory	Satisfactory
	2	20	19.95	2.454		171.52	546		220.95	703		1.29	20		14	Satisfactory	Satisfactory
	3	20	20.00	2.466		171.28	545		221.74	706		1.29	20		11	Satisfactory	Satisfactory

Test Performed by

mrahman 14.05.25

Mr. Md. Miftaur Rahman
Assistant Professor

Countersigned by

HRashed 14 MAY 2025

Dr. H. M. Mamun Al Rashed
Professor and Head

Weight Requirements and Nominal Cross-Sectional Area for Steel Rebar (As Per BDS ISO 6935-2 2021 Table 2)

Bar Designation Number/Nominal Bar Diameter, mm	6	8	10	12	16	20	25	28	32	40
Nominal Mass per Unit Length, kg/m	0.222	0.395	0.617	0.888	1.58	2.47	3.85	4.84	6.31	9.86
Permissible Variation of Nominal Mass per Unit Length, %	±8	±8	±6	±6	±5	±5	±4	±4	±4	±4
Nominal Cross-Sectional Area, mm²	28.3	50.3	78.5	113	201	314	491	616	804	1257

Minimum Tensile Requirements for Steel Rebar (As Per BDS ISO 6935-2 2021 Table 6)

Steel Grade	Upper Yield Strength R_{eH} MPa		R_m/R_{eH}	Ductility Properties A %	A_{gt} %
	Minimum	Maximum	Minimum	Minimum	Minimum
B400C-R / B400C-WR	400	—	1.15	14	7
B500C-R / B500C-WR	500	—			
B400C-S	400	—		10	
B400D/W	400	1.3 x R_{eH} (max.)	1.25	17	8
B420D/W	420			16	
B450D/W	500			13	
B600D-S	600	1.2 x R_{eH} (max.)		10	

Please Note: The client supplied the sample and the results given herewith corresponds to the sample tested only. The Department of Materials and Metallurgical Engineering of BUET takes no responsibility regarding the misidentification, if any, of the sample.

020746

Client: Engr. Md. Tanjidul Islam
Sr. Manager, Quality Control
GPH Ispat Limited
Crown Chamber
325 Asadgonj, Chattogram- 4000

Client's Ref: Nil; 22/04/2025
BRTC Ref: 1103-51047/MME/2024-25; 29/04/2025
Sample Condition: Not Sealed

10 May 2025
MME 0911/2024-2025

3p95c7udec66

TEST OF DEFORMED M.S. REBAR (Test Method BDS ISO 6935-2 2021)

Prog Mark/ Identification	Sample No.	Bar Designation/ Nominal Diameter, d	Actual Diameter	Mass per Unit Length	Average Unit Weight	Upper Yield Load	Upper Yield Strength, R_{eH}	Average Upper Yield Strength	Tensile Load	Tensile Strength, R_m	Average Tensile Strength	R_m/R_{eH}	Elongation after Fracture (G.L. 5d)	Average Elongation after Facture, A	Elongation at Maximum Force, A_{gt}	Bend Test (Separate Sample)	Rebend Test (Separate Sample)
		mm	mm	kg/m	kg/m	kN	MPa	MPa (psi)	kN	MPa	MPa (psi)		%	%	%		
GPH B500 DWR 22	1	22	21.95	2.969	2.968	208.67	549	543 (79000)	270.85	713	708 (102500)	1.30	20	22	12	Satisfactory	Satisfactory
	2	22	21.94	2.968		206.11	542		268.19	706		1.30	22		11	Satisfactory	Satisfactory
	3	22	21.94	2.968		204.98	539		268.56	706		1.31	24		11	Satisfactory	Satisfactory

Test Performed by

Hashed 10/05/2025

Dr. H. M. Mamun Al Rashed
Professor

Countersigned by

Hashed 10 MAY 2025

Dr. H. M. Mamun Al Rashed
Professor and Head

Weight Requirements and Nominal Cross-Sectional Area for Steel Rebar (As Per BDS ISO 6935-2 2021 Table 2)

Bar Designation Number / Nominal Bar Diameter, mm	6	8	10	12	16	20	25	28	32	40
Nominal Mass per Unit Length, kg/m	0.247	0.395	0.617	0.888	1.58	2.47	3.85	4.83	6.31	9.86
Permissible Variation of Nominal Mass per Unit Length, %	±8	±8	±6	±6	±5	±5	±4	±4	±4	±4
Nominal Cross-Sectional Area, mm²	28.3	50.3	78.5	113	201	314	491	615	804	1257

Minimum Tensile Requirements for Steel Rebar (As Per BDS ISO 6935-2 2021 Table 6)

Steel Grade	Upper Yield Strength R_{eH} MPa		Ductility Properties R_m/R_{eH}	A %	A_{gt} %
	Minimum	Maximum	Minimum	Minimum	Minimum
B400C-R / B400CWR	400	—	1.15	14	7
B500C-R / B500CWR	500	—		12	
B600C-R	600	—		10	
B400DWR	400	1.3 x R_{eH} (min.)	1.35	17	8
B420DWR	420			16	
B500DWR	500			13	
B600D-R	600	1.2 x R_{eH} (min.)		10	

Please Note: The client supplied the sample and the result given herewith corresponds to the sample tested only. The Department of Materials and Metallurgical Engineering of BUET takes no responsibility regarding the misidentification, if any, of the sample.

020738

Client: Engr. Md. Tanjidul Islam
Sr. Manager, Quality Control
GPH Ispat Limited
Crown Chamber
325 Asadgonj, Chattogram- 4000

Client's Ref: Nil; 22/04/2025
BRTC Ref: 1103-51049/MME/2024-25; 29/04/2025
Sample Condition: Not Sealed

10 May 2025
MME 0912/2024-2025

7lwrf3uevcpp

TEST OF DEFORMED M.S. REBAR (Test Method BDS ISO 6935-2 2021)

Frog Mark/ Identification	Sample No.	Bar Designation/ Nominal Diameter, d	Actual Diameter	Mass per Unit Length	Average Unit Weight	Upper Yield Load	Upper Yield Strength, R_{eH}	Average Upper Yield Strength	Tensile Load	Tensile Strength, R_m	Average Tensile Strength	R_m/R_{eH}	Elongation after Fracture (G.L. 5d)	Average Elongation after Facture, A	Elongation at Maximum Force, A_{gt}	Bend Test (Separate Sample)	Rebend Test (Separate Sample)
		mm	mm	kg/m	kg/m	kN	MPa	MPa (psi)	kN	MPa	MPa (psi)		%	%	%		
GPH QUANTUM B500 DWR 25	1	25	25.02	3.859	3.859	255.04	520	521 (75500)	339.61	692	693 (100500)	1.53	22	21	13	Satisfactory	Satisfactory
	2	25	24.99	3.852		255.48	520		340.60	694		1.33	21		12	Satisfactory	Satisfactory
	3	25	25.04	3.867		257.03	524		340.35	693		1.32	21		12	Satisfactory	Satisfactory

Test Performed by

Rashed 10/05/2025
Dr. H. M. Mamun Al Rashed
Professor

Countersigned by

Rashed 10 MAY 2025
Dr. H. M. Mamun Al Rashed
Professor and Head

Weight Requirements and Nominal Cross-Sectional Area for Steel Rebar (As Per BDS ISO 6935-2 2021 Table 3)

Bar Designation Number/Nominal Bar Diameter, mm	6	8	10	12	16	20	25	28	32	40
Nominal Mass per Unit Length, kg/m	0.222	0.395	0.617	0.888	1.58	2.47	3.85	4.84	6.31	9.86
Permissible Variation of Nominal Mass per Unit Length, %	±6	±6	±5	±5	±5	±5	±4	±4	±4	±4
Nominal Cross-Sectional Area, mm²	28.3	50.3	78.5	113	201	314	491	616	804	1257

Minimum Tensile Requirements for Steel Rebar (As Per BDS ISO 6935-2 2021 Table 6)

Steel Grade	Upper Yield Strength R_{eH} MPa		Ductility Properties R_m/R_{eH}	A %	A_{gt} %
	Minimum	Maximum	Minimum	Minimum	Maximum
B400C-R / B400CWR	400	—	1.15	14	7
B500C-R / B500CWR	500	—		12	
B600C-R	600	—		10	
B400DWR	400	1.3 x R_{eH} (min.)	1.35	17	9
B420DWR	420			16	
B500DWR	500			12	
B600D-R	600	1.2 x R_{eH} (min.)		10	

Please Note: The client supplied the sample and the result given herewith corresponds to the sample tested only. The Department of Materials and Metallurgical Engineering of BUET takes no responsibility regarding the misidentification, if any, of the sample.

020740

Client: Engr. Md. Tanjidul Islam
Sr. Manager, Quality Control
GPH Ispat Limited
Crown Chamber
325 Asadgonj, Chattogram- 4000

Client's Ref: Nil; 22/04/2025
BRTC Ref: 1103-51051/MME/2024-25; 29/04/2025
Sample Condition: Not Sealed

10 May 2025
MME 0913/2024-2025

5464ulu9wcgg

TEST OF DEFORMED M.S. REBAR (Test Method BDS ISO 6935-2 2021)

Frog Mark/ Identification	Sample No.	Bar Designation/ Nominal Diameter, d	Actual Diameter	Mass per Unit Length	Average Unit Weight	Upper Yield Load	Upper Yield Strength, R_{eH}	Average Upper Yield Strength	Tensile Load	Tensile Strength, R_m	Average Tensile Strength	R_m/R_{eH}	Elongation after Fracture (G.L. 5d)	Average Elongation after Facture, A	Elongation at Maximum Force, A_{gt}	Bend Test (Separate Sample)	Rebend Test (Separate Sample)
		mm	mm	kg/m	kg/m	kN	MPa	MPa (psi)	kN	MPa	MPa (psi)		%	%	%		
GPH B500 DWR 28	1	28	27.92	4.806	4.805	341.60	555	552 (80000)	455.49	740	737 (107000)	1.33	21	22	12	Satisfactory	Satisfactory
	2	28	27.92	4.806		339.27	551		454.26	738		1.34	22		13	Satisfactory	Satisfactory
	3	28	27.91	4.802		338.08	549		452.03	734		1.34	22		13	Satisfactory	Satisfactory

Test Performed by

Rashed 10/05/2025
Dr. H. M. Mamun Al Rashed
Professor

Countersigned by

Rashed 10 MAY 2025
Dr. H. M. Mamun Al Rashed
Professor and Head

Weight Requirements and Nominal Cross-Sectional Area for Steel Rebar (As Per BDS ISO 6935-2 2021 Table 2)

Bar Designation Number/Nominal Bar Diameter, mm	6	8	10	12	16	20	25	28	32	40
Nominal Mass per Unit Length, kg/m	0.222	0.395	0.617	0.888	1.58	2.47	3.85	4.84	6.31	9.86
Permissible Variation of Nominal Mass per Unit Length, %	±6	±8	±5	±5	±5	±5	±4	±4	±4	±4
Nominal Cross-Sectional Area, mm^2	28.3	50.3	78.5	113	201	314	491	616	804	1257

Minimum Tensile Requirements for Steel Rebar (As Per BDS ISO 6935-2 2021 Table 6)

Steel Grade	Upper Yield Strength R_{eH}, MPa		R_m/R_{eH}	Ductility Properties A, %	A_{gt}, %
	Minimum	Maximum	Minimum	Minimum	Minimum
B400C-R / B400CWR	400	---	1.15	16	7
B500C-R / B500CWR	500	---			
B600C-R	600	---		10	
B400DWR	400	1.3 x R_{eH} (min.)	1.25	17	9
B420DWR	420			16	
B500DWR	500			13	
B600D-R	600	1.1 x R_{eH} (min.)		10	

Please Note: The client supplied the sample and the result given herewith corresponds to the sample tested only. The Department of Materials and Metallurgical Engineering of BUET takes no responsibility regarding the misidentification, if any, of the sample.

Department of MME, Old Academic Building, 1st Floor, BUET, Dhaka 1000 +880 1741 362 504 +880 2 5516 7228-57 Ext 7629 brtcmme@mme.buet.ac.bd

Client: Engr. Md. Tanjidul Islam
Sr. Manager, Quality Control
GPH Ispat Limited
Crown Chamber
325 Asadgonj, Chattogram- 4000

Client's Ref: Nil; 22/04/2025
BRTC Ref: 1103-51053/MME/2024-25; 29/04/2025
Sample Condition: Not Sealed

10 May 2025
MME 0914/2024-2025

k5lkiquylc00

TEST OF DEFORMED M.S. REBAR (Test Method BDS ISO 6935-2 2021)

Frog Mark/ Identification	Sample No.	Bar Designation/ Nominal Diameter, d	Actual Diameter	Mass per Unit Length	Average Unit Weight	Upper Yield Load	Upper Yield Strength, R_{eH}	Average Upper Yield Strength	Tensile Load	Tensile Strength, R_m	Average Tensile Strength	R_m/R_{eH}	Elongation after Fracture (G.L. 5d)	Average Elongation after Facture, A	Elongation at Maximum Force, A_{gt}	Bend Test (Separate Sample)	Rebend Test (Separate Sample)
		mm	mm	kg/m	kg/m	kN	MPa	MPa (psi)	kN	MPa	MPa (psi)		%	%	%		
GPH QUANTUM B500 DWR 32	1	32	31.69	6.193	6.198	439.37	546	550 (80000)	560.81	697	700 (101500)	1.28	18	19	11	Satisfactory	Satisfactory
	2	32	31.70	6.196		444.74	553		564.56	702		1.27	20		12	Satisfactory	Satisfactory
	3	32	31.72	6.205		443.87	552		564.55	702		1.27	18		10	Satisfactory	Satisfactory

Test Performed by

HRashed 10/05/2025

Dr. H. M. Mamun Al Rashed
Professor

Countersigned by

HRashed 10 MAY 2025

Dr. H. M. Mamun Al Rashed
Professor and Head

Weight Requirements and Nominal Cross-Sectional Area for Steel Rebar (As Per BDS ISO 6935-2 2021 Table 2)

Bar Designation Number/Nominal Bar Diameter, mm	6	8	10	12	16	20	25	28	32	40
Nominal Mass per Unit Length, kg/m	0.222	0.395	0.617	0.888	1.58	2.47	3.85	4.84	6.31	9.86
Permissible Variation of Nominal Mass per Unit Length, %	±8	±8	±6	±6	±5	±5	±4	±4	±4	±4
Nominal Cross-Sectional Area, mm²	28.3	50.3	78.5	113	201	314	491	616	804	1257

Minimum Tensile Requirements for Steel Rebar (As Per BDS ISO 6935-2 2021 Table 6)

Steel Grade	Upper Yield Strength R_{eH} MPa		R_m/R_{eH}	Ductility Properties A %	Ductility Properties A_{gt} %
	Minimum	Maximum	Minimum	Minimum	Minimum
B400C-R / B400CWR	400	—	1.15	14	7
B500C-R / B500CWR	500	—			
B600C-R	600	—		10	
B400DWR	400	1.3 x R_{eH} (min.)	1.05	17	6
B420DWR	420			16	
B500DWR	500			13	
B600D-R	600	1.3 x R_{eH} (min.)		10	

Please Note: The client supplied the sample and the result given herewith corresponds to the sample tested only. The Department of Materials and Metallurgical Engineering of BUET takes no responsibility regarding the misidentification, if any, of the sample.

Client: Engr. Md. Tanjidul Islam
Sr. Manager, Quality Control
GPH Ispat Limited
Crown Chamber
325 Asadgonj, Chattogram 4000

Client's Ref: Nil; 22/04/2025
BRTC Ref: 1103-51026/MME/2024-25; 29/04/2025
Sample Condition: Not Sealed

10 May 2025
MME 0900/2024-2025

TEST OF DEFORMED M.S. REBAR (Test Method BDS ISO 6935-2 2021)

Frog Mark/ Identification	Sample No.	Bar Designation/ Nominal Diameter, d	Actual Diameter	Mass per Unit Length	Average Unit Weight	Upper Yield Load	Upper Yield Strength, R_{eH}	Average Upper Yield Strength	Tensile Load	Tensile Strength, R_m	Average Tensile Strength	R_m/R_{eH}	Elongation after Fracture (G.L. 5d)	Average Elongation after Facture, A	Elongation at Maximum Force, A_{gt}	Bend Test	Rebend Test
		mm	mm	kg/m	kg/m	kN	MPa	MPa (psi)	kN	MPa	MPa (psi)		%	%	%	(Separate Sample)	(Separate Sample)
GPH B420 DWR 10	1	10	9.97	0.612	0.614	36.48	464	464 (67,500)	52.33	666	668 (97,000)	1.44	23	22	11	Satisfactory	Satisfactory
	2	10	10.00	0.616		36.51	465		52.51	669		1.44	24		11	Satisfactory	Satisfactory
	3	10	9.97	0.613		36.46	464		52.44	668		1.44	18		11	Satisfactory	Satisfactory

Test Performed by
12/05/25
Mr. Humayun Kabir
Assistant Professor

Countersigned by
Rashed 12 MAY 2025
Dr. H. M. Maman Al Rashed
Professor and Head

Weight Requirements and Nominal Cross-Sectional Area for Steel Rebar (As Per BDS ISO 6935-2 2021 Table 2)

Bar Designation Number/Nominal Bar Diameter, mm	6	8	10	12	16	20	25	28	32	40
Nominal Mass per Unit Length, kg/m	0.222	0.395	0.617	0.888	1.58	2.47	3.85	4.84	6.31	9.86
Permissible Variation of Nominal Mass per Unit Length, %	±8	±8	±6	±5	±5	±5	±4	±4	±4	±4
Nominal Cross-Sectional Area, mm²	28.3	50.3	78.5	113	201	314	491	616	804	1257

Minimum Tensile Requirements for Steel Rebar (As Per BDS ISO 6935-2 2021 Table 6)

Steel Grade	Upper Yield Strength R_{eH} MPa		Tensile Strength R_m/R_{eH}	Ductility Properties A %	Ductility Properties A_{gt} %
	Minimum	Maximum	Minimum	Minimum	Minimum
B400C-R / B400CWR	400	—	1.15	14	7
B500C-R / B500CWR	500	—		12	
B600C-R	600	—		10	
B400DWR	400	1.3 x R_{eH} (min.)	1.25	17	8
B420DWR	420			16	
B500DWR	500			13	
B600D-R	600	1.2 x R_{eH} (min.)		10	

Please Note: The client supplied the sample and the result given herewith corresponds to the sample tested only. The Department of Materials and Metallurgical Engineering of BUET takes no responsibility regarding the misidentification, if any, of the sample.

020735

Department of Materials and Metallurgical Engineering (MME)
Bangladesh University of Engineering and Technology (BUET)

Client: Engr. Md. Tanjidul Islam
Sr. Manager, Quality Control
GPH Ispat Limited
Crown Chamber
325 Asadgonj, Chattogram 4000

Client's Ref: Nil; 22/04/2025
BRTC Ref: 1103-51028/MME/2024-25; 29/04/2025
Sample Condition: Not Sealed

10 May 2025
MME 0901/2024-2025

v400b2u10c33

TEST OF DEFORMED M.S. REBAR (Test Method BDS ISO 6935-2 2021)

Frog Mark/ Identification	Sample No	Bar Designation/ Nominal Diameter, d	Actual Diameter	Mass per Unit Length	Average Unit Weight	Upper Yield Load	Upper Yield Strength, R_{eH}	Average Upper Yield Strength	Tensile Load	Tensile Strength, R_m	Average Tensile Strength	R_m/R_{eH}	Elongation after Fracture (G.L. 5d)	Average Elongation after Facture, A	Elongation at Maximum Force, A_{gt}	Bend Test	Rebend Test
		mm	mm	kg/m	kg/m	kN	MPa	MPa (psi)	kN	MPa	MPa (psi)		%	%	%	(Separate Sample)	(Separate Sample)
GPH B420 DWR 12	1	12	12.05	0.895	0.889	53.44	473	454 (66,000)	73.65	651	648 (94,000)	1.38	23	25	13	Satisfactory	Satisfactory
	2	12	11.98	0.884		50.26	444		73.02	646		1.45	27		12	Satisfactory	Satisfactory
	3	12	11.99	0.886		50.35	445		73.05	646		1.45	25		11	Satisfactory	Satisfactory

Test Performed by
12/05/25
Mr. Humayun Kabir
Assistant Professor

Countersigned by
Rashid 12 MAY 2025
Dr. H. M. Mamun Al Rashed
Professor and Head

Weight Requirements and Nominal Cross-Sectional Area for Steel Rebar (As Per BDS ISO 6935-2 2021 Table 2)

Bar Designation Number/Nominal Bar Diameter, mm	6	8	10	12	16	20	25	28	32	40
Nominal Mass per Unit Length, kg/m	0.222	0.395	0.617	0.888	1.58	2.47	3.85	4.84	6.31	9.86
Permissible Variation of Nominal Mass per Unit Length, %	±6	±6	±6	±6	±5	±5	±4	±4	±4	±4
Nominal Cross-Sectional Area, mm²	28.3	50.3	78.5	113	201	314	491	616	804	1257

Minimum Tensile Requirements for Steel Rebar (As Per BDS ISO 6935-2 2021 Table 6)

Steel Grade	Upper Yield Strength R_{eH} MPa		Ductility Properties R_m/R_{eH}	A %	A_{gt} %
	Minimum	Maximum	Minimum	Minimum	Minimum
D400C-R / D400CWR	400	—	1.15	14	7
D500C-R / D500CWR	500	—		12	
D600C-R	600	—		10	
B400DWR	400	1.3 × R_{eH} (min.)	1.25	17	8
B420DWR	420			16	
B500DWR	500			13	
B600DWR	600	1.2 × R_{eH} (min.)		10	

Please Note: The client supplied the sample and the result given herewith corresponds to the sample tested only. The Department of Materials and Metallurgical Engineering of BUET takes no responsibility regarding the misidentification, if any, of the sample.

020734

Client: Engr. Md. Tanjidul Islam
Sr. Manager, Quality Control
GPH Ispat Limited
Crown Chamber
325 Asadgonj, Chattogram 4000

Client's Ref: Nil; 22/04/2025
BRTC Ref: 1103-51029/MME/2024-25; 29/04/2025
Sample Condition: Not Sealed

10 May 2025
MME 0902/2024-2025

@17szuk1cnn

TEST OF DEFORMED M.S. REBAR (Test Method BDS ISO 6935-2 2021)

Frog Mark/ Identification	Sample No	Bar Designation/ Nominal Diameter, d	Actual Diameter	Mass per Unit Length	Average Unit Weight	Upper Yield Load	Upper Yield Strength, R_{eH}	Average Upper Yield Strength	Tensile Load	Tensile Strength, R_m	Average Tensile Strength	R_{eH}/R_m	Elongation after Fracture (G.L. 5d)	Average Elongation after Facture, A	Elongation at Maximum Force, A_{gt}	Bend Test (Separate Sample)	Rebend Test (Separate Sample)
		mm	mm	kg/m	kg/m	kN	MPa	MPa (psi)	kN	MPa	MPa (psi)		%	%	%		
GPH B420 DWR 16	1	16	15.99	1.577	1.573	93.49	465	465 (67,500)	134.94	671	667 (96,500)	1.44	26	26	13	Satisfactory	Satisfactory
	2	16	15.96	1.571		93.37	464		134.16	667		1.44	26		13	Satisfactory	Satisfactory
	3	16	15.96	1.571		93.58	465		133.51	664		1.43	25		13	Satisfactory	Satisfactory

Test Performed by
12/05/25
Mr. Humayun Kabir
Assistant Professor

Countersigned by
Rashed 12 MAY 2025
Dr. H. M. Mamun Al Rashed
Professor and Head

Weight Requirements and Nominal Cross-Sectional Area for Steel Rebar (As Per BDS ISO 6935-2 2021 Table 2)

Bar Designation Number/Nominal Bar Diameter, mm	6	8	10	12	16	20	25	28	32	40
Nominal Mass per Unit Length, kg/m	0.222	0.395	0.617	0.888	1.58	2.47	3.85	4.84	6.31	9.86
Permissible Variation of Nominal Mass per Unit Length, %	±8	±8	±6	±6	±5	±5	±4	±4	±4	±4
Nominal Cross-Sectional Area, mm^2	28.3	50.3	78.5	113	201	314	491	616	804	1257

Minimum Tensile Requirements for Steel Rebar (As Per BDS ISO 6935-2 2021 Table 6)

Steel Grade	Upper Yield Strength R_{eH}, MPa		R_{eH}/R_m	Ductility Properties A, %	A_{gt}, %
	Minimum	Maximum	Maximum	Maximum	Maximum
B400C-R / B400CWR	400	—	1.35	14	7
B500C-R / B500CWR	500	—		12	
B600C-R	600	—		10	
B400DWR	400	1.3 x R_{eH} (min.)	1.25	17	9
B420DWR	420			16	
B500DWR	500			13	
B600D-R	600	1.3 x R_{eH} (min.)		10	

Please Note: The client supplied the sample and the result given herewith corresponds to the sample tested only. The Department of Materials and Metallurgical Engineering of BUET takes no responsibility regarding the misidentification, if any, of the sample.

020733

Client: Engr. Md. Tanjidul Islam
Sr. Manager, Quality Control
GPH Ispat Limited
Crown Chamber
325 Asadgonj, Chattogram 4000

Client's Ref: Nil; 22/04/2025
BRTC Ref: 1103-51030/MME/2024-25; 29/04/2025
Sample Condition: Not Sealed

10 May 2025
MME 0903/2024-2025

zn30heul4cxx

TEST OF DEFORMED M.S. REBAR (Test Method BDS ISO 6935-2 2021)

Frog Mark/ Identification	Sample No.	Bar Designation/ Nominal Diameter, d	Actual Diameter	Mass per Unit Length	Average Unit Weight	Upper Yield Load	Upper Yield Strength, R_{eH}	Average Upper Yield Strength	Tensile Load	Tensile Strength, R_m	Average Tensile Strength	R_m/R_{eH}	Elongation after Fracture (G.L. 5d)	Average Elongation after Facture, A	Elongation at Maximum Force, A_{gt}	Bend Test	Rebend Test
		mm	mm	kg/m	kg/m	kN	MPa	MPa (psi)	kN	MPa	MPa (psi)		%	%	%	(Separate Sample)	(Separate Sample)
GPH B420 DWR 20	1	20	19.95	2.455	2.461	149.29	475	478 (69,500)	207.92	662	665 (96,500)	1.39	21	22	14	Satisfactory	Satisfactory
	2	20	19.98	2.462		149.87	477		208.87	665		1.39	23		13	Satisfactory	Satisfactory
	3	20	20.00	2.467		151.25	481		209.45	667		1.39	21		12	Satisfactory	Satisfactory

Test Performed by
12/05/25
Mr. Humayun Kabir
Assistant Professor

Countersigned by
HRashed, 12 MAY 2025
Dr. H. M. Mamun Al Rashed
Professor and Head

Weight Requirements and Nominal Cross-Sectional Area for Steel Rebar (As Per BDS ISO 6935-2 2021 Table 2)

Bar Designation Number/Nominal Bar Diameter, mm	6	8	10	12	16	20	25	28	32	40
Nominal Mass per Unit Length, kg/m	0.222	0.395	0.617	0.888	1.58	2.47	3.85	4.84	6.31	9.86
Permissible Variation of Nominal Mass per Unit Length, %	±6	±5	±6	±6	±5	±5	±4	±4	±4	±4
Nominal Cross-Sectional Area, mm²	28.3	50.3	78.5	113	201	314	491	616	804	1257

Minimum Tensile Requirements for Steel Rebar (As Per BDS ISO 6935-2 2021 Table 4)

Steel Grade	Upper Yield Strength R_{eH} MPa		R_m/R_{eH}	Ductility Properties A %	A_{gt} %
	Minimum	Maximum	Minimum	Minimum	Minimum
B400C-R / B400C/WR	400	—	1.13	14	7
B500C-R / B500C/WR	500	—		14	
B600C-R	600	—		10	
B400D/WR	400	1.3 x R_{eH} (min.)	1.25	17	8
B420D/WR	420			16	
B500D/WR	500			13	
B600D-R	600	1.3 x R_{eH} (min.)		10	

Please Note: The client supplied the sample and the result given herewith corresponds to the sample tested only. The Department of Materials and Metallurgical Engineering of BUET takes no responsibility regarding the misidentification, if any, of the sample.

020732

Client: Engr. Md. Tanjidul Islam
Sr. Manager, Quality Control
GPH Ispat Limited
Crown Chamber
325 Asadgonj, Chattogram 4000

Client's Ref: Nil; 22/04/2025
BRTC Ref: 1103-51032/MME/2024-25; 29/04/2025
Sample Condition: Not Sealed

10 May 2025
MME 0904/2024-2025

6y9vfru12dl

TEST OF DEFORMED M.S. REBAR (Test Method BDS ISO 6935-2 2021)

Frog Mark/ Identification	Sample No	Bar Designation/ Nominal Diameter, d	Actual Diameter	Mass per Unit Length	Average Unit Weight	Upper Yield Load	Upper Yield Strength, R_{eH}	Average Upper Yield Strength	Tensile Load	Tensile Strength, R_m	Average Tensile Strength	R_m/R_{eH}	Elongation after Fracture (G.L. 5d)	Average Elongation after Facture, A	Elongation at Maximum Force, A_{gt}	Bend Test (Separate Sample)	Rebend Test (Separate Sample)
		mm	mm	kg/m	kg/m	kN	MPa	MPa (psi)	kN	MPa	MPa (psi)		%	%	%		
GPH B420 DWR 25	1	25	24.97	3.843	3.837	209.83	427	442 (64,000)	310.80	633	645 (93,500)	1.48	27	24	14	Satisfactory	Satisfactory
	2	25	24.95	3.838		221.94	452		320.96	654		1.45	23		14	Satisfactory	Satisfactory
	3	25	24.93	3.831		219.08	446		318.63	649		1.46	23		14	Satisfactory	Satisfactory

Test Performed by
12/05/25
Mr. Humayun Kabir
Assistant Professor

Countersigned by
Rashed 12 MAY 2025
Dr. H. M. Mamun Al Rashed
Professor and Head

Weight Requirements and Nominal Cross-Sectional Area for Steel Rebar (As Per BDS ISO 6935-2 2021 Table 2)

Bar Designation Number/Nominal Bar Diameter, mm	6	8	10	12	16	20	25	28	32	40
Nominal Mass per Unit Length, kg/m	0.222	0.395	0.617	0.888	1.58	2.47	3.85	4.83	6.31	9.86
Permissible Variation of Nominal Mass per Unit Length, %	±8	±8	±6	±6	±5	±5	±6	±4	±4	±4
Nominal Cross-Sectional Area, mm²	28.3	50.3	78.5	113	201	314	491	616	804	1257

Minimum Tensile Requirements for Steel Rebar (As Per BDS ISO 6935-2 2021 Table 6)

Steel Grade	Upper Yield Strength R_{eH} MPa		R_m/R_{eH}	Ductility Properties A %	A_{gt} %
	Minimum	Maximum	Minimum	Minimum	Maximum
B400C-R / B400CWR	400	—	1.15	16	7
B500C-R / B500CWR	500	—		14	
B600C-R	600	—		12	
B400DWR	400	1.3 x R_{eH} (min.)	1.25	17	8
B420DWR	420			16	
B500DWR	500			15	
B600D-R	600			14	

Please Note: The client supplied the sample and the result given herewith corresponds to the sample tested only. The Department of Materials and Metallurgical Engineering of BUET takes no responsibility regarding the misidentification, if any, of the sample.

Department of MME, Old Academic Building, 1st Floor, BUET, Dhaka 1000 +880 1741 362 504 +880 2 5516 7228-57 Ext 7629 brtcmme@mme.buet.ac.bd

Department of Materials and Metallurgical Engineering (MME)
Bangladesh University of Engineering and Technology (BUET)

Client: Engr. Md. Tanjidul Islam
Sr. Manager, Quality Control
GPH Ispat Limited
Crown Chamber
325 Asadgonj, Chattogram 4000

Client's Ref: Nil; 22/04/2025
BRTC Ref: 1103-51034/MME/2024-25; 29/04/2025
Sample Condition: Not Sealed

10 May 2025
MME 0905/2024-2025

1p9zspuv7cgg

TEST OF DEFORMED M.S. REBAR (Test Method BDS ISO 6935-2 2021)

Frog Mark/ Identification	Sample No.	Bar Designation/ Nominal Diameter, d	Actual Diameter	Mass per Unit Length	Average Unit Weight	Upper Yield Load	Upper Yield Strength, R_{eH}	Average Upper Yield Strength	Tensile Load	Tensile Strength, R_m	Average Tensile Strength	R_{eH}/R_m	Elongation after Fracture (G.L. 5d)	Average Elongation after Facture, A	Elongation at Maximum Force, A_{gt}	Bend Test (Separate Sample)	Rebend Test (Separate Sample)
		mm	mm	kg/m	kg/m	kN	MPa	MPa (psi)	kN	MPa	MPa (psi)		%	%	%		
GPH B420 DWR 32	1	32	32.07	6.341	6.312	371.25	462	457 (66,500)	516.56	642	639 (92,500)	1.39	24	24	12	Satisfactory	Satisfactory
	2	32	31.96	6.296		364.58	453		510.62	635		1.40	24		13	Satisfactory	Satisfactory
	3	32	31.97	6.301		367.52	457		515.01	640		1.40	25		16	Satisfactory	Satisfactory

Test Performed by
12/05/25
Mr. Humayun Kabir
Assistant Professor

Countersigned by
12 MAY 2025
Dr. H. M. Mamun Al Rashed
Professor and Head

Weight Requirements and Nominal Cross-Sectional Area for Steel Rebar (As Per BDS ISO 6935-2 2021 Table 2)

Bar Designation Number/Nominal Bar Diameter, mm	6	8	10	12	16	20	25	28	32	40
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Permissible Variation of Nominal Mass per Unit Length, %	±8	±8	±6	±6	±5	±5	±4	±4	±4	±4
Nominal Cross-Sectional Area, mm²	28.3	50.3	78.5	113	201	314	491	616	804	1257

Minimum Tensile Requirements for Steel Rebar (As Per BDS ISO 6935-2 2021 Table 4)

Steel Grade	Upper Yield Strength R_{eH} MPa		Ductility Properties R_m/R_{eH}	A %	A_{gt} %
	Minimum	Maximum	Minimum	Minimum	Minimum
B400C-R / B400C/WR	400	—	1.15	16	7
B500C-R / B500C/WR	500	—		14	
B600C-R	600	—		10	
B400D/WR	400	1.3 x R_{eH} (min.)	1.25	17	8
B420D/WR	420			16	
B500D/WR	500			15	
B600D-R	600	1.2 x R_{eH} (min.)		10	

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020730