



Client: Engr. Md. Tanjiddul Islam
Sr. Manager, Quality Control
GPH Ispat Limited

Client's Ref: Nil; 10/02/2025
BRTC Ref: 1103-44587/MME/2024-25; 17/02/2025
Sample Condition: Not Sealed

01 March 2025
MME 0712/2024-2025



716vt3uevcpp

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 Fracture, A	Elongation at Maximum Force, A_g	Bend Test
		mm	mm	kg/m	kg/m	kN	MPa	MPa (psi)	kN	MPa	MPa (psi)		%	%	%	(Separate Sample)
GPH QUANTUM B600D-R 10	1	10	10.00	0.617	0.615	50.54	643	645 (93500)	65.83	838	837 (121500)	1.30	15	15	9	Satisfactory
	2	10	9.98	0.614		50.24	640		65.62	835		1.30	15		10	Satisfactory
	3	10	9.98	0.614		51.14	651		65.86	839		1.29	14		10	Satisfactory

Test Performed by

Dr. Md. Moniruzzaman
Professor

Countersigned by

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

Page 1 of 1

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	0.345	0.617	0.889	1.58	2.47	3.85	4.84	6.31	9.85
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		Ductility Properties		
	R_{eH}		R_{eH}/R_m	A	A_g
	MPa				
	Minimum	Maximum	Minimum	Minimum	Minimum
B400C-R / B400CWE	400	—	1.15	14	7
B500C-R / B500CWE	500	—		10	
B500C-R	500	—		10	
B490DWE	490	1.2 x R_{eH} (min.)	1.25	17	
B640DWE	640			16	
B640DWE	640			13	
B640DWE	640	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.

020685



Client: Engr. Md. Tanjidal Islam
Sr. Manager, Quality Control
GPH Ispat Limited

Client's Ref: Nil; 10/02/2025
BRTC Ref: 1103-44589/MME/2024-25; 17/02/2025
Sample Condition: Not Sealed

01 March 2025
MME 0713/2024-2025



54l0tlu9wcgg

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 Fracture, A	Elongation at Maximum Force, A_g	Bend Test
		mm	mm	kg/m	kg/m	kN	MPa	MPa (psi)	kN	MPa	MPa (psi)		%	%	%	(Separate Sample)
GPH QUANTUM B600D-R 12	1	12	11.99	0.886	0.886	71.34	631	631 (91500)	90.89	804	803 (116500)	1.27	20	21	10	Satisfactory
	2	12	11.99	0.887		71.58	633		90.92	804		1.27	25		10	Satisfactory
	3	12	11.99	0.886		71.30	630		90.71	802		1.27	18		10	Satisfactory

Test Performed by

Dr. Md. Moniruzzaman
Professor

Countersigned by

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

Page 1 of 1

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	4.94	6.31	9.86
Permissible Variation of Nominal Mass per Unit Length, %	+8	+8	+5	+5	+5	+5	+4	+4	+4	+4
Nominal Cross-Sectional Area, mm ²	28.3	50.3	76.5	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		Ductility Properties		
	R_{eH}		R_m/R_{eH}	A	A_g
	MPa		%	%	%
	Minimum	Maximum	Minimum	Maximum	Minimum
B400C-R / B400CWR	400	—	1.15	14	1
B500C-R / B500CWR	500	—		10	
B600C-R	600	—		10	
B400DWR	400	1.3 x R_{eH} (min.)	1.25	17	8
B400DWR	428			16	
B500DWR	500			13	
B600DWR	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.

020686



Client: Engr. Md. Tanjiful Islam
Sr. Manager, Quality Control
GPH Ispat Limited

Client's Ref: Nil; 10/02/2025
BRTC Ref: 1103-44591/MME/2024-25; 17/02/2025
Sample Condition: Not Sealed

01 March 2025
MME 0714/2024-2025



k59paquylc00

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 Fracture, A	Elongation at Maximum Force, A_g	Bend Test
		mm	mm	kg/m	kg/m	kN	MPa	MPa (psi)	kN	MPa	MPa (psi)		%	%	%	(Separate Sample)
GPH QUANTUM B600D-R 16	1	16	16.02	1.583	1.583	126.76	630	633 (92000)	166.67	829	833 (121000)	1.32	22	21	10	Satisfactory
	2	16	16.01	1.580		127.45	634		167.72	834		1.32	22		10	Satisfactory
	3	16	16.04	1.586		127.81	636		167.82	835		1.31	19		10	Satisfactory

Test Performed by

Mamun
01/03/2025
Dr. Md. Moniruzzaman
Professor

Countersigned by

H. M. Mamun Al Rashed
02 MAR 2025
Dr. H. M. Mamun Al Rashed
Professor and Head

Page 1 of 1

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	0.362	0.617	0.888	1.38	2.47	3.83	4.84	6.31	9.86
Permissible Variation of Nominal Mass per Unit Length, %	+8	+8	+8	+8	+8	+8	+8	+8	+8	+8
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		Ductility Properties		
	R_{eH}		R_m/R_{eH}	A	A_g
	MPa			%	%
	Minimum	Maximum	Minimum	Minimum	Minimum
B500C-3/B400CWR	400	—	1.15	14	7
B500C-8/B500CWR	500	—		10	
B500C-3	400	—		17	
B400DWR	400	1.2 x R_{eH} (min)	1.25	16	8
B420DWR	420			13	
B500DWR	500			16	
B600D-R	600	1.2 x R_{eH} (min)		16	

Please Note: The client supplied the sample and the result given here with 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.

020687



Client: Engr. Md. Tanjidul Islam
Sr. Manager, Quality Control
GPH Ispat Limited

Client's Ref: Nil; 10/02/2025
BRTC Ref: 1103-44594/MME/2024-25; 17/02/2025
Sample Condition: Not Scaled

01 March 2025
MME 0715/2024-2025



pjv5azuldce

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 _{es}	Average Upper Yield Strength	Tensile Load	Tensile Strength, R _m	Average Tensile Strength	R _{el} / R _m	Elongation after Fracture (G.L. 5d)	Average Elongation after Fracture, A	Elongation at Maximum Force, A _g	Bend Test
		mm	mm	kg/m	kg/m	kN	MPa	MPa (psi)	kN	MPa	MPa (psi)		%	%	%	(Separate Sample)
GPH QUANTUM B600D-R 20	1	20	20.00	2.466	2.464	196.77	626	627 (91000)	250.52	797	798 (115500)	1.27	23	21	11	Satisfactory
	2	20	19.98	2.461		196.52	626		250.66	798		1.27	19		14	Satisfactory
	3	20	20.00	2.466		197.15	628		250.98	799		1.27	22		13	Satisfactory

Test Performed by

Mamun
01/03/2025

Dr. Md. Moniruzzaman
Professor

Countersigned by

Rashed 02 MAR 2025

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

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	1.38	2.47	3.85	4.44	6.31	9.86
Permissible Variation of Nominal Mass per Unit Length, %	+8	+8	+8	+8	+5	+5	+4	+4	+4	+4
Nominal Cross-Sectional Area, mm ²	34.3	50.3	78.5	111	201	314	491	616	804	1257

Steel Grade	Upper Yield Strength		Ductility Properties		
	R _{yk}		R _{el} /R _m	A	A _g
	MPa			%	%
	Minimum	Maximum	Minimum	Maximum	Minimum
B400C-E / B400CWR	400	—	1.15	14	7
B500C-E / B500CWR	500	—		20	
B600C-E	600	—		17	
B400DWR	400	1.2 x R _{yk} (min.)	1.25	16	8
B420DWR	420			13	
B500DWR	500			10	
B600D-E	600	1.2 x R _{yk} (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 authentication, if any, of the sample.

020693



Client: Engr. Md. Tanjiful Islam
Sr. Manager, Quality Control
GPH Ispat Limited

Client's Ref: Nil; 10/02/2025
BRTC Ref: 1103-44596/MME/2024-25; 17/02/2025
Sample Condition: Not Sealed

01 March 2025
MME 0716/2024-2025



lgvzhp54c66

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 Fracture, A	Elongation at Maximum Force, A _g	Bend Test
		mm	mm	kg/m	kg/m	kN	MPa	MPa (psi)	kN	MPa	MPa (psi)		%	%	%	(Separate Sample)
GPH QUANTUM B600D-R 25	1	25	24.97	3.844	3.844	320.60	653	649 (94000)	403.50	822	820 (119000)	1.26	17	19	9	Satisfactory
	2	25	24.97	3.845		318.10	648		402.57	820		1.27	22		9	Satisfactory
	3	25	24.96	3.842		317.05	646		401.64	818		1.27	18		10	Satisfactory

Test Performed by

Mamun
01/03/2025

Dr. Md. Moniruzzaman
Professor

Countersigned by

Hashed 02 MAR 2025

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

Page 1 of 1

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	0.221	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 4)

Minimum Tensile Requirements for Steel Rebar (ksi per AISI 305-2003 Table 3)					
Steel Grade	Upper Yield Strength		Ductility Properties		
	R_{eh}		R_u/R_{eh}	A	A_g
	MPa			%	%
	Minimum	Maximum	Minimum	Maximum	Minimum
B400C-R / B400CWR	400	—	1.15	14	7
B500C-R / B500CWR	500	—			
B600C-R	600	—		18	
B400DWR	400	1.2 x R_{eh} (min)	1.25	17	8
B500DWR	500			16	
B600DWR	600			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 BRTC takes no responsibility regarding the misidentification, if any, of the sample.

020690



Client: Engr. Md. Tanjiful Islam
Sr. Manager, Quality Control
GPH Ispat Limited

Client's Ref: Nil; 10/02/2025
BRTC Ref: 1103-44597/MME/2024-25; 17/02/2025
Sample Condition: Not Sealed

01 March 2025
MME 0717/2024-2025



eq3wfxux7cdd

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 Fracture, A	Elongation at Maximum Force, A_{gt}	Bend Test
		mm	mm	kg/m	kg/m	kN	MPa	MPa (psi)	kN	MPa	MPa (psi)		%	%	%	(Separate Sample)
GPH QUANTUM B600D-R 32	1	32	31.97	6.301	6.291	506.30	630	630 (91500)	644.49	801	801 (116000)	1.27	17	18	12	Satisfactory
	2	32	31.93	6.285		506.37	630		645.21	802		1.27	17		10	Satisfactory
	3	32	31.93	6.286		506.84	630		643.28	800		1.27	19		11	Satisfactory

Test Performed by

Mamun
01/03/2025

Dr. Md. Moniruzzaman
Professor

Countersigned by

Rashed
02 MAR 2025

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

Page 1 of 1

Bar Designation Number/Nominal Bar Diameter, mm	6	8	10	12	16	20	25	32	40
Nominal Mass per Unit Length, kg/m	0.222	0.345	0.617	0.885	1.58	2.47	3.85	6.31	9.58
Permissible Variation of Nominal Mass per Unit Length, %	+8	+8	+6	+6	+5	+5	+4	+4	+4
Nominal Cross-Sectional Area, mm ²	28.3	50.3	78.5	113	201	314	491	804	1257

Steel Grade	Upper Yield Strength		Ductility Properties		
	R_{eH}		R_{eH}/R_m	A %	A _{gt} %
	MPa				
	Minimum	Maximum	Minimum	Minimum	Maximum
B400C-E / B400C-WR	400	—	1.15	14	7
B500C-E / B500C-WR	500	—		15	
B600C-E	600	—		17	
B400D-WR	400	1.3 x R_{eH} (min.)	1.25	16	8
B420D-WR	420			15	
B500D-WR	500			13	
B600D	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 misclassification, if any, of the sample.

020691

Client: Engr. Md. Tanjidl Islam
Sr. Manager, Quality Control
GPH Ispat LimitedClient's Ref: Nil; 10/02/2025
BRTC Ref: 1103-44574/MME/2024-25; 17/02/2025
Sample Condition: Not Sealed03 March 2025
MME 0704/2024-2025

6yz2sru12c1l

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 _{el}	Average Upper Yield Strength	Tensile Load	Tensile Strength, R _m	Average Tensile Strength	R _m / R _{el}	Elongation after Fracture (G.L. 5d)	Average Elongation after Fracture, A	Elongation at Maximum Force, A _g	Bend Test	Rebend Test
		mm	mm	kg/m	kg/m	kN	MPa	MPa (psi)	kN	MPa	MPa (psi)		%	%	%	(Separate Sample)	(Separate Sample)
GPH B500 DWR 8	1	8	7.99	0.393	0.392	28.16	560	563 (81,500)	36.82	733	735 (1,06,500)	1.31	25	24	14	Satisfactory	Satisfactory
	2	8	7.99	0.394		28.11	559		36.76	731		1.31	24		12	Satisfactory	Satisfactory
	3	8	7.96	0.390		28.62	569		37.20	740		1.30	23		13	Satisfactory	Satisfactory

Test Performed by

For M. HASAN
3.3.25Dr. Md. Muktedir Billah
Professor

Countersigned by

H. M. Mamun Al Rashed
3 MAR 2025
Dr. H. M. Mamun Al Rashed
Professor and Head

Page 1 of 1

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

Bar Diameter (mm)	6	8	10	12	16	20	25	32	40
Nominal Mass per Unit Length, kg/m	0.222	0.395	0.617	0.886	1.58	2.47	3.85	6.31	9.06
Permissible Variation of Nominal Mass per Unit Length, %	+8	+8	+6	+6	+5	+5	+4	+4	+4
Nominal Cross-Sectional Area, mm ²	28.3	50.3	78.5	113	201	314	491	804	1257

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

Steel Grade	Upper Yield Strength		Ductility Properties		
	R _{el}		A		A _g
	MPa		%	%	%
B400C-R / B400C-WR	400	—	1.15	14	1
B500C-R / B500C-WR	500	—		19	
B600C-R	600	—		17	
B400D-R	400	1.3 × R _{el} (min.)	1.25	16	8
B400D-WR	420			15	
B500D-WR	500			13	
B600D-R	600	1.2 × R _{el} (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.

020694



Client: Engr. Md. Tanjidal Islam
Sr. Manager, Quality Control
GPH Ispat Limited

Client's Ref: Nil; 10/02/2025
BRTC Ref: 1103-44576/MME/2024-25; 17/02/2025
Sample Condition: Not Sealed

03 March 2025
MME 0705/2024-2025



1p15cpuv7cgg

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 _{uH}	Average Upper Yield Strength	Tensile Load	Tensile Strength, R _m	Average Tensile Strength	R _m / R _{uH}	Elongation after Fracture (G.L. 5d)	Average Elongation after Fracture, A	Elongation at Maximum Force, A _g	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	9.95	0.610	0.611	42.60	542	540 (78,500)	56.19	715	713 (1,03,500)	1.32	31	29	16	Satisfactory	Satisfactory
	2	10	9.95	0.610		42.48	541		56.03	713		1.32	27		15	Satisfactory	Satisfactory
	3	10	9.96	0.611		42.09	536		55.86	711		1.33	28		16	Satisfactory	Satisfactory

Test Performed by

for M. HASAN
3.3.25

Dr. Md. Muktaadir Billah
Professor

Countersigned by

Hashed 03 MAR 2025
Dr. H. M. Mamun Al Rashed
Professor and Head

Page 1 of 1

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

Bar Designation: Rebar/Nominal Bar Diameter, mm	6	8	10	12	16	20	25	28	32	40
Nominal Mass per Unit Length, kg/m	0.132	0.201	0.617	0.885	1.58	2.47	3.85	4.84	6.31	9.86
Permissible Variation of Nominal Mass per Unit Length, %	±8	±8	±5	±5	±5	±5	±4	±4	±4	±4
Nominal Cross-Sectional Area, mm ²	26.3	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		Ductility Properties		
	R _{uH}		R _m /R _{uH}	A	A _g
	MPa		%	%	%
	Minimum	Maximum	Minimum	Minimum	Minimum
B490C-R / B490CWR	490	—	1.15	14	1
B500C-R / B500CWR	500	—		16	
B490C-E	500	—		30	
B490DWR	490	1.5 x R _{uH} (mm)	1.25	17	8
B420DWR	420			16	
B500DWR	500			17	
B500E-E	500	1.2 x R _{uH} (mm)		10	

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

020696



Client: Engr. Md. Tanjidul Islam
Sr. Manager, Quality Control
GPH Ispat Limited

Client's Ref: Nil; 10/02/2025
BRTC Ref: 1103-44578/MME/2024-25; 17/02/2025
Sample Condition: Not Sealed

03 March 2025
MME 0706/2024-2025



wevgt7u5pc77

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 _{el}	Average Upper Yield Strength	Tensile Load	Tensile Strength, R _m	Average Tensile Strength	R _{el} / R _m	Elongation after Fracture (G.L. 5d)	Average Elongation after Fracture, A	Elongation at Maximum Force, A _g	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 12	1	12	11.93	0.878	0.877	61.21	541	540 (78,500)	78.97	698	697 (1,01,000)	1.29	28	25	15	Satisfactory	Satisfactory
	2	12	11.91	0.875		61.05	540		78.70	696		1.29	25		13	Satisfactory	Satisfactory
	3	12	11.92	0.877		61.00	539		78.66	696		1.29	23		15	Satisfactory	Satisfactory

Test Performed by

for M. HASAN
3.3.25

Dr. Md. Muktadir Billah
Professor

Countersigned by

Hashed 03 MAR 2025
Dr. H. M. Mamun Al Rashed
Professor and Head

Page 1 of 1

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

Bar Designation/Nominal Bar Diameter, mm	6	8	10	12	16	20	25	28	32	40
Nominal Mass per Unit Length, kg/m	0.222	0.295	0.517	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	50.1	78.5	113	201	314	491	616	804	1,257

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

Steel Grade	Upper Yield Strength		Ductility Properties		
	R _{el}		R _{el} /R _m		A _g
	Minimum	Maximum	Minimum	Maximum	Minimum
B46C-R / B46C-MR	460	---	1.15	14	7
B56C-R / B56C-MR	520	---		10	
B60C-R	600	---		17	
B400DWR	480	---	1.25	16	8
B500DWR	470	1.3 x R _{el} (min)		13	
B500DWR	500	---		18	
B600D-R	600	1.2 x R _{el} (min)	---	---	---

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.

020695



Client: Engr. Md. Tanjiful Islam
Sr. Manager, Quality Control
GPH Ispat Limited

Client's Ref: Nil; 10/02/2025
BRTC Ref: 1103-44579/MME/2024-25; 17/02/2025
Sample Condition: Not Sealed

03 March 2025
MME 0707/2024-2025



0rkgjhjuxpcw

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 _{el}	Average Upper Yield Strength	Tensile Load	Tensile Strength, R _m	Average Tensile Strength	R _{el} / R _m	Elongation after Fracture (G.L. 5d)	Average Elongation after Fracture, 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 16	1	16	15.95	1.569	1.568	109.81	546	544 (79,000)	145.95	726	725 (1,05,000)	1.33	25	24	14	Satisfactory	Satisfactory
	2	16	15.95	1.569		108.77	541		145.50	724		1.34	24		15	Satisfactory	Satisfactory
	3	16	15.94	1.566		109.32	544		145.92	726		1.33	22		13	Satisfactory	Satisfactory

Test Performed by

Bill 03.03.2025

Dr. Md. Muktadir Billah
Professor

Countersigned by

Hashed 03/03/2025

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

Page 1 of 1

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

Bar Designation/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	9.56
Permissible Variation of Nominal Mass per Unit Length, %	+8	-8	-8	-8	+5	+5	+5	+4	+4	+4
Nominal Cross-Sectional Area, mm ²	28.3	50.3	78.5	113	201	314	491	608	804	1257

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

Steel Grade	Upper Yield Strength		Ductility Properties		
	R _{el}		R _{el} /R _m	A	A _{gt}
	MPa		%	%	%
B40C-E / B40C-WR	400	—	1.15	14	8
B50C-E / B50C-WR	500	—		10	
B60C-E	600	—		17	
B40D-WR	400	1.3 x R _m (min.)	1.25	10	
B42D-WR	420			10	
B48D-WR	480			10	
B60D-E	600	1.2 x R _m (min.)		10	

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



Client : Engr. Md. Tanjidul Islam
Sr. Manager, Quality Control
GPH Ispat Limited

Client's Ref: Nil; 10/02/2025
BRTC Ref: 1103-44580/MME/2024-25; 17/02/2025
Sample Condition: Not Sealed

23 February 2025
MME 0708/2024-2025



qxv2svuq9cee

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 _{el}	Average Upper Yield Strength	Tensile Load	Tensile Strength, R _m	Average Tensile Strength	R _m / R _{el}	Elongation after Fracture (G.L. 5d)	Average Elongation after Fracture, A	Elongation at Maximum Force, A _g	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 20	1	20	19.98	2.461	2.460	171.84	547	548 (79500)	223.08	710	710 (103000)	1.30	20	20	11	Satisfactory	Satisfactory
	2	20	19.96	2.457		172.15	548		223.13	710		1.30	20		11	Satisfactory	Satisfactory
	3	20	19.99	2.463		172.53	549		223.18	710		1.29	20		11	Satisfactory	Satisfactory

Test Performed by

Hashed 23/2/2025

Dr. H. M. Mamun Al Rashed
Professor

Countersigned by

Hashed 23 FEB 2025

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

Page 1 of 1

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	32	40
Nominal Mass per Unit Length, kg/m	0.222	0.335	0.617	0.888	1.58	2.47	3.85	4.84	6.31
Permissible Variation of Nominal Mass per Unit Length, %	±6	±6	±6	±6	±3	±3	±4	±4	±4
Nominal Cross-Sectional Area, mm ²	28.3	50.3	76.5	113	201	314	491	816	1257

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

Steel Grade	Upper Yield Strength		Ductility Properties			
	R _{el}		R _m /R _{el}	A	A _g	
	MPa			%	%	
	Minimum	Maximum	Minimum	Minimum	Minimum	
B400C-B / B400CWR	400	—	1.15	14	8	
B500C-B / B500CWR	500	—		17		
B600C-B	600	—		17		
B400DWR	400	1.5 × R _{el} (min.)	1.25	17		8
B400DWR	420			18		
B500DWR	500			18		
B600C-B	600	1.2 × R _{el} (min.)		18		

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.

020660



Client : Engr. Md. Tanjiful Islam
Sr. Manager, Quality Control
GPH Ispat Limited

Client's Ref: Nil; 10/02/2025
BRTC Ref: 1103-44582/MME/2024-25; 17/02/2025
Sample Condition: Not Sealed

23 February 2025
MME 0709/2024-2025



nxv7t4u0kc66

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 _{el}	Average Upper Yield Strength	Tensile Load	Tensile Strength, R _m	Average Tensile Strength	R _m / R _{el}	Elongation after Fracture (G.L. 5d)	Average Elongation after Fracture, A	Elongation at Maximum Force, A _g	Bend Test	Rebend Test
		mm	mm	kg/m	kg/m	kN	MPa	MPa (psi)	kN	MPa	MPa (psi)		%	%	%	(Separate Sample)	(Separate Sample)
GPH B500 DWR 22	1	22	21.89	2.955		207.68	546		266.43	701		1.28	24		13	Satisfactory	Satisfactory
	2	22	21.89	2.955	2.955	209.62	551	550 (80000)	267.17	703	702 (102000)	1.28	20	22	12	Satisfactory	Satisfactory
	3	22	21.89	2.955		210.11	553		267.24	703		1.27	21		12	Satisfactory	Satisfactory

Test Performed by

Hashed 23/2/2025

Dr. H. M. Mamun Al Rashed
Professor

Countersigned by

Hashed 23 FEB 2025

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

Page 1 of 1

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, %	±0	±0	±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		Ductility Properties		
	R _{el}		R _m /R _{el}		A _g
	MPa		%		%
	Minimum	Maximum	Minimum	Minimum	Minimum
B400C-R / B400CWR	400	—	1.15	14	7
B500C-R / B500CWR	500	—			
B600C-R	600	—		18	
B400DWR	400	1.2 x R _{el} (min.)	1.25	17	8
B425DWR	425			18	
B500DWR	500			19	
B600D-R	600	1.2 x R _{el} (min.)		10	

Please Note: The client supplied the sample and the results given herewith correspond 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.

020661



Client : Engr. Md. Tanjidul Islam
Sr. Manager, Quality Control
GPH Ispat Limited

Client's Ref: Nil; 10/02/2025
BRTC Ref: 1103-44584/MME/2024-25; 17/02/2025
Sample Condition: Not Sealed

23 February 2025
MME 0710/2024-2025



2gfpuku40cjj

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 _{el}	Average Upper Yield Strength	Tensile Load	Tensile Strength, R _m	Average Tensile Strength	R _{el} / R _m	Elongation after Fracture (G.L. 5d)	Average Elongation after Fracture, A	Elongation at Maximum Force, A _g	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 25	1	25	24.95	3.839	3.832	262.94	536	535 (77500)	354.82	723	723 (105000)	1.35	20	20	11	Satisfactory	Satisfactory
	2	25	24.91	3.826		261.75	533		355.04	723		1.36	21		12	Satisfactory	Satisfactory
	3	25	24.93	3.833		263.07	536		354.73	723		1.35	20		11	Satisfactory	Satisfactory

Test Performed by

H. M. Mamun Al Rashed 23/02/2025Dr. H. M. Mamun Al Rashed
Professor

Countersigned by

H. M. Mamun Al Rashed 23 FEB 2025Dr. H. M. Mamun Al Rashed
Professor and Head

Page 1 of 1

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	32	40
Nominal Mass per Unit Length, kg/m	0.222	0.395	0.617	0.888	1.58	2.47	3.85	6.31	9.86
Permissible Variation of Nominal Mass per Unit Length, %	±5	±5	±5	±5	±5	±4	±4	±4	±3
Nominal Cross-Sectional Area, mm ²	28.3	50.3	78.5	113	201	314	491	804	1257

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

Steel Grade	Upper Yield Strength		Ductility Properties		
	R _{el}		R _{el} /R _m		A _g
	MPa		%		%
	Minimum	Maximum	Minimum	Minimum	Minimum
B400C-B / B400CW	420	—	1.15	14	7
B500C-B / B500CW	500	—		10	
B500C-B	620	—		17	
B600CW	420	1.3 × R _{el} (min.)	1.35	16	8
B420CW	420			13	
B500CW	500			18	
B600C-B	620	1.3 × R _{el} (min.)			

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.

020659



Client : Engr. Md. Tanjidul Islam
Sr. Manager, Quality Control
GPH Ispat Limited

Client's Ref: Nil; 10/02/2025
BRTC Ref: 1103-44586/MME/2024-25; 17/02/2025
Sample Condition: Not Sealed

23 February 2025
MME 0711/2024-2025



3pej7Tudec66

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 _{el}	Average Upper Yield Strength	Tensile Load	Tensile Strength, R _m	Average Tensile Strength	R _{el} / R _m	Elongation after Fracture (G.L. 5d)	Average Elongation after Fracture, A	Elongation at Maximum Force, A _g	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 D'WR 32	1	32	31.96	6.297	6.290	422.96	526	531 (77000)	561.49	698	697 (101000)	1.33	19	19	13	Satisfactory	Satisfactory
	2	32	31.93	6.285		428.33	533		559.69	696		1.31	19		12	Satisfactory	Satisfactory
	3	32	31.94	6.289		429.32	534		560.17	697		1.31	19		13	Satisfactory	Satisfactory

Test Performed by

Hashed 23/02/2025

Dr. H. M. Mamun Al Rashed
Professor

Countersigned by

Hashed 23 FEB 2025

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

Page 1 of 1

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	32	40
Nominal Mass per Unit Length, kg/m	0.213	0.305	0.617	0.888	1.58	2.47	3.85	6.31	9.86
Permissible Variation of Nominal Mass per Unit Length, %	±8	±8	±5	±5	±5	±5	±5	±4	±4
Nominal Cross-Sectional Area, mm ²	28.3	50.3	76.5	113	201	314	491	804	1257

Minimum Tensile Requirements for Steel Rebar (As Per BDS ISO 6935-2 2021 Table 1)

Steel Grade	Upper Yield Strength		Ductility Properties		
	R _{el}		R _{el} /R _m		A _g
	Minimum	Maximum	Minimum	Minimum	Minimum
B400C-F / B400CW	400	—	1.15	14	7
B500C-F / B500CW	500	—		10	
B600C-F	600	—		17	
B400D-F	400	1.3 x R _{el} (min.)	1.25	16	8
B400D-F	420			17	
P500DWR	500			10	
B600D-F	600	1.2 x R _{el} (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 existence/location, if any, of the sample.

020654



Client: Engr. Md. Tanjidal Islam
Sr. Manager, Quality Control
GPH Ispat Limited

Client's Ref: Nil; 10/02/2025
BRTC Ref: 1103-44565/MME/2024-25; 17/02/2025
Sample Condition: Not Sealed

25 February 2025
MME 0698/2024-2025



gj2gbzulkcmn

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 _{el}	Average Upper Yield Strength	Tensile Load	Tensile Strength, R _m	Average Tensile Strength	R _{el} / R _m	Elongation after Fracture (G.L. 5d)	Average Elongation after Fracture, A	Elongation at Maximum Force, A _g	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 10	1	10	9.97	0.613	0.612	35.09	447	449 (65,000)	51.62	657	657 (95,500)	1.47	28	25	12	Satisfactory	Satisfactory
	2	10	9.97	0.613		35.42	451		51.67	658		1.46	26		11	Satisfactory	Satisfactory
	3	10	9.96	0.612		35.17	448		51.55	656		1.46	22		12	Satisfactory	Satisfactory

Test Performed by

Mr. Humayun Kabir
25/02/2025

Mr. Humayun Kabir
Assistant Professor

Countersigned by

Dr. H. M. Mamun Al Rashed
5 FEB 2025
Dr. H. M. Mamun Al Rashed
Professor and Head

Page 1 of 1

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

Bar Designation (Nominal Bar Diameter, mm)	6	8	10	12	16	20	25	32	40
Nominal Mass per Unit Length, kg/m	0.222	0.395	0.613	0.888	1.59	2.47	3.85	4.84	6.31
Possible Variation of Nominal Mass per Unit Length, %	±8	±8	±5	±5	±3	±3	±3	±3	±3
Nominal Cross-Sectional Area, mm ²	28.3	50.3	78.5	113	201	314	491	816	1257

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

Steel Grade	Upper Yield Strength		Tensile Properties		
	F _{yk}		R _{el} /R _m	A	A _g
	Minimum	Maximum	Minimum	Maximum	Minimum
B400C/B, B400CW	400	—	1.15	14	7
B500C/B, B500CW	500	—		16	
B600C/B	600	—		17	
B400CW	400	—	1.25	16	8
B420CW	420	1.3 x R _{yk} (min.)		17	
B500CW	500	1.2 x R _{yk} (min.)		18	
B600C	600	—	—	18	—

Please Note: The client supplied the sample and the result given here with corresponds to the sample tested only. The Department of Materials and Metallurgical Engineering of BRTC takes no responsibility regarding the misclassification of any of the sample.

020662



Client: Engr. Md. Tanjidl Islam
Sr. Manager, Quality Control
GPH Ispat Limited

Client's Ref: Nil; 10/02/2025
BRTC Ref: 1103-44566/MME/2024-25; 17/02/2025
Sample Condition: Not Sealed

25 February 2025
MME 0699/2024-2025



znvyfeul4cxx

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 Fracture, A	Elongation at Maximum Force, A_{g0}	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	11.98	0.885	0.886	52.54	465	466 (67,500)	75.00	663	663 (96,000)	1.43	29	25	12	Satisfactory	Satisfactory
	2	12	11.99	0.886		53.07	469		75.07	664		1.42	25		15	Satisfactory	Satisfactory
	3	12	12.00	0.887		52.62	465		74.91	662		1.42	22		13	Satisfactory	Satisfactory

Test Performed by

Mr. Humayun Kabir
Assistant Professor

Countersigned by

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

Page 1 of 1

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	32	40
Nominal Mass per Unit Length, kg/m	0.222	0.395	0.617	0.888	1.58	2.47	3.85	6.31	9.86
Permissible Variation of Nominal Mass per Unit Length, %	±8	±8	±6	±6	±5	±5	±4	±4	±4
Nominal Cross-Sectional Area, mm ²	28.3	50.3	78.5	113	201	314	491	816	1257

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

Steel Grade	Upper Yield Strength		Ductility Properties		
	R_{eH}		R_m/R_{eH}		A
	Minimum	Maximum	Minimum	Maximum	Minimum
B40C-B / B40C-WR	400	—	1.15	—	14
B40C-R / B40C-WR	500	—		—	7
B40C-R	600	—		—	10
B400DWR	400	—	1.25	—	17
B400DWR	420	1.3 x R_{eH} (mm)		—	16
B500DWR	500	—		—	15
B500DWR	520	1.2 x R_{eH} (mm)		—	8

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 misclassification, if any, of the sample.

020677

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Client: Engr. Md. Tanjidel Islam
Sr. Manager, Quality Control
GPH Ispat Limited

Client's Ref: Nil; 10/02/2025
BRTC Ref: 1103-44568/MME/2024-25; 17/02/2025
Sample Condition: Not Sealed

24 February 2025
MME 0700/2024-2025



jed5ikukxcqq

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 _{el}	Average Upper Yield Strength	Tensile Load	Tensile Strength, R _m	Average Tensile Strength	R _{el} / R _m	Elongation after Fracture (G.L. 5d)	Average Elongation after Fracture, A	Elongation at Maximum Force, A _g	Bend Test	Rebend Test
		mm	mm	kg/m	kg/in	kN	MPa	MPa (psi)	kN	MPa	MPa (psi)		%	%	%	(Separate Sample)	(Separate Sample)
GPH B420 DWR 16	1	16	16.02	1.582	1.583	93.52	465	466 (67,500)	135.20	672	672 (97,500)	1.45	29	27	14	Satisfactory	Satisfactory
	2	16	16.02	1.582		94.23	469		135.40	673		1.43	25		13	Satisfactory	Satisfactory
	3	16	16.03	1.584		93.05	463		135.20	672		1.45	26		13	Satisfactory	Satisfactory

Test Performed by

Mr. Humayun Kabir
Assistant Professor

Countersigned by

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

Page 1 of 1

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	32	40
Nominal Mass per Unit Length, kg/m	0.222	0.385	0.617	0.888	1.58	2.47	3.85	6.34	9.86
Permissible Variation of Nominal Mass per Unit Length, %	±8	±8	±6	±6	±3	±3	±4	±4	±5
Nominal Cross-Sectional Area, mm ²	28.3	50.3	78.5	113	201	314	491	816	1257

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

Steel Grade	Upper Yield Strength		Ductility Properties		
	R _{el}		R _{el} /R _m	A	A _g
	MPa		%	%	%
	Minimum	Maximum	Minimum	Maximum	Minimum
B400C-E / B400CWR	400	—	1.15	14	3
B500C-E / B500CWR	500	—		15	
B600C-E	600	—		17	
B400DWR	400	1.2 x R _{el} (min.)	1.25	16	8
B420DWR	420			16	
B500DWR	500			17	
B600DWR	600	1.2 x R _{el} (min.)	—	18	—

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 authentication, if any, of the sample.

020678

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Client: Engr. Md. Tanjiful Islam
Sr. Manager, Quality Control
GPH Ispat LimitedClient's Ref: Nil; 10/02/2025
BRTC Ref: 1103-44570/MME/2024-25; 17/02/2025
Sample Condition: Not Sealed25 February 2025
MME 0701/2024-2025

v4lla2u10c33

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 _{uH}	Average Upper Yield Strength	Tensile Load	Tensile Strength, R _m	Average Tensile Strength	R _{uH} / R _m	Elongation after Fracture (G.L. 5d)	Average Elongation after Fracture, A	Elongation at Maximum Force, A _g	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	19.99	2.465	2.451	146.59	467	462 (67,000)	206.65	658	655 (95,000)	1.41	25	27	14	Satisfactory	Satisfactory
	2	20	19.98	2.461		145.42	463		205.86	655		1.41	27		17	Satisfactory	Satisfactory
	3	20	19.96	2.457		143.25	456		204.85	652		1.43	28		17	Satisfactory	Satisfactory

Test Performed by

Mr. Humayun Kabir
Assistant Professor

Countersigned by

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

Page 1 of 1

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

Bar Designation Nominal Diameter, mm	6	8	10	12	16	20	25	32	40
Nominal Mass per Unit Length, kg/m	0.222	0.369	0.517	0.888	1.58	2.47	3.85	6.31	9.86
Permissible Variation of Nominal Mass per Unit Length, %	+8	+8	+6	+6	+5	+5	+4	+4	+4
Nominal Cross-Sectional Area, mm ²	28.3	50.3	78.5	113	201	314	491	804	1257

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

Steel Grade	Upper Yield Strength		Elongation Properties		
	R _{uH}		R _{uH} /R _m		A _g
	Minimum	Maximum	Minimum	Maximum	Maximum
B400C-R (1000 Wk)	400	—	1.15	14	7
B500C-R (1100 Wk)	500	—		18	
B600C-R	600	—		17	
B400DWR	400	1.3 x R _{uH} (min)	1.25	16	8
B420DWR	420			17	
B500DWR	500			18	
B600DWR	600	1.2 x R _{uH} (min)	—	19	—

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.

020679



Client: Engr. Md. Tanjidiul Islam
Sr. Manager, Quality Control
GPH Ispat Limited

Client's Ref: Nil; 10/02/2025
BRTC Ref: 1103-44572/MME/2024-25; 17/02/2025
Sample Condition: Not Sealed

25 February 2025
MME 0702/2024-2025



gj2kfzulk1cnn

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 _{el}	Average Upper Yield Strength	Tensile Load	Tensile Strength, R _m	Average Tensile Strength	R _{el} / R _m	Elongation after Fracture (G.L. 5d)	Average Elongation after Fracture, A	Elongation at Maximum Force, A _g	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 25	1	25	24.97	3.843	3.825	220.38	449	448 (65,000)	316.55	645	645 (93,500)	1.44	24	24	14	Satisfactory	Satisfactory
	2	25	24.98	3.849		219.83	448		316.67	645		1.44	23		15	Satisfactory	Satisfactory
	3	25	24.77	3.783		219.87	448		316.48	645		1.44	24		14	Satisfactory	Satisfactory

Test Performed by

Mr. Humayun Kabir
25/02/2025

Mr. Humayun Kabir
Assistant Professor

Countersigned by

Dr. H. M. Mamun Al Rashed
5 FEB 2025
Dr. H. M. Mamun Al Rashed
Professor and Head

Page 1 of 1

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	32	40
Nominal Mass per Unit Length, kg/m	0.222	0.360	0.617	0.885	1.58	2.47	3.85	6.31	9.85
Permissible Variation of Nominal Mass per Unit Length, %	±8	±8	±6	±6	±5	±5	±4	±4	±3
Nominal Cross-Sectional Area, mm ²	28.3	50.3	78.5	113	201	314	491	804	1257

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

Steel Grade	Upper Yield Strength		Ductility Properties		
	R _{el}		R _{el} /R _m	A	A _g
	MPa		%	%	%
	Minimum	Maximum	Maximum	Minimum	Minimum
S235JR / S235JRG	490	—	1.15	14	8
S275JR / S275JRG	510	—		10	
S355JR	490	—		17	
S460CWR	490	1.3 x R _{el} (min.)	1.25	16	8
S460CWR	510			10	
S460CWR	510			10	
S690CWR	690	1.2 x R _{el} (min.)	—	10	—

Please Note: The client supplied the sample and the result given here is only corresponding 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.

020680



Client: Engr. Md. Tanjiful Islam
Sr. Manager, Quality Control
GPH Ispat Limited

Client's Ref: Nil; 10/02/2025
BRTC Ref: 1103-44573/MME/2024-25; 17/02/2025
Sample Condition: Not Sealed

25 February 2025
MME 0703/2024-2025



znvpaoul4cxx

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 _{el} / R _{eh}	Elongation after Fracture (G.L. 5d)	Average Elongation after Fracture, A _g	Elongation at Maximum Force, A _g	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 32	1	32	31.97	6.302	6.303	370.20	460	459 (66,500)	519.05	645	646 (93,500)	1.40	28	27	18	Satisfactory	Satisfactory
	2	32	32.02	6.323		370.97	461		522.15	649		1.41	25		12	Satisfactory	Satisfactory
	3	32	31.92	6.284		367.39	457		517.10	643		1.41	28		14	Satisfactory	Satisfactory

Test Performed by

Mr. Humayun Kabir
Assistant Professor

Countersigned by

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

Page 1 of 1

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	14	16	18	20	22	25	28	32	40
Nominal Mass per Unit Length, kg/m	0.221	0.355	0.617	0.885	1.34	1.99	2.84	3.95	5.32	7.05	9.26	12.31	19.64
Permissible Variation of Nominal Mass per Unit Length, %	+6	+8	+6	+6	+5	+5	+4	+4	+4	+4	+4	+4	+4
Nominal Cross-Sectional Area, mm ²	28.3	50.3	78.5	113	158	201	251	314	393	491	606	804	1257

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

Steel Grade	Upper Yield Strength		Ductility Properties		
	R _{eh}		R _m /R _{eh}		A _g
	Minimum	Maximum	Minimum	Maximum	Minimum
B420C-E/B420CWR	460	—	1.15	14	7
B500C-E/B500CWR	500	—			
B600C-E	600	—			
B420DWR	460	—	1.25	17	8
B500DWR	500	—			
B600DWR	600	—			
B500E-E	500	—			

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

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