



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

Client's Ref: Nil; 15/04/2024
BRTC Ref: 1103-20937/MME/2023-24; 29/04/2024
Sample Condition: Not Sealed

19 May 2024
MME 1337/2023-2024



34d1t7urh6w

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_{gt}	Bend Test	Re-bend Test
		mm	mm	kg/m	kg/m	kN	MPa	MPa (psi)	kN	MPa	MPa (psi)		%	%	%	(Separate Sample)	(Separate Sample)
GPH B420DWR 10	1	10	9.98	0.610	0.612	36.43	464	466 (67500)	50.40	642	640 (93000)	1.38	30	29	15	Satisfactory	Satisfactory
	2	10	9.97	0.613		36.32	462		50.14	638		1.38	27		14	Satisfactory	Satisfactory
	3	10	9.97	0.613		36.98	471		50.38	641		1.36	29		15	Satisfactory	Satisfactory

Rashid
19/5/2024

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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

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.

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_{gt}
	MPa			%	%
	Minimum	Maximum	Minimum	Minimum	Minimum
B400C-R / B400CWR	400	---	1.15	14	7
B500C-R / B500CWR	500	---		10	
B600C-R	600	---		17	
B400DWR	400	1.3 x R_{eH} (min.)	1.25	16	8
B420DWR	420			13	
B500DWR	500			10	
B600D-R	600	1.2 x R_{eH} (min.)		10	

Client : Engr. Md. Tanjidul Islam
Sr. Manager, Quality Control
GPH Ispat LimitedClient's Ref: Nil; 15/04/2024
BRTC Ref: 1103-20939/MME/2023-24; 29/04/2024
Sample Condition: Not Sealed19 May 2024
MME 1339/2023-2024

5kd3tlu4hgr

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_{gt}	Bend Test	Re-bend Test
		mm	mm	kg/m	kg/m	kN	MPa	MPa (psi)	kN	MPa	MPa (psi)		%	%	%	(Separate Sample)	(Separate Sample)
GPH B420DWR 12	1	12	11.98	0.884	0.884	51.49	455	455 (66000)	69.88	618	617 (89500)	1.36	31	31	17	Satisfactory	Satisfactory
	2	12	11.98	0.884		51.18	453		69.55	615		1.36	33		16	Satisfactory	Satisfactory
	3	12	11.98	0.884		51.65	457		70.06	619		1.35	30		18	Satisfactory	Satisfactory

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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

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.

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_{gt}
	MPa			%	%
	Minimum	Maximum	Minimum	Minimum	Minimum
B400C-R / B100CWR	400	---	1.15	14	7
B500C-R / B500CWR	500	---		10	
B600C-R	600	---		17	
B400DWR	400	1.3 x R_{eH} (min.)	1.25	16	8
B420DWR	420			13	
B500DWR	500			10	
B600D-R	600	1.2 x R_{eH} (min.)			



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

Client's Ref: Nil; 15/04/2024
BRTC Ref: 1103-20938/MME/2023-24; 29/04/2024
Sample Condition: Not Sealed

19 May 2024
MME 1338/2023-2024



Tj3ef3uw4p4

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_{gt}	Bend Test	Re-bend Test
		mm	mm	kg/m	kg/m	kN	MPa	MPa (psi)	kN	MPa	MPa (psi)		%	%	%	(Separate Sample)	(Separate Sample)
GPH B420DWR 16	1	16	15.96	1.571	1.568	93.07	463	460 (66500)	129.82	646	644 (93500)	1.40	28	27	15	Satisfactory	Satisfactory
	2	16	15.93	1.565		92.18	458		129.20	643		1.40	27		14	Satisfactory	Satisfactory
	3	16	15.96	1.570		92.58	460		129.11	642		1.40	26		15	Satisfactory	Satisfactory

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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	894	1257

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.

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_{gt}
	MPa			%	%
	Minimum	Maximum	Minimum	Minimum	Minimum
B400C-R / B400CWR	400	---	1.15	14	7
B500C-R / B500CWR	500	---		10	
B600C-R	600	---		17	
B400DWR	400	1.3 x R_{eH} (min.)	1.25	16	8
B420DWR	420			13	
B500DWR	500			10	
B600D-R	600	1.2 x R_{eH} (min.)		10	



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

Client's Ref: Nil; 15/04/2024
BRTC Ref: 1103-20940/MME/2023-24; 29/04/2024
Sample Condition: Not Sealed

19 May 2024
MME 1340/2023-2024



kkj4uqu7h05

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_{gt}	Bend Test	Re-bend Test
		mm	mm	kg/m	kg/m	kN	MPa	MPa (psi)	kN	MPa	MPa (psi)		%	%	%	(Separate Sample)	(Separate Sample)
GPH B420DWR 20	1	20	19.93	2.448	2.452	148.87	474	474 (68500)	212.45	676	676 (98000)	1.43	24	23	14	Satisfactory	Satisfactory
	2	20	19.94	2.450		148.78	474		212.39	676		1.43	21		15	Satisfactory	Satisfactory
	3	20	19.96	2.456		149.34	475		212.55	677		1.43	25		13	Satisfactory	Satisfactory

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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

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.

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

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



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

Client's Ref: Nil; 15/04/2024
BRTC Ref: 1103-20941/MME/2023-24; 29/04/2024
Sample Condition: Not Sealed

14 May 2024
MME 1341/2023-2024



pyretzunheg

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_{gt}	Bend Test	Re-bend Test
		mm	mm	kg/m	kg/m	kN	MPa	MPa (psi)	kN	MPa	MPa (psi)		%	%	%	(Separate Sample)	(Separate Sample)
GPH B420DWR 25	1	25	24.94	3.837	3.837	221.85	452	438 (64000)	320.10	652	639 (93000)	1.44	26	26	13	Satisfactory	Satisfactory
	2	25	24.94	3.838		211.35	430		310.46	632		1.47	26		15	Satisfactory	Satisfactory
	3	25	24.94	3.836		211.00	430		309.96	631		1.47	24		15	Satisfactory	Satisfactory

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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	8.86
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

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.

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_{gt}
	MPa			%	%
	Minimum	Maximum	Minimum	Minimum	Minimum
B400C-R / B400CWR	400	---	1.15	14	7
B500C-R / B500CWR	500	---		10	
B600C-R	600	---		17	
B400DWR	400	1.3 x R_{eH} (min.)	1.25	16	8
B420DWR	420			13	
B500DWR	500			10	
B600D-R	600	1.2 x R_{eH} (min.)		10	



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

Client's Ref: Nil; 15/04/2024
BRTC Ref: 1103-20942/MME/2023-24; 29/04/2024
Sample Condition: Not Sealed

08 May 2024
MME 1342/2023-2024



l4kjcpeuh6n

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

Bend Test (Separate Sample)	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_{gt}	Bend Test (Separate Sample)	Re-bend Test (Separate Sample)
		mm	mm	kg/m	kg/m	kN	MPa	MPa (psi)	kN	MPa	MPa (psi)		%	%	%		
GPH B420DWR 32	1	32	31.81	6.239	6.244	370.71	461	461 (67000)	533.79	664	664 (96500)	1.44	22	23	15	Satisfactory	Satisfactory
	2	32	31.81	6.239		371.09	461		534.72	665		1.44	24		13	Satisfactory	Satisfactory
	3	32	31.85	6.252		370.73	461		534.06	664		1.44	24		16	Satisfactory	Satisfactory

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08/5/2024

Dr. A. K. M. Bazlur Rashid
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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	4.64	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

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.

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_{mH}	A	A_{gt}
	MPa			%	%
	Minimum	Maximum	Minimum	Minimum	Minimum
B400C-R / B400CWR	400	---	1.15	14	7
B500C-R / B500CWR	500	---		10	
B600C-R	600	---		17	
B400DWR	400	1.3 x R_{eH} (min.)	1.25	16	
B420DWR	420			13	
B500DWR	500			10	
B600D-R	600	1.2 x R_{eH} (min.)		10	



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

Client's Ref: Nil; 15/04/2024
BRTC Ref: 1103-20943/MME/2023-24; 29/04/2024
Sample Condition: Not Sealed

08 May 2024
MME 1343/2023-2024



ej0ybzukhd2

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

Bend Test (Separate Sample)	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_{gt}	Bend Test	Re-bend Test
		mm	mm	kg/m	kg/m	kN	MPa	MPa (psi)	kN	MPa	MPa (psi)		%	%	%	(Separate Sample)	(Separate Sample)
GPH B500DWR 8	1	8	7.91	0.386	0.387	26.60	529	533 (77500)	36.45	725	729 (105500)	1.37	20	21	12	Satisfactory	Satisfactory
	2	8	7.92	0.387		26.76	532		36.69	730		1.37	21		10	Satisfactory	Satisfactory
	3	8	7.93	0.387		27.00	537		36.83	733		1.36	21		11	Satisfactory	Satisfactory

Rashid 8/5/2024

Dr. A. K. M. Bazlur Rashid
Professor and Head

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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

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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_{gt}
	MPa			%	%
	Minimum	Maximum	Minimum	Minimum	Minimum
B400C-R / B400CWR	400	---	1.15	14	8
B500C-R / B500CWR	500	---		10	
B600C-R	600	---		17	
B400DWR	400	1.3 x R_{eH} (min.)	1.25	16	
B420DWR	420			13	
B500DWR	500			10	
B600D-R	600	1.2 x R_{eH} (min.)		10	

Client : Engr. Md. Tanjidul Islam
Sr. Manager, Quality Control
GPH Ispat LimitedClient's Ref: Nil; 15/04/2024
BRTC Ref: 1103-20946/MME/2023-24; 29/04/2024
Sample Condition: Not Sealed11 May 2024
MME 1344/2023-2024

r95rcgu2hkn

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_{gt}	Bend Test	Re-bend Test
		mm	mm	kg/m	kg/m	kN	MPa	MPa (psi)	kN	MPa	MPa (psi)		%	%	%	(Separate Sample)	(Separate Sample)
GPH QUANTUM B500DWR 10	1	10	10.01	0.617	0.618	42.45	540	548 (79500)	54.28	691	692 (100500)	1.28	20	22	12	Satisfactory	Satisfactory
	2	10	10.01	0.618		43.59	555		54.15	689		1.24	21		11	Satisfactory	Satisfactory
	3	10	10.03	0.620		43.02	548		54.60	695		1.27	25		10	Satisfactory	Satisfactory

Dr. A. K. M. Bazlur Rashid
Professor and Head

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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

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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_{gt}
	MPa			%	%
	Minimum	Maximum	Minimum	Minimum	Minimum
B400C-R / B400CWR	400	—	1.15	14	7
B500C-R / B500CWR	500	—		10	
B600C-R	600	—		17	
B400DWR	400	1.3 x R_{eH} (min.)	1.25	16	8
B420DWR	420			13	
B500DWR	500			10	
B600D-R	600	1.2 x R_{eH} (min.)		10	



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

Client's Ref: Nil; 15/04/2024
BRTC Ref: 1103-20947/MME/2023-24; 29/04/2024
Sample Condition: Not Sealed

09 May 2024
MME 1345/2023-2024



xxj0aru4hvn

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_{gt}	Bend Test	Re-bend Test
		mm	mm	kg/m	kg/m	kN	MPa	MPa (psi)	kN	MPa	MPa (psi)		%	%	%	(Separate Sample)	(Separate Sample)
GPH QUANTUM B500DWR 12	1	12	12.16	0.911	0.911	62.58	553	554 (80500)	79.96	707	709 (103000)	1.28	28	25	11	Satisfactory	Satisfactory
	2	12	12.16	0.912		62.71	554		80.07	708		1.28	27		14	Satisfactory	Satisfactory
	3	12	12.15	0.910		62.84	556		80.41	711		1.28	21		10	Satisfactory	Satisfactory

Rashid 09/5/2024

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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	±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_m/R_{eH}	A	A_{gt}
	MPa			%	%
	Minimum	Maximum	Minimum	Minimum	Minimum
B400C-R / B400CWR	400	---	1.15	14	7
B500C-R / B500CWR	500	---		10	
B600C-R	600	---		17	
B400DWR	400	1.3 x R_{eH} (min.)	1.25	16	8
B420DWR	420			13	
B500DWR	500			10	
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

Client's Ref: Nil; 15/04/2024
BRTC Ref: 1103-20948/MME/2023-24; 29/04/2024
Sample Condition: Not Sealed

09 May 2024
MME 1346/2023-2024



9545f2uqhlq

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_{gt}	Bend Test	Re-bend Test
		mm	mm	kg/m	kg/m	kN	MPa	MPa (psi)	kN	MPa	MPa (psi)		%	%	%	(Separate Sample)	(Separate Sample)
GPH QUANTUM B500DWR 16	1	16	16.05	1.588	1.591	108.96	542	543 (79000)	141.65	705	705 (102500)	1.30	22	22	13	Satisfactory	Satisfactory
	2	16	16.07	1.592		109.49	545		142.05	706		1.30	22		14	Satisfactory	Satisfactory
	3	16	16.07	1.591		108.84	541		141.80	705		1.30	23		13	Satisfactory	Satisfactory

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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

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.

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_{gt}
	MPa		%	%	%
	Minimum	Maximum	Minimum	Minimum	Minimum
B400C-R / B400CWR	400	---	1.15	14	7
B500C-R / B500CWR	500	---		10	
B600C-R	600	---		17	
B400DWR	400	1.3 x R_{eH} (min.)	1.25	16	8
B420DWR	420			13	
B500DWR	500			10	
B600D-R	600	1.2 x R_{eH} (min.)		10	



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

Client's Ref: Nil; 15/04/2024
BRTC Ref: 1103-20949/MME/2023-24; 29/04/2024
Sample Condition: Not Sealed

09 May 2024
MME 1347/2023-2024



y5jqizuwhl6

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 _{gt}	Bend Test	Re-bend Test
		mm	mm	kg/m	kg/m	kN	MPa	MPa (psi)	kN	MPa	MPa (psi)		%	%	%	(Separate Sample)	(Separate Sample)
GPH QUANTUM B500DWR 20	1	20	20.05	2.480	2.484	170.43	540	540 (78500)	214.31	679	678 (98500)	1.26	24	24	13	Satisfactory	Satisfactory
	2	20	20.05	2.480		171.00	542		214.50	679		1.25	22		12	Satisfactory	Satisfactory
	3	20	20.10	2.492		171.22	540		214.35	676		1.25	25		13	Satisfactory	Satisfactory

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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		Ductility Properties		
	R _{elt}		R _m / R _{elt}	A	A _{gt}
	MPa			%	%
	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 _{elt} (min.)	1.25	17	8
B420DWR	420			16	
B500DWR	500			13	
B600D-R	600	1.2 x R _{elt} (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 LimitedClient's Ref: Nil; 15/04/2024
BRTC Ref: 1103-20950/MME/2023-24; 29/04/2024
Sample Condition: Not Sealed09 May 2024
MME 1348/2023-2024

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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 _{gt}	Bend Test	Re-bend Test
		mm	mm	kg/m	kg/m	kN	MPa	MPa (psi)	kN	MPa	MPa (psi)		%	%	%	(Separate Sample)	(Separate Sample)
GPH B500DWR 22	1	22	21.95	2.971	2.973	209.67	554	554 (80500)	275.25	727	728 (105500)	1.31	24	23	11	Satisfactory	Satisfactory
	2	22	21.96	2.974		208.02	549		274.97	726		1.32	24		11	Satisfactory	Satisfactory
	3	22	21.96	2.973		212.08	560		276.46	730		1.30	22		11	Satisfactory	Satisfactory

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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		Ductility Properties		
	R _{eH}		R _{eH} /R _m	A	A _{gt}
	MPa		%	%	
	Minimum	Maximum	Minimum	Minimum	Minimum
B400C-R / B400CWR	400	---	1.15	14	7
B500C-R / B500CWR	500	---		10	
B600C-R	600	---		17	
B400DWR	400	1.3 x R _{eH} (min.)	1.25	16	8
B420DWR	420			13	
B500DWR	500			10	
B600D-R	600	1.2 x R _{eH} (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.



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

Client's Ref: Nil; 15/04/2024
BRTC Ref: 1103-20951/MME/2023-24; 29/04/2024
Sample Condition: Not Sealed

09 May 2024
MME 1349/2023-2024



d35vheuyhlr

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_{gt}	Bend Test	Re-bend Test
		mm	mm	kg/m	kg/m	kN	MPa	MPa (psi)	kN	MPa	MPa (psi)		%	%	%	(Separate Sample)	(Separate Sample)
GPH Quantum B500DWR 25	1	25	25.09	3.882	3.880	271.05	548	546 (79000)	345.40	699	698 (101000)	1.27	22	22	10	Satisfactory	Satisfactory
	2	25	25.09	3.883		269.74	546		345.31	698		1.28	21		10	Satisfactory	Satisfactory
	3	25	25.07	3.874		269.26	545		344.68	698		1.28	22		11	Satisfactory	Satisfactory

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09/5/2024

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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

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.

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_{gt}
	MPa			%	%
	Minimum	Maximum	Minimum	Minimum	Minimum
B400C-R / B400CWR	400	---	1.15	14	7
B500C-R / B500CWR	500	---		10	
B600C-R	600	---		17	
B400DWR	400	1.3 x R_{eH} (min.)	1.25	16	8
B420DWR	420			13	
B500DWR	500			10	
B600D-R	600	1.2 x R_{eH} (min.)			



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

Client's Ref: Nil; 15/04/2024
BRTC Ref: 1103-20952/MME/2023-24; 29/04/2024
Sample Condition: Not Sealed

09 May 2024
MME 1350/2023-2024



j9x6fkuphqe

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_{gt}	Bend Test	Re-bend Test
		mm	mm	kg/m	kg/m	kN	MPa	MPa (psi)	kN	MPa	MPa (psi)		%	%	%	(Separate Sample)	(Separate Sample)
GPH B500DWR 28	1	28	27.94	4.814	4.820	337.74	551	550 (80000)	444.66	725	725 (105000)	1.32	18	19	12	Satisfactory	Satisfactory
	2	28	27.96	4.821		335.14	546		443.14	722		1.32	20		13	Satisfactory	Satisfactory
	3	28	27.97	4.825		340.00	553		447.11	728		1.32	19		14	Satisfactory	Satisfactory

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Dr. A. K. M. Bazlur Rashid
Professor and Head

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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

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.

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_{gt}
	MPa		%	%	%
	Minimum	Maximum	Minimum	Minimum	Minimum
B400C-R / B400CWR	400	---	1.15	14	7
B500C-R / B500CWR	500	---		10	
B600C-R	600	---		17	
B400DWR	400	1.3 x R_{eH} (min.)	1.25	16	8
B420DWR	420			13	
B500DWR	500			10	
B600D-R	600	1.2 x R_{eH} (min.)		10	



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

Client's Ref: Nil; 15/04/2024
BRTC Ref: 1103-20954/MME/2023-24; 29/04/2024
Sample Condition: Not Sealed

07 May 2024
MME 1351/2023-2024



vgepf2u6h39

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_{gt}	Bend Test	Re-bend Test
		mm	mm	kg/m	kg/m	kN	MPa	MPa (psi)	kN	MPa	MPa (psi)		%	%	%	(Separate Sample)	(Separate Sample)
GPH QUANTUM B500DWR 32	1	32	31.91	6.276	6.273	428.35	533	534 (77500)	561.32	698	698 (101000)	1.31	18	20	13	Satisfactory	Satisfactory
	2	32	31.90	6.274		430.81	536		562.54	699		1.30	21		13	Satisfactory	Satisfactory
	3	32	31.89	6.269		429.00	533		561.71	698		1.31	20		14	Satisfactory	Satisfactory

Rashid 07/5/2024

Dr. A. K. M. Bazlur Rashid
Professor and Head

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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

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.

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_{gt}
	MPa		%	%	%
	Minimum	Maximum	Minimum	Minimum	Minimum
B400C-R / B400CWR	400	---	1.15	14	7
B500C-R / B500CWR	500	---		10	
B600C-R	600	---		17	
B400DWR	400	1.3 x R_{eH} (min.)	1.25	16	8
B420DWR	420			13	
B500DWR	500			10	
B600D-R	600	1.2 x R_{eH} (min.)		10	



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

Client's Ref: Nil; 15/04/2024
BRTC Ref: 1103-20961/MME/2023-24; 29/04/2024
Sample Condition: Not Sealed

14 May 2024
MME 1356/2023-2024



w0jrf7uzh7g

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_{gt}	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	11.90	0.874	0.875	71.08	628	631 (91500)	93.26	825	822 (119000)	1.31	23	21	12	Satisfactory
	2	12	11.92	0.875		71.35	631		92.76	820		1.30	17		12	Satisfactory
	3	12	11.91	0.875		71.68	634		92.88	821		1.29	24		12	Satisfactory

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

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
missible 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_m/R_{eH}	A	A_{gt}
	MPa		%	%	%
	Minimum	Maximum	Minimum	Minimum	Minimum
B400C-R / B400CWR	400	—	1.15	14	7
B500C-R / B500CWR	500	—		10	
B600C-R	600	—		17	
B400DWR	400	1.3 x R_{eH} (min.)	1.25	16	8
B420DWR	420			13	
B500DWR	500			10	
B600D-R	600	1.2 x R_{eH} (min.)		10	

Case 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 LimitedClient's Ref: Nil; 15/04/2024
BRTC Ref: 1103-20960/MME/2023-24; 29/04/2024
Sample Condition: Not Sealed07 May 2024
MME 1355/2023-2024

lj1qupu0hge

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_{gt}	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	15.96	1.570	1.573	127.10	632	634 (92000)	167.45	833	833 (121000)	1.32	22	22	12	Satisfactory
	2	16	16.02	1.583		127.56	634		167.15	831		1.31	23		13	Satisfactory
	3	16	15.95	1.568		127.94	636		167.61	834		1.31	20		10	Satisfactory

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Professor and Head

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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

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.

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_{gt}
	MPa			%	%
	Minimum	Maximum	Minimum	Minimum	Minimum
B400C-R / B400CWR	400	---	1.15	14	7
B500C-R / B500CWR	500	---		10	
B600C-R	600	---		17	
B400DWR	400	---	1.25	16	8
B420DWR	420	1.3 x R_{eH} (min.)		13	
B500DWR	500	1.2 x R_{eH} (min.)		10	
B600D-R	600	---			



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

Client's Ref: Nil; 15/04/2024
BRTC Ref: 1103-20959/MME/2023-24; 29/04/2024
Sample Condition: Not Sealed

07 May 2024
MME 1354/2023-2024



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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_{gt}	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	20.03	2.474	2.477	206.65	658	656 (95000)	263.28	838	838 (121500)	1.27	19	18	14	Satisfactory
	2	20	20.04	2.477		205.63	655		263.55	839		1.28	19		13	Satisfactory
	3	20	20.05	2.478		205.74	655		263.33	838		1.28	17		11	Satisfactory

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

Client's Ref: Nil; 15/04/2024
BRTC Ref: 1103-20958/MME/2023-24; 29/04/2024
Sample Condition: Not Sealed

07 May 2024
MME 1353/2023-2024



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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_{gt}	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	24.84	3.803	3.817	303.79	627	631	386.06	797	801	1.27	20	20	14	Satisfactory
	2	25	24.90	3.822		314.40	646		396.97	815		1.26	20		10	Satisfactory
	3	25	24.91	3.826		302.69	621		385.42	791		1.27	21		11	Satisfactory

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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

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.

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_{gt}
	MPa			%	%
	Minimum	Maximum	Minimum	Minimum	Minimum
B400C-R / B400CWR	400	---	1.15	14	7
B500C-R / B500CWR	500	---		10	
B600C-R	600	---		17	
B400DWR	400	1.3 x R_{eH} (min.)	1.25	16	8
B420DWR	420			13	
B500DWR	500			10	
B600D-R	600	1.2 x R_{eH} (min.)		10	



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

Client's Ref: Nil; 15/04/2024
BRTC Ref: 1103-20956/MME/2023-24; 29/04/2024
Sample Condition: Not Sealed

07 May 2024
MME 1352/2023-2024



ggddizuphnhw

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_{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	32.00	6.315	6.316	506.75	630	632 (91500)	648.14	806	805 (117000)	1.28	18	19	13	Satisfactory
	2	32	32.02	6.321		508.52	632		647.22	805		1.27	19		14	Satisfactory
	3	32	32.00	6.314		509.30	633		647.47	805		1.27	20		15	Satisfactory

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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
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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_{gt}
	MPa		%	%	%
	Minimum	Maximum	Minimum	Minimum	Minimum
B400C-R / B400CWR	400	---	1.15	14	7
B500C-R / B500CWR	500	---		10	
B600C-R	600	---		17	
B400DWR	400	1.3 x R_{eH} (min.)	1.25	16	8
B420DWR	420			13	
B500DWR	500			10	
B600D-R	600	1.2 x R_{eH} (min.)		10	