



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

Client's Ref: Nil; 25/06/2024
BRTC Ref: 1103-26877/MME/2024-25; 06/07/2024
Sample Condition: Not Sealed
Test Performed by: Mr. Md. Miftaur Rahman

27 July 2024
MME 0017/2024-2025



e6bzux7cdd

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 B 420 DWR 10	1	10	9.97	0.613	0.611	37.06	472	468 (68000)	51.63	657	655 (95000)	1.39	23	23	9	Satisfactory	Satisfactory
	2	10	9.94	0.609		36.80	469		51.46	655		1.40	23		11	Satisfactory	Satisfactory
	3	10	9.95	0.611		36.39	463		51.35	654		1.41	23		13	Satisfactory	Satisfactory

Dr. Md. Aminul Islam
Professor and Head

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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 identification, if any, of the sample.

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; 25/06/2024
BRTC Ref: 1103-26878/MME/2024-25; 06/07/2024
Sample Condition: Not Sealed
Test Performed by: Mr. Md. Miftaur Rahman

27 July 2024
MME 0018/2024-2025



r6sgud0ckk

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 B 420 DWR 12	1	12	12.03	0.892	0.892	51.93	459	462 (67000)	72.86	644	645 (93500)	1.40	21	24	13	Satisfactory	Satisfactory
	2	12	12.04	0.893		52.24	462		73.04	646		1.40	24		14	Satisfactory	Satisfactory
	3	12	12.03	0.892		52.42	463		72.92	645		1.39	27		15	Satisfactory	Satisfactory

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



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

Client's Ref: Nil; 25/06/2024
BRTC Ref: 1103-26879/MME/2024-25; 06/07/2024
Sample Condition: Not Sealed
Test Performed by: Mr. Md. Miftaur Rahman

27 July 2024
MME 0019/2024-2025



xytrug6cvv

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 B 420 DWR 16	1	16	15.99	1.576	1.581	90.11	448	451 (65500)	131.56	654	653 (94500)	1.46	25	25	14	Satisfactory	Satisfactory
	2	16	16.03	1.585		91.36	454		131.76	655		1.44	25		14	Satisfactory	Satisfactory
	3	16	16.02	1.583		90.70	451		130.35	648		1.44	26		12	Satisfactory	Satisfactory

Dr. Md. Aminul Islam
Professor and Head

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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.

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	
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; 25/06/2024
BRTC Ref: 1103-26880/MME/2024-25; 06/07/2024
Sample Condition: Not Sealed
Test Performed by: Mr. Md. Miftaur Rahman

27 July 2024
MME 0020/2024-2025



97u2uzycll

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 B 420 DWR 20	1	20	19.93	2.448	2.449	147.38	469	467 (67500)	212.22	676	674 (98000)	1.44	21	22	10	Satisfactory	Satisfactory
	2	20	19.93	2.448		146.19	465		211.70	674		1.45	22		10	Satisfactory	Satisfactory
	3	20	19.93	2.450		146.88	468		211.36	673		1.44	24		10	Satisfactory	Satisfactory

Dr. Md. Aminul Islam
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
B460C-R / B400CWR	400	---	1.15	14	7
B500C-R / B500CWR	500	---		10	
B600C-R	600	---		17	
B420DWR	420	1.3 x R_{eH} (min.)	1.25	16	8
B500DWR	500			13	
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; 25/06/2024
BRTC Ref: 1103-26883/MME/2024-25; 06/07/2024
Sample Condition: Not Sealed
Test Performed by: Mr. Md. Miftaur Rahman

27 July 2024
MME 0021/2024-2025



y1f2u3ecll

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 B 420 DWR 25	1	25	25.02	3.859	3.858	230.38	469	470 (68000)	323.03	658	657 (95500)	1.40	21	23	12	Satisfactory	Satisfactory
	2	25	25.02	3.859		231.85	472		322.87	658		1.39	23		13	Satisfactory	Satisfactory
	3	25	25.01	3.856		230.23	469		321.98	656		1.40	24		14	Satisfactory	Satisfactory

Dr. Md. Aminul Islam
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_e/R_{eH}	A	A_g
	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; 25/06/2024
BRTC Ref: 1103-26887/MME/2024-25; 06/07/2024
Sample Condition: Not Sealed
Test Performed by: Mr. Md. Miftaur Rahman

27 July 2024
MME 0022/2024-2025



47ieu3vcqq

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 B 420 DWR 32	1	32	32.01	6.319	6.317	381.29	474	474 (68500)	541.13	673	674 (98000)	1.42	26	25	11	Satisfactory	Satisfactory
	2	32	32.01	6.316		381.50	474		542.46	674		1.42	25		14	Satisfactory	Satisfactory
	3	32	32.01	6.317		381.14	474		542.05	674		1.42	24		11	Satisfactory	Satisfactory

Dr. Md. Aminul Islam
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, %	±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; 25/06/2024
BRTC Ref: 1103-26888/MME/2024-25; 06/07/2024
Sample Condition: Not Sealed
Test Performed by: Mr. Md. Miftaur Rahman

27 July 2024
MME 0023/2024-2025



dxheug9ccl

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_{dH}	Average Upper Yield Strength	Tensile Load	Tensile Strength, R_m	Average Tensile Strength	R_m/R_{dH}	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 B 500 DWR 8	1	8	7.92	0.387	0.389	27.80	553	555 (80500)	37.04	737	747 (108500)	1.33	29	28	9	Satisfactory	Satisfactory
	2	8	7.99	0.394		28.56	568		38.37	763		1.34	27		9	Satisfactory	Satisfactory
	3	8	7.91	0.386		27.30	543		37.28	742		1.37	28		9	Satisfactory	Satisfactory

Dr. Md. Aminul Islam
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	0.223	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_{dH}		R_m/R_{dH}	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_{dH} (min.)	1.25	16	8
B420DWR	420			13	
B500DWR	500			10	
B600D-R	600	1.2 x R_{dH} (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 LimitedClient's Ref: Nil; 25/06/2024
BRTC Ref: 1103-26889/MME/2024-25; 06/07/2024
Sample Condition: Not Sealed
Test Performed by: Mr. Md. Miftaur Rahman27 July 2024
MME 0024/2024-2025

jejkukxcq

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_{elH}	Average Upper Yield Strength	Tensile Load	Tensile Strength, R_m	Average Tensile Strength	R_m/R_{elH}	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 B 500 DWR 10	1	10	9.84	0.597	0.595	42.96	547	556 (80500)	55.30	704	712 (103500)	1.29	26	27	10	Satisfactory	Satisfactory
	2	10	9.80	0.592		43.92	559		56.16	715		1.28	29		12	Satisfactory	Satisfactory
	3	10	9.84	0.596		44.09	561		56.24	716		1.28	28		11	Satisfactory	Satisfactory

Dr. Md. Aminul Islam
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, %	±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_{elH}		R_m/R_{elH}	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_{elH} (min.)	1.25	16	8
B420DWR	420			13	
B500DWR	500			10	
B600D-F	600	1.2 x R_{elH} (min.)	—	—	—



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

Client's Ref: Nil; 25/06/2024
BRTC Ref: 1103-26890/MME/2024-25; 06/07/2024
Sample Condition: Not Sealed
Test Performed by: Mr. Md. Miftaur Rahman

27 July 2024
MME 0025/2024-2025



v44a2u10c33

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_{elH}	Average Upper Yield Strength	Tensile Load	Tensile Strength, R_m	Average Tensile Strength	R_m/R_{elH}	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 QUANTUM B 500 DWR 12	1	12	12.20	0.917	0.916	62.41	552	551 (80000)	79.80	706	703 (102000)	1.28	26	26	12	Satisfactory	Satisfactory
	2	12	12.19	0.916		61.97	548		79.31	701		1.28	28		13	Satisfactory	Satisfactory
	3	12	12.17	0.914		62.53	553		79.48	703		1.27	25		12	Satisfactory	Satisfactory

Dr. Md. Aminul Islam
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, %	±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_{elH}		R_{elH}/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_{elH} (min.)	1.25	16	8
B420DWR	420			13	
B500DWR	500			10	
B600D-R	600	1.2 x R_{elH} (min.)		10	

Client : Engr. Md. Tanjidul Islam
Sr. Manager, Quality Control
GPH Ispat LimitedClient's Ref: Nil; 25/06/2024
BRTC Ref: 1103-26891/MME/2024-25; 06/07/2024
Sample Condition: Not Sealed
Test Performed by: Mr. Md. Miftaur Rahman27 July 2024
MME 0026/2024-2025

gjgbzuk1cnn

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_{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 B 500 DWR 16	1	16	15.77	1.532	1.534	108.38	539	536 (78000)	138.19	687	687 (99500)	1.28	26	24	12	Satisfactory	Satisfactory
	2	16	15.77	1.533		107.20	533		137.76	685		1.29	24		13	Satisfactory	Satisfactory
	3	16	15.79	1.537		107.65	535		138.19	687		1.28	23		11	Satisfactory	Satisfactory

Dr. Md. Aminul Islam
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, %	±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_{el}		R_m/R_{el}	A	A_g
	MPa		%	%	%
	Minimum	Maximum	Minimum	Minimum	Minimum
B460C-R / B400CWR	400	---	1.15	14	7
B500C-R / B500CWR	500	---		10	
B600C-R	600	---		17	
B400DWR	400	1.3 x R_{el} (min.)	1.25	16	8
B420DWR	420			13	
B500DWR	500			10	
B600D-R	600	1.2 x R_{el} (min.)			



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

Client's Ref: Nil; 25/06/2024
BRTC Ref: 1103-26892/MME/2024-25; 06/07/2024
Sample Condition: Not Sealed
Test Performed by: Dr. Kazi Mohammad Shorowordi

27 July 2024
MME 0027/2024-2025



znyeul4cxx

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_{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 B500 DWR 20	1	20	20.07	2.484	2.482	169.50	540	539 (78000)	213.22	679	679 (98500)	1.26	24	25	14	Satisfactory	Satisfactory
	2	20	20.06	2.482		169.05	538		213.40	679			24		13	Satisfactory	Satisfactory
	3	20	20.06	2.480		169.62	540		213.18	679			26		13	Satisfactory	Satisfactory

Dr. Md. Aminul Islam
Professor and Head

Page 1 of 1

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.

Steel Grade	Upper Yield Strength		Ductility Properties		
	R_{el}		R_m / R_{el}	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_{el} (min.)	1.25		17
B420DWR	420			16	
B500DWR	500			13	
B600D-R	600	1.2 x R_{el} (min.)		10	



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

Client's Ref: Nil; 25/06/2024
BRTC Ref: 1103-26893/MME/2024-25; 06/07/2024
Sample Condition: Not Sealed
Test Performed by: Dr. Kazi Mohammad Shorowordi

27 July 2024
MME 0028/2024-2025



6yetr12c1l

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 B500 DWR 22	1	22	21.95	2.971	2.969	212.38	559	560 (81000)	279.76	736	735 (106500)	1.31	22	21	13	Satisfactory	Satisfactory
	2	22	21.96	2.973		215.25	566		280.78	739			20		12	Satisfactory	Satisfactory
	3	22	21.93	2.965		211.17	556		277.60	730			22		14	Satisfactory	Satisfactory

Dr. Md. Aminul Islam
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, %	±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_g
	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 × R_{eH} (min.)	1.25	16	8
B420DWR	420			13	
B500DWR	500			10	
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.



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

Client's Ref: Nil; 25/06/2024
BRTC Ref: 1103-26894/MME/2024-25; 06/07/2024
Sample Condition: Not Sealed
Test Performed by: Dr. Kazi Mohammad Shorowordi

27 July 2024
MME 0029/2024-2025



1plupuv7cgg

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 B500 DWR 25	1	25	24.99	3.850	3.858	259.58	529	531 (77000)	355.08	723	725 (105000)	1.36	21	22	11	Satisfactory	Satisfactory
	2	25	25.02	3.858		260.88	531		355.64	725			21		12	Satisfactory	Satisfactory
	3	25	25.04	3.864		261.37	532		356.22	726			23		15	Satisfactory	Satisfactory

Dr. Md. Aminul Islam
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, %	±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



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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 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

Rashid 09/5/2024
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; 25/06/2024
BRTC Ref: 1103-26897/MME/2024-25; 06/07/2024
Sample Condition: Not Sealed
Test Performed by: Dr. Kazi Mohammad Shorowordi

31 July 2024
MME 0031/2024-2025



Ordijuxpcvv

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	11.89	0.871	0.871	69.93	618	620 (90000)	91.40	808	808 (117000)	1.30	18	19	10	Satisfactory
	2	12	11.88	0.870		69.76	617		91.35	808			21		09	Satisfactory
	3	12	11.88	0.871		70.70	625		91.41	808			19		11	Satisfactory

Rashed 31/07/2024
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	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.

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; 25/06/2024
BRTC Ref: 1103-26898/MME/2024-25; 06/07/2024
Sample Condition: Not Sealed
Test Performed by: Dr. Md. Moniruzzaman

31 July 2024
MME 0033/2024-2025



nxnc4u0kc66

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 B600 D-R 16	1	16	15.72	1.524	1.542	125.10	622	631 (91500)	160.17	797	810 (117500)	1.28	23	21	12	Satisfactory
	2	16	15.71	1.521		125.20	623		159.53	793		1.27	21		10	Satisfactory
	3	16	16.01	1.581		130.05	647		168.95	840		1.30	20		9	Satisfactory

Handwritten signature

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, %	±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-E / B400CWR	400	---	1.15	14	7
B500C-E / B500CWR	500	---		10	
B600C-E	600	---		17	
B400DWR	400	1.3 x R_{eH} (min.)	1.25	16	
B420DWR	420			13	
B500DWR	500			10	
B600D-E	600	1.2 x R_{eH} (min.)		10	



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

Client's Ref: Nil; 25/06/2024
BRTC Ref: 1103-26899/MME/2024-25; 06/07/2024
Sample Condition: Not Sealed
Test Performed by: Dr. Md. Moniruzzaman

31 July 2024
MME 0032/2024-2025



qxjhvuq9cee

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 B600 D-R 20	1	20	19.99	2.463	2.467	188.50	600	619 (90000)	248.58	791	806 (117000)	1.32	19	19	13	Satisfactory
	2	20	20.03	2.475		204.60	651		261.27	832		1.28	19		10	Satisfactory
	3	20	19.99	2.463		190.42	606		242.64	795		1.31	20		10	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
	MPa		%	%
	Minimum	Maximum	Minimum	Minimum
B400C-R / B400CWR	400	---	1.15	14
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; 25/06/2024
BRTC Ref: 1103-26900/MME/2024-25; 06/07/2024
Sample Condition: Not Sealed
Test Performed by: Dr. Md. Moniruzzaman

31 July 2024
MME 0034/2024-2025



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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 B600 D-R 25	1	25	24.98	3.846	3.844	318.60	649	650 (94500)	404.26	824	825 (119500)	1.27	18	18	11	Satisfactory
	2	25	24.95	3.839		318.80	649		405.00	825		1.27	20		13	Satisfactory
	3	25	24.98	3.846		319.75	651		405.53	826		1.27	17		14	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	—		10	
B600C-R	600	—		17	
B400DWR	400	1.3 x R _{elt} (min.)	1.25	16	8
B420DWR	420			13	
B500DWE	500			10	
B600D-R	600	1.2 x R _{elt} (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. Tanjidiul Islam
Sr. Manager, Quality Control
GPH Ispat Limited

Client's Ref: Nil; 25/06/2024
BRTC Ref: 1103-26901/MME/2024-25; 06/07/2024
Sample Condition: Not Sealed
Test Performed by: Dr. Md. Moniruzzaman

31 July 2024
MME 0035/2024-2025



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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 B600 D-R 28	1	28	27.84	4.780	4.785	380.50	618	619 (90000)	491.61	798	800 (116000)	1.29	19	18	12	Satisfactory
	2	28	27.87	4.789		381.13	619		493.53	802		1.30	17		10	Satisfactory
	3	28	27.86	4.786		381.55	620		492.39	800		1.29	18		8	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_{eff}		R_{m}/R_{eff}	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_{eff} (min.)	1.25	16	8
B420DWR	420			13	
B500DWR	500			10	
B600D-R	600	1.2 x R_{eff} (min.)		10	



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

Client's Ref: Nil; 25/06/2024
BRTC Ref: 1103-26902/MME/2024-25; 06/07/2024
Sample Condition: Not Sealed
Test Performed by: Dr. Md. Moniruzzaman

31 July 2024
MME 0036/2024-2025



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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 B600 D-R 32	1	32	31.87	6.264	6.275	502.00	624	628 (91000)	648.80	807	808 (117000)	1.29	19	19	10	Satisfactory
	2	32	31.84	6.250		503.85	626		648.98	807		1.29	19		10	Satisfactory
	3	32	31.99	6.310		509.41	633		650.70	809		1.28	18		11	Satisfactory

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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.

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	
B420DWR	420			13	
B500DWR	500			10	
B600D-R	600	1.2 x R_{eH} (min.)		10	