



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

Client's Ref: Nil; 25/12/2024
BRTC Ref: 1103-39796/MME/2024-25; 28/12/2024
Sample Condition: Not Sealed

07 January 2025
MME 0523/2024-2025



d19cwg9c11

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, ReH	Average Upper Yield Strength	Tensile Load	Tensile Strength, Rm	Average Tensile Strength	Rm/ ReH	Elongation after Fracture (G.L. 5d)	Average Elongation after Fracture, A	Elongation at Maximum Force, Agt	Bend Test
		mm	mm	kg/m	kg/m	kN	MPa	MPa (psi)	kN	MPa	MPa (psi)		%	%	%	(Separate Sample)
GPH QUANTUM B600 D-R 10	1	10	9.96	0.612	0.611	50.71	646	642 (93,000)	65.75	837	836 (121,500)	1.30	18	18	9	Satisfactory
	2	10	9.96	0.612		50.23	640		65.96	840		1.31	18		8	Satisfactory
	3	10	9.94	0.609		50.20	639		65.37	832		1.30	17		8	Satisfactory

Test Performed by

Mr. H. M. Mamun Al Rashed
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 Bar Diameter, mm	6	8	10	12	16	20	25	28	32	40
Nominal Mass per Unit Length, kg/m	0.221	0.345	0.617	0.888	1.58	2.47	3.85	4.90	6.31	9.86
Permissible Variation of Nominal Mass per Unit Length, %	+8	+8	+6	+6	+5	+4	+4	+4	+4	+4
Nominal Cross-Sectional Area, mm ²	28.5	50.3	76.3	110	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 _y		R _m /R _y		A _g
	Minimum	Maximum	Minimum	Maximum	Minimum
B400C-E / B500CWE	400	—	1.25	14	7
B500C-E / B500CWE	500	—		10	
B500C-E	500	—		17	
B400CWE	400	1.3 x R _y (mm)	1.25	15	8
B400DWE	400			17	
B500DWE	500			17	
B600D-E	600	1.2 x R _y (mm)	—	18	—

Please Note: The client supplied the sample and the results given hereafter corresponds to the sample tested only. The Department of Materials and Metallurgical Engineering of BUET takes no responsibility regarding the authentication of any of the samples.

020614



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

Client's Ref: Nil; 25/12/2024
BRTC Ref: 1103-39797/MME/2024-25; 28/12/2024
Sample Condition: Not Sealed

07 January 2025
MME 0524/2024-2025



j3yhkukccqq

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, ReH	Average Upper Yield Strength	Tensile Load	Tensile Strength, Rm	Average Tensile Strength	Rm/ ReH	Elongation after Fracture (G.L. 5d)	Average Elongation after Fracture, A	Elongation at Maximum Force, Agt	Bend Test
		mm	mm	kg/m	kg/m	kN	MPa	MPa (psi)	kN	MPa	MPa (psi)		%	%	%	(Separate Sample)
GPH QUANTUM B600 D-R 12	1	12	11.92	0.877	0.874	70.97	628	631 (91,500)	93.49	827	826 (120,000)	1.32	15	16	9	Satisfactory
	2	12	11.91	0.874		72.20	638		93.68	828		1.30	15		8	Satisfactory
	3	12	11.90	0.873		71.01	628		93.13	823		1.31	19		10	Satisfactory

Test Performed by *

Mr. Humayun Kabir
Assistant Professor

Countersigned by

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

Page 1 of 1

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	0.245	0.347	0.498	1.58	2.47	3.83	4.94	6.31	9.86
Possible Variation of Nominal Mass per Unit Length, %	±8	±8	±6	±6	±5	±3	±4	±4	±4	±4
Nominal Cross-Sectional Area, mm ²	28.3	50.3	78.5	113	201	393	491	615	804	1257

Steel Grade	Upper Yield Strength		Tensile Properties		
	R _{yk}		R _m /R _{yk}	A	A _{gt}
	MPa			%	%
	Minimum	Maximum	Minimum	Minimum	Minimum
B40C-R / B40CWR	400	—	1.15	14	7
B50C-R / B50CWR	500	—		16	
B60C-R	600	—		18	
B40CWR-2	400	—	1.25	17	8
B50CWR-2	500	1.2 × R _{yk} (max.)		18	
B60CWR-2	600	1.2 × R _{yk} (max.)		20	

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.

020613

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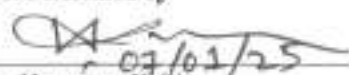
Client : Engr. Md. Tanjiful Islam
Sr. Manager, Quality Control
GPH Ispat LimitedClient's Ref: Nil; 25/12/2024
BRTC Ref: 1103-39798/MME/2024-25; 28/12/2024
Sample Condition: Not Sealed07 January 2025
MME 0525/2024-2025

vdda2u10e33

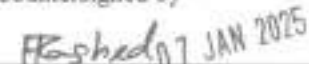
TEST OF DEFORMED M.S. REBAR (Test Method BDS ISO 6935-2 2021)

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, ReH	Average Upper Yield Strength	Tensile Load	Tensile Strength, Rm	Average Tensile Strength	Rm/ ReH	Elongation after Fracture (G.L. 5d)	Average Elongation after Fracture, A	Elongation at Maximum Force, Ag1	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	15.97	1.573	1.574	128.29	638	637 (92,500)	168.21	837	835 (121,000)	1.31	20	20	12	Satisfactory
	2	16	15.98	1.575		127.60	635		167.61	834		1.31	19		13	Satisfactory
	3	16	15.97	1.573		128.32	638		167.98	835		1.31	22		13	Satisfactory

Test Performed by


07/01/25
Mr. Humayun Kabir
Assistant Professor

Countersigned by


07 JAN 2025
Dr. H. M. Mamun Al Rashed
Professor and Head

Page 1 of 1

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

Bar Designation/Nominal/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	0.888	1.58	2.47	3.85	4.84	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	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 _{el} /R _m	A	A _{gt}
	MPa			%	%
BRCR-RL / BRCR-WB	480	—	1.15	14	7
BRCR-RL / BRCR-WB	580	—		16	
BRCR-RL	680	—		17	
BRCR-WB	480	—	1.25	16	8
BRCR-WB	580	1.2 x R _{el} (min.)		17	
BRCR-WB	680	1.2 x R _{el} (min.)		18	

Please Note: The client supplies 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.

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

Client's Ref: Nil; 25/12/2024
BRTC Ref: 1103-39799/MME/2024-25; 28/12/2024
Sample Condition: Not Sealed

07 January 2025
MME 0526/2024-2025



ggxuzuk1cnn

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, ReH	Average Upper Yield Strength	Tensile Load	Tensile Strength, Rm	Average Tensile Strength	Rm/ ReH	Elongation after Fracture (G.L. 5d)	Average Elongation after Fracture, A	Elongation at Maximum Force, Agt	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	19.92	2.447	2.448	198.15	631	630 (91,500)	254.16	809	808 (117,000)	1.28	22	21	9	Satisfactory
	2	20	19.94	2.452		197.94	630		253.85	808		1.28	21		10	Satisfactory
	3	20	19.92	2.447		197.53	629		253.69	808		1.28	20		10	Satisfactory

Test Performed by

07/02/25
Mr. Humayun Kabir
Assistant Professor

Countersigned by

07 JAN 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	28	32	40
Nominal Mass per Unit Length, kg/m	0.222	0.365	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	-8	-8	-5	-5	-5	-5	-5	-5
Nominal Cross-Sectional Area, mm ²	20.1	50.3	78.5	113	201	314	491	616	804	1257

Steel Grade	Upper Yield Strength		Ductility Properties		
	R _{eH}		R _m /R _{eH}	A	A _g
	MPa			%	%
	Minimum	Maximum	Minimum	Minimum	Minimum
B400C-B / B400CBE	400	—	1.15	14	7
B500C-B / B500CBE	500	—		16	
B600C-B	600	—		18	
B400BWB	400	—	1.25	17	8
B500BWB	500	—		18	
B600BWB	600	—		19	
B600D-R	600	—		19	

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

020610

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

Client's Ref: Nil; 25/12/2024
BRTC Ref: 1103-39800/MME/2024-25; 28/12/2024
Sample Condition: Not Sealed

07 January 2025
MME 0527/2024-2025



zweceul4c0x

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, ReH	Average Upper Yield Strength	Tensile Load	Tensile Strength, Rm	Average Tensile Strength	Rm/ ReH	Elongation after Fracture (G.L., 5d)	Average Elongation after Fracture, A	Elongation at Maximum Force, Ag _t	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	24.89	3.818	3.816	314.38	640	641 (93,000)	395.85	806	807 (117,000)	1.26	19	19	9	Satisfactory
	2	25	24.85	3.806		315.80	643		397.27	809		1.26	18		13	Satisfactory
	3	25	24.90	3.823		313.72	639		395.80	806		1.26	20		12	Satisfactory

Test Performed by

Mr. Humayun Kabir
07/01/25

Mr. Humayun Kabir
Assistant Professor

Countersigned by

Dr. H. M. Mamun Al Rashed
07 JAN 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	1.38	2.47	3.85	4.84	6.31	8.86
Permissible Variation of Nominal Mass per Unit Length, %	±5	±6	±6	±6	±5	±5	±4	±4	±4	±4
Nominal Cross-Sectional Area, mm ²	28.3	50.3	78.5	113	201	314	491	616	804	1257

Minimum Tensile Requirements for Steel Rebar (As Per BDS ISO 6935-2 2021 Table 3)

Steel Grade	Upper Yield Strength		Ductility Properties		
	R _y		R _m /R _y	A	A _g
	MPa			%	%
	Minimum	Minimum	Minimum	Minimum	Minimum
B400C-R / B400C-TR	400	—	1.15	14	8
B500C-R / B500C-TR	500	—		16	
B400C-R	400	—		17	
B400D-R	400	1.25 × R _y (min.)	1.25	16	8
B400D-R	400			17	
B500D-R	500			18	
B600D-R	600	1.25 × R _y (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.

020611

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

Client's Ref: Nil; 25/12/2024
BRTC Ref: 1103-39801/MME/2024-25; 28/12/2024
Sample Condition: Not Sealed

07 January 2025
MME 0528/2024-2025



6kjtru12ccl

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, ReH	Average Upper Yield Strength	Tensile Load	Tensile Strength, Rm	Average Tensile Strength	Rm/ Rel	Elongation after Fracture (G.L., 5d)	Average Elongation after Fracture, A	Elongation at Maximum Force, Agf	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	31.99	6.310	6.313	516.13	642	640 (93,000)	651.25	810	809 (117,500)	1.26	15	17	9	Satisfactory
	2	32	31.99	6.308		515.10	640		650.45	809		1.26	19		9	Satisfactory
	3	32	32.02	6.321		512.28	637		649.43	807		1.27	16		8	Satisfactory

Test Performed by :

Mr. Humayun Kabir
Assistant Professor

Countersigned by

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

Page 1 of 1

Bar Designation/Nominal Diameter, mm	6	8	10	12	16	20	25	32	40
Nominal Mass per Unit Length, kg/m	0.222	0.295	0.473	0.688	1.18	2.47	3.80	6.34	10.0
Permissible Variation of Nominal Mass per Unit Length, %	±8	±8	±6	±6	±5	±4	±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 _y		R _y /R _m	A	A _g
	MPa			%	%
	Minimum	Maximum	Minimum	Minimum	Minimum
B400C-B / B100CW8	400	—	1.15	14	7
B500C-B / B100CW8	500	—		16	
B600C-B	600	—		17	
B400CVR	400	1.3 × R _m (min)	0.25	16	8
S420CVR	420			15	
B500CVR	500			17	
B600C-R	600	1.2 × R _m (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 non-identification, if any, of the sample.

020603



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

Client's Ref: Nil; 25/12/2024
BRTC Ref: 1103-39784/MME/2024-25; 28/12/2024
Sample Condition: Not Sealed

07 January 2025
MME 0515/2024-2025



peltzuldce

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, ReH	Average Upper Yield Strength	Tensile Load	Tensile Strength, Rm	Average Tensile Strength	Rm/ ReH	Elongation after Fracture (G.L. 5d)	Average Elongation after Fracture, A	Elongation at Maximum Force, Ag1	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	7.92	0.387	0.387	27.89	555	555 (80500)	36.97	735	736 (106500)	1.32	20	20	13	Satisfactory	Satisfactory
	2	8	7.92	0.386		27.97	556		37.06	737		1.33	20		12	Satisfactory	Satisfactory
	3	8	7.94	0.389		27.88	555		37.07	737		1.33	21		11	Satisfactory	Satisfactory

Test Performed by

Mamun
08/01/2025

Dr. Md. Moniruzzaman
Professor

Countersigned by

Hashed
08 JAN 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	0.223	0.395	0.617	0.888	1.58	2.47	3.87	6.31	9.86
Permissible Variation of Nominal Mass per Unit Length, %	±8	±8	±8	±8	±5	±5	±4	±4	±4
Nominal Cross-Sectional Area, mm ²	20.1	50.1	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 _{yk}		R _{yk} /R _{yk1}	A	A _g
	Minimum	Maximum	Minimum	Maximum	Minimum
B490C-E / D400C/VR	490	—	1.13	14	7
B490C-A / B500C/VR	500	—		10	
B500C-E	500	—		17	
S400DWR	400	1.3 x R _{yk} (min)	1.25	16	8
B430DWR	430			17	
B460DWR	460			18	
B600D-E	600	1.2 x R _{yk} (min)	—	19	—

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

020619

Client : Engr. Md. Tanjidul Islam
Sr. Manager, Quality Control
GPH Ispat LimitedClient's Ref: Nil; 25/12/2024
BRTC Ref: 1103-39785/MME/2024-25; 28/12/2024
Sample Condition: Not Sealed07 January 2025
MME 0516/2024-2025

151fpu54c65

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, ReH	Average Upper Yield Strength	Tensile Load	Tensile Strength, Rm	Average Tensile Strength	Rm/ ReH	Elongation after Fracture (G.L. 5d)	Average Elongation after Fracture, A	Elongation at Maximum Force, Agf	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	0.610	42.54	542	543 (79000)	56.27	716	716 (104000)	1.32	24	23	10	Satisfactory	Satisfactory
	2	10	9.95	0.610		42.94	547		56.33	717		1.31	24		12	Satisfactory	Satisfactory
	3	10	9.94	0.609		42.30	539		56.11	714		1.32	20		11	Satisfactory	Satisfactory

Test Performed by

Dr. Md. Moniruzzaman
Professor

Countersigned by

Dr. H. M. Mamun Al Rashid
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	+3	+4
Nominal Cross-Sectional Area, mm ²	28.3	50.3	78.5	113	201	314	491	615	804	1257

Steel Grade	Upper Yield Strength		Ductility Requirement		
	R _y		R _m /R _y		A _g
	MPa		%		%
	Minimum	Maximum	Minimum	Maximum	Minimum
B400C, B, B1000C, W, B	400	—	1.15	14	7
B500C, B, B1000C, W, B	500	—		18	—
B600C, B	600	—		17	—
B400D, W, B	400	1.3 x R _y (min)	1.25	16	8
B420D, W, B	420			15	
B500D, W, B	500			18	
B600D, B	600	1.3 x R _y (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 misclassification, if any, of any sample.

020618

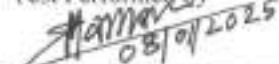
Client : Engr. Md. Tanjidul Islam
Sr. Manager, Quality Control
GPH Ispat LimitedClient's Ref: Nil; 25/12/2024
BRTC Ref: 1103-39787/MME/2024-25; 28/12/2024
Sample Condition: Not Sealed07 January 2025
MME 0517/2024-2025

ewzhgux7cdd

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, ReH	Average Upper Yield Strength	Tensile Load	Tensile Strength, Rm	Average Tensile Strength	Rm/ ReH	Elongation after Fracture (G.L. 5d)	Average Elongation after Fracture, A	Elongation at Maximum Force, Agf	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	63.01	557	555 (80500)	79.97	707	707 (102500)	1.27	23	21	10	Satisfactory	Satisfactory
	2	12	11.92	0.875		63.52	562		80.28	710		1.26	20		13	Satisfactory	Satisfactory
	3	12	11.93	0.877		61.80	546		79.51	703		1.29	20		12	Satisfactory	Satisfactory

Test Performed by


 08/01/2025
 Dr. Md. Moniruzzaman
 Professor

Countersigned by


 08 JAN 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	0.249	0.317	0.398	0.596	0.845	1.02	1.37	1.86
Permissible Variation of Nominal Mass per Unit Length, %	±8	±8	±8	±8	±5	±5	±4	±4	±4
Nominal Cross-Sectional Area, mm ²	28.3	50.3	78.5	110	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 _{eH}		A		A _g
	Minimum	Maximum	Minimum	Minimum	Minimum
B400C-H / B400C-LE	400	—	1.15	14	7
B500C-H / B500C-LE	500	—		—	
B600C-H	600	—		18	
B400DWH	400	1.3 x R _{eH} (min)	1.25	17	8
B500DWH	500			18	
B600DWH	600			18	
B400D-H	400	1.2 x R _{eH} (min)	—	10	—

Please Note: The client supplied the sample and the tensile grip length 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.

020620



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

Client's Ref: Nil; 25/12/2024
BRTC Ref: 1103-39789/MME/2024-25; 28/12/2024
Sample Condition: Not Sealed

07 January 2025
MME 0518/2024-2025



rxlugud0ckk

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, ReH	Average Upper Yield Strength	Tensile Load	Tensile Strength, Rm	Average Tensile Strength	Rm/ ReH	Elongation after Fracture (G.L. 5d)	Average Elongation after Fracture, A	Elongation at Maximum Force, Agt	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	15.98	1.575	1.576	109.27	543	543 (79000)	146.73	730	730 (106000)	1.34	21	22	12	Satisfactory	Satisfactory
	2	16	16.00	1.578		109.44	544		146.98	731		1.34	24		11	Satisfactory	Satisfactory
	3	16	15.98	1.574		108.90	542		146.87	730		1.35	21		13	Satisfactory	Satisfactory

Test Performed by

Mamun
08/01/2025

Dr. Md. Moniruzzaman
Professor

Countersigned by

Hoshel 08 JAN 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	0.260	0.317	0.388	0.580	0.87	1.33	1.98	2.86
Permissible Variation of Nominal Mass per Unit Length, %	±4	±4	±4	±4	±4	±4	±4	±4	±4
Nominal Cross-Sectional Area, mm ²	28.3	50.3	78.5	110	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		Quality Properties		
	R _{yk}		R _{yk} /R _{yk}		A _g
	MPa		%		%
	Minimum	Maximum	Minimum	Minimum	Minimum
B400C-E / B400CWR	400	—	1.15	14	3
B500C-E / B500CWR	500	—		15	
B600C-E	600	—		17	
B400DWR	400	1.3 x R _{yk} (min.)	1.25	16	8
B400DWR	400			13	
B500DWR	500			13	
B600D-E	600	1.2 x R _{yk} (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 for negligence the misidentification, if any, of the sample.

020625



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

Client's Ref: Nil; 25/12/2024
BRTC Ref: 1103-39791/MME/2024-25; 28/12/2024
Sample Condition: Not Sealed

07 January 2025
MME 0519/2024-2025



x61crug6cvv

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

Frog Mark/ Identification	Sample No.	Bar Designation/ Nominal Diameter, ϕ	Actual Diameter	Mass per Unit Length	Average Unit Weight	Upper Yield Load	Upper Yield Strength, ReH	Average Upper Yield Strength	Tensile Load	Tensile Strength, Rm	Average Tensile Strength	Rm/ ReH	Elongation after Fracture (G.L. 5d)	Average Elongation after Fracture, A	Elongation at Maximum Force, Agf	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	19.95	2.453	2.455	173.63	553	553 (80000)	224.37	714	714 (103500)	1.29	25	24	9	Satisfactory	Satisfactory
	2	20	19.95	2.453		173.64	553		224.45	714		1.29	23		13	Satisfactory	Satisfactory
	3	20	19.97	2.458		173.47	552		224.48	715		1.30	25		16	Satisfactory	Satisfactory

Test Performed by

Dr. Md. Moniruzzaman
Professor

Countersigned by

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

Page 1 of 1

Bar Designation (Nominal Bar Diameter, mm)	6	8	10	12	16	20	25	32	40
Nominal Mass per Unit Length, kg/m	0.222	0.295	0.417	0.604	1.18	2.47	3.85	6.34	9.86
Permissible Variation of Nominal Mass per Unit Length, %	±4	±4	±6	±6	±7	±7	±4	±4	±4
Nominal Cross-Sectional Area, mm ²	28.3	50.1	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	Minimum
B500C-E / B500C-WB	400	—	1.15	14	3
B500C-E / B500C-WB	500	—		10	
B500C-E	600	—		17	
B420DWB	400	1.3 x R_{eH} (min.)	1.25	16	8
B420DWB	420			13	
B500DWB	500			17	
B500D-E	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.

020616

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

Client's Ref: Nil; 25/12/2024
BRTC Ref: 1103-39792/MME/2024-25; 28/12/2024
Sample Condition: Not Sealed

07 January 2025
MME 0520/2024-2025



96ga2uzycll

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, ReH	Average Upper Yield Strength	Tensile Load	Tensile Strength, Rm	Average Tensile Strength	Rm/ ReH	Elongation after Fracture (G.L. 5d)	Average Elongation after Fracture, A	Elongation at Maximum Force, Ag1	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	21.96	2.974	2.974	211.18	556	559 (81000)	278.05	731	732 (106000)	1.31	24	23	14	Satisfactory	Satisfactory
	2	22	21.94	2.968		210.65	554		276.78	728		1.31	23		11	Satisfactory	Satisfactory
	3	22	21.99	2.981		215.22	566		280.62	738		1.30	23		13	Satisfactory	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 3)

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	0.617	0.889	1.58	2.47	3.80	6.30	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	28.1	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 Requirement		
	R _y		R _m /R _y	A	A _{g1}
	MPa			%	%
	Minimum	Maximum	Minimum	Minimum	Minimum
B490C-K / B490C-WR	490	—	1.15	14	7
B500C-K / B500C-WR	500	—		—	
B600C-K	600	—		10	
B490DWE	490	—	1.25	17	8
B500DWE-K	500	1.2 x R _m (min)		16	
B500DWE	500	—		13	
B500DWE	500	1.2 x R _m (min)		18	

Please Note: The client supplied the sample and the results given hereon correspond to the sample tested only. The Department of Materials and Metallurgical Engineering of BRTC takes no responsibility regarding the misclassification, if any, of the sample.

020621

Department of MME, Old Academic Building, 1st Floor, BUET, Dhaka 1000

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+880 2 5516 7225-57 Ext 7629

brcmme@mme.buet.ac.bd

Client : Engr. Md. Tanjiful Islam
Sr. Manager, Quality Control
GPH Ispat LimitedClient's Ref: Nil; 25/12/2024
BRTC Ref: 1103-39793/MME/2024-25; 28/12/2024
Sample Condition: Not Sealed07 January 2025
MME 0521/2024-2025

y10i2u3ecll

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

Frog Mark/ Identification	Sample No.	Bar Designation/ Nominal Diameter, d mm	Actual Diameter mm	Mass per Unit Length kg/m	Average Unit Weight kg/m	Upper Yield Load kN	Upper Yield Strength, ReH MPa	Average Upper Yield Strength MPa (psi)	Tensile Load kN	Tensile Strength, Rm MPa	Average Tensile Strength MPa (psi)	Rm/ ReH	Elongation after Fracture (G.L. 5d) %	Average Elongation after Fracture, A %	Elongation at Maximum Force, Ag1 %	Bend Test (Separate Sample)	Rebend Test (Separate Sample)
GPH QUANTUM B500 DWR 25	1	25	24.97	3.844	3.839	264.26	538	536 (77500)	357.36	728	727 (105500)	1.35	20	20	9	Satisfactory	Satisfactory
	2	25	24.96	3.840		262.73	535		356.77	727		1.36	21		9	Satisfactory	Satisfactory
	3	25	24.94	3.834		263.01	536		356.78	727		1.36	20		12	Satisfactory	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/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	3.83	4.84	6.31	9.46
Permissible Variation of Nominal Mass per Unit Length, %	±6	±6	±6	±6	±5	±5	±4	±4	±4	±4
Nominal Cross-Sectional Area, mm ²	28.3	50.3	78.3	113	201	314	491	615	804	1257

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

Steel Grade	Upper Yield Strength		Ductility Properties		
	R _{yk}		R _{yk} /R _{yk}		A _{yk}
	MPa		%		%
	Minimum	Maximum	Minimum	Maximum	Minimum
B400C-B / B400C-W	400	—	1.15	14	7
B500C-B / B500C-W	500	—			
B600C-B	600	—			
B400D-W	400	—	1.25	17	8
B400D-W	475	1.7 × R _{yk} (min.)			
B500D-W	500	—			
B600D-B	600	1.2 × R _{yk} (min.)			

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

020622

Client : Engr. Md. Tanjiful Islam
Sr. Manager, Quality Control
GPH Ispat LimitedClient's Ref: Nil; 25/12/2024
BRTC Ref: 1103-39794/MME/2024-25; 28/12/2024
Sample Condition: Not Sealed07 January 2025
MME 0522/2024-2025

49kseu3vcqq

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, ReH	Average Upper Yield Strength	Tensile Load	Tensile Strength, Rm	Average Tensile Strength	Rm/ ReH	Elongation after Fracture (G.L. 5d)	Average Elongation after Fracture, A	Elongation at Maximum Force, Agf	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 32	1	32	31.91	6.279	6.272	450.60	560	559 (81000)	582.25	724	723 (105000)	1.29	20	21	12	Satisfactory	Satisfactory
	2	32	31.90	6.272		448.83	558		581.10	723		1.30	23		11	Satisfactory	Satisfactory
	3	32	31.87	6.264		450.38	560		581.62	723		1.29	20		13	Satisfactory	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 7)

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	0.617	0.888	1.58	2.47	3.85	6.31	9.86
Permissible Variation of Nominal Mass per Unit Length, %	+6	+6	+6	+6	+5	+5	+4	+2	+4
Nominal Cross-Sectional Area, mm ²	20.1	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 _{yk}		R _{yk} /R _m	A	A _{gt}
	MPa			%	%
	Minimum	Maximum	Minimum	Minimum	Minimum
B40C-E / B40C-WR	400	—	1.15	14	9
B50C-E / B50C-WR	500	—		10	
B60C-E	600	—		17	
B400WR	400	1.2 x R _{yk} (min.)	1.25	16	8
B420WR	420			15	
B500WR	500			10	
B600-E	600	1.2 x R _{yk} (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.

020615



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

Client's Ref: Nil; 25/12/2024
BRTC Ref: 1103-39776/MME/2024-25; 28/12/2024
Sample Condition: Not Sealed

07 January 2025
MME 0509/2024-2025



npva4u0kc66

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, ReH	Average Upper Yield Strength	Tensile Load	Tensile Strength, Rm	Average Tensile Strength	Rm/ ReH	Elongation after Fracture (G.L. 5d)	Average Elongation after Fracture, A	Elongation at Maximum Force, Agf	Bend Test	Rebend Test
		mm	mm	kg/m	kg/m	kN	MPa	MPa (psi)	kN	MPa	MPa (psi)		%	%	%	(Separate Sample)	(Separate Sample)
GPH B420 DWR 10	1	10	9.97	0.613	0.612	35.29	449	448 (65,000)	50.94	649	648 (94,000)	1.45	28	26	17	Satisfactory	Satisfactory
	2	10	9.96	0.612		35.12	447		50.92	648		1.45	24		17	Satisfactory	Satisfactory
	3	10	9.96	0.612		35.20	448		50.80	647		1.44	25		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 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	±8	±6	±5	±5	±4	±8	±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}		A		A _g
	MPa		%		%
	Minimum	Maximum	Minimum	Maximum	Minimum
B500C-B / B500C-BK	400	—	1.15	14	T
B500C-B / B500C-BK	500	—		16	
B500C-B	600	—		18	
B500D-BK	400	1.2 x R _{eH} (Min)	1.25	17	F
B420D-BK	420			18	
B500D-BK	500			19	
B600D-BK	600	1.2 x R _{eH} (Min)		18	

Please Note: The client supplies 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.

020604



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

Client's Ref: Nil; 25/12/2024
BRTC Ref: 1103-39777/MME/2024-25; 28/12/2024
Sample Condition: Not Sealed

07 January 2025
MME 0510/2024-2025



2r4sku40cjj

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

Forg Mark/ Identification	Sample No.	Bar Designation/ Nominal Diameter, d mm	Actual Diameter mm	Mass per Unit Length kg/m	Average Unit Weight kg/m	Upper Yield Load kN	Upper Yield Strength, ReH MPa	Average Upper Yield Strength MPa (psi)	Tensile Load kN	Tensile Strength, Rm MPa	Average Tensile Strength MPa (psi)	Rm/ ReH	Elongation after Fracture (G.L. Sd) %	Average Elongation after Fracture, A %	Elongation at Maximum Force, Agf %	Bend Test (Separate Sample)	Rebend Test (Separate Sample)
GPH B420 DWR 12	1	12	11.95	0.880	0.881	51.23	453	454 (66,000)	73.18	647	648 (94,000)	1.43	25	24	15	Satisfactory	Satisfactory
	2	12	11.96	0.882		51.35	454		73.34	648		1.43	22		20	Satisfactory	Satisfactory
	3	12	11.95	0.880		51.32	454		73.28	648		1.43	26		14	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 4955-2 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	0.245	0.367	0.598	1.16	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 6)

Steel Grade	Upper Yield Strength		Ductility Properties		
	R _y		R _u /R _y	A	A _g
	Minimum	Minimum	Minimum	Minimum	Minimum
B400C-R / B400CWR	400	—	1.15	14	8
B500C-R / B500CWR	500	—		10	
B600C-R	600	—		10	
B400DWR	400	1.2 x R _u (max.)	1.25	17	8
B420DWR	420			16	
B500DWR	500			15	
B600D-R	600	1.2 x R _u (max.)	—	10	—

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

020605



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

Client's Ref: Nil; 25/12/2024
BRTC Ref: 1103-39778/MME/2024-25; 28/12/2024
Sample Condition: Not Sealed

07 January 2025
MME 0511/2024-2025



3xdj7udec66

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, ReH	Average Upper Yield Strength	Tensile Load	Tensile Strength, Rm	Average Tensile Strength	Rm/ ReH	Elongation after Fracture (G.L. 5d)	Average Elongation after Fracture, A	Elongation at Maximum Force, Agf	Bend Test (Separate Sample)	Rebend Test (Separate Sample)
		mm	mm	kg/m	kg/m	kN	MPa	MPa (psi)	kN	MPa	MPa (psi)		%	%	%		
GPH B420 DWR 16	1	16	15.98	1.574	1.574	95.04	473	469 (68,000)	137.11	682	680 (98,500)	1.44	24	24	12	Satisfactory	Satisfactory
	2	16	15.97	1.572		94.41	470		136.84	681		1.45	25			Satisfactory	Satisfactory
	3	16	15.99	1.576		93.45	465		136.25	678		1.46	23			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

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	0.355	0.617	0.888	1.58	2.47	3.85	4.84	6.31	9.86
Permissible Variation of Nominal Mass per Unit Length, %	+8	+8	+6	+5	+5	+5	+4	+4	+4	+4
Nominal Cross-Sectional Area, mm ²	28.3	50.3	78.5	113	201	314	491	616	804	1257

Steel Grade	Upper Yield Strength		Tensile Properties		
	R _y		R _m /R _y	A	A _{gt}
	Minimum	Maximum	Minimum	Minimum	Minimum
B400C, B, I, B400C/WB	400	—	1.13	14	7
B500C, B, I, B500C/WB	500	—		16	
B500C, B, I	500	—		16	
B400C/WB	400	—	1.25	17	8
B500C/WB	500	1.2 × R _y (min)		18	
B500C/WB	500	1.2 × R _y (min)		18	
B500C, B	500	1.2 × R _y (min)	—	18	—

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

020606



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

Client's Ref: Nil; 25/12/2024
BRTC Ref: 1103-39779/MME/2024-25; 28/12/2024
Sample Condition: Not Sealed

07 January 2025
MME 0512/2024-2025



7dkf3uevcpp

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, ReH	Average Upper Yield Strength	Tensile Load	Tensile Strength, Rm	Average Tensile Strength	Rm/ ReH	Elongation after Fracture (G.L. 5d)	Average Elongation after Fracture, A	Elongation at Maximum Force, Agf	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	19.97	2.458	2.457	146.62	467	466 (67,500)	204.12	650	649 (94,000)	1.39	23	24	16	Satisfactory	Satisfactory
	2	20	19.97	2.460		146.10	465		203.78	649		1.40	22		18	Satisfactory	Satisfactory
	3	20	19.95	2.455		146.56	467		204.01	649		1.39	27		15	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

Bar Designation/Nominal Bar Diameter, mm	6	8	10	12	16	20	25	32	40
Nominal Mass per Unit Length, kg/m	0.222	0.295	0.617	0.888	1.58	2.47	3.85	4.84	9.31
Permissible Variation of Nominal Mass per Unit Length, %	±8	±8	±6	±6	±5	±5	±4	±4	±4
Nominal Cross-Sectional Area, mm ²	28.5	50.3	78.5	113	201	314	491	616	804

Steel Grade	Upper Yield Strength		Ductility Properties		
	ReH		Rm/Rm	A	Agf
	MPa		%	%	%
	Minimum	Maximum	Minimum	Minimum	Minimum
B400C-H / B400C-E	400	—	1.13	14	8
B500C-H / B500C-E	500	—		16	
B500C-E	500	—		18	
B400D-E	400	—	1.25	17	8
E350D-E	350	1.2 x R _{yk} (min)		16	
B500D-E	500	—		17	
B600D-E	600	1.2 x R _{yk} (min)		18	

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

020607

Client : Engr. Md. Tanjidul Islam
Sr. Manager, Quality Control
GPH Ispat LimitedClient's Ref: Nil; 25/12/2024
BRTC Ref: 1103-39781/MME/2024-25; 28/12/2024
Sample Condition: Not Sealed07 January 2025
MME 0513/2024-2025

5ywulu9wccg

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, ReH	Average Upper Yield Strength	Tensile Load	Tensile Strength, Rm	Average Tensile Strength	Rm/ ReH	Elongation after Fracture (G.L. 5d)	Average Elongation after Fracture, A	Elongation at Maximum Force, Ag	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	24.99	3.851	3.846	225.58	460	455 (66,000)	319.59	651	651 (94,500)	1.42	26	26	15	Satisfactory	Satisfactory
	2	25	24.93	3.839		218.39	443		319.87	652		1.47	25		19	Satisfactory	Satisfactory
	3	25	24.98	3.849		225.20	459		319.53	651		1.42	26		19	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	0.223	0.395	0.617	0.889	1.58	2.43	3.53	5.34	8.36
Permissible Variation of Nominal Mass per Unit Length, %	+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	804	1257

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

Steel Grade	Upper Yield Strength		Density Properties		
	R_{yk}	R_{yk}/R_m	A_g	A_{g1}	A_{g2}
	Minimum	Minimum	Minimum	Minimum	Minimum
B420C-E / B420C-WR	420	—	1.10	14	7
B500C-E / B500C-WR	500	—		16	
B420C-E	420	—		17	
B420DWR	420	1.3 x R_{yk} (min.)	1.25	16	8
B420EWR	420	1.3 x R_{yk} (min.)		17	
B500D-E	500	1.3 x R_{yk} (min.)		18	
B420D-E	420	1.2 x R_{yk} (min.)		16	

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

020608



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

Client's Ref: Nil; 25/12/2024
BRTC Ref: 1103-39782/MME/2024-25; 28/12/2024
Sample Condition: Not Sealed

07 January 2025
MME 0514/2024-2025



k7etquy/c00

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, ReH	Average Upper Yield Strength	Tensile Load	Tensile Strength, Rm	Average Tensile Strength	Rm/ ReH	Elongation after Fracture (G.L. 5d)	Average Elongation after Fracture, A	Elongation at Maximum Force, Agf	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	31.98	6.305	6.269	367.92	457	460 (66,500)	517.23	643	644 (93,500)	1.41	26	26	18	Satisfactory	Satisfactory
	2	32	31.94	6.290		372.63	463		519.91	646		1.40	26		18	Satisfactory	Satisfactory
	3	32	31.74	6.212		369.60	460		518.16	644		1.40	25		15	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

Bar Designation/Nominal Bar Diameter, mm	6	8	10	12	16	20	25	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
Permissible Variation of Nominal Mass per Unit Length, %	±8	±8	±8	±8	±5	±5	±4	±4	±4
Nominal Cross-Sectional Area, mm ²	28.3	50.3	78.5	111	201	314	491	616	1257

Steel Grade	Upper Yield Strength		Ductility Requirement		
	R _y		R _m /R _y	A	A _g
	MPa			%	%
	Minimum	Maximum	Minimum	Minimum	Minimum
B420C, B / B420C, B	480	—	1.15	14	1
B420C, B / B420C, B	500	—		14	1
B420C, B	600	—		14	1
B420D, B	450	—	1.25	17	1
B420D, B	475	1.3 x R _y (min)		17	1
B420D, B	500	1.3 x R _y (min)		17	1
B420D, B	550	1.3 x R _y (min)	1.25	17	1
B420D, B	600	1.3 x R _y (min)	1.25	17	1

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 recertification, if any, of the sample.

020609

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