



# BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY (BUET)

## DEPARTMENT OF CIVIL ENGINEERING

Mobile: 01819557964; PABX: (8802) - 55167100, 55167228-57 Ext. 7226, Info: <http://brtc.ce.buet.ac.bd/#/home>, Report verification: <http://verify.ce.buet.ac.bd>

### STRENGTH OF MATERIALS LABORATORY

19 (i) of 19



#### TEST OF DEFORMED M.S. BARS [BDS ISO 6935-2:2021]

Sent by: Engr. Md. Tanjidul Islam, Sr. Manager, Quality Control

GPH Ispat Limited.

Project: -----

BRTC No.: 1103-75236/CE/25-26; Dt. 2/3/2026

Ref.: Letter; Dt. 1/3/2026

Date of Test: 10/3/2026

Samples were received in UNSEALED condition.

Sl. No.	Frog Mark / Identification	Nominal dia.	Actual dia.	Mass Per Unit Length	Average Mass Per Unit Length	Yield or Proof Load	Yield or Proof Strength	Average Yield Strength	Tensile Load	Tensile Strength	Average Tensile Strength	$R_m/R_{eH}$	Total Elongation (%)	Average Total Elongation (%)	Bend Test	Rebend Test
		mm	mm	kg/m	kg/m	kN	$R_{eH}$ MPa	$R_{eH}$ MPa	kN	MPa	$R_m$ MPa		(gauge length = 5d)	(%)		
1	GPH QUANTUM B600 D-R	10	9.9	0.608	0.608	51.4	650	650	66.1	835	835	1.28	24	22	-	-
2	GPH QUANTUM B600 D-R	10	9.9	0.608		51.4	650		65.7	830			20		-	-
3	GPH QUANTUM B600 D-R	10	9.9	0.607		51.4	650		65.7	830			22		-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Conversion factor: 1.0 MPa = 1.0 N/mm<sup>2</sup> = 145 psi. Strengths are based on nominal area.

BDS ISO 6935-2:2021 Weight Requirements, Nominal Area etc. (Table 2)

Nominal bar dia., mm	6	8	10	12	14	16	20	22*	25	28	32	40	50
Nominal cross sectional area, sq.mm	28.3	50.3	78.5	113	154	201	314	380	491	616	804	1267	1964
Nominal mass per unit length	Nominal, kg/m	0.222	0.395	0.616	0.887	1.21	1.58	2.46	2.98	3.85	4.84	6.31	9.87
	Permissible deviation, %	±8	±8	±8	±6	±5	±5	±5	±5	±4	±4	±4	±4

\*22mm dia. bar is not covered in BDS ISO 6935-2:2021. Its properties are derived following the principle used for other bar sizes. Actual diameter of bars are shown for informative purpose only. It is not a requirement of BDS ISO 6935-2:2021. Actual diameter is the diameter of a perfectly round plain bar having same mass per unit length.

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11 March 2026

Test performed by:

Dr. Md. Jahangir Alam

Professor, Dept. of Civil Engg., BUET

Countersigned by:

Prof. Dr. Bashir Ahmed, Test-in-Charge

Dept. of Civil Engg., BUET.

BDS ISO 6935-2:2021 Tensile Requirements for Common Steel Grades (Table 6)

Ductility Class	Steel Grade	Yield Strength, $R_{eH}$ , MPa		$R_m/R_{eH}$	Ductility Properties	
		Min.	Max.		Elongation, % (min.)	
C	B400C-R	400	--	1.15	14	7
	B400CWR	400	--	1.15	14	7
	B500C-R	500	--	1.15	14	7
	B500CWR	500	--	1.15	14	7
	B600C-R	600	--	1.15	10	7
	B450CWR	450	1.25 $R_{eH}$ (min.)	1.15	--	7.5
D	B400D-R	400	1.30 $R_{eH}$ (min.)	1.25	17	8
	B400DWR	400	1.30 $R_{eH}$ (min.)	1.25	17	8
	B420DWR	420	1.30 $R_{eH}$ (min.)	1.25	16	8
	B500D-R	500	1.25 $R_{eH}$ (min.)	1.25	13	8
	B500DWR	500	1.30 $R_{eH}$ (min.)	1.25	13	8
	B600D-R	600	1.20 $R_{eH}$ (min.)	1.25	10	8

$R_m$  = Tensile (ultimate) strength, MPa.

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1	GPH QUANTUM B600 D-R	12	12.0	0.887	0.886	72.8	645	640	91.6	810	810	1.27	25	26	-	-
2	GPH QUANTUM B600 D-R	12	12.0	0.884		72.4	640		91.2	805			25			
3	GPH QUANTUM B600 D-R	12	12.0	0.887		72.4	640		91.6	810			27			
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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Conversion factor: 1.0 MPa = 1.0 N/mm<sup>2</sup> = 145 psi. Strengths are based on nominal area.

BDS ISO 6935-2:2021 Weight Requirements, Nominal Area etc. (Table 2).

Nominal bar dia., mm	6	8	10	12	14	16	20	22*	25	28	32	40	50
Nominal cross sectional area, sq.mm	28.3	50.3	78.5	113	154	201	314	380	491	616	804	1257	1964
Nominal mass per unit length	0.222	0.395	0.616	0.887	1.21	1.58	2.45	2.98	3.85	4.84	6.31	9.87	15.42
Permissible deviation, %	±8	±8	±6	±6	±5	±5	±5	±5	±4	±4	±4	±4	±4

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BDS ISO 6935-2:2021 Tensile Requirements for Common Steel Grades (Table 6)

Ductility Class	Steel Grade	Yield Strength, $R_{eH}$ , MPa			Ductility Properties	
		Min.	Max.	$R_m/R_{eH}$ min.	Elongation, % (min.)	
C	B400C-R	400	--	1.15	14	7
	B400CWR	400	--	1.15	14	7
	B500C-R	500	--	1.15	14	7
	B500CWR	500	--	1.15	14	7
	B600C-R	600	--	1.15	10	7
	B450CWR	450	1.25 $R_{eH}$ (min.)	1.15	--	7.5
D	B400D-R	400	1.30 $R_{eH}$ (min.)	1.25	17	8
	B400DWR	400	1.30 $R_{eH}$ (min.)	1.25	17	8
	B420DWR	420	1.30 $R_{eH}$ (min.)	1.25	16	8
	B500D-R	500	1.25 $R_{eH}$ (min.)	1.25	13	8
	B500DWR	500	1.30 $R_{eH}$ (min.)	1.25	13	8
	B600D-R	600	1.20 $R_{eH}$ (min.)	1.25	10	8

$R_m$  = Tensile (ultimate) strength, MPa.



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11 March 2026



Countersigned by:  
Prof. Dr. Bashir Ahmed, Test-in-Charge  
Dept. of Civil Engg., BUET.

Test performed by:  
Dr. Md. Jahangir Alam  
Professor, Dept. of Civil Engg., BUET

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GPH Ispat Limited.

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		mm	mm	kg/m	kg/m	kN	$R_{eH}$ MPa	$R_{eH}$ MPa	kN	MPa	MPa	MPa	(gauge length = 5d)	(%)	-	-
1	GPH QUANTUM B600 D-R	16	16.0	1.585	1.574	125	620	625	164	815	825	1.32	16	16	-	-
2	GPH QUANTUM B600 D-R	16	16.0	1.570		127	630		166	825			15			
3	GPH QUANTUM B600 D-R	16	15.9	1.567		127	630		166	825			16			
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Ductility Class	Steel Grade	Yield Strength, $R_{eH}$ , MPa			Ductility Properties	
		Min.	Max.	$R_m/R_{eH}$ min.	Elongation, % (min.)	
					Total	At $R_m$
C	B400C-R	400	--	1.15	14	7
	B400CWR	400	--	1.15	14	7
	B500C-R	500	--	1.15	14	7
	B500CWR	500	--	1.15	14	7
	B600C-R	600	--	1.15	10	7
	B450CWR	450	1.25 $R_{eH}$ (min.)	1.15	--	7.5
D	B400D-R	400	1.30 $R_{eH}$ (min.)	1.25	17	8
	B400DWR	400	1.30 $R_{eH}$ (min.)	1.25	17	8
	B420DWR	420	1.30 $R_{eH}$ (min.)	1.25	16	8
	B500D-R	500	1.25 $R_{eH}$ (min.)	1.25	13	8
	B500DWR	500	1.30 $R_{eH}$ (min.)	1.25	13	8
	B600D-R	600	1.20 $R_{eH}$ (min.)	1.25	10	8

$R_m$  = Tensile (ultimate) strength, MPa.



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Test performed by: Dr. Md. Jahangir Alam Professor, Dept. of Civil Engg., BUET

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		mm	mm	kg/m	kg/m	kN	MPa	MPa	kN	MPa	MPa					
1	GPH QUANTUM B600 D-R	20	20.0	2.470	2.460	201	640	635	254	810	805	1.27	20	20	-	-
2	GPH QUANTUM B600 D-R	20	20.0	2.462		200	635		253	805			20		-	-
3	GPH QUANTUM B600 D-R	20	19.9	2.448		200	635		254	810			21		-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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	B500C-R	500	--	1.15	14	7	
	B500CWR	500	--	1.15	14	7	
	B600C-R	600	--	1.15	10	7	
	B450CWR	450	1.25 $R_{eH}$ (min.)	1.15	--	7.5	
D	B400D-R	400	1.30 $R_{eH}$ (min.)	1.25	17	8	
	B400DWR	400	1.30 $R_{eH}$ (min.)	1.25	17	8	
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	B600D-R	600	1.20 $R_{eH}$ (min.)	1.25	10	8	

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1	GPH QUANTUM B600 D-R	25	25.0	3.849	3.843	312	635	635	398	810	805	1.27	20	19	-	-
2	GPH QUANTUM B600 D-R	25	25.0	3.849		311	635		397	810			19		-	-
3	GPH QUANTUM B600 D-R	25	24.9	3.832		311	635		395	805			19		-	-
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Conversion factor: 1.0 MPa = 1.0 N/mm<sup>2</sup> = 145 psi. Strengths are based on nominal area.

BDS ISO 6935-2:2021 Weight Requirements, Nominal Area etc. (Table 2)

Nominal bar dia., mm	6	8	10	12	14	16	20	22*	25	28	32	40	50
Nominal cross sectional area, sq.mm	28.3	50.3	78.5	113	154	201	314	380	491	616	804	1257	1964
Nominal mass per unit length	0.222	0.395	0.616	0.887	1.21	1.58	2.46	2.99	3.85	4.84	6.31	9.87	15.42
Permissible deviation, %	±8	±8	±6	±6	±5	±5	±5	±5	±4	±4	±4	±4	±4

\*22mm dia. bar is not covered in BDS ISO 6935-2:2021. Its properties are derived following the principle used for other bar sizes. Actual diameter of bars are shown for informative purpose only. It is not a requirement of BDS ISO 6935-2:2021. Actual diameter is the diameter of a perfectly round plain bar having same mass per unit length.

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11 March 2026

Test performed by: Dr. Md. Jahangir Alam Professor, Dept. of Civil Engg., BUET

Countersigned by: Prof. Dr. Bashir Ahmed, Test-in-Charge Dept. of Civil Engg., BUET.

BDS ISO 6935-2:2021 Tensile Requirements for Common Steel Grades (Table 6)

Ductility Class	Steel Grade	Yield Strength, $R_{eH}$ , MPa			Ductility Properties	
		Min.	Max.	$R_m/R_{eH}$ min.	Elongation, % (min.)	
					Total	At $R_m$
C	B400C-R	400	--	1.15	14	7
	B400CWR	400	--	1.15	14	7
	B500C-R	500	--	1.15	14	7
	B500CWR	500	--	1.15	14	7
	B600C-R	600	--	1.15	16	7
	B450CWR	450	1.25 $R_{eH}$ (min.)	1.15	--	7.5
D	B400D-R	400	1.30 $R_{eH}$ (min.)	1.25	17	8
	B400DWR	400	1.30 $R_{eH}$ (min.)	1.25	17	8
	B420DWR	420	1.30 $R_{eH}$ (min.)	1.25	16	8
	B500D-R	500	1.25 $R_{eH}$ (min.)	1.25	13	8
	B500DWR	500	1.30 $R_{eH}$ (min.)	1.25	13	8
	B600D-R	600	1.20 $R_{eH}$ (min.)	1.25	10	8

$R_m$  = Tensile (ultimate) strength, MPa.



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# BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY (BUET)

## DEPARTMENT OF CIVIL ENGINEERING

Mobile: 01819557964; PABX: (8802) - 55167100, 55167228-57 Ext. 7226, Info: <http://brtc.ce.buet.ac.bd/#/home>, Report verification: <http://verify.ce.buet.ac.bd>

### STRENGTH OF MATERIALS LABORATORY

14 (i) of 19



#### TEST OF DEFORMED M.S. BARS [BDS ISO 6935-2:2021]

Sent by: Engr. Md. Tanjidul Islam, Sr. Manager, Quality Control

GPH Ispat Limited.

Project: -----

BRTC No.: 1103-75236/CE/25-26; Dt. 2/3/2026

Ref.: Letter; Dt. 1/3/2026

Date of Test: 10/3/2026

Samples were received in UNSEALED condition.

Sl. No.	Frog Mark / Identification	Nominal dia.	Actual dia.	Mass Per Unit Length	Average Mass Per Unit Length	Yield or Proof Load	Yield or Proof Strength	Average Yield Strength	Tensile Load	Tensile Strength	Average Tensile Strength	$R_{m}/R_{eH}$	Total Elongation (%)	Average Total Elongation (%)	Bend Test	Rebend Test
		mm	mm	kg/m	kg/m	kN	MPa	MPa	kN	MPa	MPa		(gauge length = 5d)			
1	GPH QUANTUM B600 D-R	32	32.0	6.331	6.326	505	630	630	645	805	800	1.27	18	18	-	-
2	GPH QUANTUM B600 D-R	32	32.1	6.341		507	630		645	805			18		-	
3	GPH QUANTUM B600 D-R	32	32.0	6.307		506	630		643	800			18		-	
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Conversion factor: 1.0 MPa = 1.0 N/mm<sup>2</sup> = 145 psi. Strengths are based on nominal area.

BDS ISO 6935-2:2021 Weight Requirements, Nominal Area etc. (Table 2)

Nominal bar dia., mm	6	8	10	12	14	16	20	22*	25	28	32	40	50
Nominal cross sectional area, sq.mm	28.3	50.3	78.5	113	154	201	314	380	491	616	804	1257	1964
Nominal mass per unit length	0.222	0.395	0.616	0.887	1.21	1.58	2.46	2.98	3.85	4.84	6.31	9.87	15.42
Permissible deviation, %	±8	±8	±6	±6	±5	±5	±5	±5	±4	±4	±4	±4	±4

\*22mm dia. bar is not covered in BDS ISO 6935-2:2021. Its properties are derived following the principle used for other bar sizes. Actual diameter of bars are shown for informative purpose only. It is not a requirement of BDS ISO 6935-2:2021. Actual diameter is the diameter of a perfectly round plain bar having same mass per unit length.

BDS ISO 6935-2:2021 Tensile Requirements for Common Steel Grades (Table 6)

Ductility Class	Steel Grade	Yield Strength, $R_{eH}$ , MPa		$R_m/R_{eH}$ min.	Ductility Properties	
		Min.	Max.		Elongation, % (min.)	
					Total	At $R_m$
C	B400C-R	400	--	1.15	14	7
	B400CWR	400	--	1.15	14	7
	B500C-R	500	--	1.15	14	7
	B500CWR	500	--	1.15	14	7
	B600C-R	600	--	1.15	10	7
	B450CWR	450	1.25 $R_{eH}$ (min.)	1.15	--	7.5
D	B400D-R	400	1.30 $R_{eH}$ (min.)	1.25	17	8
	B400DWR	400	1.30 $R_{eH}$ (min.)	1.25	17	8
	B420DWR	420	1.30 $R_{eH}$ (min.)	1.25	16	8
	B500D-R	500	1.25 $R_{eH}$ (min.)	1.25	13	8
	B500DWR	500	1.30 $R_{eH}$ (min.)	1.25	13	8
	B600D-R	600	1.20 $R_{eH}$ (min.)	1.25	10	8

$R_m$  = Tensile (ultimate) strength, MPa.

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11 March 2026

Test performed by:

Dr. Md. Jahangir Alam

Professor, Dept. of Civil Engg., BUET

Countersigned by:

Prof. Dr. Bashir Ahmed, Test-in-Charge

Dept. of Civil Engg., BUET.

**Important Note:** Samples as supplied to us have been tested. BRTC does not have any responsibility as to the representative character of the samples required to be tested. It is recommended that the samples are sent in a secure and sealed cover/packet/container under the signature of a competent authority. In order to avoid fraudulent fabrication of test results, this report has been printed on a security paper. It is also recommended that the test results be collected by a duly authorized person.

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# BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY (BUET)

## DEPARTMENT OF CIVIL ENGINEERING

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### STRENGTH OF MATERIALS LABORATORY

13 (i) of 19



#### TEST OF DEFORMED M.S. BARS [BDS ISO 6935-2:2021]

Sent by: Engr. Md. Tanjidul Islam, Sr. Manager, Quality Control

GPH Ispat Limited.

Project: -----

BRTC No.: 1103-75236/CE/25-26; Dt. 2/3/2026

Ref.: Letter; Dt. 1/3/2026

Date of Test: 4/3/2026

Samples were received in UNSEALED condition.

Sl. No.	Frog Mark / Identification	Nominal dia.	Actual dia.	Mass Per Unit Length	Average Mass Per Unit Length	Yield or Proof Load	Yield or Proof Strength	Average Yield Strength	Tensile Load	Tensile Strength	Average Tensile Strength	$R_m/R_{eH}$	Total Elongation (%)	Average Total Elongation (%)	Bend Test	Rebend Test
		mm	mm	kg/m	kg/m	kN	MPa	MPa	kN	MPa	MPa		(gauge length = 5d)	(%)		
1	GPH B500 DWR	8	8.0	0.394	0.393	26.8	535	535	34.9	695	695	1.30	28	26	-	-
2	GPH B500 DWR	8	8.0	0.393		26.8	535		34.9	695			25		-	-
3	GPH B500 DWR	8	8.0	0.392		26.8	535		34.9	695			25		-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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Conversion factor: 1.0 MPa = 1.0 N/mm<sup>2</sup> = 145 psi. Strengths are based on nominal area.

BDS ISO 6935-2:2021 Weight Requirements, Nominal Area etc. (Table 2)

Nominal bar dia., mm	6	8	10	12	14	16	20	22*	25	28	32	40	50
Nominal cross sectional area, sq.mm	28.3	50.3	78.5	113	154	201	314	380	491	616	804	1257	1964
Nominal mass per unit length	0.222	0.395	0.616	0.887	1.21	1.58	2.46	2.98	3.85	4.84	6.31	9.87	15.42
Permissible deviation, %	±8	±8	±6	±6	±5	±5	±5	±5	±4	±4	±4	±4	±4

\*22mm dia. bar is not covered in BDS ISO 6935-2:2021. Its properties are derived following the principle used for other bar sizes. Actual diameter of bars are shown for informative purpose only. It is not a requirement of BDS ISO 6935-2:2021. Actual diameter is the diameter of a perfectly round plain bar having same mass per unit length.

BDS ISO 6935-2:2021 Tensile Requirements for Common Steel Grades (Table 6)

Ductility Class	Steel Grade	Yield Strength, $R_{eH}$ , MPa			Ductility Properties	
		Min.	Max.	$R_m/R_{eH}$ min.	Elongation, % (min.)	
					Total	At $R_m$
C	B400C-R	400	--	1.15	14	7
	B400CWR	400	--	1.15	14	7
	B500C-R	500	--	1.15	14	7
	B500CWR	500	--	1.15	14	7
	B600C-R	600	--	1.15	10	7
	B450CWR	450	1.25 $R_{eH}$ (min.)	1.15	--	7.5
D	B400D-R	400	1.30 $R_{eH}$ (min.)	1.25	17	8
	B400DWR	400	1.30 $R_{eH}$ (min.)	1.25	17	8
	B420DWR	420	1.30 $R_{eH}$ (min.)	1.25	16	8
	B500D-R	500	1.25 $R_{eH}$ (min.)	1.25	13	8
	B500DWR	500	1.30 $R_{eH}$ (min.)	1.25	13	8
	B600D-R	600	1.20 $R_{eH}$ (min.)	1.25	10	8

$R_m$  = Tensile (ultimate) strength, MPa.

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11 March 2026

Test performed by: Dr. Md. Jahangir Alam Professor, Dept. of Civil Engg., BUET

Countersigned by: Prof. Dr. Bashir Ahmed, Test-in-Charge Dept. of Civil Engg., BUET.

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## DEPARTMENT OF CIVIL ENGINEERING

Mobile: 01819557964; PABX: (8802) - 55167100, 55167228-57 Ext. 7226, Info: <http://brtc.ce.buet.ac.bd/#/home>, Report verification: <http://verify.ce.buet.ac.bd>

### STRENGTH OF MATERIALS LABORATORY

12 (i) of 19



#### TEST OF DEFORMED M.S. BARS [BDS ISO 6935-2:2021]

Sent by: Engr. Md. Tanjidul Islam, Sr. Manager, Quality Control

GPH Ispat Limited.

Project: -----

BRTC No.: 1103-75236/CE/25-26; Dt. 2/3/2026

Ref.: Letter; Dt. 1/3/2026

Date of Test: 4/3/2026

Samples were received in UNSEALED condition.

Sl. No.	Frog Mark / Identification	Nominal dia.	Actual dia.	Mass Per Unit Length	Average Mass Per Unit Length	Yield or Proof Load	Yield or Proof Strength	Average Yield Strength	Tensile Load	Tensile Strength	Average Tensile Strength	$R_m/R_{eH}$	Total Elongation (%)	Average Total Elongation (%)	Bend Test	Rebend Test
		mm	mm	kg/m	kg/m	kN	MPa	MPa	kN	MPa	MPa	MPa	(gauge length = 5d)	(%)	-	-
1	GPH QUANTUM B500 DWR	10	10.0	0.615	0.614	43.1	545	550	54.2	685	695	1.26	30	29	-	-
2	GPH QUANTUM B500 DWR	10	10.0	0.615		44.1	560		55.3	700			30		-	-
3	GPH QUANTUM B500 DWR	10	10.0	0.613		43.1	545		55.3	700			28		-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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Conversion factor: 1.0 MPa = 1.0 N/mm<sup>2</sup> = 145 psi. Strengths are based on nominal area.

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Nominal bar dia., mm	6	8	10	12	14	16	20	22*	25	28	32	40	50
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Permissible deviation, %	±8	±8	±6	±6	±5	±5	±5	±5	±4	±4	±4	±4	±4

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Ductility Class	Steel Grade	Yield Strength, $R_{eH}$ , MPa			Ductility Properties	
		Min.	Max.	$R_m/R_{eH}$ min.	Elongation, % (min.)	
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C	B400C-R	400	--	1.15	14	7
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	B500C-R	500	--	1.15	14	7
	B500CWR	500	--	1.15	14	7
	B600C-R	600	--	1.15	10	7
	B450CWR	450	1.25 $R_{eH}$ (min.)	1.15	--	7.5
D	B400D-R	400	1.30 $R_{eH}$ (min.)	1.25	17	8
	B400DWR	400	1.30 $R_{eH}$ (min.)	1.25	17	8
	B420DWR	420	1.30 $R_{eH}$ (min.)	1.25	16	8
	B500D-R	500	1.25 $R_{eH}$ (min.)	1.25	13	8
	B500DWR	500	1.30 $R_{eH}$ (min.)	1.25	13	8
	B600D-R	600	1.20 $R_{eH}$ (min.)	1.25	10	8

$R_m$  = Tensile (ultimate) strength, MPa.

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11 March 2026

Test performed by: Dr. Md. Jahangir Alam Professor, Dept. of Civil Engg., BUET

Countersigned by: Prof. Dr. Bashir Ahmed, Test-in-Charge Dept. of Civil Engg., BUET.

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# BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY (BUET)

## DEPARTMENT OF CIVIL ENGINEERING

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### STRENGTH OF MATERIALS LABORATORY



#### TEST OF DEFORMED M.S. BARS [BDS ISO 6935-2:2021]

Sent by: Engr. Md. Tanjidul Islam, Sr. Manager, Quality Control

GPH Ispat Limited.

Project: -----

BRTC No.: 1103-75236/CE/25-26; Dt. 2/3/2026

Ref.: Letter; Dt. 1/3/2026

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		mm	mm	kg/m	kg/m	kN	MPa	MPa	kN	MPa	MPa					
1	GPH QUANTUM B500 DWR	12	12.0	0.889	0.890	60.3	535	535	78.6	695	700	1.31	27	26	-	-
2	GPH QUANTUM B500 DWR	12	12.0	0.892		61.3	545		79.6	705			25		-	-
3	GPH QUANTUM B500 DWR	12	12.0	0.890		60.3	535		79.6	705			25		-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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BDS ISO 6935-2:2021 Weight Requirements, Nominal Area etc. (Table 2).

Nominal bar dia., mm	6	8	10	12	14	16	20	22*	25	28	32	40	50
Nominal cross sectional area, sq.mm	28.3	50.3	78.5	113	154	201	314	380	491	616	804	1257	1964
Nominal mass per unit length	0.222	0.395	0.616	0.887	1.21	1.58	2.46	2.98	3.85	4.84	6.31	9.87	15.42
Permissible deviation, %	±8	±8	±6	±6	±5	±5	±5	±5	±4	±4	±4	±4	±4

\*22mm dia. bar is not covered in BDS ISO 6935-2:2021. Its properties are derived following the principle used for other bar sizes.  
Actual diameter of bars are shown for informative purpose only. It is not a requirement of BDS ISO 6935-2:2021.  
Actual diameter is the diameter of a perfectly round plain bar having same mass per unit length.

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11 March 2026

Countersigned by:  
Prof. Dr. Bashir Ahmed, Test-in-Charge  
Dept. of Civil Engg., BUET.

Test performed by:  
Dr. Md. Jahangir Alam  
Professor, Dept. of Civil Engg., BUET

BDS ISO 6935-2:2021 Tensile Requirements for Common Steel Grades (Table 6)

Ductility Class	Steel Grade	Yield Strength, $R_{eH}$ , MPa		$R_m/R_{eH}$ min.	Ductility Properties	
		Min.	Max.		Elongation, % (min.)	
					Total	At $R_m$
C	B400C-R	400	--	1.15	14	7
	B400CWR	400	--	1.15	14	7
	B500C-R	500	--	1.15	14	7
	B500CWR	500	--	1.15	14	7
	B600C-R	600	--	1.15	10	7
	B450CWR	450	1.25 $R_{eH}$ (min.)	--	1.15	--
D	B400D-R	400	1.30 $R_{eH}$ (min.)	1.25	17	8
	B400DWR	400	1.30 $R_{eH}$ (min.)	1.25	17	8
	B420DWR	420	1.30 $R_{eH}$ (min.)	1.25	16	8
	B500D-R	500	1.25 $R_{eH}$ (min.)	1.25	13	8
	B500DWR	500	1.30 $R_{eH}$ (min.)	1.25	13	8
	B600D-R	600	1.20 $R_{eH}$ (min.)	1.25	10	8

$R_m$  = Tensile (ultimate) strength, MPa.

**Important Note:** Samples as supplied to us have been tested. BRTC does not have any responsibility as to the representative character of the samples required to be tested. It is recommended that the samples are sent in a secure and sealed cover/packet/container under the signature of a competent authority. In order to avoid fraudulent fabrication of test results, this report has been printed on a security paper. It is also recommended that the test results be collected by a duly authorized person.

BUETCE 06 2 1556





# BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY (BUET)

## DEPARTMENT OF CIVIL ENGINEERING

Mobile: 01819557964; PABX: (8802) - 55167100, 55167228-57 Ext. 7226, Info: <http://brtc.ce.buet.ac.bd/#/home>, Report verification: <http://verify.ce.buet.ac.bd>



### STRENGTH OF MATERIALS LABORATORY

#### TEST OF DEFORMED M.S. BARS [BDS ISO 6935-2:2021]

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

Project: -----

BRTC No.: 1103-75236/CE/25-26; Dt. 2/3/2026

Ref.: Letter; Dt. 1/3/2026

Date of Test: 3/3/2026

Samples were received in UNSEALED condition.

Sl. No.	Frog Mark / Identification	Nominal dia. mm	Actual dia. mm	Mass Per Unit Length kg/m	Average Mass Per Unit Length kg/m	Yield or Proof Load kN	Yield or Proof Strength $R_{eH}$ MPa	Average Yield Strength, $R_{eH}$ MPa	Tensile Load kN	Tensile Strength $R_m$ MPa	Average Tensile Strength, $R_m$ MPa	$R_m/R_{eH}$	Total Elongation (%) (gauge length = 5d)	Average Total Elongation (%)	Bend Test	Rebend Test
2	GPH QUANTUM B500 DWR	16	15.9	1.568	112	555	140	700	18	-	-					
3	GPH QUANTUM B500 DWR	16	15.9	1.562	109	540	139	695	16	-	-					
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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Conversion factor: 1.0 MPa = 1.0 N/mm<sup>2</sup> = 145 psi. Strengths are based on nominal area.

BDS ISO 6935-2:2021 Weight Requirements, Nominal Area etc. (Table 2)

Nominal bar dia., mm	6	8	10	12	14	16	20	22*	25	28	32	40	50
Nominal cross sectional area, sq.mm	28.3	50.3	78.5	113	154	201	314	380	491	616	804	1257	1964
Nominal mass per unit length	0.222	0.395	0.616	0.887	1.21	1.58	2.46	2.88	3.85	4.84	6.31	9.87	15.42
Permissible deviation, %	±8	±8	±6	±6	±5	±5	±5	±5	±4	±4	±4	±4	±4

\*22mm dia. bar is not covered in BDS ISO 6935-2:2021. Its properties are derived following the principle used for other bar sizes.  
Actual diameter of bars are shown for informative purpose only. It is not a requirement of BDS ISO 6935-2:2021.  
Actual diameter is the diameter of a perfectly round plain bar having same mass per unit length.

BDS ISO 6935-2:2021 Tensile Requirements for Common Steel Grades (Table 6)

Ductility Class	Steel Grade	Yield Strength, $R_{eH}$ , MPa			Ductility Properties	
		Min.	Max.	$R_m/R_{eH}$ min.	Total Elongation, % (min.)	At $R_m$
C	B400C-R	400	--	1.15	14	7
	B400CWR	400	--	1.15	14	7
	B500C-R	500	--	1.15	14	7
	B500CWR	500	--	1.15	14	7
	B600C-R	600	--	1.15	10	7
	B450CWR	450	1.25 $R_{eH}$ (min.)	1.15	--	7.5
D	B400D-R	400	1.30 $R_{eH}$ (min.)	1.25	17	8
	B400DWR	400	1.30 $R_{eH}$ (min.)	1.25	17	8
	B420DWR	420	1.30 $R_{eH}$ (min.)	1.25	16	8
	B500D-R	500	1.25 $R_{eH}$ (min.)	1.25	13	8
	B500DWR	500	1.30 $R_{eH}$ (min.)	1.25	13	8
	B600D-R	600	1.20 $R_{eH}$ (min.)	1.25	10	8

$R_m$  = Tensile (ultimate) strength, MPa.



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11 March 2026



Countersigned by:  
Prof. Dr. Bashir Ahmed, Test-in-Charge  
Dept. of Civil Engg., BUET.

Test performed by:  
Dr. Md. Jahangir Alam  
Professor, Dept. of Civil Engg., BUET

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BUETCE 0521553



# BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY (BUET)

## DEPARTMENT OF CIVIL ENGINEERING

Mobile: 01819557964; PABX: (8802) - 55167100, 55167228-57 Ext. 7226, Info: <http://brtc.ce.buet.ac.bd/#/home>, Report verification: <http://verify.ce.buet.ac.bd>



### STRENGTH OF MATERIALS LABORATORY

#### TEST OF DEFORMED M.S. BARS [BDS ISO 6935-2:2021]

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

Project: -----

BRTC No.: 1103-75236/CE/25-26; Dt. 2/3/2026

Ref.: Letter; Dt. 1/3/2026

Date of Test: 3/3/2026

Samples were received in UNSEALED condition.

Sl. No.	Frog Mark / Identification	Nominal dia. mm	Actual dia. mm	Mass Per Unit Length kg/m	Average Mass Per Unit Length kg/m	Yield or Proof Load kN	Yield or Proof Strength $R_{eH}$ MPa	Average Yield Strength, $R_{eH}$ MPa	Tensile Load kN	Tensile Strength $R_m$ MPa	Average Tensile Strength, $R_m$ MPa	$R_m/R_{eH}$	Total Elongation (%) (gauge length = 5d)	Average Total Elongation (%)	Bend Test	Rebend Test
1	GPH QUANTUM B500 DWR	20	20.0	2.471	2.471	171	545	545	222	710	705	1.29	23	22	-	-
2	GPH QUANTUM B500 DWR	20	20.0	2.469		171	545		222	710						
3	GPH QUANTUM B500 DWR	20	20.0	2.473		170	540		221	705						
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Conversion factor: 1.0 MPa = 1.0 N/mm<sup>2</sup> = 145 psi. Strengths are based on nominal area.

BDS ISO 6935-2:2021 Weight Requirements, Nominal Area etc. (Table 2).

Nominal bar dia., mm	6	8	10	12	14	16	20	22*	25	28	32	40	50
Nominal cross sectional area, sq.mm	28.3	50.3	78.5	113	154	201	314	380	491	616	804	1257	1964
Nominal mass per unit length	0.222	0.395	0.616	0.887	1.21	1.58	2.46	2.98	3.85	4.84	6.31	9.87	15.42
Permissible deviation, %	±8	±8	±6	±6	±5	±5	±5	±5	±4	±4	±4	±4	±4

\*22mm dia. bar is not covered in BDS ISO 6935-2:2021. Its properties are derived following the principle used for other bar sizes.  
Actual diameter of bars are shown for informative purpose only. It is not a requirement of BDS ISO 6935-2:2021.  
Actual diameter is the diameter of a perfectly round plain bar having same mass per unit length.

BDS ISO 6935-2:2021 Tensile Requirements for Common Steel Grades (Table 6)

Ductility Class	Steel Grade	Yield Strength, $R_{eH}$ , MPa			Ductility Properties	
		Min.	Max.	$R_m/R_{eH}$ min.	Elongation, % (min.)	
					Total	At $R_m$
C	B400C-R	400	--	1.15	14	7
	B400CWR	400	--	1.15	14	7
	B500C-R	500	--	1.15	14	7
	B500CWR	500	--	1.15	14	7
	B600C-R	600	--	1.15	10	7
	B450CWR	450	1.25 $R_{eH}$ (min.)	1.15	--	7.5
D	B400D-R	400	1.30 $R_{eH}$ (min.)	1.25	17	8
	B400DWR	400	1.30 $R_{eH}$ (min.)	1.25	17	8
	B420DWR	420	1.30 $R_{eH}$ (min.)	1.25	16	8
	B500D-R	500	1.25 $R_{eH}$ (min.)	1.25	13	8
	B500DWR	500	1.30 $R_{eH}$ (min.)	1.25	13	8
	B600D-R	600	1.20 $R_{eH}$ (min.)	1.25	10	8

$R_m$  = Tensile (ultimate) strength, MPa.

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11 March 2026



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Countersigned by:  
Prof. Dr. Bashir Ahmed, Test-in-Charge  
Dept. of Civil Engg., BUET.

Test performed by:  
Dr. Md. Jahangir Alam  
Professor, Dept. of Civil Engg., BUET

**Important Note:** Samples as supplied to us have been tested. BRTC does not have any responsibility as to the representative character of the samples required to be tested. It is recommended that the samples are sent in a secure and sealed cover/packet/container under the signature of a competent authority. In order to avoid fraudulent fabrication of test results, this report has been printed on a security paper. It is also recommended that the test results be collected by a duly authorized person.



# BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY (BUET)

## DEPARTMENT OF CIVIL ENGINEERING

Mobile: 01819557964; PABX: (8802) - 55167100, 55167228-57 Ext. 7226, Info: <http://brtc.ce.buet.ac.bd/#/home>, Report verification: <http://verify.ce.buet.ac.bd>

### STRENGTH OF MATERIALS LABORATORY

8 (i) of 19



#### TEST OF DEFORMED M.S. BARS [BDS ISO 6935-2:2021]

Sent by: Engr. Md. Tanjidul Islam, Sr. Manager, Quality Control

GPH Ispat Limited.

Project: -----

BRTC No.: 1103-75236/CE/25-26; Dt. 2/3/2026

Ref.: Letter; Dt. 1/3/2026

Date of Test: 3/3/2026

Samples were received in UNSEALED condition.

Sl. No.	Frog Mark / Identification	Nominal dia.	Actual dia.	Mass Per Unit Length	Average Mass Per Unit Length	Yield or Proof Load	Yield or Proof Strength	Average Yield Strength	Tensile Load	Tensile Strength	Average Tensile Strength	$R_m/R_{eH}$	Total Elongation (%)	Average Total Elongation (%)	Bend Test	Rebend Test
		mm	mm	kg/m	kg/m	kN	MPa	MPa	kN	MPa	MPa		(gauge length = 5d)	(%)		
1	GPH QUANTUM B500 DWR	25	25.0	3.859	3.862	275	560	560	365	745	745	1.33	21	21	-	-
2	GPH QUANTUM B500 DWR	25	25.0	3.859		276	565		364	740			21		-	-
3	GPH QUANTUM B500 DWR	25	25.1	3.869		275	560		364	740			22		-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Conversion factor: 1.0 MPa = 1.0 N/mm<sup>2</sup> = 145 psi. Strengths are based on nominal area.

BDS ISO 6935-2:2021 Weight Requirements, Nominal Area etc. (Table 2).

Nominal bar dia., mm	6	8	10	12	14	16	20	22*	25	28	32	40	50
Nominal cross sectional area, sq.mm	28.3	50.3	78.5	113	154	201	314	380	491	616	804	1257	1964
Nominal mass per unit length	0.222	0.395	0.616	0.887	1.21	1.58	2.46	2.98	3.85	4.84	6.31	9.87	15.42
Permissible deviation, %	±0	±0	±6	±6	±5	±5	±5	±5	±4	±4	±4	±4	±4

\*22mm dia. bar is not covered in BDS ISO 6935-2:2021. Its properties are derived following the principle used for other bar sizes.  
Actual diameter of bars are shown for Informative purpose only. It is not a requirement of BDS ISO 6935-2:2021.  
Actual diameter is the diameter of a perfectly round plain bar having same mass per unit length.

Authenticity of this page is Verifiable from <http://verify.ce.buet.ac.bd> with the QR Code or ID

11 March 2026

Test performed by:  
Dr. Md. Jahangir Alam  
Professor, Dept. of Civil Engg., BUET



BDS ISO 6935-2:2021 Tensile Requirements for Common Steel Grades (Table B)

Ductility Class	Steel Grade	Yield Strength, $R_{eH}$ , MPa		$R_m/R_{eH}$ min.	Ductility Properties	
		Min.	Max.		Elongation, % (min.)	
					Total	At $R_m$
C	B400C-R	400	--	1.15	14	7
	B400CWR	400	--	1.15	14	7
	B500C-R	500	--	1.15	14	7
	B500CWR	500	--	1.15	14	7
	B600C-R	600	--	1.15	10	7
	B450CWR	450	1.25 $R_{eH}$ (min.)	1.15	--	7.5
D	B400D-R	400	1.30 $R_{eH}$ (min.)	1.25	17	8
	B400DWR	400	1.30 $R_{eH}$ (min.)	1.25	17	8
	B420DWR	420	1.30 $R_{eH}$ (min.)	1.25	16	8
	B500D-R	500	1.25 $R_{eH}$ (min.)	1.25	13	8
	B500DWR	500	1.30 $R_{eH}$ (min.)	1.25	13	8
	B600D-R	600	1.20 $R_{eH}$ (min.)	1.25	10	8

$R_m$  = Tensile (ultimate) strength, MPa.

Countersigned by:  
Prof. Dr. Bashir Ahmed, Test-in-Charge  
Dept. of Civil Engg., BUET.

**Important Note:** Samples as supplied to us have been tested. BRTC does not have any responsibility as to the representative character of the samples required to be tested. It is recommended that the samples are sent in a secure and sealed cover/packet/container under the signature of a competent authority. In order to avoid fraudulent fabrication of test results, this report has been printed on a security paper. It is also recommended that the test results be collected by a duly authorized person.

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# BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY (BUET)

## DEPARTMENT OF CIVIL ENGINEERING

Mobile: 01819557964; PABX: (8802) - 55167100, 55167228-57 Ext. 7226, Info: <http://brtc.ce.buet.ac.bd/#/home>, Report verification: <http://verify.ce.buet.ac.bd>

### STRENGTH OF MATERIALS LABORATORY

6 (i) of 19



#### TEST OF DEFORMED M.S. BARS [BDS ISO 6935-2:2021]

Sent by: Engr. Md. Tanjidul Islam, Sr. Manager, Quality Control  
GPH Ispat Limited.  
Project: -----

BRTC No.: 1103-75236/CE/25-26; Dt. 2/3/2026

Ref.: Letter; Dt. 1/3/2026  
Date of Test: 7/3/2026

Samples were received in UNSEALED condition.

Sl. No.	Frog Mark / Identification	Nominal dia.	Actual dia.	Mass Per Unit Length	Average Mass Per Unit Length	Yield or Proof Load	Yield or Proof Strength	Average Yield Strength	Tensile Load	Tensile Strength	Average Tensile Strength	$R_m/R_{eH}$	Total Elongation (%)	Average Total Elongation (%)	Bend Test	Rebend Test
		mm	mm	kg/m	kg/m	kN	MPa	MPa	kN	MPa	MPa	(gauge length = 5d)	(%)	-	-	
1	GPH B420 DWR	10	10.0	0.613	0.613	35.7	453	449	50.5	640	635	1.41	22	23	-	-
2	GPH B420 DWR	10	10.0	0.615		35.3	447		50	635			24		-	-
3	GPH B420 DWR	10	10.0	0.612		35.3	447		50.5	640			22		-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Conversion factor: 1.0 MPa = 1.0 N/mm<sup>2</sup> = 145 psi. Strengths are based on nominal area.

BDS ISO 6935-2:2021 Weight Requirements, Nominal Area etc. (Table 2)

Nominal bar dia., mm	6	8	10	12	14	16	20	22*	25	28	32	40	50
Nominal cross sectional area, sq.mm	28.3	50.3	78.5	113	154	201	314	380	491	616	804	1257	1964
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Permissible deviation, %	±8	±8	±6	±6	±5	±5	±5	±5	±4	±4	±4	±4	±4

\*22mm dia. bar is not covered in BDS ISO 6935-2:2021. Its properties are derived following the principle used for other bar sizes.  
Actual diameter of bars are shown for informative purpose only. It is not a requirement of BDS ISO 6935-2:2021.  
Actual diameter is the diameter of a perfectly round plain bar having same mass per unit length.

BDS ISO 6935-2:2021 Tensile Requirements for Common Steel Grades (Table 6)

Ductility Class	Steel Grade	Yield Strength, $R_{eH}$ , MPa		$R_m/R_{eH}$ min.	Ductility Properties	
		Min.	Max.		Elongation, % (min.)	
					Total	At $R_m$
C	B400C-R	400	--	1.15	14	7
	B400CWR	400	--	1.15	14	7
	B500C-R	500	--	1.15	14	7
	B500CWR	500	--	1.15	14	7
	B600C-R	600	--	1.15	10	7
	B450CWR	450	1.25 $R_{eH}$ (min.)	1.15	--	7.5
D	B400D-R	400	1.30 $R_{eH}$ (min.)	1.25	17	8
	B400DWR	400	1.30 $R_{eH}$ (min.)	1.25	17	8
	B420DWR	420	1.30 $R_{eH}$ (min.)	1.25	16	8
	B500D-R	500	1.25 $R_{eH}$ (min.)	1.25	13	8
	B500DWR	500	1.30 $R_{eH}$ (min.)	1.25	13	8
	B600D-R	600	1.20 $R_{eH}$ (min.)	1.25	10	8

$R_m$  = Tensile (ultimate) strength, MPa.



M7HtAHbnP

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11 March 2026

Test performed by:  
Dr. Md. Jahangir Alam  
Professor, Dept. of Civil Engg., BUET

Countersigned by:  
Prof. Dr. Bashir Ahmed, Test-in-Charge  
Dept. of Civil Engg., BUET.

**Important Note:** Samples as supplied to us have been tested. BRTC does not have any responsibility as to the representative character of the samples required to be tested. It is recommended that the samples are sent in a secure and sealed cover/packet/container under the signature of a competent authority. In order to avoid fraudulent fabrication of test results, this report has been printed on a security paper. It is also recommended that the test results be collected by a duly authorized person.

BUETCE 06 25 254

# BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY (BUET)

## DEPARTMENT OF CIVIL ENGINEERING

Mobile: 01819557964; PABX: (8802) - 55167100, 55167228-57 Ext. 7226, Info: <http://brtc.ce.buet.ac.bd/#/home>, Report verification: <http://verify.ce.buet.ac.bd>

### STRENGTH OF MATERIALS LABORATORY



#### TEST OF DEFORMED M.S. BARS [BDS ISO 6935-2:2021]

Sent by: Engr. Md. Tanjidul Islam, Sr. Manager, Quality Control  
GPH Ispat Limited.  
Project: -----

BRTC No.: 1103-75236/CE/25-26; Dt. 2/3/2026

Ref.: Letter; Dt. 1/3/2026

Date of Test: 7/3/2026

Samples were received in UNSEALED condition.

Sl. No.	Frog Mark / Identification	Nominal dia.	Actual dia.	Mass Per Unit Length	Average Mass Per Unit Length	Yield or Proof Load	Yield or Proof Strength	Average Yield Strength	Tensile Load	Tensile Strength	Average Tensile Strength	$R_m/R_{eH}$	Total Elongation (%)	Average Total Elongation (%)	Bend Test	Rebend Test	
		mm	mm	kg/m	kg/m	kN	MPa	MPa	kN	MPa	MPa		(gauge length = 5d)				
1	GPH B420 DWR	12	12.0	0.885	0.884	52.3	463	464	73.7	655	655	1.41	25	25	-	-	
2	GPH B420 DWR	12	12.0	0.864		52.7	467		74.6	660			-		-	-	-
3	GPH B420 DWR	12	12.0	0.883		52.3	463		73.7	655			-		-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
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Conversion factor: 1.0 MPa = 1.0 N/mm<sup>2</sup> = 145 psi. Strengths are based on nominal area.

BDS ISO 6935-2:2021 Weight Requirements, Nominal Area etc. (Table 2).

Nominal bar dia., mm	6	8	10	12	14	16	20	22*	25	28	32	40	50
Nominal cross sectional area, sq.mm	28.3	50.3	78.5	113	154	201	314	380	491	616	804	1257	1964
Nominal mass per unit length	0.222	0.395	0.616	0.887	1.21	1.58	2.46	2.99	3.85	4.84	6.31	9.87	15.42
Permissible deviation, %	±0	±8	±6	±6	±5	±5	±5	±5	±4	±4	±4	±4	±4

\*22mm dia. bar is not covered in BDS ISO 6935-2:2021. Its properties are derived following the principle used for other bar sizes.  
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Actual diameter is the diameter of a perfectly round plain bar having same mass per unit length.

BDS ISO 6935-2:2021 Tensile Requirements for Common Steel Grades (Table 6)

Ductility Class	Steel Grade	Yield Strength, $R_{eH}$ , MPa			Ductility Properties	
		Min.	Max.	$R_m/R_{eH}$ min.	Elongation, % (min.)	
					Total	At $R_m$
C	B400C-R	400	--	1.15	14	7
	B400CWR	400	--	1.15	14	7
	B500C-R	500	--	1.15	14	7
	B500CWR	500	--	1.15	14	7
	B600C-R	600	--	1.15	10	7
	B450CWR	450	1.25 $R_{eH}$ (min.)	1.15	--	7.5
D	B400D-R	400	1.30 $R_{eH}$ (min.)	1.25	17	8
	B400DWR	400	1.30 $R_{eH}$ (min.)	1.25	17	8
	B420DWR	420	1.30 $R_{eH}$ (min.)	1.25	16	8
	B500D-R	500	1.25 $R_{eH}$ (min.)	1.25	13	8
	B500DWR	500	1.30 $R_{eH}$ (min.)	1.25	13	8
	B600D-R	600	1.20 $R_{eH}$ (min.)	1.25	10	8

$R_m$  = Tensile (ultimate) strength, MPa.

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11 March 2026

Countersigned by:  
Prof. Dr. Bashir Ahmed, Test-in-Charge  
Dept. of Civil Engg., BUET.

Test performed by:  
Dr. Md. Jahangir Alam  
Professor, Dept. of Civil Engg., BUET



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BUETCE 06 2 15 3 B



# BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY (BUET)

## DEPARTMENT OF CIVIL ENGINEERING

Mobile: 01819557964; PABX: (8802) - 55167100, 55167228-57 Ext. 7226, Info: <http://brtc.ce.buet.ac.bd/#/home>, Report verification: <http://verify.ce.buet.ac.bd>

### STRENGTH OF MATERIALS LABORATORY

4 (i) of 19



#### TEST OF DEFORMED M.S. BARS [BDS ISO 6935-2:2021]

Sent by: Engr. Md. Tanjidul Islam, Sr. Manager, Quality Control

GPH Ispat Limited.

Project: -----

BRTC No.: 1103-75236/CE/25-26; Dt. 2/3/2026

Ref.: Letter; Dt. 1/3/2026

Date of Test: 7/3/2026

Samples were received in UNSEALED condition.

Sl. No.	Frog Mark / Identification	Nominal dia.	Actual dia.	Mass Per Unit Length	Average Mass Per Unit Length	Yield or Proof Load	Yield or Proof Strength	Average Yield Strength	Tensile Load	Tensile Strength	Average Tensile Strength	$R_m/R_{eH}$	Total Elongation (%)	Average Total Elongation (%)	Bend Test	Rebend Test
		mm	mm	kg/m	kg/m	kN	MPa	MPa	kN	MPa	MPa		(gauge length = 5d)	(%)		
1	GPH B420 DWR	16	16.0	1.574	1.571	94.1	468	463	133	665	665	1.44	20	20	-	-
2	GPH B420 DWR	16	16.0	1.569		93.1	463		133	665						
3	GPH B420 DWR	16	16.0	1.569		92.1	458		133	660						
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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Conversion factor: 1.0 MPa = 1.0 N/mm<sup>2</sup> = 145 psi. Strengths are based on nominal area.

BDS ISO 6935-2:2021 Weight Requirements, Nominal Area etc. (Table 2).

Nominal bar dia., mm	6	8	10	12	14	16	20	22*	25	28	32	40	50
Nominal cross sectional area, sq.mm	28.3	50.3	78.5	113	154	201	314	380	491	616	804	1257	1964
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Permissible deviation, %	±8	±8	±6	±6	±5	±5	±5	±5	±4	±4	±4	±4	±4

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BDS ISO 6935-2:2021 Tensile Requirements for Common Steel Grades (Table 6)

Ductility Class	Steel Grade	Yield Strength, $R_{eH}$ , MPa			Ductility Properties	
		Min.	Max.	$R_m/R_{eH}$ min.	Elongation, % (min.)	
					Total	At $R_m$
C	B400C-R	400	--	1.15	14	7
	B400CWR	400	--	1.15	14	7
	B500C-R	500	--	1.15	14	7
	B500CWR	500	--	1.15	14	7
	B600C-R	600	--	1.15	10	7
	B450CWR	450	1.25 $R_{eH}$ (min.)	1.15	--	7.5
D	B400D-R	400	1.30 $R_{eH}$ (min.)	1.25	17	8
	B400DWR	400	1.30 $R_{eH}$ (min.)	1.25	17	8
	B420DWR	420	1.30 $R_{eH}$ (min.)	1.25	16	8
	B500D-R	500	1.25 $R_{eH}$ (min.)	1.25	13	8
	B500DWR	500	1.30 $R_{eH}$ (min.)	1.25	13	8
	B600D-R	600	1.20 $R_{eH}$ (min.)	1.25	10	8

$R_m$  = Tensile (ultimate) strength, MPa.



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11 March 2026

Countersigned by:  
Prof. Dr. Bashir Ahmed, Test-in-Charge  
Dept. of Civil Engg., BUET.

Test performed by:  
Dr. Md. Jahangir Alam  
Professor, Dept. of Civil Engg., BUET



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## DEPARTMENT OF CIVIL ENGINEERING

Mobile: 01819557964; PABX: (8802) - 55167100, 55167228-57 Ext. 7226, Info: <http://brtc.ce.buet.ac.bd/#/home>, Report verification: <http://verify.ce.buet.ac.bd>

### STRENGTH OF MATERIALS LABORATORY



#### TEST OF DEFORMED M.S. BARS [BDS ISO 6935-2:2021]

Sent by: Engr. Md. Tanjidul Islam, Sr. Manager, Quality Control

GPH Ispat Limited.

Project: -----

BRTC No.: 1103-75236/CE/25-26; Dt. 2/3/2026

Ref.: Letter; Dt. 1/3/2026

Date of Test: 7/3/2026

Samples were received in UNSEALED condition.

Sl. No.	Frog Mark / Identification	Nominal dia.	Actual dia.	Mass Per Unit Length	Average Mass Per Unit Length	Yield or Proof Load	Yield or Proof Strength	Average Yield Strength	Tensile Load	Tensile Strength	Average Tensile Strength	$R_m/R_{eH}$	Total Elongation (%)	Average Total Elongation (%)	Bend Test	Rebend Test	
		mm	mm	kg/m	kg/m	kN	MPa	MPa	kN	MPa	MPa		(gauge length = 5d)	(%)			
1	GPH B420 DWR	20	20.0	2.463	2.463	151	482	482	208	665	665	1.38	26	25	-	-	
2	GPH B420 DWR	20	20.0	2.464		151	482		208	665			-		-	-	-
3	GPH B420 DWR	20	20.0	2.461		151	482		208	665			-		-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
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Conversion factor: 1.0 MPa = 1.0 N/mm<sup>2</sup> = 145 psi. Strengths are based on nominal area.

BDS ISO 6935-2:2021 Weight Requirements, Nominal Area etc. (Table 2).

Nominal bar dia., mm	6	8	10	12	14	16	20	22*	25	28	32	40	50
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BDS ISO 6935-2:2021 Tensile Requirements for Common Steel Grades (Table 6)

Ductility Class	Steel Grade	Yield Strength, $R_{eH}$ , MPa			Ductility Properties	
		Min.	Max.	$R_m/R_{eH}$ min.	Elongation, % (min.)	
					Total	At $R_m$
C	B400C-R	400	--	1.15	14	7
	B400CWR	400	--	1.15	14	7
	B500C-R	500	--	1.15	14	7
	B500CWR	500	--	1.15	14	7
	B600C-R	600	--	1.15	10	7
	B450CWR	450	1.25 $R_{eH}$ (min.)	1.15	--	7.5
D	B400D-R	400	1.30 $R_{eH}$ (min.)	1.25	17	8
	B400DWR	400	1.30 $R_{eH}$ (min.)	1.25	17	8
	B420DWR	420	1.30 $R_{eH}$ (min.)	1.25	16	8
	B500D-R	500	1.25 $R_{eH}$ (min.)	1.25	13	8
	B500DWR	500	1.30 $R_{eH}$ (min.)	1.25	13	8
	B600D-R	600	1.20 $R_{eH}$ (min.)	1.25	10	8

$R_m$  = Tensile (ultimate) strength, MPa



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*(Signature)*

11 March 2026



Countersigned by:  
Prof. Dr. Bashir Ahmed, Test-in-Charge  
Dept. of Civil Engg., BUET.

Test performed by:  
Dr. Md. Jahangir Alam  
Professor, Dept. of Civil Engg., BUET

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# BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY (BUET)

## DEPARTMENT OF CIVIL ENGINEERING

Mobile: 01819557964; PABX: (8802) - 55167100, 55167228-57 Ext. 7226, Info: <http://brtc.ce.buet.ac.bd/#/home>, Report verification: <http://verify.ce.buet.ac.bd>

### STRENGTH OF MATERIALS LABORATORY

2 (i) of 19



#### TEST OF DEFORMED M.S. BARS [BDS ISO 6935-2:2021]

Sent by: Engr. Md. Tanjiful Islam, Sr. Manager, Quality Control

GPH Ispat Limited.

Project: -----

BRTC No.: 1103-75236/CE/25-26; Dt. 2/3/2026

Ref.: Letter; Dt. 1/3/2026

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Sl. No.	Frog Mark / Identification	Nominal dia.	Actual dia.	Mass Per Unit Length	Average Mass Per Unit Length	Yield or Proof Load	Yield or Proof Strength $R_{eH}$	Average Yield Strength $R_{eH}$	Tensile Load	Tensile Strength $R_m$	Average Tensile Strength $R_m$	$R_m/R_{eH}$	Total Elongation (%) (gauge length = 5d)	Average Total Elongation (%)	Bend Test	Rebend Test
		mm	mm	kg/m	kg/m	kN	MPa	MPa	kN	MPa	MPa					
1	GPH B420 DWR	25	25.0	3.840	3.840	233	475	475	323	655	655	1.38	26	26	-	-
2	GPH B420 DWR	25	25.0	3.844		232	473		322	655			26		-	-
3	GPH B420 DWR	25	24.9	3.837		234	477		323	655			25		-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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		Min.	Max.	$R_m/R_{eH}$ min.	Elongation, % (min.)	
					Total	At $R_m$
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	B400CWR	400	--	1.15	14	7
	B500C-R	500	--	1.15	14	7
	B500CWR	500	--	1.15	14	7
	B600C-R	600	--	1.15	10	7
	B450CWR	450	1.25 $R_{eH}$ (min.)	1.15	--	7.5
D	B400D-R	400	1.30 $R_{eH}$ (min.)	1.25	17	8
	B400DWR	400	1.30 $R_{eH}$ (min.)	1.25	17	8
	B420DWR	420	1.30 $R_{eH}$ (min.)	1.25	16	8
	B500D-R	500	1.25 $R_{eH}$ (min.)	1.25	13	8
	B500DWR	500	1.30 $R_{eH}$ (min.)	1.25	13	8
	B600D-R	600	1.20 $R_{eH}$ (min.)	1.25	10	8

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RNHHPXFDP

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11 March 2026

Countersigned by:

Prof. Dr. Bashir Ahmed, Test-in-Charge

Dept. of Civil Engg., BUET.

Test performed by:

Dr. Md. Jahangir Alam

Professor, Dept. of Civil Engg., BUET

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BUETCE 06 2 15 29



# BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY (BUET)

## DEPARTMENT OF CIVIL ENGINEERING

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### STRENGTH OF MATERIALS LABORATORY

1 (i) of 19



#### TEST OF DEFORMED M.S. BARS [BDS ISO 6935-2:2021]

Sent by: Engr. Md. Tanjidul Islam, Sr. Manager, Quality Control

GPH Ispat Limited.

Project: -----

BRTC No.: 1103-75236/CE/25-26; Dt. 2/3/2026

Ref.: Letter; Dt. 1/3/2026

Date of Test: 7/3/2026

Samples were received in UNSEALED condition.

Sl. No.	Frog Mark / Identification	Nominal dia.	Actual dia.	Mass Per Unit Length	Average Mass Per Unit Length	Yield or Proof Load	Yield or Proof Strength	Average Yield Strength	Tensile Load	Tensile Strength	Average Tensile Strength	$R_m/R_{eH}$	Total Elongation (%)	Average Total Elongation (%)	Bend Test	Rebend Test
		mm	mm	kg/m	kg/m	kN	MPa	MPa	kN	MPa	MPa		(gauge length = 5d)	(%)		
1	GPH B420 DWR	32	31.8	6.226	6.247	368	458	460	530	660	665	1.45	23	23	-	-
2	GPH B420 DWR	32	31.9	6.255		369	459		533	665			23		-	-
3	GPH B420 DWR	32	31.9	6.259		373	464		537	670			24		-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Conversion factor: 1.0 MPa = 1.0 N/mm<sup>2</sup> = 145 psi. Strengths are based on nominal area.

BDS ISO 6935-2:2021 Weight Requirements, Nominal Area etc. (Table 2).

Nominal bar dia., mm	6	8	10	12	14	16	20	22*	25	28	32	40	50
Nominal cross sectional area, sq.mm	28.3	50.3	78.5	113	154	201	314	380	491	616	804	1257	1964
Nominal mass per unit length	0.222	0.395	0.616	0.887	1.21	1.58	2.46	2.98	3.85	4.84	6.31	9.87	15.42
Permissible deviation, %	±8	±8	±6	±6	±5	±5	±5	±5	±4	±4	±4	±4	±4

\*22mm dia. bar is not covered in BDS ISO 6935-2:2021. Its properties are derived following the principle used for other bar sizes.  
Actual diameter of bars are shown for informative purpose only. It is not a requirement of BDS ISO 6935-2:2021.  
Actual diameter is the diameter of a perfectly round plain bar having same mass per unit length.

BDS ISO 6935-2:2021 Tensile Requirements for Common Steel Grades (Table 6)

Ductility Class	Steel Grade	Yield Strength, $R_{eH}$ , MPa		$R_m/R_{eH}$ min.	Ductility Properties	
		Min.	Max.		Elongation, % (min.)	
					Total	At $R_m$
C	B400C-R	400	--	1.15	14	7
	B400CWR	400	--	1.15	14	7
	B500C-R	500	--	1.15	14	7
	B500CWR	500	--	1.15	14	7
	B600C-R	600	--	1.15	10	7
	B450CWR	450	1.25 $R_{eH}$ (min.)	1.15	--	7.5
	B400D-R	400	1.30 $R_{eH}$ (min.)	1.25	17	8
	B400DWR	400	1.30 $R_{eH}$ (min.)	1.25	17	8
	B420DWR	420	1.30 $R_{eH}$ (min.)	1.25	16	8
	B500D-R	500	1.25 $R_{eH}$ (min.)	1.25	13	8
B500DWR	500	1.30 $R_{eH}$ (min.)	1.25	13	8	
B600D-R	600	1.20 $R_{eH}$ (min.)	1.25	10	8	

$R_m$  = Tensile (ultimate) strength, MPa.



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Authenticity of this page is Verifiable from <http://verify.ce.buet.ac.bd> with the QR Code or ID

11 March 2026

Countersigned by:

Prof. Dr. Bashir Ahmed, Test-in-Charge

Dept. of Civil Engg., BUET.

Test performed by:

Dr. Md. Jahangir Alam

Professor, Dept. of Civil Engg., BUET



**Important Note:** Samples as supplied to us have been tested. BRTC does not have any responsibility as to the representative character of the samples required to be tested. It is recommended that the samples are sent in a secure and sealed cover/packet/container under the signature of a competent authority. In order to avoid fraudulent fabrication of test results, this report has been printed on a security paper. It is also recommended that the test results be collected by a duly authorized person.

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