

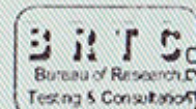


# BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY (BUET)

## DEPARTMENT OF CIVIL ENGINEERING

Mobile: 01819 557 964; PABX: 966 5650-80 Ext. 7226; <http://ce.buet.ac.bd>

### STRENGTH OF MATERIALS LABORATORY



#### TEST OF DEFORMED M.S. BARS (BDS ISO 6935-2:2016)

Sent by: Mohammad Sarwar Alam,  
Director, Golden Ispat Limited.  
Project: Quality Control Test

BRTC No.: 1102-25874/CE/20-21; Dt. 4/1/2021

Ref.: GOLDEN/BUET/30/20; Dt. 30/12/2020

Date of Test: 12/1/2021

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	$R_{m}/R_{yk}$	Total Elongation (%)	Average Total Elongation (%)	Bend Test (Seperate samples)	Rebend Test (Seperate samples)
		mm	mm	kg/m	kg/m	kN	MPa	MPa	kN	MPa	MPa	(G.Length = 5d)	(%)	(Satisfactory)	(Satisfactory)	
1	GOLDEN TMT B500 CWR	32	32.2	6.406	6.398	491	610	600	608	755	740	1.23	21	20	Satisfactory	Satisfactory
2	GOLDEN TMT B500 CWR	32	32.2	6.405		494	615		599	745			19		Satisfactory	Satisfactory
3	GOLDEN TMT B500 CWR	32	32.2	6.383		460	570		575	715			20		Satisfactory	Satisfactory
4	GOLDEN TMT B500 CWR	25	25.1	3.875	3.869	265	540	540	337	685	690	1.28	23	23	Satisfactory	Satisfactory
5	GOLDEN TMT B500 CWR	25	25.0	3.865		266	540		337	685			24		Satisfactory	Satisfactory
6	GOLDEN TMT B500 CWR	25	25.0	3.868		266	540		339	690			23		Satisfactory	Satisfactory
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BDS ISO 6935-2:2016 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 6935-2:2016. 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 6935-2:2016.

Actual diameter is the diameter of a perfectly round plain bar having same mass per unit length.

BDS ISO 6935-2 Tensile Requirements for Common Steel Grades

Steel Grade	Yield Strength, $R_{yk}$ , MPa		Ductility Properties		
	Min.	Max.	$R_{m}/R_{yk}$ min.	Elongation, % (min.) Total	$A_5 R_m$
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 $R_{yk}$ (min.)	1.15	--	7.5
B400DWR	400	1.3 $R_{yk}$ (min.)	1.25	17	8
B420DWR	420	1.3 $R_{yk}$ (min.)	1.25	16	8
B500DWR	500	1.3 $R_{yk}$ (min.)	1.25	13	8

Countersigned by:  
Prof. Dr. A.B.M. Badruzzaman, Test-in-Charge  
Dept. of Civil Engg., BUET

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



Test performed by:  
Dr. Md. Mafizur Rahman  
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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## STRENGTH OF MATERIALS LABORATORY



### TEST OF DEFORMED M.S. BARS (BDS ISO 6935-2:2016)

Sent by: MD Sarowar Alam  
 Director, Golden Ispat Ltd  
 Project: MS (500W) Test-BDS-ISO-6935-2

BRTC No.: 1102-25874/CE/20-21; Dt. 4/1/2021

Ref.: GOLDEN/BUET/30/20; Dt. 30/12/2020

Date of Test: 11/1/2021

Contractor/supplier: Client

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 (Separate samples)	Rebend Test (Separate samples)
		mm	mm	kg/m	kg/m	kN	MPa	MPa	kN	MPa	MPa		(G length = 5d)			
1	GOLDEN TMT B500 CWR	12	12.1	0.902		62.3	550		80	710			30		Satisfactory	Satisfactory
2	GOLDEN TMT B500 CWR	12	12.1	0.897	0.900	57	505	520	76	675	685	1.32	30	30	Satisfactory	Satisfactory
3	GOLDEN TMT B500 CWR	12	12.1	0.900		56.6	500		76	675			30		Satisfactory	Satisfactory
1	GOLDEN TMT B500 CWR	10	10.0	0.617		41.6	525		51.7	655			28		Satisfactory	Satisfactory
2	GOLDEN TMT B500 CWR	10	10.1	0.623	0.620	41.6	525	525	51.7	655	650	1.24	28	29	Satisfactory	Satisfactory
3	GOLDEN TMT B500 CWR	10	10.0	0.620		41.1	520		50.8	645			30		Satisfactory	Satisfactory
1	GOLDEN TMT B500 CWR	8	8.1	0.405		29.2	580		34.9	695			28		Satisfactory	Satisfactory
2	GOLDEN TMT B500 CWR	8	8.1	0.407	0.405	28.7	570	575	34.5	685	685	1.19	30	29	Satisfactory	Satisfactory
3	GOLDEN TMT B500 CWR	8	8.1	0.403		28.7	570		33.6	670			30		Satisfactory	Satisfactory
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

BDS ISO 6935-2:2016 Weight Requirements, Nominal Area etc. (Table 2)

Nominal bar dia., mm	5	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 6935-2:2016. Its properties are derived following the principle used for other bar sizes. Actual dia. of bars are shown for informative purpose only. It is not a requirement of BDS ISO 6935-2:2016.

BDS ISO 6935-2 Tensile Requirements for Common Steel Grades

Steel Grade	Yield Strength, $R_{eH}$ , MPa		Ductility Properties		
	Min.	Max.	$R_m/R_{eH}$ min.	Elongation, % (min.)	
				Total	At $R_m$
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
B400DWR	400	1.3 $R_{eH}$ (min.)	1.25	17	8
B420DWR	420	1.3 $R_{eH}$ (min.)	1.25	16	8
B500DWR	500	1.3 $R_{eH}$ (min.)	1.25	13	8

*Jalil*

Countersigned by:  
 Prof. Dr. Md. Abdul Jalil, Test-in-Charge  
 Dept. of Civil Engg., BUET



*Md Mafizur Rahman*  
 17/1/21



Test performed by:  
 Dr. Md. Mafizur Rahman  
 Professor, Dept. of Civil Engg.

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Sent by: MD Sarwar Alam

Director, Golden Ispat Ltd

Project: MS (500W) Test-BDS-ISO-6935-2

BRTC No.: 1102-25874/CE/20-21; Dt. 4/1/2021

Ref.: GOLDEN/BUET/30/20; Dt. 30/12/2020

Date of Test: 11/1/2021

Contractor/supplier: Client

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 (Separate samples)	Rebend Test (Separate samples)
		mm	mm	kg/m	kg/m	kN	MPa	MPa	kN	MPa	MPa		(G length = 5d)	(%)		
1	GOLDEN TMT B500 CWR	22	22.1	3.007		204	535		270	710			23		Satisfactory	Satisfactory
2	GOLDEN TMT B500 CWR	22	22.1	3.003	3.004	202	530	540	274	720	720	1.33	21	22	Satisfactory	Satisfactory
3	GOLDEN TMT B500 CWR	22	22.1	3.002		211	555		275	725			22		Satisfactory	Satisfactory
1	GOLDEN TMT B500 CWR	20	20.1	2.488		178	565		227	725			22		Satisfactory	Satisfactory
2	GOLDEN TMT B500 CWR	20	20.1	2.488	2.490	179	570	565	230	730	725	1.28	20	21	Satisfactory	Satisfactory
3	GOLDEN TMT B500 CWR	20	20.1	2.493		176	560		228	725			21		Satisfactory	Satisfactory
1	GOLDEN TMT B500 CWR	16	16.0	1.587		112	555		135	670			25		Satisfactory	Satisfactory
2	GOLDEN TMT B500 CWR	16	16.1	1.590	1.590	116	575	570	137	680	680	1.19	24	24	Satisfactory	Satisfactory
3	GOLDEN TMT B500 CWR	16	16.1	1.592		115	570		138	685			24		Satisfactory	Satisfactory
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BDS ISO 6935-2:2016 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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				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
B400DWR	400	1.3 $R_{eh}$ (min.)	1.25	17	8
B420DWR	420	1.3 $R_{eh}$ (min.)	1.25	16	8
B500DWR	500	1.3 $R_{eh}$ (min.)	1.25	13	8

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



*Handwritten signature*

Countersigned by:  
Prof. Dr. Md. Abdul Jalil, Test-in-Charge  
Dept. of Civil Engg., BUET

*Ma*  
*12/1/21*



Test performed by:  
Dr. Md. Mafizur Rahman  
Professor, Dept. of Civil Engg.

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