BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY (BUET)
DEPARTMENT OF CIVIL ENGINEERING

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BRTC Bureau of Research Testing & Consultation

BUETCE 0492182

STRENGTH OF MATERIALS LABORATORY

TEST OF DEFORMED M.S. BARS [ASTM A 615M-16]

Sent by: Md. Moniruzzaman, Deputy General Manager, Sales & Marketing
Elite Iron & Steel Ind. Ltd., Bade Kalmeswar, Board Bazar, Joydebpur, Gazipur.

Project: - - - -

BRTC No.: 1103-30095/CE/24-25; Dt. 31/8/2024
Ref.: Letter; Dt. 31/8/2024
Date of Test: 1/9/2024

Samples were received in UNSEALED condition.

Sl. No.	Frog Mark / Identification	Bar Desig./ Nominal dia. mm	Actual bar dia. mm	Unit Weight kg/m	Average Unit Weight kg/m	Yield or Proof Load kN	Yield or Proof Strength MPa	Average Yield or Proof Strength (YS) MPa	Tensile Load kN	Tensile Strength MPa	Average Tensile Strength (TS) MPa	TS/YS	Elongation (%) (G. length = 200 mm)	Average Elongation (%)	Bend Test (Seperate samples)
1	ELITE SUPER POWER EIS B500 DWR	25	24.8	3.786		265	**540**	**520**	331	**675**	**660**		**18**		**Satisfactory**
2	ELITE SUPER POWER EIS B500 DWR	25	24.7	3.766	3.769	246	**500**	(75500 psi)	317	**645**	(95500 psi)	**1.27**	**17**	**17**	**Satisfactory**
3	ELITE SUPER POWER EIS B500 DWR	25	24.7	3.756		254	**520**		323	**660**			**17**		**Satisfactory**
-	-	-	-	-		-	-	-	-	-	-		-		-
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ASTM A615M-16 Weight Requirements and Nominal Area of bars (Table A1.1)

Bar desig./Nominal dia., mm	*8*	10	12	16	20	*22*	25	28	32	36	40	50	60
Nominal area, sq.mm	*50.3*	79	113	201	314	*380*	491	616	804	1018	1257	1963	2827
Nominal weight, kg/m	*0.395*	0.617	0.888	1.578	2.466	*2.98*	3.853	4.834	6.313	7.99	9.865	15.41	22.2

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

Measured unit weight shall not be less than 94% of the nominal weight. 8mm bar size is not covered in ASTM A615M-16.
Area and weight of 8mm and 22m dia. bars are derived based on principle follwed for other sizes in Table A1.1
Actual dia. and TS/YS ratio are provided for informative purpose only. These are not requirements of ASTM A615M-16.
Actual diameter is the diameter of a perfectly round plain bar having same mass per unit length.

ASTM A615M-16 Tensile Requirements for Common Steel Grades

	Grade 60 [420]	Grade 75 [520]	Grade 80 [550]
Tensile strength, min. psi [MPa]	90 000 [620]	100 000 [690]	105 000 [725]
Yield strength, min, psi [MPa]	60 000 [420]	75 000 [520]	80 000 [550]
Elongation in 8 in. [200 mm], min, %			
Bar Designation No.			
10, 12, 16, 20	9	7	7
25, 22	8	7	7
28, 32, 36, 40, 50, 60	7	6	6

Countersigned by:
Prof. Dr. Hasib Mohammed Ahsan, Test-in-Charge
Dept. of Civil Engg., BUET, Dhaka-1000, Bangladesh

04 September 2024

Test performed by:
Dr. Mahbuba Begum
Professor, Dept. of Civil Engg., BUET

Department of Civil Engineering ★ BUET, Dhaka-1000, Bangladesh ★

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 fradulent 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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BRTC
Bureau of Research, Testing & Consultation

STRENGTH OF MATERIALS LABORATORY

BUETCE 04

TEST OF DEFORMED M.S. BARS [BDS ISO 6935-2:2016]

Sent by: Md. Moniruzzaman, Deputy General Manager, Sales & Marketing
Elite Iron & Steel Ind. Ltd., Bade Kalmeswar, Board Bazar, Joydebpur, Gazipur.

Project: - - - -

BRTC No.: 1103-30095/CE/23-24; Dt. 31/8/2024
Ref.: Letter; Dt. 31/8/2024
Date of Test: 1/9/2024

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 (%) (G.length = 5d)	Average Total Elongation (%)	Bend Test	Rebend Test (Seperate samples)
1	ELITE 60 EIS B420 DWR	25	24.8	3.786		-	-		-	-			-		-	Satisfactory
2	ELITE 60 EIS B420 DWR	25	24.7	3.766	3.769	-	-	-	-	-	-	-	-	-	-	Satisfactory
3	ELITE 60 EIS B420 DWR	25	24.7	3.756		-	-		-	-			-		-	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	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	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.

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

BDS ISO 6935-2 Tensile Requirements for Common Steel Grades

Steel Grade	Yield Strength, R_{eH}, MPa		Ductiliy Properties		
	Min.	Max.	R_m/R_{eH} min.	Elongation, % (min.) Total	Elongation, % (min.) 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

Department of Civil Engineering
BUET, Dhaka-1000, Bangladesh

04 September 2024

Countersigned by:
Prof. Dr. Hasib Mohammed Ahsan, Test-in-Charge
Dept. of Civil Engg., BUET, Dhaka-1000, Bangladesh

Test performed by:
Dr. Mahbuba Begum
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