



BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY (BUET)

DEPARTMENT OF CIVIL ENGINEERING STRENGTH OF MATERIALS LABORATORY

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TEST OF DEFORMED M.S. BARS IASTM A 615M-161

Sent by: Md. Moniruzzaman, Deputy General Manager

Elite Iron & Steel Ind. Ltd., Bade Kalmeswar, Board Bazar, Joydebpur, Gazipur

BRTC No.: 1103-11416/CE/23-24; Dt. 16/1/2024

Ref.: Letter. Dt. 16/1/2024

Date of Test: 18/1/2024

Project: - - -

Samples were received in UNSEALED condition.

Sl. No.	Frog Mark / Identification	Bar Desig / Nominal dia.	Actual bar dia.	Unit Weight	Average Unit Weight	Yield or Proof Load	Yield or Proof Strength	Average Yield or Proof Strength (YS)	Tensile Load	Tensile Strength	Average Tensile Strength (TS)	TS/YS	Elongation (%) (G. length = 200 mm)	Average Elongation (%)	Bend Test (Separate samples)
1	ELITE PURE 60 EIS B420 DWR	10	9.8	0.587	-	36.7	465	465	48.2	610	610	-	17	-	Satisfactory
2	ELITE PURE 60 EIS B420 DWR	10	9.8	0.592	0.591	36.7	465	(67500 psi)	48.2	610	(88500 psi)	1.31	17	17	Satisfactory
3	ELITE PURE 60 EIS B420 DWR	10	9.8	0.593	-	36.7	465	-	48.2	610	-	-	17	-	Satisfactory
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Conversion factor: 1.0 MPa = 1.0 N/mm² = 145 psi. Strengths are based on nominal area.

ASTM A615M-16 Weight Requirements and Nominal Area of bars (Table A1.1)

Bar design/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

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 followed 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. %	9	7	7
Bar Designation No.	9	7	7
10, 12, 16, 20	8	7	7
25, 22	7	6	6
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

Test performed by:

Dr. Sheikh Moklesur Rahman
Associate Professor, Dept. of Civil Engg., BUET

24 January 2024



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 coverpacket/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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TEST OF DEFORMED M.S. BARS IBDS ISO 6935-2:2016I

Sent by: Md. Monruzaman, Deputy General Manager

Elite Iron & Steel Ind. Ltd., Bade Kalmeswar, Board Bazar, Joydebpur, Gazipur

Project: - - -

BRTC No.: 1103-11416/CEI23-24; Dt. 16/1/2024

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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} MPa	Average Yield Strength, R_{eh} MPa	Tensile Load	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	Reband Test (Separate samples)	
																	mm
1	ELITE PURE 60 EIS B420 DWR	10	9.8	0.587	-	-	-	-	-	-	-	-	-	-	-	-	-
2	ELITE PURE 60 EIS B420 DWR	10	9.8	0.592	0.591	-	-	-	-	-	-	-	-	-	-	-	-
3	ELITE PURE 60 EIS B420 DWR	10	9.8	0.593	-	-	-	-	-	-	-	-	-	-	-	-	-

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

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

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	360	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	± 8	± 6	± 6	± 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.

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	A 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

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