



DEPARTMENT OF CIVIL ENGINEERING

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

STRENGTH OF MATERIALS LABORATORY



TENSION TEST OF DEFORMED M.S. BARS

Sent by: Col. Towficur Rahman(Rtd), Sr. General Manager(Marketing& Sales), Ratanpur Steel Re-rolling Mills Ltd.

Nahar Mansion, 116 CDA Avenue, Muradpur, Chittagong

Project: Test of deformed MS bars for RSRM

BRTC No.: 1100-72282/CE/14-15; Dt. 15/10/2014

Ref.: RSRM/BUET (BRTC)/400W&500W-8/14; Dt. 15/10/2014

Date of Test: 16/10/2014

Contractor: -

Sl. No.	Frog Mark	Nominal Dia	Actual Dia	Actual Unit Weight	Average Actual Unit Weight	Yield or Proof Load	Yield or Proof Strength *	Average Yield or Proof Strength (YS)	Ultimate Load	Ultimate Strength *	Average Ultimate Strength (TS)	TS/YS	Elongation (%) (Gauge length = 203.2 mm)	Average Elongation (%) (G. length = 203.2 mm)	Bend Test (ISO 6935)	Rebend Test (ISO 6935)
1	RSRM.TMT.500W	25	25.0	3.866	3.865	269	550	560	340	690	690	1.23	18	19	Satisfactory	-
2	RSRM.TMT.500W	25	25.0	3.859		278	565	(81500 psi)	338	690	(100000 psi)		19		Satisfactory	-
3	RSRM.TMT.500W	25	25.1	3.871		280	570	(5700 kg/sq.cm)	341	695	(7050 kg/sq.cm)		19		Satisfactory	-
4	RSRM.XPOWER.500W	20	19.8	2.426	2.479	160	510	550	209	665	690	1.25	16	16	Satisfactory	-
5	RSRM.XPOWER.500W	20	20.1	2.502		178	565	(79500 psi)	220	700	(100000 psi)		16		Satisfactory	-
6	RSRM.XPOWER.500W	20	20.2	2.508		178	565	(5600 kg/sq.cm)	220	700	(7050 kg/sq.cm)		16		Satisfactory	-
7	RSRM.XPOWER.500W	16	15.9	1.564	1.560	103	510	510	129	645	645	1.26	17	-	Satisfactory	-
8	RSRM.XPOWER.500W	16	15.9	1.562		101	505	(74500 psi)	129	645	(93500 psi)		18		Satisfactory	-
9	RSRM.XPOWER.500W	16	15.9	1.554		105	520	(5200 kg/sq.cm)	130	650	(6600 kg/sq.cm)		14		Satisfactory	-
10	RSRM.XPOWER.500W	12	11.7	0.844	0.853	58	515	535	80	705	690	1.29	13	13	Satisfactory	-
11	RSRM.XPOWER.500W	12	11.8	0.855		60.6	535	(77500 psi)	77	680	(100000 psi)		14		Satisfactory	-
12	RSRM.XPOWER.500W	12	11.8	0.861		62.8	555	(5450 kg/sq.cm)	77	685	(7050 kg/sq.cm)		13		Satisfactory	-
13	RSRM.XPOWER.500W	10	9.8	0.596	0.600	39.8	505	510	48	610	615	1.21	13	13	Satisfactory	-
14	RSRM.XPOWER.500W	10	9.8	0.596		39.8	505	(73500 psi)	49	615	(89500 psi)		13		Satisfactory	-
15	RSRM.XPOWER.500W	10	9.9	0.607		40.7	515	(5200 kg/sq.cm)	49	620	(6300 kg/sq.cm)		13		Satisfactory	-

Conversion factors: 1.0 kg/cm² = 14.219 psi (lb/in²) = 0.09807 MPa (N/mm²)

*Strengths are based on nominal area

Nom. Bar Dia. (mm)	40	32	28	25	22	20	16	12	10	8
Nom. Area. (sq.mm)	1257	804	616	491	380	314	201	113	79	50

Samples were received in unsealed condition

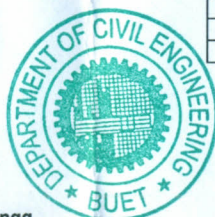
Minimum Standard Requirements (BDS / ISO 6935-2:1991(E))			
Grade	Yield Strength N/mm ² or MPa	Ultimate Strength N/mm ² or MPa	Elongation %
300	300	330	16
400/400W	400	440	14
500/500W	500	550	14

Minimum Standard Requirements (ASTM A615/A 615M - 96a)

ASTM A 615			ASTM A 615M			ASTM A 615/ A 615M			
Grade	Yield Strength psi (kg/cm ²)	Ultimate Strength psi (kg/cm ²)	Grade	Yield Strength MPa (kg/cm ²)	Ultimate Strength MPa (kg/cm ²)	Minimum Elongation in 8" (203.2 mm) GL, (%)			
40	40000 (2810)	70000 (4910)	300	300 (3050)	500 (5090)	10 mm	13, 16, 19 mm	22, 25 mm	29, 32, 36 mm
60	60000 (4210)	90000 (6310)	420	420 (4275)	620 (6295)	9	9	8	7
75	75000 (5255)	100000 (7015)	520	520 (5275)	690 (7010)	-	7*	7	6

* For 19 mm bar only.

Countersigned by: Dr. Abu Siddique, Professor, Dept. of Civil Engg.



Test performed by: Dr. A. F. M. Saiful Amin, Professor, Dept. of Civil Engg.

Important Notes: Samples as supplied to us have been tested in our laboratory. 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 signature of the competent authority. In order to avoid fraudulent fabrication of test results, it is recommended that all test reports be collected by duly authorized person, and not by the Contractor/Supplier.



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1	RSRM.G60.400W	25	24.8	3.795	3.810	225	458	483	377	770	-	-	14	-	Satisfactory	-
2	RSRM.G60.400W	25	24.9	3.809		246	500	(70000 psi)	296	605	-		20		Satisfactory	-
3	RSRM.G60.400W	25	24.9	3.825		240	489	(4920 kg/sq.cm)	292	595	-		20		Satisfactory	-
4	RSRM.G60.400W	20	19.9	2.441	2.440	140	446	452	216	690	700	1.55	19	17	Satisfactory	-
5	RSRM.G60.400W	20	19.9	2.435		144	459	(65500 psi)	227	725	(102000 psi)		16		Satisfactory	-
6	RSRM.G60.400W	20	19.9	2.445		142	452	(4610 kg/sq.cm)	217	690	(7150 kg/sq.cm)		17		Satisfactory	-
7	RSRM.G60.400W	16	15.9	1.560	1.558	82.4	410	411	136	680	670	1.63	19	19	Satisfactory	-
8	RSRM.G60.400W	16	15.9	1.558		82.4	410	(59500 psi)	134	670	(97500 psi)		19		Satisfactory	-
9	RSRM.G60.400W	16	15.9	1.557		83.3	415	(4190 kg/sq.cm)	134	670	(6850 kg/sq.cm)		19		Satisfactory	-
10	RSRM.G60.400W	12	12.0	0.883	0.884	46	407	409	71	625	625	1.53	18	18	Satisfactory	-
11	RSRM.G60.400W	12	12.0	0.884		46.9	415	(59500 psi)	71	625	(91000 psi)		18		Satisfactory	-
12	RSRM.G60.400W	12	12.0	0.884		45.6	403	(4170 kg/sq.cm)	71	625	(6400 kg/sq.cm)		19		Satisfactory	-
13	RSRM.G60.400W	10	10.0	0.621	0.624	36.7	465	465	55	700	700	1.51	15	15	Satisfactory	-
14	RSRM.G60.400W	10	10.0	0.622		37.2	471	(67500 psi)	56	705	(102000 psi)		15		Satisfactory	-
15	RSRM.G60.400W	10	10.1	0.628		36.3	459	(4740 kg/sq.cm)	55	695	(7150 kg/sq.cm)		16		Satisfactory	-

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ASTM A 615			ASTM A 615M			ASTM A 615/ A 615M			
Grade	Yield Strength	Ultimate Strength	Grade	Yield Strength	Ultimate Strength	Minimum Elongation in 8" (203.2 mm) GL, (%)			
	psi (kg/cm ²)	psi (kg/cm ²)		MPa (kg/cm ²)	MPa (kg/cm ²)	10 mm	13, 16, 19 mm	22, 25 mm	29, 32, 36 mm
40	40000 (2810)	70000 (4910)	300	300 (3050)	500 (5090)	11	12	-	-
60	60000 (4210)	90000 (6310)	420	420 (4275)	620 (6295)	9	9	8	7
75	75000 (5255)	100000 (7015)	520	520 (5275)	690 (7010)	-	7*	7	6

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