

TESTING OF "RS" BRAND TMT (RB 500) RIBBED STEEL BARS BY IWW STEEL INDUSTRIES (PVT) LTD

Report No : UM/MT/48/04/26

Client : Deputy Chief Secretary (Engineering Services),
North Western Province,
Chief Secretary's Office -
North Western Province
Engineering Services Division,
3rd Floor, Pehesara Building,
North Western Provincial Council Office Complex,
Kurunegala.

Client's reference : Letter Dated 21st April 2026

Item : Samples of 8 mm, 10 mm, 12 mm, 16 mm and 20 mm "RS"
Brand Ribbed Steel Bars

Item Description ⁽¹⁾	
Customer	Deputy Chief Secretary (Engineering Services), NWP, Provincial Council Office Complex, Kurunegala.
Supplier	IWW Steel Industries (Pvt) Ltd
Brand	"RS"
Manufactured By	IWW Steel Industries, Bopitiya
Staff Member Assigned	Mr. A.M.C.S. Gunarathne, Quality Control Research Centre and Testing Laboratory, NWP

Note (1): Information provided by the client

Tests Performed : All tests carried out as per **SLS 375:2009** Standards

This report refers specifically to the samples submitted for testing to the Department of Materials Science and Engineering at University of Moratuwa.

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Erg. M.P.R. Navaratne
Deputy Chief Secretary
Chief Secretary's Office - NWP

Results

Tensile Properties

Tested Property		Sample Diameter (8 mm)				
		Sample - 1	Sample - 2	Sample - 3	Sample - 4	Sample - 5
Mass Per Meter (Kg)		0.398	0.391	0.396	0.389	0.394
Cross Sectional Area (mm ²)		50.7	49.8	50.4	49.6	50.2
Yield Strength, R_e (MPa)	Individual	623.4	618.8	632.6	630.6	634.5
	Mean Value ($\bar{X}$)	628.0				
	Standard deviation (s)	6.6				
	$(\bar{X} - ks)$ (k=1.53)	617.8				
Stress Ratio (R_m/R_e)		1.14	1.12	1.12	1.13	1.13
Total Elongation at Maximum Force, A_{gt} (%)	Individual	9.1	9.5	8.8	8.6	8.4
	Mean Value ($\bar{X}$)	8.9				
	Standard deviation (s)	0.4				
	$(\bar{X} - ks)$ (k=1.53)	8.2				
Elongation after Fracture, A (%)	Individual	22.9	23.9	22.1	21.8	21.1
	Mean Value ($\bar{X}$)	22.4				
	Standard deviation (s)	1.1				
	$(\bar{X} - ks)$ (k=1.53)	20.7				

Tested Property		Sample Diameter (10 mm)				
		Sample - 1	Sample - 2	Sample - 3	Sample - 4	Sample - 5
Mass Per Meter (Kg)		0.601	0.606	0.599	0.596	0.601
Cross Sectional Area (mm ²)		76.6	77.2	76.3	75.9	76.6
Yield Strength, R_e (MPa)	Individual	589.6	594.3	580.1	578.3	599.5
	Mean Value ($\bar{X}$)	588.4				
	Standard deviation (s)	9.1				
	$(\bar{X} - ks)$ (k=1.53)	574.5				
Stress Ratio (R_m/R_e)		1.14	1.12	1.14	1.15	1.13
Total Elongation at Maximum Force, A_{gt} (%)	Individual	9.2	9.1	9.5	9.9	8.9
	Mean Value ($\bar{X}$)	9.3				
	Standard deviation (s)	0.4				
	$(\bar{X} - ks)$ (k=1.53)	8.7				
Elongation after Fracture, A (%)	Individual	23.0	22.6	23.9	24.8	22.1
	Mean Value ($\bar{X}$)	23.3				
	Standard deviation (s)	1.1				
	$(\bar{X} - ks)$ (k=1.53)	21.6				

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Director Engineering
Chief Secretary's Office - NWP

Department of Materials Science and Engineering
University of Moratuwa, Moratuwa,
Sri Lanka.

Tested Property		Sample Diameter (12 mm)				
		Sample - 1	Sample - 2	Sample - 3	Sample - 4	Sample - 5
Mass Per Meter (Kg)		0.875	0.885	0.889	0.877	0.891
Cross Sectional Area (mm ²)		111.5	112.7	113.2	111.7	113.5
Yield Strength, R_e (MPa)	Individual	567.5	578.6	581.3	569.4	573.2
	Mean Value ($\bar{X}$)	574.0				
	Standard deviation (s)	5.9				
	$(\bar{X} - ks)$ (k=1.53)	565.0				
Stress Ratio (R_m/R_e)		1.16	1.15	1.15	1.14	1.16
Total Elongation at Maximum Force, A_{gt} (%)	Individual	10.6	9.6	9.9	9.4	10.3
	Mean Value ($\bar{X}$)	10.0				
	Standard deviation (s)	0.5				
	$(\bar{X} - ks)$ (k=1.53)	9.2				
Elongation after Fracture, A (%)	Individual	26.5	23.9	24.9	23.5	25.9
	Mean Value ($\bar{X}$)	24.9				
	Standard deviation (s)	1.3				
	$(\bar{X} - ks)$ (k=1.53)	23.0				

Tested Property		Sample Diameter (16 mm)				
		Sample - 1	Sample - 2	Sample - 3	Sample - 4	Sample - 5
Mass Per Meter (Kg)		1.55	1.54	1.55	1.54	1.55
Cross Sectional Area (mm ²)		197.5	196.2	197.5	196.2	197.5
Yield Strength, R_e (MPa)	Individual	564.5	573.4	558.1	562.5	556.5
	Mean Value ($\bar{X}$)	563.0				
	Standard deviation (s)	6.7				
	$(\bar{X} - ks)$ (k=1.53)	552.8				
Stress Ratio (R_m/R_e)		1.16	1.14	1.17	1.16	1.16
Total Elongation at Maximum Force, A_{gt} (%)	Individual	9.9	9.6	10.0	10.4	10.6
	Mean Value ($\bar{X}$)	10.1				
	Standard deviation (s)	0.4				
	$(\bar{X} - ks)$ (k=1.53)	9.5				
Elongation after Fracture, A (%)	Individual	24.8	24.1	25.1	25.9	26.5
	Mean Value ($\bar{X}$)	25.3				
	Standard deviation (s)	0.9				
	$(\bar{X} - ks)$ (k=1.53)	23.8				



Tested Property		Sample Diameter (20 mm)				
		Sample -1	Sample - 2	Sample - 3	Sample - 4	Sample - 5
Mass Per Meter (Kg)		2.39	2.41	2.42	2.38	2.4
Cross Sectional Area (mm ²)		304.5	307.0	308.3	303.2	305.7
Yield Strength, R_e (MPa)	Individual	543.6	556.6	540.7	558.8	554.5
	Mean Value ($\bar{X}$)	550.8				
	Standard deviation (s)	8.1				
	$(\bar{X} - ks)$ (k=1.53)	538.4				
	Stress Ratio (R_m/R_e)	1.15	1.13	1.15	1.14	1.13
Total Elongation at Maximum Force, A_{gt} (%)	Individual	10.3	10.0	10.8	9.7	10.1
	Mean Value ($\bar{X}$)	10.2				
	Standard deviation (s)	0.4				
	$(\bar{X} - ks)$ (k=1.53)	9.6				
	Stress Ratio (R_m/R_e)	1.15	1.13	1.15	1.14	1.13
Elongation after Fracture, A (%)	Individual	25.8	24.8	26.9	24.2	25.1
	Mean Value ($\bar{X}$)	25.4				
	Standard deviation (s)	1.0				
	$(\bar{X} - ks)$ (k=1.53)	23.8				
	Stress Ratio (R_m/R_e)	1.15	1.13	1.15	1.14	1.13

Bending and Re-bending Properties

Sample (Diameter)	Test Result	
	Bend Test	Re - bend Test
8 mm	Pass*	Pass*
10 mm	Pass*	Pass*
12 mm	Pass*	Pass*
16 mm	Pass*	Pass*
20 mm	Pass*	Pass*

* All five specimens

Chemical Composition

Sample (Diameter)	Element (%) by Mass				
	C	S	P	Cu	Carbon Equivalent
8 mm	0.219	0.025	0.019	0.193	0.35
10 mm	0.207	0.018	0.021	0.158	0.33
12 mm	0.205	0.020	0.016	0.172	0.33
16 mm	0.197	0.023	0.020	0.153	0.32
20 mm	0.195	0.018	0.026	0.167	0.32
Specification (Maximum)	0.240	0.055	0.055	0.850	0.52



Rib Geometry

Sample (Diameter)		Height of Transverse Ribs (mm)		Rib Spacing Range (mm)	
		Specified Values (Minimum)	Tested Value	Specified Values	Tested Value
8 mm	1	0.52	0.70	4.0 – 8.0	5.9
	2		0.65		5.8
	3		0.65		6.0
	4		0.60		5.8
	5		0.70		6.0
10 mm	1	0.65	0.85	5.0 – 8.0	7.1
	2		0.85		6.9
	3		0.90		6.9
	4		0.90		7.0
	5		0.90		6.9
12 mm	1	0.78	1.05	6.0 – 9.6	8.4
	2		1.00		8.2
	3		1.00		8.5
	4		1.00		8.6
	5		1.05		8.5
16 mm	1	1.04	1.25	8.0 – 12.8	11.0
	2		1.25		10.8
	3		1.20		10.6
	4		1.20		11.0
	5		1.20		10.8
20 mm	1	1.30	1.55	10.0 – 16.0	13.1
	2		1.50		12.9
	3		1.50		13.2
	4		1.55		12.9
	5		1.55		13.2

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Sample (Diameter)		Transverse Rib Inclination		Ribless Perimeter (mm)	
		Specified Values	Tested Value	Specified Values (Maximum)	Tested Value
8 mm	1	35° to 75°	68°	6.28	0.0
	2		68°		0.0
	3		68°		0.0
	4		69°		0.0
	5		69°		0.0
10 mm	1	35° to 75°	65°	7.85	0.0
	2		65°		0.0
	3		66°		0.0
	4		66°		0.0
	5		66°		0.0
12 mm	1	35° to 75°	67°	9.42	0.0
	2		67°		0.0
	3		67°		0.0
	4		67°		0.0
	5		67°		0.0
16 mm	1	35° to 75°	66°	12.56	0.0
	2		66°		0.0
	3		65°		0.0
	4		65°		0.0
	5		66°		0.0
20 mm	1	35° to 75°	66°	15.70	0.0
	2		66°		0.0
	3		65°		0.0
	4		65°		0.0
	5		65°		0.0

Specification for Mass per Metre	
Sample (Diameter)	(kg/m)
8 mm	0.371 – 0.419
10 mm	0.588 – 0.644
12 mm	0.848 – 0.928
16 mm	1.51 – 1.65
20 mm	2.36 – 2.58



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Specified Characteristic Values	Yield Strength, R_e (MPa)	Stress Ratio (R_m/R_e)	Elongation after Fracture, A (%)	Total Elongation at Maximum Force, A_{gt} (%)
	500 - 650	>1.05	>14.0	>2.5

Conclusion :

All tested properties of all specimens comply with grade RB500 of SLS 375:2009 standards.

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