SABS

TEST REPORT

PDV LIMITED
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Your ref	:	Mark No. New
Our ref	:	M101/25
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Report No.	:	2536/M101/25
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Date	:	2025 – 09 – 17

TESTING OF STEEL BARS TO SANS 920: 2011

"Steel bars for concrete reinforcement"

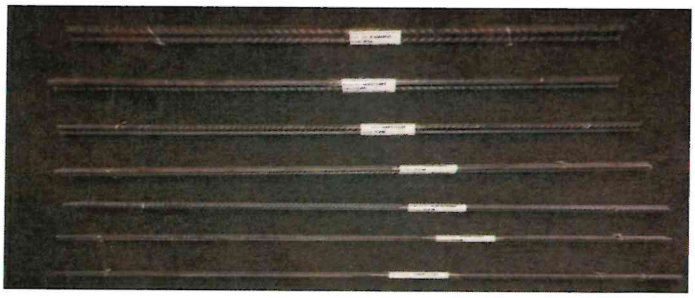
1. CONCLUSION

The high tensile steel reinforcement bars samples submitted complied with the requirements of SANS 920: 2011, "Steel bars for concrete reinforcement". Refer to clause 3 of this report for details of the results.

The statement of conformity is based on the sabs laboratory services' decision rule of "where the addition of the measurement uncertainty to the calculated test results leads to an inconclusive statement of conformity, but the result is within the pass criteria of the specification, the outcome shall be stated as compliance.

2. DESCRIPTION OF SAMPLE

Sample No.	Quantity	Batch No.	Description
M101/25a_1	03	A0043	1m × Y8 Reinforcing Bar
M101/25a_2	03	A0045	1m × Y10 Reinforcing Bar
M101/25a_3	03	A0009	1m × Y12 Reinforcing Bar
M101/25a_4	03	A0050	1m × Y16 Reinforcing Bar
M101/25a_5	03	A0046	1m × Y20 Reinforcing Bar
M101/25a_6	03	A0049	1m × Y25 Reinforcing Bar
M101/25a_7	03	A0052	1m × Y32 Reinforcing Bar



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5. The results enclosed within this Test report apply to the sample as received.
6. Declaration of interest: By signing this Test report, the signatories hereby declares that there is no conflict of interest with the aforementioned customer.

3. RESULTS

Clause	Nature of test	Requirements	Results	Remarks
3	Requirements			
3.1	General	The steel shall have been made by the open hearth (acid or basic) process, the electric process or the basic oxygen process, and the bars shall be a) hot-rolled mild steel bars of plain round cross-section; b) hot-rolled mild steel deformed bars, cold-worked to increase yield stress; c) hot-rolled high yield stress steel deformed bars; or d) hot-rolled mild steel bars of plain cross-section, deformed and cold-reduced to increase yield stress.	The sample(s) submitted were: c) hot-rolled high yield stress steel deformed bars.	Complied
3.2	Finish	a) The bars shall be well and cleanly rolled. b) Rust, seams, surface irregularities and mill scall shall not be cause for rejection, provided that the mass per metre, dimensions, cross-sectional area and tensile properties of a test specimen comply with the applicable requirements of this specification.	The bars were well and cleanly rolled. Dimensions, cross-sectional area and tensile properties of the tested samples complied with the applicable requirements of the specification.	Complied
3.3	Nominal size	The nominal size of a bar, determined in accordance with 5.2, shall be one of the following: 6; 8; 10; 12; 16; 20; 25; 32 or 40 mm.	Refer to table 3.3 below for the detailed nominal size results.	Complied

Table 3.3 – Nominal size

Samples	Actual diameter (mm)	Nominal specified diameter (mm)	Remarks
M101/25a1	8,00	8	Complied
M101/25a2	9,96	10	Complied
M101/25a3	12,00	12	Complied
M101/25a4	15,97	16	Complied
M101/25a5	19,97	20	Complied
M101/25a6	24,92	25	Complied
M101/25a7	32,00	32	Complied

3.4	**Length**	When bars of a specific length are required, the actual length, determined in accordance with 5.2, shall be at least equal to the specified value and shall not exceed that value by more than 50 mm.	Refer to table 3.4 below for the detailed length results.	Complied

Table 3.4 - Length			
Sample	**Length (mm)**		**Remarks**
	Actual	**Specified**	
M101/25a1	1003,00 (For testing purposes)	950 – 1050	Complied
M101/25a2	1001,67 (For testing purposes)		Complied
M101/25a3	1001,83 (For testing purposes)		Complied
M101/25a4	1002,33 (For testing purposes)		Complied
M101/25a5	1004,50 (For testing purposes)		Complied
M101/25a6	1003,33 (For testing purposes)		Complied
M101/25a7	1002,67 (For testing purposes)		Complied

3.5	**Mass**	a) The mass per metre of a bar, determined in accordance with 5.2, shall not differ from the nominal value by more than the appropriate tolerance given in column 2 of table 1. b) In addition, the actual batch mass of a consignment of bars shall be equal to the value stated in the relevant consignment document(s) subject, except in the case of a coil[2)], to the appropriate tolerance given in column 3 of table 1.	Refer to table 3.5 below for the detailed mass results.	Complied

Table 3.5 - Mass			
Samples	**Mass per meter (kg/m)**		**Remarks**
	Actual	**Specified**	
M101/25a1	0,400	0,372 – 0,419	Complied
M101/25a2	0,617	0,581 – 0,655	Complied
M101/25a3	0,890	0,854 – 0,925	Complied
M101/25a4	1,537	1,519 – 1,645	Complied
M101/25a5	2,447	2,378 – 2,576	Complied
M101/25a6	3,743	3,712 – 4,021	Complied
M101/25a7	6,330	6,077 – 6,583	Complied

3.6	**Pitch (cold-twisted bars)**	In the case of cold-twisted bars, the pitch, determined in accordance with 5.2, of one complete twist through 360 shall be not less than 8 times and not more than 12 times the nominal size of the bar.	The samples submitted were of hot-rolled high yield stress steel deformed bars. Therefore, this clause is not applicable.	Not applicable
3.7	**Tensile properties**	When a bar is tested in accordance with 5.3, a) the characteristic strength and elongation of the steel shall be at least as given in columns 3 and 4 of table 2; b) the ultimate tensile strength of the bar shall be at least 15% greater than the yield stress or 0,20 % proof stress, as relevant, determined in the tensile test; and c) in the case of a mild steel bar, the yield stress of the bar shall not exceed 400 MPa.	Refer to table 3.7 below for the detailed tensile properties results.	Complied

Table 3.7 – Tensile properties

Sample	Type of steel	Characteristic strength (MPa), min		Elongation (%), min		Average % of Yield to UTS, min		Remarks
		Actual	Specified	Actual	Specified	Actual	Specified	
M101/25a1	High yield	637,05	450	29,52	14	19,07	15	Complied
M101/25a2		601,54		28,32		16,14		Complied
M101/25a3		566,98		30,05		20,87		Complied
M101/25a4		612,95		22,36		15,00		Complied
M101/25a5		551,41		22,46		24,44		Complied
M101/25a6		570,39		24,69		19,32		Complied
M101/25a7		538,02		24,41		20,21		Complied

3.8	**Resistance to cold bending**	**3.8.1 Bending** When tested in accordance with 5.4, a bar shall withstand, without transverse rupture of the surface of the metal, being bent through an angle of 180° round a mandrel of the appropriate diameter given in column 3 of table 3.	When tested in accordance with 5.4, the bars withstood being bent through an angle of 180° round a mandrel without transverse rupture of the surface of the metal.	Complied

3.8	**Resistance to cold bending**	**3.8.2 Re-bending** When tested in accordance with 5.5, a bar shall withstand, without fracture, a) being bent through an angle of 45° round a mandrel of twice the nominal size of the bar in the case of mild steel bar and five times the nominal size of the bar in the case of high yield stress steel bar; and then b) being bent back (partially restraightened) by a steadily applied force through an angle of at least 23°.	When tested with accordance with 5.5, the bars withstood, without fracture being bent through an angle of 45° round a mandrel of five times the nominal size of the bars and being bent back (partially restraightened) by a steadily applied force through an angle of 23°.	Complied
3.9	**Deformed bars**	A bar shall be deemed to be deformed if it complies with either (a) or (b) below: a) **Geometrical properties.** When measured in accordance with 5.6.1, a bar shall have two or more rows of transverse ribs as shown in figure 2, with a substantially uniform spacing of not more than 0,8 d where d is the nominal size of the bar. The included angle of the transverse rib at the longitudinal axis of the bar shall be at least 45°. The mean area of ribs (per unit length of bar) above the core of the bar projected on the plane normal to the axis of the bar shall be at least 0,15 d mm^2/mm.	When measured in accordance with 5.6.1, the bars had two (2) rows of transverse ribs, with a substantially uniform spacing of not more than 0,8 d. The included angle of the longitudinal axis of the bar was more than 45° and the mean area of ribs was greater than 0,15 d mm^2/mm. Refer to table 3.9 below for the detailed geometrical properties results.	Complied
3.9	**Deformed bars**	b) **Resistance to pull-out.** When a bar is tested in accordance with 5.6.2, the average free-end slip of the bar shall not exceed 0,2 mm.	This clause is not applicable.	Not applicable

Table 3.9 – Geometrical properties							
Sample	**Spacing of transverse ribs (mm)**		**Included angle (°)**		**Mean area of ribs per unit length (mm^2/mm)**		**Remarks**
	Actual	**Specified**	**Actual**	**Specified**	**Actual**	**Specified**	
M101/25a_1	5,63	6,4 (max)	63,0	45 (min)	2,90	1,2 (min)	Complied
M101/25a_2	7,10	8,0 (max)	63,0		4,26	1,5 (min)	Complied
M101/25a_3	8,08	9,6 (max)	65,7		6,36	1,8 (min)	Complied
M101/25a_4	9,93	12,8 (max)	65,0		7,34	2,4 (min)	Complied
M101/25a_5	9,93	16,0 (max)	64,0		10,56	3,0 (min)	Complied
M101/25a_6	13,29	20,0 (max)	67,0		12,37	3,75 (min)	Complied
M101/25a_7	15,18	25,6 (max)	63,0		12,96	4,8 (min)	Complied

4	**Marking**	**4.1 Bars** In the case of hot-rolled high yield steel bars, each bar shall bear a pair of longitudinal stripes rolled into the bar at intervals not exceeding 1,5 m. (if transverse ribs intersect these stripes, the ribs may be discontinued at the point of intersection).	Each bar had a pair of longitudinal stripes that were rolled into the bar at intervals not exceeding 1,5 m on the size submitted.	Complied
		4.2 Bundles Each bundle or coil dispatched from the rolling mills shall have securely attached to it a metal label that bears the following information: a) the manufacturer's name or trade name or trademark; b) the type, cast number and nominal size of the bar(s); c) the number or mass of bar(s) in the bundle or coil, as relevant; d) when relevant, an indication that the steel was made by the basic oxygen process.	Each bundle had securely attached to it a label with the following information: a) PDV METALS. b) The type. HRB500, HRB500, HRB500, HRB500, HRB450, HRB500 & HRB450, cast no. A0044, A0045, A0009, A0050, A0046, A0049 & A0052 and nominal size. Y8, Y10, Y12, Y16, Y20, Y25 & Y32. c) the number of bar(s) in the bundle. 3, for testing purposes only. d) Not relevant.	Complied

4. SAMPLE SUBMITTED

The samples were received in good condition and suitable for testing

Date sample received : 2025 – 09 – 05
Test commencement date : 2025 – 09 – 15
Test completion date : 2025 – 09 – 17

5. EQUIPMENT

Clause	Equipment	Serial No	Next calibration date	UoM
3.3	Digital Vernier	160316250	2025/09	± 0,015 mm
3.4	5m Tape	907689	2026/06	± 0,3 mm
3.5	Balance Scale	SABSAE F1.2	2026/07	± 0,03 kg
3.7	Universal Testing Machine	06000073	2025/10	± 0,43 %
3.7	Thermocouple with k-probe	04270034101	2025/09	± 1,0 °C
3.8	Tensile & Compression Machine - Instron	H2122/UK120	2026/05	± 0,42 %

The reported uncertainties of measurement are based on a standard uncertainty multiplied by coverage factor of k=2 which, unless specifically stated otherwise, provide a level of confidence of approximately 95%.

6. CONDITIONING AND TEST ENVIRONMENT

The samples required to be tested at the specified temperature of 10°C – 35°C for clause 3.7 of tensile properties and the actual temperature reading was 22,7°C and 21,1°C during the test.

7. SUBCONTRACTING TESTS

Mechanical Testing Laboratory at SABS Commercial SOC Ltd performed all the tests.

8. REMARKS

Tested samples will be disposed of, if not collected within a period of one week from the date of this test report.

Checked by: V. Kgati
Technical Signatory
Mechanical Testing Laboratory

Tested by: T.A Makgae
Test Officer
Mechanical Testing Laboratory

Approved by: F. Zhakata
Acting Technical lead
Mechanical Testing Laboratory

*****END OF REPORT*****