Data sheet: G1.1

Reinforcing steel bars

Hot rolled plain & deformed steel bars, mild & high-strength grades

General description

ArcelorMittal South Africa, Newcastle Steel produces steel for the reinforcement of concrete according to the requirements of SANS 920: 2011, BS 4449: 1997 and BS 4449:2005. Two types are produced viz. mild steel smooth bar and deformed high strength bar.

Steel specifications

Profile	Specification[1]	Code	CE[2&3]
Mild steel smooth bar	BS 4449: 1997 250 MPa	365 001	0.42
	SANS 920: 2011 250 MPa	640 001	
Mesh smooth bar[4]	Mesh 6	C36 140	n/a
	Mesh 8	551 180	
	Mesh 10	552 140	
	Mesh 12	553 210	
Rebar (High Strength)	BS 4449: 2005 Gr B500B	488 286	0.50
		488 510	
	BS4449:1997 460B SANS 920:2011 460MPa	630 001	0.51
		630 003	
		630 009	
		630 286	

1 *Only applicable to steel made by the basic oxygen process.*

2 *Weldability: If the actual carbon equivalent of a cast is less or equal than specified in the table for a specific cast, the steel may be regarded as being weldable provided the correct welding procedures are followed. If weldability is an essential requirement for high strength bars it should be specified in the order.*

3 *Carbon equivalent = %C+%Mn/6+(%Cr+%Mo+%V)/5+(%Ni+%Cu)/15*

4 Mesh not suitable for galvanizing.

For further information, contact:
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Mechanical properties

Specification	Yield strength[1 & 2] (min) [MPa]	Tensile strength (min)[MPa]	Elongation[3] (min) [%]	Mandrel diameter 180° bend test[4]
SANS 920: 2011 250 MPa	250 - 400	>1.15 x Actual yield strength	22 min	2D
BS 4449: 2005 Gr B500B (only available in 6-32mm)	485 – 650	>1.08	Agt=5 min	3D re-bend 5D re-bend ≤16mm 4D re-bend >16mm 7D
BS 4449:1997 460B SANS 920:2011 450MPa	460	>1.08	Agt=5 min	3D re-bend 5D re-bend ≤16mm 4D re-bend >16mm 7D

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1 *Characteristic strength for Limit State Design.*
2 *Yield strength or 0,2% proof stress.*
3 *Gauge length = 5,65 x square root of A_o, where A_o = original cross section of the bar.*
4 *D = bar diameter*

Plain and deformed standard sizes

Nominal diameter	Nominal mass	Available as lengths (L) and/or coils (C)	Nominal cross-sectional area[2]	Circumference
mm	kg/m		Mm	mm
6	0,222	L[1] and C	28,27	18,85
8	0,395	L[1] and C	50,27	25,13
10	0,617	L and C	78,54	31,42
12	0,888	L and C	113,1	37,70
14		L		
14.5		L		
15.5		L		
16	1,578	L	201,1	50,27
20	2,466	L	314,2	62,83
25	3,853	L	490,9	78,53
32	6,313	L	804,2	100,5
40	9,865	L	1256,6	125,7

1. *Straightening may cause deviations from the* NOSTRA® *requirements.*
2. *Nominal cross-sectional area for deformed bar is the equivalent nominal cross sectional area of corresponding size plain bar.*
3. *40mm Can only be supplied in grades other than BS4449:2005 Grade B500B.*

Dimensional tolerance

Size	Permissible variation in:	
	Diameter	Maximum ovality
6 - 12 mm in coils	± 0,40 mm	0,65 mm
6 - 8 mm in lengths	± 0,40 mm	0,65 mm
10 mm in lengths	± 0,40 mm	0,80 mm
12 - 40 mm in lengths	± 0,80 mm	1,60 mm

The above dimensional tolerances are applicable to SANS 920 and BS 4449 tolerances.

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Coil mass and dimensions

Coils are produced in the following sizes:

Characteristics	For rod diameters 5,5 to 14 mm	
	Small coils	Large coils
Nominal mass	1680 kg	2140 kg
Minimum inside diameter	800 mm	
Maximum outside diameter	1250 mm	
Maximum height	1300 mm	1650 mm

Note: All masses will be within 10% of the nominal mass.

Bundle mass

Bundle mass with a maximum of 2 tons must be specified by the customer.

Lengths

Bar Mill - 6m to 18m in increments of 1 meter Rod Mill - 5m to 13m in increments of 1 meter

Other lengths subject to enquiry

Mass and length tolerances

	Bar diameter (mm)	Tolerance
Batch mass (applicable to lengths only)	All diameters	+6,0 - 4,0%
Linear mass (individual bars)	All diameters	+8,0 - 8,0%
Length	All diameters	- 0 + 50 mm

Rolled-in marking

BS 4449: Grade B500B – The reinforcing steel bars shall be identified by the ArcelorMittal Logo and the lettering B500B on the surface at intervals not greater than 1.5 m to indicate that the origin is from ArcelorMittal South Africa, Newcastle Steel.

Corrosion

Tightly adherent light corrosion products should not adversely affect the bond strength of reinforcing bars. Loose corrosion products should be removed by wire brushing.

Straightening

Note that not all straightening machines are suitable for the straightening of coiled NOSTRA® rebar. The straightness of cold straightened material is not guaranteed to the normal 4mm/m guarantee. The material will not contain any kinks or sharp bends and will be fit for purpose for reinforcing and general use.

Certification

Test and analysis certificates are supplied with all material.
The mechanical and chemical laboratories of ArcelorMittal Steel South Africa, Newcastle Steel are SANAS accredited facilities

Applications

ArcelorMittal Steel South Africa's reinforcing steel is used for the full range of concrete reinforcement applications such as foundations, columns, beams and slabs as well as bridge and water-retention structures. A specially adapted ribbed bar is also widely used as roof bolting for the mining industry.

Bundling

Coils (5,5 – 14mm): Individual coils are strapped with four straps evenly spaced around the periphery. Coils for the export market are further secured with a lateral rod tie at each strap position. A radial or belly wire is attached to the lateral ties in the middle of the coil.

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Lengths: Lengths are securely tied in bundles normally containing a standard number of bars per size and length. Bundles are secured with wire ties or steel straps depending on bar diameter, two adjacent straps approximately 150 - 250 mm from each end and intermediate straps at approximately 1.5 m intervals. (A list of standard bundles is available on request)

Labels and marking

Labels

One polyester label on a metal backing will be tied to each end of the coil/bundle by means of wire ties or laced to coil/bundle straps at works' option.

Coloured metal backings are available in: white, blue, green, purple, grey, brown, orange, pink, black, beige, light green, light blue and red.

Where no metal backing colour is specified on orders, white labels will normally be used at the works' discretion.

Labels will bear information on a maximum of four lines with a maximum of forty-five characters per line.

The following standard information will normally be stated:

- ArcelorMittal Steel South Africa's order confirmation number
- Port of destination (export)
- Cast number
- Steel grade and bar diameter
- Coil/bundle mass
- Number of bars per bundle (if specifically requested)
- Coil/bundle number
- Coil/bundle numbers are also printed on a bar code.

Colour marking

Water based paint marking is available in single colours or up to three stripes in two colours or up to three stripes in three colour combinations, for customer's identification purposes.

Colours available: red, green, blue, pink and white

Coloured lines/bands are approximately 50 or 100mm wide and are applied through approximately 180 degrees. Colour splashes are approximately 100mm in diameter.

Note: Paint marking is not available on products produced at the Rod Mill.

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