

Data sheet: S3

Bar and structural products

Profiles, dimensions & tolerances

Introduction

ArcelorMittal South Africa, Vereeniging Works produces a wide variety of long and forged products. Products are available in various sizes of round bar, square sections with round corners and flats bar. Sizes from 16mm up to 85mm in diameter are hot rolled while sizes from 90mm to 180mm are forged on a GFM long forging machine. Semi Forged sizes is 185 to 260mm. Round bar in coil, 10.5 to 28.5mm isn't currently available from Vereeniging works. The sizes available will vary according to the product and to the facility used to produce it. The purpose of this data sheet is to list the sizes and tolerances applicable to these sizes. Sizes and profiles not included may, however, be available subject to enquiry.

- *For specific information relating to the production facilities, Steel grades and other products at ArcelorMittal South Africa, Vereeniging Works: Refer to data sheets listed below*
 - ArcelorMittal VN S1 Production Facilities
 - ArcelorMittal VN S2 Steel Grades
 - **ArcelorMittal VN S3 Profiles**
 - ArcelorMittal VN S4.1 Forge Facilities
 - ArcelorMittal VN S4.2 Forged Products
 - ArcelorMittal VN S4.3 Forged ingots blooms billet
 - ArcelorMittal VN S5 Seamless Tubes
 - ArcelorMittal VN V1.1 Standard Window Profiles
 - ArcelorMittal VN V1.2 Light Window Profiles
 - ArcelorMittal VN V2.1 Fencing Profiles
 - ArcelorMittal VN V2.2 Afri-post
 - ArcelorMittal VN V2.3 Palisades

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Standard lengths (All profiles)

Standard lengths are available in steps of 100 mm in the range of 3 to 13 meters, with the exception of the limitations listed below. Lengths ordered shorter than 5m, as-rolled condition, is only available for >25mm diameter.

Conditions for standard lengths

Length extras are charged if the following conditions can't be accepted as part of the order:

5% Shorts acceptable (carbon steel)

Up to 5% of the ordered mass can be supplied in random short lengths from 3 metres up to the ordered length. Orders to be endorsed "5% shorts acceptable".

10% Shorts acceptable (alloy steel)

Up to 10% of the ordered mass can be supplied in random short lengths from 3 metres up to the ordered length. Orders to be endorsed "10% shorts acceptable".

Multiples

The shortest specified length that can be ordered is 4 metres. Orders must be endorsed "Multiples" quoting the multiple lengths. Final lengths consisting of several multiples will be supplied within a cutting tolerance of -0.0mm - +50mm overall. Customer must be prepared to accept up to 10% of the bars shorter than 4 metres but these will be supplied in multiples as requested.

Notes

- Notwithstanding any lengths quoted in the table for length limitations, the maximum length that can be supplied:
 - Normalised or annealed condition is 6 meters
 - Hardened and tempered condition 6 meters
- The maximum length that can be tested for surface cracks by MPI is 7 metres.
- The standard cutting tolerance on mill-cut lengths is -0.0mm +50mm.
- Stricter cutting tolerances are available on request.

Straightness tolerance

A commercial straightness tolerance of 5mm maximum deviation over 1 meter will apply for all round, square and flat bar.

When the order is endorsed "special straightening" in which case the maximum deviation will be 2.5mm over 1meter (Round bar only). This is only available for diameters over 16mm and lengths up to 7 meters maximum.

Hot rolled rounds: kg/m and tolerances

Φ Size mm	Mass kg/m	Tolerance (mm)		
		Commercial	Bolt & chain	SS 10/301
16.0	1.58	± 0.30	"	"
16.5	1.68	"	"	± 0.21
17.0	1.78	"	"	"
18.0	2.00	± 0.30	± 0.25	"
18.5	2.11	"	"	"
19.0	2.23	"	"	"
20.0	2.47	"	"	"
20.5	2.59	"	± 0.30	± 0.25
21.5	2.85	"	"	"
22.0	2.98	"	"	"
23.0	3.26	"	"	"
23.5	3.40	± 0.30	± 0.30	"
24.0	3.55	"	"	"
24.5	3.70	"	"	± 0.28
25.0	3.85	"	"	"
26.0	4.17	"	"	"
26.5	4.33	"	"	"
27.0	4.49	"	"	"
28.0	4.84	"	"	"
28.5	5.00	"	"	"
30.0	5.55	± 0.45	± 0.35	± 0.33

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Φ Size mm	Mass kg/m	Tolerance (mm)		
		Commercial	Bolt & chain	SS 10/301
32.0	6.31	"	± 0.50	"
33.5	6.92	"	"	± 0.41
34.0	7.12	"	"	"
35.0	7.55	"	"	"
36.0	7.99	"	"	"
36.5	8.20	"	"	"
37.0	8.44	"	"	"
38.0	8.90	"	"	"
39.0	9.37	"	"	"
40.0	9.85	± 0.60	"	± 0.46
42.0	10.9	"	"	"
43.0	11.4	"	"	"
45.0	12.5	"	"	± 0.56
46.5	13.3	"	"	"
48.0	14.2	"	"	"
50.0	15.4	"	"	"
51.5	16.34	"	"	"
52.0	16.65	"	"	"
53.0	17.3	"	"	"
54.0	18.0	± 0.80	"	"
55.0	18.7	"	"	"
58.0	20.7	"	"	"
60.0	22.2	"	"	"
63.0	24.5	"	"	"
64.0	25.23	± 1.20	"	± 0.64
65.0	26.0	"	"	± 0.64
68.0	28.5	"	"	"
70.0	30.2	"	"	"
73.0	32.9	"	"	"
75.0	34.7	"	"	"
78.0	37.5	± 1.57	"	"
80.0	39.5	"	"	"
85.0	44.5	"	"	"

NOTE: Out of roundness tolerance is equal to a maximum of 75% of the total tolerance.

Standard lengths Rounds

Φ Size (mm)	Ingot route			B/M route		
	Group 1 (m)	Group 2 (m)	Group 3 (m)	Group 1 (m)	Group 2 (m)	Group 3 (m)
68	5.20	6.20	7.80	4.40	5.80	7.00
70	5.00	6.00	7.50	5.50	6.50	8.20
73	5.50	6.70	-	5.00	6.00	-
75	5.20	6.50	8.60	4.10	5.80	7.20
78	5.20	6.50	-	4.80	6.00	-
80	4.60	5.60	7.50	5.00	6.40	8.50
85	5.10	6.70	10.00	4.50	5.60	7.50

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Rolled Round cornered squares: kg/m and Tolerances

Size (mm)	Mass (kg/m)	Approximate corner radius (mm)	Rolling tolerance (± mm)
35.0	9.57	4.50	0.43
40.0	12.51	5.00	0.50
45.0	15.83	5.50	0.56
50.0	19.54	6.25	0.63
55.0	23.66	6.75	0.64
60.0	28.14	7.50	0.75
65.0	33.03	8.00	0.80
70.0	38.30	8.75	0.88
75.0	44.15	9.13	0.92
80.0	50.03	10.00	1.00
85.0	56.90	11.25	1.08
92.1	66.20	11.25	1.10

Standard lengths: Round cornered squares

Size (mm)	Variable length (m)					
	Ingot route 950			B/M route 1050		
55	6.50	7.80	9.60	6.10	7.20	8.50
60	5.40	6.40	8.00	6.00	7.20	9.00
65	5.50	7.00	9.00	5.10	6.20	7.60
70		6.00	8.00	5.50	6.50	9.00
75	5.20	7.00	10.50	5.80	7.50	11.60
80		6.00	9.00	5.10	7.00	10.00
85	5.50		8.00	6.00	9.00	

Hot-rolled flats: Available sizes and kg/m

Thickness (mm)	Width (mm)							
	44.5	50	50,8	57.15	60	63.5	65	70
6	2.03	2.29	2.33		2.76	2.93	3.00	3.23
6.5	2.23							
7	2.36	2.66			3.21	3.40	3.49	3.76
7.4	2.54							
8	2.68	3.03	3.08	3.48	3.66	3.88	3.97	4.28
9		3.39		3.90	4.10	4.35		4.80
9.1	3.14							
10		3.75		4.31	4.54	4.81	4.93	5.32
11		4.11			4.97	5.27		5.83
12		4.46			5.40	5.73		6.34
13		4.81			5.83	6.19		6.85
14		5.16			6.26			7.36
15					6.68			7.86
16		5.84		6.74	7.10			
17					7.53			
18								
20								
21		7.67						

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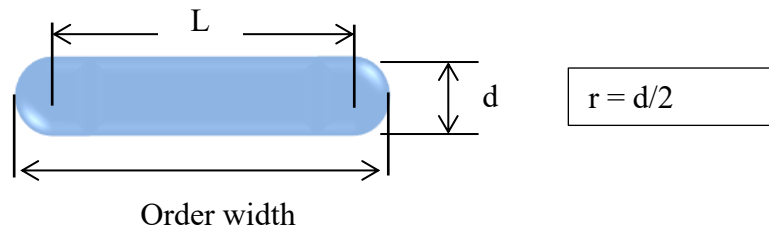
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Thickness (mm)	Width (mm)					
	75	76.2	80	90*	100*	103*
6		3.53				
7			4.31			
8		4.67	4.91	5.54	6.17	
9		5.24	5.51	6.22	6.92	
10	5.71	5.81	6.11	6.89	7.67	
11	6.27	6.37	6.70	7.56	8.42	
12	6.82	6.93	7.29	8.23	9.17	
12.7						10.15
13	7.36	7.48	7.89	8.89	9.91	
14	7.90	8.04	8.45	9.55	10.65	
15			9.03	10.21	11.38	
16		9.13	9.61	10.86	12.12	
18						14.43
20				13.44	15.01	
21			13.21			
22				15.25	16.94	
23				15.94	17.71	
24				16.63	18.48	
25				17.67	19.61	20.23

* 90 up to 105mm widths are supplied to uncontrolled corner radius.

Calculation of kg/m for flats: (Round cornered)



$$\text{Kg/m} = (\text{Corner area} + \text{rectangular area}) \times \text{density}$$

$$\text{Kg/m} = ((\pi r^2) + (L \times d)) \times 7.85$$

Standard tolerances: Flats

Nominal width (mm)	Width tolerance (mm)
44.5 ≤ 50.8	± 0.30
>50.8 ≤ 80	± 0.50
Nominal width (mm)	Width tolerance (mm)
>80.0 ≤ 100.0	+0.76
	-0.38

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Nominal Width (mm)	Thickness tolerance (mm)		
	< = 10	> 10	
44.5 ≤ 80.0	± 0.15	± 0.20	
Nominal Width (mm)	Thickness tolerance (mm)		
	< = 8	> 8-16	>16
>80.0 ≤ 100.0	+0.38	+0.38	+0.51
	-0.13	-0.26	-0.38

Concavity in measured according to DIN 4620

Width (mm)	Thickness	
	< = 10 mm	> 10 mm
44.5 ≤ 50.8	0.15mm max	0.15mm max
>50.8 ≤ 80	0.15mm max	0.20mm max
>80 ≤ 100	0.20mm max	0.30mm max

Hexagons

Size (mm)	Mass (kg/m)	Tolerance (mm)
19.2	2.2	+0.00 –0.40
22.4	3.1	+0.00 –0.40
25.6	4.0	+0.00 –0.60
31.75	6.0	+0.00 –0.90

Hollow drill steels

Alloy or carbon steels according to ISO 722: 1991 and ISO 1722: 1991

Description	Nominal		A	Approx Mass kg/m	Hole size (mm)	Ovality (mm)	Max Eccentricity (mm)	Lengths (m)
	Size	Tol						
19mm Round corner	19.2	+ 0.0 -0.4	21.4	2.2	5.6 ± 0.70	± 1.4	1.0	8 to 11
22mm Round corner	22.4	+ 0.0 -0.4	24.8	3.1	6.7 ± 0.70	± 1.4	1.0	8 to 11
25mm Round corner	25.6	+ 0.0 -0.6	28.5	4.0	7.6 ± 0.75	± 1.5	1.5	8 to 11
32mm Round corner	31.75	+ 0.0 -0.9	35.2	6.0	10.35 ± 1.0	± 2.0	1.5	6 to 9.0

Non-standard sizes: on enquiry only

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Round Hollow Bar (Furnace lance)

Size	Tolerance (mm)	Hole size & tolerance (mm)	Ovality (mm)	Eccentricity (mm)
32mm	-0 +0.51	9.5 ± 1.0	± 2	1.5
35mm	-0 +0.53	10.35 ± 1.0	± 2	1.5

Note: Deformed Hollow bar available in 24 & 25mm

DQS Certificates:

- **ISO 9001 : 2015, Registration number 314994 QM15, date re- certified 2017-11-11 valid until 2020-11-10**
- **ISO 14001 : 2015, Registration number 314994 UM15, re – certified 2017-11-11, valid until 2020-11-10**
- **BS OSHAS 18001 : 2007: Registration number 314994 BSOH, re – certified 2017-11-11, valid until 2020-11-10**

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