

Data sheet: H1.1

Rails

Hot rolled steel sections for railway material

General description

Rails for use in mines are supplied to ArcelorMittal Steel South Africa's own specification as Mines and Sidings rails in 15 kg/m, 22 kg/m and 30 kg/m sizes.

This data sheet contains only the standard manufactured specifications. Other steel specifications, surface specifications, rolling tolerances, sizes and lengths may be considered on an enquiry basis.

Steel making

Steel used for the manufacture of rails is made in a basic oxygen furnace and then continuously cast into blooms before rolling.

Quality assurance

Quality assurance systems based on the requirements of SANS ISO 9001: 2000 are in operation.

Steel specification

Specification	Code	Rail size	% Carbon Equivalent ¹
Mines and Sidings: Grade 700	512 300	15 kg/m	0,63/0,74
Mines and Sidings: Grade 700	512 300	22 kg/m	0,63/0,74
Mines and Sidings: Grade 700	512 550	30 kg/m	0,67/0,82

$$1 \% \text{ Carbon equivalent} = \% C + \frac{\% Mn}{4} + \frac{(\% Cr + \% Mo + \% V)}{5} + \frac{(\% Ni + \% Cu)}{15}$$

Mechanical properties

Modern testing and analysis facilities are used to ensure compliance with the rail specifications.

Specification	Tensile strength (min) MPa	Elongation (min) %	Yield ¹ strength (min) MPa
Mines and Sidings Grade 700	680	10	400

¹ Typical values, not guaranteed.

Design data

Data	Sizes in kg/m		
	15	22	30
Nominal mass (kg/m)	14,905	22,542	30,250
Total Cross sectional areas (x10 ³ mm ²)	1,899	2,872	3,853
Moments of inertia: x : (10 ⁶ mm ⁴)	1,49	3,51	6,25
Moments of inertia: y : (10 ⁵ mm ⁴)	3,86	8.61	15.58

Note: See the cross sectional drawings for other dimensions.

For further information, contact:

ArcelorMittal Steel South Africa Limited, Newcastle Steel, PO Box 2, Newcastle 2940. Tel (034) 314-8629 Fax (034) 314-8211
e-mail address: enquiries.newcastle@arcelormittal.com

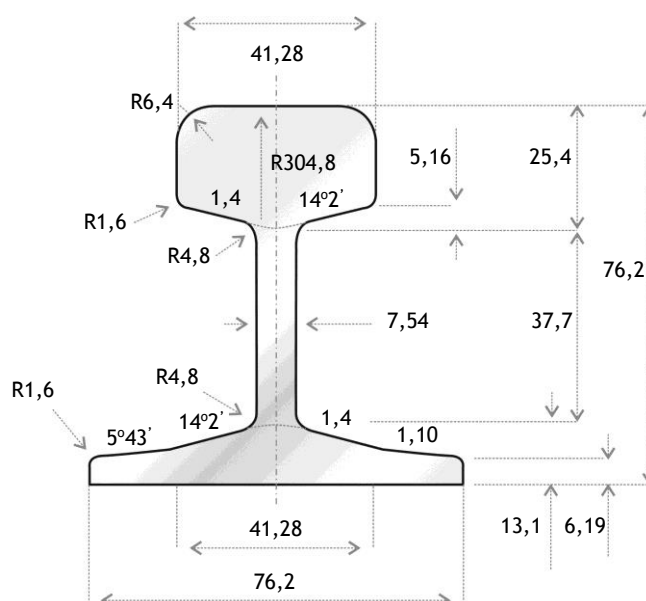
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Welding

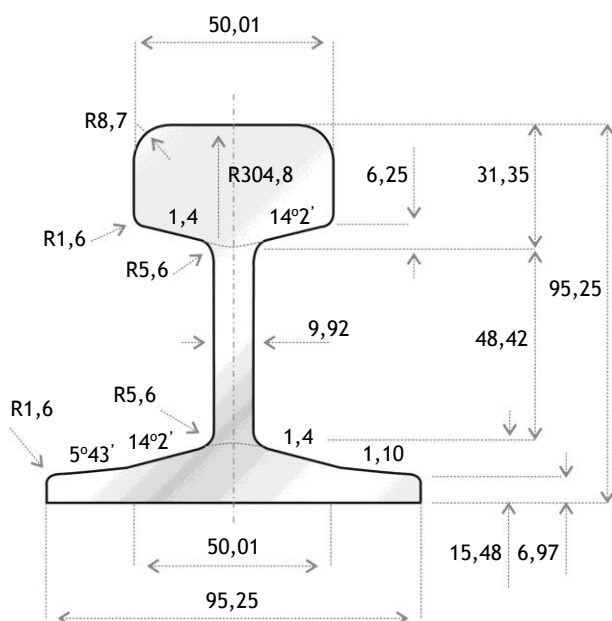
Rails produced by ArcelorMittal Steel South Africa can be welded by "flash-butt" or "thermite" techniques. For practical details it is recommended that an authority should be consulted. The following table gives an indication of the minimum cooling time recommended for the heat-affected zone.

Specification	Minimum cooling time from 800 °C to 500 °C in seconds	
	1000 °C ¹	850 °C ¹
Mines and Sidings: Grade 700	35	26

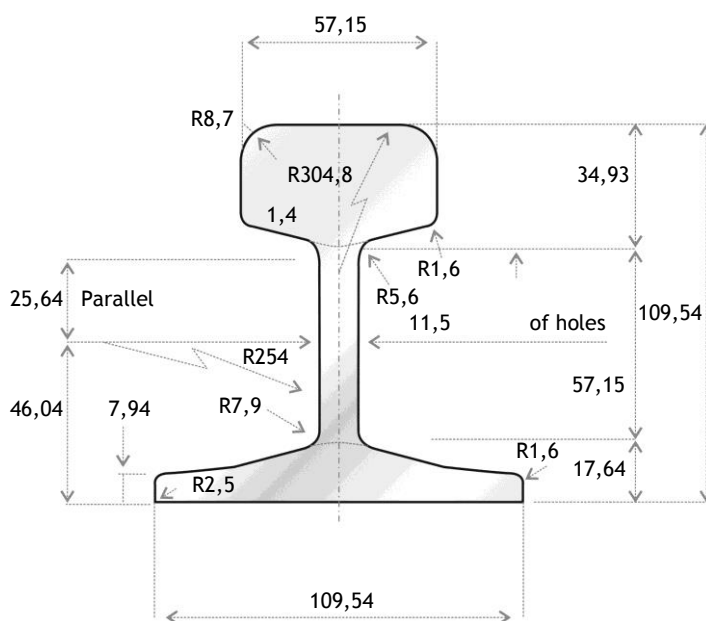
1 Austenitising temperature



15 kg/m



22 kg/m



30 kg/m

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Tolerances to SPE 240

	15, 22 and 30 kg/m rails
Overall height	+1,0 -0,5 mm
Width of the head	± 1,0 mm
Width of the base	± 2,0 mm
Thickness of the web	+1,0 -0,5 mm
Corner radius	± 1,0 mm
Length	+ 50 mm; 0mm
Delivery tolerance:	
40 < 100 tons	± 10 %
≥ 100 tons	± 5%

Camber rails are supplied as rolled to a max camber of 6mm per meter of length.

Standard lengths

5 - 18m

Rails are friction saw cut and the squareness of the cut is not guaranteed. Burrs resulting from the cutting and punching process are not removed.

Punched Rails

Designated mass (kg/m)	Distance Between Hole Centres	Number	Hole Diameter (mm)	Start Distance (mm)
30	101,6	4	23 +-1	34,1 - 38,1
22	101,6	4	23 +-1	34,1 - 38,1
15	101,6	4	20 +-1	35,6 - 39,6
15	88,9	4	20 +-1	29,3 - 33,3

Supply conditions

Rails are supplied in accordance with ArcelorMittal Steel South Africa's General Conditions of Sale and Price List on Rails Number 240.

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