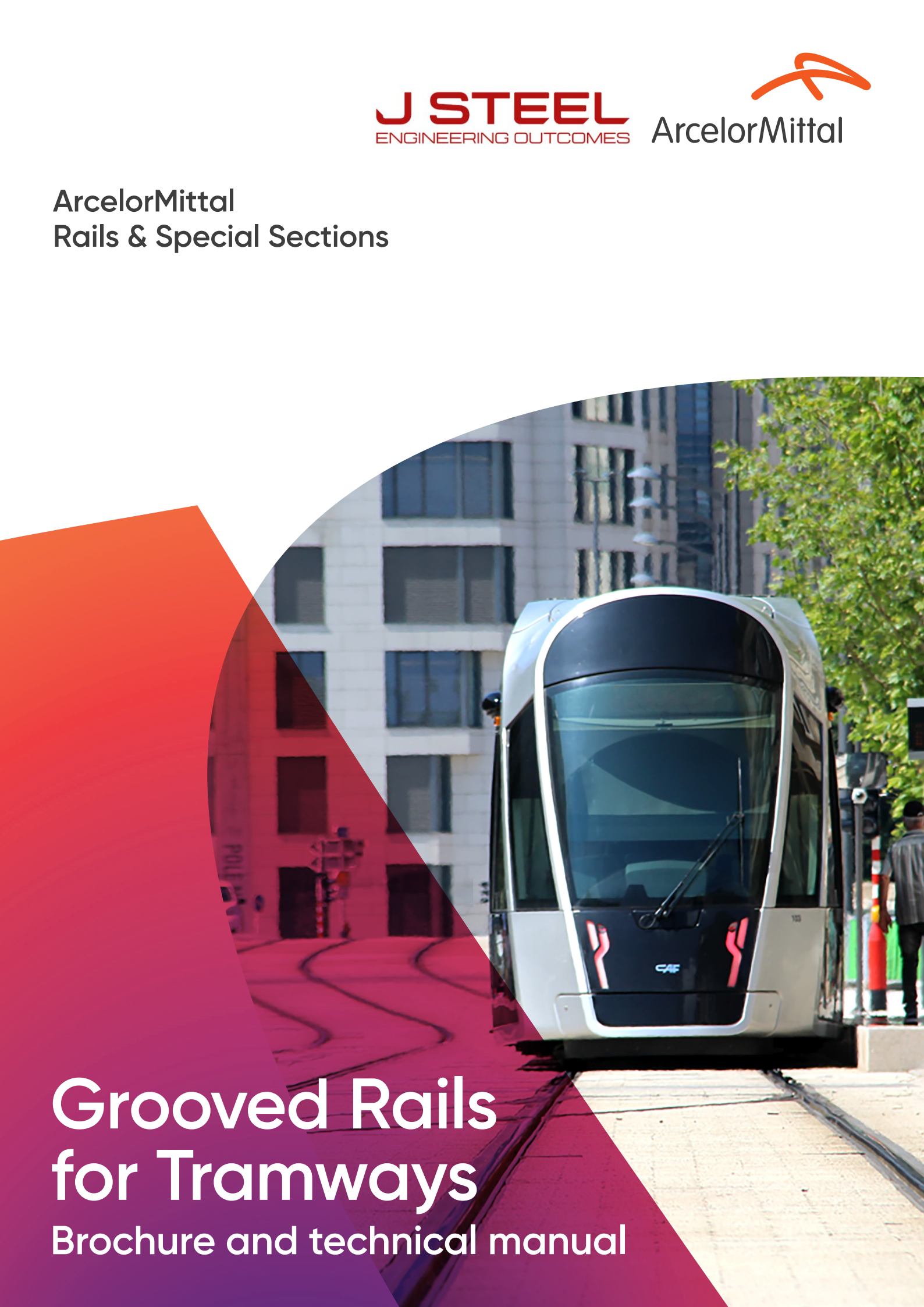


ArcelorMittal
Rails & Special Sections



Grooved Rails for Tramways

Brochure and technical manual

Our Company

ArcelorMittal with over 158.000 employees across 60 countries and industrial locations in 17 countries is the world's leading steel and mining company.

ArcelorMittal is one of the world's largest rail producers with a capacity of 1 million tons of annual rail production with true global presence; supplying rails for railways, metro, tramway, light tracks, crossings, crane rails and rail components.

Due to urban growth and the saturation that it originates, urban transport market is expanding rapidly throughout the world, demanding new requirements that request specific products; ArcelorMittal offers a wide portfolio of railway products for Tram and Light Rail Systems produced at our world-class manufacturing plants in Luxembourg and Poland. Our process complies with most demanding European requirements according to EN 14811.

As the world's leading steel company, we are committed to leading our industry's efforts to decarbonise, and to be part of the solution to the world reaching net-zero by 2050

Achieving carbon neutral steel

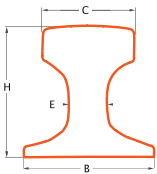
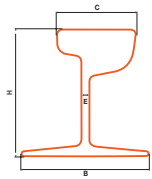
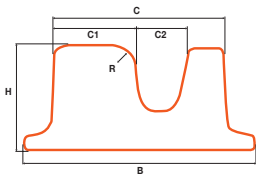
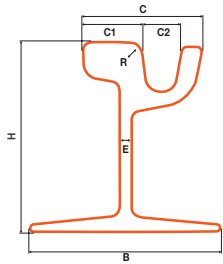
ArcelorMittal Europe has committed to reduce CO₂ emissions by 35 % by 2030, with a further ambition to be carbon neutral by 2050, in line with the EU's Green Deal and the Paris Agreement.

As the leading global steel company, we are engaged in the most important challenge faced by the industry: producing all the steel the world needs in an environmentally sustainable way.

XCarb™ is the new brand name for ArcelorMittal's ongoing global program of steelmaking innovation targeted at carbon-neutral steel by 2050. The initiatives that are part of XCarb™ aim to reduce the carbon footprint of ArcelorMittal and of our customers.

Our first XCarb™ products are now ready for market: XCarb™ green steel certificates and XCarb™ recycled and renewably produced for steel products made via the electric arc furnace route using scrap steel and 100% renewable energy.





RAIL PROFILE	EQUIVALENT PROFILE	MASS /M kg/m	DIMENSIONS (mm)						
EN 14811			R	C1	C2	H	B	E	C
51R1	Ri52	51,37	13/80/300	55,83	42,35	130,00	150,00	12,00	113,00
53R1	Ri53	52,98	13/80/300	55,83	36,34	130,00	150,00	12,00	113,00
54G1 54R1	41GPU	54,26	13/60/200	56,16	41,09	152,50	141,50	13,00	116,82
54G2	Ri54G2	54,55	13/80/200	55,91	41,55	152,50	141,50	13,00	116,82
55G1	35GP	54,77	10/225	56,23	35,94	152,50	141,50	13,00	111,82
55G2	41GP10	55,33	10/225	56,23	40,94	152,50	141,50	13,00	116,82
55G3	41GP13	55,27	13/225	55,61	40,18	152,50	141,50	13,00	116,82
55R1	Ri55NK	55,45	13/80/300	56,00	36,00	150,00	150,00	12,00	113,00
57R1	Ph37	56,54	9/210	51,92	60,46	182,00	150,00	11,00	127,00
59R1	Ri59	58,97	10/225	56,00	42,00	180,00	180,00	12,00	113,00
59R2	Ri59N	58,20	13/80/300	55,83	42,35	180,00	180,00	12,00	113,00
60R1	Ri60	60,59	10/225	55,00	36,00	180,00	180,00	12,00	113,00
60R2	Ri60N	59,75	13/80/300	55,83	36,35	180,00	180,00	12,00	113,00
62R1	NP4aM	62,37	10/225	56,03	34,44	180,00	180,00	12,00	116,00
62R2	NP4aS	61,91	13/80/300	56,86	36,98	180,00	180,00	12,00	116,00
67R1	Ph37A	66,76	13/80/300	60,03	58,66	180,00	180,00	13,00	135,00
53K2	MSzTS52	53,34	10/225	56,00	45,00	70,00	156,00	-	116,00
57K2	LK1	57,68	13/80/300	56,00	36,00	72,00	156,00	-	115,00
58K2	112T	58,29	13/60/200	56,20	41,50	72,00	156,00	-	120,00
73C1	VKRi60	72,73	-	-	-	180,00	180,00	12,00	113,10
MRS125	-	125,00	-	-	-	180,00	180,00	40,00	120,00

GRADES	MECHANICAL PROPERTIES ACCORDING EN14811				CHEMICAL COMPOSITION					
	HBW	ELONG	Rm(Mpa)	C%	Mn%	Si%	Cr%	S%	H2ppm	V%
R200	200-240	≥14	≥680	0.40-0.60	0.70-1.20	0.15-0.58	<0.15	<0.035	<2.5	-
R200V	200-240	≥15	≥690	0.30-0.48	0.70-1.20	0.15-0.58	<0.15	<0.035	<2.5	0.08-0.20
R220G 1	220-260	≥12	≥780	0.50-0.65	1.00-1.25	0.15-0.58	<0.15	<0.025	<2.5	-
R260	260-300	≥10	≥880	0.62-0.80	0.70-1.20	0.15-0.58	<0.15	<0.025	<2.5	-
R260V	260-300	≥11	≥890	0.45-0.58	0.70-1.20	0.15-0.58	<0.15	<0.025	<2.5	0.08-0.20
R290V	290-330	≥10	≥960	0.45-0.58	1.00-1.25	0.15-0.58	<0.15	<0.025	<2.5	0.08-0.20
R320V	320-360	≥9	≥1080	0.65-0.85	0.90-1.30	0.15-0.58	0.20-0.80	<0.025	<2.5	0.05-0.15
B1000	320-360	≥9	≥1080	0.65-0.85	0.90-1.30	0.15-0.58	0.20-0.80	<0.025	<2.5	0.05-0.15

Low carbon vanadium grades for increased service life

ArcelorMittal offers a complete range of Low Carbon Vanadium (LCV) grades for grooved rails which provide better performance and increased service life for Light Rail Transit operators.

At ArcelorMittal, we are actively involved in designing new rail-based solutions that meet the needs and requirements of light rail transit (LRT) operators with the support of our ArcelorMittal Global R&D rail unit. Thanks to pilot plants and prototyping facilities, new products and rail mill processes can be developed, as well as monitor on-track real performance, wear behavior to fatigue, and weldability.

Low Carbon Vanadium (LCV) for better performance, why?

- Able to perform gauge corner restoration.
- Easy maintenance.
- Welding according EN 16771.
- Increased wear resistance.
- Increased fracture toughness.
- Low brittleness.

Increased Service life
Environmental
friendly solution

Better performance compared to conventional heat treatment grades

PERFORM GAUGE CORNER RESTORATION

- Reduction of street interferences.
- Less affection to the urban environment due to noise, dust and traffic diversions.
- Low pre-heat, avoiding problems with the embedded system.

EASY - MAINTENANCE TRACKS

- Smooth grinding effect on softer low carbon vanadium grades for LRT's wheel/rail interaction.
- Reducing maintenance cost.

INCREASED WEAR RESISTANCE

Vanadium content provides:

- Extra strengthening
- Higher fracture toughness
- Low brittleness.

ArcelorMittal Global R&D

In ArcelorMittal we are permanently committed to improving rail steel quality, production and new developments. The development of new materials starts with a design of new material, continues with the fabrication and testing of the prototypes and ends with real test track. To carry out such process, ArcelorMittal Global R&D designs and builds different equipment, such as for advanced laboratory testing and in-use properties control (twin-disk and real size Rolling Contact Fatigue Bench).

In addition, there is a pilot welding plant with: aluminothermic welding equipment, preheating devices and specific repair welding equipment, among others. The rail welding research line has extensive experience in finite element simulation of rail joining processes, which allows us to advance on specific procedures adapted to the new rail grades.

Once the rail is installed on track, a monitoring of the most relevant parameters is carried out. This monitoring of the performance may include hardness, wear, rolling contact fatigue or corrosion evolution.

ArcelorMittal New Rail Service Centre

With this new in-house downstream facility, the service center enables ArcelorMittal Rails & Special Sections to offer full solutions performance and reliability advantages for customers.

The rail service center is designed to carry out, on a surface of 6000 m², a broad range of finishing operations on crane, grooved, light and transport rails. In this first phase, the service center offers the following finishing services: drilling, bending and cutting.

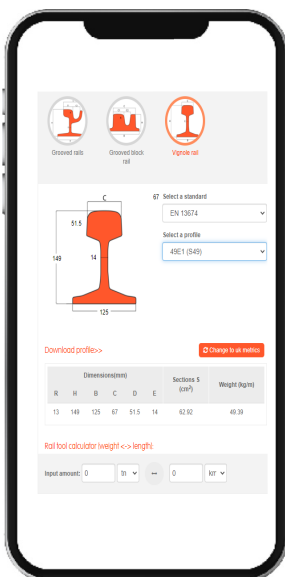
ArcelorMittal strategy, of being a full-service provider and one-stop solution for our customers, brings many benefits as: one single contact, package option, possibility to group standard rails with complex finished rails, 'transformed rails' versus as rolled rails.

Additional information can be found on:

<http://rails.arcelormittal.com>

September 2022

Rail Tool app



rails.arcelormittal.com/rail-tool



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