

Environmental Product Declaration



In accordance with ISO 14025:2006 for:

Railway wheels from *United Metallurgical Company (OMK)*



Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
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Programme information

Programme:	<p>The International EPD® System</p> <p>EPD International AB Box 210 60 SE-100 31 Stockholm Sweden</p> <p>www.environdec.com info@environdec.com</p>
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Accountabilities for PCR, LCA and independent, third-party verification	
Product Category Rules (PCR)	
PCR 2014:10 Fabricated steel products, except construction products, machinery and equipment (being replaced) (2.12)	
PCR review was conducted by: <i>IVL Swedish Environmental Research Institute Secretariat of the International EPD® System</i>	
Life Cycle Assessment (LCA)	
LCA accountability: CIS Center. Moscow, Lyusinovskaya 36/1, www.ciscenter.org , info@ciscenter.org . Phone: +7 495 128 95 45 Dmitry Vadivasov Olga Reshetar	
Third-party verification	
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via:	
<input checked="" type="checkbox"/> EPD verification by individual verifier	
Third-party verifier: Dr Hüdai Kara, Metsims Sustainability Consulting (www.metsims.com)	
Approved by: The International EPD® System	
Procedure for follow-up of data during EPD validity involves third-party verifier:	
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	

The EPD owner has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but from different programmes may not be comparable.

Company information

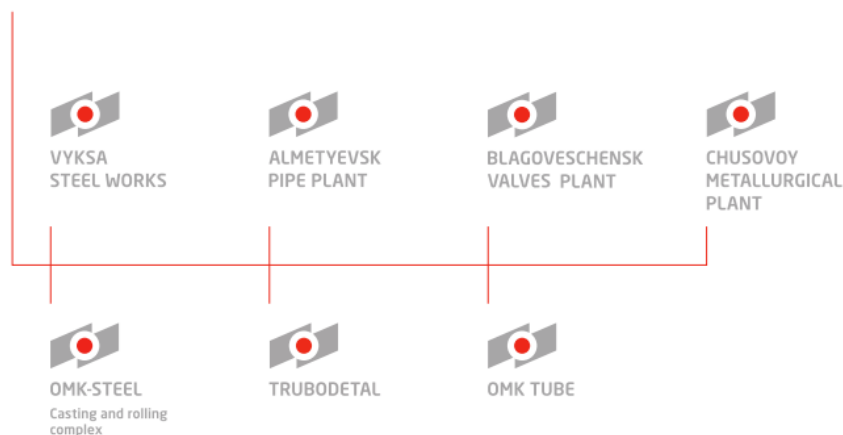
Owner of the EPD:

United Metallurgical Company (OMK)
115184, Russia, Moscow, Ozerkovskaya nab. 28 - 2
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info@omk.ru

Description of the organisation:

United Metallurgical Company (OMK) is a Russian manufacturer of high-quality steel products and integrated solutions designed to meet the most exacting consumer specifications in the fuel energy, transport, construction and other industries.

OMK consists of six large metallurgical plants in Vyksa (Nizhny Novgorod region), Almeteyevsk (Republic of Tatarstan), Chusovoy (Perm region), Chelyabinsk, Blagoveshchensk (Republic of Bashkortostan), and Belgorod, one of the largest train car repair companies in the country OMK Steel Way, a metal service and trading network.



OMK is a national and a CIS leader in railway wheel manufacture.

OMK's railway wheel manufacturing at Vyksa Steel Works utilizes a forged wheel rolling line with a capacity of 950,000 wheels a year. Vyksa Steel Works produces wheels with diameters range of 790 and 1,000 mm for freight and passenger cars, locomotives, and electric subway trains. OMK Railway products' manufacturing facility operates the country's only line to make hi-tech forged wheels for high-speed trains.

OMK Railway products is a leading partner in developing advanced innovative wheel designs. The introduction of such designs helps increase haulage efficiency, develop heavy freight and high-speed passenger traffic.

The principal customers are domestic. However, the business unit's export presence covers over 30 countries, including the US, Canada, Slovakia, Czechia, India, the Baltic nations, etc.

OMK's products for the railways meet international standards, including EN 13262, AAR M-107/M-208, IRS R-19/93, GOST 10791, and custom technical specifications.

Quality of OMK's wheels is evidenced by a certification for compliance with the requirements of Customs Union Technical Regulations (EAEU) 001 and 002, the TSI European technical regulations as well as those of the Association of American Railways (AAR).

The facility and the manufacturing management systems are certified per the requirements of ISO/TS 22163 (IRIS), ISO 9001, ISO 14001, ISO 45001, ISO 50001 as well as per national railway standards.

Name and location of production site:

Vyksa Steel Works (VSW)

st. Br. Batashev, 45, Vyksa, Nizhny Novgorod region, 607060

Product information

Product name:

Railway wheel

Product identification:

OMK's wheels are produced according to international standards and specially developed specifications.

Type of wheels		Steel grade	Diameter, mm	Standards
Wheels for freight and passenger trains				
All -rolled wheels for freight and passenger cars with an axle load of 23.5 tf, 25-30 tf.		2, T	Ø957	GOST 10791-2011
All -rolled wheels of low-loaded design with enhanced performance indicators:	For freight cars with axial load from 23,5 to 27 tf	T	Ø957	GOST 10791-2011
	For freight cars with 23.5 tf axial load	2		
	for passenger rolling stock	L		
Wheels for subway trains		2, L	Ø790	GOST 10791-2011
Wheels for rail buses			Ø865	
All -rolled wheels for North American freight transport		C, D	Ø914-960	AAR M-107/M-208
all -rolled wheels for freight and passenger cars for European countries		ER7, ER8, ER9	Ø840-960	EN 13262:2020
All -rolled wheels for passenger cars and locomotives in Asia		ER7, ER8, ER9, RSW2, class B, class C	Ø840-1000	IRS R 19-93 p. II, AAR M-107/M-208, EN 13262:2020, KS R 9221

Type of wheels	Steel grade	Diameter, mm	Standards
Wheels for high-speed trains			
All -rolled wheels for passenger trains on the road network of the Russian Federation	L, ER9	Ø920-957	GOST 10791-2011/EN 13262:2020
All -rolled wheels for passenger trains of European countries	ER7, ER8, ER9	Ø800-960	GOST 10791-2011/EN 13262:2020
All -rolled wheels for passenger trains of Asian countries	ER7, ER8, ER9, RSW2	Ø840-920	EN 13262:2020, KS R 9221

More information could be found at the company's website: <https://omksteel.com/>

UN CPC code:

41253

Geographical scope:

The main manufacturing plant is situated in Russia, as well as raw material suppliers. As Vyksa Steel Works export its products to the wide range of markets Global geographic coverage is expected to be appropriate for the EPD.

LCA information

Functional unit / declared unit:

The declared unit of product under the research is 1 tonne of railway wheels.

Reference service life:

No applicable

Time representativeness:

Primary data were collected for the 2021 year. Time representativeness of the secondary data was estimated mainly good; no datasets older than 10 years from the representative year were used.

Database(s) and LCA software used:

GaBi Software version 10.6.2.9 was used to model the product life cycle. GaBi professional and construction materials databases were used. Some datasets from the Environmental Footprint (EF) database were also utilised.

Description of system boundaries:

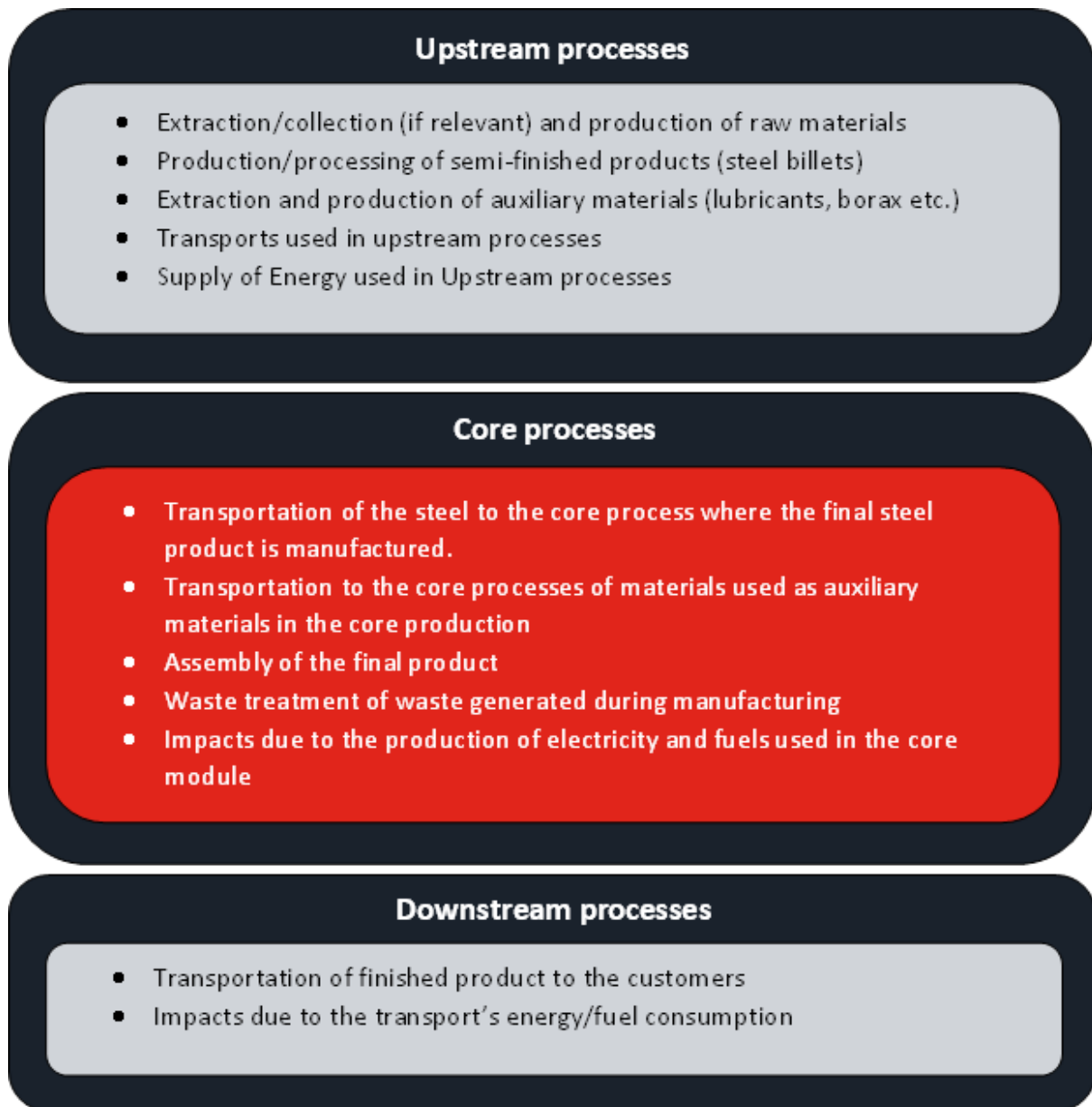
For this LCA and EPD the system boundary “cradle-to-grave” according to the current PCR is considered.

Excluded lifecycle stages:

Impacts from the use of the railway wheel are negligible, therefore, this stage of the life cycle was excluded from the study.

Manufacturing of production equipment, buildings and other capital goods; business travel of personnel; travel to and from work by personnel; research and development activities were also not considered in the impact assessment, as outlined in the PCR

System diagram:



Estimations and Assumptions

In the underlying study, the following assumptions were made:

- The scenario of re-using the spikes on which the wheels are stored was chosen as the main option. As a result, the impact of packaging due to its repeated use is almost negligible.

Allocation

No allocations were made for the modelling of production processes, as the available data do not concern other products manufactured in the plant and there are no coupling processes. Nor were any multi-input processes carried out.

Content declaration

Product

Product components	Weight, kg	Post-consumer material, weight-%	Biogenic material, weight-% and kg C/kg
Steel	1000	Up to 99%	0
TOTAL	1000	Up to 99%	0

Environmental performance

Potential environmental impact

Indicator	Unit	UPSTREAM	CORE	DOWNSTREAM	TOTAL
GWP-fossil	kg CO ₂ eq.	4.84E+02	4.23E+02	2.13E+01	9.29E+02
GWP-biogenic	kg CO ₂ eq.	8.96E+01	1.60E+01	2.15E-01	1.06E+02
GWP-luluc	kg CO ₂ eq.	1.34E-01	1.44E-02	7.39E-04	1.50E-01
GWP - total	kg CO ₂ eq.	5.74E+02	4.39E+02	2.15E+01	1.03E+03
ODP	kg CFC 11 eq.	8.63E-09	5.10E-11	4.12E-12	8.69E-09
AP	mol H ⁺ eq.	1.17E+00	9.49E-01	1.46E-01	2.26E+00
EP-freshwater	kg P eq.	4.83E-01	3.94E-05	2.01E-06	4.83E-01
EP-marine	kg N eq.	3.05E-01	1.69E-01	2.02E-02	4.94E-01
EP-terrestrial	mol N eq.	3.25E+00	1.86E+00	2.21E-01	5.33E+00
POCP	kg NMVOC eq.	1.15E+00	5.00E-01	6.07E-02	1.71E+00
ADP-minerals & metals*	kg Sb eq.	1.87E-04	2.54E-05	1.34E-06	2.14E-04
ADP-fossil*	MJ	5.88E+03	7.41E+03	3.88E+02	1.37E+04
WDP	m ³	2.38E+03	6.52E+03	1.14E+03	1.00E+04
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals & metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption				

Potential environmental impact – additional mandatory and voluntary indicators

Indicator	Unit	UPSTREAM	CORE	DOWNSTREAM	TOTAL
GWP-GHG1	kg CO ₂ eq.	4.85E+02	4.23E+02	2.13E+01	9.29E+02

¹ This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO₂ is set to zero.

Use of resources

Indicator	Unit	UPSTREAM	CORE	DOWNSTREAM	TOTAL
PERE	MJ	3.48E+03	2.26E+02	3.54E+01	3.74E+03
PERM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	3.48E+03	2.26E+02	3.54E+01	3.74E+03
PENRE	MJ	5.79E+03	7.41E+03	3.88E+02	1.36E+04
PENRM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ	5.79E+03	7.41E+03	3.88E+02	1.36E+04
SM	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m3	9.23E+02	5.33E+02	9.06E+01	1.55E+03
Acronyms	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water				

Waste production and output flows

Waste production

PARAMETER	UNIT	Upstream	Core	Downstream	TOTAL
Hazardous waste disposed	kg	5.94E-07	1.24E-06	1.33E-08	1.85E-06
Non-hazardous waste disposed	kg	1.23E+00	4.68E+00	1.39E-01	6.06E+00
Radioactive waste disposed	kg	3.89E-01	1.79E-01	3.10E-02	5.99E-01

Output flows

PARAMETER	UNIT	Upstream	Core	Downstream	TOTAL
Components for reuse	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Material for recycling	kg	0.00E+00	2.52E+02	0.00E+00	2.52E+00
Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, electricity	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, thermal	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00

References

General Programme Instructions of the International EPD® System. Version 4.0.

PCR 2014:10 Fabricated steel products, except construction products, machinery and equipment, version 2.12

ISO 14025:2006, Environmental labels and declarations – Type III Environmental declarations – Principles and procedures, International Organization for Standardization (ISO)

