Environmental Product Declaration

In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021 for:

Steel coil, Hot rolled

from

United Metallurgical Company (OMK)

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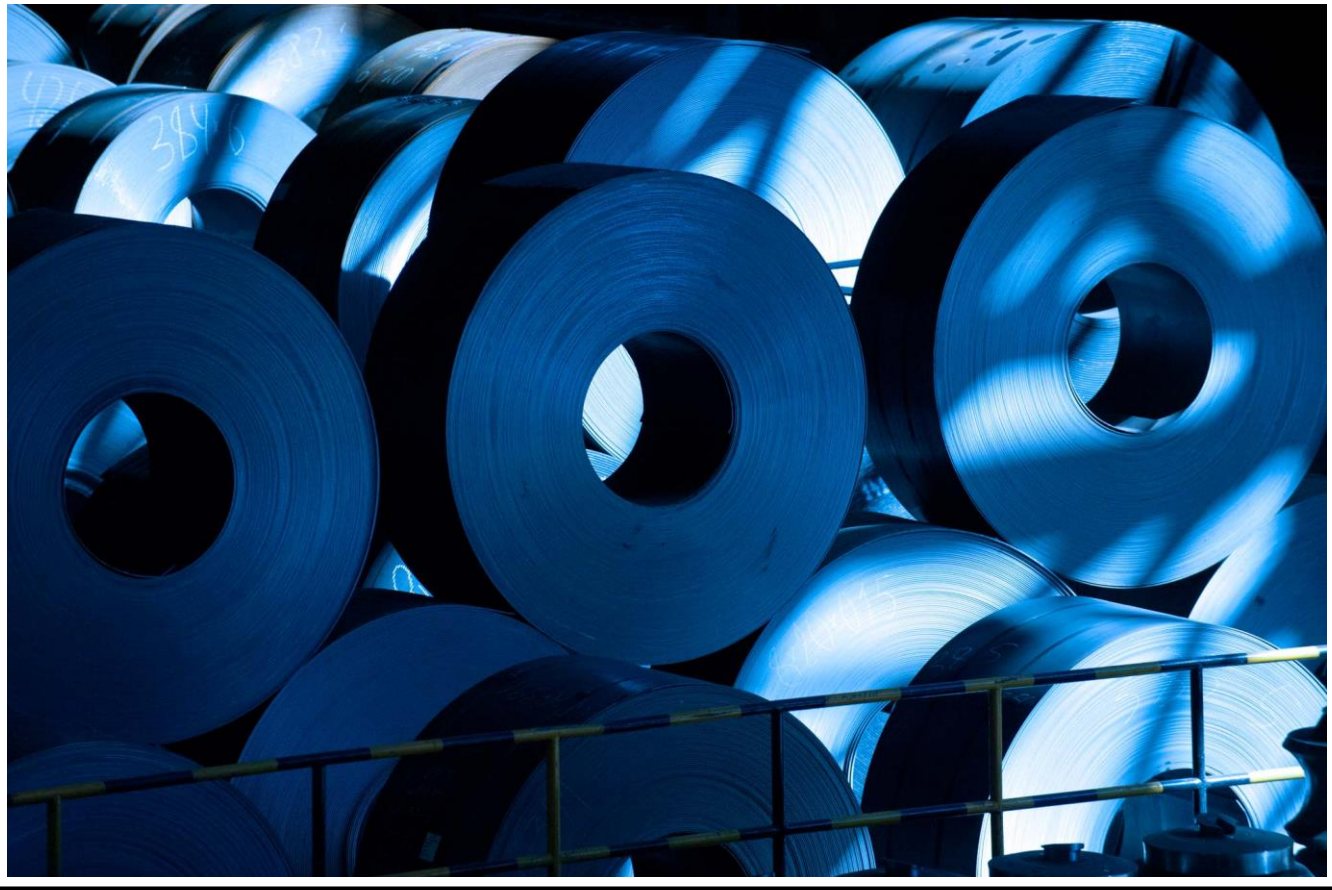

General information

Programme information

Programme:	The International EPD® System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Website:	www.environdec.com
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Accountabilities for PCR, LCA and independent, third-party verification
Product Category Rules (PCR)
CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product Category Rules (PCR): 2019:14 Construction products, version 1.2.5
PCR review was conducted by: Martin Erlandsson, IVL Swedish Environmental Research Institute, martin.erlandsson@ivl.se
Life Cycle Assessment (LCA)
LCA accountability: CIS Center. Moscow, Lyusinovskaya 36/1, www.ciscenter.org, info@ciscenter.org. Phone: +7 495 128 95 45
Third-party verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: ☒ 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: ☐ Yes ☒ No

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EPDs within the same product category but registered in different EPD programmes, or not compliant with EN 15804, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

Company information

Owner of the EPD:

UNITED METALLURGICAL COMPANY

United Metallurgical Company (OMK). Vyksa Steel Works
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info@omk.ru
https://omksteel.com/

Description of the organisation:

United Metallurgical Company (OMK) is one of Russia's largest industrial enterprises and a major contributor to the country's economy. We produce high-quality products which meet the most stringent demands of our customers. It supplies perfectly mature steel and service solutions to the Russian energy industry, including nuclear and heat installations, construction companies, machine building, the automotive sector, railway car construction, and railway transportation.

Vyksa Steel Works (VSW)

One of the oldest metallurgical centres in Russia was established in 1757. The facility produces steel coils, strips and wide sheets in a wide range of parameters and grades from hot rolled produced in 2 industrial complexes: LPK (Casting and Rolling Complex) and STAN-5000 (Heavy Plate Mill).

Product-related or management system-related certifications:

Casting and Rolling Complex (LPK), as well as Heavy Plate Mill (STAN-5000 complex) of the Vyksa Steel Works has certificates "TUV Rheinland", confirming the compliance of manufactured products with the requirements of EU regulation 305/2011/EU (construction products) and compliance of the quality management system with the requirements of the EU directive 2014/68/EU (pressure equipment). The Complexes also have certificates of the Maritime and River Register recognizing the manufacturer as a manufacturer of rolled products for shipbuilding.

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 standards.

Name and location of production site(s):
Vyksa Steel Works (VSW)
st. Br. Batashev, 45, Vyksa, Nizhny Novgorod region, 607060

Product information

Product name:
Steel coil, Hot rolled

Product identification:
Vyksa Steel Works is capable to produce steel coil, strip and wide sheet from hot rolled steel from LPK complex and STAN-5000 complex. Depending on customer request, the company provides products in a wide range of physical parameters and steel grades.

Cast and Rolling Complex		
Steel grade	**Product standard**	**Geometry standard, assortment**
Metalworks		
Ст2пс, Ст3сп, Ст3пс	GOST 14637-89; GOST 16523-97	GOST 19903-2015
10	GOST 1577-93	
20		
С235–С440	GOST 27772-2015	
S235–S450	EN 10025-2	
09Г2С, 17Г1С-У	GOST 19281-2014	
Engineering industry		
Ст2пс, Ст3сп, Ст3пс	GOST 14637-89; GOST 16523-97	GOST 19903-2015
10	GOST 1577-93	
20		
S235–S450	EN 10025-2	
09Г2С, 17Г1С-У, 10-15ХСНД	GOST 19281-2014	
Steel Pipes		
К34–К60	GOST 1577-93 GOST 14637-89 GOST 16523-97 GOST 19281-2014 TS 14-1-3579-83 TS 14-1-5493-2004	GOST 19903-2015
Ст2пс, Ст3сп, Ст3пс, 09Г2С, 09Г2ФБ, 09ГСФ, 17Г1С(-У), 22ГЮ, 08пс, 10, 20, С235-С440, S235-S420		
42–Х70		
Heavy Plate Mill-5000		
Steel grade	**Product standard**	**Geometry standard, assortment**
Metalworks		
Ст0–Ст5 (сп, пс)	GOST 14637-89; GOST 16523-97	GOST 19903-2015, EN 10029:2011-02
08–25 (сп, пс), 30–70 and other	GOST 1577-93	

C235–C440	GOST 27772-2015	
S235–S460	EN 10025-2, 3, 4, 5	
09Г2Д, 09Г2С, 17Г1С-У and other	GOST 19281-2014	
A36 and other	ASTM A36 and other.	
Engineering industry		
09Г2С	GOST 5520-79	GOST 19903-2015,
15К, 20К, 22К	EN 10028–2, 3, 5	EN 10029:2011-02
Heavy engineering		
09Г2С	GOST 19281-2014	GOST 19903-2015
10ХСНД, 15ХСНД		

Product description:

Vyksa Steel Works manufacture Hot rolled steel products can be produced on both complexes (LPK and STAN-5000). Depending on customer request these Complex and Mill are capable to produce the next range of steel products:

CASTING AND ROLLING COMPLEX

Roll thickness:	1.20-12.70 mm
Coil width:	1000-1750 mm
Strip width:	170-1750 mm
Coil diameter (inner/max. outer):	762/2300 mm
Maximum weight of a coil:	12-36 tonnes
Sheet length:	3000-12 200 mm
Width of sheet:	1000-1750 mm

HEAVY PLATE MILL-5000

Wide plate thickness:	7-150 mm
Wide plate width:	900-4850 mm

UN CPC code:

412 - Rolled, drawn and folded products of iron and steel

Geographical scope:

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

LCA information

Functional unit / declared unit:

Declared unit is 1 tonne of hot rolled steel coils from Vyksa Steel Works

Reference service life:

Not applicable for this type of products.

Time representativeness:

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

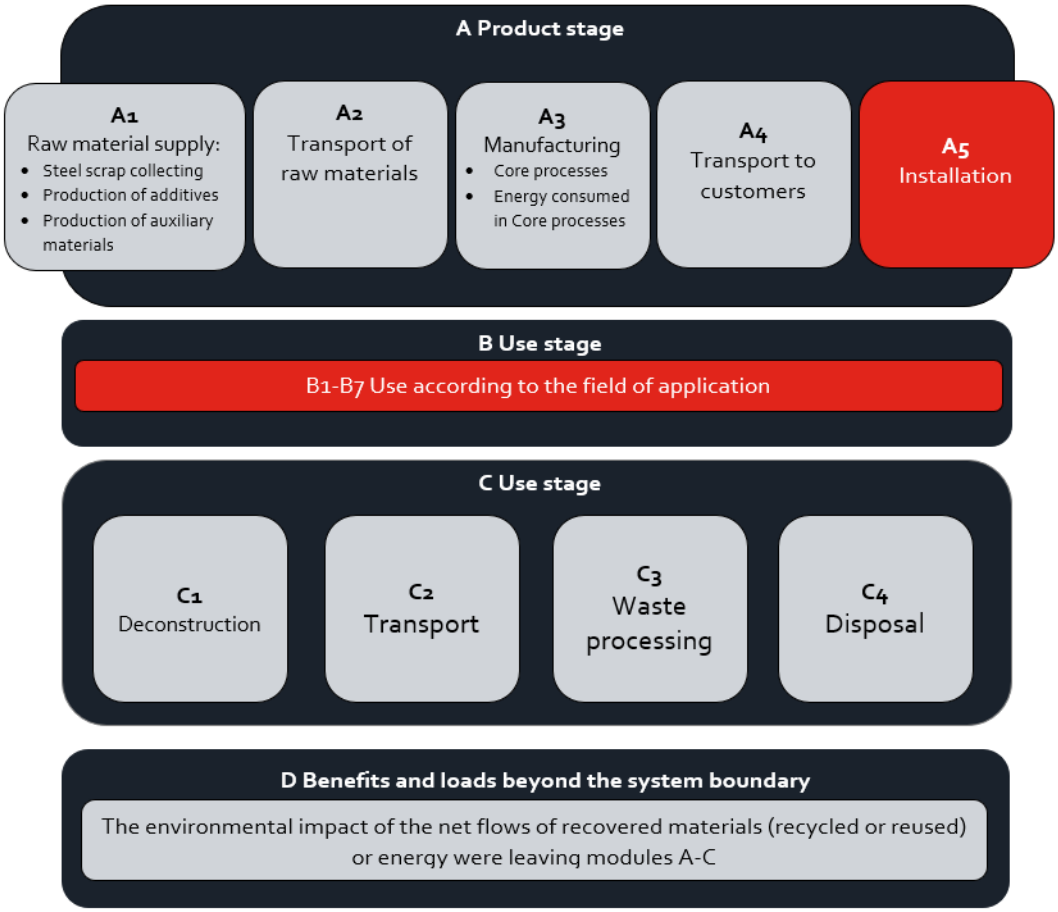
Database(s) and LCA software used:

GaBi Software version 10.6.2.9 was used to model the hot rolled steel from Vyksa Steel Work. GaBi professional and construction materials databases were used. Some datasets from the Environmental Footprint (EF) database were also used to model the impacts from 2 raw materials from the Inventory.

Description of system boundaries:

The system boundaries is “Cradle to gate with options, modules C1-C4, module D and with optional modules (A1-A3 + A4 + C + D)”.

System diagram:



Estimates and Assumptions

In the underlying LCA study, the following assumptions were made:

- The LCIA Results per declared unit is an average-weighted results of hot rolled steel produced at Cast and Rolling Complex (LPK) and Heavy Plate Mill (STAN-5000), respectively.
- For the End-of-Life scenario it is assumed that 5% of the product is lost during de-construction and recycling, and 95% of product mass at EoL stage is reached to the recycling system.

Allocation

No allocation was needed for the studied product system.

Modules declared, geographical scope, share of specific data (in GWP-GHG results) and data variation (in GWP-GHG results):

	Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
Module	**A1**	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Modules declared	X	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	RU	RU	RU	GLO	–	–	–	–	–	–	–	–	GLO	GLO	GLO	GLO	GLO
Specific data used	>90%			–	–	–	–	–	–	–	–	–	–	–	–	–	–
Variation – products	<10%			–	–	–	–	–	–	–	–	–	–	–	–	–	–
Variation – sites	Not relevant			–	–	–	–	–	–	–	–	–	–	–	–	–	–

ND – module not declared

Content information

Product components	Weight, kg	Post-consumer material, weight-%	Biogenic material, weight-% and kg C/kg
Steel	960-984	100	0
Additives	16-40	1.6-4.0	0
TOTAL	1000	100	0

None of the components present in the final product are included in the "Candidate List of Substances of Extreme Concern in the authorization procedure" of the REACH regulation.

Environmental Information

Potential environmental impact – mandatory indicators according to EN 15804

Results per declared unit								
Indicator	**Unit**	**A1-A3**	**A4**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-fossil	kg CO2 eq.	6.74E+02	1.86E-01	1.29E+00	3.83E+00	0.00E+00	3.74E-01	-2.02E+01
GWP-biogenic	kg CO2 eq.	4.52E+01	6.39E-04	3.17E-01	2.14E-01	0.00E+00	3.85E-02	-3.79E+00
GWP-luluc	kg CO2 eq.	9.56E-02	3.56E-12	2.73E-04	2.59E-02	0.00E+00	6.90E-04	-5.58E-03
GWP-total	kg CO2 eq.	7.20E+02	1.84E+01	1.61E+00	4.07E+00	0.00E+00	4.13E-01	-2.40E+01
ODP	kg CFC 11 eq.	3.80E-09	1.26E-01	1.89E-11	3.77E-13	0.00E+00	8.85E-13	-3.14E-10
AP	mol H+ eq.	2.55E+00	1.74E-06	2.84E-03	4.29E-03	0.00E+00	2.65E-03	-4.89E-02
EP-freshwater	kg P eq.	4.41E-01	1.91E-01	6.35E-04	1.38E-03	0.00E+00	6.75E-04	-6.50E-05
EP-marine	kg N eq.	4.41E-01	1.91E-01	6.35E-04	1.38E-03	0.00E+00	6.75E-04	-1.27E-02
EP-terrestrial	mol N eq.	4.78E+00	5.24E-02	6.65E-03	1.66E-02	0.00E+00	7.45E-03	-1.35E-01
POCP	kg NMVOC eq.	1.43E+00	9.89E+02	1.72E-03	3.69E-03	0.00E+00	2.06E-03	-4.80E-02
ADP-minerals&metals*	kg Sb eq.	3.38E+03	1.33E-06	3.76E-07	3.88E-07	0.00E+00	3.88E-08	-7.70E-06
ADP-fossil*	MJ	1.43E+04	2.66E+02	1.39E+01	4.98E+01	0.00E+00	4.73E+00	-2.43E+02
WDP*	m3	1.99E+03	0.00E+00	7.05E+01	2.60E+00	0.00E+00	8.45E-01	-9.87E+01
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							

** Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.*

Potential environmental impact – additional mandatory and voluntary indicators

Results per declared unit								
Indicator	**Unit**	**A1-A3**	**A4**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-GHG[1]	kg CO2 eq.	6,75E+02	1,84E+01	1,29E+00	3,86E+00	0,00E+00	3,74E-01	-1,93E+02

Use of resources

Results per declared unit								
Indicator	**Unit**	**A1-A3**	**A4**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	2.13E+03	3.06E+01	1.30E+01	3.50E+00	0.00E+00	7.35E-01	-1.47E+02
PERM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	2.13E+03	3.06E+01	1.30E+01	3.50E+00	0.00E+00	7.35E-01	-1.47E+02
PENRE	MJ	9.76E+03	3.35E+02	2.34E+01	5.05E+01	1.00E+00	4.90E+00	-2.44E+02
PENRM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ	9.76E+03	3.35E+02	2.34E+01	5.05E+01	1.00E+00	4.90E+00	-2.44E+02
SM	kg	0.00E+00	0.00E+00	0.00E+00	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	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m3	1.63E+03	7.83E+01	6.50E+00	2.11E-01	2.00E+00	2.21E-01	-3.88E+01
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							

[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 CO_2 is set to zero.

Waste production and output flows

Waste production

Results per declared unit								
Indicator	**Unit**	**A1-A3**	**A4**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed	kg	9.25E-07	1.15E-08	2.03E-09	2.68E-10	0.00E+00	2.52E-10	-2.50E-08
Non-hazardous waste disposed	kg	2.95E+01	1.20E-01	1.77E-02	8.25E-03	5.00E-01	2.50E+01	-4.66E-02
Radioactive waste disposed	kg	5.37E-01	2.68E-02	3.75E-03	9.40E-05	1.00E+00	5.35E-05	-1.64E-02

Output flows

Results per declared unit								
Indicator	**Unit**	**A1-A3**	**A4**	**C1**	**C2**	**C3**	**C4**	**D**
Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Material for recycling	kg	1.00E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.5E+02	0.00E+00
Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	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	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	0.00E+00	0.00E+00	0.00E+00

References

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

PCR 2019:14 Construction products, version 1.2.5

EN 15804:2012 + A2:2019, Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products

GaBi software version 10.6.2.9

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