

# Environmental Product Declaration



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

## Steel pipes, large diameter

from

***United Metallurgical Company (OMK)***



Programme:	The International EPD® System, <a href="http://www.environdec.com">www.environdec.com</a>
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## General information

### Programme information

<b>Programme:</b>	The International EPD® System
<b>Address:</b>	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
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<b>Accountabilities for PCR, LCA and independent, third-party verification</b>
<b>Product Category Rules (PCR)</b>
CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product Category Rules (PCR): <i>2019:14 Construction products, version 1.2.5</i>
PCR review was conducted by: Martin Erlandsson, IVL Swedish Environmental Research Institute, <a href="mailto:martin.erlandsson@ivl.se">martin.erlandsson@ivl.se</a>
<b>Life Cycle Assessment (LCA)</b>
LCA accountability: CIS Center. Moscow, Lyusinovskaya 36/1, <a href="http://www.ciscenter.org">www.ciscenter.org</a> , <a href="mailto:info@ciscenter.org">info@ciscenter.org</a> . Phone: +7 495 128 95 45
<b>Third-party verification</b>
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 ( <a href="http://www.metsims.com">www.metsims.com</a> )
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 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 (OMK)

### Contact:

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

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Description of the organisation: United Metallurgical Company (OMK) is one of the largest Russian producers of pipes, fittings and other metal products for fuel and energy, transport and industrial enterprises. 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 pipes with diameter starting from 21.3 up to 1422 and wall thickness 1 to 48 mm. At customer's request, pipes can be produced with external three-layer polyethylene/polypropylene anticorrosive coating, as well as with external one-/two-layer anticorrosive epoxy coating.

Rolled steel for pipes is manufactured also at the VSW. This reduces the impacts associated with the raw material delivery.

### Product-related or management system-related certifications:

VSW's Quality Management System (QMS) is applied to the design and production of electric-welded pipes with plain ends manufactured. Using the submerged arc welding method; electric-welded pipes with plain ends manufactured using HFC welding method; electric-welded pipes with external anticorrosion coating and with internal anticorrosion or anti-friction coating; HFC-welded OCTG or tubing pipes (with plain ends or with thread and couplings); hot-formed seamless pipes manufactured from round billets; seamless couplings; solid-rolled railway wheels; steel ingots; hot-rolled steel products, and constructed according to the following standards and specifications:

- ISO 9001 (GOST ISO 9001);
- ANSI/ API Q1/ ISO 29001;
- Gazprom company standard 9001;
- 97/23/EC Instructions.

The comprehensive management system according to ISO 14001, Environment Management Systems and OHSAS 18001, Occupational Health and Safety Management Systems standards has been in place at the plant since 2009. Beside QMS certification, VSW applies direct certification of the pipe production. To meet requirements of customers from Russia and near-abroad countries, the Vyksa plant`s pipes are certified in accordance with technical Regulations of the Customs Union (TR CU 010/2011, TR CU 032/2013). And VSW offers its products not only on Russian markets, but on international markets as well.

Starting from 1995 Vyksa Plant has American Petroleum Institute (API) certificates with API 5L and API 5CT specifications.

As requested by Polish customers, certification was carried out for steel longitudinal electric-welded pipes with anti-corrosion coating and uncoated pipes with diameters from 114 to 530 mm and wall thicknesses from 4.5 up to 10 mm of L245NB, L290NB, 415NB, L245MB, L290MB, L360MB, L415MB steel grades, manufactured in accordance with EN 10208-2 with the right to use the W safety sign in marking. The certification was performed by ZETOM Katowice (Poland).

Moreover, Vyksa Steel Works has received a certificate of conformity from TUV Rheinland for electric-welded steel pipes with diameters from 21.3 to 508 mm and hollow sections sized 20 x 20 to 80 x 80 mm and 30 x 20 to 100 x 60 mm manufactured from construction steel with the strength level from S235 to S355, produced to EN 10219-1:2006 with the right to use the CE marking, starting from March 2011.

These certificates guarantee that the production process is in accordance with applicable standards, technical regulations and specifications.

Name and location of production site(s):

Vyksa Steel Works (VSW)

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

Russia

## Product information

Product name: Steel pipes, large diameter

Product identification:

Large diameter pipes (LDP) are manufactured by Vyksa Steel Works, one of the key plants within OMK.

Product range:

- SAWL pipes 0 508–1422 mm (20–56”), wall thickness up to 48 mm (1.89”);
- ERW pipes 0 508–530 mm (20–21”).

Standard length of all pipes is from 11.6 to 12.4 m (38–40 ft).

At customer's request, pipes can be produced with external three-layer anticorrosive coating or with external three-layer polyethylene or polypropylene coating, as well as with one/two-layer epoxy coating.

Product description: Vyksa Steel Works manufacture pipes on two separate lines using different production methods — UOE Line (TESA 1020) and JCOE Line (TESA 1420). Pipes can be made with either one or two longitudinal welds.

Product range and scope of application.

Standard	Outside dia., inches (mm)	Wall thickness, mm	Steel grade	Scope of application
API Spec 5L/ ISO 3183	20" (508)– 56" (1422)	8.0–48.0	Strength class Gr.B — X100 Steel L245– L555	For construction of gas and oil pipelines, water transportation systems both in oil and gas industry
DNV-OS-F101	20" (508) – 56" (1422)	8.0–48.0	Steel L245– L555	Subsea pipe systems used in the oil and gas sector
DIN 10217	20" (508) – 56" (1422)	8.0–40.0	Steel P235– P265	Multi-purpose pipes
DIN 10219	20" (508) – 56" (1422)	8.0–40.0	Steel S235– S460	Multi-purpose pipes

UN CPC code: 4127

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: 1 tonne of Steel pipes, large diameter

Reference service life: 20 years.

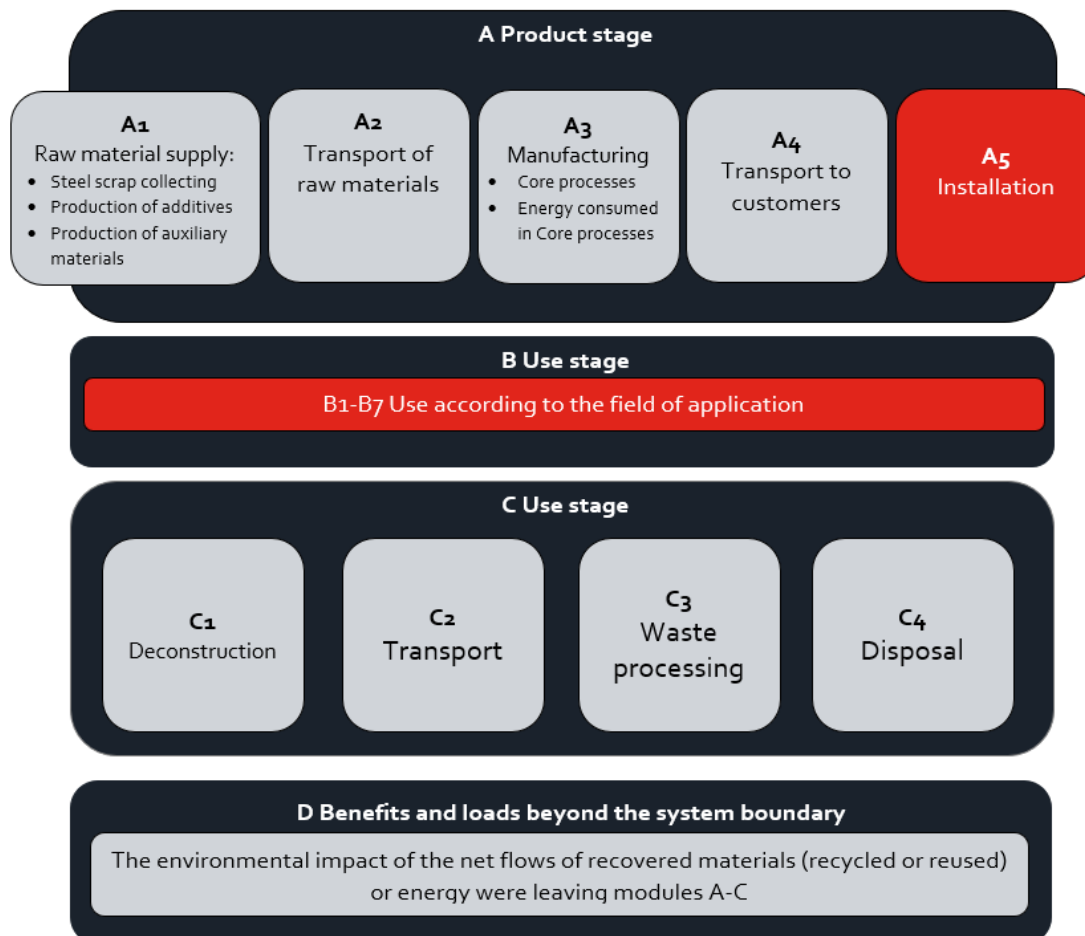
Time representativeness: Primary data were collected for the 2021 year. Time representativeness of the secondary data was estimated mainly good; no datasets older than 10 years from the representative year were used.

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 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 this study, the following assumptions were made:

- The assumption was made that the impacts from socketed and coated pipes would be similar to those of non-socketed and uncoated pipes. The difference in environmental impacts of coated, uncoated, socketed and non-socketed pipes are smaller than 10%. Therefore, the results for these types of pipes are included in the averaged LCIA results for pipes.
- 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.

Impacts from packaging are excluded from the study because of the negligible contribution to the impacts in the life cycle perspective of steel pipes.

### Allocation

Since the pipes of different diameters can be produced in the same workshops (EWPWs), allocation of inputs and outputs by mass was applied. Allocations in the LCA datasets used are documented accordingly in the datasets themselves.

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	1000	Up to 99%	0
TOTAL	1000	Up to 99%	0

## Environmental Information

### Potential environmental impact – mandatory indicators according to EN 15804

#### Results per 1 tonne of Steel pipes, large diameter

Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D
GWP-fossil	kg CO2 eq.	7.58E+02	3.98E+01	1.29E+00	7.65E+00	2.58E+00	7.47E-01	-1.82E+01
GWP-biogenic	kg CO2 eq.	3.25E+01	4.01E-01	3.17E-01	4.28E-01	6.33E-01	7.69E-02	-3.41E+00
GWP-luluc	kg CO2 eq.	8.23E-02	1.38E-03	2.73E-04	5.17E-02	5.46E-04	1.38E-03	-5.03E-03
GWP-total	kg CO2 eq.	7.91E+02	4.02E+01	1.61E+00	8.14E+00	3.21E+00	8.25E-01	-2.16E+01
ODP	kg CFC 11 eq.	2.41E-09	7.69E-12	1.89E-11	7.54E-13	3.78E-11	1.77E-12	-2.83E-10
AP	mol H+ eq.	3.16E+00	2.71E-01	2.84E-03	8.58E-03	5.67E-03	5.29E-03	-4.40E-02
EP-freshwater	kg P eq.	5.41E-04	3.76E-06	3.77E-06	2.74E-05	7.53E-06	1.27E-06	-5.86E-05
EP-marine	kg N eq.	5.09E-01	3.76E-02	6.35E-04	2.76E-03	1.27E-03	1.35E-03	-1.14E-02
EP-terrestrial	mol N eq.	5.55E+00	4.12E-01	6.65E-03	3.31E-02	1.33E-02	1.49E-02	-1.22E-01
POCP	kg NMVOC eq.	1.60E+00	1.13E-01	1.72E-03	7.38E-03	3.44E-03	4.11E-03	-4.32E-02
ADP-minerals & metals*	kg Sb eq.	2.62E-04	0.00E+00	3.76E-07	7.74E-07	7.03E-07	7.69E-08	-6.94E-06
ADP-fossil*	MJ	1.01E+04	0.00E+00	1.39E+01	1.01E+02	4.68E+01	9.77E+00	-2.19E+02
WDP*	m3	2.29E+04	2.13E+03	7.05E+01	5.19E+00	1.41E+02	1.69E+00	-8.89E+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 1 tonne of Steel pipes, large diameter

Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D
GWP-GHG <sup>1</sup>	kg CO2 eq.	7.58E+02	3.98E+01	1.29E+00	7.71E+00	2.58E+00	7.48E-01	-1.82E+01

## Use of resources

### Results per 1 tonne of Steel pipes, large diameter

Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D
PERE	MJ	1.81E+03	6.60E+01	1.30E+01	6.99E+00	2.60E+01	1.47E+00	-1.33E+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	1.81E+03	6.60E+01	1.30E+01	6.99E+00	2.60E+01	1.47E+00	-1.33E+02
PENRE	MJ	1.15E+04	7.23E+02	2.34E+01	1.01E+02	4.68E+01	9.79E+00	-2.19E+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	1.15E+04	7.23E+02	2.34E+01	1.01E+02	4.68E+01	9.79E+00	-2.19E+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	2.06E+03	1.69E+02	6.50E+00	4.21E-01	1.30E+01	4.41E-01	-3.50E+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							

<sup>1</sup> 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<sub>2</sub> is set to zero.

## Waste production and output flows

### Waste production

Results per 1 tonne of Steel pipes, large diameter								
Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D
Hazardous waste disposed	kg	9.66E-07	2.47E-08	2.03E-09	5.35E-10	4.05E-09	5.03E-10	-2.26E-08
Non-hazardous waste disposed	kg	3.50E+01	2.60E-01	1.77E-02	1.65E-02	3.53E-02	5.00E+01	-4.20E-02
Radioactive waste disposed	kg	6.53E-01	5.79E-02	3.75E-03	1.88E-04	7.49E-03	1.07E-04	-1.47E-02

### Output flows

Results per 1 tonne of Steel pipes, large diameter								
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	3.05E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.50E+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

