ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025 / ISO 21930

STEEL STRUCTURES

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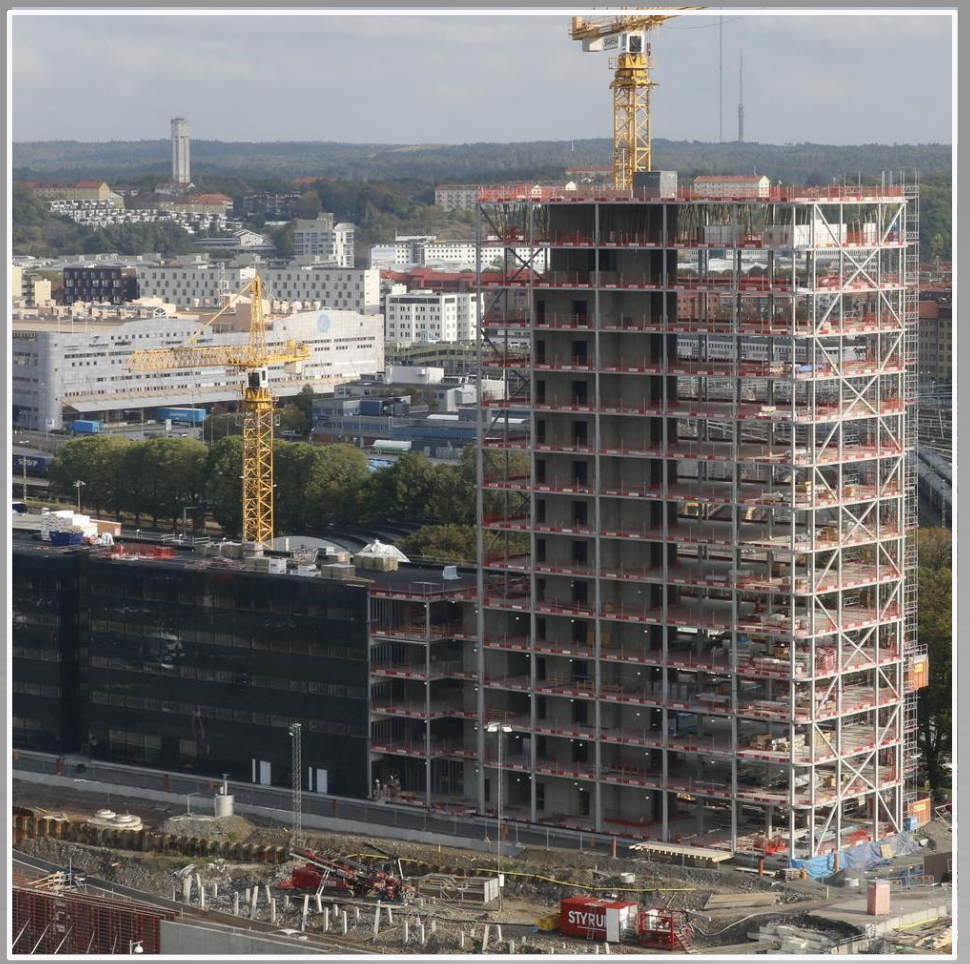

GENERAL INFORMATION

MANUFACTURER INFORMATION

Manufacturer	RK Metāls
Address	Lauktehnikas street 12, Grobina, Latvia, LV3430
Contact details	rkmetals@rkmetals.lv
Website	https://www.rkmetals.lv/

PRODUCT IDENTIFICATION

Product name	Steel structures
Place(s) of production	Grobiņa, Latvia

EPD INFORMATION

EPDs of construction products may not be comparable if they do not comply with EN 15804 and if they are not compared in a building context.

EPD program operator	The Building Information Foundation RTS sr / Building Information Ltd Malminkatu 16 A, 00100 Helsinki, Finland http://cer.rts.fi
EPD standards	This EPD is in accordance with EN 15804+A2 and ISO 14025 standards.
Product category rules	The CEN standard EN 15804+A2 serves as the core PCR. In addition, the RTS PCR (English version, 26.08.2020.) is used.
EPD author	Ritvars Višs, RK Metāls
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal certification ☑ External verification
Verification date	15.2.2021
EPD verifier	Silvia Vilčeková, Silcert, s.r.o.
EPD number	RTS_99_21
Publishing date	11.3.2021
EPD valid until	15.2.2026

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RTS EPD Committee secretary

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Managing Director

PRODUCT INFORMATION

PRODUCT DESCRIPTION

Steel structures for buildings, bridges and machines

PRODUCT APPLICATION

Used as load supporting frames to hold buildings, bridges and machines.

TECHNICAL SPECIFICATIONS

Rolled steel profiles are used with most efficient production processes and highest possible scrap content.

PRODUCT STANDARDS

According to ISO 9001, EN 3834 and EN 1090 till EXC 4

PHYSICAL PROPERTIES OF THE PRODUCT

Steel can be used in range of S235 - S700
Also wear resistant and stainless steel materials can be used.

ADDITIONAL TECHNICAL INFORMATION

Further information can be found at https://www.rkmetals.lv/.

PRODUCT RAW MATERIAL COMPOSITION

Material	Quantity, mass [%]	Usability			Origin of the raw materials
		Renewable	Non-renewable	Recycled	
Hollow sections	22		X	X	Europe
Plates	29		X	X	Europe
Profiles	49		X	X	Europe

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass-%	Material origin
Metals	100	Europe
Minerals	0	-
Fossil materials	0	-
Bio-based materials	0	-

SUBSTANCES, REACH - VERY HIGH CONCERN

The product does not contain any REACH SVHC substances in amounts greater than 0,1 % (1000 ppm).

PRODUCT LIFE-CYCLE

MANUFACTURING AND PACKAGING (A1-A3)

According to project documentation. Possible variations are shown in flow chart. Packaging materials are not used. Goods are fixed with lanyards on truck.

TRANSPORT AND INSTALLATION (A4-A5)

Transportation impacts occurred from final products delivery to construction sites (A4) cover fuel direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions.

Scenario A5 is modelled as installation of a typical steel structures in a building. Fossil fuel for building machinery is included.

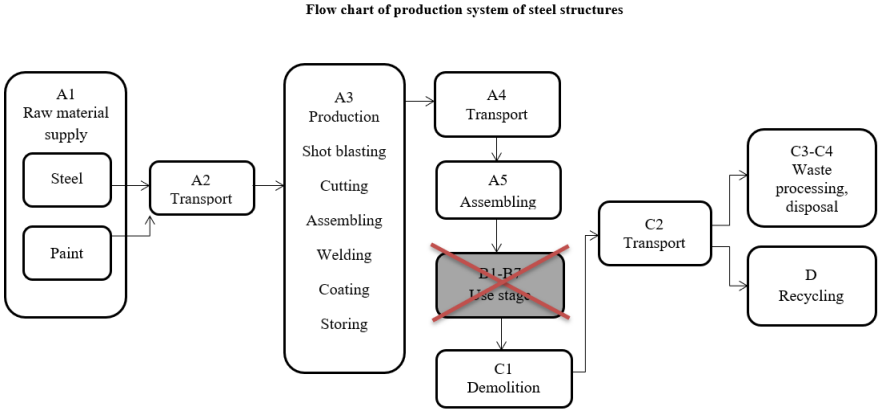
PRODUCT USE AND MAINTENANCE (B1-B7)

This EPD does not cover use phase. Air, soil and water impacts during the use phase have not been studied.

PRODUCT END OF LIFE (C1-C4, D)

At the end-of-life, in the demolition phase 100% of the waste is assumed to be collected as separate construction waste. The demolition process consumes energy in the form of diesel fuel used by building machines (C1). The dismantled steel is delivered to the nearest scrapping plant (C2). 95% of the end-of-life product primary and secondary steel is sent to recycling (C3), 5 % is landfilled (C4). Due to the recycling potential of the metal, the end-of-life product is converted into recycled raw materials (D).

MANUFACTURING PROCESS



LIFE-CYCLE ASSESSMENT

LIFE-CYCLE ASSESSMENT INFORMATION

Period for data	Manufacturer data for the calendar year 2019 is used.

DECLARED AND FUNCTIONAL UNIT

Declared unit	1 ton
Mass per declared unit	1000 kg

BIOGENIC CARBON CONTENT

Neither the product itself nor the packaging contains biogenic carbon, so the biogenic carbon content at the factory gate is 0 kg.

Biogenic carbon content in product, kg C	-
Biogenic carbon content in packaging, kg C	-

SYSTEM BOUNDARY

This EPD covers cradle to gate with options scope with following modules; A1 (Raw material supply), A2 (Transport) and A3 (Manufacturing), A4 (Transport), A5 (Assembly) as well as C1 (Deconstruction), C2 (Transport at end-of-life), C3 (Waste processing) and C4 (Disposal). In addition, module D - benefits and loads beyond the system boundary is included.

Product stage			Assembly stage		Use stage							End of life stage				Beyond the system boundaries		
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D	D	D
x	x	x	x	x	MND	MND	MND	MND	MND	MND	MND	x	x	x	x	x	x	x
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstr./demol.	Transport	Waste processing	Disposal	Reuse	Recovery	Recycling

Modules not declared = MND. Modules not relevant = MNR.

CUT-OFF CRITERIA

The study does not exclude any modules or processes which are stated mandatory in the EN 15804:2012+A2:2019 and RTS PCR. The study does not exclude any hazardous materials or substances.

The study includes all major raw material and energy consumption. All inputs and outputs of the unit processes which data are available for are included in the calculation. There is no neglected unit process more than 1% of total mass and energy flows. The total neglected input and output flows do also not exceed 5% of energy usage or mass. The life cycle analysis includes all industrial processes from raw material acquisition to production, distribution and end-of-life stages.

As paint weight in finished steel structures is less than 1% it was not included in calculations.

Packaging does not include any biogenic carbon as product is only packaged using reusable tie down straps.

For easier modelling and because of lack of accuracy in available modelling resources many constituents under 0,1 % of product mass are excluded.

The production of capital equipment, construction activities, and infrastructure, maintenance and operation of capital equipment, personnel-related activities, energy and water use related to company management and sales activities are excluded.

The modules B1-B7 have not been calculated nor included in the LCA calculations as that is not mandatory for this LCA report.

ALLOCATION, ESTIMATES AND ASSUMPTIONS

The values for 1 ton of element are calculated by considering the total product weight per annual production. In the factory, several kinds of steel elements are produced; since the production processes of these products are similar, the annual production percentages are taken into consideration for allocation. According to the ratio of the annual production of the declared product to the total annual production at the factory, the annual total raw materials, energy consumption and the generated waste per the declared product are allocated. Subsequently, the product output fixed to 1000 kg and the corresponding amount of product is used in the calculations.

This LCA study is conducted in accordance with all methodological considerations, such as performance, system boundaries, data quality, allocation procedures, and decision rules to evaluate inputs and outputs. All estimations and assumptions are given below:

Module A1: Raw material composition is an average value calculated using total annual material consumption for the product by mass within the studied year 2019.

Module A4: Transportation from the manufacturing plants to the building site has been calculated using a most likely scenario for the export of the declared unit of one tonne to each of the market countries separately - Sweden, Norway, Denmark, United Kingdom, with fill rate assumed to be 100%.

For transportation to building sites in Sweden it is assumed that 335 km of the total distance are covered by a lorry and it is assumed that 275 km of the total distance are covered by a ferry.

For transportation to building sites in Norway it is assumed that 655 km of the total distance are covered by a lorry and it is assumed that 275 km of the total distance are covered by a ferry.

For transportation to building sites in Denmark it is assumed that 310 km of the total distance are covered by a lorry and it is assumed that 400 km of the total distance are covered by a ferry.

For transportation to building sites in the United Kingdom it is assumed that 710 km of the total distance are covered by a lorry and it is assumed that 1300 km of the total distance are covered by a ferry.

Transportation does not cause losses as products are packaged properly. Packaging does not include wooden pallets. Bulk density varies depending on product type and thickness. Also, volume capacity utilisation factor is assumed to be 1 for the nested packaged products.

Module A5: Assembly/Installation is modelled as installation of a typical steel structures in a building. Fossil fuel for building machinery is included.

It is assumed that the waste is insignificant during the assembly process. The assembly process is also assumed to be similar across all of the market countries. The energy required for the installation process are taken as the industry average values for the steel structures assembly process.

Module C1: Energy consumption of a demolition process is on the average 12 kWh/t (Erlandsson & Petersson 2015). The source of energy is diesel fuel used by work machines.

Module C2: It is estimated that there is no mass loss during the use of the product, therefore the end-of-life product is assumed that it has the same weight with the declared product. All of the end-of-life product is assumed to be sent to the closest facilities such as recycling and landfill. Transportation distance to the closest disposal area is estimated as 50 km and the transportation method is lorry which is the most common.

Module A2, A4 & C2: Vehicle capacity utilization volume factor is assumed to be 1 which means full load. In reality, it may vary but as role of transportation emission in total results is small, the variety in load is assumed to be negligible. Empty returns are not taken into account as it is assumed that return trip is used by the transportation company to serve the needs of other clients.

Module C3: It is assumed that about 95% of steel (World Steel Association, 2020) are recycled. The process losses of the waste treatment plant are assumed to be negligible. It is assumed that the end of life scenario is similar across all of the target market countries.

Module C4: The remaining 5% of steel are assumed to be send to the landfill.

Module D: The recycled end-of-life product is assumed to be converted into a raw material after recycling. Module D calculated for primary steel to avoid double counting.

ENVIRONMENTAL IMPACT DATA

NOTE : ENVIRONMENTAL IMPACTS - EN 15804+A1, CML / ISO 21930 AND ENVIRONMENTAL IMPACTS - TRACI 2.1. / ISO 21930 ARE PRESENTED IN ANNEX

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4 - SWE	A4- NOR	A4-DK	A4-UK	A5	B1-B7	C1	C2	C3	C4	D
Climate change – total	kg CO2e	2,18E3	3,85E1	1,78E1	2,24E3	3,6E1	6,51E1	3,63E1	9,09E1	2,46E0	MND	3,93E0	4,53E0	2,59E1	1,58E−1	−9,34E2
Climate change – fossil	kg CO2e	2,13E3	3,83E1	1,78E1	2,19E3	3,57E1	6,45E1	3,6E1	9,01E1	2,45E0	MND	3,93E0	4,5E0	2,31E1	1,57E−1	−9,39E2
Climate change – biogenic	kg CO2e	4,87E1	1,87E−1	4,23E−2	4,89E1	1,61E−1	3,02E−1	1,56E−1	3,77E−1	4,16E−3	MND	6,65E−3	2,2E−2	2,81E0	6,95E−4	4,73E0
Climate change – LULUC	kg CO2e	1,15E0	1,16E−2	1,66E−3	1,17E0	1,16E−2	2,03E−2	1,2E−2	3,09E−2	2,09E−4	MND	3,34E−4	1,37E−3	2,66E−2	1,59E−5	2,6E−2
Ozone depletion	kg CFC11e	1,28E−4	9,08E−6	2,57E−6	1,4E−4	8,32E−6	1,52E−5	8,31E−6	2,07E−5	5,34E−7	MND	8,54E−7	1,07E−6	3,37E−6	2,79E−8	−2,5E−5
Acidification	mol H+e	9,93E0	9,08E−2	2,13E−2	1E1	1,95E−1	2,63E−1	2,46E−1	7,35E−1	4,23E−3	MND	6,76E−3	1,07E−2	1,92E−1	4,14E−4	−3,38E0
Eutrophication, aquatic freshwater	kg PO4e	1,59E0	2,75E−3	9,13E−4	1,59E0	2,45E−3	4,52E−3	2,41E−3	5,91E−3	8,98E−5	MND	1,44E−4	3,24E−4	1,99E−2	1,6E−5	−4,01E−1
Eutrophication, aquatic marine	kg Ne	1,95E0	1,3E−2	5,91E−3	1,97E0	4,81E−2	5,79E−2	6,46E−2	2,01E−1	5,69E−4	MND	9,1E−4	1,53E−3	2,08E−2	4,54E−5	−7,08E−1
Eutrophication, terrestrial	mol Ne	1,98E1	1,39E−1	6,28E−2	2E1	5,27E−1	6,31E−1	7,08E−1	2,2E0	6,08E−3	MND	9,73E−3	1,63E−2	2,35E−1	5,23E−4	−6,77E0
Photochemical ozone formation	kg NMVOCe	8,24E0	7,65E−2	2,12E−2	8,34E0	1,68E−1	2,26E−1	2,12E−1	6,36E−1	6,05E−3	MND	9,68E−3	9E−3	8,27E−2	3,61E−4	−3,79E0
Abiotic depletion, minerals & metals	kg Sbe	3,57E−2	6,59E−4	2,19E−5	3,64E−2	7,42E−4	1,24E−3	8,05E−4	2,15E−3	3,78E−6	MND	6,04E−6	7,75E−5	1,3E−3	2,22E−7	−9,32E−4
Abiotic depletion of fossil resources	MJ	3,06E4	5,94E2	3,3E2	3,15E4	5,4E2	9,87E2	5,37E2	1,33E3	3,36E1	MND	5,38E1	6,99E1	3,17E2	2,07E0	−1,16E4
Water use	m3e depr.	1,06E5	8,63E2	4,67E5	5,74E5	7,42E2	1,39E3	7,19E2	1,73E3	1,9E1	MND	3,04E1	1,01E2	2,28E3	1,49E0	2,96E4

EN 15804+A2 disclaimer for Abiotic depletion and Water use indicators and all optional indicators except Particulate matter and Ionizing radiation, human health: The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.Eutrophication aquatic freshwater is reported as *kg PO_4 eq,* although the reference given ("EUTREND model, Struijs et al., 2009b, as implemented in ReCiPe") uses the unit *kg P eq.*

ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4 - SWE	A4-NOR	A4-DK	A4-UK	A5	B1-B7	C1	C2	C3	C4	D
Particulate matter	Incidence	1,87E−4	3,33E−6	3,07E−7	1,91E−4	2,77E−6	5,27E−6	2,64E−6	6,24E−6	6,34E−7	MND	1,01E−6	3,92E−7	3,35E−6	3,32E−8	−6,51E−5
Ionizing radiation, human health	kBq U235e	1,58E2	3,06E0	3,26E−1	1,62E2	2,74E0	5,04E0	2,71E0	6,66E0	1,55E−1	MND	2,47E−1	3,6E−1	3,35E0	8,9E−3	4,2E1
Eco-toxicity (freshwater)	CTUe	6,42E2	2,53E1	9,8E−1	6,69E2	2,08E1	3,99E1	1,97E1	4,63E1	1,86E−1	MND	2,98E−1	2,98E0	2,28E1	1,07E−2	4E1
Human toxicity, cancer effects	CTUh	1,73E−5	1,09E−8	1,63E−8	1,73E−5	1,09E−8	1,91E−8	1,14E−8	2,93E−8	6,58E−10	MND	1,05E−9	1,28E−9	3,07E−8	4,65E−11	−1,82E−6
Human toxicity, non-cancer effects	CTUh	2,3E−4	7,26E−7	1,43E−7	2,31E−4	6,43E−7	1,19E−6	6,32E−7	1,55E−6	1,39E−8	MND	2,22E−8	8,54E−8	4,12E−6	1,45E−9	2,34E−4
Land use related impacts/soil quality	-	1,41E3	8,83E2	3,07E0	2,29E3	6,97E2	1,36E3	6,46E2	1,48E3	5,27E−1	MND	8,43E−1	1,04E2	7,11E1	−1,05E1	−1,62E3

EN 15804+A2 disclaimer for Ionizing radiation, human health. This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

USE OF NATURAL RESOURCES

Impact category	Unit	A1	A2	A3	A1-A3	A4 - SWE	A4-NOR	A4-DK	A4-UK	A5	B1-B7	C1	C2	C3	C4	D
Renewable PER used as energy	MJ	0E0	7,56E0	9,49E2	9,56E2	6,56E0	1,23E1	6,39E0	1,55E1	1,84E−1	MND	2,94E−1	8,9E−1	0E0	0E0	9,2E1
Renewable PER used as materials	MJ	2,5E3	0E0	1,12E0	2,5E3	0E0	0E0	0E0	0E0	MND	MND	0E0	0E0	5,1E1	1,99E−2	0E0
Total use of renewable PER	MJ	2,5E3	7,56E0	9,5E2	3,45E3	6,56E0	1,23E1	6,39E0	1,55E1	1,84E−1	MND	2,94E−1	8,9E−1	5,1E1	1,99E−2	9,2E1
Non-renew. PER used as energy	MJ	0E0	6,05E2	3,22E2	9,27E2	5,49E2	1E3	5,46E2	1,35E3	3,38E1	MND	5,41E1	7,12E1	0E0	0E0	−1,08E4
Non-renew. PER used as materials	MJ	3,3E4	0E0	1,14E1	3,3E4	0E0	0E0	0E0	0E0	MND	MND	0E0	0E0	3,62E2	2,1E0	0E0
Total use of non-renewable PER	MJ	3,3E4	6,05E2	3,33E2	3,39E4	5,49E2	1E3	5,46E2	1,35E3	3,38E1	MND	5,41E1	7,12E1	3,62E2	2,1E0	−1,08E4
Use of secondary materials	kg	4,84E2	2,07E−1	2,11E−1	4,85E2	1,96E−1	3,52E−1	1,98E−1	5E−1	1,67E−2	MND	2,67E−2	2,44E−2	9,5E2	1,25E−3	5,79E2
Use of renewable secondary fuels	MJ	6,76E1	2,65E−1	1,05E−1	6,79E1	2,2E−1	4,19E−1	2,1E−1	4,96E−1	4,53E−3	MND	7,24E−3	3,11E−2	1,3E0	2,15E−2	0E0
Use of non-renew. secondary fuels	MJ	1,61E3	8,87E−1	5,73E−1	1,61E3	8,2E−1	1,49E0	8,23E−1	2,05E0	6,66E−2	MND	1,07E−1	1,04E−1	8,92E−1	3,4E−3	0E0
Use of net fresh water	m3	9,6E2	9,41E0	1,13E0	9,71E2	8,3E0	1,54E1	8,14E0	1,99E1	2,76E−1	MND	4,41E−1	1,11E0	1,38E1	1,5E−2	−6,23E0

PER abbreviation stands for primary energy resources

END OF LIFE – WASTE

Impact category	Unit	A1	A2	A3	A1-A3	A4 - SWE	A4- NOR	A4-DK	A4-UK	A5	B1-B7	C1	C2	C3	C4	D
Hazardous waste	Kg	7,82E2	5,84E−1	3,65E−1	7,83E2	5,55E−1	9,94E−1	5,64E−1	1,42E0	3,66E−2	MND	5,86E−2	6,87E−2	1,7E0	5E1	−1,13E2
Non-hazardous waste	Kg	6,89E3	6,46E1	5,94E0	6,96E3	5,23E1	1,01E2	4,91E1	1,14E2	3,91E−1	MND	6,26E−1	7,6E0	1,01E2	7,49E−2	−1,27E3
Radioactive waste	Kg	6,3E−2	4,14E−3	2,46E−4	6,74E−2	3,77E−3	6,89E−3	3,75E−3	9,29E−3	2,39E−4	MND	3,82E−4	4,87E−4	1,94E−3	1,26E−5	5,08E−3

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1	A2	A3	A1-A3	A4 - SWE	A4- NOR	A4-DK	A4-UK	A5	B1-B7	C1	C2	C3	C4	D
Components for reuse	Kg	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	MND	0E0	0E0	0E0	0E0	0E0
Materials for recycling	Kg	4,82E2	1,8E−1	2,08E−1	4,82E2	1,79E−1	3,14E−1	1,86E−1	4,78E−1	1,64E−2	MND	2,63E−2	2,11E−2	9,5E2	8,68E−4	0E0
Materials for energy recovery	Kg	7,58E−1	2,91E−3	1,08E−3	7,62E−1	2,42E−3	4,61E−3	2,31E−3	5,47E−3	5,09E−5	MND	8,14E−5	3,42E−4	1,42E−2	2,11E−4	0E0
Exported energy	MJ	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0	MND	0E0	0E0	0E0	0E0	0E0

KEY INFORMATION TABLE (RTS) – KEY INFORMATION PER KG OF PRODUCT

Impact category	Unit	A1	A2	A3	A1-A3	A4 - SWE	A4- NOR	A4-DK	A4-UK	A5	B1-B7	C1	C2	C3	C4	D
Climate change – total	kg CO2e	2,18E0	3,85E−2	1,78E−2	2,24E0	3,59E−2	6,49E−2	3,61E−2	9,05E−2	2,46E−3	MND	3,93E−3	4,53E−3	2,59E−2	1,58E−4	−9,34E−1
Abiotic depletion, minerals & metals	kg Sbe	3,57E−5	6,59E−7	2,19E−8	3,64E−5	7,42E−7	1,24E−6	8,05E−7	2,15E−6	3,78E−9	MND	6,04E−9	7,75E−8	1,3E−6	2,22E−1	−9,32E−7
Abiotic depletion of fossil resources	MJ	3,06E1	5,94E−1	3,3E−1	3,15E1	5,4E−1	9,87E−1	5,37E−1	1,33E0	3,36E−2	MND	5,38E−2	6,99E−2	3,17E−1	2,07E−3	−1,16E1
Water use	m3e depr.	9,6E−1	9,41E−3	1,13E−3	9,71E−1	8,3E−3	1,54E−2	8,14E−3	1,99E−2	2,76E−4	MND	4,41E−4	1,11E−3	1,38E−2	1,5E−5	−6,23E−3
Use of secondary materials	kg	4,84E−1	2,07E−4	2,11E−4	4,85E−1	1,96E−4	3,52E−4	1,98E−4	5E−4	1,67E−5	MND	2,67E−5	2,44E−5	9,5E−1	1,25E−6	5,79E−1
Biogenic carbon content in product	kg C	N/A	N/A	0E0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Biogenic carbon content in packaging	kg C	N/A	N/A	0E0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

SCENARIO DOCUMENTATION

Manufacturing energy scenario documentation

Scenario parameter	Value
Electricity data source and quality	Electricity production, hydro, run-of-river (Reference product: electricity, high voltage) Ecoinvent v3.6, Latvia, year: 2020
Electricity CO2e / kWh	0.004
District heating data source and quality	Heat and power co-generation, natural gas, combined cycle power plant, 400mw electrical (Reference product: heat, district or industrial, natural gas), Ecoinvent v3.6, Latvia, year: 2020
District heating CO2e / kWh	0.0964

End of life scenario documentation

Scenario parameter	Value
Collection process – kg collected separately	1000
Collection process – kg collected with mixed waste	0
Recovery process – kg for re-use	0
Recovery process – kg for recycling	950
Recovery process – kg for energy recovery	0
Disposal (total) – kg for final deposition	50
Scenario assumptions e.g. transportation	End-of-life product is transported 50 km with an average lorry.

Transport scenario documentation

Scenario parameter, Sweden	Value
A4 Truck >32 metric ton Euro 5, kgCO2e / tonkm	0.0909
A4 Ferry, kgCO2e / tonkm	0.0203
A4 average transport distance, Truck, km	335
A4 average transport distance, Ferry, km	275
Scenario parameter, United Kingdom	**Value**
A4 Truck >32 metric ton Euro 5, kgCO2e / tonkm	0.0909
A4 Ferry, kgCO2e / tonkm	0.0203
A4 average transport distance, Truck, km	710
A4 average transport distance, Ferry, km	1300
Scenario parameter, Denmark	**Value**
A4 Truck >32 metric ton Euro 5, kgCO2e / tonkm	0.0909
A4 Ferry, kgCO2e / tonkm	0.0203
A4 average transport distance, Truck, km	310
A4 average transport distance, Ferry, km	400
Scenario parameter, Norway	**Value**
A4 Truck >32 metric ton Euro 5, kgCO2e / tonkm	0.0909
A4 Ferry, kgCO2e / tonkm	0.0203
A4 average transport distance, Truck, km	655
A4 average transport distance, Ferry, km	275

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ABOUT THE MANUFACTURER

RK Metāls group is one of the largest manufacturers of steel building structures and products of machinery solutions in the Baltics. The main areas of activities include steel structures, steel design, machinery solutions, project development, production, installation and logistics. European certificates in stainless steel and aluminium processing confirm the high quality standards maintained at RK Metāls.

Quality and Environment Management system of the company is certified according to the requirements of the international standards ISO 9001 and ISO 14001. HSE processes are managed according to the requirements of the international standard ISO 45001.

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EPD verifier	Silvia Vilčeková, Silcert, s.r.o.
EPD program operator	The Building Information Foundation RTS
Background data	This EPD is based on Ecoinvent 3.6 (cut-off) and One Click LCA databases.
LCA software	The LCA and EPD have been created using One Click LCA Pre-Verified EPD Generator for Primary Steel and Aluminium and all Metal-Based Products

ANNEX : ENVIRONMENTAL IMPACTS – EN 15804+A1, CML / ISO 21930

Impact category	Unit	A1	A2	A3	A1-A3	A4-SWE	A4-NOR	A4-DK	A4-UK	A5	B1-B7	C1	C2	C3	C4	D
Global warming potential	kg CO2e	2,22E3	3,86E1	1,82E1	2,28E3	3,6E1	6,51E1	3,63E1	9,09E1	2,47E0	MND	3,96E0	4,55E0	2,35E1	1,59E−1	−8,93E2
Depletion of stratospheric ozone	kg CFC11e	1,16E−4	7,22E−6	1,93E−6	1,25E−4	6,63E−6	1,21E−5	6,63E−6	1,65E−5	4,23E−7	MND	6,76E−7	8,49E−7	2,86E−6	2,22E−8	−2,21E−5
Acidification	kg SO2e	8,76E0	7,86E−2	1,78E−2	8,86E0	1,58E−1	2,17E−1	1,96E−1	5,83E−1	3,65E−3	MND	5,84E−3	9,25E−3	1,77E−1	3,6E−4	−2,84E0
Eutrophication	kg PO4 3e	5,8E0	1,59E−2	5,02E−3	5,82E0	2,66E−2	3,85E−2	3,2E−2	9,3E−2	6,43E−4	MND	1,03E−3	1,87E−3	7,21E−2	7,5E−5	−1,57E0
Photochemical ozone formation	kg C2H4e	1,24E0	4,98E−3	1,57E−3	1,24E0	6,57E−3	1,03E−2	7,48E−3	2,08E−2	3,76E−4	MND	6,01E−4	5,86E−4	8,28E−3	8,26E−5	−7,35E−1
Abiotic depletion of non-fossil res.	kg Sbe	3,57E−2	6,59E−4	2,19E−5	3,64E−2	7,42E−4	1,24E−3	8,05E−4	2,15E−3	3,78E−6	MND	6,04E−6	7,75E−5	1,3E−3	2,22E−7	−9,32E−4
Abiotic depletion of fossil resources	MJ	3,06E4	5,94E2	3,3E2	3,15E4	5,4E2	9,87E2	5,37E2	1,33E3	3,36E1	MND	5,38E1	6,99E1	3,17E2	2,07E0	−1,16E4

ANNEX : ENVIRONMENTAL IMPACTS - TRACI 2.1. / ISO 21930

Impact category	Unit	A1	A2	A3	A1-A3	A4 - SWE	A4-NOR	A4-DK	A4-UK	A5	B1-B7	C1	C2	C3	C4	D
Global warming potential	kg CO2e	2,1E3	3,82E1	1,78E1	2,15E3	3,56E1	6,44E1	3,59E1	8,98E1	2,44E0	MND	3,91E0	4,5E0	2,3E1	1,54E−1	−8,66E2
Ozone depletion	kg CFC11e	1,56E−4	9,62E−6	2,68E−6	1,68E−4	8,81E−6	1,61E−5	8,81E−6	2,19E−5	5,64E−7	MND	9,02E−7	1,13E−6	3,74E−6	2,96E−8	−3,2E−5
Acidification	kg SO2e	8,3E0	7,42E−2	1,87E−2	8,39E0	1,66E−1	2,22E−1	2,1E−1	6,31E−1	3,43E−3	MND	5,5E−3	8,73E−3	1,54E−1	3,33E−4	−2,82E0
Eutrophication	kg Ne	1,28E1	3,49E−2	8,24E−3	1,28E1	3,57E−2	6,2E−2	3,74E−2	9,73E−2	1,5E−3	MND	2,39E−3	4,1E−3	1,6E−1	1,64E−4	−3,39E0
Photochemical Smog Formation	kg O3e	1,05E2	7,8E−1	3,62E−1	1,07E2	3,02E0	3,61E0	4,07E0	1,27E1	3,46E−2	MND	5,54E−2	9,18E−2	1,18E0	2,65E−3	−3,73E1
Depletion of non-renewable energy	MJ	1,35E3	8,6E1	4,7E1	1,48E3	7,83E1	1,43E2	7,8E1	1,93E2	5,03E0	MND	8,05E0	1,01E1	3,34E1	2,65E−1	−8,81E1