Environmental Product Declaration

In accordance with ISO 14025 and EN 15804:2012+A2:2019 for:

REINFORCEMENT STEEL PRODUCTS

from

“INTERSTEEL Latvija” SIA

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

Programme information

Programme:	The International EPD® System
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ISO Standard ISO 21930 and CEN standard EN 15804:2012+A2:2019 serves as the Core Product Category Rules (PCR)
Product category rules (PCR): PCR 2019:14 Construction products (EN 15804:A2) (1.11)
PCR review was conducted by: The Technical Committee of the International EPD® System. See www.environdec.com/TC for a list of members. Review chair: Claudia A. Peña, University of Concepción (Chile). The review panel may be contacted via the Secretariat info@environdec.com
Independent third-party verification of the declaration and data, according to ISO 14025:2006: ☐ EPD process certification ☒ EPD verification
Third party verifier: Elisabet Amat, eamat@greenize.es Approved by: The International EPD® System
LCA and EPD has been worked out by Bureau Veritas Latvia. E-mail: riga@bureauveritas.com (www.bureauveritas.lv)
Procedure for follow-up of data during EPD validity involves third party verifier: ☐ Yes ☒ No

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but from different programs may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804:2012+A2:2019. For further information about comparability, see EN 15804:2012+A2:2019 and ISO 14025.

Company information

Owner of the EPD: “INTERSTEEL Latvija” SIA, Brīvības iela 97A, LV-3401 Liepāja, Latvija

Contact: Pēteris Zommers, e-mail: zommers@intersteel.lv, tel. +371 26 744 557

Description of the organisation: Company is specialized in the production of reinforcement steel products. The in-line production process can produce various types of reinforcement steel products that are used in the construction or steel industry.

Product-related or management system-related certifications: Globecert Nr. 1702 ; KIWA Certificate Nr. 12304;

Name and location of production site(s): “INTERSTEEL Latvija” SIA, Brīvības iela 97 A, Liepāja, LV-3401; Latvija

Product information

Product name: Reinforcement Steel for concrete structures (straight rebars, re-bundling, cut rebars, cut and bent rebars, meshes, cages).

Product identification: The CEN standard EN 15804:2012+A2:2019 serves as the core PCR. In addition, PCR 2019:14 Construction products (EN 15804:A2) (1.11) and the EN 1090.

Information on fire protection according to EN 13501 – 1 or any national standard.

Class of construction material - A1 by default.

Product description: Products are used as reinforcing steel for concrete, afterward the reinforced concrete is used as a structural component for buildings, wind turbines and other load bearing frames. The steel structures are prepared by cutting and bending at Intersteel Latvia factory which is in Liepāja, Latvia.

The products are produced according to following standards.

EU - EN 10080:2005; **SWE** - SS212540:2014; **NOR** - NS 3576-4:2005; **FIN** -TR 392:2018,

SFS 1267:2008; **LAT** - LVS 191-1:2021+AG:2015

The target group of the product is Business to business (B2B).

LCA information

Functional unit / declared unit: 1 ton of average bent and welded steel product.

Reference service life: 50 years.

Time representativeness: The production data are from 2021, and the database data are from 2013 – 2021 i.e., no data is older than 10 years.

Database(s) and LCA software used: Database used is mainly Ecoinvent 3.8. The LCA software used is SimaPro 9.3.

Data quality:

The foreground data was collected internally considering the latest available average production amounts and measures during the last year (2021). Data regarding the end-of-life modules are based on the experts’ judgment and database data (i.e., Ecoinvent 3.8.).

According to the criteria of the UN Environment Global Guidance on LCA database development, the quality level can be defined as very good. Data is geographically representative as it comes from the area of study, it is technical representative as it comes from processes and products under study using the same state of technology defined in goal and scope, and it is also time representative as data used was collected less than 3 years difference between the reference year according to the documentation.

Description of system boundaries:

LCA is made in “Cradle-to-gate with options, modules C1-C4, module D and with optional module A4” form. All major materials, production energy use and waste are included for product stages A1, A2, A3, A4, C2, C3, C4 and D. All life cycle impacts are included, see flowchart below. The following information describes the scenarios in the different modules of the EPD. All major raw materials and all the essential energy are included. Marginal production process for raw materials and energy flows with a cut-off of 1% are not included. This cut-off rule does not apply to hazardous materials and substances.

- **Raw material supply (A1)**

The material that is needed to produce bend and welded rebar steel products is mostly steel – steel rebar and steel coil. Other materials that are used in the process have not been considered because of a quantity less than 1% in mass.

- **Transport (A2)**

Steel materials are transported from Russia, Belarus, Moldova, Ukraine, Poland, and Germany – 1,16 % from Moldova for a distance of 1112,56 km; 70,52 % from Belarus for a distance of 704,37 km; 22,38 % from Russia for a distance of 1760,46 km; 3,71 % from Ukraine for a distance of 1133,27 km; 1,46 % from Poland for a distance of 524,01 km; 0,76 % from Germany for a distance of 910,63 km.

- **Manufacturing (A3)**

The processes that are included in the manufacturing phase are the bending and welding of rebars, of which energy consumption, auxiliary material consumption, waste and gaseous emissions have been modeled. As the ancillary material is used for machinery oiling afterward the same amount of oil is categorized as the waste material that is collected by the supplier. During the manufacturing process, there is created metal waste - 51,7 % of metal wastes are recycled and 48,3 % are disposed in landfills. The packaging waste is assumed as mixed plastic waste, most of the packaging materials are reused multiple times but plastic materials such as wrapping film and plastic for product identification tags are not reusable.

- **Transport from production place to user (A4)**

From the production site at Intersteel in Latvia, the product is transported to customers in Latvia, Lithuania, Estonia, Poland, Finland, Sweden and Norway. Transportation by road includes transport type lorry of 16 – 32 metric ton EURO5, lorry of 7,5 – 16 metric ton EURO5 and light commercial vehicle, and water transportation by includes transport type ferry. The transportation impacts cover fuel direct exhaust emissions, environmental impacts of fuel production and related to infrastructure emissions. The information of these transports is shown in the table below.

Type	Vehicle	Distance km	Fuel/energy consumption	Value (l/t)
Latvia				
Truck	Lorry, 16-32t, EURO5	167,50	0,0441 l/tkm	7,38
Truck	Lorry, 7,5-16t, EURO5	63,70	0,0557 l/tkm	3,54
Van	Light commercial vehicle	39,60	0,3766 l/tkm	14,91
Lithuania				
Truck	Lorry, 16-32t, EURO5	182,21	0,0441 l/tkm	8,03
Estonia				
Truck	Lorry, 16-32t, EURO5	540,00	0,0441 l/tkm	23,80
Poland				
Truck	Lorry, 16-32t, EURO5	1094,00	0,0441 l/tkm	48,22
Finland				
Truck	Lorry, 16-32t, EURO5	897,00	0,0441 l/tkm	39,54
Boat	Ferry	87,00	0,0399 l/tkm	3,47
Sweden				
Truck	Lorry, 16-32t, EURO5	520,00	0,0441 l/tkm	22,92
Boat	Ferry	293,00	0,0399 l/tkm	11,69
Norway				
Truck	Lorry, 16-32t, EURO5	837,00	0,0441 l/tkm	36,90
Boat	Ferry	277,00	0,0399 l/tkm	11,05

- **Demolition (C1)**

No process and impacts are attributed to rebar products in the demolition stage. It is considered that all demolition processes and the impacts are attributed to constructions in which rebar products are used (e.g., reinforced concrete demolition), and not the rebar products themselves.

- **Transport (C2)**

Average waste transportation for 50 km by municipal waste collection truck is assumed.

- **Waste processing (C3)**

The waste processing phase includes procedures of steel sorting and decompositions from other possible building materials.

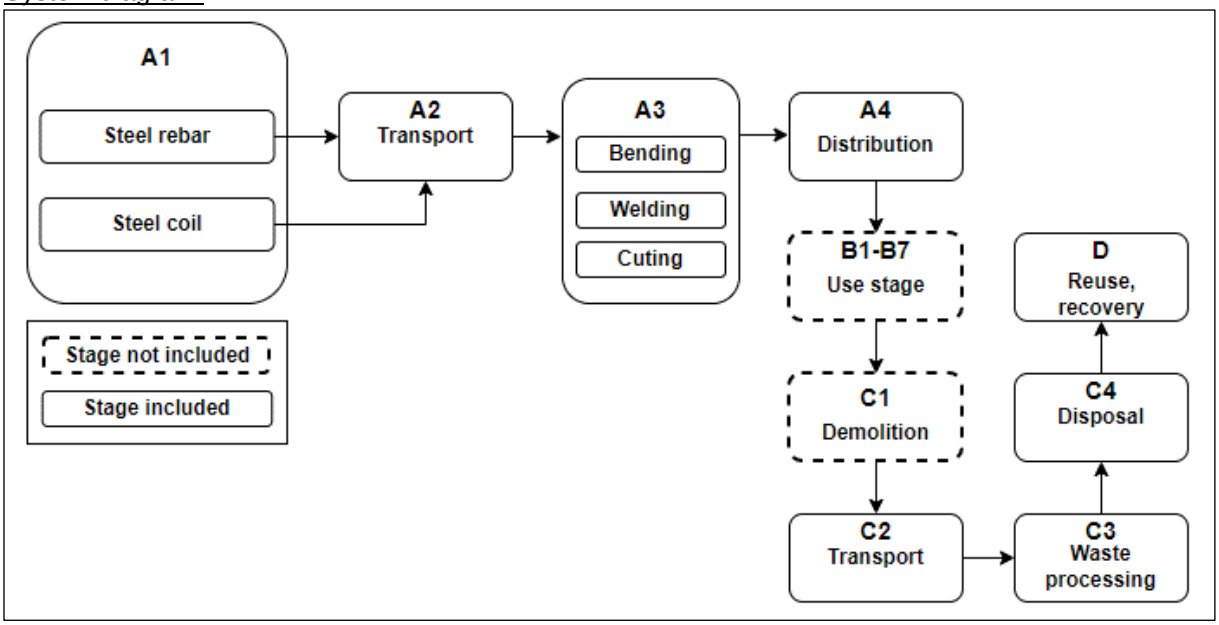
- **Disposal (C4)**

Based on Eurostat data for the year 2019 annual steel waste recycling rate is 77,4 % and disposal rate are 22,6 %. Regarding to differences in recycling rates that is presented in Ecoinvent and from Eurostat for module C4 is used information regarding to data from Ecoinvent calculations, respectively, recycling rate is 87%.

- **Reuse, recovery, recycling, potential (D)**

Based on the information presented in module C4 the steel scrap after sorting is recycled and reused. The recycled steel amount is having the same recycling rate as module C4 – 87%, and rests of it is disposed of, respectively 13%.

System diagram:



More information: Electricity, waste and ancillary materials in production are calculated as an average weight per produced tonne of all products using yearly production data and the rate for 2021. For manufacturing processes, the specific country mix of electricity is considered. For secondary data on materials' flow information has been gathered from the Ecoinvent 3.8. database. In addition, the allocation is made following the provisions of PCR 2019:14 Construction products (EN 15804:A2) (1.11). The recycling process and transportation of the material is considered in this analysis. The polluter pays and modularity principles are followed. The processes excluded from analysis are environmental impacts from infrastructure, construction, production equipment, and tools that are not directly consumed in the production process and personnel-related impacts.

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

	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	GLO	EU	LV	GLO	ND	ND	ND	ND	ND	ND	ND	ND	EU	EU	EU	EU	EU
Specific data used	> 90%					-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	straight rebars, cut rebars, cut and bent rebars, meshes, cages					-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	No data declared					-	-	-	-	-	-	-	-	-	-	-	-

More information: Note that ND stands for “Not Declared” as reported by EN 15804:2012+A2:2019.

Content information

Data refer to the declared unit of product.

Product components	Weight, %	Post-consumer material, weight-%	Renewable material, weight-%
Steel	100%	87%	0%
TOTAL	100%	>87%	0%

Since the plastic tags, tie wire and packaging are present in a quantity of less than 1%, it can be assumed that the entire declared unit consists of 1 ton of steel. The product does not contain any REACH SVHC substances.

Environmental Information

Potential environmental impact – mandatory indicators according to EN 15804:2012+A2:2019

Indicator	Unit	A1	A2	A3	A4	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq.	1,10 E+03	1,02 E+03	4,56 E+00	1,51 E+02	0,00 E+00	6,39 E+01	5,78 E+01	6,85 E-01	-9,16 E+01
GWP-fossil	kg CO_2 eq.	1,09 E+03	1,02 E+03	4,10 E+00	1,50 E+02	0,00 E+00	6,39 E+01	5,77 E+01	6,82 E-01	-9,31 E+01
GWP-biogenic	kg CO_2 eq.	6,69 E+00	2,44 E+00	4,53 E-01	3,64 E-01	0,00 E+00	5,45 E-02	9,90 E-02	2,11 E-03	1,43 E+00
GWP-luluc	kg CO_2 eq.	1,49 E+00	3,43 E-01	4,40 E-03	5,62 E-02	0,00 E+00	5,90 E-03	5,40 E-03	1,85 E-04	1,33 E-01
ODP	kg CFC 11 eq.	7,41 E-05	2,32 E-04	6,51 E-07	1,18 E+01	0,00 E+00	3,92 E+00	4,47 E+00	8,53 E-02	-1,88 E-06
AP	mol H^+ eq.	5,12 E+00	4,09 E+00	2,78 E-02	8,19 E-01	0,00 E+00	4,03 E-01	6,00 E-01	6,44 E-03	-1,90 E-01
EP-freshwater	kg PO_4^{3-} eq.	1,53 E+00	2,08 E-01	1,97 E-03	3,35 E-02	0,00 E+00	3,59 E-03	6,45 E-03	1,93 E-04	-1,54 E-01
EP-freshwater	kg P eq.	5,06 E-01	6,85 E-02	6,50 E-04	1,11 E-02	0,00 E+00	1,18 E-03	2,13 E-03	6,37 E-05	-5,08 E-02
EP-marine	kg N eq.	1,51 E+00	1,25 E+00	6,39 E-03	2,39 E-01	0,00 E+00	1,62 E-01	2,66 E-01	2,25 E-03	-1,47 E-02
EP-terrestrial	mol N eq.	1,11 E+01	1,37 E+01	6,93 E-02	2,62 E+00	0,00 E+00	1,78 E+00	2,91 E+00	2,46 E-02	-6,91 E-01
POCP	kg NMVOC eq.	3,97 E+00	4,17 E+00	2,09 E-02	7,73 E-01	0,00 E+00	6,27 E-01	7,99 E-01	7,14 E-03	-5,86 E-01
ADP-minerals&metals*	kg Sb eq.	8,50 E-03	3,68 E-03	4,43 E-06	6,77 E-04	0,00 E+00	5,68 E-05	3,68 E-05	1,53 E-06	7,48 E-04
ADP-fossil*	MJ	1,26 E+04	1,54 E+04	6,18 E+01	2,25 E+03	0,00 E+00	8,70 E+02	8,06 E+02	1,91 E+01	-7,31 E+02
WDP	m^3	5,82 E+02	4,39 E+01	4,95 E-01	6,72 E+00	0,00 E+00	7,22 E-01	1,29 E+00	8,59 E-01	3,42 E+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.*

Global warming potential - GHG

Indicator	Unit	A1	A2	A3	A4	C1	C2	C3	C4	D
GWP-GHG	kg CO_2 eq.	1,06 E+03	1,01 E+03	4,04 E+00	1,49 E+02	0,00 E+00	6,33 E+01	5,71 E+01	6,66 E-01	-8,36 E+01
Acronyms	GWP-GHG = Global Warming Potential, Green House Gases emissions.									

Potential environmental impact – additional mandatory and voluntary indicators

Indicator	Unit	A1	A2	A3	A4	C1	C2	C3	C4	D
PM	Disease inc.	9,59 E-05	7,07 E-05	3,86 E-07	1,05 E-05	0,00 E+00	8,65 E-06	1,59 E-05	1,26 E-07	-2,52 E-06
IRP	kBq U-235 eq	9,56 E+01	8,06 E+01	4,99 E-01	1,18 E+01	0,00 E+00	3,92 E+00	4,47 E+00	8,53 E-02	3,44 E+00
ETP-fw	CTUe	3,56 E+04	1,18 E+04	4,10 E+01	1,76 E+03	0,00 E+00	4,86 E+02	4,62 E+02	1,20 E+01	-8,32 E+02
HTP-c	CTUh	2,78 E-05	4,21 E-07	6,97 E-09	8,00 E-08	0,00 E+00	9,38 E-09	2,28 E-08	3,58 E-10	2,27 E-06
HTP-nc	CTUh	2,59 E-05	1,20 E-05	2,47 E-08	1,76 E-06	0,00 E+00	3,21 E-07	3,28 E-07	7,50 E-09	-1,69 E-06
SQP	Pt	4,86 E+03	1,06 E+04	2,63 E+01	1,46 E+03	0,00 E+00	1,53 E+02	1,21 E+02	4,02 E+01	-3,00 E+02
Acronyms	PM = Potential incidence of disease due to PM emissions; IRP = Potential Human exposure efficiency relative to U235; ETP-fw= Potential Comparative Toxic Unit for ecosystems; HTP-c = Potential Comparative Toxic Unit for humans; HTP-nc = Potential Comparative Toxic Unit for humans; SQP = Potential Soil quality index									

Use of resources

Indicator	Unit	A1	A2	A3	A4	C1	C2	C3	C4	D
PERE	MJ	8,63 E+02	1,51 E+02	1,56 E+01	2,33 E+01	0,00 E+00	2,29 E+00	1,31 E+01	1,05 E-01	5,50 E+01
PERM	MJ	2,26 E+02	5,65 E+01	5,02 E+00	8,30 E+00	0,00 E+00	1,04 E+00	2,24 E+00	4,93 E-02	4,52 E-01
PERT	MJ	1,09 E+03	2,08 E+02	2,06 E+01	3,16 E+01	0,00 E+00	3,33 E+00	1,53 E+01	1,54 E-01	5,55 E+01
PENRE	MJ	1,26 E+04	1,54 E+04	6,17 E+01	2,25 E+03	0,00 E+00	8,70 E+02	8,06 E+02	1,91 E+01	-7,31 E+02
PENRM	MJ	4,51 E-01	3,18 E-01	5,41 E-04	5,32 E-02	0,00 E+00	5,10 E-03	2,22 E-03	9,82 E-05	3,31 E-02
PENRT	MJ	1,26 E+04	1,54 E+04	6,17 E+01	2,25 E+03	0,00 E+00	8,70 E+02	8,06 E+02	1,91 E+01	-7,31 E+02
SM	kg	8,73 E-01	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00
RSF	MJ	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00
NRSF	MJ	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00
FW	m^3	1,69 E+01	1,55 E+00	2,25 E-02	2,66 E-01	0,00 E+00	3,68 E-02	8,29 E-02	2,05 E-02	1,07 E+00
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

Indicator	Unit	A1	A2	A3	A4	C1	C2	C3	C4	D
Hazardous waste disposed	kg	3,28 E-02	4,02 E-02	7,47 E-05	8,76 E-03	0,00 E+00	2,34 E-03	2,13 E-03	2,82 E-05	-1,66 E-02
Non-hazardous waste disposed	kg	6,16 E+02	7,39 E+02	2,22 E-01	9,98 E+01	0,00 E+00	4,11 E+00	1,02 E+00	1,30 E+02	4,02 E+01
Radioactive waste disposed	kg	4,01 E-02	1,06 E-01	2,92 E-04	1,53 E-02	0,00 E+00	6,18 E-03	5,69 E-03	1,26 E-04	9,36 E-04

Output flows

Indicator	Unit	A1	A2	A3	A4	C1	C2	C3	C4	D
Components for re-use	kg	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00
Material for recycling	kg	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	1,30 E-01
Material for energy recovery	kg	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00
Exported energy	MJ	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00

Information on biogenic carbon content

Results per functional or declared unit		
BIOGENIC CARBON CONTENT	**Unit**	**QUANTITY**
Biogenic carbon content in product	kg C	0,00 E+00
Biogenic carbon content in packaging	kg C	0,00 E+00

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO_2.

To obtain the results in accordance with the provisions of EN 15804:2012+A2:2019, the “EF method”, “EDIP”, “CED” and “IPCC” methodologies have been used for environmental impacts, waste generation, energy consumption and biogenic carbon content respectively.

Information related to the EPD sector

This EPD® is individual.

References

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

- General Programme Instructions of the International EPD® System. Version 3.01

- ISO 14025:2006. Environmental labels and declarations — Type III environmental declarations — Principles and procedures

- ISO 14040:2006. Environmental management – Life cycle assessment – Principles and framework

- ISO 14044:2006. Environmental management – Life cycle assessment – Requirements and guidelines

- Yeung J., Walbridge S., Haas C., et al., (2017). Understanding the total life cycle cost implications of reusing structural steel. Environ Syst Decis. 37:101-120

- LCA software SimaPro 9.3

- PCR 2019:14 Construction products (EN 15804:A2) (1.11)

- EN ISO 3834-2: Quality requirements for fusion welding of metallic materials - Part 2: Comprehensive quality requirements

- EN 1090-2: Execution of steel structures and aluminium structures - Part 2: Technical requirements for steel structures

- EN ISO 9001: Quality management systems — Requirements

- EN ISO 14001:2015: Environmental management systems — Requirements with guidance for use

- “Statistics | Eurostat.” Packaging waste by waste management operations: https://ec.europa.eu/eurostat/databrowser/view/ENV_WASPAC__custom_3013758/default/table?lang=en

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