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The Norwegian EPD Foundation

ENVIRONMENTAL PRODUCT DECLARATION

in accordance with ISO 14025, ISO 21930 and EN 15804

Owner of the declaration:	CSK Ståindustri A/S
Program operator:	The Norwegian EPD Foundation
Publisher:	The Norwegian EPD Foundation
Declaration number:	NEPD-3003-1678-EN
Registration number:	NEPD-3003-1678-EN
ECO Platform reference number:	-
Issue date:	16.08.2021
Valid to:	16.08.2026

Prefabricated steel balconies

With glass railings

CSK Ståindustri A/S



General information

Product

Prefabricated steel balconies

Program operator

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Declaration number

NEPD-3003-1678-EN

ECO Platform reference number

Product Category Rules

EN 15804:2012 + A1:2013 serves as PCR
 NPCR 013:2019 Part B for Steel and aluminium construction
 products is used as a guiding document.

Statement of liability

The owner of the declaration shall be liable for the
 underlying information and evidence. EPD Norway shall
 not be liable with respect to manufacturer information, life
 cycle assessment data and evidences.

Declared unit

-

Declared unit with options (A1-A4, C1-C4, D):

1 steel balcony, H=1,2 m, W=3,8 m, D= 1,4 m, cradle-to-
 gate A1-A3 with options

Functional unit

-

Verification

The CEN Norm EN 15804 serves as the core PCR.
 Independent verification of the declaration and data,
 according to ISO14025:2010

internal external

Third party verifier:

Ole M.K. Iversen

Ole M. K. Iversen

Independent verifier approved by EPD Norway

Owner of the declaration

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Manufacturer

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Place of production

Denmark

Management system

EN ISO 9001
 EN ISO 14001
 BS/EN 1090

Organisation number

20216883

Issue date

16.08.2021

Valid to

16.08.2026

Year of study

2021

Comparability

EPD of construction products may not be comparable if they
 not comply with EN 15804 and seen in a building context.

The EPD has been worked out by

Michael M. Jenssen, Asplan Viak AS

Michael M. Jenssen  **asplan viak**

Approved

Håkon Hauan

Håkon Hauan
 Managing Director of EPD-Norway

Product

About CSK Steel

CSK Steel is a specialized global steel manufacturer driven by close relations with our customers. CSK Steel is certified to supply CE marked steel structures for the European market in all Execution Classes (EXC1-EXC4).

Our quality assurance system is based on ISO 3834, and we are certified according to 1090-1. External quality audits are performed on an ongoing basis to ensure that our certification is always valid and up-to-date.

At CSK Steel we strive to always offer - and deliver - high-quality steel structures and service, ensured by the continuous development and improvement of our quality assurance system and policies.

We are also certified according to international standards for occupational health and safety DS/OHSAS 18001:2007 / ISO 45001:2018. Our environmental management system is certified according to ISO 14001:2015.

Product Variation

The declared product is produced by CSK and the results are an average of three variations with different railing configurations. Variance between 3% - 13% for Global Warming Potential (kg CO₂eq).

Product description

CSK Balconies are steel balconies with wood decking boards and glass railing, manufactured by CSK per customer specification. Incoming hot-rolled profiles are first sand blasted, then cut and welded to the desired shape and surface treated. The steel frame, railing and wood decking is then assembled per customer specification and transported to the building site.

Technical data

Steel grade S235 / S275 and S355.

Product specification

Materials	kg	%
Hot-rolled steel	420 - 490 (avg.: 460)	67 - 70
Wood and wood composites	61	9
Glass	150	21 - 24
Total balcony weight	631 - 731	
Calculated weight	671	

Market

Nordics

Reference service life, product

60 years

Reference service life, building

60 years

LCA: Calculation rules

Declared unit

1 steel balcony, H=1,2 m, W=3,8 m, D= 1,4 m, cradle-to-gate A1-A3 with options

System boundary

Modules are declared according to the PCR. Declared modules are shown in *Figure 1*. Gray boxes denote modules not declared.

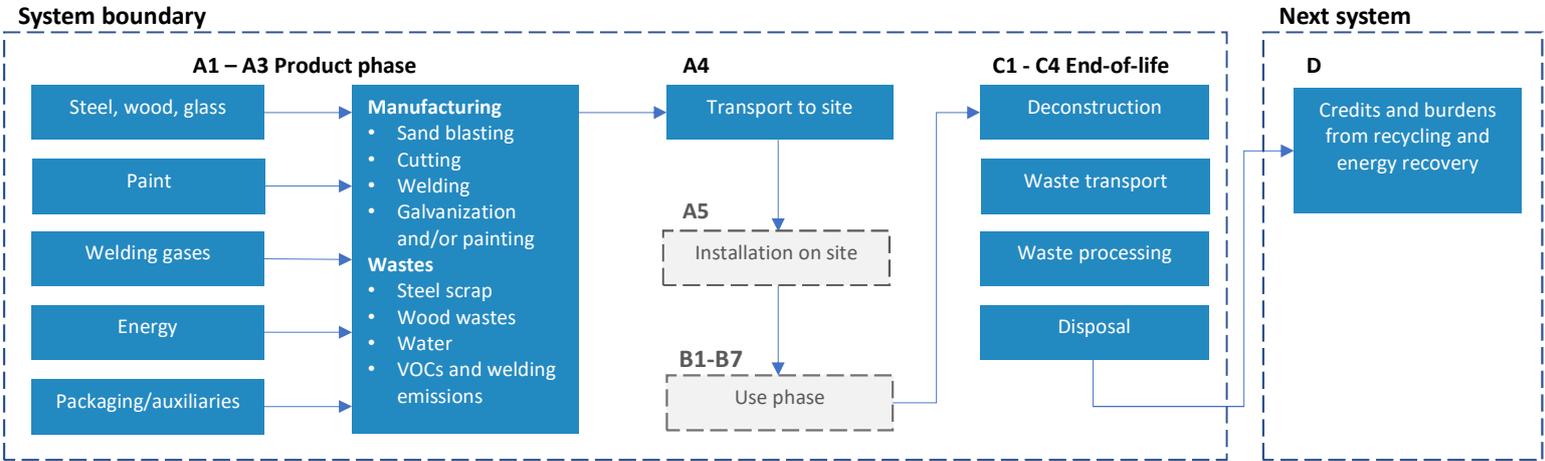


Figure 1: System boundaries

Data quality

General requirements and guidelines concerning the use of generic and specific data and the quality of those are as described in EN 15804: 2012+A1:2013, clause 6.3.6 and 6.3.7., including ISO14044:2006, 4.2.3.6. The data is representative according to temporal, geographical and technological requirements. Reference year for the manufacturer's specific data is 2019. Database used has been ecoinvent v3.6. Calculations have been carried out using Simapro v9.

Allocation

The allocation is made in accordance with the provisions of EN 15804. Production activities, energy, water and waste production in-house is allocated equally among all products through mass allocation. Effects of primary production of recycled materials allocated to the main product in which the material was used. The recycling process and transportation of the material is allocated to this analysis.

Cut-off criteria

All major raw materials and all the essential energy is included. The production process for raw materials and energy flows that are included with very small amounts (<1% energy, mass, impact) are not included. This cut-off rule does not apply for hazardous materials and substances.

Benefits and loads beyond the system boundary (Module D)

Module D is calculated from the amount of recycled steel sorted out after the building's life (C3) and exported heat and energy from incineration of the decking boards in module C3. Burdens and credits from recycling of steel is calculated from net new scrap.

LCA: Scenarios and additional technical information

The following information describe the scenarios in the different modules of the EPD.

Transport from production place to user (A4)

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance km	Fuel/Energy consumption	Value (l/t)
Truck	44 %	Lorry >32t EURO5	300	0.022 l/tkm	6.6

Scenario for distance to building site following NPCR 013 Part B.

End of Life (C1, C3, C4)

	Unit	Value
Hazardous waste disposed	kg	0
Collected as mixed construction waste	kg	0
Reuse	kg	0
Recycling	kg	437
Energy recovery (C3)	kg	61
To landfill (C4)	kg	173

Benefits and loads beyond the system (D)

	Unit	Value
Net new scrap	kg	94
Substitution of heat	MJ	111.86
Substitution of energy	MJ	13.72

End of life scenario

Net new scrap for steel is calculated by subtracting the scrap content of outgoing steel from the recycling rate. An average scrap content of 75% is used, reflecting average European supply of steel primary and secondary production. Note that outgoing scrap and the parameter for Secondary Material content (SM) differ, wherein the latter accounts for the total amount of scrap needed in the system to fulfill the declared unit.

For steel, a 95% recovery rate is assumed, wherein 5% is assumed landfilled - in effect providing a 95% recycling rate. Reuse is not included in this scenario. It is further assumed that all wood elements are incinerated with energy recovery, substituting Danish electricity supply and district heating. Glass is considered landfilled.

Transport to waste processing (C2)

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance km	Fuel/Energy consumption	Value (l/t)
Waste collection	50 %	Lorry 21t	19	0.39 l/tkm	7.4
Truck	26 %	Lorry 7,5-16t EURO5	278	0.04 l/tkm	12.2

To provide a plausible scenario for transportation to waste processing, a study of Norwegian waste treatment was used as proxy data (Raadal et al., 2009).

LCA: Results
System boundaries (X=included, MND= module not declared, MNR=module not relevant)

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

Environmental impact

Parameter	Unit	A1-A3	A4	C1	C2	C3	C4	D	
GWP	kg CO ₂ -eqv	1.09E+03	1.74E+01	1.42E+01	4.64E+01	1.74E+01	1.19E-01	-1.53E+02	
ODP	kg CFC11-eqv	1.16E-04	4.30E-06	3.09E-06	1.04E-05	9.74E-07	5.03E-08	9.12E-07	
POCP	kg C ₂ H ₄ -eqv	4.42E-01	2.18E-03	2.37E-03	6.80E-03	1.82E-03	3.66E-05	-6.55E-02	
AP	kg SO ₂ -eqv	6.07E+00	4.57E-02	1.07E-01	1.67E-01	3.31E-02	8.75E-04	-3.01E-01	
EP	kg PO ₄ ³⁻ -eqv	9.92E-01	6.15E-03	2.34E-02	3.10E-02	7.11E-03	1.54E-04	-2.44E-02	
ADPM	kg Sb-eqv	8.37E-01	3.12E-04	2.20E-05	9.36E-04	8.15E-05	1.12E-06	-4.80E-04	
ADPE	MJ	1.64E+04	2.85E+02	1.97E+02	6.77E+02	8.00E+01	3.41E+00	-2.25E+03	

GWP Global warming potential; ODP Depletion potential of the stratospheric ozone layer; POCP Formation potential of tropospheric photochemical oxidants; AP Acidification potential of land and water; EP Eutrophication potential; ADPM Abiotic depletion potential for non fossil resources; ADPE Abiotic depletion potential for fossil resources

Resource use

Parameter	Unit	A1-A3	A4	C1	C2	C3	C4	D	
RPEE	MJ	5.39E+03	3.58E+00	1.07E+00	7.68E+00	7.68E+00	2.80E-02	-1.11E+02	
RPEM	MJ	1.14E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
TPE	MJ	6.53E+03	3.58E+00	1.07E+00	7.68E+00	7.68E+00	2.80E-02	-1.11E+02	
NRPE	MJ	1.76E+04	2.85E+02	1.97E+02	6.77E+02	8.00E+01	3.41E+00	-2.25E+03	
NRPM	MJ	2.13E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
TRPE	MJ	1.78E+04	2.85E+02	1.97E+02	6.77E+02	8.00E+01	3.41E+00	-2.25E+03	
SM	kg	4.41E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
RSF	MJ	0.00E+00							
NRSF	MJ	0.00E+00							
W	m ³	1.75E+01	3.24E-02	1.01E-02	7.39E-02	5.42E-02	3.65E-03	-1.25E+02	

RPEE Renewable primary energy resources used as energy carrier; RPEM Renewable primary energy resources used as raw materials; TPE Total use of renewable primary energy resources; NRPE Non renewable primary energy resources used as energy carrier; NRPM Non renewable primary energy resources used as materials; TRPE Total use of non renewable primary energy resources; SM Use of secondary materials; RSF Use of renewable secondary fuels; NRSF Use of non renewable secondary fuels; W Use of net fresh water

End of life - Waste

Parameter	Unit	A1-A3	A4	C1	C2	C3	C4	D	
HW	kg	5.25E+00	1.56E-02	5.80E-03	3.02E-02	1.70E+02	2.63E-04	-1.42E-03	
NHW	kg	3.25E+02	2.48E+01	2.33E-01	2.34E+01	6.23E+00	2.31E+01	-9.49E-02	
RW	kg	5.90E-02	1.94E-03	1.37E-03	4.68E-03	4.29E-04	2.24E-05	-5.10E-05	

HW Hazardous waste disposed; NHW Non hazardous waste disposed; RW Radioactive waste disposed

End of life - Output flow

Parameter	Unit	A1-A3	A4	C1	C2	C3	C4	D	
CR	kg	0.00E+00							
MR	kg	0.00E+00							
MER	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.10E+01	0.00E+00	0.00E+00	
EEE	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.37E+01	0.00E+00	0.00E+00	
ETE	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.12E+02	0.00E+00	0.00E+00	

CR Components for reuse; MR Materials for recycling; MER Materials for energy recovery; EEE Exported electric energy; ETE Exported thermal energy

Reading example: 9,0 E-03 = 9,0*10⁻³ = 0,009

Additional Norwegian requirements

Greenhouse gas emission from the use of electricity in the manufacturing phase

Danish production mix from import, medium voltage (production of transmission lines, in addition to direct emissions and losses in grid) of applied electricity for the manufacturing process (A3).

Data source	Amount	Unit
Econinvent v3.6 - Denmark	0.359	kg CO ₂ -eqv/kWh

Dangerous substances

- The product contains no substances given by the REACH Candidate list or the Norwegian priority list
- The product contains substances given by the REACH Candidate list or the Norwegian priority list that are less than 0,1 % by weight.
- The product contain dangerous substances, more then 0,1% by weight, given by the REACH Candidate List or the Norwegian Priority list, see table.
- The product contains no substances given by the REACH Candidate list or the Norwegian priority list. The product is classified as hazardous waste (Avfallsforsikten, Annex III), see table.

Indoor environment

No tests have been carried out on the product concerning indoor climate - Not relevant.

Carbon footprint

Carbon footprint has not been worked out for the product.

Bibliography

ISO 14025:2010	<i>Environmental labels and declarations - Type III environmental declarations - Principles and procedures</i>
ISO 14044:2006	<i>Environmental management - Life cycle assessment - Requirements and guidelines</i>
EN 15804:2012+A1:2013	<i>Sustainability of construction works - Environmental product declaration - Core rules for the product category of construction products</i>
ISO 21930:2007	<i>Sustainability in building construction - Environmental declaration of building products</i>
Jennssen, M.M. (2020)	<i>LCA report for CSK Stålindustri A/S</i>
NPCR 013:2019	<i>Part B for Steel and Aluminium products</i>
Raadal et al. (2009)	<i>Klimaregnskap for avfallshåndtering. Fase I og II: Glassemballasje, metallemballasje, papir, papp, plastemballasje, våtorganisk avfall, treavfall og restavfall fra husholdninger. ISBN: 82-8035-073-X.</i>

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