Environmental Product Declaration (EPD)

IN ACCORDANCE WITH ISO 14025:2006 AND EN 15804:2012+A2:2019/AC:2021

JOS SPIRAL STAIRCASE

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THE INTERNATIONAL EPD® SYSTEM

Verification Information

Programme operator

The International EPD® System

EPD International AB
Box 210 60
SE-100 31 Stockholm
Sweden

www.environdec.com
info@environdec.com

Product-specific rules: (PCR) 2019:14 – Construction products v.1.3.2 & UN CPC 42911

PCR inspection carried out by: IVL Swedish Environmental Research Institue
Chair: Martin Erlandsson
Contact via: martin.erlandsson@ilv.se

LCA carried out by: Isak Eklöv and Felix Jansson, Sweco

Third party inspector: Pär Lindman, Miljögiraff

Independent EPD verification of declaration and data in accordance with: ISO 14025 EN 15804:2012+A2:2019/AC:2021

Approved by: The international EPD® System

The procedure for following up information during the period of validity of the EPD involves a third party inspector

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Company Information

EPD owner
Weland AB
Malmgatan 34, 333 30 Smålandsstenar
Tel. 0371-344 00
info@weland.se

Company description
Weland AB is a family company with a factory and head office in Smålandsstenar, Sweden. A leading manufacturer and supplier of spiral staircases, straight flight staircases, railings, ramps, and floor grating in steel. Weland is also one of Sweden's leading players in the sheet metal working sector. Weland is the parent company of some 30 or so manufacturing entities in Sweden and 4 subsidiaries based overseas. What is significant for all companies in the Group is that they produce and sell Swedish-made products.

Name and place of manufacture
Smålandsstenar, Sweden

Product name: JOS Spiral Staircase

Product description: The JOS Spiral Staircase is a steel staircase intended for use in indoor and outdoor environments. In order to ensure an accurate comparison of the enviromental impact of the staircase it should be remembered that the JOS Spiral Staircase is approx. 30% lighter than a traditional steel spiral staircase.

UN CPC code: 412

Geographical scope: Europe

LCA Information

Declared unit: 1 tonne JOS Spiral Staircase
Reference year for information: 2022
Database used: Ecoinvent 3.9.1
LCA software: SimaPro 9.5

Description of LCA

The system boundaries in this LCA have been set based on the minimum requirement for life cycle stages that must be declared in an EPD in accordance with the requirements of EN 15804+A2. This LCA covers cradle-to-grate (production stages A1-A3), end phases C1-C4, and post-life cycle impact D. Module A5 is included in the modelling, but is not fully declared in order to balance biogenic emissions of carbon dioxide and renewable energy that are used as raw materials. The production phase covers the recovery of raw materials upstream (A1), transportation of raw materials to core production (A2), and the fabrication of the steel staircase in Weland's facility (A3). The end phases cover disassembly after use (C1), transportation to waste management (C2), waste management (C3, C4), and post-life cycle loads/benefits (D).

A1: Raw Materials Supply

Module A1 includes the recovery and processing of raw materials used in the fabrication of the steel staircase. Production of packaging material for the constituent materials is also included in this module.

A2: Transportation to Manufacturing

Module A2 includes impact associated with the transportation of raw materials and internal transports. The impact includes both the production and combustion of fuel during transportation.

A3: Manufacturing

Module A3 consists of the manufacturing process of the steel staircase. The module includes the direct emissions generated by the combustion of diesel in internal transports. Emissions associated with the electricity used in the facility are also included in module A3. In addition to this, emissions from processing the waste generated during manufacturing are also included. In line with Chapter 6.3.5.2 of EN 15804:2012+A2:2019, potential benefits from module A3 are not included in module D. Module A3 also includes production of packaging material for the staircase.
The results for modules A1-A3 are presented in aggregated form.
A specific electricity mix has been used in order to assess Weland's use of energy in Sweden. The electricity used by all production units comes from Göteborgs Energi AB without active environmental choice. The electricity mix for corporate customers of Göteborgs Energi AB that have not taken out environmental options in 2022 comprises 62% generated from fossil energy sources, 21% from nuclear power, and 17% from renewable sources. The following climate impact emissions factors have been calculated for the specific electricity consumption mix in all Weland production units: 0.45 kg CO2 eq. /kWh (GWP-GHG).

C1: Dismantling

Module C1 includes the dismantling of the steel staircase. Dismantling requires a small amount of energy and, in relation to other processes and materials during the staircase life cycle, dismantling constitutes a small proportion of the total energy inflow and outflow (less than 1%). Because of this, dismantling has been excluded and therefore no processes for module C1 are included in this LCA.

C2: Transportation to Waste Management

Module C2 includes emissions from transportation of the steel staircase to waste management (both indirect emissions from fuel production and direct emissions from the combustion of that fuel).

C3: Waste Management

Waste from the steel staircase is included in module C until an "end-of-waste" state is achieved, otherwise waste is sent to landfill. Based on statistics from SGU (SGU 2013), it is assumed that 95% of the material in the steel staircase will be recycled, with the remaining 5% sent to landfill. The benefits associated with recycling are presented in module D.

C4: Disposal

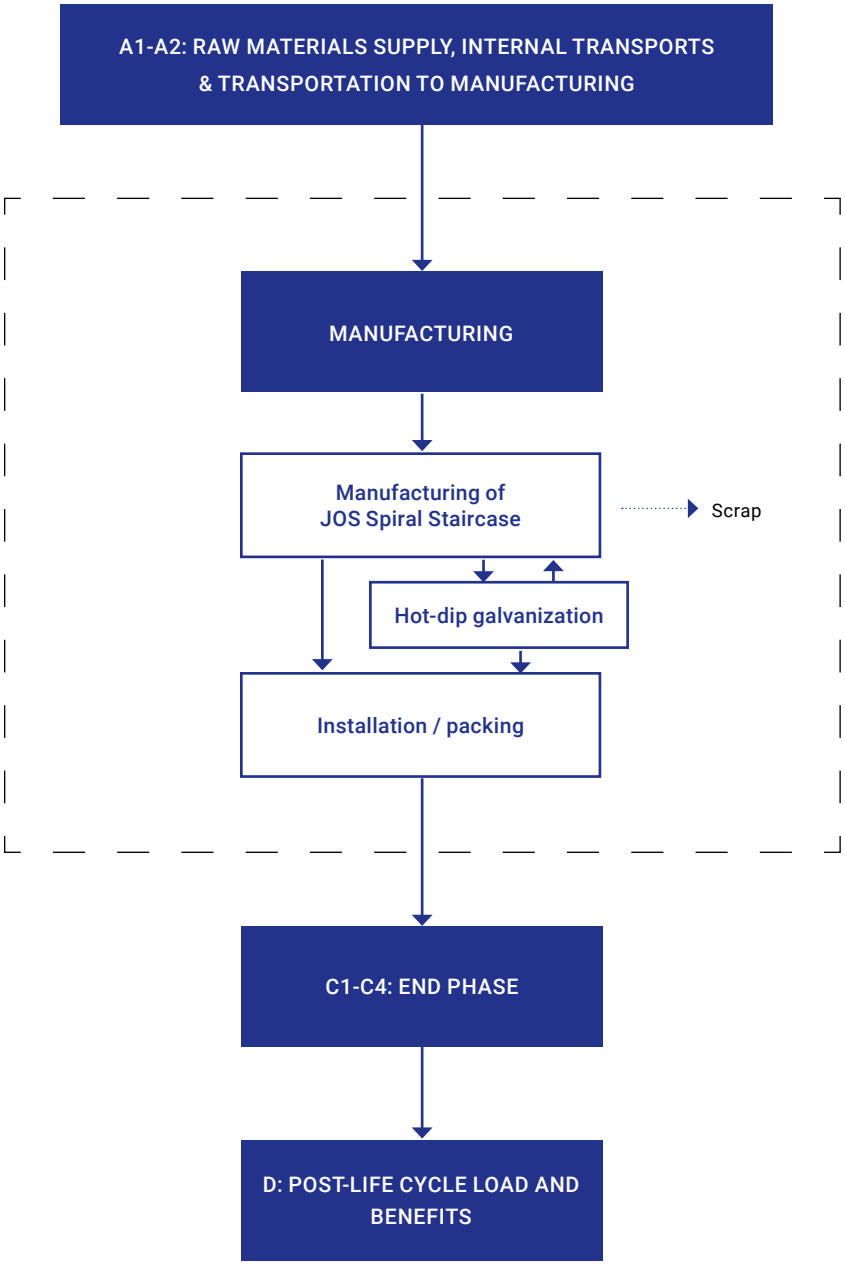
Module C4 includes the disposal of the steel staircase. Based on statistics from SGU (SGU 2013), it is assumed that 5% of the material in the steel staircase will be sent to landfill.

D: Post-Life Cycle Load and Benefits

Module D includes the benefit associated with the recycling of the steel in the steel staircase. The benefit comes in the form of avoiding having to produce virgin steel for use as a raw material for the proportion of the steel in the staircase that is recycled.

Process Schedule

JOS Spiral Staircase



Infrastructure is included in underlying dataset for upstream and downstream processes.

Infrastructure for core process is not included. The main parts of the process consists of punching and bending.

Declared modules, geographical scope, proportion of specific data (in GWP GHG result) and data variation (in GWP GHG result)

	Product			Design phase		Use							End phase				Outside system boundaries
	Raw material supply	Transport	Manufacturing	Transport	Installation	Use	Maintenance	Repair	Replacement	Renovation	Operative energy use	Operative water use	Dismantling	Transport	Waste Management	Landfill	Reuse & recycling
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Declared modules	x	x	x	MND	MND	MND	MND	MND	MND	MND	MND	MND	x	x	x	x	x
Geography	EUR	SE	SE	-	-	-	-	-	-	-	-	-	EUR	EUR	EUR	EUR	EU
Specific data	> 90 %																
Variation of products	0 %																
Variation of production locations	0 %																

[1] The module is not fully declared but is included in the modification in order to balance biogenic emissions and renewable energy that are used as raw materials.

DECLARATION OF CONTENTS

The product contains no hazardous substances from the SVHC candidate list.

Components	Raw material	Net weight of production (tonnes)	Used recycled material (post-consumer) percentage weight of 1 tonne spiral staircase %	Biogenic material in percentage weight % and kg C/kg
Railing infill and step	Sheet metal with magnesium coating	0,71	19,03	0
Perforated plate floor	Sheet metal with magnesium coating	0,14	3,75	0
Centre column	Hot-dip galvanized steel tube	0,12	0	0
Handrail	Sheet metal with magnesium coating	0,03	0,80	0
TOTAL		1	23,58	0

Components	Raw material	Net weight of production (tonnes)	Used recycled material (post-consumer) percentage weight of 1 tonne spiral staircase %	Biogenic material in percentage weight % and kg C/kg
Pallets and wood box	Wood pallet	0,04	0	47,2%, 19,89 kg C / DE
Packaging material, insert material	Kraft paper	0,001	0	41,6%, 0,416 kg C / DE
TOTAL		0,041	0	

ENVIRONMENTAL IMPACT

Environmental impact for 1 tonne of JOS Spiral Staircase. Mandatory environmental impact categories in accordance with EN 15804.

RESULT PER DECLARED UNIT								
Indicator	**Unit**	**A1-A3**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	kg CO_2 eq.	1,73E+03	8,83E+01	0,00E+00	3,40E+00	2,09E+01	3,04E-01	-1,20E+03
GWP-fossil	kg CO_2 eq.	1,79E+03	0,00E+00	0,00E+00	3,39E+00	2,13E+01	3,04E-01	-1,20E+03
GWP-biogenic	kg CO_2 eq.	-6,45E+01	8,83E+01	0,00E+00	6,63E-03	-4,33E-01	1,74E-04	3,97E+00
GWP-luluc	kg CO_2 eq.	9,89E-01	0,00E+00	0,00E+00	2,14E-03	2,58E-02	1,83E-04	-3,12E-01
ODP	kg CFC 11 eq.	1,65E-05	0,00E+00	0,00E+00	7,19E-08	3,36E-07	8,80E-09	-2,90E-05
AP	mol H* eq.	6,51E+00	0,00E+00	0,00E+00	1,74E-02	2,58E-01	2,29E-03	-4,54E+00
EP-fresh water	kg P eq.	6,47E-02	0,00E+00	0,00E+00	3,87E-04	1,42E-02	2,53E-05	-4,84E-01
EP-marine	kg N eq.	1,74E+00	0,00E+00	0,00E+00	6,82E-03	5,75E-02	8,79E-04	-1,11E+00
EP-ground	mol N eq.	1,82E+01	0,00E+00	0,00E+00	7,31E-02	6,44E-01	9,42E-03	-1,17E+01
POCP	kg NMVOC eq.	5,56E+00	0,00E+00	0,00E+00	2,47E-02	1,91E-01	3,28E-03	-6,48E+00
ADP-ADP- mineral & metals[1]	kg Sb eq.	5,40E-02	0,00E+00	0,00E+00	1,04E-05	1,51E-03	4,22E-07	-6,71E-04
ADP-fossil resources [1]	MJ	2,38E+04	0,00E+00	0,00E+00	4,91E+01	2,88E+02	7,57E+00	-1,28E+04
WDP[1]	m^3	2,92E+02	0,00E+00	0,00E+00	2,46E-01	3,79E+00	3,34E-01	-6,27E+01
PM	kBq U235 eq.	3,76E-05	0,00E+00	0,00E+00	3,26E-07	3,47E-06	5,01E-08	-8,47E-05
IRP[2]	Occurrence of illness	1,33E+02	0,00E+00	0,00E+00	1,44E-01	2,60E+00	4,80E-03	-1,60E+01
ETP-fw1[1]	kBq U235 eq.	6,81E+03	0,00E+00	0,00E+00	2,36E+01	2,29E+02	3,55E+00	-3,51E+03
HTP-c[1]	CTUe	4,07E-07	0,00E+00	0,00E+00	2,10E-09	3,56E-08	1,29E-10	-6,58E-06
HTP-nc[1]	CTUh	7,62E-06	0,00E+00	0,00E+00	3,69E-08	1,66E-06	1,62E-09	-4,68E-06
SQP[1]	No unit	8,30E+03	0,00E+00	0,00E+00	3,59E+01	5,58E+02	1,50E+01	-2,55E+03

GWP-total = Total Global Warming Potential; **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** = Ozone Depletion; **AP** = Acidification; **EP-freshwater** = Eutrophication – aquatic freshwater; **EP-marine** = Eutrophication – aquatic marine; **EP-ground** = Eutrophication – terrestrial; **POCP** = Photochemical zone formation; **ADP-minerals & metals** = Abiotic Depletion Potential – minerals and metals; **ADP-fossil** = Abiotic Depletion Potential – fossil fuels; **WDP** = Water use; **PM** = Particle emissions; **IRP** = Ionizing radiation, human health; **ETP-fw** = Ecotoxicity (freshwater); **HTP-c** = Human toxicity, non-cancer effects; **HTP-nc** = Human toxicity non-cancer related effects; **SQP** = Land use-related impacts/Soil quality

[1]The result of this environmental impact indicator must be used with caution as there is significant uncertainty due to limited experience of the indicator.
[2]This environmental impact indicator primarily includes the impact of ionizing radiation at low doses on human health in the nuclear fuel cycle. It does not take the effects of possible nuclear power accidents, professional exposure, or the disposal of radioactive waste in underground facilities into account. Potential ionizing radiation from the ground, from radon, and from certain building materials is not measured in the indicator.

Other mandatory & voluntary environmental impact categories

Mandatory environmental impact categories in accordance with EN 15804

RESULT PER DECLARED UNIT								
Indicator	**Unit**	**A1-A3**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-GHG[1]	kg CO_2 eq.	1,79E+03	0,00E+00	0,00E+00	3,40E+00	2,14E+01	3,04E-01	-1,20E+03

USE OF RESOURCES

RESULT PER DECLARED UNIT								
Parameter	**UNIT**	**A1-A3**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
FPEE	MJ	1,99E+04	0,00E+00	0,00E+00	1,36E+00	5,09E+01	6,41E-02	-2,75E+02
FPEM	MJ	6,68E+02	-6,68E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
TFE	MJ	1,99E+04	0,00E+00	0,00E+00	1,36E+00	5,09E+01	6,48E-02	-2,75E+02
IFPE	MJ	2,87E+04	0,00E+00	0,00E+00	5,21E+01	3,05E+02	8,05E+00	-1,42E+04
IFPM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
TIFE	MJ	2,87E+04	0,00E+00	0,00E+00	5,21E+01	3,05E+02	8,05E+00	-1,42E+04
SM	kg	8,34E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FSB	MJ	1,29E-20	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
IFSB	MJ	1,52E-19	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
V	m^3	1,64E+01	0,00E+00	0,00E+00	1,03E-02	1,19E-01	8,08E-03	-4,54E+00

FPEE - Use of renewable primary energy excluding renewable primary energy resources used as raw materials; **FPEM** - Use of renewable primary energy resources used as raw materials; **TFE** - Total use of renewable primary energy resources; **IFPE** - Use of non renewable primary energy resources used as raw materials; **IFPM** - Use of non renewable primary energy resources used as raw materials; **TIFE** - Total use of non renewable primary energy resources; **SM** - Use of secondary material; **FSB** - Use of renewable secondary fuels; **IFSB** - Use of non renewable secondary fuels; **V** - Net use of fresh water

This indicator takes all greenhouse gases into account, except for absorbtion and emissions of biogenic carbon dioxide and biogenic carbon stored in the product. As a result, the indicator is identical to GWP-total, except that the calculation factor (CF) for biogenic CO2 is set to zero.

WASTE AND OTHER OUTFLOWS PER (kg)

RESULT PER FUNCTIONAL OR DECLARED UNIT								
Parameter	**Unit**	**A1-A3**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
FA	kg	5,67E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
IFA	kg	1,06E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RA	kg	3,83E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
KÅ	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MÅ	kg	1,92E+02	0,00E+00	0,00E+00	0,00E+00	9,50E+02	0,00E+00	0,00E+00
MEG	kg	1,41E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EV	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

FA - Hazardous waste disposed; **IFA** - Non-hazardous waste disposed; **RA** - Radioactive waste disposed; **KÅ** - Components for re-use; **MÅ** - Materials for recycling; **MEG** - Materials for energy recovery; **EE** - Exported energy; **EV** - Exported heat

The results of impact categories abiotic emptying of minerals and metals, land use, human toxicity (cancer), human toxicity (non-cancer), and ecotoxicity (freshwater) can be highly uncertain in LCA studies that include capital goods/infrastructure in the generic dataset where the capital goods/infrastructure makes a significant contribution to the total results. This is due to LCI data for infrastructure/capital goods used to quantify these indicators in the currently available generic dataset sometimes lacking temporal, technological, and geographical representation. Caution should be observed when using the results from these indicators as a basis for making decisions.

Summary

This EPD declares the environmental impacts from the production of Spiral Staircase JOS.

Weland AB is a family company with a factory and head office in Smålandsstenar. A leading manufacturer and supplier of spiral stairs, straight stairs, railings, ramps and gratings in steel. Weland is also one of Sweden's largest players in the field of sheet metal working.

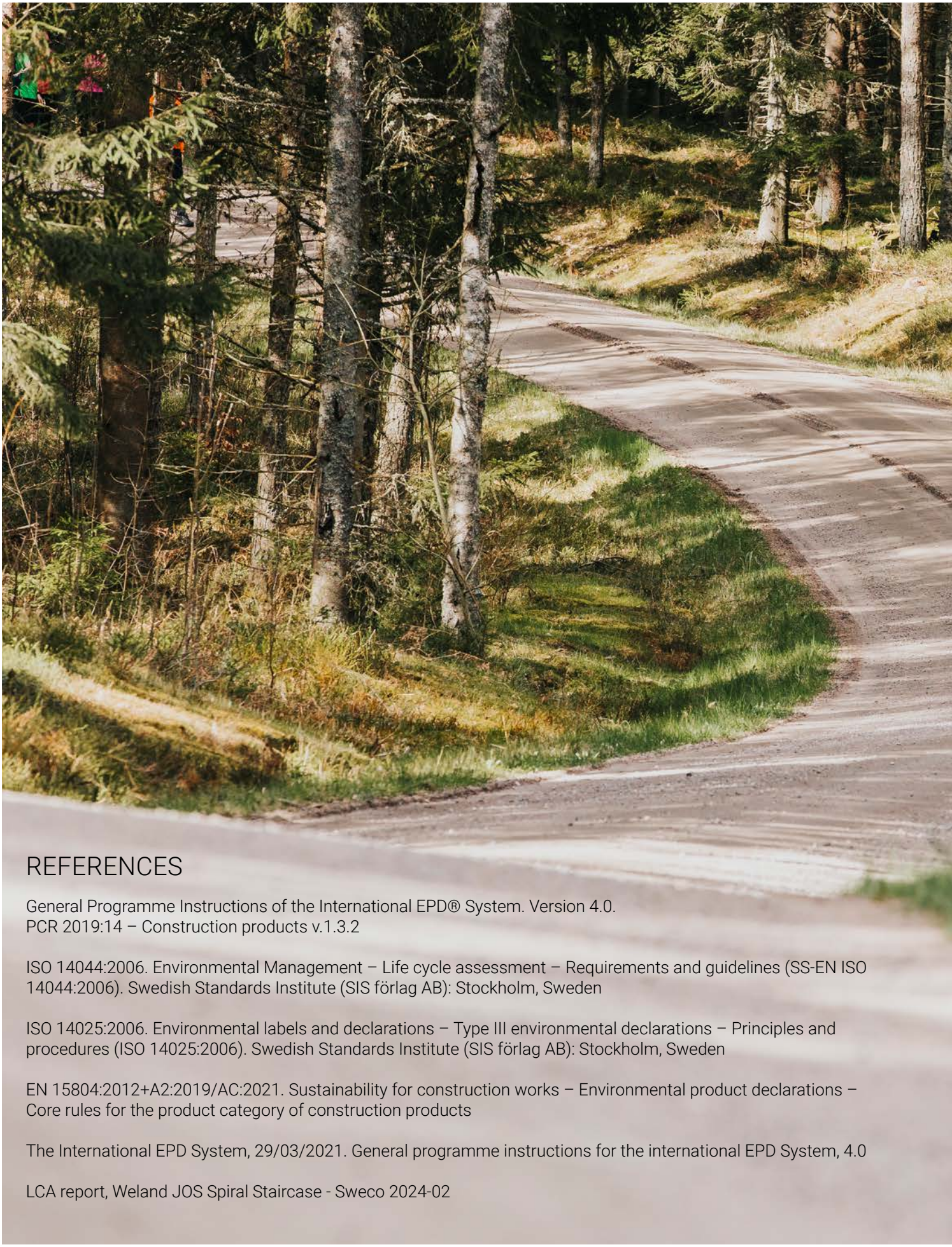
Weland AB is the parent company of 32 manufacturing companies in Sweden and 4 foreign subsidiaries.
Significant for all companies included in the group is that they produce and sell Swedish-made products.
Production and surface treatment plant for this scope is in Smålandsstenar and Ulricehamn.

Declared product Spiral Staircase JOS
Declared unit 1 ton Spiral Staircase JOS

System boundaries Cradle to gate with modules C1-C4 and D

Environmental Performance

Potential environmental impact per 1 ton of Spiral Staircase JOS was calculated with the EN15804 +A2 method.
See page 7 for environmental performance.



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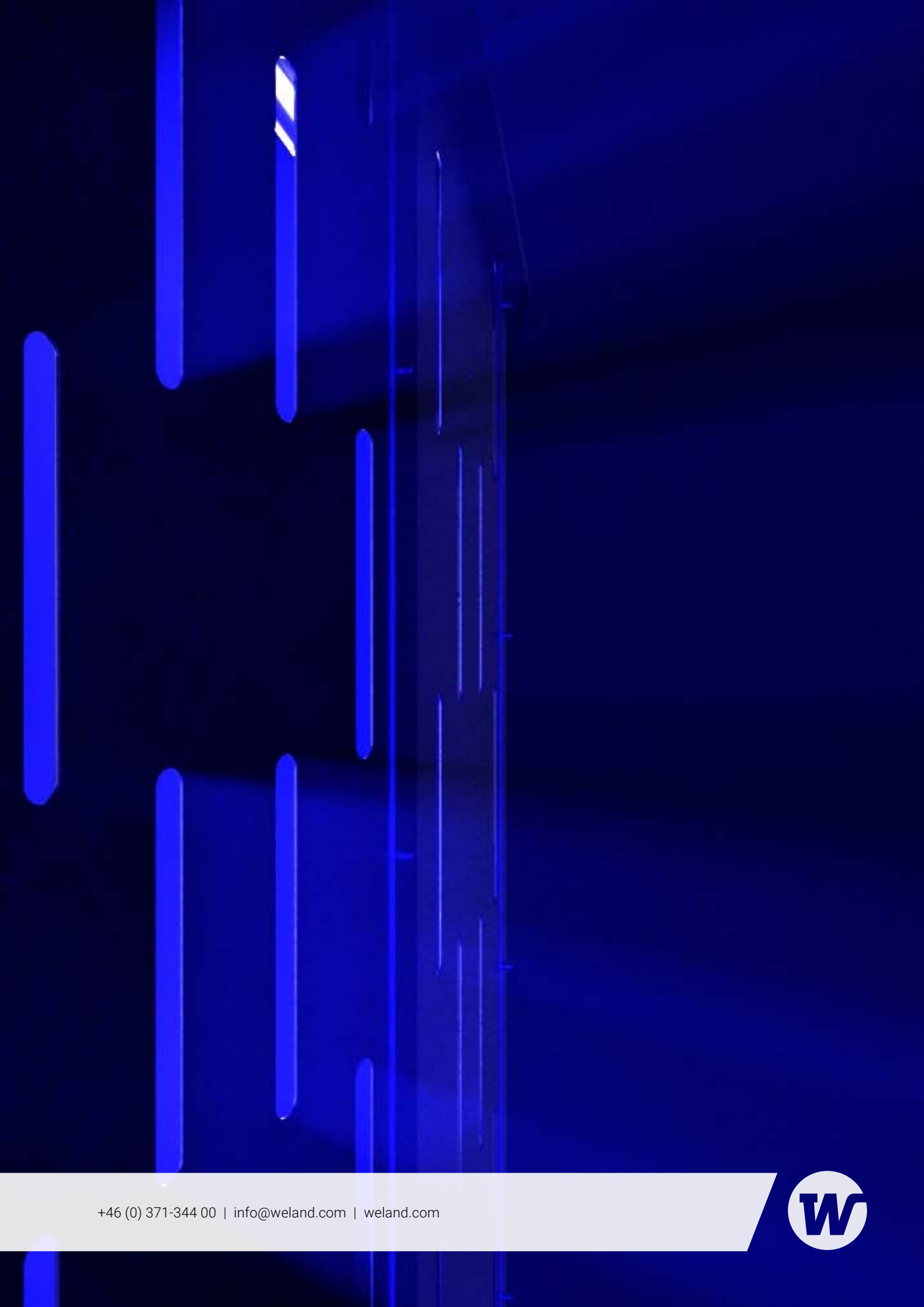
LCA report, Weland JOS Spiral Staircase - Sweco 2024-02



+46 (0) 371-344 00 | info@weland.com | weland.com