

Environmental Product Declaration



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

Mill Finished, Fabricated Profiles

from

Hydro Extrusion Slovakia a.s.

EPD of multiple products, based on average results



Programme:	The International EPD® System, www.environdec.com
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An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com



General information

Programme information

Programme:	The International EPD® System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Website:	www.environdec.com
E-mail:	info@environdec.com

Accountabilities for PCR, LCA and independent, third-party verification

Product Category Rules (PCR)

CEN standard EN 15804 serves as the Core Product Category Rules (PCR)

Product Category Rules (PCR): PCR 2019:14 CONSTRUCTION PRODUCTS, version 1.3.4.

PCR review was conducted by: The Technical Committee of the International EPD® System. Chair of the PCR review is Claudia A. Peña. The review panel may be contacted via info@environdec.com

Life Cycle Assessment (LCA)

LCA accountability: LCA Studio s.r.o.
Ing. Petra Kšenzíhová, Ing. et Ing. Tatiana Trecáková, PhD., prof. Ing. Vladimír Kočí, Ph.D., MBA
Šárecká 1962/5, 16000 Prague 6, Czech Republic, www.lcastudio.cz



Third-party verification

Independent third-party verification of the declaration and data, according to ISO 14025:2006, via:

☒ EPD verification by individual verifier

Third-party verifier: prof. Ing. Silvia Vilčeková, Ph.D., Silcert, s.r.o.

Approved by: The International EPD® System

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 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: Hydro Extrusion Slovakia a.s.

Contact: Ing. Viktor Fára, MBA, Managing Director, E-mail: viktor.fara@hydro.com

Description of the organisation: Hydro is a leading aluminium and renewable energy company that builds businesses and partnerships for a more sustainable future. Hydro Extrusion Slovakia located in Žiar nad Hronom, in Slovakia is a part of this company. Hydro Extrusion Slovakia is a traditional producer of aluminium extruded profiles with more than 55 years history. To satisfy the demanding customer requirements, it offers a comprehensive service from extrusion through surface treatment to a wide range of fabrication operations, all in one place. Hydro Extrusion Slovakia serves more than 500 active customers in all industrial segments, from B&C, Automotive and Transport, General and Electrical Engineering.

Hydro Extrusion Slovakia has roughly 400 employees. Production is equipped with two extrusion presses (7" and 10"), one anodising line (colours: natural anodising, bronze shades (C31 until C35) and extensive fabrication operations.

Product-related or management system-related certifications: ISO 9001:2015, ISO 14001:2015, ISO 45001:2018, ISO 50001:2018, IATF 16949:2016, EN 15088:2005, ASI Performance Standard, ASI Chain of Custody

Name and location of production site(s): Hydro Extrusion Slovakia a.s., Na Vartičke 7, 965 01 Žiar and Hronom, Slovakia

Product information

Product name: Mill Finished, Fabricated Aluminium Profiles

Product description: Mill Finished, Fabricated Aluminium profiles are produced by Hydro Extrusion Slovakia starting from aluminium billets (externally purchased from various sources). The extrusion process is the main production step, common for all types of aluminium profiles. The extrusion process starts with ingots of aluminium alloy. These are cut into billets, which are then heated in a furnace to the correct extrusion temperature of 450 – 500°C. The heated billet is then forced through a die under great pressure, and the finished profile is squeezed out of the extrusion die. The profile is cooled using air or water. After cooling, the profile is stretched to relieve any stress and to give it the desired straightness. The quality of the surface and of any dimensions that are important to the function of the profile are checked at the same time. The profile is then cut to a suitable length or to the length requested by the customer. The final strength of the material is controlled by natural or artificial ageing. Moreover, fabrication operation, are applied on mill finished profiles. Hydro Extrusion Slovakia offers the following fabrication operations:

- Cutting
- Milling
- Drilling
- Punching
- Deburring
- Tumbling
- Etc.

Aluminium profiles are used in almost all industries. We can find their applications in products intended for building & construction, general engineering, automotive, transportation, electrical engineering, but also equipment for domestic & office equipment. In addition to mill finished profiles, we also offer higher added value in the form of surface treatment and fabrication of aluminium profiles.

The weighted average results of the included products based on production volumes were calculated.

UN CPC code: 415 Semi-finished products of copper, nickel, aluminium, lead, zinc and tin or their alloys

Geographical scope: Global, Slovak Republic

LCA information

Functional unit / declared unit: Declared unit is 1 kg of the aluminium profile.

Reference service life: RSL is dependent on product application. Aluminium itself has an infinite lifetime.

Time representativeness: Site specific data from producer are based on 1 year average for process data (reference year 07/2022-06/2023). Time scope less than 10-years was applied for background data. Time scope less than 2-years was applied for specific data.

Database(s) and LCA software used: LCA for Experts (Sphera), Sphera database and ecoinvent database.

Description of system boundaries:

This EPD is based on system boundary cradle to gate, modules C1–C4, module D and with optional modules A4-A5.

The system boundary covers the production of raw materials, all relevant transport down to factory gate, manufacturing by Hydro Extrusion Slovakia, transport from the Hydro Extrusion Slovakia plant to the site (586 km) and installation of aluminium profiles including product unpacking, transport of used aluminium profiles (100 km), sorting of used aluminium profiles, treatment of produced waste (recycling and landfill of fractions not entering the recycling treatment).

System boundaries:

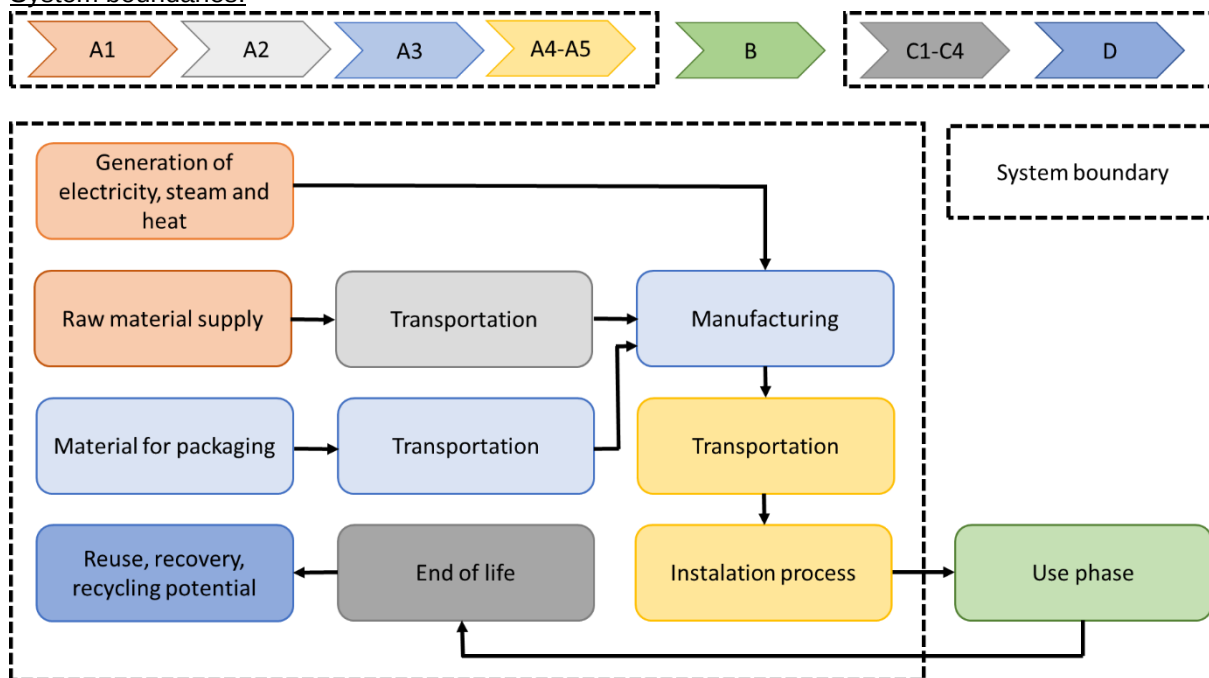


Figure 1 System boundary of the LCA study conducted on production of anodised aluminium profiles

System diagram:

Scheme of the manufacturing process occurring at Hydro Extrusion Slovakia for Mill Finished, Fabricated Profiles

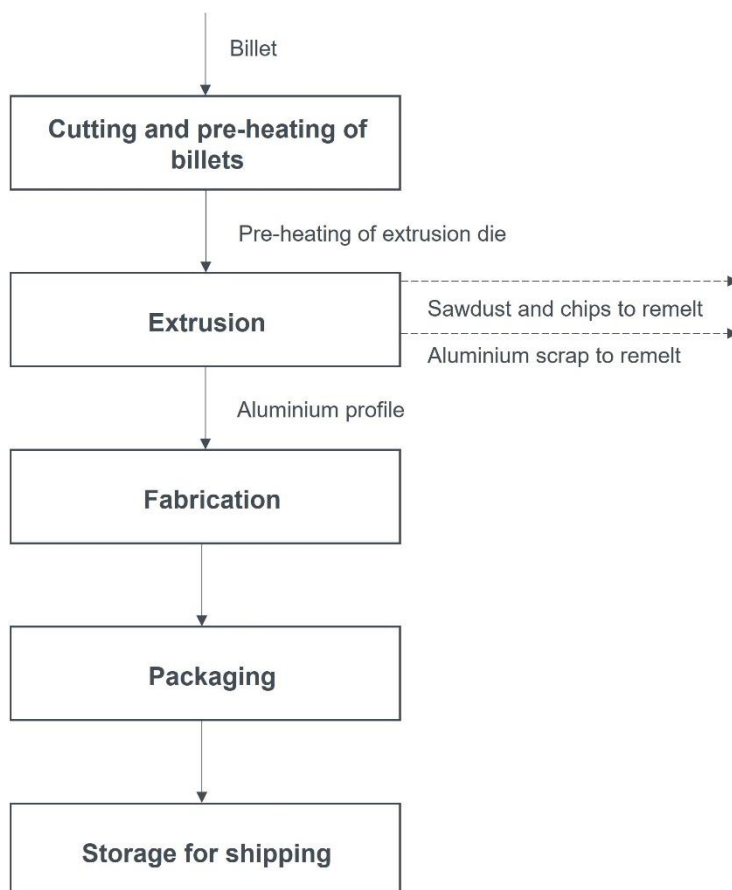


Figure 2: Production process of fabricated aluminium profiles

Cut off rules: The cut-off criterion was chosen based on the used PCR. According to the used PCR, more than 95 % of flows were included.

Allocations: Specific inputs and outputs were measured or calculated for specific product. The allocation of common inputs (thermal energy) is based on the general allocation rule what represents the proportion of production of every specific product in overall production expressed in kilograms. The allocation of outputs is based on mass allocation.

Generic process data for the production of input materials and components were used. General content of secondary paper fibres is used in a production of secondary cardboard. Secondary polyethylene terephthalate granulate is used in a production of secondary PET tape. No secondary fuels are used in production. Secondary materials are allocated based on supplier's EPDs.

Electricity mix: Generation of electricity consumed within Hydro Extrusion Slovakia production was based on the Slovak residual electricity grid mix. GWP-GHG indicator of the used residual electricity grid mix is 0,27 kg CO₂eq./kWh.

Characterisation factors: Characterisation factors are based on Environmental Footprint 3.1. (EF 3.1).

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	x	ND	ND	ND	ND	ND	ND	ND	x	x	x	x	X
Geography	GLO	GLO	SK	GLO	GLO	NR	NR	NR	NR	NR	NR	NR	GLO	GLO	GLO	GLO	GLO
Specific data used	82%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	<5%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	0%			-	-	-	-	-	-	-	-	-	-	-	-	-	-

Content information

Product components	Weight, kg	Post-consumer material, weight-%	Biogenic material, weight-% and kg C/kg
Aluminium Ingot	1,0	0	0
TOTAL	1,0	0	0
Packaging materials	Weight, kg	Weight-% (versus the product)	Weight biogenic carbon, kg C/kg
Paper packaging virgin	0,0060	0,60%	0,43
Paper packaging secondary	0,0014	0,14%	0,53
Wood pellets	0,0677	6,77%	0
PET tape secondary	0,0003	0,03%	0
Plastic packaging -- LDPE	0,0017	0,17%	0
TOTAL	0,0798	7,98%	0,96

Dangerous substances from the candidate list of SVHC for Authorisation	EC No.	CAS No.	Weight-% per 1 kg of aluminium profile
No substances from the SVHC list to report.			

Results of the environmental performance indicators

Mandatory impact category indicators according to EN 15804

Results per 1 kg of aluminium profile									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-fossil	kg CO ₂ eq.	6,90E+00	6,04E-02	4,95E-03	0,00E+00	9,56E-03	1,77E-02	7,40E-04	-8,32E+00
GWP-biogenic	kg CO ₂ eq.	-1,18E-01	-8,95E-04	1,30E-01	0,00E+00	-1,42E-04	1,14E-05	-2,55E-05	1,60E-03
GWP-luluc	kg CO ₂ eq.	1,16E-03	5,60E-04	9,58E-08	0,00E+00	8,86E-05	9,07E-07	2,33E-06	-1,14E-03
GWP-total	kg CO ₂ eq.	6,78E+00	6,01E-02	1,35E-01	0,00E+00	9,51E-03	1,77E-02	7,17E-04	-8,32E+00
ODP	kg CFC 11 eq.	5,75E-01	5,29E-15	1,28E-15	0,00E+00	8,38E-16	1,23E-13	1,91E-15	-1,08E-11
AP	mol H ⁺ eq.	4,68E-02	7,85E-05	1,34E-06	0,00E+00	1,24E-05	2,68E-05	5,33E-06	-2,95E-02
EP-freshwater	kg P eq.	7,65E-04	2,20E-07	3,57E-10	0,00E+00	3,49E-08	6,62E-09	1,51E-09	-4,04E-06
EP-marine	kg N eq.	1,74E-03	2,76E-05	4,30E-07	0,00E+00	4,37E-06	7,96E-06	1,38E-06	-5,51E-03
EP-terrestrial	mol N eq.	1,88E-02	3,31E-04	6,10E-06	0,00E+00	5,25E-05	8,62E-05	1,51E-05	-5,99E-02
POCP	kg NMVOC eq.	7,03E-03	6,81E-05	1,18E-06	0,00E+00	1,08E-05	2,31E-05	4,15E-06	-1,63E-02
ADP-minerals&metals*	kg Sb eq.	4,69E-07	3,93E-09	1,14E-11	0,00E+00	6,22E-10	1,53E-09	3,47E-11	-3,58E-07
ADP-fossil*	MJ	3,08E+01	8,22E-01	3,02E-03	0,00E+00	1,30E-01	3,36E-01	1,00E-02	-1,13E+02
WDP*	m ³	6,89E-01	6,97E-04	7,91E-04	0,00E+00	1,10E-04	9,38E-04	8,25E-05	-4,78E-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.

Additional mandatory and voluntary impact category indicators

Results per 1 kg of aluminium profile									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-GHG ¹	kg CO ₂ eq.	6,90E+00	6,11E-02	4,95E-03	0,00E+00	9,68E-03	1,77E-02	7,45E-04	-8,33E+00
Particulate matter	Disease incidences	1,13E-06	5,22E-10	1,14E-11	0,00E+00	8,27E-11	2,11E-10	6,55E-11	-3,09E-07
Ionising radiation, human health	kBq U235 eq.	2,79E-01	1,54E-04	1,78E-05	0,00E+00	2,43E-05	6,40E-03	1,32E-05	-1,88E+00
Ecotoxicity fresh water	CTUe	5,48E+00	5,79E-01	1,78E-03	0,00E+00	9,17E-02	7,77E-02	7,25E-03	-2,92E+01
Human toxicity, cancer	CTUh	9,55E-10	1,17E-11	9,71E-14	0,00E+00	1,85E-12	2,73E-12	8,40E-13	-3,38E-09
Human toxicity, non-cancer	CTUh	4,64E-08	5,15E-10	6,79E-12	0,00E+00	8,16E-11	7,80E-11	8,87E-11	-6,93E-08
Land Use	Pt	1,46E+01	3,43E-01	7,62E-04	0,00E+00	5,43E-02	2,43E-02	2,43E-03	-7,61E+00

Resource use indicators

Results per 1 kg of aluminium profile									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	MJ	9,17E+01	5,82E-02	7,25E-04	0,00E+00	9,21E-03	3,82E-02	1,63E-03	-3,79E+01
PERM	MJ	2,48E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	5,12E+01	5,82E-02	7,25E-04	0,00E+00	9,21E-03	3,82E-02	1,63E-03	-3,79E+01
PENRE	MJ	1,47E+02	8,24E-01	3,02E-03	0,00E+00	1,30E-01	3,36E-01	1,00E-02	-1,13E+02
PENRM	MJ	6,77E-10	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	8,51E+01	8,24E-01	3,02E-03	0,00E+00	1,30E-01	3,36E-01	1,00E-02	-1,13E+02
SM	kg	1,34E-01	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	0,00E+00

¹ 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 CO₂ is set to zero.

NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m³	1,36E-01	6,41E-05	1,87E-05	0,00E+00	1,01E-05	5,80E-05	2,53E-06	-7,45E-02
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 indicators

Results per 1 kg of aluminium profile									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste disposed	kg	1,08E+00	3,05E-12	4,36E-14	0,00E+00	4,83E-13	1,90E-11	2,18E-13	-4,24E-09
Non-hazardous waste disposed	kg	2,89E+00	1,19E-04	5,27E-04	0,00E+00	1,88E-05	7,09E-05	5,00E-02	-1,86E+00
Radioactive waste disposed	kg	2,59E-03	1,07E-06	1,22E-07	0,00E+00	1,69E-07	4,37E-05	1,14E-07	-8,62E-03

Output flow indicators

Results per 1 kg of aluminium profile									
Indicator	Unit	A1-A3	A4	A5	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	0,00E+00
Material for recycling	kg	3,99E-02	0,00E+00	7,52E-02	0,00E+00	0,00E+00	1,00E+00	0,00E+00	0,00E+00
Materials for energy recovery	kg	4,79E-07	0,00E+00	3,82E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy, electricity	MJ	4,93E-06	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-1,29E-02
Exported energy, thermal	MJ	9,16E-07	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-2,31E-02

Additional environmental information

Hydro's environmental work is highly organized and transparency is the fundament of Hydro's reporting. Together with risk analysis and extensive stakeholder dialogue, we have defined the main elements of our reporting:

- Climate change
- GHG emissions
- Energy consumption
- Renewable energy consumption
- Non-GHG emissions
- Water resources
- Biodiversity
- Resource used and circular economy
- and others

You can find more information in our Annual reports, [Annual reports \(hydro.com\)](https://www.hydro.com/annual-reports)

Additional social and economic information

Responsible company

Hydro has a responsibility to provide a safe and inclusive work environment for all workers, including own employees, temporary employees, agency workers and contractors. More about social and governance information you can find in our Annual reports, [Annual reports \(hydro.com\)](https://www.hydro.com/annual-reports)

Responsible supply chain

Sustainability is strategic to our company and we believe that the supply chain is a critical part of it. In order to create a responsible supply chain, we take several steps:

- **ASI Chain of Custody**, through certification, we achieved that we have the entire supply chain under control. You can find more information here: [Hydro ASI certifications](https://www.hydro.com/asi-certifications)
- **Hydro's Supplier Code of Conduct** we expect suppliers and subcontractors to adhere to the principles set in the Code, which sets minimum standards in key areas including business ethics, and anti-corruption behaviour, as well as human rights, working conditions, environmental impact and climate [Responsible supply chain \(hydro.com\)](https://www.hydro.com/responsible-supply-chain)

References

General Programme Instructions of the International EPD[®] System. Version 5.0.

Product Category Rules (PCR) document for Construction Products (PCR 2019:14 Version 1.3.4 2024-04-30)

ISO 14020:2000 Environmental labels and declarations — General principles, 2000-09

ISO 14025: EN ISO 14025:2006-11: Environmental labels and declarations - Type III environmental declarations — Principles and procedures

ISO 14040:2006 Environmental management — Life cycle assessment — Principles and framework, 2006-07

ISO 14044:2006 Environmental management — Life cycle assessment — Requirements and guidelines, 2006-07

EN 15804+A2:2019/AC:2021 European Committee for Standardization: Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products, 2021

Ecoinvent: www.ecoinvent.org, ecoinvent database.

Sphera: software LCA for Experts. 2023, Sphera solutions, www.sphera.com

