

# Environmental Product Declaration



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

## Diamond Series

from

**NINGBO HELONG NEW MATERIAL CO., LTD**



### 2 Programme:

Programme operator:

EPD registration number:

Publication date:

Valid until:

### 3 The International EPD® System, [www.environdec.com](http://www.environdec.com)

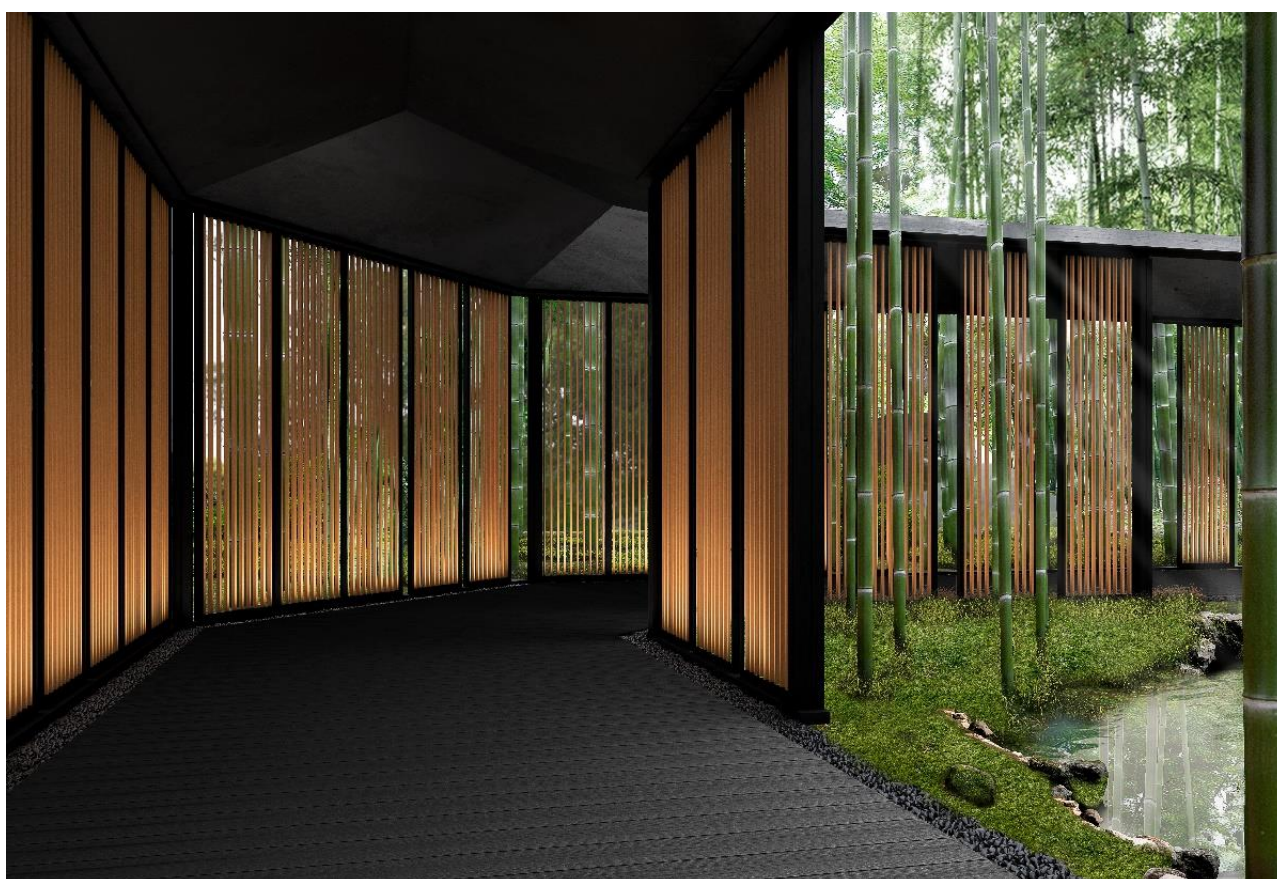
EPD International AB

EPD-IES-0015630

2024-07-24

2029-07-23

*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](http://www.environdec.com)*



## General information

### Programme information

<b>Programme:</b>	The International EPD® System
<b>Address:</b>	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
<b>Website:</b>	<a href="http://www.environdec.com">www.environdec.com</a>
<b>E-mail:</b>	<a href="mailto:info@environdec.com">info@environdec.com</a>

### 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 [valid until: 2025-06-20]

PCR review was conducted by: The Technical Committee of the International EPD System. The review panel may be contacted via [info@environdec.com](mailto:info@environdec.com).

#### Life Cycle Assessment (LCA)

LCA accountability: Sijia YANG from IVL Swedish Environmental Research Institute and Shuhan HUANG from IVL Environmental Technologies (Beijing) Company Ltd.

#### 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: Matthew Fishwick from Fishwick Environmental Ltd.



Approved by: The International EPD® System

Procedure for follow-up of data during EPD validity involves third party verifier:

☐ Yes ☒ No

[Procedure for follow-up the validity of the EPD is at minimum required once a year with the aim of confirming whether the information in the EPD remains valid or if the EPD needs to be updated during its validity period. The follow-up can be organized entirely by the EPD owner or together with the original verifier via an agreement between the two parties. In both approaches, the EPD owner is responsible for the procedure being carried out. If a change that requires an update is identified, the EPD shall be re-verified by a verifier]

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.

It is discouraged to use of the results of modules A1-A3 without considering the results of module C.

## Company information

Owner of the EPD: NINGBO HELONG NEW MATERIAL CO., LTD

Contact: Yun ZHOU (+86 138 5832 8002)

Website: yardcom.net

### Description of the organisation:

Ningbo Helong New Materials Co., Ltd. was established in May 2011. It is a green and high-tech enterprise specialising in the research and development of plastic wood decking, plastic wood siding, plastic wood decorative materials and landscape materials.

The first phase of the factory covers an area of more than 100 acres, with nearly 30 high-strength quality plastic wood composite material production lines, and the current annual capacity of 50,000 tons. The company adheres "He" culture as the core, always putting people first, being humble, innovative quality, restoring nature, and benefiting mankind for the mission, focus on the creation of quality new wood materials. Building a new economy of circular ecology. The new generation of high-quality wood-plastic decking, wood-plastic wallboard, wood-plastic gallery frames, wood-plastic fences, wood-plastic flower boxes and other products developed by the company, embodies the core technology of Helong people's ingenuity and innovation for many years, and completes the revolutionary reshaping and upgrading of wood-plastic composite new materials. More than a dozen performance test indicators in the industry are internationally advanced, defining the next generation of high-quality wood-plastic standards. At the same time, the wood-plastic landscape of Helong all over the world has become a new natural landmark of many public scenic spots. The company's innovative research and development of high-end co-extruded wood plastic products with double-sided matte imitation wood effect is the world's first, has been widely recognised in the world, and sold in more than 30 countries. The product has been able to compete with the United States of the world's top brand similar products and some of the core indicators are world's leading. After years of research and development, through advanced unique technology, the production of products with high strength and hardness can replace the use of preserved wood and natural wood.

### Product-related or management system-related certifications:

#### **For products:**

The product follows the standards and/or certificates of GB/T 24508-2020 "Wood-plastic composite flooring", EN 15534-1:2014+A1 "2017 Composites made from cellulose-based materials and thermoplastics (usually called wood-polymer composites (WPC) or natural fibre composites (NFC) Part 1: "Test methods for characterisation of compounds and products", GB/T 35612-2017 "Green product assessment. Wood plastic composites products", and ASTM F 1838-19 "Standard Performance Requirements for Adult and Children's Plastic Chairs for Outdoor Use".

#### **For management system:**

Helong company has the management system-related certifications including ISO 9001 - Quality Management System, ISO 14001 – Environmental Management System, ISO 45001 - Occupational Health and Safety Management Systems, Chain of Custody Certification of Forest Stewardship Council, Global Recycled Standard, WWF Low Carbon Manufacturing Programme.

### Name and location of production site:

The address of the production plant is West Three Farmland Road No.218, Zhouxiang Town, Cixi City, Zhejiang Province, PRC China.

## Product information

**Product name:**

Diamond Series

**Product description:**

The product is a kind of aluminium plastic product, consisting of aluminium alloy profile as the main "core layer" material, modified HDPE as the main "exterior cladding layer" material, and through the modification technology of the functional surface layer and the development of special adhesives, it achieves the plastic clad metal profile with high weather resistance, high strength and high adhesion. The product is a polymer material cladding on the surface of aluminium alloy, which not only achieves superior thermal insulation effect, but also solves the bottleneck of aluminium alloy in the door and window filling thermal insulation, or the need for partition processing, etc., and also greatly enhances the service life of aluminium alloy, and its product life can reach more than 25 years. The outer surface layer of the product is the independently developed high weather-resistant functional polymer wood-like material layer, which breaks through from the field of wood-plastic to the field of metal materials, and makes the application end of the material technology break through the limitations of the wood-plastic single industry. The density of the product is 2.00 g/cm<sup>3</sup>. The performance of the product is shown in the table below.

Table 1. Product performance of the Diamond Series product

Test Item	Test Standard	Test Result
Anti-Bacteria Performance	JIS Z 2801:2010	≥99%
Anti-Fungal Performance	ISO 16869:2008	Grade 0
UV Aging (2000 hours)	ISO 4892-2:2013	ΔE: 1.83 Grey scale: 4
Phthalates, flame retardants	GB/T 35612-2017	Not detected
Volatile organic compounds (day 3)	GB/T 35612-2017	Not detected
Surface peeling power	J/CT 2781-2023	>3000N/m
Boiling water resistance	120 hours	No detachment
Resistance to hot and cold test	-20°C to 60°C, 1000 hours cycling	No detachment
Anti-Bacteria Performance	JIS Z 2801:2010	≥99%

**UN CPC code:**

392

**Geographical scope:**

Modules A1-A3 represent production of the products in China. Module A4 and A5 represent the shipping and construction from China to all over the world. Module B, C, and D represent the use and end-of-life treatment with benefits out of the system boundary of the products worldwide.

## LCA information

**Declared unit:**

1 tonne of the studied product

**Reference service life:**

25 years

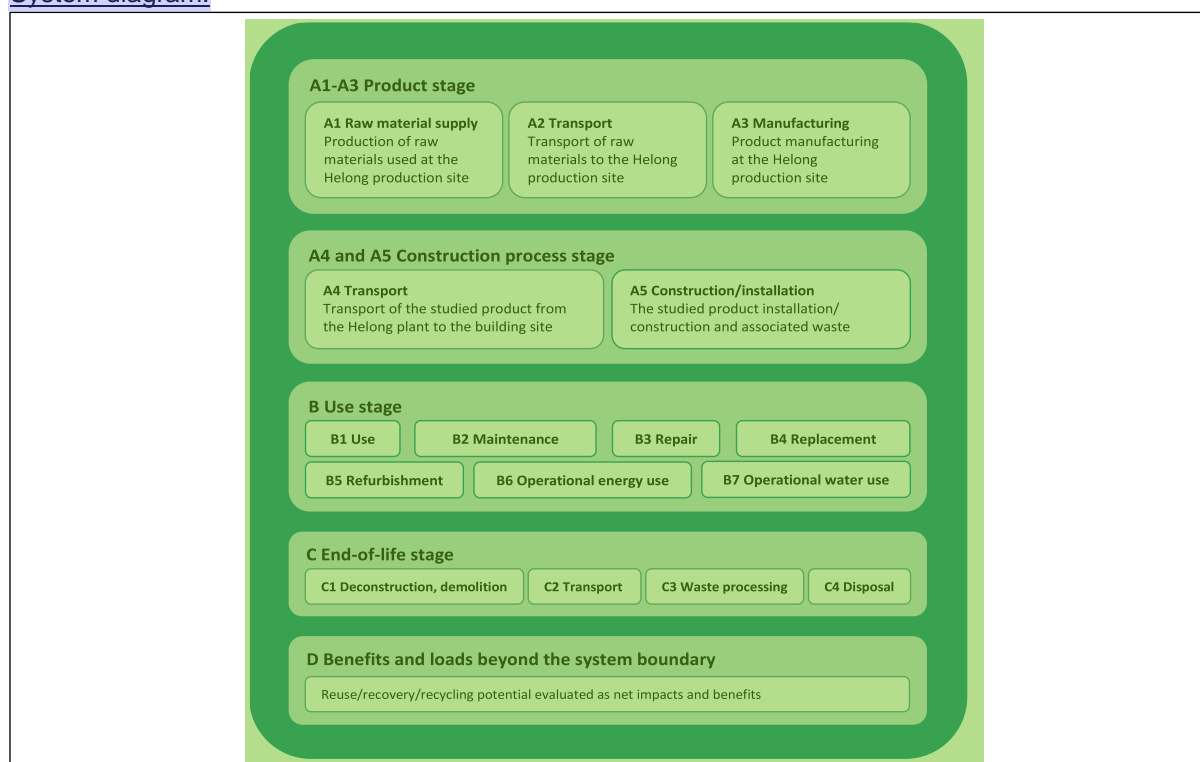
Time representativeness:  
2023 (January to December).

Database(s) and LCA software used:  
Managed LCA Content 2023.2 Databases and ecoinvent 3.9.1 (cut-off), LCA for Experts (Gabi)

Description of system boundaries:

The scope of the EPD generated corresponds to “cradle to gate with options” which serves type (b) EPD, assessing the potential environmental impacts associated with the studied product. The information module included in the study is A1-A3, A4-A5, B1-B7, C1-C4, and D, no processes are omitted or excluded in this study.

System diagram:



Manufacturing processes:

As the manufacturing process is important to understand the whole studied system, the description of the main manufacturing processes for producing the studied product is explained as below. A flow chart of product manufacturing is shown below.

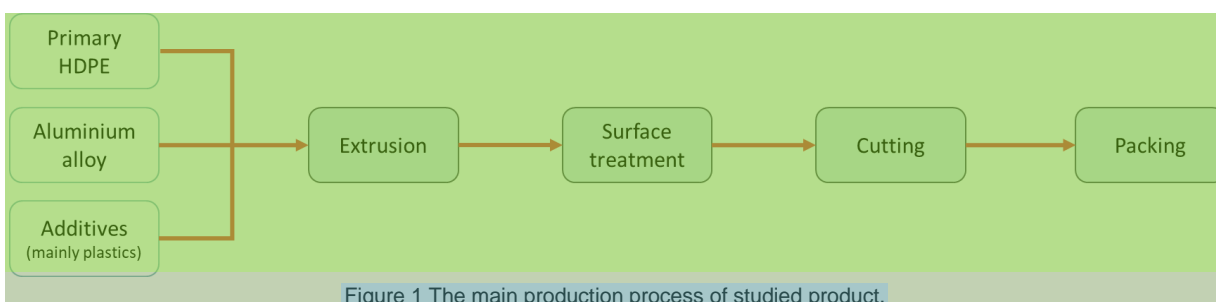


Figure 1 The main production process of studied product.



Diamond series product is made of aluminium alloy profiles and modified HDPE as the main materials, and the HDPE-based polymer material is externally wrapped on the surface of aluminium alloy using high bonding adhesive. After the extrusion process for all products, then is the surface treatment and cutting process to make the finished product and sent to packaging process.

The GWP-GHG of electricity mix for Zhejiang province in this study is 0.807 kg CO<sub>2</sub> eq./kWh. Note that the Guarantees of Origin market in China represents an extremely small proportion of production and consumption, and therefore the consumption mix is effectively the same as the residual mix.

Table 2. Electricity structure of the Zhejiang province and the dataset chosen for it

Electricity generation sources	Dataset used in the model	GWP-GHG (CO <sub>2</sub> eq./kWh)	Percentage in Zhejiang province
Electricity from fossil fuel <sup>(1)</sup>	CN: Electricity from hard coal Sphera	1.11	72.23%
Electricity from hydro power	CN: Electricity from hydro power Sphera	0.00745	5.63%
Electricity from nuclear power	CN: Electricity from nuclear power Sphera	0.00446	17.32%
Electricity from wind power	CN: Electricity from wind power Sphera	0.0171	1.16%
Electricity from photovoltaic	CN: Electricity from photovoltaic Sphera	0.0288	3.67%

(1) In the 2022 China Electricity Yearbook, the percentage of electricity from fossil fuel for each province is not specified. A brief description of electricity from fossil fuel for the whole country is given in the yearbook, i.e. it covers coal, gas, oil, biomass, and a small amount of unidentified sources for generating electricity. Based on the information in the yearbook, i.e., electricity from hard coal accounts for more than 80% of the thermal power generation types, and considering that China is a country where coal-fired power generation is the main source of thermal power generation, the LCA practitioner (IVL) decide to use electricity from hard coal as 100% of the dataset selection for electricity from fossil fuel in this study for modelling.

## More information:

### Scenarios and additional technical information:

- The product is manufactured in China, and the waste treatment of the waste generated during the manufacturing process was included in the system boundary.
- The product is sent to and used globally. For module A4, the longest shipping distance is applied for the model as the conservative consideration, which is selling to the United States. The specific data of the longest transportation information from the manufacturing plants to the overseas selling destination is collected by the client, which is the specific data.
- With regard to module A5, during the construction stage, the product requires some screws, which are included in the study. The energy consumption of the construction, i.e., electricity, is included in the study. Besides, according to the information provided by the client, the packaging of the studied products is assumed to become to waste in this stage and is treated to end-of-life stage.
- In module B, the product in this study do not generate emissions and consume energy and water during the whole use phase, so the use phase environmental impact is deemed to be zero.
- The modelling of module C1 is assumed that the consumption of additional materials and energy used in the deconstruction stage for installation is zero. The 24% of the rest of the waste product would be sent to C4 for disposal, and 76% to material recycle according to the recycling data from the International Aluminium Institute. For module C2, conservative assumptions have been made that the waste product would be transported for 500 km by truck. For the waste processing module C3, disposal module C4, and module D (benefits and loads beyond the system boundary), the

generic data has been applied. Besides, it is assumed the waste products would be processed in C3 with a 3.01% mass loss.

- Regarding the module D calculation, it should be noted that the product does not have post-consumer materials as the raw material. Meanwhile, this study does not consider the co-product allocation in this project, so there is no co-product allocation issue for the module D calculation.

#### Allocation:

Allocation rules for co-products are mentioned in the PCR. In this study, there are no co-products produced. No co-product allocation has been applied in this study i.e. all burdens are allocated to the final studied product. For the allocation of waste and module D calculation, this study strictly follows the PCR.

#### Cut-off rules:

The cut-off criteria established by the PCR is that data for elementary flows to and from the product system contributing to a minimum of 95% of the declared environmental impacts shall be included (not including processes that are explicitly outside the system boundary).

This study strictly follows the cut-off rule. Raw materials with high environmental impacts were reserved in calculation even though their mass is smaller than 5% of the whole product. The cut-off rule is only applied on auxiliary materials of the studied product. The total amount of cut-off materials in the product system is fully below 1% and no high emission material is used for those materials. Besides, the transportation of A3 manufacturing waste which are sent third-party for treatment is cut-off. The sensitivity analysis is applied on the cut-off part to ensure the environmental impact of the cut-off part is below 5%.



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	X	X	X	X	X	X	X	X	X	X	X	X
Geography	CN	CN	CN	CN to GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO
Specific data used	11.10%					-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	0%					-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	0%					-	-	-	-	-	-	-	-	-	-	-	-

(1) Modules included in the EPD (X) and the modules not declared (ND).

## Content information

Product components	Weight, kg	Post-consumer material, weight-% of total product	Biogenic material, kg C/product
Aluminium alloy	773.63	0.00%	0.00
Primary polymers	182.69	0.00%	0.00
Adhesive	35.74	0.00%	0.00
Masterbatch	7.94	0.00%	0.00
TOTAL	1000.00	0.00%	0.00
Packaging materials	Weight, kg	Weight-% (versus the product)	Weight biogenic carbon, kg C/product
PET package	0.80	0.08%	0.00
PE package (LDPE)	8.00	0.80%	0.00
Wood package	42.00	4.20%	18.61
TOTAL	50.80	5.08%	18.61

At the time of data collection, no substance included in the Candidate List of Substances of Very High Concern (SVHC) for authorization under the REACH Regulations is present in the products covered by this LCA and EPD either above the threshold for registration with the European Chemicals Agency or above 0.1% (wt/wt).

Depending on the PCR, in general, the production and end-of-life processes of infrastructure or capital goods used in the product system should be excluded, unless there is evidence that they are relevant in terms of their environmental impact, or when a generic LCI dataset includes infrastructure/capital goods, and it is not possible, within reasonable effort, to subtract the data on infrastructure/capital goods from this dataset (directly citation from section 4.3.2 of PCR 1.3.4). In this study, the infrastructure and capital goods are not included in the LCA analysis since they are used plenty of times for several years for the product manufacturing. According to the PCR, it should be excluded.

All results in this LCA analysis are calculated by the EN 15804+A2. The "EN 15804 reference package" is calculated based on EF 3.1.

## Results of the environmental performance indicators

The estimated impact results are only relative statements which do not indicate the end points of the impact categories, exceeding threshold values, safety margins or risks.

All results are calculated on the declared unit, which is 1 tonne of the studied product in this study.

### Mandatory impact category indicators according to EN 15804

#### Results per tonne of Diamond Series

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-fossil	kg CO <sub>2</sub> eq.	8.13E+03	2.25E+02	6.66E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.12E+01	1.91E+00	3.89E+00	-4.67E+03
GWP-biogenic	kg CO <sub>2</sub> eq.	-6.16E+01	7.89E-02	6.72E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.57E-02	6.35E+00	2.14E+00	-9.49E+00
GWP-luluc	kg CO <sub>2</sub> eq.	1.62E+01	1.48E-02	1.60E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.81E-02	1.46E-02	1.23E-02	-8.64E-01
GWP-total	kg CO <sub>2</sub> eq.	8.09E+03	2.25E+02	1.34E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.13E+01	8.27E+00	6.04E+00	-4.68E+03
ODP	kg CFC 11 eq.	8.10E-05	7.84E-12	1.68E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.18E-12	3.25E-12	1.01E-11	-3.51E-08
AP	mol H <sup>+</sup> eq.	4.62E+01	4.23E+00	1.16E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.97E-02	1.01E-02	2.80E-02	-2.72E+01
EP-freshwater	kg P eq.	2.38E+00	6.62E-05	8.17E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.08E-04	6.62E-06	7.95E-06	-2.10E-03
EP-marine	kg N eq.	8.25E+00	1.79E+00	2.91E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.68E-02	4.66E-03	7.24E-03	-3.93E+00
EP-terrestrial	mol N eq.	8.58E+01	1.96E+01	3.28E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.89E-01	5.14E-02	7.96E-02	-4.30E+01
POCP	kg NMVOC eq.	2.79E+01	4.85E+00	9.11E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.85E-02	1.26E-02	2.18E-02	-1.19E+01
ADP-minerals&metals*	kg Sb eq.	6.96E-02	1.85E-06	8.68E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.78E-06	2.08E-06	1.83E-07	-1.05E-03
ADP-fossil*	MJ	1.20E+05	2.94E+03	4.60E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.55E+02	3.83E+01	5.26E+01	-5.74E+04
WDP*	m <sup>3</sup>	2.30E+03	1.04E+00	1.09E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.47E+00	3.78E-01	4.34E-01	-6.93E+02
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 tonne of Diamond Series

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-GHG <sup>1</sup>	kg CO <sub>2</sub> eq.	8.15E+03	2.25E+02	6.67E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.13E+01	1.92E+00	3.90E+00	-4.67E+03

## Resource use indicators

### Results per tonne of Diamond Series

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	1.12E+04	1.06E+01	9.70E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.37E+01	3.56E+00	8.58E+00	-2.60E+04
PERM	MJ	6.40E+02	0.00E+00	-6.40E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	1.19E+04	1.06E+01	-5.43E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.37E+01	3.56E+00	8.58E+00	-2.60E+04
PENRE	MJ	1.09E+05	2.95E+03	4.62E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.95E+02	3.84E+01	5.26E+01	-5.74E+04
PENRM	MJ	1.12E+04	0.00E+00	-3.58E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-8.22E+03	-2.60E+03	0.00E+00
PENRT	MJ	1.20E+05	2.95E+03	1.04E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.95E+02	-8.18E+03	-2.54E+03	-5.74E+04
SM	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	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m <sup>3</sup>	5.53E+01	3.22E-02	3.14E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.13E-02	1.09E-02	1.33E-02	-6.58E+01

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

<sup>1</sup> 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 CO<sub>2</sub> is set to zero.

## Waste indicators

Results per tonne of Diamond Series																
Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste disposed	kg	1.99E-06	1.49E-09	1.10E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.71E-09	-9.93E-11	1.14E-09	-4.04E-05
Non-hazardous waste disposed	kg	1.33E+01	1.13E-01	5.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.18E-02	1.01E-02	2.63E+02	-1.40E+03
Radioactive waste disposed	kg	9.00E-01	1.10E-03	1.14E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.71E-03	5.15E-04	6.02E-04	3.42E+00

## Output flow indicators

Results per tonne of Diamond Series																
Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	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	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.37E+02	0.00E+00	0.00E+00
Materials for energy recovery	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, electricity	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, thermal	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

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