ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025

FDC-DD circular fire damper
Klimaoprema d.o.o.

Life Cycle Assessment study has been performed in accordance with the requirements of EN 15804, EPD Hub PCR version 1.2 (24 Mar 2025) and JRC characterization factors EF 3.1.

Created with One Click LCA

GENERAL INFORMATION

MANUFACTURER

Manufacturer	Klimaoprema d.o.o.
Address	Gradna 78a, 10430 Samobor, Hrvatska
Contact details	info@klimaoprema.com
Website	https://www.klimaoprema.com/

EPD STANDARDS, SCOPE AND VERIFICATION

Program operator	EPD Hub, hub@epdhub.com
Reference standard	and ISO 14025
PCR	EPD Hub Core PCR Version 1.2, 24 Mar 2025
Sector	Construction product
Category of EPD	Private EPD
Parent EPD number	
Scope of the EPD	Cradle to gate with modules C1-C4, D
EPD author	Dario Vuk
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☑ Internal verification ☐ External verification

This EPD is intended for business-to-business and/or business-to-consumer communication. The manufacturer 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 and if they are not compared in a building context.

PRODUCT

Product name	FDC-DD circular fire damper
Additional labels	
Product reference	717
Place(s) of raw material origin	Italy, Croatia
Place of production	Industrijski Park 19, 35400 Nova Gradiška, Croatia
Place(s) of installation and use	European Union
Period for data	01. January 2024-31. December 2024
Averaging in EPD	No grouping
Variation in GWP-fossil for A1-A3 (%)	
GTIN (Global Trade Item Number)	-
NOBB (Norwegian Building Product Database)	-
A1-A3 Specific data (%)	3,9

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 unit of fire damper with an electric actuator
Declared unit mass	3,109 kg
Mass of packaging	0,31808 kg
GWP-fossil, A1-A3 ($kgCO_2e$)	7
GWP-total, A1-A3 ($kgCO_2e$)	6,97
Secondary material, inputs (%)	23,5
Secondary material, outputs (%)	0
Total energy use, A1-A3 (kWh)	26,3
Net freshwater use, A1-A3 (m^3)	0,09

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

Klimaoprema is a manufacturing technology solution company in the field of cleanrooms and HVAC systems.

PRODUCT DESCRIPTION

Fire dampers FDC-DD are used for prevention of fire spread through the ventilation ducts and between fire sections. The FDC-DD fire damper is time-classified at 60 or 120 minutes, depending on the type of installation. Fire damper is always tested in standardized support frames (both in a rigid wall and in a flexible wall) in accordance with EN 1366-2:2015. Installation in both, vertical and horizontal axis of rotation of the dampers blade is acceptable (with the axis angle 0 - 360°). The FDC-DD fire damper is maintenance free. For additional information on cleaning and commissioning, see chapter maintenance and operation in product catalogue.
Link to the product catalogue:
https://hvac.klimaoprema.hr/index.php?prefix=element&elid=810#&tab=Documents
FDC - DD fire damper consists of several main parts: the casing, the damper blade and the actuator. Casing is made of galvanized steel sheet and the damper blade is made out calcium silicate. Damper blade is equipped with brass bearings andis equipped with the seal made out of EPDM rubber. The fire damper is equipped with a Belimo electric actuator and fire - resistant installation frame.

Technical specifications:
Diameter: d100 - d630[mm] with electric actuator.
Casing length: 170 mm
Casing air leakage: Class C, according to EN1751
Closed blade air leakage: Class 3, according to EN 1751
Declaration of performance: 717/ENG/02-2023
Accessories for the FDC-DD are: Flexible duct connection and safety grilles

Further information can be found at: https://www.klimaoprema.com/

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass %	Material origin
Metals	50,40%	EU
Minerals	36,35%	EU
Fossil materials	13,25%	EU
Bio-based materials	-	-

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	-
Biogenic carbon content in packaging, kg C	0,1114

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 unit of fire damper with an electric actuator
Mass per declared unit	3,109 kg
Functional unit	
Reference service life	20

SUBSTANCES, REACH - VERY HIGH CONCERN

The product does not contain any REACH SVHC substances in amounts greater than 0,1 % (1000 ppm).

PRODUCT LIFE-CYCLE

SYSTEM BOUNDARY

This EPD covers the life-cycle modules listed in the following table.

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

Not declared = ND.

MANUFACTURING AND PACKAGING (A1-A3)

The environmental impacts considered for the product stage cover the manufacturing of raw materials used in the production as well as packaging materials and other ancillary materials. Also, fuels used by machines, and handling of waste formed in the production processes at the manufacturing facilities are included in this stage. The study also considers the material losses occurring during the manufacturing processes as well as losses during electricity transmission.

A market-based approach is used in modelling the electricity mix utilized in the factory.
The reference product consists of the main product (product frame: casing and damper blade) and the electric actuator. Casing is made of galvanized steel sheet and the damper blade is made of calcium silicate. The electric actuator is made of plastic and galvanized sheet steel. The materials are transported to the production facility of Klimaoprema d.d. The production facility is located in Nova Gradiška, address: Industrijski Park 19, 35400 Nova Gradiška, Croatia. In the production facility, the galvanized sheet undergoes stamping, rolling and profiling. Plastic parts are purchased, so there is no plastic waste. Electrical devices and tools are used in the production process. Production energy is taken based on the place/country of electricity production. Each part of the production process is considered separately, and disposal of process waste is calculated based on waste distribution at the factory level. The finished product is packed in cardboard boxes and tied to wooden pallets with plastic strips before shipping.
The use of green energy in manufacturing is demonstrated through contractual instruments (GOs, RECs, etc.), and its use is ensured throughout the validity period of this EPD.

TRANSPORT AND INSTALLATION (A4-A5)

Transportation impacts occurred from final products delivery to construction site (A4) cover fuel direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions.

The transport distance is defined according to the PCR. To define the distribution of the product to the customer, the weighted average of the five largest customers is considered.It is assumed that the average transportation distance from the production facility to the construction site is 1450,4 km.It is assumed that the volume factor of vehicle capacity utilization is 100%, which means full load. It may vary, but since the role of traffic emissions in the overall results is small, it is assumed that the diversity in cargo is negligible.

Empty returns are not considered as it is assumed that the transport company uses the return journey for the needs of other customers.
Transportation does not cause losses because the products are properly packed. It is also assumed that the volume capacity utilization factor is 100% for nested packaged products.
Environmental impacts from building installation include waste packaging material (A5) and the release of biogenic carbon dioxide from waste from the processing of wooden pallets. The product can be installed without electricity consumption.

PRODUCT USE AND MAINTENANCE (B1-B7)

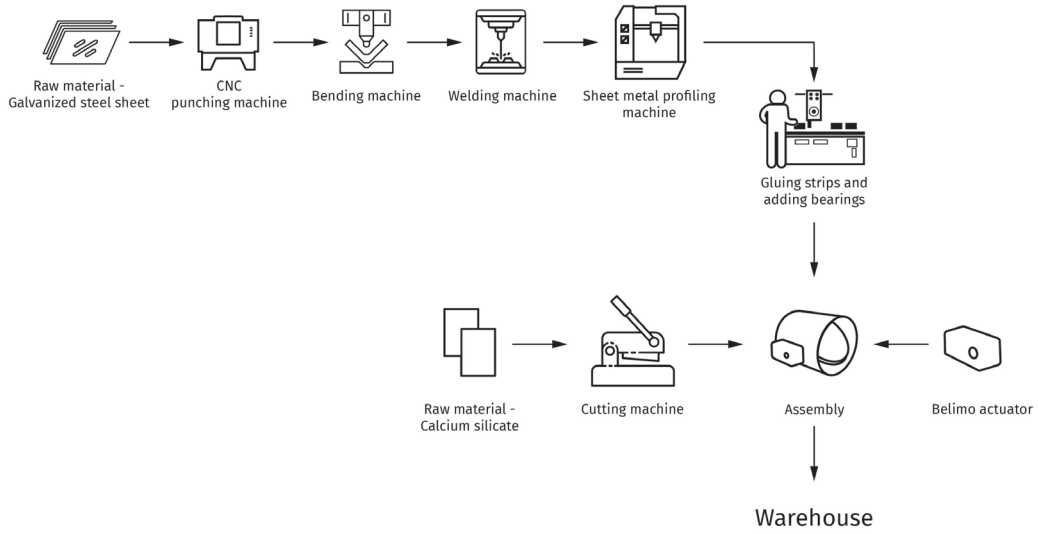
The product does not require maintenance. Electricity consumption is calculated for a period of 20 years, and the product is in standby mode, which consumes 0.7 W. Replacement of components or parts is not included.
Air, soil, and water impacts during the use phase have not been studied.

PRODUCT END OF LIFE (C1-C4, D)

Consumption of energy and natural resources in the demolition process is assumed to be negligible. It is assumed that the waste is collected separately and transported to the waste treatment plant. Transportation distance to treatment is assumed as 50 km and the transportation method is assumed to be lorry (C2). According to EN 50693:2019, the sequence of treatment operations occurring to the product shall include de-pollution, fractions separation and preparation (dismantling, crushing, shredding, sorting), recycling, other material recovery, energy recovery and disposal. In this study, the default values from table G.4 of EN 50693 are used for treating materials in different waste treatment methods.

Module C3 accounts for energy and resource inputs for sorting and treating these waste streams for recycling and incineration with energy recovery. As per the used standard, 20% of steel, 30% of brass, 40% of copper and 40-50% of plastic waste go to landfill. Due to the material and energy recovery potential of parts in the end-of-life product and packaging, recycled raw materials leads to avoided virgin material production, while the energy recovered from incineration displaces electricity and heat production (D). The benefits and loads of incineration and recycling are included in Module D.

MANUFACTURING PROCESS



LIFE-CYCLE ASSESSMENT

CUT-OFF CRITERIA

The study does not exclude any modules or processes which are stated mandatory in the reference standard and the applied PCR. The study does not exclude any hazardous materials or substances. The study includes all major raw material and energy consumption. All inputs and outputs of the unit processes, for which data is available for, are included in the calculation. There is no neglected unit process more than 1% of total mass or energy flows. The module specific total neglected input and output flows also do not exceed 5% of energy usage or mass.

The production of capital equipment, construction activities, and infrastructure, maintenance and operation of capital equipment, personnel-related activities, energy and water use related to company management and sales activities are excluded.

All industrial processes from raw material acquisition and pre-processing, production, product distribution, installation, use/application of product and end-of-life management are included. For easier modelling and because of lack of accuracy in available modelling resources many constituents under 0,1% of product mass are excluded. These include some ancillary materials which are used in the production only in very small amounts and have no serious impact on the emissions of the product. Further, water used for cleaning and the maintenance of capital equipment, transportation and waste streams of the packaging materials used for delivering the raw materials to the factory are omitted since the quantified mass contribution is less than 0.1%.

The production of capital equipment, construction activities, and infrastructure, personnel-related activities, energy and water use related to company management and sales activities are excluded.

VALIDATION OF DATA

Data collection for production, transport, and packaging was conducted using time and site-specific information, as defined in the general information section on page 1 and 2. Upstream process calculations rely on generic data as defined in the Bibliography section. Manufacturer-provided specific and generic data were used for the product's manufacturing stage. The analysis was performed in One Click LCA EPD Generator, with the 'Cut-Off, EN 15804+A2' allocation method, and characterization factors according to EN 15804:2012+A2:2019/AC:2021 and JRC EF 3.1.

ALLOCATION, ESTIMATES AND ASSUMPTIONS

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation. All allocations are done as per the reference standards and the applied PCR. In this study, allocation has been done in the following ways:

Data type	Allocation
Raw materials	No allocation
Packaging material	Allocated by mass or volume
Ancillary materials	Allocated by mass or volume
Manufacturing energy and waste	Allocated by mass or volume

PRODUCT & MANUFACTURING SITES GROUPING

Type of grouping	No grouping
Grouping method	Not applicable
Variation in GWP-fossil for A1-A3, %	

This EPD is product and factory specific.

LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator for EPD Hub V3 and EPD Process Certification v3.2.4. The LCA and EPD have been prepared according to the reference standards and ISO 14040/14044. The EPD Generator uses Ecoinvent v3.10.1/3.11/3.12 and One Click LCA databases as sources of environmental data. Allocation used in Ecoinvent 3.10.1/3.11/3.12 environmental data sources follow the methodology ‘allocation, Cut-off, EN 15804+A2‘.

ENVIRONMENTAL IMPACT DATA

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.

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total[1)]	kg CO_2e	6,43E+00	2,69E-01	2,71E-01	6,97E+00	5,33E-01	3,75E-01	ND	0,00E+00	ND	ND	ND	4,04E+01	ND	0,00E+00	0,00E+00	4,92E-01	6,68E-02	9,63E-01
GWP – fossil	kg CO_2e	6,46E+00	2,69E-01	2,68E-01	7,00E+00	5,32E-01	7,10E-03	ND	0,00E+00	ND	ND	ND	4,01E+01	ND	0,00E+00	0,00E+00	4,92E-01	6,68E-02	9,73E-01
GWP – biogenic	kg CO_2e	-3,18E-02	3,39E-05	0,00E+00	-3,18E-02	0,00E+00	3,68E-01	ND	0,00E+00	ND	ND	ND	9,00E-02	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-9,47E-03
GWP – LULUC	kg CO_2e	3,61E-03	1,19E-04	2,90E-03	6,63E-03	2,00E-04	2,93E-06	ND	0,00E+00	ND	ND	ND	1,23E-01	ND	0,00E+00	0,00E+00	4,21E-05	2,59E-05	2,12E-04
Ozone depletion pot.	kg $CFC\text{-}_{11}$e	2,92E-07	3,97E-09	5,66E-09	3,02E-07	1,07E-08	7,30E-11	ND	0,00E+00	ND	ND	ND	7,40E-07	ND	0,00E+00	0,00E+00	5,58E-10	3,90E-10	5,50E-10
Acidification potential	mol H^+e	8,87E-02	9,56E-04	1,55E-03	9,12E-02	1,72E-03	5,11E-05	ND	0,00E+00	ND	ND	ND	2,36E-01	ND	0,00E+00	0,00E+00	4,40E-04	2,15E-04	1,71E-03
EP-freshwater[2)]	kg Pe	2,20E-03	2,07E-05	1,89E-04	2,41E-03	3,59E-05	2,27E-06	ND	0,00E+00	ND	ND	ND	3,74E-02	ND	0,00E+00	0,00E+00	2,02E-05	2,35E-05	4,05E-04
EP-marine	kg Ne	6,87E-03	3,22E-04	4,26E-04	7,61E-03	5,84E-04	2,55E-05	ND	0,00E+00	ND	ND	ND	3,70E-02	ND	0,00E+00	0,00E+00	1,33E-04	6,89E-05	8,00E-04
EP-terrestrial	mol Ne	1,20E-01	3,50E-03	3,33E-03	1,27E-01	6,35E-03	2,37E-04	ND	0,00E+00	ND	ND	ND	3,32E-01	ND	0,00E+00	0,00E+00	1,32E-03	7,26E-04	8,98E-03
POCP ("smog")[3)]	kg NMVOCe	2,77E-02	1,41E-03	1,16E-03	3,03E-02	2,80E-03	6,30E-05	ND	0,00E+00	ND	ND	ND	1,09E-01	ND	0,00E+00	0,00E+00	3,73E-04	2,17E-04	3,21E-03
ADP-minerals & metals[4)]	kg Sbe	1,51E-04	7,40E-07	3,21E-06	1,55E-04	1,47E-06	2,88E-08	ND	0,00E+00	ND	ND	ND	5,42E-04	ND	0,00E+00	0,00E+00	2,04E-06	2,65E-07	1,50E-05
ADP-fossil resources	MJ	8,33E+01	3,90E+00	5,12E+00	9,24E+01	7,71E+00	6,64E-02	ND	0,00E+00	ND	ND	ND	9,34E+02	ND	0,00E+00	0,00E+00	4,82E-01	4,39E-01	7,63E+00
Water use[5)]	m^3e depr.	5,53E+00	1,90E-02	1,48E-01	5,70E+00	3,95E-02	8,65E-03	ND	0,00E+00	ND	ND	ND	2,55E+01	ND	0,00E+00	0,00E+00	3,64E-02	4,50E-03	2,04E-01

1) GWP = Global Warming Potential; 2) EP = Eutrophication potential. Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO4e; 3) POCP = Photochemical ozone formation; 4) ADP = Abiotic depletion potential; 5) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Particulate matter	Incidence	7,00E-07	2,66E-08	1,64E-08	7,43E-07	5,30E-08	6,59E-10	ND	0,00E+00	ND	ND	ND	8,42E-07	ND	0,00E+00	0,00E+00	5,20E-09	2,40E-09	5,72E-08
Ionizing radiation[6)]	kBq U235e	3,49E-01	3,36E-03	9,49E-02	4,47E-01	9,30E-03	2,19E-04	ND	0,00E+00	ND	ND	ND	2,58E+01	ND	0,00E+00	0,00E+00	3,57E-03	9,31E-04	-9,96E-02
Ecotoxicity (freshwater)	CTUe	4,98E+01	5,46E-01	1,23E+00	5,16E+01	9,09E-01	4,35E-02	ND	0,00E+00	ND	ND	ND	1,42E+02	ND	0,00E+00	0,00E+00	1,10E+00	8,05E+00	2,95E+00
Human toxicity, cancer	CTUh	2,09E-08	4,39E-11	3,94E-10	2,14E-08	8,77E-11	8,67E-12	ND	0,00E+00	ND	ND	ND	1,36E-08	ND	0,00E+00	0,00E+00	6,03E-11	1,44E-09	1,32E-10
Human tox. non-cancer	CTUh	8,97E-07	2,49E-09	4,87E-09	9,04E-07	5,01E-09	5,39E-10	ND	0,00E+00	ND	ND	ND	7,03E-07	ND	0,00E+00	0,00E+00	2,86E-09	3,53E-08	7,55E-09
SQP[7)]	-	1,50E+03	3,87E+00	2,99E+01	1,53E+03	7,77E+00	3,93E-02	ND	0,00E+00	ND	ND	ND	2,08E+02	ND	0,00E+00	0,00E+00	7,99E-01	5,08E-01	-2,39E+00

6) EN 15804+A2 disclaimer for Ionizing radiation, human health. This impact category deals mainly with the eventual impact of low-dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator; 7) SQP = Land use related impacts/soil quality.

USE OF NATURAL RESOURCES

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Renew. PER as energy[8)]	MJ	8,86E+00	5,28E-02	2,78E+00	1,17E+01	1,26E-01	-5,21E+00	ND	0,00E+00	ND	ND	ND	2,56E+02	ND	0,00E+00	0,00E+00	7,67E-02	1,80E-02	-6,62E-01
Renew. PER as material	MJ	1,15E+00	0,00E+00	8,87E-01	2,04E+00	0,00E+00	2,36E+00	ND	0,00E+00	ND	ND	ND	0,00E+00	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-5,69E-03
Total use of renew. PER	MJ	1,00E+01	5,28E-02	3,67E+00	1,37E+01	1,26E-01	-2,86E+00	ND	0,00E+00	ND	ND	ND	2,56E+02	ND	0,00E+00	0,00E+00	7,67E-02	1,80E-02	-6,67E-01
Non-re. PER as energy	MJ	7,42E+01	3,90E+00	4,93E+00	8,30E+01	7,71E+00	2,56E-02	ND	0,00E+00	ND	ND	ND	9,34E+02	ND	0,00E+00	0,00E+00	-7,90E+00	4,24E-01	7,61E+00
Non-re. PER as material	MJ	8,78E+00	0,00E+00	6,62E-02	8,85E+00	0,00E+00	4,09E-02	ND	0,00E+00	ND	ND	ND	0,00E+00	ND	0,00E+00	0,00E+00	2,95E+00	1,55E-02	2,31E-02
Total use of non-re. PER	MJ	8,30E+01	3,90E+00	4,99E+00	9,19E+01	7,71E+00	6,64E-02	ND	0,00E+00	ND	ND	ND	9,34E+02	ND	0,00E+00	0,00E+00	-4,95E+00	4,39E-01	7,64E+00
Secondary materials	kg	7,32E-01	1,64E-03	6,33E-02	7,97E-01	3,34E-03	1,32E-04	ND	0,00E+00	ND	ND	ND	1,55E-01	ND	0,00E+00	0,00E+00	6,96E-04	1,14E-04	-8,47E-01
Renew. secondary fuels	MJ	1,56E-02	2,08E-05	9,60E-02	1,12E-01	4,21E-05	5,00E-07	ND	0,00E+00	ND	ND	ND	1,23E-03	ND	0,00E+00	0,00E+00	2,51E-05	2,31E-06	1,26E-04
Non-ren. secondary fuels	MJ	8,50E-03	0,00E+00	0,00E+00	8,50E-03	0,00E+00	0,00E+00	ND	0,00E+00	ND	ND	ND	0,00E+00	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m^3	8,08E-02	5,70E-04	4,12E-03	8,55E-02	1,14E-03	6,11E-05	ND	0,00E+00	ND	ND	ND	8,07E-01	ND	0,00E+00	0,00E+00	7,11E-04	2,48E-04	-9,85E-04

8) PER = Primary energy resources.

END OF LIFE – WASTE

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste	kg	1,42E+00	6,53E-03	1,84E-02	1,44E+00	1,12E-02	1,84E-03	ND	0,00E+00	ND	ND	ND	2,36E+00	ND	0,00E+00	0,00E+00	1,21E-02	4,37E-01	4,70E-01
Non-hazardous waste	kg	1,08E+01	1,21E-01	8,85E-01	1,18E+01	2,24E-01	2,64E-01	ND	0,00E+00	ND	ND	ND	1,83E+02	ND	0,00E+00	0,00E+00	3,06E-01	3,93E-02	2,70E+00
Radioactive waste	kg	2,21E-04	8,22E-07	2,44E-05	2,46E-04	2,30E-06	5,56E-08	ND	0,00E+00	ND	ND	ND	6,63E-03	ND	0,00E+00	0,00E+00	9,13E-07	2,33E-07	-2,57E-05

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1	A2	A3	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	ND	0,00E+00	ND	ND	ND	0,00E+00	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	kg	1,22E-02	0,00E+00	0,00E+00	1,22E-02	0,00E+00	2,52E-01	ND	0,00E+00	ND	ND	ND	0,00E+00	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for energy rec	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	0,00E+00	ND	ND	ND	0,00E+00	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy	MJ	4,12E-03	0,00E+00	0,00E+00	4,12E-03	0,00E+00	2,86E+00	ND	0,00E+00	ND	ND	ND	0,00E+00	ND	0,00E+00	0,00E+00	5,43E+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	4,30E-01	ND	0,00E+00	ND	ND	ND	0,00E+00	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy – Heat	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,43E+00	ND	0,00E+00	ND	ND	ND	0,00E+00	ND	0,00E+00	0,00E+00	5,43E+00	0,00E+00	0,00E+00

ENVIRONMENTAL IMPACTS – EN 15804+A1, CML

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Global Warming Pot.	kg CO_2e	4,44E+00	2,67E-01	2,79E-01	4,99E+00	5,29E-01	7,72E-03	ND	0,00E+00	ND	ND	ND	4,02E+01	ND	0,00E+00	0,00E+00	4,91E-01	6,66E-02	9,66E-01
Ozone depletion Pot.	kg $CFC_{-11}e$	3,47E-07	3,17E-09	5,38E-09	3,56E-07	8,52E-09	6,01E-11	ND	0,00E+00	ND	ND	ND	6,18E-07	ND	0,00E+00	0,00E+00	4,69E-10	3,13E-10	1,75E-09
Acidification	kg SO_2e	7,12E-02	7,27E-04	1,22E-03	7,32E-02	1,30E-03	3,65E-05	ND	0,00E+00	ND	ND	ND	2,01E-01	ND	0,00E+00	0,00E+00	3,44E-04	1,61E-04	1,16E-03
Eutrophication	kg PO_4^3e	6,90E-03	1,77E-04	2,55E-03	9,63E-03	3,30E-04	1,33E-05	ND	0,00E+00	ND	ND	ND	2,60E-02	ND	0,00E+00	0,00E+00	6,45E-05	3,43E-05	5,94E-04
POCP (“smog”)	kg C_2H_4e	3,74E-03	6,45E-05	1,09E-04	3,91E-03	1,23E-04	3,31E-06	ND	0,00E+00	ND	ND	ND	1,10E-02	ND	0,00E+00	0,00E+00	2,13E-05	1,17E-05	5,80E-04
ADP-elements	kg Sbe	1,47E-04	7,22E-07	3,20E-06	1,51E-04	1,44E-06	2,71E-08	ND	0,00E+00	ND	ND	ND	5,40E-04	ND	0,00E+00	0,00E+00	2,02E-06	1,56E-07	1,50E-05

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
ADP-fossil	MJ	5,30E+01	3,84E+00	3,46E+00	6,03E+01	7,56E+00	6,27E-02	ND	0,00E+00	ND	ND	ND	4,79E+02	ND	0,00E+00	0,00E+00	4,21E-01	4,24E-01	9,44E+00

ADDITIONAL INDICATOR – GWP-GHG

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-GHG[9)]	kg CO_2e	6,46E+00	2,69E-01	2,71E-01	7,00E+00	5,33E-01	7,10E-03	ND	0,00E+00	ND	ND	ND	4,03E+01	ND	0,00E+00	0,00E+00	4,92E-01	6,68E-02	9,73E-01

9) This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. In addition, the characterisation factors for the flows – CH4 fossil, CH4 biogenic and Dinitrogen monoxide – were updated. This indicator is identical to the GWP-total of EN 15804:2012+A2:2019 except that the characterisation factor for biogenic CO2 is set to zero

SCENARIO DOCUMENTATION

DATA SOURCES

Manufacturing energy scenario documentation

1. Green electricity, origin certified, One Click LCA
2. Electricity PV panel (irradiation 1100 kWh per m2) in MJ, World, Ecoinvent, 0.0250 kgCO2e/MJ

Transport scenario documentation - A4 (Transport resources)

1. Market for transport, freight, lorry >32 metric ton, EURO5, 1450.4 km