

Environmental product declaration

In accordance with ISO 14025 and EN 15804 +A2

SafeRing 12/24 kV - CCF




Owner of the declaration:

ABB Electrification Norway AS

Declared unit:

1 Pcs SafeRing 12/24 kV - CCF

Product Category:

Electronic and electrical components / cables / products

This declaration is based on Product Category Rules:

EN 15804:2012+A2:2019 serves as core PCRs. EN 50693:2019 and PCR EPDIItaly015 - Electronic and electrical products and systems - Switchboards

Program operator:

The Norwegian EPD Foundation

Declaration number:

NEPD-3385-1903-EN

Registration number:

NEPD-3385-1903-EN

Issue date: 07.03.2022

Valid to: 07.03.2027

EPD Software:

LCA.no EPD generator

System ID: 44051

General information

Product

SafeRing 12/24 kV - CCF

Program operator:

Post Box 5250 Majorstuen, 0303 Oslo, Norway
The Norwegian EPD Foundation
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Declaration number:

NEPD-3385-1903-EN

Owner of the declaration:

ABB Electrification Norway AS
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Manufacturer:

ABB Electrification Norway AS
Amtm. Aallsgt. 73, 3716 Skien
Norway

Place of production:

ABB Poland
Przy Rondzie 4, 31-547 Kraków
Poland

This declaration is based on Product Category Rules:

EN 15804:2012+A2:2019 serves as core PCRs. EN 50693:2019 and PCR EPDItaly015 - Electronic and electrical products and systems - Switchboards

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:

1 Pcs SafeRing 12/24 kV - CCF

Declared unit with option:

A1,A2,A3,A4,A5,B1,B6,C1,C2,C3,C4,D

Functional Unit

Declared unit for 1 Safering 12/24 kV - CCF, including packaging with optional modules B1, B6, C1-C4 and D.

Organisation no:

921 186 037

Issue date:

07.03.2022

Valid to:

07.03.2027

Year of study:

2020

Comparability:

EPD from programmes that do not have a mutual recognition agreement with the Norwegian EPD Foundation, may not be comparable.

The EPD has been worked out by:

The declaration is created using EPD tool lca.tools ver EPD2021.09, developed by LCA.no.

Developer of EPD:

Mie Vold

and

Jeroen Graafland

Verification:

Independent verification of data, other environmental information and the declaration according to ISO14025:2010, § 8.1.3 and § 8.1.4

Third party verifier:

Jane Anderson, ConstructionLCA Ltd

(Independent verifier approved by EPD Norway)

Approved:

Sign

Håkon Hauan, CEO EPD-Norge

Product

Product description:

ABB SafeRing Switchgear is a medium voltage gas insulated ring main unit for secondary distribution. The main function of the switchgears is to “establish and cut off the supply of a downstream installation from an electrical and/or mechanical control and to protect people and premises at risk of fire or explosion against insulation defects”. SafeRing can be supplied in a number of different configurations suitable for most switching applications in 12/24 kV distribution networks.

The CCF switchgear consist of two load-break switch units (C-module) plus one protection unit connected to the transformer (F-module), which protect the transformer against the impact of internal and external faults normally includes switch disconnecter, earthing switch and back-up fuses.

The manufacturer proclaims a minimum product service life of 30 years but the calculations are based on 20 years as the PCR dictates.

The functional unit of this study is described as 1 piece of CCF panel including heat loss during a 20 year product lifetime.

Technical data:

Parameter Amount
 Rated voltage: 24 kV
 Rated frequency: 50 Hz
 Rated nominal current: 630 A
 Rated power frequency withstand voltage: 50 kV
 Rated lightning impulse withstand voltage: 125 kV
 Rated short-time withstand current: 16 kA
 Rated duration of short-circuit: 1 s
 Rated peak withstand current: 40 kA

Market:

Italy

Reference service life, product

20 years

Reference service life, building

Not relevant

Product specification

Materials	kg	%
Metal	342,29	84,06
Plastics	22,21	5,45
SF6	2,27	0,56
Epoxy resin insulator, Al2O3	40,42	9,93
Total:	407,18	
Packaging	kg	%
Packaging - Pallet	25,00	82,24
Packaging - Plastic	1,40	4,61
Packaging - Wood	4,00	13,16
Total including packaging	437,58	

LCA: Calculation rules

Declared unit:

1 Pcs SafeRing 12/24 kV - CCF

Cut-off criteria:

All major raw materials and all the essential energy is included. The production processes for raw materials and energy flows with very small amounts (less than 2%) might not be included. These cut-off criteria do not apply for hazardous materials and substances.

Data quality:

Specific data for the product composition are provided by the manufacturer. They represent the production of the declared product and were collected for EPD development in the year of study. Background data is based on EPDs according to EN 15804, Norsus, ecoinvent and other LCA databases. The data quality of the raw materials in A1 is presented in the table below.

Materials	Source	Data quality	Year
Epoxy resin insulator, Al2O3	ecoinvent 3.6	Database	2019
Metal	ecoinvent 3.6	Database	2019
Packaging - Pallet	ecoinvent 3.6	Database	2019
Packaging - Plastic	ecoinvent 3.6	Database	2019
Packaging - Wood	ecoinvent 3.6	Database	2019
Plastics	ecoinvent 3.6	Database	2019
Processing	ecoinvent 3.6	Database	2019
SF6	ecoinvent 3.6	Database	2019

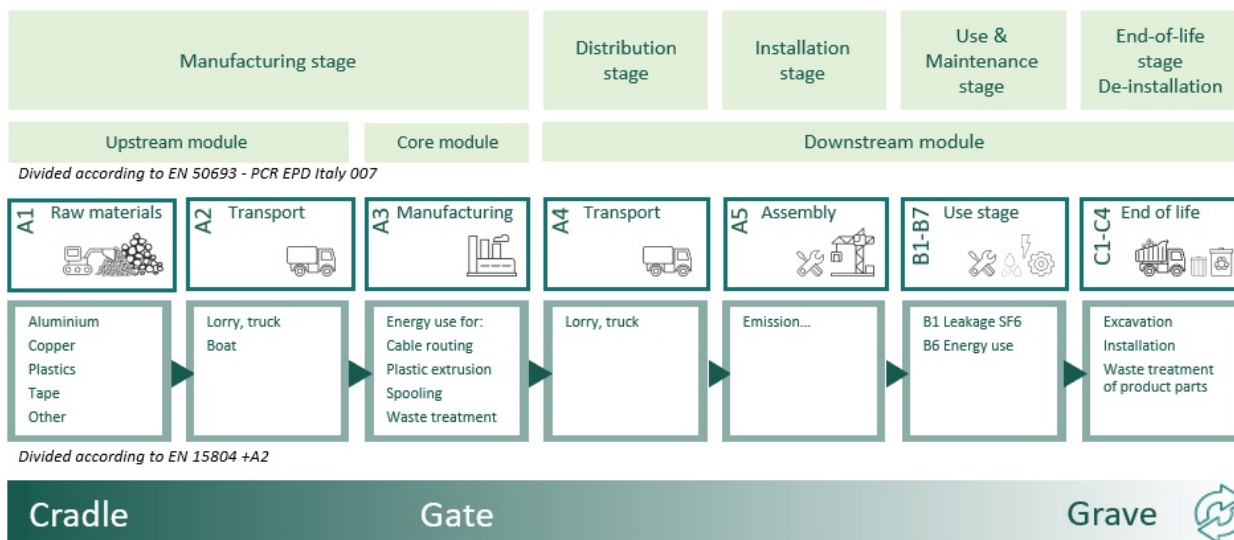
Allocation:

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

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

Product stage			Construction installation stage			User 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	X	X					X		X	X	X	X	X

System boundary:



Additional technical information:

No additional technical has been provided in this EPD.

LCA: Scenarios and additional technical information

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

The impact of installing the unit in A5 is assumed to be very low and is set as 0. B1 includes leakage of SF6 during reference service life, based confirmation certificate for the product. B6 includes electricity lost through heat loss during reference service life in accordance with the PCR. The impact of removing the unit from its place of usage (C1) to transport is assumed to be very low and is set as 0. In C2 the CCF-units are assumed to be transported back to Norway for disassembly. The waste treatment company has a process for collection and incineration of all remaining gas in the unit. There is no SF6-leakage during the disassembly. End-of-life treatment scenarios for the product in modules C3 and C4 are based on the default values given in EN 50963 Annex G, Table G.4.

Transport from production place to user (A4)	Capacity Utilization	Distance (km)	Fuel/Energy Consumption	Unit	Value (L/t)
Truck, 16-32 tonnes, EURO 5 (kgkm) - RER	38,8 %	1658	0,045	l/tkm	74,61
Ship, Ferry, Sea (kgkm)	50,0 %	163	0,034	l/tkm	5,54

Assembly (A5)	Unit	Value			
	/DU	1,00			
Waste, mixed plastic, to average treatment (kg)	kg	1,40			
Waste, wood, average treatment - A5 (kg)	kg	27,00			

Operational energy (B6)	Unit	Value			
Electricity, Italy (kWh)	kWh/DU	9420,54			

Additional B6 information	Unit	Value			
Service life of product	SRL (years)	20			
Resistance Avg (for each phase) R_phase- Avg	microOhm	C: 87,33 and F: 473,33			
Rated continuous current	A	C: 630 and F: 70			
Effective current (load rate), I effective (50 % of nominal current)	A	C: 315 and F: 35			

Transport to waste processing (C2)	Capacity Utilization	Distance (km)	Fuel/Energy Consumption	Unit	Value (L/t)
Truck, 16-32 tonnes, EURO 5 (kgkm) - RER	38,8 %	1658	0,045	l/tkm	74,61
Ship, Ferry, Sea (kgkm)	50,0 %	163	0,034	l/tkm	5,54

C3 Waste Processing	Unit	Value			
Aluminium to recycling (kg)	kg	3,88			
Copper to recycling (kg)	kg	24,61			
Other non-ferrous metals to recycling (kg)	kg	3,86			
Plastics mixture, to recycling (kg)	kg	0,01			
Steel to recycling (kg)	kg	231,98			
Waste treatment per kg Plastics mixture, incineration (kg)	kg	5,71			
Waste treatment per kg Polyethylene terephthalate (PET), from incineration (kg)	kg	5,32			
Waste treatment per kg Polypropylene (PP), from incineration (kg)	kg	0,02			
Waste treatment per kg Rubber, incineration (kg)	kg	0,05			
Waste, Hazardous, incineration (kg)	kg	42,69			

C4 Disposal	Unit	Value			
Disposal, landfilling of aluminium (kg)	kg	0,97			
Disposal, landfilling of copper (kg)	kg	16,41			
Disposal, landfilling of other ferrous metals(kg)	kg	0,22			
Disposal, landfilling of other non-ferrous metals(kg)	kg	2,35			
Disposal, landfilling of steel (kg)	kg	58,00			
Landfilling of ashes from incineration of Plastics mixture (kg)	kg	0,40			
Landfilling of ashes from incineration of Polyethylene terephthalate (PET) (kg)	kg	0,23			
Landfilling of ashes from incineration of Polypropylene (PP) (kg)	kg	0,00			
Landfilling of ashes from incineration of Rubber, (kg)	kg	0,01			
Landfilling of mixed plastics (kg)	kg	11,10			

D Reuse-Recovery Recycling potential	Unit	Value			
Substitution of primary aluminium with net scrap (kg)	kg	3,88			
Substitution of primary copper with net scrap (kg)	kg	16,24			
Substitution of primary other non-ferrous metals with net scrap (kg)	kg	3,72			
Substitution of primary steel with net scrap (kg)	kg	174,19			
Substitution of electricity, in Norway (MJ)	MJ	116,48			
Substitution of thermal energy, district heating, in Norway (MJ)	MJ	1283,16			

LCA: Results

The LCA results are presented below for the declared unit defined on page 2 of the EPD document.

Environmental impact							
Parameter		Unit	A1-A3	A4	A5	B1	B6
	GWP-total	kg CO ₂ -eq.	3,35E+03	1,28E+02	4,35E-01	5,92E+02	4,01E+03
	GWP-fossil	kg CO ₂ -eq.	3,40E+03	1,28E+02	4,35E-01	5,92E+02	3,94E+03
	GWP-biogenic	kg CO ₂ -eq.	-5,37E+01	0,00E+00	5,45E+01	0,00E+00	6,99E+01
	GWP-luluc	kg CO ₂ -eq.	2,81E+00	4,69E-02	5,42E-05	0,00E+00	7,60E-01
	ODP	kg CFC11-eq.	3,56E-01	2,82E-05	3,13E-08	0,00E+00	5,42E-04
	AP	mol H ⁺ -eq.	4,52E+01	7,46E-01	4,33E-03	0,00E+00	2,15E+01
	EP-FreshWater ³	kg P-eq.	8,99E-01	9,75E-04	5,78E-06	0,00E+00	1,26E-01
	EP-Marine	kg N-eq.	4,71E+00	2,09E-01	2,14E-03	0,00E+00	2,78E+00
	EP-Terrestrial	mol N-eq.	5,70E+01	2,32E+00	2,19E-02	0,00E+00	3,98E+01
	POCP	kg NMVOC-eq.	1,67E+01	6,76E-01	5,41E-03	0,00E+00	9,15E+00
	ADPE ¹	kg Sb-eq.	3,30E-01	3,31E-03	1,47E-06	0,00E+00	3,09E-02
	ADPF ¹	MJ	3,72E+04	1,91E+03	2,93E+00	0,00E+00	5,82E+04
	WDP ¹	m ³	4,11E+04	1,75E+03	8,97E+00	0,00E+00	6,19E+05
Parameter		Unit	C1	C2	C3	C4	D
	GWP-total	kg CO ₂ -eq.	0	1,28E+02	1,34E+02	5,25E+00	-5,25E+02
	GWP-fossil	kg CO ₂ -eq.	0	1,28E+02	1,34E+02	5,25E+00	-5,23E+02
	GWP-biogenic	kg CO ₂ -eq.	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	GWP-luluc	kg CO ₂ -eq.	0	4,69E-02	2,05E-02	3,66E-04	-2,52E+00
	ODP	kg CFC11-eq.	0	2,82E-05	1,22E-05	2,95E-07	-5,42E-01
	AP	mol H ⁺ -eq.	0	7,46E-01	1,55E-01	1,11E-02	-2,12E+01
	EP-FreshWater ³	kg P-eq.	0	9,75E-04	2,24E-03	3,87E-04	-2,55E+00
	EP-Marine	kg N-eq.	0	2,09E-01	3,19E-02	9,87E-02	-1,33E+00
	EP-Terrestrial	mol N-eq.	0	2,32E+00	3,54E-01	3,42E-02	-1,75E+01
	POCP	kg NMVOC-eq.	0	6,76E-01	9,58E-02	2,63E-02	-5,61E+00
	ADPE ¹	kg Sb-eq.	0	3,31E-03	2,14E-04	8,60E-06	-6,82E-02
	ADPF ¹	MJ	0	1,91E+03	4,90E+02	2,36E+01	-6,71E+03
	WDP ¹	m ³	0	1,75E+03	4,83E+00	5,72E+02	-6,43E+03

GWP-total Global Warming Potential total; GWP-fossil Global Warming Potential fossil fuels; GWP-biogenic Global Warming Potential biogenic; GWP-luluc Global Warming Potential land use change; ODP Ozone Depletion; AP Acidification; EP-freshwater Eutrophication aquatic freshwater; EP-marine Eutrophication aquatic marine; EP-terrestrial Eutrophication terrestrial; POCP Photochemical zone formation; ADPE Abiotic Depletion Potential minerals and metals; ADPF Abiotic Depletion Potential fossil fuels;

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

*INA Indicator Not Assessed

1. The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator

3. Eutrophication aquatic freshwater shall be in kg P-eq., there is a typo in EN 15804:2012+A2:2019 regarding this unit. Eutrophication calculated as PO4-eq is presented on page 11

Additional environmental impact indicators

Parameter		Unit	A1-A3	A4	A5	B1	B6
	PM	Disease incidence	2,40E-04	8,15E-06	4,59E-08	0,00E+00	8,28E-05
	IRP ²	kgBq U235-eq.	1,25E+02	8,36E+00	6,49E-03	0,00E+00	1,59E+02
	ETP-fw ¹	CTUe	4,20E+05	1,39E+03	5,69E+00	1,87E-03	5,11E+04
	HTP-c ¹	CTUh	2,14E-05	0,00E+00	9,49E-10	0,00E+00	1,37E-06
	HTP-nc ¹	CTUh	4,33E-04	1,44E-06	4,71E-08	0,00E+00	3,98E-05
	SQP ¹	Pt	2,33E+04	1,26E+03	9,42E-01	0,00E+00	2,30E+04
Parameter		Unit	C1	C2	C3	C4	D
	PM	Disease incidence	0	8,15E-06	1,41E-06	1,48E-07	-7,79E-05
	IRP ²	kgBq U235-eq.	0	8,36E+00	2,10E+00	1,57E-01	-4,15E+01
	ETP-fw ¹	CTUe	0	1,39E+03	2,01E+03	8,32E+02	-1,88E+05
	HTP-c ¹	CTUh	0	0,00E+00	6,56E-08	2,86E-09	-6,72E-06
	HTP-nc ¹	CTUh	0	1,44E-06	7,25E-07	3,63E-08	-2,39E-04
	SQP ¹	Pt	0	1,26E+03	1,05E+02	4,79E+01	-4,52E+03

PM Particulate Matter emissions; IRP Ionizing radiation – human health; ETP-fw Eco toxicity – freshwater; HTP-c Human toxicity – cancer effects; HTP-nc Human toxicity – non cancer effects; SQP Soil Quality (dimensionless)

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

*INA Indicator Not Assessed

1. The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator

2. 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.

Resource use

Parameter		Unit	A1-A3	A4	A5	B1	B6
	PERE	MJ	5,92E+03	2,62E+01	1,01E-01	0,00E+00	1,82E+04
	PERM	MJ	4,03E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	PERT	MJ	6,32E+03	2,62E+01	1,01E-01	0,00E+00	1,82E+04
	PENRE	MJ	3,72E+04	1,93E+03	3,36E+00	0,00E+00	5,82E+04
	PENRM	MJ	5,95E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	PENRT	MJ	3,76E+04	1,93E+03	3,36E+00	0,00E+00	5,82E+04
	SM	kg	6,84E+01	7,68E-01	-1,94E-03	0,00E+00	6,47E+01
	RSF	MJ	4,31E+01	9,32E-01	2,36E-03	0,00E+00	3,19E+03
	NRSF	MJ	1,60E+02	3,06E+00	-4,81E-02	0,00E+00	1,70E+01
	FW	m ³	3,91E+01	1,96E-01	5,82E-03	0,00E+00	6,22E+01
Parameter		Unit	C1	C2	C3	C4	D
	PERE	MJ	0	2,62E+01	2,02E+01	2,82E+00	-2,44E+03
	PERM	MJ	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	PERT	MJ	0	2,62E+01	2,02E+01	2,82E+00	-2,44E+03
	PENRE	MJ	0	1,93E+03	4,90E+02	2,40E+01	-6,72E+03
	PENRM	MJ	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	PENRT	MJ	0	1,93E+03	4,90E+02	2,40E+01	-7,18E+03
	SM	kg	0	7,68E-01	-1,43E-02	3,13E-02	-2,37E+01
	RSF	MJ	0	9,32E-01	1,92E-03	5,84E-02	-3,94E-01
	NRSF	MJ	0	3,06E+00	-1,98E-02	-2,91E-02	-3,97E+01
	FW	m ³	0	1,96E-01	3,71E-01	3,19E-02	-7,35E+00

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 resources;

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

*INA Indicator Not Assessed

End of life - Waste

Parameter		Unit	A1-A3	A4	A5	B1	B6
	HWD	kg	6,91E+00	9,63E-02	2,79E-01	0,00E+00	5,13E+00
	NHWD	kg	6,91E+03	8,69E+01	8,52E-01	0,00E+00	1,87E+02
	RWD	kg	8,55E-02	1,30E-02	8,25E-06	0,00E+00	1,58E-01
Parameter		Unit	C1	C2	C3	C4	D
	HWD	kg	0	9,63E-02	2,84E-03	1,12E-01	6,92E-02
	NHWD	kg	0	8,69E+01	2,33E+01	8,92E+01	-2,65E+03
	RWD	kg	0	1,30E-02	2,90E-03	1,70E-04	-1,97E-02

HWD Hazardous waste disposed; NHWD Non-hazardous waste disposed; RWD Radioactive waste disposed;

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

*INA Indicator Not Assessed

End of life - Output flow

Parameter		Unit	A1-A3	A4	A5	B1	B6
	CRU	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	MFR	kg	5,97E-01	1,03E-02	2,56E-05	0,00E+00	9,68E+00
	MER	kg	2,19E+00	6,55E-01	7,25E-01	0,00E+00	3,13E+01
	EEE	MJ	6,73E+00	7,13E-02	1,88E+01	0,00E+00	2,36E+00
	EET	MJ	4,82E+01	1,08E+00	2,84E+02	0,00E+00	3,57E+01
Parameter		Unit	C1	C2	C3	C4	D
	CRU	kg	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	MFR	kg	0	1,03E-02	2,02E-05	5,77E-04	-3,64E-03
	MER	kg	0	6,55E-01	3,07E+02	1,07E-02	-3,59E-02
	EEE	MJ	0	7,13E-02	7,79E+01	1,67E-02	-3,65E-03
	EET	MJ	0	1,08E+00	6,99E+02	2,52E-01	-5,52E-02

CRU Components for re-use; MFR Materials for recycling; MER Materials for energy recovery; EEE Exported electrical energy; EET Exported energy Thermal

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

*INA Indicator Not Assessed

Biogenic Carbon Content

Indicator	Unit	At the factory gate
Biogenic carbon content in product	kg C	0,00E+00
Biogenic carbon content in accompanying packaging	kg C	1,21E+01

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO₂

Additional Norwegian requirements

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

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

Electricity mix	Data source	Amount	Unit
Electricity, Poland (kWh)	ecoinvent 3.6	1060,47	g CO ₂ -eq/kWh

Dangerous substances

The product contains no substances given by the REACH Candidate list or the Norwegian priority list.

Indoor environment

Not relevant.

Additional Environmental Information

Environmental impact indicators EN 15804+A1 and NPCR Part A v2.0

Parameter	Unit	A1-A3	A4	A5	B1	B6
GWP	kg CO ₂ -eq.	3,33E+03	1,27E+02	4,08E-01	5,18E+02	4,38E+03
ODP	kg CFC11-eq.	2,68E-04	2,28E-05	1,61E-01	0,00E+00	5,04E-04
POCP	kg C ₂ H ₄ -eq.	3,17E+00	2,11E-02	2,50E-04	0,00E+00	7,77E-01
AP	kg SO ₂ -eq.	3,41E+01	4,40E-01	1,80E-03	0,00E+00	1,73E+01
EP	kg PO ₄ ³⁻ -eq.	7,65E+00	4,74E-02	1,90E-04	0,00E+00	1,64E+00
ADPM	kg Sb-eq.	5,12E+03	3,31E-03	2,77E+00	0,00E+00	3,09E-02
ADPE	MJ	2,57E+04	1,91E+03	6,07E+00	0,00E+00	5,82E+04
GWPIOBC	kg CO ₂ -eq.	3,38E+03	1,27E+02	4,08E-01	0,00E+00	4,38E+03
GWPBC	kg CO ₂ -eq.	-5,45E+01	0,00E+00	5,45E+01	0,00E+00	0,00E+00

Parameter	Unit	C1	C2	C3	C4	D
GWP	kg CO ₂ -eq.	0	1,27E+02	1,28E+02	5,46E+01	-3,55E+02
ODP	kg CFC11-eq.	0	2,28E-05	1,11E-05	2,53E-07	-2,34E-05
POCP	kg C ₂ H ₄ -eq.	0	2,11E-02	4,78E-03	1,04E-02	-4,49E-01
AP	kg SO ₂ -eq.	0	4,40E-01	1,27E-01	5,85E-03	-7,15E+00
EP	kg PO ₄ ³⁻ -eq.	0	4,74E-02	2,13E-02	4,56E-02	-4,69E-01
ADPM	kg Sb-eq.	0	3,31E-03	2,15E-04	8,81E-06	-4,25E+03
ADPE	MJ	0	1,91E+03	4,62E+02	2,39E+01	-1,15E+02
GWPIOBC	kg CO ₂ -eq.	0	1,27E+02	1,28E+02	5,46E+01	-3,55E+02
GWPBC	kg CO ₂ -eq.	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Key Carbon related indicators 15804+A2	Unit	Amount
GWP - total, Production Product (A1-A3)	kg CO ₂ -eq.	3,35E+03
GWP - total, Product lifecycle (A1-C4) incl. B6	kg CO ₂ -eq.	8,35E+03
Delivered energy use over FU (B6)	kWh	9,42E+03

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