ENVIRONMENTAL PRODUCT DECLARATION

SENTRON

MCB 5SY61..-.

Type II according to ISO 14021 including life cycle impact assessment (LCIA)
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General information

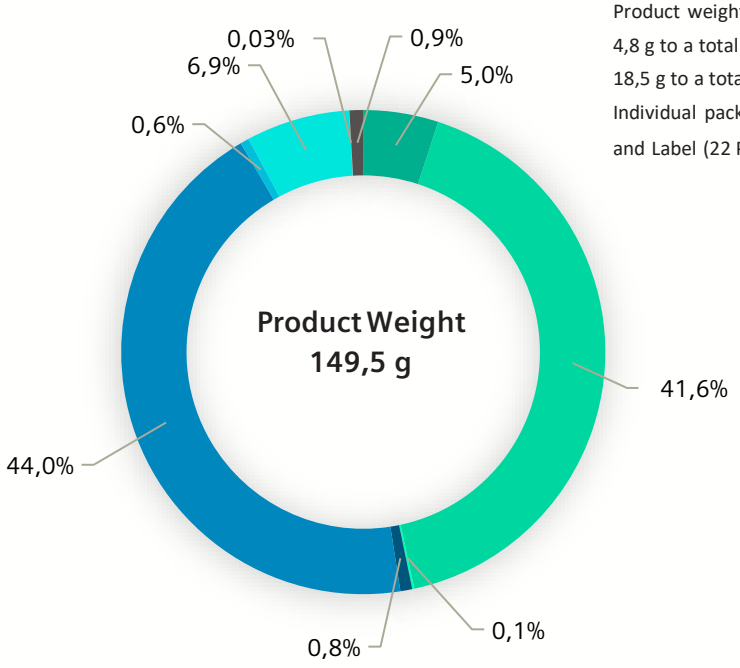
This environmental product declaration (EPD) is based on the international standard ISO 14021 (“Environmental labels and declarations – Self declared environmental claims – Type II”). The data in this EPD has been evaluated on a full-scale life cycle assessment (LCA) study according to ISO 14040/44, taking into account the product category rules (PCR) for electronic and electrotechnical products and systems defined in EN 50693, as well as product specific rules (PSR) for low-voltage switchgear and controlgear equipment in IEC TS 63058 ED1.0.

Siemens is dedicated to an environmentally conscious design of its products in line with IEC 62430 and has implemented an integrated management system according to ISO 9001, ISO 14001 and ISO 45001.

Products	All variants in the range of 5SY61..-.
Represented by	5SY6106-7
Product Description	Miniature circuit breaker 230/400 V 6kA, 1-pole, C, 6 A, D=70 mm
Functional Unit	To protect against overcurrents of wiring installations of buildings and similar applications according to IEC/EN 60898-1 over the reference service lifetime of 20 years.

Material composition

The following chart outlines the overall material composition of the calculated reference product.



Product weight of 149,5 g adds up with packaging weight of:
4,8 g to a total weight of 154,3 g (bulk packaging with 12 pieces per carton);
18,5 g to a total weight of 167,5 g (individual packaging).
Individual packaging consists of cardboard (20 PAP Corrugated Fiber Board; ~18 g) and Label (22 PAP-Paper, ~0,5 g).

- Thermoplastics
- Thermosets
- Elastomers
- High-alloyed steel
- Low-alloyed steel
- Iron & Alloys
- Copper & Alloys
- Precious metals
- Others

Substance assessment

At Siemens, we are committed to the development and production of environmentally sound and sustainably produced equipment. This includes avoiding hazardous substances in our products without compromising their benefits for our customers. Please visit the following website to learn more about how we comply with product-related environmental regulations like RoHS, REACH, WEEE and others: Product Related Environmental Protection

Life cycle stages and reference scenarios

Manufacturing

This stage covers the extraction of natural resources, production of raw materials, manufacturing, packaging and transport distances.

Operations

This stage covers the product's installation, use and maintenance. Different operating conditions can lead to deviations from the standard scenario.

End-of-life

This stage covers the disassembly, material recycling and thermal treatment of all recyclable materials as well as the disposal of all other materials.

Scenarios

Energy model used:
EU-28: Electricity grid mix

Transportation model used:
100 km default distance,
GLO: Truck-trailer, Euro IV

Energy model used:
EU-28: Electricity grid mix

Use scenario:
1,6 W full load,
50% loading rate of I_n: 6 A,
30% service uptime;
20 years reference lifetime

Energy model used:
EU-28: Electricity grid mix

Key environmental performance indicators

The following impact categories characterize the product's environmental footprint. The first 16 impact categories have been calculated with LCIA methodology EF3.0 and the last 6 with EN 15804+A2; LCA tool: GaBi 10.6.2, Database: GaBi Professional & Extensions, 2020.

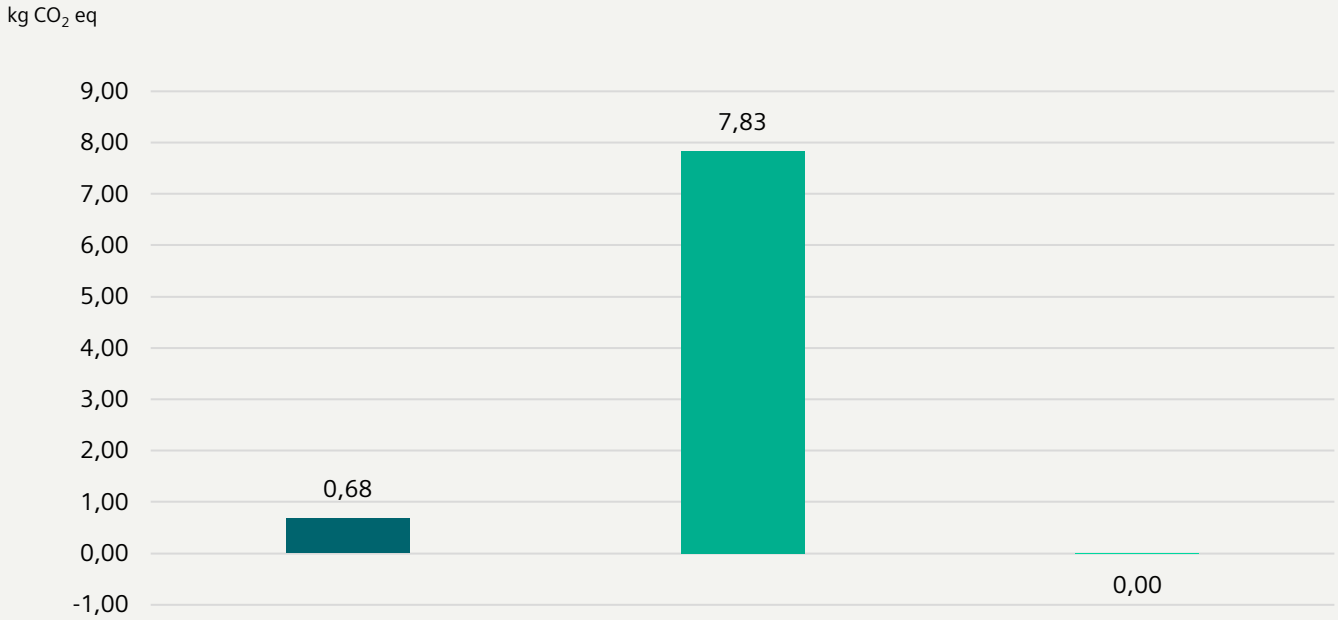
Impact category	Unit	Total	Manufacturing	Operation	End of Life
Acidification	Mole of H+ eq	1,88E-02	2,86E-03	1,70E-02	-1,12E-03
Global warming potential	kg CO_2 eq	8,50E+00	6,83E-01	7,83E+00	-4,82E-03
Ecotoxicity, freshwater – total	CTUe	6,68E+01	5,70E+00	6,16E+01	-4,82E-01
Eutrophication, freshwater	kg P eq	2,43E-05	1,71E-06	2,26E-05	-7,63E-08
Eutrophication, marine	kg N eq	4,10E-03	3,75E-04	3,82E-03	-9,08E-05
Eutrophication, terrestrial	Mole of N eq	4,32E-02	4,00E-03	4,01E-02	-8,99E-04
Human toxicity, cancer – total	CTUh	3,61E-09	2,03E-09	1,77E-09	-1,90E-10
Human toxicity, non-cancer – total	CTUh	7,39E-08	1,20E-08	6,48E-08	-2,86E-09
Ionising radiation, human health	kBq U235 eq	3,94E+00	1,34E-01	3,81E+00	-3,91E-04
Land Use	dimensionless (pt)	5,32E+01	2,69E+00	5,07E+01	-2,16E-01
Ozone depletion	kg CFC-11 eq	1,53E-08	1,51E-08	1,13E-10	6,26E-11
Particulate matter	Disease incidences	1,56E-07	2,45E-08	1,41E-07	-9,20E-09
Photochemical ozone formation	kg NMVOC eq	1,14E-02	1,36E-03	1,03E-02	-3,21E-04
Resource use, fossils	MJ	1,50E+02	1,13E+01	1,41E+02	-1,83E+00
Resource use, mineral and metals	kg Sb eq	9,73E-06	3,28E-05	2,12E-06	-2,52E-05
Water scarcity	m^3 world eq	1,88E+00	1,06E-01	1,77E+00	7,46E-04
Use of non-renewable primary energy	MJ	1,50E+02	1,13E+01	1,41E+02	-1,84E+00
Use of renewable primary energy	MJ	8,13E+01	3,22E+00	7,81E+01	-2,57E-02
Net use of fresh water	m^3	7,89E-02	4,43E-03	7,45E-02	-3,99E-05
Hazardous waste disposed	kg	4,69E-07	4,57E-07	1,22E-08	-1,53E-10
Non-hazardous waste disposed	kg	1,42E-01	3,17E-02	1,06E-01	4,61E-03
Radioactive waste disposed	kg	2,33E-02	8,18E-04	2,25E-02	-1,36E-05

* Includes potential benefit of End-of-Life

Global warming potential

This chart shows the overall global warming potential of the product. The operations phase is the lifecycle phase with the biggest overall impact. Different operating conditions can lead to deviations from the standard scenario.

Manufacturing | Operations | End of Life



End-of-life scenario

The end of life stage was modelled by shredding of the device, followed by sorting and material separation process. It leads to

- an overall product recyclability of up to 45% mainly due to metal content
- an energy recoverability of up to 51% from plastic materials
- a minimum landfill rate of 6%

The exact final values depend on the used recycling process and add up to 100%.

Note: The device should not be disposed of as unsorted municipal waste. Special treatment for specific components may be mandated by law or ecologically sensible. Observe all local and applicable laws.

Legal Disclaimer

This Environmental Product Declaration (EPD) is for information purposes only. It is based upon the standards mentioned above.

This EPD does not warrant or guarantee the composition of a product or that the product will retain a particular composition for a particular period. Therefore, all warranties, representations, conditions, and all other terms of any kind whatsoever implied by statute or common law are – to the fullest extent permitted by applicable law – excluded.

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Please be aware that the data of this EPD cannot be compared with data calculated based upon product category rules (PCRs) other than the standards mentioned above. The values given are only valid within the context specified and cannot be used directly to draw up the environmental assessment of an installation.

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