ENVIRONMENTAL PRODUCT DECLARATION

SIVACON S4

8PQ....-BA

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

SIEMENS

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 environmental labelling”). 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 control gear 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.

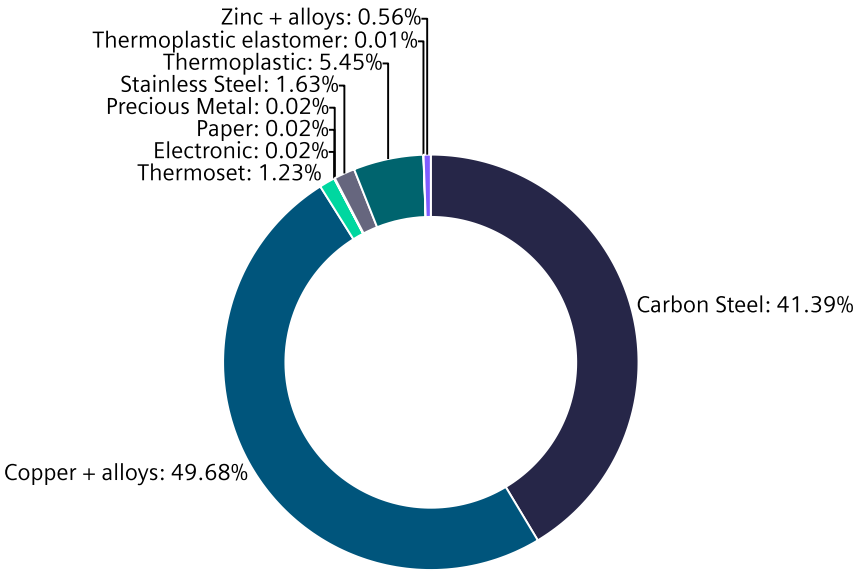
Products	**All variants in range of 8PQ....-BA**
Represented by the reference product	SIVACON S4 Main busbar rear: 3.200 A
Product Description	Switchboard
Functional Unit	Design verified solutions according to IEC61439-1/2 for following functions: • Incoming / outgoing section for 3WA air circuit breaker • Coupling section for 3WA air circuit breaker • Outgoing section • Outgoing section with distribution busbar • Outgoing section ALPHA DIN • Busbar section • Mounting plate according to IEC/EN 61008 over the reference service lifetime of 30 years. This value cannot be equated with the minimum, average or individual lifetime.[1]

[1] The lifetime value used for calculation is a reference value and does not equate with the minimum, average or real life time.

Material composition

The following chart outlines the overall material composition of the calculated reference product without packaging. Product weight of 576.73 kg adds up with packaging weight of 14.65 kg to a total weight of 591.38 kg. Packaging consists of: Corrugated box (average composition), EPS-Foam (15 kg/m3), PE film.

Product Weight 576.73 kg



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 transportation.

Distribution and Operation

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

End-of-Life

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

Scenarios

Energy model used:
Europe (standard mix)

Transportation model:
Road Truck-trailer, 34 - 40t, 1000 km

Energy model used:
Europe (standard mix);

Distribution scenario:
Truck-trailer (34-40 t) 3500 km

Use Scenario:
365 W full load, 25% loading rate, 95% service uptime: reference lifetime 30 years

Energy model used:
EMEA

End-of-Life methodology:
Avoided burden (net-scrap calculation)

Key environmental performance indicators

The following impact categories characterize the product's environmental footprint. They have been calculated with LCIA methodology EN15804+A2 (EF 3.1); LCA tool: Green Digital Twin Version 4.0, Database: One Siemens LCA Database (based on Sphera MLC CUP 2024.1).

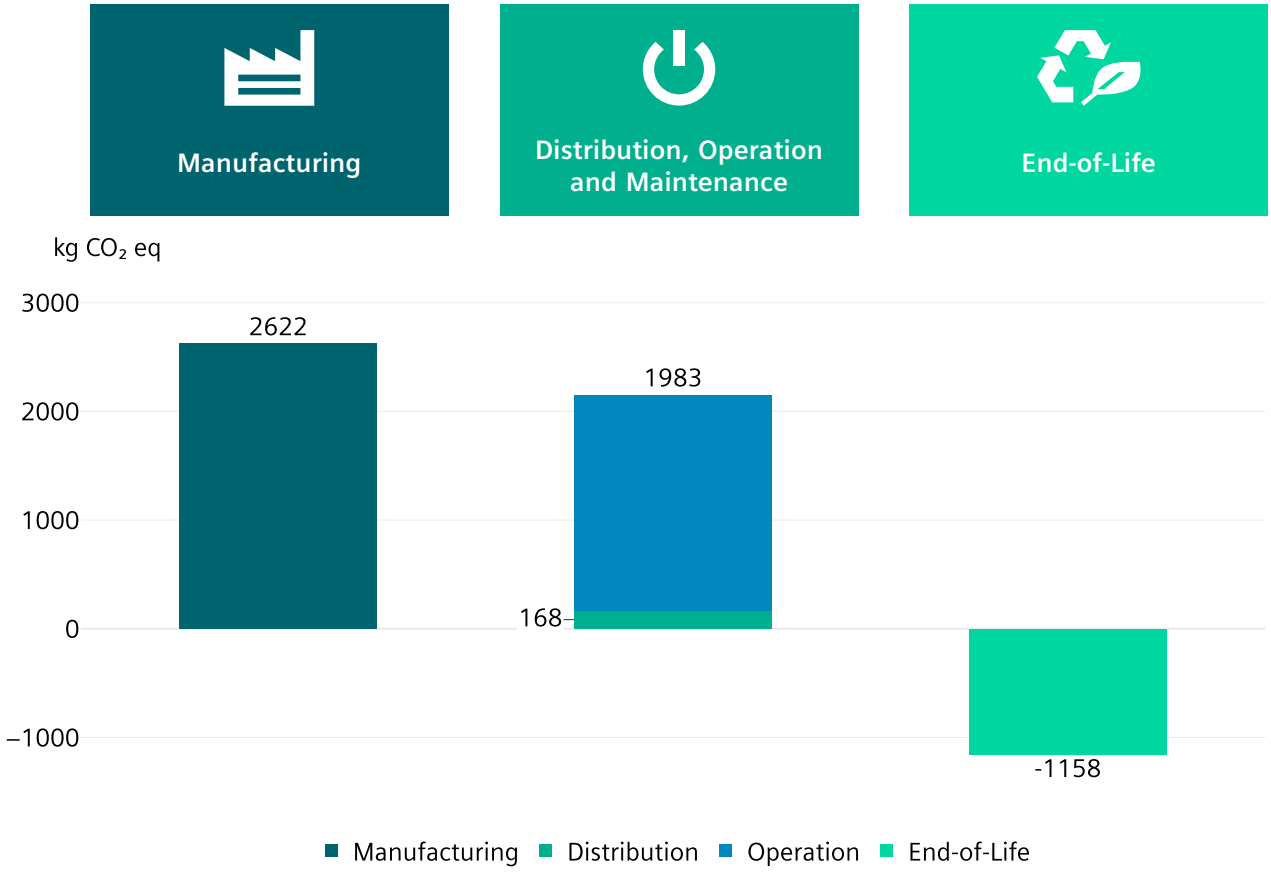
To ensure the high quality and completeness of the LCA results, primary data have been used whenever possible. Datasets for resources, such as electrical energy or natural gas, are chosen from the region where the device is produced and assembled. If primary data are not available, datasets reflecting state-of-the-art manufacturing technology are considered.

For products belonging to the same homogeneous product family range the scaling factors in the appendix can be used to derive their corresponding environmental impacts according to the standard EN50693.

Impact Category	Unit	Total	Manufacturing	Distribution	Operation	End of life
Climate change – total	kg CO_2 eq	3.62E+3	2.62E+3	1.68E+2	1.98E+3	-1.16E+3
Climate change – fossil	kg CO_2 eq	3.61E+3	2.62E+3	1.65E+2	1.97E+3	-1.14E+3
Climate change – biogenic	kg CO_2 eq	4.76E+0	-1.35E+1	3.68E-1	1.77E+1	1.53E-1
Climate Change, land use and land use change	kg CO_2 eq	-7.08E+0	8.75E+0	2.59E+0	2.99E-1	-1.87E+1
Ozone depletion	kg CFC-11 eq	6.01E-8	1.98E-8	2.33E-11	4.46E-8	-4.30E-9
Acidification	Mole of H+ eq	3.05E+1	4.23E+1	2.12E-1	3.79E+0	-1.58E+1
Eutrophication, freshwater	kg P eq	5.73E-3	4.01E-3	6.65E-4	8.20E-3	-7.15E-3
Eutrophication, marine	kg N eq	1.05E+0	2.02E+0	7.69E-2	9.47E-1	-1.99E+0
Eutrophication, terrestrial	Mole of N eq	2.66E+1	3.70E+1	9.17E-1	9.91E+0	-2.12E+1
Photochemical ozone formation, human health	kg NMVOC eq	6.82E+0	1.02E+1	2.11E-1	2.50E+0	-6.12E+0
Resource use, mineral and metals	kg Sb eq	-5.97E-1	1.64E-2	1.34E-5	3.68E-4	-6.14E-1
Resource use, fossils	MJ	5.82E+4	2.92E+4	2.03E+3	4.12E+4	-1.41E+4
Water use	m^3 world eq deprived water	1.15E+3	1.38E+3	3.29E+0	5.35E+2	-7.73E+2
Particulate matter	Disease incidences	1.15E-5	1.14E-4	2.12E-6	3.17E-5	-1.37E-4
Ionising radiation, human health	kBq U235 eq	1.13E+3	6.61E+1	5.48E-1	1.08E+3	-1.70E+1
Ecotoxicity, freshwater – total	CTUe	2.60E+4	1.91E+4	1.51E+3	1.19E+4	-6.51E+3
Human toxicity, cancer – total	CTUh	1.54E-5	1.58E-5	3.05E-8	6.70E-7	-1.14E-6
Human toxicity, non-cancer – total	CTUh	-2.07E-5	1.31E-5	1.37E-6	1.03E-5	-4.55E-5
Land Use	dimensionless (pt)	3.52E+4	2.04E+4	1.00E+3	1.74E+4	-3.65E+3

Climate change

This chart shows the overall impact of the product on climate change – total. The manufactering phase is the life cycle phase with the biggest overall impact. Different operating conditions can lead to deviations from the reference scenario.



End-of-Life results

The end-of-life stage was modelled by shredding of the device, followed by sorting and material separation process.The end-of-life parameters are calculated according to IEC TR 62635.

It leads to:

- **product recyclability of up to 87%** mainly due to metal content
- **energy recoverability of up to 7%** from plastic materials
- **minimum disposal 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 recommended for environmental reasons. Observe all local and applicable laws.

Appendix

To extrapolate the impact from the reference product to another product from the range, multiply the following scaling factors by the impact category per life cycle stage from page 5:

Product	Manufacturing	Distribution	Operation	End-of-life
Coupling section for 3WA air circuit breaker	0,82	0,76	0,53	0,81
Outgoing section ALPHA DIN	0,25	0,34	0,45	0,29
Incoming / outgoing section for 3WA air circuit breaker	0,49	0,72	1,34	0,43
Busbar section	0,37	0,46	0,82	0,50
Mounting plate	0,21	0,29	0,45	0,26
Outgoing section	0,52	0,57	0,62	0,44
Outgoing Section with distribution busbar	1,00	1,00	1,00	1,00

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