ENVIRONMENTAL PRODUCT DECLARATION

SIMATIC ET 200SP
CPU 6ES7677-2.B..-....

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"). 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.

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 products in the range of 6ES7677-2.B..-...., including their SIPLUS extreme variants
Represented by	6ES7677-2DB42-0GB0 (CPU 1515SP PC2 w/o ET 200SP BusAdapter)
Product Description	SIMATIC ET 200SP Open Controller, CPU 1515SP PC2, 8 GB RAM, 128 GB CFast with Windows 10 IoT Enterprise 64-bit and S7-1500 Software Controller CPU 1505SP pre-installed, Interfaces: 1x Slot CFast, 1x slot SD/MMC, 1x connection for ET 200SP bus Adapter PROFINET, 1x 10/100/1000 Mbit/s Ethernet, 2x USB 3.0, 2x USB 2.0, 1x display port, ET 200SP BusAdapter is not included
Functional Unit	To control industrial automation applications over the reference service lifetime of 10 years

Material composition

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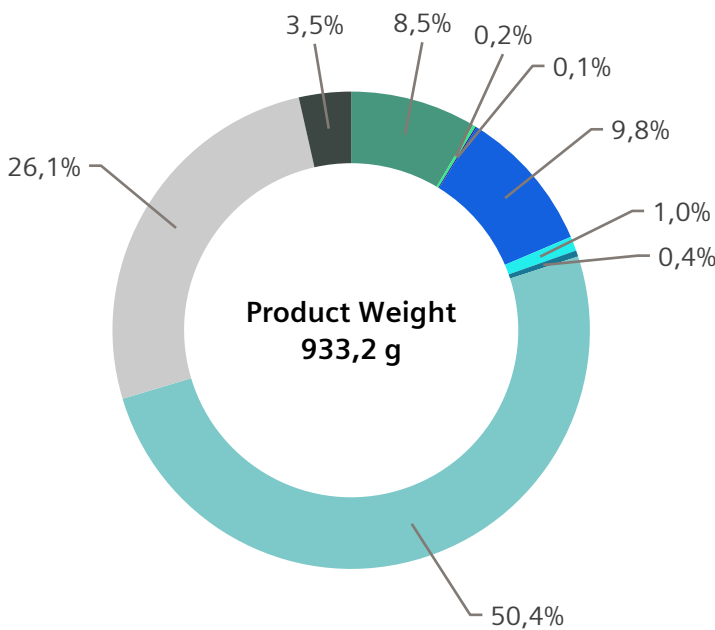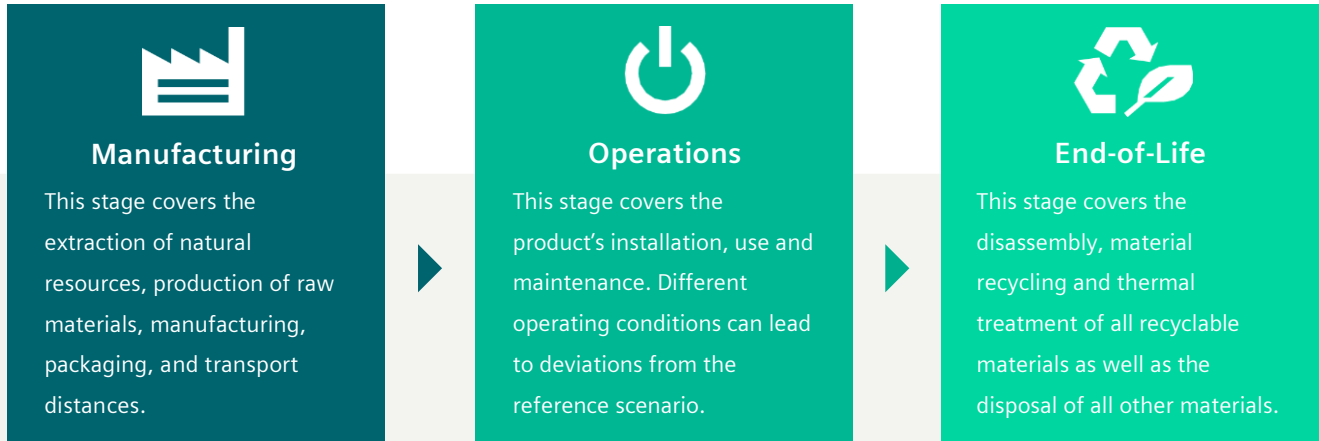

Product weight of 933,2 g adds up with packaging weight of 104,0 g to a total weight of 1037,2 g. Packaging consists of cardboard (102,0 g), polyethylene (1,2 g) and paper (0,8 g).

- Thermoplastics
- Elastomers
- High-alloyed steel
- Low-alloyed steel
- Copper & Alloys
- Aluminium & Alloys
- Magnesium & Alloys
- Electronics
- Various

Chart values: 3,5% | 8,5% | 0,2% | 0,1% | 9,8% | 1,0% | 0,4% | 50,4% | 26,1%

Product Weight 933,2 g

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 reference 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:

70% active mode (16,0 W[1]),
30% Off,
reference lifetime 10 years

Energy model used:

EU-28: Electricity grid mix

Key environmental performance indicators

The following impact categories characterize the product's environmental footprint. They have been calculated with LCIA methodology EF3.0; LCA tool: GaBi 10.6.2.9, Database: GaBi Professional & Extensions, 2022.2.
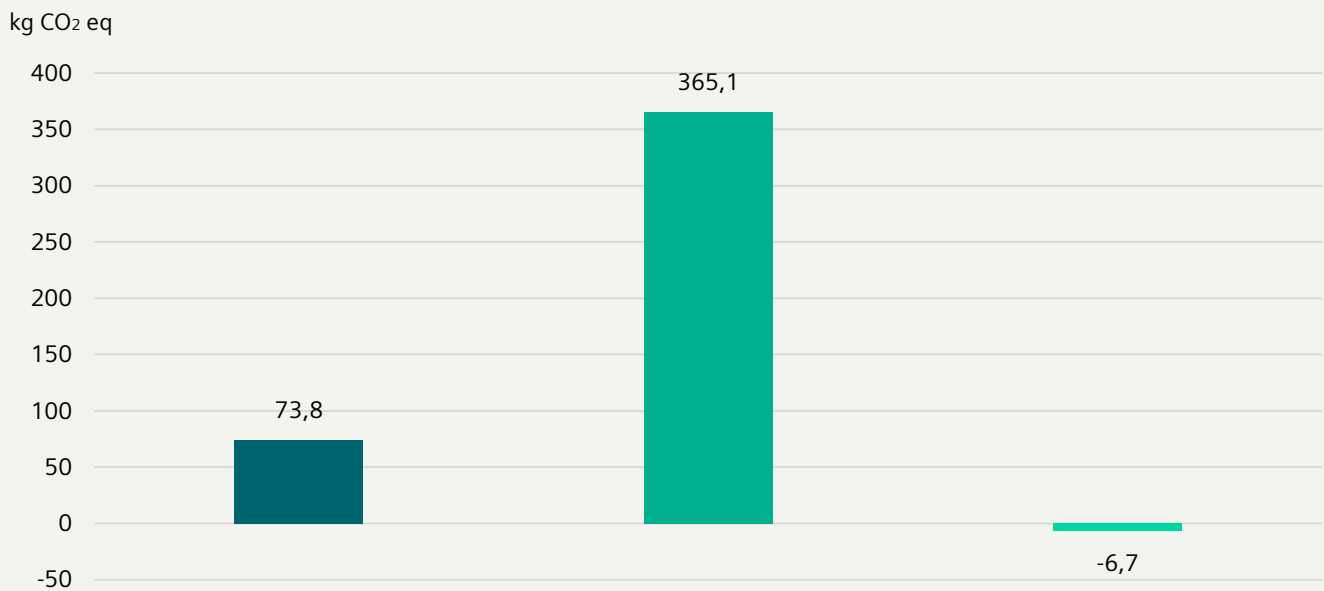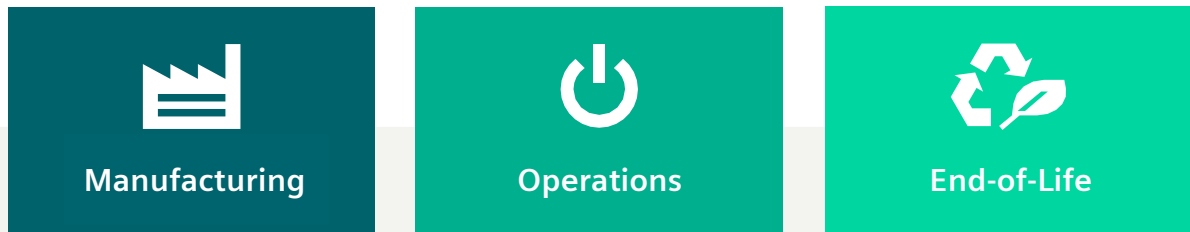
Impact category	Unit	Total	Manufacturing	Distribution[2]	Operation	End-of-Life
Acidification	Mole of H+ eq	1,03E+00	3,84E-01	1,01E-03	7,94E-01	-1,51E-01
Climate change – total	kg CO_2 eq	4,32E+02	7,38E+01	1,78E-01	3,65E+02	-6,71E+00
Ecotoxicity, freshwater – total	CTUe	3,28E+03	4,29E+02	1,65E+00	2,88E+03	-2,75E+01
Eutrophication, freshwater	kg P eq	1,24E-03	1,83E-04	5,30E-07	1,06E-03	-1,52E-06
Eutrophication, marine	kg N eq	2,30E-01	5,93E-02	4,94E-04	1,78E-01	-7,60E-03
Eutrophication, terrestrial	Mole of N eq	2,44E+00	6,46E-01	5,47E-03	1,87E+00	-8,27E-02
Human toxicity, cancer – total	CTUh	9,42E-08	1,53E-08	3,32E-11	8,26E-08	-3,75E-09
Human toxicity, non-cancer – total	CTUh	3,53E-06	6,63E-07	1,83E-09	3,03E-06	-1,62E-07
Ionising radiation, human health	kBq U235 eq	1,82E+02	4,91E+00	4,29E-04	1,78E+02	-9,56E-01
Land Use	dimensionless (pt)	2,52E+03	1,27E+02	8,17E-01	2,37E+03	2,91E+01
Ozone depletion	kg CFC-11 eq	9,83E-09	3,49E-09	1,06E-14	5,30E-09	1,05E-09
Particulate matter	Disease incidences	4,82E-05	4,27E-05	3,47E-09	6,58E-06	-1,13E-06
Photochemical ozone formation	kg NMVOC eq	6,33E-01	1,79E-01	9,53E-04	4,82E-01	-2,80E-02
Resource use, fossils	MJ	7,40E+03	9,18E+02	2,37E+00	6,56E+03	-8,71E+01
Resource use, mineral and metals	kg Sb eq	3,89E-03	5,85E-03	1,49E-08	9,87E-05	-2,05E-03
Water use	m³ world eq	9,30E+01	1,11E+01	1,59E-03	8,25E+01	-6,58E-01

[1] Measurement setup: room temperature; 24 V power supply; running PassMark BurnInTest (V10.2) with setting: CPU Load – 100%, 2D Graphics Test – 100%, Memory Test – 100%, Disk Test – 50%; Windows Network connected; Software CPU up and running mid-size project; no ET 200SP module; Display and USB mouse and keyboard connected

[2] Distribution scenario: Truck-trailer (GLO), Euro IV, 27 t payload, 85% loading rate, 3500 km

Climate change

This chart shows the overall impact of the product on climate change. The operations phase is the lifecycle phase with the biggest overall impact. Different operating conditions can lead to deviations from the reference scenario. The distribution stage of the reference product is not shown in the chart due to its relatively small contribution to climate change.

Manufacturing	Operations	End-of-Life

kg CO_2 eq

- Manufacturing: 73,8
- Operations: 365,1
- End-of-Life: -6,7

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 rate of up to 62,7%**
- **an energy recoverability rate of up to 25,6%**
- **a minimum disposal rate of 11,8%**

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.

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.

Siemens therefore does not assume any liability for any error or for any consequence which may arise from the use of this information to the maximum extent under the law.

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.