



ENVIRONMENTAL PRODUCT DECLARATION

SIMATIC S7-1500

CPU 6ES7516-3.P03-0AB0

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.

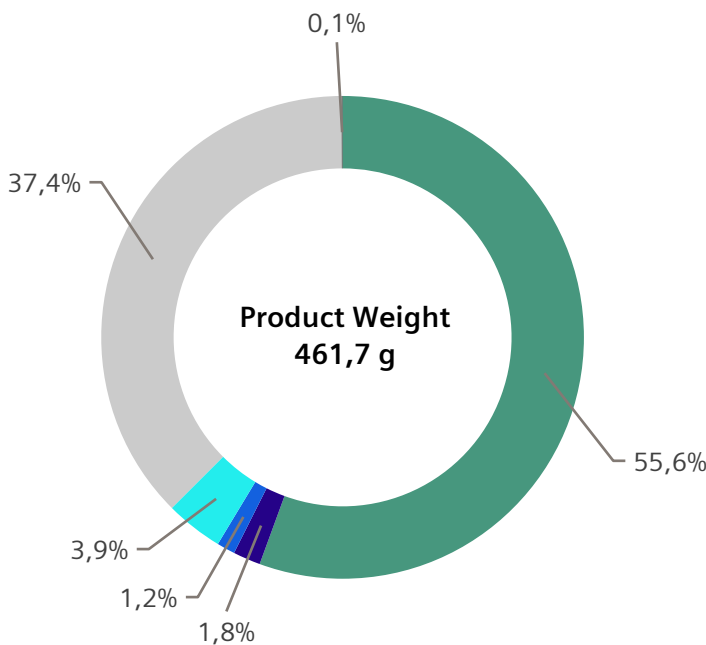
Siemens is dedicated to an environmentally conscious design of its products in line with IEC 62430 and has implemented an integrated management system according to ISO 9001, ISO 14001 and ISO 45001.

Products	All products in the range of 6ES7516-3.P03-0AB0, including their SIPLUS extreme variants
Represented by	6ES7516-3AP03-0AB0
Product Description	SIMATIC S7-1500, CPU 1516-3 PN/DP, central processing unit with 2 MB work memory for program and 7.5 MB for data, 1st interface: PROFINET IRT with 2-port switch, 2nd interface: PROFINET RT, 3rd interface: PROFIBUS, 6 ns bit performance
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.

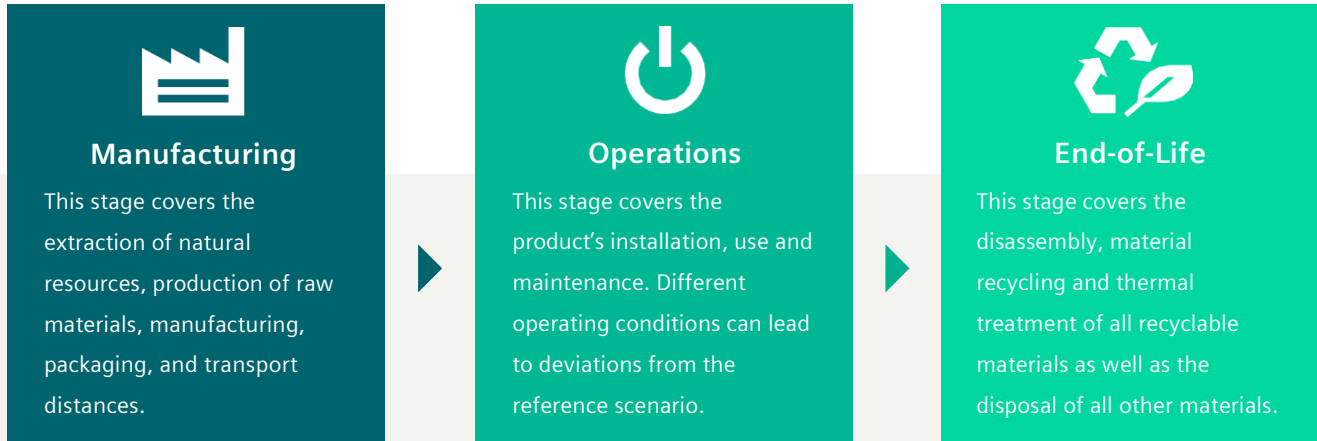


Product weight of 461,7 g adds up with packaging weight of 73,8 g to a total weight of 535,4 g. Packaging consists of cardboard (72,0 g) polyethylene (0,4 g) and paper (1,4 g).

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



Scenarios

Scenarios	Scenarios	Scenarios
<p>Energy model used: EU-28: Electricity grid mix</p> <p>Transportation model used: 100 km default distance, GLO: Truck-trailer, Euro IV</p>	<p>Energy model used: EU-28: Electricity grid mix</p> <p>Use scenario: 70% active mode (3,4 W¹), 30% Off, reference lifetime 10 years</p>	<p>Energy model used: EU-28: Electricity grid mix</p>

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.

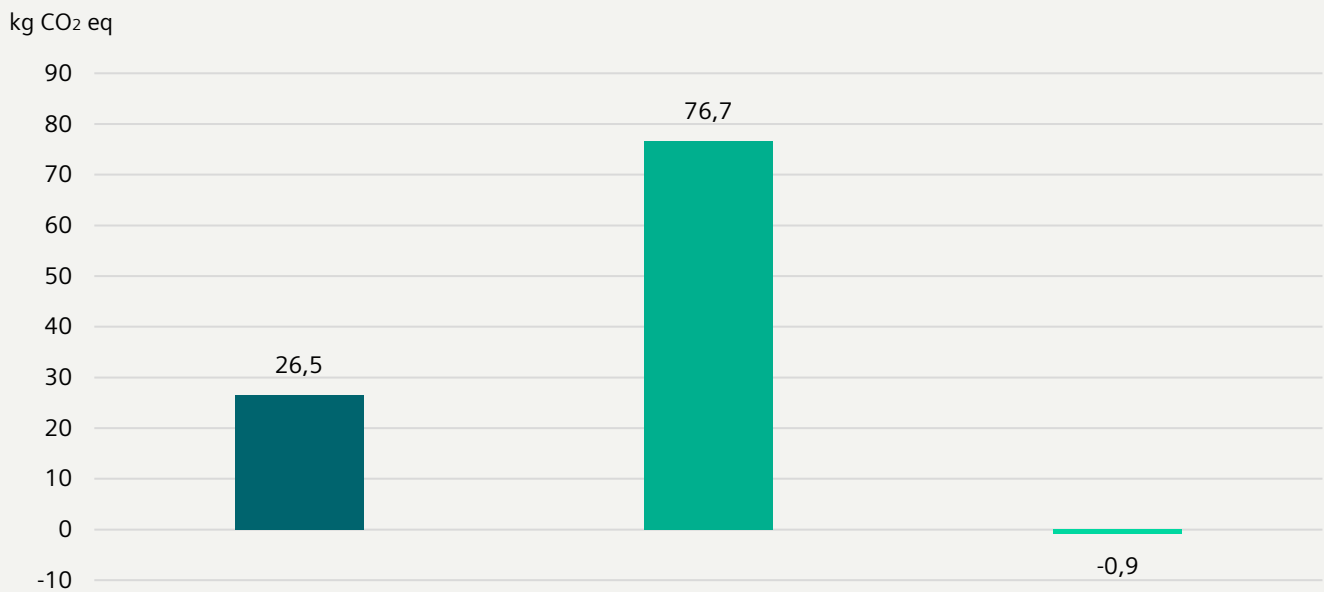
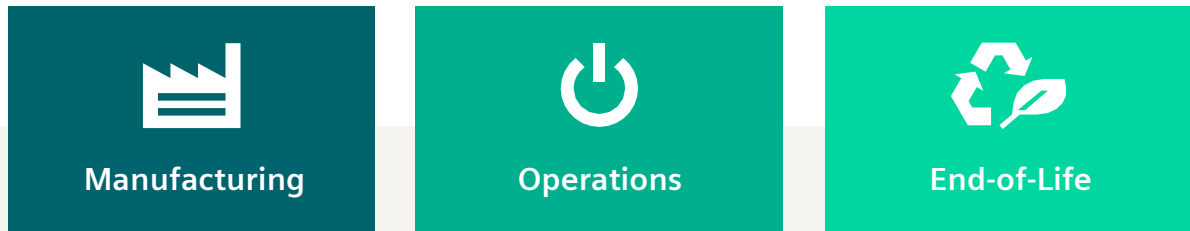
Impact category	Unit	Total	Manufacturing	Distribution ²	Operation	End-of-Life
Acidification	Mole of H ⁺ eq	2,63E-01	1,54E-01	5,21E-04	1,67E-01	-5,83E-02
Climate change – total	kg CO ₂ eq	1,02E+02	2,65E+01	9,19E-02	7,67E+01	-8,98E-01
Ecotoxicity, freshwater – total	CTUe	8,90E+02	2,90E+02	8,50E-01	6,04E+02	-4,92E+00
Eutrophication, freshwater	kg P eq	1,47E-03	1,25E-03	2,73E-07	2,22E-04	-8,00E-07
Eutrophication, marine	kg N eq	6,21E-02	2,67E-02	2,55E-04	3,74E-02	-2,23E-03
Eutrophication, terrestrial	Mole of N eq	6,17E-01	2,46E-01	2,82E-03	3,93E-01	-2,40E-02
Human toxicity, cancer – total	CTUh	3,58E-08	1,94E-08	1,71E-11	1,73E-08	-9,20E-10
Human toxicity, non-cancer – total	CTUh	1,03E-06	4,60E-07	9,46E-10	6,35E-07	-6,31E-08
Ionising radiation, human health	kBq U235 eq	3,92E+01	1,92E+00	2,21E-04	3,73E+01	-9,07E-03
Land Use	dimensionless (pt)	5,58E+02	6,39E+01	4,21E-01	4,97E+02	-3,37E+00
Ozone depletion	kg CFC-11 eq	9,16E-08	8,99E-08	5,49E-15	1,11E-09	5,40E-10
Particulate matter	Disease incidences	2,62E-06	1,65E-06	1,79E-09	1,38E-06	-4,17E-07
Photochemical ozone formation	kg NMVOC eq	1,60E-01	6,76E-02	4,91E-04	1,01E-01	-9,14E-03
Resource use, fossils	MJ	1,72E+03	3,57E+02	1,22E+00	1,38E+03	-1,95E+01
Resource use, mineral and metals	kg Sb eq	1,95E-03	2,87E-03	7,69E-09	2,07E-05	-9,41E-04
Water use	m ³ world eq	2,22E+01	5,15E+00	8,22E-04	1,73E+01	-2,71E-01

¹ Measurement setup: room temperature, typical power consumption at 24 V, 25% load on the S7-1500 bus (only the internal power loss in the PLC is taken into account), PB interface not connected, all PN interfaces active

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.



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 16,3%**
- an **energy recoverability rate of up to 71,2%**
- a **minimum disposal rate of 12,5%**

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.

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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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