

BUSCH-BALANCE® AP COMBINATIONS

# PEP ecopassport®

## Product Environmental Profile



Product Environmental Profile - PEP Ecopassport.  
Document in compliance with ISO 14025: 2006 "Environmental labels and declarations. Type III environmental declarations"

ORGANIZATION		CONTACT INFORMATION			
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# ABB Purpose & Embedding Sustainability

ABB is committed to continually promoting and embedding sustainability across its operations and value chain, aspiring to become a role model for others to follow. With its ABB Purpose, ABB is focusing on reducing harmful emissions, preserving natural resources and championing ethical and humane behavior.

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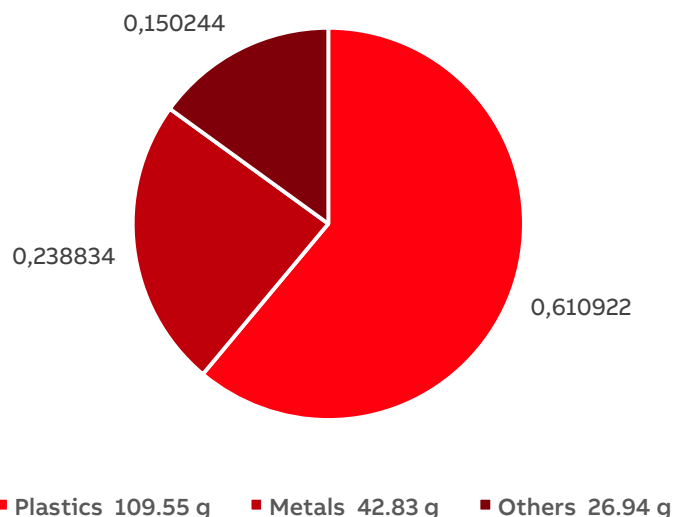
## General Information

<b>Reference product</b>	2TKA00005536 Combi switch / schuko outlet safety+  The content of this PEP cannot be compare with content from another program.
<b>Description of the product</b>	The reference product is 2TKA00005536 Combi switch / schuko outlet safety+, whose dimensions are 56 x 60 x 118 mm. The reference product belongs to Busch-balance® AP Combinations of sockets outlets and switches, which are used at the same time for connecting and disconnecting the plug of an electrical load, and for establish-ing and cutting off the supply of electrical circuit.
<b>Functional unit</b>	Establish and interrupt a rated current of 10A and rated voltage of 230V for a wall-mounted installation; while connecting/disconnecting the plug of a load consuming 16 A maximum under a voltage of 230V with a degree of protection of IP20 in the Household/Commercial application area according to the appropriate use scenario and for the reference service life of the product of 20 years.
<b>Other products covered</b>	The PEP covers other products from Busch-balance AP Sockets family. All the products covered by this PEP are listed on page 9.

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# Constituent Materials



Total weight of Reference product with packaging

179,32

g

Plastics as % of weight		Metals as % of weight		Others as % of weight	
Name and CAS number	Weight%	Name and CAS number	Weight%	Name and CAS number	Weight%
Bio-circular polycarbonate	38,9	Brass	16,4	Glass fibres	2,9
Polycarbonate	10,0	Stainless steel	3,4	Cardboard packaging	10,8
Polyamide	5,8	Copper	2,4	Polyethylene packaging	1,3
Formaldehyde resin	4,8	Steel	1,2	–	x
PBT	1,7	Silver alloys	0,5	–	–

The reference product and other products in this range are in conformity with the provisions of Low Voltage Directive 2014/35/EU, RoHS directive 2011/65/EU, covering 2015/863(EU), REACH regulation No 1907/2006, and national legislation. Plastics used for the reference product are halogen-free materials (IEC/61249-2-21) and they are also recyclable.

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# Additional Environmental Information

<b>Manufacturing</b>	<p>Includes the environmental impacts associated with the extraction and processing of the raw materials making up the product and its packaging, as well as their transport to the manufacturing site.</p> <p>Additionally, it includes the electricity consumption required for the product assembly and the wastes generated during the manufacturing process.</p>
<b>Distribution</b>	<p>Includes the transportation in its packaging from the manufacturer's last logistics platform to the customer.</p>
<b>Installation</b>	<p>Installation stage includes the manual installation of the products by the customer (no energy consumption is required during installation) and the disposal of the packaging.</p>
<b>Use</b>	<p>Includes the energy consumption due to electrical losses of the socket and the switch during the RLT in the customer's locations.</p>
<b>End of life</b>	<p>Includes the transportation of the product from the installation site to the final end of life treatment site, as well as the end of life treatment processes. A value of 1,000 km transport by lorry is used for the transportation.</p>
<b>Benefits and loads beyond the system boundaries</b>	<p>Potential for reuse, recovery and/or recycling, expressed as net benefits and impacts</p>

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# Environmental Impacts

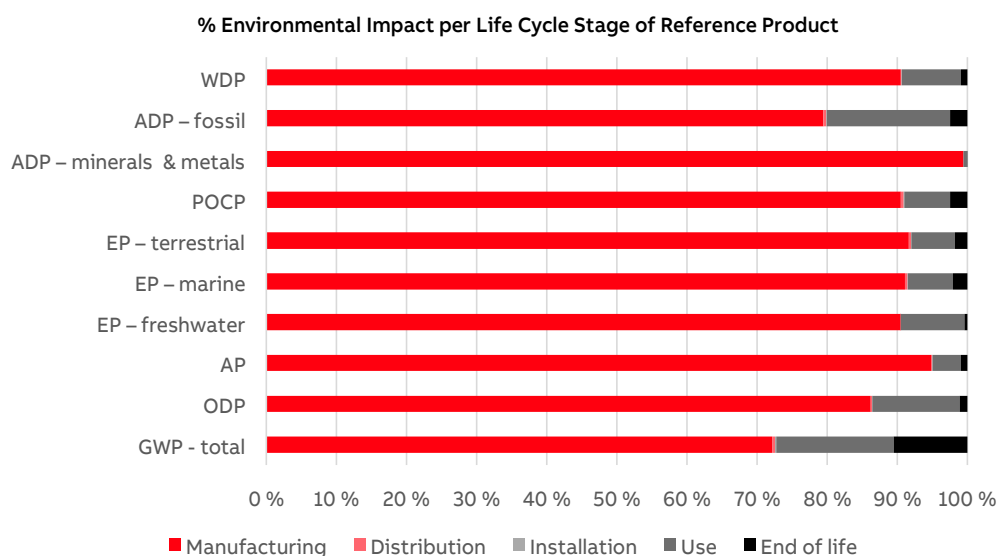
<b>Reference lifetime</b>	20 years
<b>Product category</b>	Combination of functions, sockets and switches
<b>Installation elements</b>	Manual installation by the customer.
<b>Use scenario</b>	Defined by the PSR for both product categories: 10% of the load rate with a use time rate of 30% during 20 years
<b>Geographical representativeness</b>	Global.
<b>Technological representativeness</b>	Materials and processes data are representative of the production of 2TKA00005536 and other products of its homogeneous environmental Busch-balance® AP Combinations family.
<b>Software and database used</b>	SimaPro 9.5.0.1 & Ecoinvent 3.9

Energy model used

<b>Manufacturing</b>	Electricity mixes of Estonia, Germany and Czech Republic.
<b>Installation</b>	No energy required.
<b>Use</b>	Electricity mixes of the Netherlands, Germany and Austria.
<b>End of life</b>	Product recycling

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## Common base of mandatory indicators



### Environmental impact indicators

Indicator	Unit	Total	Manu- facturing	Distri- bution	Installation	Use	End of life	Bene- fits
<b>GWP-total</b>	<b>kg CO<sub>2</sub> eq.</b>	2,81E+00	2,02E+00	1,11E-02	4,11E-03	4,72E-01	2,94E-01	-7,39E-01
<b>GWP-fossil</b>	<b>kg CO<sub>2</sub> eq.</b>	2,80E+00	2,20E+00	1,11E-02	3,96E-03	4,70E-01	1,15E-01	-7,35E-01
<b>GWP-biogenic</b>	<b>kg CO<sub>2</sub> eq.</b>	5,61E-03	-1,74E-01	3,52E-06	1,52E-04	1,27E-03	1,78E-01	-2,50E-03
<b>GWP-luluc</b>	<b>kg CO<sub>2</sub> eq.</b>	2,24E-03	1,97E-03	5,38E-06	8,37E-07	2,14E-04	5,47E-05	-9,80E-04
GWP-fossil = Global Warming Potential fossil fuels GWP-biogenic = Global Warming Potential biogenic GWP-luluc = Global Warming Potential land use and land use change								
<b>ODP</b>	<b>kg CFC-11 eq.</b>	1,14E-07	9,84E-08	2,41E-10	4,79E-11	1,42E-08	1,24E-09	-5,05E-08
ODP = Depletion potential of the stratospheric ozone layer								
<b>AP</b>	<b>H+ eq.</b>	2,76E-02	2,61E-02	3,61E-05	8,25E-06	1,12E-03	2,54E-04	-1,85E-02
AP = Acidification potential, Accumulated Exceedance								
<b>EP-freshwater</b>	<b>kg P eq.</b>	2,51E-04	2,27E-04	8,86E-08	2,51E-08	2,28E-05	9,70E-07	-8,91E-05
<b>EP-marine</b>	<b>kg N eq.</b>	3,57E-03	3,25E-03	1,23E-05	3,17E-06	2,29E-04	7,39E-05	-1,18E-03
<b>EP-terrestrial</b>	<b>mol N eq.</b>	4,38E-02	4,02E-02	1,31E-04	3,29E-05	2,73E-03	7,78E-04	-1,55E-02
EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment EP-terrestrial = Eutrophication potential, Accumulated Exceedance								
<b>POCP</b>	<b>kg NMVOC eq.</b>	1,27E-02	1,15E-02	5,39E-05	1,19E-05	8,27E-04	3,15E-04	-5,25E-03
POCP = Formation potential of tropospheric ozone								
<b>ADP-minerals &amp; metals</b>	<b>kg Sb eq.</b>	8,39E-04	8,34E-04	3,55E-08	7,11E-09	4,39E-06	3,28E-07	-2,12E-04
<b>ADP-fossil</b>	<b>MJ</b>	3,87E+01	3,07E+01	1,57E-01	2,10E-02	6,82E+00	9,59E-01	-1,40E+01
ADP-minerals & metals = Abiotic depletion potential for non-fossil resources ADP-fossil = Abiotic depletion for fossil resources potential								
<b>WDP</b>	<b>m<sup>3</sup> eq. depr.</b>	7,53E-01	6,82E-01	6,40E-04	1,79E-04	6,39E-02	6,84E-03	-5,22E-01
WDP = Water Deprivation potential								

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## Common base of mandatory indicators

### Inventory flows indicator – Resource use indicators

Indicator	Unit	Total	Manu- facturing	Distri- bution	Installation	Use	End of life	Bene- fits
PERE	MJ	4,63E+00	3,22E+00	2,43E-03	7,50E-04	1,36E+00	4,37E-02	-1,27E+00
PERM	MJ	2,14E+00	2,14E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	6,77E+00	5,36E+00	2,43E-03	7,50E-04	1,36E+00	4,37E-02	-1,27E+00
PENRE	MJ	3,32E+01	2,52E+01	1,57E-01	2,10E-02	6,82E+00	9,59E-01	-1,40E+01
PENRM	MJ	1,44E+00	1,44E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	3,46E+01	2,67E+01	1,57E-01	2,10E-02	6,82E+00	9,59E-01	-1,40E+01

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

### Inventory flows indicator – Indicators describing the use of secondary materials, water, and energy resources

Indicator	Unit	Total	Manu- facturing	Distri- bution	Installation	Use	End of life	Bene- fits
SM	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m <sup>3</sup>	2,10E-02	1,70E-02	2,24E-05	7,49E-06	3,70E-03	2,45E-04	-1,35E-02

SM = Use of secondary material

RSF = Use of renewable secondary fuels

NRSF = Use of non-renewable secondary fuels

FW = Use of net fresh water

### Inventory flows indicator – Waste category indicators

Indicator	Unit	Total	Manu- facturing	Distri- bution	Installation	Use	End of life	Bene- fits
Hazardous waste disposed	kg	3,51E-04	3,24E-04	9,99E-07	1,20E-07	2,17E-05	4,69E-06	-2,55E-05
Non- hazardous waste disposed	kg	4,01E-01	3,04E-01	7,67E-03	3,07E-03	2,70E-02	5,91E-02	-1,34E-01
Radioactive waste disposed	kg	6,12E-05	4,54E-05	5,10E-08	1,73E-08	1,49E-05	8,60E-07	-1,79E-05

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## Common base of mandatory indicators

### Inventory flows indicator – Output flow indicators

Indicator	Unit	Total	Manu- facturing	Distri- bution	Installation	Use	End of life	Bene- fits
Components for re-use	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	kg	1,51E-01	1,96E-03	0,00E+00	1,68E-02	0,00E+00	1,32E-01	0,00E+00
Materials for energy recovery	kg	1,02E-02	3,20E-04	0,00E+00	2,62E-03	0,00E+00	7,25E-03	0,00E+00
Exported energy	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

### Inventory flow indicator – other indicators

Indicator	Unit	Total	Manu- facturing	Distri- bution	Installation	Use	End of life	Bene- fits
Biogenic carbon content of the product	kg of C	4,94E-02	4,94E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Biogenic carbon content of the associated packaging	kg of C	9,65E-03	9,65E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

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## Extrapolation Factors

For other products than the Reference product covered by this PEP, the environmental impacts for each phase of the lifecycle are obtained by multiplying the values of the Reference product by the following coefficients:

\* if the coefficient is "1", the impacts of the phase of the life cycle are assimilated to the Reference product, meaning that the impacts are unchanged in comparison to the Reference product

Product name	Manu- facturing	Distri- bution	Installation	Use	End of life	Benefits
2TKA00005536	1,00	1,00	1,00	1,00	1,00	1,00
2TKA00005537	0,99	0,99	1,00	1,00	0,99	0,99
2TKA00005538	1,02	1,02	1,00	1,00	1,02	1,02
2TKA00005539	1,02	1,02	1,00	1,00	1,02	1,02
2TKA00005540	0,88	0,88	1,00	1,00	0,87	0,88
2TKA00005541	0,88	0,88	1,00	1,00	0,87	0,88
2TKA00005542	0,91	0,91	1,00	1,00	0,90	0,91
2TKA00005543	0,91	0,91	1,00	1,00	0,90	0,91
2TKA00005544	1,47	1,47	0,76	1,41	1,57	1,47
2TKA00005545	1,47	1,47	0,76	1,41	1,57	1,47
2TKA00005546	1,50	1,50	0,76	1,41	1,60	1,50
2TKA00005547	1,50	1,50	0,76	1,41	1,60	1,50
2TKA00006255	1,10	1,10	1,03	1,00	1,11	1,10
2TKA00006256	1,10	1,10	1,03	1,00	1,11	1,10
2TKA00006257	1,13	1,13	1,03	1,00	1,14	1,13
2TKA00006258	1,13	1,13	1,03	1,00	1,14	1,13
2TKA00006259	0,98	0,98	1,03	1,00	0,98	0,98
2TKA00006260	0,98	0,98	1,03	1,00	0,98	0,98
2TKA00006261	1,01	1,01	1,03	1,00	1,01	1,01
2TKA00006262	1,01	1,01	1,03	1,00	1,01	1,01
2TKA00006265	1,70	1,70	1,73	1,41	1,70	1,70
2TKA00006266	1,70	1,70	1,73	1,41	1,70	1,70
2TKA00006267	1,73	1,73	1,73	1,41	1,73	1,73
2TKA00006268	1,73	1,73	1,73	1,41	1,73	1,73

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## Environmental Impact Indicator Glossary


### Impact indicators

Indicator	Description	Distribution
Global warming potential (GWP) - total	Indicator of potential global warming caused by emissions to air contributing to the greenhouse effect. The total global warming potential (GWP-total) is the sum of three sub-categories of climate change. GWP-total = GWP-fossil + GWP-biogenic + GWP- land use and land use change	kg CO <sub>2</sub> eq.
Ozone depletion (ODP)	Emissions to air that contribute to the destruction of the stratospheric ozone layer	kg CFC-11 eq.
Acidification of soil and water (A)	Acidification of soils and water caused by the release of certain gases to the atmosphere, such as nitrogen oxides and sulphur oxides	H+ eq.
Eutrophication (E)	Indicator of the contribution to eutrophication of water by the enrichment of the aquatic ecosystem with nutritional elements, e.g. industrial or domestic effluents, agriculture, etc. This indicator is divided to three: freshwater, marine and terrestrial.	kg P eq., kg N eq., mole N eq.
Photochemical ozone creation (POCP)	Indicator of emissions of gases that affect the creation of photochemical ozone in the lower atmosphere (smog) because of the rays of the sun.	kg NMVOC eq.
Depletion of abiotic resources – elements (ADPe)	Indicator of the depletion of natural non-fossil resources	kg Sb eq.
Depletion of abiotic resources – fossil fuels (ADPf)	The use of non-renewable fossil resources in an unsustainable way (e.g. from material to waste)	MJ (lower heating value)
Water Deprivation potential (WDP)	Deprivation-weighted water consumption. Assesses the potential of water deprivation, to either humans or ecosystems, building on the assumption that the less water remaining available per area, the more likely another user will be deprived.	m <sup>3</sup> eq. depr.

### Resource use indicators

Indicator	Description	Distribution
Total use of primary energy	Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials) + Total use of renewable primary energy re-sources (primary energy and primary energy resources used as raw materials)	MJ (lower heating value)

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Verifier accreditation number: VH45	Information and reference documents: <a href="http://www.pep-ecopassport.org">www.pep-ecopassport.org</a>
Date of issue: 09-2024	Validity period: 5 years
Independent verification of the declaration and data, in compliance with ISO 14025: 2006	
<b>Internal:</b> <input type="radio"/> <b>External:</b> <input checked="" type="radio"/>	
The PCR review was conducted by a panel of experts chaired by Julie ORGELET (DDemain)	
PEP are compliant with XP C08-100-1 :2016 or EN 50693:2019 or NE E38-500 :2022 The components of the present PEP may not be compared with elements from any other program.	
Document in compliance with ISO 14025: 2006 "Environmental labels and declarations. Type III environmental declarations"	
	

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