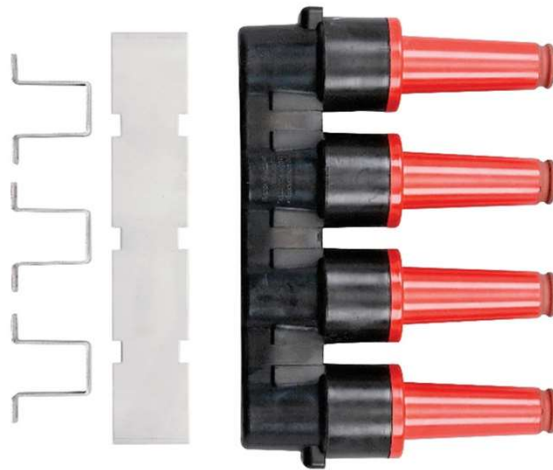


ELASTIMOLD® JUNCTION

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.



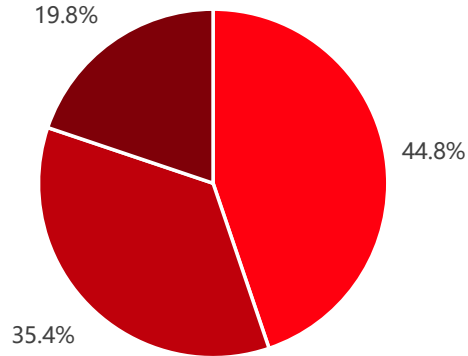
General Information

Reference product	Product 164J4-5
Description of the product	Junctions of ABB Elastimold® are used to connect equipment and cable on primary feeder and network circuits
Functional unit	The functional unit is to connect together the power transmission cables, or connect them to equipment, for one unit and its packaging, under operating conditions to those of the cable, namely: 1 A for during 40 years, with a use rate of 100%, according to the standards in force.
Other products covered	List of other products covered in this PEP is presented in the paragraph which concerned the extrapolation rules

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Constituent Materials



■ Plastics 1.63 kg ■ Metals 1.29 kg ■ Others 0.72 kg

Total weight of Reference product included packaging (kg)

3.63

kg

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%
Rubber	32.5	Copper	25.8	Wood	9.4
PA	6.4	Steel	7.3	Carton	7.0
Glass fiber	3.0	Aluminium	2.2	Paper	0.2
PE	2.9	Brass	0.1	Chemicals	3.2

The weight of the reference product is 3.02 kg. The weight of its packaging is 0.61 kg.

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Additional Environmental Information

Manufacturing	The manufacturing stage includes the production and transportation to the manufacturer's last logistic platform of Elastimold® junction and its packaging. The final assembly of the product is carried out at ABB's plant located in Albuquerque, NM
Distribution	The transport from the ABB US (Albuquerque, NM) factory to the warehouseS (Byhalia and Bromont) site was considered. For the distribution of the products from storages to the final customer, primary data about the location of the ABB clients has been considered and a weighted average has been computed relative to distances
Installation	This phase includes the disposal of the packaging and of the Cap and Lube
Use	<p>The PEP submitted was prepared taking into consideration the following parameters:</p> <ul style="list-style-type: none"> •1 packaging unit for the production, distribution, installation and end of life stages in system boundaries •1 packaging unit for benefits and impacts outside system boundaries •1 packaging unit and 1A for the use stage <p>The potential impact of the use stage, estimated as Joule losses, shall be calculated by the user of the PEP as a function of the actual amperage during the use of the product by multiplying the impact considered by the square of the intensity. The PEP is valid within an intensity range taking into account of the maximum permissible intensity.</p>
End of life	The default end-of-life scenario provided by the PCR-ed4-EN-2021 09 06 document has been adopted for the the Elastimold® junction (100% landfill).
Benefits and loads beyond the system boundaries	The potential benefits derives from the impacts prevented by recycling and waste to energy recovery of the packaging in the installation phase

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Environmental Impacts

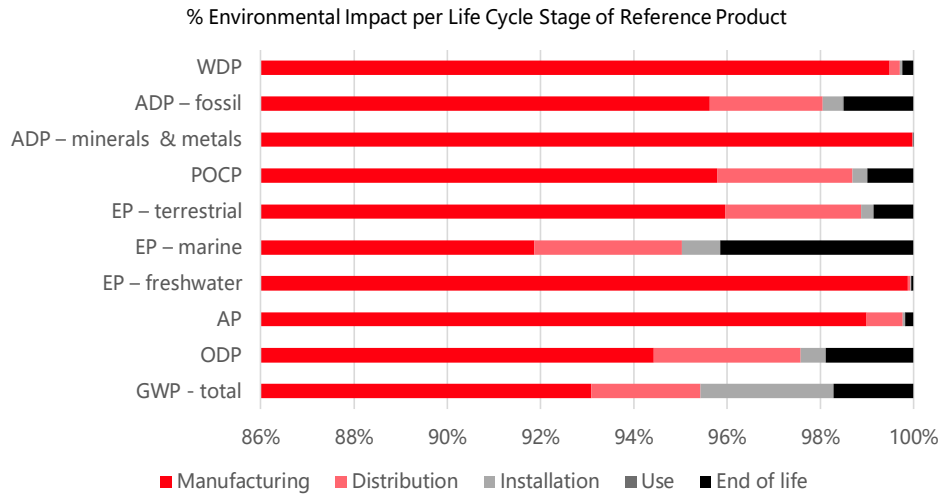
Reference lifetime	40 years
Product category	Power connection accessories
Installation elements	No installation materials are required in the life cycle of the product.
Use scenario	<p>PSR-0001-ed4-EN-2022 11 16 reported that for power connection accessories, the environmental impacts of the use stage are considerable negligible, with the exception of the power consumption, which is expressed by the Joule losses over the use time. In order to calculate this consumption the following formula was applied: $E=R \cdot I^2 \cdot \Delta t$, where:</p> <ul style="list-style-type: none"> - E is the power consumption expressed in J, - R is the resistance of the conducting part of the reference product for the power connection accessory, expressed in Ω - I is the intensity in A - Δt is time of use in s
Geographical representativeness	The suppliers are collocated all over the world, the products are fabricated in Albuquerque, NM and distributed all over the world.
Technological representativeness	Technological representativeness refers to the specific production process for primary data.
Software and database used	SimaPro 9.6 and ecoinvent 3.9.1

Energy model used

Manufacturing	<p>Manufacturing internal and storage: An ad-hoc process has been created, which considers 100% hydroelectric energy Netherlands as reported in the Renewable Energy Certificate System (RECs). Storage CA: the Canadian energy mix considered in ecoinvent 3.9.1 dataset has been selected. The energy-related processes used for all the other inputs of the manufacturing stage are those included in the ecoinvent 3.9.1 datasets selected for the analysis.</p>
Installation	No energy consumption occur during the installation stage.
Use	Energy mix created considering the % of the sold product in the different States.
End of life	The energy-related processes used for the inputs of the end-of-life stage are those included in ecoinvent 3.9.1

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Common base of mandatory indicators



Environmental impact indicators

Indicator	Unit	Total (no Benefits)	Manu-facturing	Distri-bution	Installation	Use	End of life	Bene-fits
GWP-total	kg CO ₂ eq.	4.27E+01	3.98E+01	1.00E+00	1.21E+00	8.88E-03	7.32E-01	-2.14E-01
GWP-fossil	kg CO ₂ eq.	4.24E+01	4.03E+01	1.00E+00	3.38E-01	8.82E-03	7.31E-01	-2.89E-01
GWP-biogenic	kg CO ₂ eq.	3.11E-01	-5.61E-01	2.07E-04	8.72E-01	5.00E-05	3.64E-04	7.56E-02
GWP-luluc	kg CO ₂ eq.	6.31E-02	6.21E-02	5.77E-04	9.20E-05	1.38E-05	3.17E-04	-4.86E-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								
ODP	kg CFC-11 eq.	5.12E-07	4.83E-07	1.62E-08	2.71E-09	4.50E-11	9.62E-09	-2.72E-09
ODP = Depletion potential of the stratospheric ozone layer								
AP	H ⁺ eq.	1.51E+00	1.49E+00	1.16E-02	8.23E-04	3.01E-05	2.68E-03	-1.16E-03
AP = Acidification potential, Accumulated Exceedance								
EP-freshwater	kg P eq.	1.14E-01	1.14E-01	6.81E-05	1.83E-05	5.64E-06	5.02E-05	-9.65E-05
EP-marine	kg N eq.	1.03E-01	9.49E-02	3.26E-03	8.48E-04	5.40E-06	4.28E-03	-2.55E-04
EP-terrestrial	mol N eq.	1.22E+00	1.17E+00	3.57E-02	3.16E-03	4.87E-05	1.05E-02	-2.60E-03
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								
POCP	kg NMVOC eq.	3.70E-01	3.55E-01	1.07E-02	1.21E-03	1.90E-05	3.64E-03	-8.88E-04
POCP = Formation potential of tropospheric ozone								
ADP-minerals & metals	kg Sb eq.	1.80E-02	1.80E-02	2.23E-06	5.35E-07	7.29E-08	1.86E-06	-1.86E-07
ADP-fossil	MJ	5.77E+02	5.51E+02	1.40E+01	2.41E+00	1.58E-01	8.63E+00	-3.95E+00
ADP-minerals & metals = Abiotic depletion potential for non-fossil resources ADP-fossil = Abiotic depletion for fossil resources potential								
WDP	m ³ eq. depr.	2.79E+01	2.78E+01	6.15E-02	1.37E-02	1.88E-03	6.71E-02	-4.34E-02
WDP = Water Deprivation potential								

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Common base of mandatory indicators

Inventory flows indicator – Resource use indicators

Indicator	Unit	Total (no Benefits)	Manu- facturing	Distri- bution	Installation	Use	End of life	Bene- fits
PERE	MJ	1.67E+02	1.67E+02	1.58E-01	3.56E-02	2.07E-02	1.15E-01	0.00E+00
PERM	MJ	7.37E+00	7.37E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	1.75E+02	1.74E+02	1.58E-01	3.56E-02	2.07E-02	1.15E-01	0.00E+00
PENRE	MJ	5.17E+02	4.92E+02	1.40E+01	2.41E+00	1.58E-01	8.63E+00	0.00E+00
PENRM	MJ	5.93E+01	5.93E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ	5.76E+02	5.51E+02	1.40E+01	2.41E+00	1.58E-01	8.63E+00	0.00E+00

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 (no Benefits)	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 ³	6.96E-01	6.92E-01	1.96E-03	4.38E-04	7.14E-05	1.92E-03	-1.69E-03

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 (no Benefits)	Manu- facturing	Distri- bution	Installation	Use	End of life	Bene- fits
Hazardous waste disposed	kg	2.32E-03	2.17E-03	8.37E-05	1.53E-05	3.47E-07	5.45E-05	-1.01E-05
Non- hazardous waste disposed	kg	1.93E+01	1.44E+01	9.28E-01	6.06E-01	5.49E-04	3.30E+00	-1.88E-02
Radioactive waste disposed	kg	7.22E-04	7.16E-04	2.68E-06	5.81E-07	7.81E-07	1.85E-06	-7.26E-06

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Common base of mandatory indicators

Inventory flows indicator – Output flow indicators

Indicator	Unit	Total (no Benefits)	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	1.92E+00	1.92E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy	MJ	4.66E+00	2.79E+00	0.00E+00	1.87E+00	0.00E+00	0.00E+00	0.00E+00

Inventory flow indicator – other indicators

Indicator	Unit	Total (no Benefits)	Manu- facturing	Distri- bution	Installation	Use	End of life	Bene- fits
Biogenic carbon content of the product	kg of C	0.00E+00	0.00E+00	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	2.46E-01	2.46E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

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Optional indicators

Environmental indicators

Indicator	Unit	Total (no Benefits)	Manu- facturing	Distri- bution	Installation	Use	End of life	Bene- fits
Total use of primary energy during the life cycle	MJ	7.51E+02	7.26E+02	1.42E+01	2.44E+00	1.79E-01	8.74E+00	0.00E+00
Emissions of fine particles	incidence of diseases	4.84E-06	4.69E-06	8.25E-08	1.42E-08	1.51E-10	5.03E-08	-1.15E-08
Ionizing radiation, human health	kBq U235 eq.	2.84E+00	2.81E+00	1.13E-02	2.43E-03	3.39E-03	7.76E-03	-2.97E-02
Ecotoxicity (fresh water)	CTUe	1.71E+03	1.69E+03	7.31E+00	2.46E+00	2.34E-02	8.17E+00	-6.06E-01
Human toxicity, carcinogenic effects	CTUh	2.79E-07	2.57E-07	4.36E-10	9.01E-11	2.95E-12	2.21E-08	-1.74E-10
Human toxicity, non-carcinogenic effects	incidence of diseases	2.08E-05	1.93E-05	8.68E-09	3.07E-09	1.12E-10	1.51E-06	-1.85E-09
Impact related to land use/soil quality		6.23E+02	6.03E+02	1.09E+01	1.62E+00	2.62E-02	6.67E+00	-1.02E+01

Other indicators

Indicator	Unit	Total (no Benefits)	Manu- facturing	Distri- bution	Installation	Use	End of life	Bene- fits
No Other indicators used								

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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 ₂ 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 ³ 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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Approach for extrapolation rules applied to a homogeneous environmental family

The PEP can cover products different from the reference product if they belong to a homogeneous environmental family. This means that the group of products must satisfy the following characteristics:

- same function;
- same product standard;
- same manufacturing technology: the same type of materials and same manufacturing processes.

The Elastimold® junctions product family satisfy these conditions, so extrapolation rules were applied to assess the environmental impact of the products belonging to the family, following the PCR indication. No extrapolation rules for cable management products are set in the PSR-0001-ed4-EN-2022 11 16, thus the next steps have been followed to define the extrapolation rules:

- Analyse the products covered by the PEP belonging to the same homogenous family;
- Perform the LCA of a representative product of the homogeneous family;
- Identify and quantify the product parameters that vary between the various products of the homogeneous environmental family (i.e. dimensions, the weight of parts, materials, energy consumption, etc.).

Lastly, a sensitivity analysis was performed for each life cycle stage to identify which parameters of the ones selected are sensitive to environmental impacts to create extrapolation rules.

The parameters identified are listed below:

- product weight;
- packaging weight;
- product composition (Aluminium, copper, glass fiber PA 40%, EPDM, steel)
- power consumption
- packaging composition (Paper, PE, Vinyl and Polyester, Cardboard, LDPE, Wood)

The representative product considered for the calculation of the extrapolation rules is 164J4-5. This product is most representative for the sales.

The results of the sensitivity analysis show that all the parameters considered are sensitive, except the packaging weight.

The products included in the Elastimold® junctions product family and considered for the application of the extrapolation rules are presented in the following table.

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Catalog Number	Weight of Steel (kg)	Weight of Aluminium (kg)	Weight of EPDM Rubber (kg)	Weight of Copper (kg)	Remaining SKU Weight (kg)	Packaging Weight (kg)	Weight of Cardboard (kg)	Weight of Wood (kg)	Remaining Packaging Weight.1 (kg)	Power Consumption (J)
164FT	6.03E-02	2.60E-01	6.71E-01	4.23E-01	3.02E-01	5.11E-01	1.56E-01	3.40E-01	1.48E-02	4.92E+04
164FT2-AB	1.08E+00	1.03E-01	6.94E-01	4.48E-01	3.17E-01	5.11E-01	1.56E-01	3.40E-01	1.48E-02	4.92E+04
164FT3-AB	1.61E+00	1.55E-01	1.04E+00	6.71E-01	4.75E-01	7.67E-01	2.74E-01	3.40E-01	1.52E-01	5.80E+04
164FT3-AB-CS1902	1.61E+00	1.55E-01	1.04E+00	6.71E-01	4.75E-01	7.67E-01	2.74E-01	3.40E-01	1.52E-01	5.80E+04
164FT4-AB	2.15E+00	2.07E-01	1.39E+00	8.95E-01	6.33E-01	1.02E+00	5.83E-01	3.40E-01	9.91E-02	6.66E+04
164FT-CS2034	6.03E-02	2.60E-01	6.71E-01	4.23E-01	3.02E-01	5.11E-01	1.56E-01	3.40E-01	1.48E-02	4.92E+04
164FTO-CS850	6.03E-02	2.60E-01	6.71E-01	4.23E-01	3.02E-01	5.11E-01	1.56E-01	3.40E-01	1.48E-02	4.92E+04
164FT-SS	3.85E-01	0.00E+00	6.71E-01	4.23E-01	2.02E-01	5.11E-01	1.56E-01	3.40E-01	1.48E-02	4.92E+04
164FTV	4.19E-01	2.60E-01	6.71E-01	4.23E-01	2.42E-01	5.11E-01	1.56E-01	3.40E-01	1.48E-02	4.92E+04
164FTV-CS1912	4.19E-01	2.60E-01	6.71E-01	4.23E-01	2.42E-01	5.11E-01	1.56E-01	3.40E-01	1.48E-02	4.92E+04
164J2	6.03E-02	2.60E-01	6.71E-01	4.23E-01	1.93E-01	5.11E-01	1.56E-01	3.40E-01	1.48E-02	4.92E+04
164J2-5	6.03E-02	2.60E-01	6.71E-01	4.23E-01	1.93E-01	5.11E-01	1.56E-01	3.40E-01	1.48E-02	4.92E+04
164J2-CS1090	6.03E-02	2.60E-01	6.71E-01	4.23E-01	1.93E-01	5.11E-01	1.56E-01	3.40E-01	1.48E-02	4.92E+04
164J3	1.61E+00	1.55E-01	1.04E+00	6.71E-01	4.58E-01	7.32E-01	3.54E-01	3.40E-01	3.76E-02	5.80E+04
164J3-5	1.90E-01	5.44E-02	1.04E+00	6.71E-01	4.04E-01	5.37E-01	1.68E-01	3.40E-01	2.89E-02	5.80E+04
164J3-5-PREPACK	1.90E-01	5.44E-02	1.04E+00	6.71E-01	2.67E-01	5.37E-01	1.68E-01	3.40E-01	2.89E-02	5.80E+04
164J3-5-SRP	1.90E-01	5.44E-02	1.04E+00	6.71E-01	2.67E-01	5.37E-01	1.68E-01	3.40E-01	2.89E-02	5.80E+04
164J3-CS490	1.90E-01	5.44E-02	1.04E+00	6.71E-01	2.67E-01	7.32E-01	3.54E-01	3.40E-01	3.76E-02	5.80E+04
164J3-CS511	1.90E-01	5.44E-02	1.04E+00	6.71E-01	2.67E-01	7.32E-01	3.54E-01	3.40E-01	3.76E-02	5.80E+04
164J3V	1.90E-01	5.44E-02	1.04E+00	6.71E-01	2.67E-01	7.32E-01	3.54E-01	3.40E-01	3.76E-02	5.80E+04
164J4	1.81E+00	1.73E-01	1.29E+00	9.39E-01	6.40E-01	7.31E-01	3.54E-01	3.40E-01	3.67E-02	6.66E+04
164J4-5	2.66E-01	8.16E-02	1.18E+00	9.39E-01	5.52E-01	6.14E-01	2.54E-01	3.40E-01	1.99E-02	6.66E+04
164J4-5-PREPACK	2.66E-01	8.16E-02	1.18E+00	9.39E-01	5.52E-01	6.14E-01	2.54E-01	3.40E-01	1.99E-02	6.66E+04
164J4-5-CS2061	2.66E-01	8.16E-02	1.18E+00	9.39E-01	5.52E-01	7.01E-01	3.41E-01	3.40E-01	1.99E-02	6.66E+04
164J4-CS1004	1.81E+00	1.73E-01	1.29E+00	9.39E-01	6.40E-01	7.31E-01	3.54E-01	3.40E-01	3.67E-02	6.66E+04
164J4-CS1090	1.81E+00	1.73E-01	1.29E+00	9.39E-01	6.40E-01	7.31E-01	3.54E-01	3.40E-01	3.67E-02	6.66E+04
164J4-CS1108	1.81E+00	1.73E-01	1.29E+00	9.39E-01	6.40E-01	7.31E-01	3.54E-01	3.40E-01	3.67E-02	6.66E+04
164J4-CS490	1.81E+00	1.73E-01	1.29E+00	9.39E-01	6.40E-01	7.31E-01	3.54E-01	3.40E-01	3.67E-02	6.66E+04
164J4-CS533	1.81E+00	1.73E-01	1.29E+00	9.39E-01	6.40E-01	7.31E-01	3.54E-01	3.40E-01	3.67E-02	6.66E+04
164J4-CS646	1.81E+00	1.73E-01	1.29E+00	9.39E-01	6.40E-01	7.31E-01	3.54E-01	3.40E-01	3.67E-02	6.66E+04
164J4-CS842	1.81E+00	1.73E-01	1.29E+00	9.39E-01	6.40E-01	7.31E-01	3.54E-01	3.40E-01	3.67E-02	6.66E+04
164J4-CS887	1.81E+00	1.73E-01	1.29E+00	9.39E-01	6.40E-01	7.31E-01	3.54E-01	3.40E-01	3.67E-02	6.66E+04

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Catalog Number	Weight of Steel (kg)	Weight of Aluminium (kg)	Weight of EPDM Rubber (kg)	Weight of Copper (kg)	Remaining SKU Weight (kg)	Packaging Weight (kg)	Weight of Cardboard (kg)	Weight of Wood (kg)	Remaining Packaging Weight.1 (kg)	Power Consumption (J)
274FT	1.83E-01	3.76E-01	1.19E+00	5.13E-01	3.35E-01	6.30E-01	2.74E-01	3.40E-01	1.48E-02	4.94E+04
274FT(1)-CS854	1.83E-01	3.76E-01	1.19E+00	5.13E-01	3.35E-01	6.30E-01	2.74E-01	3.40E-01	1.48E-02	4.94E+04
274FT2-AB-CS1992	1.65E+00	1.83E-01	1.23E+00	5.64E-01	3.62E-01	6.30E-01	2.74E-01	3.40E-01	1.48E-02	4.94E+04
274FT3-AB	2.47E+00	2.74E-01	1.85E+00	8.46E-01	5.44E-01	9.44E-01	4.12E-01	3.40E-01	1.92E-01	4.94E+04
274FT3-AB-CS1902	2.47E+00	2.74E-01	1.85E+00	8.46E-01	5.44E-01	9.44E-01	4.12E-01	3.40E-01	1.92E-01	4.94E+04
274FT-CS812	1.83E-01	3.76E-01	1.19E+00	5.13E-01	3.35E-01	6.30E-01	2.74E-01	3.40E-01	1.48E-02	4.94E+04
274FT-CS870	1.83E-01	3.76E-01	1.19E+00	5.13E-01	3.35E-01	6.30E-01	2.74E-01	3.40E-01	1.48E-02	4.94E+04
274FTV	1.65E+00	1.83E-01	1.23E+00	5.64E-01	3.62E-01	6.30E-01	2.74E-01	3.40E-01	1.48E-02	4.94E+04
274FTVWB	1.65E+00	1.83E-01	1.23E+00	5.64E-01	3.62E-01	6.30E-01	2.74E-01	3.40E-01	1.48E-02	4.94E+04
274FTWB	1.83E-01	3.76E-01	1.19E+00	5.13E-01	3.35E-01	6.30E-01	2.74E-01	3.40E-01	1.48E-02	4.94E+04
274J2	1.83E-01	3.76E-01	1.19E+00	5.13E-01	3.35E-01	9.64E-01	5.83E-01	3.40E-01	4.07E-02	4.94E+04
274J2(1)	1.83E-01	3.76E-01	1.19E+00	5.13E-01	3.35E-01	9.64E-01	5.83E-01	3.40E-01	4.07E-02	4.94E+04
274J2(1)-5	1.83E-01	3.76E-01	1.19E+00	5.13E-01	3.35E-01	9.64E-01	5.83E-01	3.40E-01	4.07E-02	4.94E+04
274J2-5	1.83E-01	3.76E-01	1.19E+00	5.13E-01	3.35E-01	9.64E-01	5.83E-01	3.40E-01	4.07E-02	4.94E+04
274J3	2.03E+00	2.99E-01	1.85E+00	5.53E-01	4.95E-01	9.64E-01	5.83E-01	3.40E-01	4.07E-02	7.15E+04
274J3(1)-5-CS854	6.78E-01	3.29E-01	1.85E+00	5.53E-01	4.65E-01	6.30E-01	2.61E-01	3.40E-01	2.89E-02	7.15E+04
274J3-5	6.78E-01	3.29E-01	1.85E+00	5.53E-01	4.65E-01	6.30E-01	2.61E-01	3.40E-01	2.89E-02	7.15E+04
274J3A-PGE	2.03E+00	2.99E-01	1.85E+00	5.53E-01	4.95E-01	9.64E-01	5.83E-01	3.40E-01	4.07E-02	7.15E+04
274J3-CS1795	2.03E+00	2.99E-01	1.85E+00	5.53E-01	4.95E-01	9.64E-01	5.83E-01	3.40E-01	4.07E-02	7.15E+04
274J3-CS511	2.03E+00	2.99E-01	1.85E+00	5.53E-01	4.95E-01	9.64E-01	5.83E-01	3.40E-01	4.07E-02	7.15E+04
274J3-CS854	2.03E+00	2.99E-01	1.85E+00	5.53E-01	4.95E-01	9.64E-01	5.83E-01	3.40E-01	4.07E-02	7.15E+04
274J3-CS870	2.03E+00	2.99E-01	1.85E+00	5.53E-01	4.95E-01	9.64E-01	5.83E-01	3.40E-01	4.07E-02	7.15E+04
274J3WB	2.03E+00	2.99E-01	1.85E+00	5.53E-01	4.95E-01	9.64E-01	5.83E-01	3.40E-01	4.07E-02	7.15E+04
274J4	3.30E+00	3.65E-01	2.47E+00	1.13E+00	7.25E-01	9.64E-01	5.83E-01	3.40E-01	4.07E-02	8.94E+04
274J4(1)-5	9.33E-01	3.90E-01	2.47E+00	1.13E+00	6.73E-01	9.53E-01	5.83E-01	3.40E-01	2.99E-02	8.94E+04
274J4(1)-5-CS854	9.33E-01	3.90E-01	2.47E+00	1.13E+00	6.73E-01	9.53E-01	5.83E-01	3.40E-01	2.99E-02	8.94E+04
274J4(1)-CS854	3.30E+00	3.65E-01	2.47E+00	1.13E+00	7.25E-01	9.64E-01	5.83E-01	3.40E-01	4.07E-02	8.94E+04
274J4-5-CS2061	9.33E-01	3.90E-01	2.47E+00	1.13E+00	6.73E-01	1.14E+00	7.74E-01	3.40E-01	2.99E-02	8.94E+04
274J4-CS511	3.30E+00	3.65E-01	2.47E+00	1.13E+00	7.25E-01	9.64E-01	5.83E-01	3.40E-01	4.07E-02	8.94E+04
274J4WB	3.30E+00	3.65E-01	2.47E+00	1.13E+00	7.52E-01	9.64E-01	5.83E-01	3.40E-01	4.07E-02	8.94E+04
371FT	1.83E-01	3.76E-01	1.19E+00	5.13E-01	4.17E-01	6.32E-01	2.74E-01	3.40E-01	1.71E-02	8.20E+04

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Catalog Number	Weight of Steel (kg)	Weight of Aluminium (kg)	Weight of EPDM Rubber (kg)	Weight of Copper (kg)	Remaining SKU Weight (kg)	Packaging Weight (kg)	Weight of Cardboard (kg)	Weight of Wood (kg)	Remaining Packaging Weight.1 (kg)	Power Consumption (J)
373FT	2.09E-01	2.49E-01	1.14E+00	3.90E-01	1.24E+00	6.30E-01	2.74E-01	3.40E-01	1.48E-02	8.20E+04
373FT4-AB	3.35E+00	1.77E-01	2.47E+00	7.80E-01	2.20E+00	6.30E-01	2.74E-01	3.40E-01	1.48E-02	8.20E+04
373FT-CS1061	2.09E-01	2.49E-01	1.14E+00	3.90E-01	1.24E+00	6.30E-01	2.74E-01	3.40E-01	1.48E-02	8.20E+04
373FTV	5.02E-01	3.76E-01	1.19E+00	5.13E-01	3.91E-01	6.30E-01	2.74E-01	3.40E-01	1.48E-02	8.20E+04
373J2	2.09E-01	2.49E-01	1.14E+00	3.90E-01	1.24E+00	9.56E-01	5.83E-01	3.40E-01	3.30E-02	8.20E+04
373J2-5	2.09E-01	2.49E-01	1.14E+00	3.90E-01	1.24E+00	6.30E-01	2.74E-01	3.40E-01	1.48E-02	8.20E+04
373J3	2.94E+00	1.91E-01	2.27E+00	5.85E-01	1.74E+00	9.56E-01	5.83E-01	3.40E-01	3.30E-02	1.08E+05
373J3-5	9.80E-01	1.91E-01	2.27E+00	5.85E-01	1.74E+00	9.56E-01	5.83E-01	3.40E-01	3.30E-02	1.08E+05
373J4	3.35E+00	1.77E-01	2.47E+00	7.80E-01	2.20E+00	9.56E-01	5.83E-01	3.40E-01	3.30E-02	1.26E+05
373J4-5	9.94E-01	9.53E-02	2.47E+00	7.80E-01	2.20E+00	9.44E-01	5.83E-01	3.40E-01	2.13E-02	1.26E+05
K1601WFT	7.20E-02	3.11E-01	5.82E-01	5.05E-01	3.93E-01	5.11E-01	1.56E-01	3.40E-01	1.48E-02	4.92E+04
K1601WFTV	5.47E-01	3.11E-01	5.82E-01	5.05E-01	3.93E-01	5.11E-01	1.56E-01	3.40E-01	1.48E-02	4.92E+04
K1601WJ2	1.42E+00	1.37E-01	6.68E-01	5.92E-01	3.38E-01	9.44E-01	4.12E-01	3.40E-01	1.92E-01	4.92E+04
K1601WJ2-PGE	1.42E+00	1.37E-01	6.68E-01	5.92E-01	3.38E-01	9.44E-01	4.12E-01	3.40E-01	1.92E-01	4.92E+04
K1601WJ3	2.14E+00	2.05E-01	1.00E+00	8.88E-01	5.08E-01	7.67E-01	2.74E-01	3.40E-01	1.52E-01	5.80E+04
K1601WJ3-5	9.49E-01	2.73E-01	1.34E+00	1.18E+00	6.77E-01	7.67E-01	2.74E-01	3.40E-01	1.52E-01	5.80E+04
K1601WJ3-51	9.49E-01	2.73E-01	1.34E+00	1.18E+00	6.77E-01	7.67E-01	2.74E-01	3.40E-01	1.52E-01	5.80E+04
K1601WJ3-PGE	2.14E+00	2.05E-01	1.00E+00	8.88E-01	5.08E-01	7.67E-01	2.74E-01	3.40E-01	1.52E-01	5.80E+04
K1601WJ4	2.85E+00	2.73E-01	1.34E+00	1.18E+00	6.77E-01	1.02E+00	5.83E-01	3.40E-01	9.91E-02	6.66E+04
K1601WJ4-5	9.49E-01	2.73E-01	1.34E+00	1.18E+00	6.77E-01	1.02E+00	5.83E-01	3.40E-01	9.91E-02	6.66E+04
K1601WJ4-51	9.49E-01	2.73E-01	1.34E+00	1.18E+00	6.77E-01	1.02E+00	5.83E-01	3.40E-01	9.91E-02	6.66E+04
K1601WJ4-CS1795	2.85E+00	2.73E-01	1.34E+00	1.18E+00	6.77E-01	1.02E+00	5.83E-01	3.40E-01	9.91E-02	6.66E+04
K1601WJ4-PGE	2.85E+00	2.73E-01	1.34E+00	1.18E+00	6.77E-01	1.02E+00	5.83E-01	3.40E-01	9.91E-02	6.66E+04

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Extrapolation rules

The extrapolation rules have been calculated based on the environmental impact assessment results considering all the 15 products, and the sensitivity analysis carried out for extrapolation rules. For the manufacturing stage, distribution stage and end-of-life stage, the influential parameters considered for the calculation of the LCIA impacts of the variants are steel, aluminium, EPDM rubber, copper, remaining SKU weight and packaging. For the installation stage, the influential parameters considered for the calculation of the LCIA impacts of the variants are cardboard, wood, remaining packaging weight. For the use stage, the influential parameters considered for the calculation of the LCIA impacts of the variants is the power consumption. For the end of life stage, the influential parameters considered for the calculation of the LCIA impacts of the variants are steel, aluminium, EPDM rubber, copper and remaining SKU weight.

The calculation of the LCIA impacts of the variants through these parameters indicated that the correlation between the impacts of the representative product and the variants is a multiple linear correlation. Using the SimaPro impact results and the weights of multiple variables (steel, aluminium, EPDM rubber, copper, remaining SKU weight, packaging, cardboard, wood, remaining packaging weight) the best fit equation was found. These equations show the impact based on each of the SKUs analysed with an average error for each impact category of <10%, except for ADPE (average error of 12%), EE (average error of 26%) and HTP-nc (average error of 11%). To calculate the best fit equation the data was plugged into a data analysis software (Python).

Each environmental indicator value shall be calculated using the following formulas:

- For manufacturing and distribution stage for US and Canadian market:

$$y = ax_1 + bx_2 + cx_3 + dx_4 + ex_5 + fx_6 + g$$

where x1 = weight of steel
 x2 = weight of aluminium
 x3 = weight of EPDM rubber
 x4 = weight of copper
 x5 = weight of remaining SKU weight
 x6 = weight of packaging

- For the installation stage:

$$y = ax_1 + bx_2 + cx_3 + d$$

where x1 = weight of cardboard
 x2 = weight of wood
 x3 = weight of remaining packaging weight

- For the use stage for US and Canadian market:

$$y = ax_1 + b$$

where x1 = energy consumption during the use stage

- For the end of life stage:

$$y = ax_1 + bx_2 + cx_3 + dx_4 + ex_5 + f$$

where x1 = weight of steel
 x2 = weight of aluminium
 x3 = weight of EPDM rubber
 x4 = weight of copper
 x5 = weight of remaining SKU weight

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For the weights of the components above reported for all the variants, please refer to the table above.
The following tables reports the linear coefficients (a, b, c, ecc) for each life cycle stage.

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MANUFACTURING STAGE - US							
	a	b	c	d	e	f	g
GWP-total	1.87E+01	1.36E+01	2.88E+00	-8.01E+00	2.27E+01	3.88E+01	-2.93E+00
GWP-fossil	1.87E+01	1.35E+01	2.84E+00	-8.01E+00	2.26E+01	4.02E+01	-3.19E+00
GWP-biogenic	1.75E-02	-3.12E-02	3.50E-02	1.45E-02	-3.39E-02	-1.41E+00	2.74E-01
GWP-luluc	1.95E-02	8.63E-02	9.70E-04	-1.08E-02	4.07E-02	7.02E-02	-1.31E-02
ODP	2.35E-07	3.80E-07	1.37E-08	-1.26E-07	4.51E-07	4.19E-07	-6.88E-08
AP	1.04E-01	-7.15E-01	-9.24E-02	1.74E-01	1.43E+00	1.52E+00	-3.68E-01
EP-freshwater	7.12E-03	-6.43E-02	-8.14E-03	1.39E-02	1.12E-01	1.19E-01	-2.93E-02
EP-marine	1.98E-02	-1.89E-02	-8.81E-04	9.43E-04	7.47E-02	9.53E-02	-1.63E-02
EP-terrestrial	1.98E-01	-3.04E-01	-3.90E-02	3.93E-02	1.02E+00	1.21E+00	-2.47E-01
POCP	7.29E-02	-8.74E-02	1.14E-03	-1.41E-03	2.90E-01	3.61E-01	-7.00E-02
ADPE	4.19E-04	-1.21E-02	-1.36E-03	2.84E-03	1.82E-02	1.84E-02	-4.77E-03
ADPF	2.12E+02	3.83E+01	8.68E+01	-9.44E+01	2.77E+02	5.01E+02	-3.66E+01
WDP	3.48E+00	-1.30E+01	8.38E-01	3.62E+00	1.98E+01	2.34E+01	-3.46E+00
PERT+PENRT	2.74E+02	5.15E+01	1.16E+02	-8.02E+01	3.67E+02	6.14E+02	-5.57E+01
PERE	6.15E+01	1.19E+01	2.88E+01	1.34E+01	8.87E+01	9.98E+01	-1.62E+01
PERM	5.67E-01	1.32E+00	4.83E-01	8.10E-01	8.60E-01	1.33E+01	-2.95E+00
PERT	6.21E+01	1.32E+01	2.92E+01	1.42E+01	8.96E+01	1.13E+02	-1.92E+01
PENRE	2.11E+02	6.77E+01	5.40E+01	-9.61E+01	2.75E+02	4.85E+02	-4.51E+01
PENRM	1.29E+00	-2.93E+01	3.27E+01	1.65E+00	1.95E+00	1.52E+01	8.58E+00
PENRT	2.12E+02	3.83E+01	8.67E+01	-9.44E+01	2.77E+02	5.01E+02	-3.65E+01
SM	-3.68E-03	2.68E-01	1.07E-01	1.73E-02	-6.27E-02	-1.28E-01	-4.81E-02
RSF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	1.14E-01	-2.27E-01	1.51E-02	5.86E-02	4.81E-01	6.26E-01	-8.87E-02
HWD	7.74E-04	6.13E-03	2.29E-04	-6.17E-04	9.59E-04	2.04E-03	-2.44E-04
NHWD	1.34E+01	-6.16E+00	1.40E+00	-8.58E+00	8.48E+00	2.10E+01	-2.42E+00
RWD	2.63E-04	-3.16E-04	4.74E-05	-1.06E-04	5.38E-04	7.78E-04	-1.35E-04
CRU	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	1.24E+00	2.40E-01	3.72E-01	-1.40E-01	9.11E-01	1.23E+00	-1.53E-01
MER	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE	1.55E-01	-4.68E+00	-3.62E-01	1.14E+00	6.00E-01	5.81E-01	1.76E+00
PM	1.50E-06	3.78E-07	7.86E-08	-4.54E-07	3.52E-06	5.00E-06	-8.81E-07
IRP	1.06E+00	-1.17E+00	1.75E-01	-4.39E-01	2.10E+00	3.07E+00	-5.15E-01
ETP-fw	1.03E+02	-9.93E+02	-9.16E+01	1.89E+02	1.65E+03	1.74E+03	-4.32E+02
HTP-c	1.08E-07	-1.60E-07	-8.10E-09	-4.01E-08	2.25E-07	3.15E-07	-6.01E-08
HTP-nc	5.30E-07	-1.26E-05	-1.38E-06	2.36E-06	1.95E-05	2.06E-05	-5.28E-06
SQP	9.84E+01	-2.67E+02	-8.84E+00	2.33E+01	4.81E+02	6.84E+02	-1.43E+02
Biogenic C content_packaging	1.92E-02	4.00E-02	1.73E-02	2.27E-02	2.53E-02	4.43E-01	-9.19E-02
Biogenic C content_product	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

STATUS	SECURITY LEVEL	REGISTRATION NUMBER	REV.	LANG.	PAGE
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DISTRIBUTION STAGE -US							
	a	b	c	d	e	f	g
GWP-total	2.79E-01	2.91E-01	2.76E-01	2.85E-01	2.84E-01	2.43E-01	7.47E-03
GWP-fossil	2.78E-01	2.91E-01	2.76E-01	2.84E-01	2.84E-01	2.43E-01	7.46E-03
GWP-biogenic	5.75E-05	6.00E-05	5.70E-05	5.87E-05	5.86E-05	5.01E-05	1.54E-06
GWP-luluc	1.60E-04	1.67E-04	1.59E-04	1.64E-04	1.63E-04	1.40E-04	4.29E-06
ODP	4.49E-09	4.69E-09	4.45E-09	4.58E-09	4.57E-09	3.91E-09	1.20E-10
AP	3.22E-03	3.36E-03	3.19E-03	3.29E-03	3.28E-03	2.80E-03	8.62E-05
EP-freshwater	1.89E-05	1.97E-05	1.87E-05	1.93E-05	1.93E-05	1.65E-05	5.06E-07
EP-marine	9.06E-04	9.46E-04	8.98E-04	9.25E-04	9.23E-04	7.89E-04	2.43E-05
EP-terrestrial	9.90E-03	1.03E-02	9.81E-03	1.01E-02	1.01E-02	8.63E-03	2.65E-04
POCP	2.98E-03	3.12E-03	2.96E-03	3.05E-03	3.04E-03	2.60E-03	7.99E-05
ADPE	6.20E-07	6.47E-07	6.14E-07	6.33E-07	6.32E-07	5.40E-07	1.66E-08
ADPF	3.89E+00	4.06E+00	3.85E+00	3.97E+00	3.96E+00	3.39E+00	1.04E-01
WDP	1.71E-02	1.78E-02	1.69E-02	1.75E-02	1.74E-02	1.49E-02	4.58E-04
PERT+PENRT	3.93E+00	4.11E+00	3.90E+00	4.02E+00	4.01E+00	3.43E+00	1.05E-01
PERE	4.39E-02	4.58E-02	4.35E-02	4.48E-02	4.47E-02	3.82E-02	1.18E-03
PERM	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	4.39E-02	4.58E-02	4.35E-02	4.48E-02	4.47E-02	3.82E-02	1.18E-03
PENRE	3.89E+00	4.06E+00	3.85E+00	3.97E+00	3.96E+00	3.39E+00	1.04E-01
PENRM	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	3.89E+00	4.06E+00	3.85E+00	3.97E+00	3.96E+00	3.39E+00	1.04E-01
SM	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	5.45E-04	5.69E-04	5.40E-04	5.57E-04	5.55E-04	4.75E-04	1.46E-05
HWD	2.32E-05	2.43E-05	2.30E-05	2.37E-05	2.37E-05	2.03E-05	6.23E-07
NHWD	2.57E-01	2.69E-01	2.55E-01	2.63E-01	2.62E-01	2.24E-01	6.90E-03
RWD	7.44E-07	7.78E-07	7.38E-07	7.61E-07	7.59E-07	6.49E-07	1.99E-08
CRU	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MER	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PM	2.29E-08	2.39E-08	2.27E-08	2.34E-08	2.33E-08	1.99E-08	6.13E-10
IRP	3.15E-03	3.29E-03	3.12E-03	3.22E-03	3.21E-03	2.74E-03	8.44E-05
ETP-fw	2.03E+00	2.12E+00	2.01E+00	2.07E+00	2.07E+00	1.77E+00	5.43E-02
HTP-c	1.21E-10	1.26E-10	1.20E-10	1.24E-10	1.23E-10	1.05E-10	3.24E-12
HTP-nc	2.41E-09	2.52E-09	2.39E-09	2.46E-09	2.46E-09	2.10E-09	6.46E-11
SQP	3.04E+00	3.17E+00	3.01E+00	3.10E+00	3.10E+00	2.65E+00	8.14E-02
Biogenic C content_packaging	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Biogenic C content_product	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

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INSTALLATION STAGE				
	a	b	c	d
GWP-total	2.36E+00	-3.67E+13	3.37E+00	1.25E+13
GWP-fossil	3.84E-01	-6.59E+13	3.25E+00	2.24E+13
GWP-biogenic	1.97E+00	2.92E+13	1.12E-01	-9.95E+12
GWP-luluc	1.46E-04	-5.52E+09	3.13E-04	1.88E+09
ODP	3.95E-09	-1.85E+05	9.90E-09	6.30E+04
AP	1.26E-03	-5.60E+10	2.99E-03	1.90E+10
EP-freshwater	2.54E-05	-3.63E+09	1.06E-04	1.23E+09
EP-marine	2.23E-03	5.74E+09	1.72E-03	-1.95E+09
EP-terrestrial	4.52E-03	-2.18E+11	1.18E-02	7.42E+10
POCP	2.07E-03	-6.71E+10	4.00E-03	2.28E+10
ADPE	8.01E-07	-3.51E+07	1.90E-06	1.19E+07
ADPF	3.58E+00	-1.59E+14	8.55E+00	5.40E+13
WDP	2.71E-02	-8.52E+11	5.16E-02	2.90E+11
PERT+PENRT	3.64E+00	-1.60E+14	8.65E+00	5.46E+13
PERE	6.20E-02	-1.79E+12	1.14E-01	6.11E+11
PERM	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	6.20E-02	-1.79E+12	1.14E-01	6.11E+11
PENRE	3.58E+00	-1.59E+14	8.55E+00	5.40E+13
PENRM	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	3.58E+00	-1.59E+14	8.55E+00	5.40E+13
SM	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	8.06E-04	-2.79E+10	1.66E-03	9.48E+09
HWD	2.23E-05	-1.06E+09	5.64E-05	3.61E+08
NHWD	1.21E+00	-2.14E+13	1.60E+00	7.27E+12
RWD	1.05E-06	-2.72E+07	1.80E-06	9.26E+06
CRU	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MER	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE	8.00E-01	-2.81E+14	1.51E+01	9.56E+13
PM	2.10E-08	-9.29E+05	4.99E-08	3.16E+05
IRP	4.37E-03	-1.15E+11	7.57E-03	3.91E+10
ETP-fw	6.26E+00	-2.95E+13	5.33E+00	1.00E+13
HTP-c	1.26E-10	-6.37E+03	3.50E-10	2.17E+03
HTP-nc	5.77E-09	-1.45E+05	1.01E-08	4.94E+04
SQP	2.53E+00	-9.99E+13	5.52E+00	3.40E+13
Biogenic C content_packaging	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Biogenic C content_product	0.00E+00	0.00E+00	0.00E+00	0.00E+00

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USE STAGE -US		
	a	b
GWP-total	1.33E-07	5.20E-18
GWP-fossil	1.32E-07	-1.73E-17
GWP-biogenic	7.51E-10	2.03E-20
GWP-luluc	2.07E-10	2.03E-20
ODP	6.75E-16	-5.17E-26
AP	4.52E-10	-3.39E-20
EP-freshwater	8.47E-11	-1.86E-20
EP-marine	8.11E-11	1.61E-20
EP-terrestrial	7.32E-10	-5.42E-20
POCP	2.85E-10	1.02E-20
ADPE	1.09E-12	-1.06E-22
ADPF	2.38E-06	-1.11E-16
WDP	2.82E-08	-1.73E-18
PERT+PENRT	2.69E-06	3.05E-16
PERE	3.10E-07	-2.08E-17
PERM	0.00E+00	0.00E+00
PERT	3.10E-07	-2.08E-17
PENRE	2.38E-06	7.22E-16
PENRM	0.00E+00	0.00E+00
PENRT	2.38E-06	7.22E-16
SM	0.00E+00	0.00E+00
RSF	0.00E+00	0.00E+00
NRSF	0.00E+00	0.00E+00
FW	1.07E-09	8.13E-20
HWD	5.21E-12	-1.59E-22
NHWD	8.24E-09	8.67E-19
RWD	1.17E-11	-1.91E-21
CRU	0.00E+00	0.00E+00
MFR	0.00E+00	0.00E+00
MER	0.00E+00	0.00E+00
EE	0.00E+00	0.00E+00
PM	2.27E-15	2.07E-25
IRP	5.09E-08	-1.73E-18
ETP-fw	3.51E-07	1.04E-17
HTP-c	4.43E-17	-1.21E-27
HTP-nc	1.68E-15	-5.43E-25
SQP	3.94E-07	6.94E-17
Biogenic C content_packaging	0.00E+00	0.00E+00
Biogenic C content_product	0.00E+00	0.00E+00

STATUS	SECURITY LEVEL	REGISTRATION NUMBER	REV.	LANG.	PAGE
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END OF LIFE STAGE						
	a	b	c	d	e	f
GWP-total	1.97E-01	2.55E-01	2.86E-01	2.18E-01	2.15E-01	-1.46E-03
GWP-fossil	1.97E-01	2.55E-01	2.86E-01	2.18E-01	2.14E-01	-1.46E-03
GWP-biogenic	7.01E-05	5.05E-04	1.35E-04	1.01E-04	9.11E-05	-3.33E-07
GWP-luluc	1.04E-04	1.49E-04	1.05E-04	1.03E-04	1.09E-04	-3.65E-06
ODP	3.21E-09	3.70E-09	3.17E-09	3.17E-09	3.39E-09	-1.21E-10
AP	8.88E-04	1.15E-03	8.93E-04	8.73E-04	9.27E-04	-3.12E-05
EP-freshwater	1.61E-05	2.82E-05	1.66E-05	1.61E-05	1.70E-05	-5.55E-07
EP-marine	3.10E-04	6.22E-04	2.49E-03	8.41E-04	5.45E-04	1.36E-04
EP-terrestrial	3.49E-03	4.24E-03	3.50E-03	3.41E-03	3.62E-03	-1.22E-04
POCP	1.20E-03	1.45E-03	1.22E-03	1.18E-03	1.25E-03	-4.12E-05
ADPE	6.25E-07	7.37E-07	6.16E-07	6.06E-07	6.45E-07	-2.21E-08
ADPF	2.86E+00	3.46E+00	2.84E+00	2.83E+00	3.03E+00	-1.07E-01
WDP	1.87E-02	2.78E-02	2.18E-02	2.28E-02	2.47E-02	-9.64E-04
PERT+PENRT	2.90E+00	3.54E+00	2.88E+00	2.87E+00	3.07E+00	-1.08E-01
PERE	3.58E-02	7.48E-02	3.84E-02	3.62E-02	3.80E-02	-1.16E-03
PERM	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	3.58E-02	7.48E-02	3.84E-02	3.62E-02	3.80E-02	-1.16E-03
PENRE	2.86E+00	3.46E+00	2.84E+00	2.83E+00	3.03E+00	-1.07E-01
PENRM	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	2.86E+00	3.46E+00	2.84E+00	2.83E+00	3.03E+00	-1.07E-01
SM	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	5.49E-04	8.44E-04	6.25E-04	6.45E-04	6.97E-04	-2.65E-05
HWD	1.83E-05	2.06E-05	1.80E-05	1.79E-05	1.92E-05	-6.80E-07
NHWD	1.14E+00	1.23E+00	1.09E+00	1.08E+00	1.16E+00	-4.09E-02
RWD	5.70E-07	1.19E-06	6.23E-07	5.80E-07	6.06E-07	-1.77E-08
CRU	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MER	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PM	1.67E-08	2.07E-08	1.68E-08	1.63E-08	1.73E-08	-5.80E-10
IRP	2.40E-03	4.93E-03	2.62E-03	2.44E-03	2.55E-03	-7.52E-05
ETP-fw	1.59E+00	9.71E+00	1.82E+00	3.14E+00	3.82E+00	-2.53E-01
HTP-c	4.03E-10	-1.53E-09	-7.66E-10	1.44E-08	2.11E-08	-2.08E-09
HTP-nc	2.35E-08	-1.12E-07	-5.67E-08	9.84E-07	1.45E-06	-1.43E-07
SQP	1.93E+00	2.42E+00	2.09E+00	2.32E+00	2.57E+00	-1.12E-01
Biogenic C content_packaging	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Biogenic C content_product	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

STATUS	SECURITY LEVEL	REGISTRATION NUMBER	REV.	LANG.	PAGE
Approved	Public	ABBG-00693-V01.02-EN	0	en	21/26

MANUFACTURING STAGE - CA							
	a	b	c	d	e	f	g
GWP-total	1.88E+01	2.75E+01	7.94E-01	-4.09E+00	2.53E+01	3.50E+01	-5.43E+00
GWP-fossil	1.88E+01	2.75E+01	7.52E-01	-4.07E+00	2.53E+01	3.63E+01	-5.69E+00
GWP-biogenic	1.74E-02	-2.89E-02	3.38E-02	1.39E-02	-3.37E-02	-1.40E+00	2.70E-01
GWP-luluc	1.87E-02	2.86E-02	7.90E-03	-2.95E-02	2.92E-02	1.02E-01	-9.50E-03
ODP	2.36E-07	5.47E-07	-1.99E-08	-9.07E-08	4.81E-07	4.48E-07	-1.33E-07
AP	1.40E-01	2.31E+00	-5.11E-01	1.08E+00	2.02E+00	3.55E-01	-7.66E-01
EP-freshwater	1.01E-02	1.84E-01	-4.24E-02	8.85E-02	1.61E-01	2.23E-02	-6.17E-02
EP-marine	2.13E-02	1.14E-01	-1.92E-02	4.05E-02	1.00E-01	4.48E-02	-3.40E-02
EP-terrestrial	2.20E-01	1.57E+00	-2.99E-01	5.98E-01	1.38E+00	4.99E-01	-5.00E-01
POCP	7.92E-02	4.48E-01	-7.33E-02	1.58E-01	3.94E-01	1.59E-01	-1.42E-01
ADPE	9.33E-04	3.04E-02	-7.20E-03	1.56E-02	2.65E-02	1.74E-03	-1.02E-02
ADPF	2.16E+02	3.78E+02	3.93E+01	6.75E+00	3.43E+02	3.74E+02	-8.33E+01
WDP	4.05E+00	3.25E+01	-5.33E+00	1.74E+01	2.87E+01	4.77E+00	-9.00E+00
PERT+PENRT	2.80E+02	5.01E+02	5.32E+01	5.34E+01	4.54E+02	4.47E+02	-1.20E+02
PERE	6.28E+01	1.22E+02	1.33E+01	4.60E+01	1.10E+02	5.96E+01	-3.40E+01
PERM	5.58E-01	7.30E-01	5.55E-01	6.22E-01	7.44E-01	1.36E+01	-2.91E+00
PERT	6.34E+01	1.23E+02	1.39E+01	4.66E+01	1.11E+02	7.32E+01	-3.69E+01
PENRE	2.14E+02	3.69E+02	1.11E+01	-7.69E+00	3.34E+02	3.81E+02	-8.99E+01
PENRM	1.91E+00	9.48E+00	2.82E+01	1.44E+01	9.68E+00	-7.16E+00	6.77E+00
PENRT	2.16E+02	3.78E+02	3.93E+01	6.74E+00	3.43E+02	3.74E+02	-8.32E+01
SM	-9.73E-03	-1.69E-01	1.63E-01	-1.20E-01	-1.49E-01	8.04E-02	-8.55E-03
RSF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	1.26E-01	7.59E-01	-1.19E-01	3.57E-01	6.74E-01	2.27E-01	-2.10E-01
HWD	6.80E-04	-7.60E-04	1.12E-03	-2.77E-03	-3.97E-04	5.27E-03	4.11E-04
NHWD	1.36E+01	1.47E+01	-1.52E+00	-2.38E+00	1.25E+01	1.33E+01	-5.31E+00
RWD	2.78E-04	8.87E-04	-1.18E-04	2.55E-04	7.73E-04	3.11E-04	-2.92E-04
CRU	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	1.25E+00	1.22E+00	2.30E-01	1.46E-01	1.10E+00	9.05E-01	-3.07E-01
MER	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE	2.57E-01	1.96E+00	-1.15E+00	3.31E+00	1.92E+00	-3.11E+00	1.39E+00
PM	1.55E-06	4.94E-06	-5.74E-07	8.82E-07	4.40E-06	3.44E-06	-1.57E-06
IRP	1.12E+00	3.45E+00	-4.64E-01	9.44E-01	3.00E+00	1.29E+00	-1.12E+00
ETP-fw	1.48E+02	2.73E+03	-6.04E+02	1.30E+03	2.38E+03	2.97E+02	-9.15E+02
HTP-c	1.14E-07	3.83E-07	-8.30E-08	1.22E-07	3.30E-07	1.06E-07	-1.31E-07
HTP-nc	1.07E-06	3.25E-05	-7.58E-06	1.59E-05	2.83E-05	3.02E-06	-1.11E-05
SQP	1.11E+02	7.87E+02	-1.54E+02	3.39E+02	6.86E+02	2.76E+02	-2.81E+02
Biogenic C content_packaging	1.89E-02	2.35E-02	1.89E-02	1.69E-02	2.20E-02	4.55E-01	-9.24E-02
Biogenic C content_product	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

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DISTRIBUTION STAGE -CA							
	a	b	c	d	e	f	g
GWP-total	5.68E-01	5.78E-01	5.64E-01	5.75E-01	5.76E-01	5.08E-01	1.41E-02
GWP-fossil	5.67E-01	5.78E-01	5.64E-01	5.74E-01	5.76E-01	5.08E-01	1.41E-02
GWP-biogenic	2.09E-04	2.13E-04	2.08E-04	2.12E-04	2.12E-04	1.87E-04	5.20E-06
GWP-luluc	2.83E-04	2.88E-04	2.81E-04	2.86E-04	2.87E-04	2.53E-04	7.03E-06
ODP	9.36E-09	9.53E-09	9.30E-09	9.48E-09	9.50E-09	8.38E-09	2.33E-10
AP	2.49E-03	2.53E-03	2.47E-03	2.52E-03	2.52E-03	2.23E-03	6.18E-05
EP-freshwater	4.62E-05	4.71E-05	4.60E-05	4.68E-05	4.69E-05	4.14E-05	1.15E-06
EP-marine	9.12E-04	9.29E-04	9.07E-04	9.23E-04	9.25E-04	8.16E-04	2.27E-05
EP-terrestrial	9.75E-03	9.93E-03	9.69E-03	9.87E-03	9.89E-03	8.72E-03	2.42E-04
POCP	3.51E-03	3.57E-03	3.49E-03	3.55E-03	3.56E-03	3.14E-03	8.72E-05
ADPE	1.54E-06	1.57E-06	1.53E-06	1.56E-06	1.57E-06	1.38E-06	3.84E-08
ADPF	8.31E+00	8.46E+00	8.26E+00	8.41E+00	8.43E+00	7.44E+00	2.07E-01
WDP	4.23E-02	4.31E-02	4.21E-02	4.28E-02	4.29E-02	3.79E-02	1.05E-03
PERT+PENRT	8.42E+00	8.57E+00	8.37E+00	8.52E+00	8.54E+00	7.53E+00	2.09E-01
PERE	1.05E-01	1.07E-01	1.05E-01	1.07E-01	1.07E-01	9.42E-02	2.62E-03
PERM	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	1.05E-01	1.07E-01	1.05E-01	1.07E-01	1.07E-01	9.42E-02	2.62E-03
PENRE	8.31E+00	8.47E+00	8.26E+00	8.41E+00	8.43E+00	7.44E+00	2.07E-01
PENRM	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	8.31E+00	8.47E+00	8.26E+00	8.41E+00	8.43E+00	7.44E+00	2.07E-01
SM	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	1.33E-03	1.35E-03	1.32E-03	1.34E-03	1.35E-03	1.19E-03	3.30E-05
HWD	5.24E-05	5.34E-05	5.21E-05	5.31E-05	5.32E-05	4.69E-05	1.30E-06
NHWD	7.24E-01	7.38E-01	7.20E-01	7.33E-01	7.35E-01	6.48E-01	1.80E-02
RWD	1.81E-06	1.85E-06	1.80E-06	1.84E-06	1.84E-06	1.62E-06	4.51E-08
CRU	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MER	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PM	5.84E-08	5.95E-08	5.81E-08	5.92E-08	5.93E-08	5.23E-08	1.45E-09
IRP	7.63E-03	7.77E-03	7.58E-03	7.72E-03	7.74E-03	6.82E-03	1.90E-04
ETP-fw	4.41E+00	4.49E+00	4.38E+00	4.46E+00	4.47E+00	3.94E+00	1.10E-01
HTP-c	2.47E-10	2.51E-10	2.45E-10	2.50E-10	2.50E-10	2.21E-10	6.13E-12
HTP-nc	6.06E-09	6.17E-09	6.02E-09	6.13E-09	6.14E-09	5.42E-09	1.50E-10
SQP	8.42E+00	8.58E+00	8.37E+00	8.53E+00	8.54E+00	7.54E+00	2.09E-01
Biogenic C content_packaging	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Biogenic C content_product	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

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USE STAGE - CA		
	a	b
GWP-total	5.62E-08	-3.47E-18
GWP-fossil	5.28E-08	-8.67E-19
GWP-biogenic	4.94E-10	4.74E-20
GWP-luluc	2.90E-09	-2.71E-19
ODP	3.06E-16	3.55E-26
AP	2.44E-10	-4.07E-20
EP-freshwater	5.40E-11	4.24E-21
EP-marine	4.44E-11	-3.81E-21
EP-terrestrial	3.66E-10	1.36E-20
POCP	1.32E-10	3.22E-20
ADPE	7.36E-13	-3.31E-23
ADPF	1.37E-06	-1.39E-16
WDP	1.19E-08	2.17E-18
PERT+PENRT	2.15E-06	-5.55E-16
PERE	7.79E-07	5.55E-17
PERM	0.00E+00	0.00E+00
PERT	7.79E-07	5.55E-17
PENRE	1.37E-06	-1.25E-16
PENRM	0.00E+00	0.00E+00
PENRT	1.37E-06	-1.25E-16
SM	0.00E+00	0.00E+00
RSF	0.00E+00	0.00E+00
NRSF	0.00E+00	0.00E+00
FW	5.94E-09	-1.08E-19
HWD	2.33E-12	1.32E-22
NHWD	7.02E-09	0.00E+00
RWD	2.11E-11	6.35E-22
CRU	0.00E+00	0.00E+00
MFR	0.00E+00	0.00E+00
MER	0.00E+00	0.00E+00
EE	0.00E+00	0.00E+00
PM	1.00E-15	3.62E-25
IRP	6.69E-08	8.67E-19
ETP-fw	2.00E-07	-1.04E-17
HTP-c	2.51E-17	-3.23E-27
HTP-nc	1.04E-15	3.88E-26
SQP	-1.41E-07	-1.04E-17
Biogenic C content_packaging	0.00E+00	0.00E+00
Biogenic C content_product	0.00E+00	0.00E+00

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Comparability

EPDs published within the same product category, though originating from different programs, may not be comparable. Full conformance with a PCR allows PEP comparability only when all stages of a life cycle have been considered. However, variations and deviations are possible.


Applicable product standards

Product technical and Certification specifications can be found in the [product catalogue on ABB's website](#).

References

- PEP ecopassport® PROGRAM, PCR-ed4-EN-2021 09 06, Product Category Rules for Electrical, Electronic and HVAC-R Products.
- PEP ecopassport® PROGRAMME, PSR-0001-ed4-EN-2022 11 16, Specific rules for Wires, Cables and Accessories.
- ISO 14040: Life cycle assessment. Environmental management. Principles and Framework. International Organization for Standardization, 2006.
- ISO 14044: Life cycle assessment. Environmental management. Requirements and guidelines. International Organization for Standardization, 2006.
- PRé Consultants, Software SimaPro 9.6, 2024 (www.simapro.com).
- Ecoinvent, 2022. Swiss Centre for Life Cycle Assessment, v 3.9.1 (Home - ecoinvent).
- UNI EN 15804:2012+A2:2019: Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products.
- EN 50693:2019: Product category rules for life cycle assessments of electronic and electrical products and systems.

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Registration number: ABBG-00693-V01.02-EN	Drafting Rules: PCR-ed4-EN-2021 09 06
	Supplemented by: PSR-0001-ed4-EN-2022 11 16
Verifier accreditation number: VH44	Information and reference documents: www.pep-ecopassport.org
Date of issue: 04-2025	Validity period: 5 years
Independent verification of the declaration and data, in compliance with ISO 14025: 2006	
Internal: <input type="radio"/>	External: <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 The components of the present PEP may not be compared with components from any other program.	
Document in compliance with ISO 14025: 2006 "Environmental labels and declarations. Type III environmental declarations"	
	

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