OCAL® PVC-COATED ALUMINUM CONDUIT

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"

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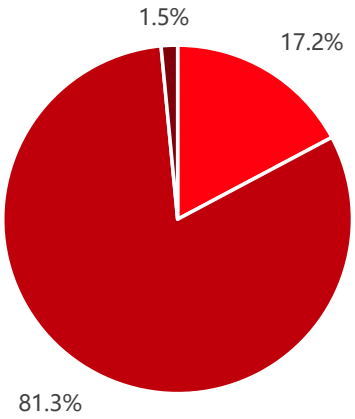
ABB Purpose & Embedding Sustainability

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 COND2SA-G
Description of the product	Ocal® PVC-coated conduit provide corrosion protection that helps extend the life of the electrical raceway system of the costumer.
Functional unit	The functional unit is to accommodate and protect the wiring along 1 meter for a Reference service Life of the product of 20 years. The distribution trucking system COND2SA-G with cross section 2167.74 mm² includes the profile and accessories that are representative of standard use.
Other products covered	List of other products covered in this PEP is presented in the paragraph which concerned the extrapolation rules

Constituent Materials



Total weight of Reference product included packaging (g)	2380	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%
PVC	17.0	Aluminium	81.3	Solvent	1.0
Nylon	0.2			Cardboard	0.4
Polyester	<0.1			Urethane	0.1
				Label	<0.1

Total weight of 1 meter of the reference product 2.37 kg/m plus packaging 0.01 kg/m.

Additional Environmental Information

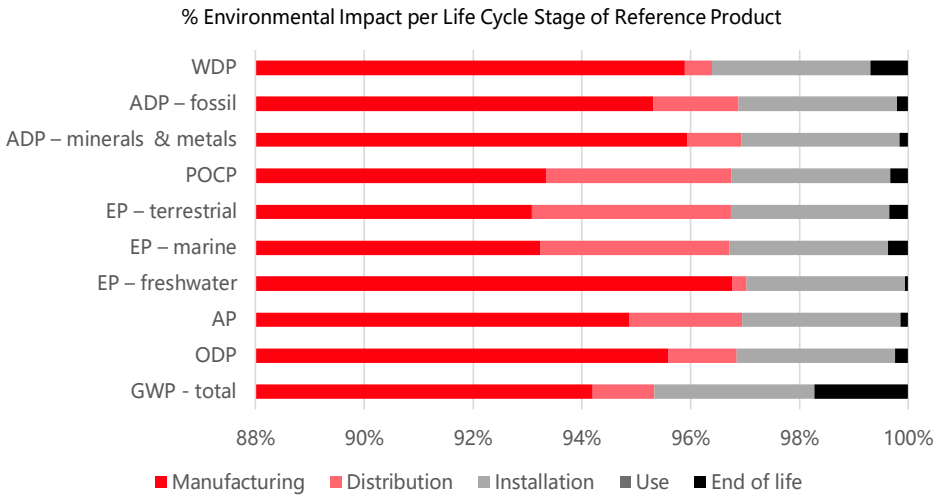
Manufacturing	The manufacturing stage includes the production and transportation to the manufacturer’s last logistic platform of Ocal® PVC-coated conduit and its packaging. The final assembly of the product is carried out at ABB's plant located in Highland Dr, Jonesboro, AR
Distribution	The transport from the ABB US (Highland Dr, Jonesboro, AR) factory to the warehouses (Byhalia, Phoenix, NEDC Carson Court Easton) sites 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 with a cut-off about 20%.
Installation	This phase includes the disposal of the packaging of Ocal® PVC-coated conduit products and consider also manufacture, transport and end of life associated with 3% scrap of the product as PSR-0003-ed2.1-EN-2023 12 08 indicate ("1.03 m of profiles taken into account to install 1 m of linear trunking function").
Use	No material and energy consumption occur during the use stage. No maintenance happens during the use phase, the environmental impacts linked to this procedure have been considered equal to zero in the respective results section.
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 Ocal® PVC-coated aluminum conduit (100% incineration).
Benefits and loads beyond the system boundaries	No benefits and loads beyond the system boundaries has been considered.

Environmental Impacts

Reference lifetime	20 years
Product category	The Ocal® PVC-coated conduit family belong to the “Cable trucking systems and conduit systems” category indicated in the PSR-0003-ed2.1-EN-2023 12 08 , in particular the sub-category “Cable trucking systems, floor trucking systems, and conduit systems”.
Installation elements	No installation materials are required in the life cycle of the product. During this phase there is the disposal of the packaging
Use scenario	No material and energy consumption occur during the use stage. No maintenance phase is planned for the the Ocal® PVC-coated aluminum conduit
Geographical representativeness	The suppliers are collocated all over the world, the products are fabricated in Jonesboro (AR) 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	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). 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.
Installation	No energy consumption occur during the installation stage.
Use	No energy consumption occur during the use stage.
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

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.	6.56E+01	6.18E+01	7.48E-01	1.93E+00	0.00E+00	1.13E+00	0.00E+00
GWP-fossil	kg CO_2 eq.	6.54E+01	6.17E+01	7.47E-01	1.91E+00	0.00E+00	1.11E+00	0.00E+00
GWP-biogenic	kg CO_2 eq.	4.30E-03	-2.91E-02	1.55E-04	1.39E-02	0.00E+00	1.94E-02	0.00E+00
GWP-luluc	kg CO_2 eq.	1.69E-01	1.63E-01	4.30E-04	4.92E-03	0.00E+00	8.21E-05	0.00E+00
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.	9.63E-07	9.20E-07	1.20E-08	2.81E-08	0.00E+00	2.35E-09	0.00E+00
ODP = Depletion potential of the stratospheric ozone layer								
AP	H+ eq.	4.15E-01	3.94E-01	8.61E-03	1.21E-02	0.00E+00	5.94E-04	0.00E+00
AP = Acidification potential, Accumulated Exceedance								
EP-freshwater	kg P eq.	2.01E-02	1.95E-02	5.08E-05	5.86E-04	0.00E+00	1.23E-05	0.00E+00
EP-marine	kg N eq.	6.98E-02	6.51E-02	2.43E-03	2.04E-03	0.00E+00	2.62E-04	0.00E+00
EP-terrestrial	mol N eq.	7.25E-01	6.74E-01	2.65E-02	2.11E-02	0.00E+00	2.52E-03	0.00E+00
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.	2.34E-01	2.18E-01	7.99E-03	6.82E-03	0.00E+00	7.77E-04	0.00E+00
POCP = Formation potential of tropospheric ozone								
ADP-minerals & metals	kg Sb eq.	1.68E-04	1.61E-04	1.66E-06	4.89E-06	0.00E+00	2.72E-07	0.00E+00
ADP-fossil	MJ	6.63E+02	6.32E+02	1.04E+01	1.93E+01	0.00E+00	1.35E+00	0.00E+00
ADP-minerals & metals = Abiotic depletion potential for non-fossil resources ADP-fossil = Abiotic depletion for fossil resources potential								
WDP	m^3 eq. depr.	9.21E+00	8.83E+00	4.59E-02	2.69E-01	0.00E+00	6.42E-02	0.00E+00
WDP = Water Deprivation potential								

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	1.10E+02	1.07E+02	1.18E-01	3.21E+00	0.00E+00	2.53E-02	0.00E+00
PERM	MJ	1.68E+00	1.63E+00	0.00E+00	4.89E-02	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	1.12E+02	1.09E+02	1.18E-01	3.26E+00	0.00E+00	2.53E-02	0.00E+00
PENRE	MJ	6.57E+02	6.26E+02	1.04E+01	1.91E+01	0.00E+00	1.35E+00	0.00E+00
PENRM	MJ	6.32E+00	6.13E+00	0.00E+00	1.84E-01	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ	6.63E+02	6.32E+02	1.04E+01	1.93E+01	0.00E+00	1.35E+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	3.72E-01	3.58E-01	1.46E-03	1.09E-02	0.00E+00	1.93E-03	0.00E+00

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	1.52E-02	1.47E-02	6.24E-05	4.42E-04	0.00E+00	8.16E-06	0.00E+00
Non- hazardous waste disposed	kg	1.25E+01	1.13E+01	6.92E-01	3.64E-01	0.00E+00	7.40E-02	0.00E+00
Radioactive waste disposed	kg	4.46E-04	4.31E-04	2.00E-06	1.30E-05	0.00E+00	3.58E-07	0.00E+00

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	1.72E+00	1.67E+00	0.00E+00	5.00E-02	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	3.98E+00	0.00E+00	0.00E+00	1.16E-01	0.00E+00	3.86E+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	5.47E-02	5.31E-02	0.00E+00	1.59E-03	0.00E+00	0.00E+00	0.00E+00

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	7.75E+02	7.41E+02	1.06E+01	2.26E+01	0.00E+00	1.38E+00	0.00E+00
Emissions of fine particles	incidence of diseases	5.07E-06	4.85E-06	6.15E-08	1.48E-07	0.00E+00	1.11E-08	0.00E+00
Ionizing radiation, human health	kBq U235 eq.	1.88E+00	1.81E+00	8.46E-03	5.47E-02	0.00E+00	1.47E-03	0.00E+00
Ecotoxicity (fresh water)	CTUe	2.14E+02	1.97E+02	5.44E+00	6.24E+00	0.00E+00	5.08E+00	0.00E+00
Human toxicity, car-cinogenic effects	CTUh	8.22E-08	7.92E-08	3.25E-10	2.39E-09	0.00E+00	2.31E-10	0.00E+00
Human toxicity, non-carcinogenic effects	incidence of diseases	1.22E-06	1.18E-06	6.48E-09	3.57E-08	0.00E+00	4.01E-09	0.00E+00
Impact related to land use/soil quality		1.59E+02	1.45E+02	8.16E+00	4.62E+00	0.00E+00	1.15E+00	0.00E+00

Other indicators

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

Environmental Impact Indicator Glossary

Impact indicators

Indicator	Description	Distri-bution
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	Distri-bution
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)

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 Ocal® PVC-coated conduit 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-0003-ed2.1-EN-2023 12 08, 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 (weights of aluminum, PVC, urethane, solvent, nylon);

The representative product considered for the calculation of the extrapolation rules is COND2SA-G. This product is most representative for the sales.

The results of the sensitivity analysis show that all the parameters considered are sensitive, except the urethane, solvent, nylon weights.

The products included in the Ocal® PVC-coated conduit product family and considered for the application of the extrapolation rules are resented in the following tables.

Ocal® PVC-coated conduit Heavy products									
Catalog Number	Aluminum Weight (kg)	PVC Weight (kg)	Cardboard Weight (kg)	Wood Weight (kg)	Product Weight (kg)	Packaging Weight (kg)	Remaining SKU Weight (kg)	Remaining Packaging Weight (kg)	Length (m)
COND1/2SA-G	1.81E+00	4.03E-01	7.89E-03	0.00E+00	2.23E+00	8.53E-03	1.50E-02	6.37E-04	3.05E+00
COND11/2SA-G	4.32E+00	7.33E-01	2.08E-02	0.00E+00	5.25E+00	2.08E-02	1.98E-01	0.00E+00	3.05E+00
COND11/4SA-G	3.61E+00	6.43E-01	1.88E-02	0.00E+00	4.41E+00	1.88E-02	1.66E-01	0.00E+00	3.05E+00
COND1SA-G	2.71E+00	5.14E-01	1.05E-02	0.00E+00	3.34E+00	1.05E-02	1.19E-01	0.00E+00	3.05E+00
COND21/2SA-G	9.17E+00	1.10E+00	4.64E-02	0.00E+00	1.07E+01	4.64E-02	4.42E-01	0.00E+00	3.05E+00
COND2SA-G	5.90E+00	1.23E+00	2.63E-02	0.00E+00	7.23E+00	2.79E-02	9.60E-02	1.59E-03	3.05E+00
COND3/4SA-G	1.74E+00	4.12E-01	8.77E-03	0.00E+00	2.22E+00	8.77E-03	7.50E-02	0.00E+00	3.05E+00
COND31/2SA-G	1.43E+01	1.53E+00	7.18E-02	0.00E+00	1.65E+01	7.18E-02	6.95E-01	0.00E+00	3.05E+00
COND3SA-G	1.18E+01	1.34E+00	5.64E-02	0.00E+00	1.37E+01	5.64E-02	5.70E-01	0.00E+00	3.05E+00
COND4SA-G	1.63E+01	2.42E+00	7.18E-02	0.00E+00	1.89E+01	7.57E-02	1.42E-01	3.96E-03	3.05E+00
COND5SA-G	2.28E+01	2.12E+00	9.87E-02	0.00E+00	2.60E+01	9.87E-02	1.11E+00	0.00E+00	3.05E+00
COND6SA-G	2.90E+01	2.97E+00	1.58E-01	0.00E+00	3.25E+01	1.66E-01	5.11E-01	8.43E-03	3.05E+00
ELL21/2SA-G	1.80E+00	2.16E-01	1.41E-02	3.93E-01	2.54E+00	4.15E-01	5.33E-01	8.10E-03	5.97E-01
ELL31/2SA-G	4.16E+00	4.46E-01	1.81E-02	5.05E-01	5.38E+00	5.34E-01	7.67E-01	1.04E-02	8.91E-01
ELL330SA-G	2.70E+00	3.06E-01	1.41E-02	3.93E-01	3.58E+00	4.15E-01	5.72E-01	8.10E-03	6.96E-01
ELL3SA-G	2.70E+00	3.06E-01	1.41E-02	3.93E-01	3.58E+00	4.16E-01	5.72E-01	8.52E-03	6.96E-01
ELL430SA-G	5.14E+00	5.24E-01	1.81E-02	5.05E-01	6.48E+00	5.35E-01	8.10E-01	1.10E-02	9.30E-01
ELL445SA-G	5.14E+00	5.24E-01	1.81E-02	5.05E-01	6.48E+00	5.35E-01	8.10E-01	1.10E-02	9.30E-01
ELL4SA-G	5.14E+00	5.24E-01	1.81E-02	5.05E-01	6.48E+00	5.35E-01	8.10E-01	1.10E-02	9.30E-01
ELL5SA-G	9.83E+00	9.12E-01	4.23E-02	1.18E+00	1.25E+01	1.25E+00	1.80E+00	2.56E-02	1.31E+00
ELL6SA-G	1.84E+01	1.88E+00	7.96E-02	4.54E+00	2.07E+01	4.66E+00	3.99E-01	4.78E-02	1.65E+00
LRELL1-1/2X36SA-G	2.81E+00	4.77E-01	2.54E-02	1.45E+00	5.04E+00	1.49E+00	1.75E+00	1.72E-02	1.98E+00
LRELL1-1/4X36SA-G	2.34E+00	4.18E-01	2.54E-02	1.45E+00	4.50E+00	1.49E+00	1.73E+00	1.72E-02	1.98E+00
LRELL1X24SA-G	1.33E+00	2.53E-01	9.07E-03	5.18E-01	2.22E+00	5.34E-01	6.39E-01	6.13E-03	1.50E+00
LRELL1X36SA-G	1.76E+00	3.34E-01	1.27E-02	7.26E-01	2.99E+00	7.47E-01	8.90E-01	8.58E-03	1.98E+00
LRELL21/2X36SA-G	5.96E+00	7.17E-01	3.18E-02	1.81E+00	8.98E+00	1.87E+00	2.30E+00	2.15E-02	1.98E+00
LRELL2X12SA-G	1.76E+00	2.74E-01	1.27E-02	7.26E-01	2.92E+00	7.47E-01	8.92E-01	8.58E-03	9.14E-01
LRELL2X24SA-G	2.88E+00	4.50E-01	1.27E-02	7.26E-01	4.27E+00	7.47E-01	9.38E-01	8.58E-03	1.50E+00

Ocal® PVC-coated conduit Heavy products									
Catalog Number	Aluminum Weight (kg)	PVC Weight (kg)	Cardboard Weight (kg)	Wood Weight (kg)	Product Weight (kg)	Packaging Weight (kg)	Remaining SKU Weight (kg)	Remaining Packaging Weight (kg)	Length (m)
LRELL2X36SA-G	3.83E+00	8.03E-01	1.29E-02	7.26E-01	4.71E+00	7.47E-01	7.12E-02	8.58E-03	1.98E+00
LRELL31/2X36SA-G	9.26E+00	9.93E-01	6.35E-02	3.63E+00	1.48E+01	3.74E+00	4.50E+00	4.29E-02	1.98E+00
LRELL3X18SA-G	4.73E+00	5.35E-01	1.98E-02	1.13E+00	6.75E+00	1.17E+00	1.48E+00	1.34E-02	1.22E+00
LRELL3X24SA-G	5.82E+00	6.58E-01	1.98E-02	1.13E+00	8.00E+00	1.17E+00	1.53E+00	1.34E-02	1.50E+00
LRELL3X36SA-G	7.69E+00	8.70E-01	2.65E-02	1.51E+00	1.06E+01	1.56E+00	2.04E+00	1.79E-02	1.98E+00
LRELL4X18SA-G	6.74E+00	6.86E-01	2.12E-02	1.21E+00	9.08E+00	1.24E+00	1.66E+00	1.31E-02	1.22E+00
LRELL4X36SA-G	1.06E+01	1.57E+00	3.55E-02	2.02E+00	1.23E+01	2.07E+00	1.29E-01	2.19E-02	1.98E+00
LRELL5X30SA-G	1.31E+01	1.22E+00	5.29E-02	3.02E+00	1.83E+01	3.11E+00	3.99E+00	3.28E-02	1.75E+00
LRELL5X36SA-G	1.48E+01	1.38E+00	5.29E-02	3.02E+00	2.03E+01	3.11E+00	4.06E+00	3.28E-02	1.98E+00

Ocal® PVC-coated conduit light products

Catalog Number	Aluminum Weight (kg)	PVC Weight (kg)	Cardboard Weight (kg)	Wood Weight (kg)	Product Weight (kg)	Packaging Weight (kg)	Remaining SKU Weight (kg)	Remaining Packaging Weight (kg)	Length (m)
CLNPL1/2SA-G	1.07E-02	2.41E-03	4.97E-03	7.08E-03	2.78E-02	1.25E-02	1.47E-02	4.86E-04	2.54E-02
CLNPL3/4SA-G	2.90E-02	6.87E-03	1.12E-02	7.08E-03	5.72E-02	1.90E-02	2.13E-02	7.38E-04	5.08E-02
ELL1/2SA-G	1.81E-01	4.03E-02	1.39E-02	2.95E-02	2.43E-01	4.33E-02	2.12E-02	5.28E-06	2.61E-01
ELL11/2SA-G	6.64E-01	1.13E-01	1.04E-01	1.70E-01	1.11E+00	2.80E-01	3.32E-01	5.68E-03	4.69E-01
ELL11/4SA-G	4.77E-01	8.51E-02	8.30E-02	1.26E-01	8.14E-01	2.14E-01	2.52E-01	4.33E-03	4.04E-01
ELL1SA-G	3.05E-01	5.80E-02	3.19E-02	2.95E-02	4.44E-01	6.26E-02	8.02E-02	1.22E-03	3.44E-01
ELL2SA-G	1.07E+00	1.67E-01	1.38E-01	2.11E-01	1.67E+00	3.56E-01	4.32E-01	6.94E-03	5.57E-01
ELL3/4SA-G	1.60E-01	3.80E-02	1.39E-02	2.95E-02	2.53E-01	4.42E-02	5.43E-02	8.62E-04	2.81E-01
LRELL3/4X24SA-G	8.54E-01	2.03E-01	1.27E-02	7.26E-01	1.91E+00	7.47E-01	8.52E-01	8.58E-03	1.50E+00
NPL1/2X5SA-G	7.56E-02	1.68E-02	4.48E-03	5.53E-03	9.99E-02	1.04E-02	7.53E-03	3.49E-04	1.27E-01
NPL1/2X6SA-G	9.07E-02	2.02E-02	4.48E-03	5.53E-03	1.18E-01	1.04E-02	7.15E-03	3.48E-04	1.52E-01
NPL11/2X4SA-G	1.44E-01	2.44E-02	5.61E-03	3.54E-03	1.84E-01	9.46E-03	1.59E-02	3.18E-04	1.02E-01
NPL3/4X12SA-G	2.27E-01	1.22E-02	1.34E-02	1.77E-02	2.52E-01	3.17E-02	1.26E-02	6.15E-04	3.05E-01
NPL3/4X2SA-G	2.90E-02	6.87E-03	2.80E-03	1.77E-03	4.20E-02	4.66E-03	6.15E-03	9.03E-05	5.08E-02
NPL3/4X4SA-G	5.79E-02	1.37E-02	5.61E-03	3.54E-03	8.40E-02	9.33E-03	1.23E-02	1.81E-04	1.02E-01
NPL3/4X5SA-G	7.24E-02	1.72E-02	5.61E-03	3.54E-03	1.02E-01	9.51E-03	1.28E-02	3.67E-04	1.27E-01
NPL3/4X6SA-G	1.13E-01	6.08E-03	3.58E-03	4.72E-03	1.30E-01	8.63E-03	1.03E-02	3.33E-04	1.52E-01

Extrapolation rules

The extrapolation rules have been calculated based on the environmental impact assessment results considering all the 12 products, and the sensitivity analysis carried out and explained in the sensibility analysis.

For the manufacturing stage and distribution stage of heavy and light weight product, the influential parameters considered for the calculation of the LCIA impacts of the variants are: the aluminium weight, PVC weight, cardboard weight (packaging) and wood weight (packaging). For the installation stage of heavy and light weight product, the influential parameters considered for the calculation of the LCIA impacts of the variants are cardboard weight (packaging), wood weight (packaging) and product weight. For the end of life stage of heavy and lght weight product, the influential parameters considered for the calculation of the LCIA impacts of the variants are: the aluminium weight, PVC weight 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 (aluminium, PVC, cardboard, wood, product weight, remaining SKU weight) the best fit equation was found. These equations show the impact based on each of the 12 SKUs analysed with an average error for each impact category of <7%. 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 the manufacturing, distribution stages:

$$y\ (Heavy\ and\ Light\ weight) = (\ ax_1 + \mathrm{b}x_2 + \mathrm{c}x_3 + \mathrm{d}x_4 + e)/x_5$$

where x1 = weight of aluminium
x2 = weight of PVC
x3 = weight of cardboard
x4 = weight of wood
x5 = length

- For the installation stage:

$$y\ (Heavy\ and\ Light\ weight) = (\ ax_1 + \mathrm{b}x_2 + \mathrm{c}x_3 + \mathrm{d})/x_4$$

where x1 = weight of cardboard
x2 = weight of wood
x3 = product weight
x4 = length

- For the end of life stage:

$$y\ (Heavy\ and\ Light\ weight) = (\ ax_1 + \mathrm{b}x_2 + \mathrm{c}x_3 + \mathrm{d})/x_4$$

where x1 = weight of Aluminium
x2 = weight of PVC
x3 = remaining SKU weight
x4 = length

For the weights of the components above reported for all the variants, please refer to the tables above.

The calculation of the coefficients for the Use Stage was not performed because the selected parameters do not affect the values for this stage.

The following tables reports the linear coefficients (a,b,c,ecc) for each life cycle stage.

- MANUFACTURING STAGE – HEAVY WEIGHT					
	a	b	c	d	e
GWP-total	1.16E+01	6.91E+01	2.50E+03	2.54E+01	-3.04E+01
GWP-fossil	1.15E+01	6.89E+01	2.49E+03	2.69E+01	-3.03E+01
GWP-biogenic	-1.68E-02	2.75E-02	-6.29E-01	-1.62E+00	-7.45E-03
GWP-luluc	3.09E-02	1.82E-01	6.68E+00	7.25E-02	-8.33E-02
ODP	1.48E-07	1.25E-06	2.40E-05	2.96E-07	-2.58E-07
AP	7.27E-02	4.44E-01	1.62E+01	1.76E-01	-2.00E-01
EP-freshwater	3.53E-03	2.22E-02	8.05E-01	8.67E-03	-9.92E-03
EP-marine	1.19E-02	7.35E-02	2.70E+00	2.96E-02	-3.28E-02
EP-terrestrial	1.23E-01	7.64E-01	2.78E+01	3.06E-01	-3.41E-01
POCP	4.16E-02	2.42E-01	8.71E+00	9.61E-02	-1.06E-01
ADPE	-2.35E-05	3.64E-04	1.28E-02	1.40E-04	-1.58E-04
ADPF	1.17E+02	7.12E+02	2.51E+04	2.73E+02	-2.97E+02
WDP	9.37E-01	1.17E+01	4.71E+02	5.07E+00	-5.33E+00
PERT+PENRT	1.48E+02	8.00E+02	2.78E+04	3.31E+02	-3.27E+02
PERE	3.02E+01	8.67E+01	2.70E+03	4.16E+01	-2.97E+01
PERM	6.78E-01	3.77E-01	1.26E+01	1.59E+01	1.84E-01
PERT	3.09E+01	8.71E+01	2.71E+03	5.75E+01	-2.95E+01
PENRE	1.17E+02	7.00E+02	2.49E+04	2.71E+02	-2.97E+02
PENRM	-1.34E-01	1.29E+01	1.27E+02	2.22E+00	-2.21E-01
PENRT	1.17E+02	7.12E+02	2.51E+04	2.73E+02	-2.97E+02
SM	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
NRSF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	5.01E-02	4.42E-01	1.74E+01	1.87E-01	-2.04E-01
HWD	-1.58E-03	3.10E-02	1.13E+00	1.22E-02	-1.41E-02
NHWD	2.11E+00	1.28E+01	4.63E+02	5.20E+00	-5.73E+00
RWD	7.18E-05	5.15E-04	1.83E-02	1.99E-04	-2.23E-04
CRU	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	-1.82E-01	3.56E+00	1.23E+02	1.38E+00	-1.49E+00
MER	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
PM	9.03E-07	5.45E-06	1.99E-04	2.19E-06	-2.46E-06
IRP	3.04E-01	2.15E+00	7.67E+01	8.37E-01	-9.36E-01
ETP-fw	2.21E+01	2.70E+02	9.71E+03	1.07E+02	-1.18E+02
HTP-c	1.52E-08	8.78E-08	3.17E-06	3.63E-08	-3.90E-08
HTP-nc	2.10E-07	1.36E-06	4.92E-05	5.30E-07	-6.10E-07
SQP	2.78E+01	1.58E+02	5.65E+03	2.77E+02	-6.63E+01
Biogenic C content_packaging	2.08E-02	1.73E-02	5.70E-01	5.12E-01	2.55E-03
Biogenic C content_product	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

MANUFACTURING STAGE – LIGHT WEIGHT					
	a	b	c	d	e
GWP-total	3.61E+01	1.96E+01	-5.01E+01	-1.92E+01	-3.90E-01
GWP-fossil	3.60E+01	1.95E+01	-4.87E+01	-1.75E+01	-3.88E-01
GWP-biogenic	-7.24E-03	2.61E-02	-1.21E+00	-1.64E+00	-6.30E-04
GWP-luluc	9.70E-02	4.67E-02	-1.04E-01	-6.49E-02	-1.20E-03
ODP	4.05E-07	9.54E-07	-4.27E-07	-4.13E-07	-6.52E-09
AP	2.33E-01	1.19E-01	-2.96E-01	-1.32E-01	-2.67E-03
EP-freshwater	1.15E-02	5.98E-03	-1.36E-02	-7.36E-03	-1.37E-04
EP-marine	3.83E-02	2.02E-02	-5.44E-02	-1.60E-02	-4.03E-04
EP-terrestrial	3.98E-01	2.08E-01	-5.08E-01	-2.15E-01	-4.53E-03
POCP	1.27E-01	6.93E-02	-1.63E-01	-6.42E-02	-1.38E-03
ADPE	1.03E-04	1.12E-04	-2.12E-04	-1.22E-04	-2.14E-06
ADPF	3.62E+02	2.28E+02	-5.38E+02	-1.37E+02	-3.60E+00
WDP	5.34E+00	2.99E+00	-1.54E+01	2.57E+00	-2.58E-02
PERT+PENRT	4.20E+02	2.64E+02	-5.81E+02	-1.18E+02	-3.86E+00
PERE	5.65E+01	3.55E+01	-5.61E+01	2.79E+00	-2.64E-01
PERM	6.65E-01	5.51E-01	1.30E+01	1.63E+01	7.81E-03
PERT	5.71E+01	3.61E+01	-4.31E+01	1.91E+01	-2.56E-01
PENRE	3.62E+02	2.12E+02	-5.11E+02	-1.54E+02	-3.69E+00
PENRM	7.86E-01	1.59E+01	-2.73E+01	1.68E+01	9.01E-02
PENRT	3.62E+02	2.28E+02	-5.38E+02	-1.37E+02	-3.60E+00
SM	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
NRSF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	2.16E-01	1.08E-01	-4.64E-01	-1.07E-03	-1.73E-03
HWD	9.57E-03	8.33E-03	-1.83E-02	-1.10E-02	-1.99E-04
NHWD	6.71E+00	3.41E+00	-7.86E+00	-4.14E+00	-7.86E-02
RWD	2.52E-04	1.56E-04	-3.53E-04	-1.28E-04	-2.83E-06
CRU	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	1.06E+00	1.24E+00	-2.56E+00	-9.45E-01	-2.16E-02
MER	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
PM	2.87E-06	1.44E-06	-3.50E-06	-1.65E-06	-3.34E-08
IRP	1.06E+00	6.45E-01	-1.50E+00	-5.25E-01	-1.18E-02
ETP-fw	1.18E+02	7.67E+01	-1.68E+02	-8.19E+01	-1.57E+00
HTP-c	4.65E-08	2.40E-08	-5.39E-08	-2.71E-08	-5.52E-10
HTP-nc	6.97E-07	3.66E-07	-8.16E-07	-4.70E-07	-8.60E-09
SQP	8.24E+01	4.90E+01	9.25E+00	1.77E+02	-7.73E-01
Biogenic C content_packaging	2.16E-02	1.81E-02	4.24E-01	5.26E-01	2.40E-04
Biogenic C content_product	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

DISTRIBUTION STAGE – HEAVY WEIGHT					
	a	b	c	d	e
GWP-total	3.16E-01	2.58E-01	2.06E+00	3.22E-01	4.04E-02
GWP-fossil	3.16E-01	2.58E-01	2.06E+00	3.22E-01	4.03E-02
GWP-biogenic	6.55E-05	5.34E-05	4.26E-04	6.66E-05	8.36E-06
GWP-luluc	1.82E-04	1.48E-04	1.18E-03	1.85E-04	2.32E-05
ODP	5.09E-09	4.15E-09	3.32E-08	5.18E-09	6.50E-10
AP	3.64E-03	2.97E-03	2.37E-02	3.71E-03	4.65E-04
EP-freshwater	2.15E-05	1.75E-05	1.40E-04	2.18E-05	2.74E-06
EP-marine	1.03E-03	8.37E-04	6.68E-03	1.04E-03	1.31E-04
EP-terrestrial	1.12E-02	9.15E-03	7.30E-02	1.14E-02	1.43E-03
POCP	3.38E-03	2.76E-03	2.20E-02	3.44E-03	4.32E-04
ADPE	7.04E-07	5.74E-07	4.58E-06	7.16E-07	8.99E-08
ADPF	4.42E+00	3.60E+00	2.88E+01	4.49E+00	5.64E-01
WDP	1.94E-02	1.58E-02	1.26E-01	1.98E-02	2.48E-03
PERT+PENRT	4.47E+00	3.64E+00	2.91E+01	4.55E+00	5.70E-01
PERE	4.99E-02	4.07E-02	3.25E-01	5.07E-02	6.36E-03
PERM	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	4.99E-02	4.07E-02	3.25E-01	5.07E-02	6.36E-03
PENRE	4.42E+00	3.60E+00	2.88E+01	4.49E+00	5.64E-01
PENRM	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	4.42E+00	3.60E+00	2.88E+01	4.49E+00	5.64E-01
SM	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
NRSF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	6.19E-04	5.05E-04	4.03E-03	6.30E-04	7.90E-05
HWD	2.64E-05	2.15E-05	1.72E-04	2.69E-05	3.37E-06
NHWD	2.93E-01	2.39E-01	1.91E+00	2.98E-01	3.74E-02
RWD	8.46E-07	6.90E-07	5.51E-06	8.61E-07	1.08E-07
CRU	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
MER	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
PM	2.60E-08	2.12E-08	1.69E-07	2.65E-08	3.32E-09
IRP	3.58E-03	2.92E-03	2.33E-02	3.64E-03	4.57E-04
ETP-fw	2.30E+00	1.88E+00	1.50E+01	2.34E+00	2.94E-01
HTP-c	1.37E-10	1.12E-10	8.94E-10	1.40E-10	1.75E-11
HTP-nc	2.74E-09	2.23E-09	1.78E-08	2.79E-09	3.50E-10
SQP	3.45E+00	2.82E+00	2.25E+01	3.51E+00	4.41E-01
Biogenic C content_packaging	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

DISTRIBUTION STAGE –LIGHT WEIGHT					
	a	b	c	d	e
GWP-total	3.27E-01	2.74E-01	-1.68E-02	5.31E-01	2.31E-03
GWP-fossil	3.27E-01	2.74E-01	-1.68E-02	5.30E-01	2.31E-03
GWP-biogenic	6.78E-05	5.68E-05	-3.48E-06	1.10E-04	4.78E-07
GWP-luluc	1.88E-04	1.58E-04	-9.67E-06	3.05E-04	1.33E-06
ODP	5.27E-09	4.42E-09	-2.71E-10	8.55E-09	3.72E-11
AP	3.77E-03	3.16E-03	-1.94E-04	6.11E-03	2.66E-05
EP-freshwater	2.22E-05	1.86E-05	-1.14E-06	3.60E-05	1.57E-07
EP-marine	1.06E-03	8.90E-04	-5.46E-05	1.72E-03	7.50E-06
EP-terrestrial	1.16E-02	9.73E-03	-5.97E-04	1.88E-02	8.20E-05
POCP	3.50E-03	2.93E-03	-1.80E-04	5.67E-03	2.47E-05
ADPE	7.29E-07	6.11E-07	-3.75E-08	1.18E-06	5.15E-09
ADPF	4.57E+00	3.83E+00	-2.35E-01	7.41E+00	3.23E-02
WDP	2.01E-02	1.68E-02	-1.03E-03	3.26E-02	1.42E-04
PERT+PENRT	4.62E+00	3.87E+00	-2.38E-01	7.50E+00	3.26E-02
PERE	5.16E-02	4.32E-02	-2.65E-03	8.36E-02	3.64E-04
PERM	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	5.16E-02	4.32E-02	-2.65E-03	8.36E-02	3.64E-04
PENRE	4.57E+00	3.83E+00	-2.35E-01	7.41E+00	3.23E-02
PENRM	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	4.57E+00	3.83E+00	-2.35E-01	7.41E+00	3.23E-02
SM	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
NRSF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	6.41E-04	5.37E-04	-3.29E-05	1.04E-03	4.52E-06
HWD	2.73E-05	2.29E-05	-1.40E-06	4.43E-05	1.93E-07
NHWD	3.03E-01	2.54E-01	-1.56E-02	4.91E-01	2.14E-03
RWD	8.76E-07	7.34E-07	-4.50E-08	1.42E-06	6.18E-09
CRU	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
MER	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
PM	2.69E-08	2.26E-08	-1.38E-09	4.36E-08	1.90E-10
IRP	3.70E-03	3.10E-03	-1.90E-04	6.00E-03	2.61E-05
ETP-fw	2.38E+00	2.00E+00	-1.23E-01	3.86E+00	1.68E-02
HTP-c	1.42E-10	1.19E-10	-7.30E-12	2.30E-10	1.00E-12
HTP-nc	2.84E-09	2.38E-09	-1.46E-10	4.60E-09	2.00E-11
SQP	3.58E+00	2.99E+00	-1.84E-01	5.79E+00	2.52E-02
Biogenic C content_packaging	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

INSTALLATION STAGE-HEAVY WEIGHT				
	a	b	c	d
GWP-total	2.45E+01	2.20E+00	7.50E-01	-2.74E-01
GWP-fossil	2.28E+01	5.66E-01	7.48E-01	-2.74E-01
GWP-biogenic	1.58E+00	1.63E+00	-3.41E-05	1.31E-03
GWP-luluc	6.55E-02	1.38E-03	1.93E-03	-9.01E-04
ODP	-2.40E-07	3.77E-09	1.19E-08	4.10E-09
AP	1.57E-01	3.64E-03	4.75E-03	-2.06E-03
EP-freshwater	7.63E-03	1.69E-04	2.30E-04	-1.00E-04
EP-marine	2.64E-02	7.10E-04	7.97E-04	-3.30E-04
EP-terrestrial	2.67E-01	7.28E-03	8.30E-03	-3.44E-03
POCP	8.25E-02	2.24E-03	2.69E-03	-1.05E-03
ADPE	7.14E-05	2.35E-06	1.78E-06	-4.53E-07
ADPF	2.24E+02	5.54E+00	7.58E+00	-2.62E+00
WDP	4.95E+00	9.86E-02	9.92E-02	-4.36E-02
PERT+PENRT	2.49E+02	6.95E+00	8.90E+00	-2.94E+00
PERE	2.47E+01	9.27E-01	1.30E+00	-3.27E-01
PERM	4.11E-01	4.77E-01	1.91E-02	1.02E-03
PERT	2.51E+01	1.40E+00	1.32E+00	-3.26E-01
PENRE	2.31E+02	5.54E+00	7.50E+00	-2.75E+00
PENRM	-6.90E+00	3.82E-04	7.92E-02	1.36E-01
PENRT	2.24E+02	5.54E+00	7.58E+00	-2.62E+00
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	1.82E-01	3.67E-03	4.11E-03	-1.91E-03
HWD	7.66E-03	2.04E-04	1.60E-04	-6.55E-05
NHWD	4.44E+00	1.33E-01	1.43E-01	-5.87E-02
RWD	1.59E-04	3.74E-06	5.10E-06	-1.97E-06
CRU	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	6.65E-01	2.27E-02	1.83E-02	-3.56E-03
MER	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE	-7.18E+00	-4.48E-02	5.82E-02	9.79E-02
PM	1.94E-06	4.55E-08	5.80E-08	-2.58E-08
IRP	6.79E-01	1.58E-02	2.14E-02	-8.43E-03
ETP-fw	7.91E+01	2.24E+00	2.41E+00	-8.42E-01
HTP-c	3.07E-08	7.58E-10	9.40E-10	-3.98E-10
HTP-nc	4.61E-07	1.21E-08	1.40E-08	-6.01E-09
SQP	5.33E+01	7.91E+00	1.82E+00	-6.18E-01
Biogenic C content_packaging	1.34E-02	1.53E-02	6.23E-04	9.84E-07
Biogenic C content_product	0.00E+00	0.00E+00	0.00E+00	0.00E+00

INSTALLATION STAGE-LIGHT WEIGHT				
	a	b	c	d
GWP-total	2.24E+00	3.28E-01	1.00E+00	-1.92E-02
GWP-fossil	6.43E-01	-1.30E+00	1.00E+00	-1.95E-02
GWP-biogenic	1.59E+00	1.63E+00	1.99E-04	3.22E-04
GWP-luluc	3.96E-03	-4.69E-03	2.60E-03	-5.96E-05
ODP	-7.22E-08	-3.77E-09	1.54E-08	-2.02E-10
AP	7.65E-03	-1.00E-02	6.38E-03	-1.36E-04
EP-freshwater	3.80E-04	-5.27E-04	3.11E-04	-6.88E-06
EP-marine	1.11E-03	-1.36E-03	1.07E-03	-2.11E-05
EP-terrestrial	1.32E-02	-1.56E-02	1.11E-02	-2.30E-04
POCP	3.88E-03	-4.87E-03	3.56E-03	-7.14E-05
ADPE	-6.19E-06	-4.87E-06	3.14E-06	-8.18E-08
ADPF	4.41E+00	-1.25E+01	1.02E+01	-1.90E-01
WDP	-1.01E-01	-5.70E-02	1.47E-01	-2.00E-03
PERT+PENRT	6.26E+00	-1.33E+01	1.17E+01	-2.11E-01
PERE	1.44E+00	-1.30E+00	1.56E+00	-2.07E-02
PERM	4.11E-01	4.76E-01	1.91E-02	9.95E-05
PERT	1.85E+00	-8.24E-01	1.58E+00	-2.06E-02
PENRE	7.01E+00	-1.34E+01	1.00E+01	-1.94E-01
PENRM	-2.60E+00	8.74E-01	1.10E-01	4.39E-03
PENRT	4.41E+00	-1.25E+01	1.02E+01	-1.90E-01
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	2.11E-03	-5.80E-03	5.85E-03	-1.03E-04
HWD	-2.93E-04	-5.04E-04	2.78E-04	-7.86E-06
NHWD	2.71E-01	-2.74E-01	1.90E-01	-3.95E-03
RWD	3.70E-06	-9.99E-06	6.97E-06	-1.42E-07
CRU	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	-8.67E-02	-3.99E-02	3.24E-02	-8.19E-04
MER	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE	-1.15E+00	2.46E-01	5.52E-02	1.12E-03
PM	1.01E-07	-1.25E-07	7.81E-08	-1.70E-09
IRP	1.67E-02	-4.19E-02	2.92E-02	-5.96E-04
ETP-fw	2.71E+00	-4.81E+00	3.41E+00	-7.25E-02
HTP-c	1.69E-09	-2.04E-09	1.26E-09	-2.74E-11
HTP-nc	2.54E-08	-3.04E-08	1.90E-08	-4.21E-10
SQP	5.52E+00	3.50E+00	2.38E+00	-4.22E-02
Biogenic C content_packaging	1.34E-02	1.53E-02	6.23E-04	2.82E-06
Biogenic C content_product	0.00E+00	0.00E+00	0.00E+00	0.00E+00

END OF LIFE STAGE -HEAVY WEIGHT				
	a	b	c	d
GWP-total	1.18E-01	1.83E+00	9.46E-01	2.93E-01
GWP-fossil	1.08E-01	1.82E+00	9.40E-01	2.94E-01
GWP-biogenic	9.69E-03	2.55E-03	6.13E-03	-1.21E-03
GWP-luluc	3.61E-05	2.96E-05	2.65E-05	-1.13E-06
ODP	7.01E-10	2.17E-09	1.98E-10	2.40E-10
AP	1.86E-04	5.05E-04	1.37E-04	5.27E-05
EP-freshwater	4.62E-06	7.53E-06	3.89E-06	4.82E-07
EP-marine	7.17E-05	2.66E-04	3.47E-05	3.20E-05
EP-terrestrial	7.37E-04	2.36E-03	5.47E-04	2.68E-04
POCP	2.51E-04	6.32E-04	1.93E-04	6.30E-05
ADPE	1.04E-07	1.56E-07	9.18E-08	8.53E-09
ADPF	5.50E-01	6.60E-01	4.45E-01	1.79E-02
WDP	1.38E-02	8.15E-02	-1.76E-02	1.09E-02
PERT+PENRT	5.59E-01	6.78E-01	4.50E-01	1.94E-02
PERE	8.88E-03	1.79E-02	5.72E-03	1.47E-03
PERM	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	8.88E-03	1.79E-02	5.72E-03	1.47E-03
PENRE	5.50E-01	6.60E-01	4.45E-01	1.79E-02
PENRM	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	5.50E-01	6.60E-01	4.45E-01	1.79E-02
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	3.85E-04	2.58E-03	-5.44E-04	3.55E-04
HWD	3.25E-06	4.14E-06	4.33E-06	1.64E-07
NHWD	2.65E-02	4.89E-02	3.51E-02	3.83E-03
RWD	1.31E-07	2.35E-07	8.50E-08	1.71E-08
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	9.16E-02	8.70E+00	3.85E-02	1.37E-01
PM	4.76E-09	4.37E-09	4.00E-09	-6.71E-11
IRP	5.43E-04	9.46E-04	3.61E-04	6.58E-05
ETP-fw	1.71E+00	3.94E+00	3.92E-01	3.58E-01
HTP-c	2.18E-11	2.56E-10	1.83E-09	5.77E-11
HTP-nc	5.65E-10	5.83E-09	4.20E-09	9.12E-10
SQP	5.21E-01	3.47E-01	4.05E-01	-2.94E-02
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

END OF LIFE STAGE -LIGHT WEIGHT				
	a	b	c	d
GWP-total	3.77E-02	2.40E+00	2.24E+00	2.47E-03
GWP-fossil	2.76E-02	2.40E+00	2.24E+00	2.47E-03
GWP-biogenic	1.00E-02	1.33E-04	4.77E-05	-3.85E-06
GWP-luluc	3.61E-05	2.89E-05	2.48E-05	-1.21E-08
ODP	5.60E-10	2.97E-09	2.39E-09	-2.69E-12
AP	1.60E-04	6.63E-04	5.55E-04	-3.03E-07
EP-freshwater	4.37E-06	9.03E-06	7.75E-06	-1.98E-09
EP-marine	5.48E-05	3.64E-04	2.99E-04	-2.43E-07
EP-terrestrial	6.04E-04	3.15E-03	2.63E-03	-1.42E-06
POCP	2.19E-04	8.20E-04	6.90E-04	-3.38E-07
ADPE	9.99E-08	1.82E-07	1.58E-07	-1.81E-11
ADPF	5.36E-01	7.34E-01	6.34E-01	-1.54E-04
WDP	6.84E-03	1.20E-01	9.24E-02	-1.71E-04
PERT+PENRT	5.45E-01	7.57E-01	6.53E-01	-1.68E-04
PERE	8.02E-03	2.28E-02	1.89E-02	-1.37E-05
PERM	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	8.02E-03	2.28E-02	1.89E-02	-1.37E-05
PENRE	5.37E-01	7.34E-01	6.34E-01	-1.54E-04
PENRM	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	5.37E-01	7.34E-01	6.34E-01	-1.54E-04
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	1.63E-04	3.81E-03	2.94E-03	-5.22E-06
HWD	3.25E-06	4.26E-06	4.17E-06	6.26E-09
NHWD	2.54E-02	5.68E-02	5.22E-02	3.96E-05
RWD	1.20E-07	2.94E-07	2.44E-07	-1.79E-10
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	-1.89E-02	9.65E+00	-2.69E-03	-1.36E-03
PM	4.76E-09	4.36E-09	3.87E-09	2.35E-13
IRP	5.03E-04	1.17E-03	9.77E-04	-6.87E-07
ETP-fw	1.47E+00	5.28E+00	4.18E+00	-6.03E-03
HTP-c	1.12E-10	-9.46E-11	4.39E-10	7.61E-12
HTP-nc	3.84E-10	7.31E-09	7.17E-09	1.24E-11
SQP	5.28E-01	2.94E-01	2.62E-01	-2.61E-05
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

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

The Ocal® PVC-coated conduit system fully complies with all standards for proper use and protection in corrosive environments mandated by UL 6, NEMA RN-1* and ANSI C80.1.

References

- PEP ecopassport® PROGRAM, PCR-ed4-EN-2021 09 06, Product Category Rules for Electrical, Electronic and HVAC-R Products.
- PEP ecopassport® PROGRAMME, PSR-0003-ed2-EN-2023 06 06, Specific rules for Cable Management Solutions.
- 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.

Registration number: **ABBG-00691-V01.01-EN**	Drafting Rules: ***PCR-ed4-EN-2021 09 06*** ***Supplemented by:*** ***PSR-0003-ed2.1-EN-2023 12 08***
Verifier accreditation number: ***VH44***	Information and reference documents: **www.pep-ecopassport.org**
Date of issue: ***11-2024***	Validity period: **5 years**

Independent verification of the declaration and data, in compliance with ISO 14025: 2006

Internal: ○ External: ◉

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"