

Cobra® clamps

PEP ecopassport®

Product Environmental Profile



PEP owner address:	ABB ELIP		
Registration number:	ABBG-00890-V01.01-EN	Drafting rules:	PCR-ed4-EN-2021 09 06
Contact information:	oscar.sarmiento-penuela@ch.abb.com	Supplemented by:	0
Verifier accreditation number:	VH44	Information and reference documents:	www.pep-ecopassport.org
Date of issue:	June-25	Validity period:	5 years
Independent verification of the declaration and data in compliance with ISO 14025: 2006			
Internal:	<input type="checkbox"/>	External:	<input checked="" type="checkbox"/>
The PCR review was conducted by a panel of experts chaired by Julie Orgelet (Ddemail)			
PEPs are compliant with XP C08-100-1-2016 and EN 50693:2019 or NF E38-500 :2022 The components of the present PEP may not be compared with components from any other program.			
Document complies with ISO 14025:2006 "Environmental labels and declarations. Type III environmental declarations"			





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.

The content of this PEP cannot be compared with the content based on another program/database.

Scan QR code for more information

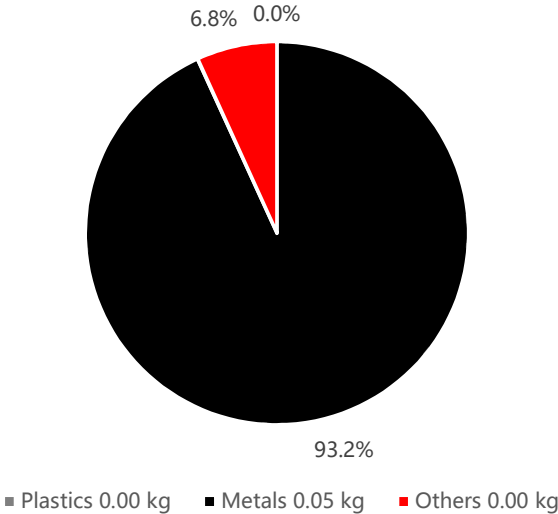


General information

Reference product	CPC050
Description of the product	Cobra® clamps are part of Superstrut® Pipe and conduit clamps family. They are used to clamp and secure pipes and conduits to steel channels, providing stable support.
Functional unit	The functional unit is clamp and secure pipes and conduits to steel channels, with a static load limit of Z for a reference life time of 20 years. The reference product is one piece of CPC050 Cobra® clamp with a weight of 0.048 kg and a packaging of 0.003 kg and static load limit of 91 kg
Other products covered	List of the other products covered in this PEP is presented in the paragraph which concerned the extrapolation rules
Manufacturing address	100 Longtin Street, Saint-Jean-Sur-Richelieu, CA



Constituent Materials



Total weight of reference product and packaging **0.051** **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%
		Steel	93.2	Wood	3.5
				Cardboard	3.3
				Paper	<0.1

The total mass of the reference product is 0.048 kg, with an additional 0.003 kg associated with packaging materials



Additional Information

Manufacturing	The manufacturing stage includes the production of the product and its packaging, as well as transportation to the manufacturer's final logistics platform. Manufacturing processes are conducted at ABB's facility in Saint-Jean-Sur-Richelieu (QC).
Distribution	Transportation from ABB's manufacturing facility in Saint-Jean-Sur-Richelieu to distribution warehouse in Bromont. Distribution from warehouse to end users is based on product-specific transport data for the reference year. The reference product is distributed in Canada
Installation	This phase includes the disposal of the product's packaging.
Use	No material or energy consumption occurs during the use phase. The product does not require maintenance.
End of life	The default end-of-life scenario specified in PSR-0003-ed2.1-EN-2023-12-08 has been adopted, assuming 100% incineration without energy recovery.
Benefits and loads beyond the system boundaries	The benefits are modelled according to PCR-ed4-EN-2021 09 06 methodology of calculating net benefits and loads beyond the system boundaries stage



Environmental Impacts

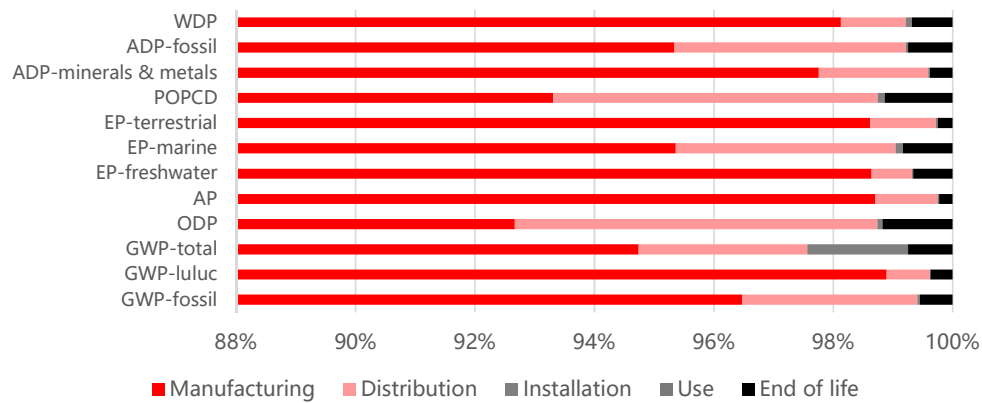
Reference lifetime	20 years
Product category	Category: Electrical, Electronic and Heating Ventilation Air Conditioning-Refrigeration (HVAC-R) products
Installation elements	No additional elements needed during installation
Use scenario	No material or energy consumption occurs during the use phase. The product does not require maintenance.
Geographical representativeness	Global
Technological representativeness	Technological representativeness for primary data refers to the specific production processes. The technological coverage for each secondary process is specified in the metadata section of the ecoinvent database.
Software and database used	SimaPro 9.6.0.1 and ecoinvent 3.10

Energy model used

Manufacturing	CA factory: the Canadian residual mix has been considered. CA storage: CA-QC electricity market mix of ecoinvent. The energy-related processes used for the inputs are those included in the datasets selected.
Installation	No energy consumption occurs during the installation phase
Use	No energy consumption occurs during the use stage
End of life	The energy-related processes used for the inputs are those included in the datasets selected.

Common base of mandatory indicators

% Environmental Impact per Life Cycle Stage of Reference Product



Environmental impact indicators

Indicator	Unit	Total	Manufacturing	Distribution	Installation	Use	End of life	Benefits	
GWP	Total	kg CO2 eq.	3.44E-01	3.26E-01	9.73E-03	5.82E-03	0.00E+00	2.56E-03	0.00E+00
	Fossil	kg CO2 eq.	3.32E-01	3.20E-01	9.73E-03	1.52E-04	0.00E+00	1.82E-03	0.00E+00
	Biogenic	kg CO2 eq.	1.19E-02	5.54E-03	3.99E-07	5.67E-03	0.00E+00	7.35E-04	0.00E+00
	Luluc	kg CO2 eq.	5.44E-04	5.38E-04	3.95E-06	4.84E-08	0.00E+00	2.01E-06	0.00E+00
ODP	kg CFC-11 eq.	2.50E-09	2.32E-09	1.52E-10	2.09E-12	0.00E+00	2.95E-11	0.00E+00	
AP	H+ eq.	3.91E-03	3.86E-03	4.05E-05	1.04E-06	0.00E+00	8.94E-06	0.00E+00	
EP	Freshwater	kg P eq.	1.14E-04	1.12E-04	7.66E-07	2.43E-08	0.00E+00	7.49E-07	0.00E+00
	Marine	kg N eq.	4.02E-04	3.83E-04	1.48E-05	4.98E-07	0.00E+00	3.34E-06	0.00E+00
	Terrestrial	mol N eq.	1.46E-02	1.44E-02	1.61E-04	4.71E-06	0.00E+00	3.61E-05	0.00E+00
POPCD	kg NMVOC eq.	1.08E-03	1.01E-03	5.88E-05	1.30E-06	0.00E+00	1.23E-05	0.00E+00	
ADP	Minerals & metals	kg SB eq.	1.45E-06	1.42E-06	2.67E-08	3.72E-10	0.00E+00	5.52E-09	0.00E+00
	Fossil	MJ	3.67E+00	3.50E+00	1.42E-01	1.61E-03	0.00E+00	2.73E-02	0.00E+00
WDP	m³ eq. depr.	6.73E-02	6.60E-02	7.30E-04	7.24E-05	0.00E+00	4.57E-04	0.00E+00	

Resource use indicators

Indicator	Unit	Total	Manufacturing	Distribution	Installation	Use	End of life	Benefits
PERE	MJ	3.70E-01	3.68E-01	1.80E-03	3.33E-05	0.00E+00	4.25E-04	0.00E+00
PERM	MJ	8.19E-02	8.19E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	4.52E-01	4.50E-01	1.80E-03	3.33E-05	0.00E+00	4.25E-04	0.00E+00
PENRE	MJ	3.65E+00	3.48E+00	1.42E-01	1.61E-03	0.00E+00	2.73E-02	0.00E+00
PENRM	MJ	1.56E-02	1.56E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ	3.67E+00	3.50E+00	1.42E-01	1.61E-03	0.00E+00	2.73E-02	0.00E+00

Common base of mandatory indicators

Use of secondary materials, water, and energy resources

Indicator	Unit	Total	Manufacturing	Distribution	Installation	Use	End of life	Benefits
SM	kg	3.50E-02	3.50E-02	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	2.29E-03	2.25E-03	2.15E-05	2.46E-06	0.00E+00	1.17E-05	0.00E+00

Waste category indicators

Indicator	Unit	Total	Manufacturing	Distribution	Installation	Use	End of life	Benefits
HWD	kg	2.45E-05	2.33E-05	9.57E-07	1.27E-08	0.00E+00	1.93E-07	0.00E+00
N-HWD	kg	9.91E-02	8.56E-02	1.21E-02	8.46E-05	0.00E+00	1.30E-03	0.00E+00
RWD	kg	3.03E-06	2.99E-06	3.07E-08	4.61E-10	0.00E+00	6.35E-09	0.00E+00

Output flow indicators

Indicator	Unit	Total	Manufacturing	Distribution	Installation	Use	End of life	Benefits
CfRu	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MfR	kg	5.21E-02	5.21E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MfER	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Other indicators

Indicator	Unit	Total
Biogenic Carbon	kg of C	0.00E+00
Product Packaging	kg of C	2.66E-03

Optional indicators

Indicator	Unit	Total	Manufacturing	Distribution	Installation	Use	End of life	Benefits
Tot PE	MJ	4.12E+00	3.95E+00	1.44E-01	1.64E-03	0.00E+00	2.77E-02	0.00E+00
Efp	Dise inc	5.33E-08	5.21E-08	9.96E-10	1.27E-11	0.00E+00	2.37E-10	0.00E+00
IrHH	kBq U-235 eq	1.24E-02	1.22E-02	1.25E-04	1.85E-06	0.00E+00	2.58E-05	0.00E+00
ETX FW	CTUe	7.15E+00	7.09E+00	3.42E-02	3.63E-03	0.00E+00	2.20E-02	0.00E+00
HTX CE	CTUh	1.71E-08	1.70E-08	4.86E-11	1.47E-12	0.00E+00	1.99E-11	0.00E+00
HTX N-CE	CTUh	7.11E-09	6.99E-09	9.14E-11	9.65E-12	0.00E+00	1.72E-11	0.00E+00
IrLS	Pt	2.15E+00	1.98E+00	1.43E-01	7.62E-04	0.00E+00	2.43E-02	0.00E+00

Glossary

Environmental impact Indicators

GWP-total	Global Warming Potential total (Climate change)
GWP-fossil	Global Warming Potential fossil
GWP-biogenic	Global Warming Potential biogenic
GWP-luluc	Global Warming Potential land use and land use change
ODP	Depletion potential of the stratospheric ozone layer
AP	Acidification potential
EP-freshwater	Eutrophication potential - freshwater compartment
EP-marine	Eutrophication potential - fraction of nutrients reaching marine end compartment
EP-terrestrial	Eutrophication potential - Accumulated Exceedance
POCP	Formation potential of tropospheric ozone
ADP-m&m	Abiotic Depletion for non-fossil resources potential
ADP-fossil	Abiotic Depletion for fossil resources potential, WDP
WDP	Water deprivation potential

Resource indicators

PENRE	Use of non-renewable primary energy excluding renewable primary energy resources used as raw material
PENRM	Use of non-renewable primary energy resources used as raw material
PENRT	Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)
PERE	Use of renewable primary energy excluding non-renewable primary energy resources used as raw material.
PERM	Use of renewable primary energy resources used as raw material
PERT	Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)

Secondary materials, water and energy resources		Waste category indicators	
SM	Use of secondary materials	HWD	Hazardous waste disposed
RSF	Use of renewable secondary fuels	N-HWD	Non-hazardous waste disposed
NRSF	Use of non-renewable secondary fuels	RWD	Radioactive waste disposed
FW	Net use of fresh water		
Output flow indicators		Optional indicators	
CfRu	Components for re-use	Tot PE	Total use of primary energy during the life cycle
MfR	Materials for recycling	Efp	Emissions of Fine particles
MfER	Materials for energy recovery	IrHH	Ionizing radiation, human health
EE	Exported Energy	ETX FW	Ecotoxicity, freshwater
		HTX CE	Human toxicity, carcinogenic effects
		HTX N-CE	Human toxicity, non-carcinogenic effects
		IrLS	Impact related to Land use / soil quality

References

- [1] PCR “PEP-PCR-ed4-EN-2021_09_06” - Product Category Rules for Electrical, Electronic and HVAC-R Products
- [2] PSR-0003-ed2.1-EN-2023 12 08 - Specific rules for Cable management solutions.
- [3] EN 50693:2019 - Product category rules for life cycle assessments of electronic and electrical products and systems
- [4] ISO 14040:2006 - Environmental management -Life cycle assessment - Principles and framework
- [5] ISO 14044:2006 - Environmental management - Life cycle assessment - Requirements and guidelines
- [6] ecoinvent v3.10 (2023). ecoinvent database version 3.10 - (<https://ecoinvent.org/>)
- [7] SimaPro Software version 9.6.0.1 - PRé Sustainability
- [8] UNI EN 15804:2012+A2:2019: Sustainability of constructions - Environmental product declarations

Approach for extrapolation rules applied to a homogeneous environmental family

The PEP can cover products belonging to a homogeneous environmental family, even though they differ from the reference product. Therefore, 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 product family satisfies these conditions, so extrapolation rules are applied following the PCR guidelines to assess the environmental impact of the products belonging to the family. The extrapolation rules are defined by the following steps:

- 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:

- packaging weight
- product weight

The representative product considered for the calculation of the extrapolation rules is CPC050. This product is most representative for the sales.

The results of the sensitivity analysis show that all the parameters considered are sensitive.

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

Cobra® clamp		
SKU name	Product Weight (kg)	Packaging Weight related to one product (kg)
CPC050	4.80E-02	3.48E-03
CPC050-RT	7.66E-02	2.76E-02
CPC075	5.42E-02	4.56E-03
CPC100	6.20E-02	4.56E-03
CPC100-RT	9.06E-02	2.76E-02
CPC125	7.10E-02	6.60E-03
CPC150	8.00E-02	9.11E-03

Extrapolation rules

The extrapolation rules are calculated based on the LCIA results of all the 5 products (reference product + variants), and the sensitivity analysis carried out for the extrapolation rules.

The influential parameters for calculating the LCIA impacts of the variants are product weight + packaging weight for the manufacturing and distribution stages. For the installation stage, the influential parameters is the packaging weight and for the end of life stage the influential parameter is the product weight.

A linear correlation between the LCIA impacts of the representative product and its variants is identified using these parameters. The most suitable equation is determined by considering the SimaPro impact results and the weights of several variables. To derive the best-fit equation, data were processed using Excel. Each environmental indicator value is calculated using the following formulas.

- Manufacturing and distribution stages:

$$y = ax_1 + b$$

where x_1 = product weight + packaging weight

- Installation stage:

$$y = ax_1 + b$$

where x_1 = packaging weight

- End of life stage:

$$y = ax_1 + b$$

where x_1 = product weight

The table above can be referenced for the components' weights and all their variants.

The coefficients' calculation for the use stage is not performed because this stage is not present in the Life cycle of the product and so there aren't impacts related to this phase.

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

MANUFACTURING STAGE		
Impact category indicator	a	b
GWP-total	4.90E+00	7.48E-02
GWP-fossil	4.93E+00	6.71E-02
GWP-biogenic	-2.07E-02	6.82E-03
GWP-luluc	9.19E-03	6.65E-05
ODP	3.65E-08	4.49E-10
AP	7.74E-02	-6.24E-05
EP-freshwater	1.70E-03	2.50E-05
EP-marine	6.44E-03	5.39E-05
EP-terrestrial	3.04E-01	-9.36E-04
POCP	1.55E-02	2.12E-04
ADPE	2.14E-05	3.28E-07
ADPF	5.39E+01	7.35E-01
WDP	1.02E+00	1.38E-02
PM	9.79E-07	2.38E-09
IRP	1.86E-01	2.69E-03
ETP-fw	1.12E+02	1.32E+00
HTP-c	2.61E-07	3.61E-09
HTP-nc	9.66E-08	2.03E-09
SQP	4.52E+01	-3.60E-01
PERE	5.97E+00	6.31E-02
PERM	2.69E+00	-6.08E-02
PERT	8.67E+00	2.51E-03
PENRE	5.36E+01	7.33E-01
PENRM	3.03E-01	1.80E-05
PENRT	5.39E+01	7.35E-01
SM	5.58E-01	6.28E-03
RSF	0.00E+00	0.00E+00
NRSF	0.00E+00	0.00E+00
FW	3.34E-02	5.35E-04
HWD	3.93E-04	3.20E-06
NHWD	1.25E+00	2.12E-02
RWD	4.53E-05	6.64E-07
CRU	0.00E+00	0.00E+00
MFR	7.53E-01	1.35E-02
MER	0.00E+00	0.00E+00
EE	0.00E+00	0.00E+00
PE	6.26E+01	7.34E-01
Biogenic C content-product	0.00E+00	0.00E+00
Biogenic C content-packaging	8.78E-02	-1.99E-03

DISTRIBUTION STAGE		
Impact category indicator	a	b
GWP-total	1.88E-01	4.40E-05
GWP-fossil	1.88E-01	4.40E-05
GWP-biogenic	7.76E-06	-1.08E-10
GWP-luluc	7.66E-05	1.47E-09
ODP	2.96E-09	-4.51E-13
AP	7.87E-04	-2.87E-08
EP-freshwater	1.49E-05	-3.71E-09
EP-marine	2.85E-04	1.13E-07
EP-terrestrial	3.11E-03	4.83E-07
POCP	1.15E-03	-3.13E-07
ADPE	5.19E-07	-3.29E-11
ADPF	2.76E+00	-1.73E-04
WDP	1.41E-02	4.64E-06
PM	1.92E-08	1.01E-11
IRP	2.44E-03	-6.77E-07
ETP-fw	6.62E-01	1.22E-04
HTP-c	9.46E-10	-6.90E-14
HTP-nc	1.78E-09	-1.91E-13
SQP	2.79E+00	-1.02E-03
PERE	3.50E-02	2.16E-06
PERM	0.00E+00	0.00E+00
PERT	3.50E-02	2.16E-06
PENRE	2.76E+00	-1.73E-04
PENRM	0.00E+00	0.00E+00
PENRT	2.76E+00	-1.73E-04
SM	0.00E+00	0.00E+00
RSF	0.00E+00	0.00E+00
NRSF	0.00E+00	0.00E+00
FW	4.20E-04	-9.92E-08
HWD	1.87E-05	-4.69E-09
NHWD	2.34E-01	5.41E-05
RWD	5.96E-07	9.40E-12
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
PE	2.79E+00	-2.07E-05
Biogenic C content-product	0.00E+00	0.00E+00
Biogenic C content-packaging	0.00E+00	0.00E+00

INSTALLATION STAGE		
Impact category indicator	a	b
GWP-total	1.67E+00	7.17E-06
GWP-fossil	4.20E-02	3.83E-06
GWP-biogenic	1.62E+00	2.05E-05
GWP-luluc	1.34E-05	1.35E-09
ODP	5.71E-10	7.01E-14
AP	2.88E-04	2.51E-08
EP-freshwater	7.24E-06	-6.25E-10
EP-marine	1.37E-04	1.41E-08
EP-terrestrial	1.30E-03	1.26E-07
POCP	3.62E-04	2.52E-08
ADPE	1.03E-07	7.68E-12
ADPF	4.51E-01	2.08E-05
WDP	1.83E-02	5.74E-06
PM	3.58E-09	1.84E-13
IRP	5.00E-04	7.05E-08
ETP-fw	8.90E-01	3.53E-04
HTP-c	4.14E-10	1.42E-14
HTP-nc	2.63E-09	3.12E-13
SQP	2.15E-01	9.27E-06
PERE	9.03E-03	1.19E-06
PERM	0.00E+00	0.00E+00
PERT	9.03E-03	1.19E-06
PENRE	4.50E-01	3.10E-05
PENRM	0.00E+00	0.00E+00
PENRT	4.50E-01	3.10E-05
SM	0.00E+00	0.00E+00
RSF	0.00E+00	0.00E+00
NRSF	0.00E+00	0.00E+00
FW	6.14E-04	2.17E-07
HWD	3.45E-06	4.82E-10
NHWD	2.37E-02	1.34E-06
RWD	1.25E-07	1.44E-11
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
PE	4.59E-01	3.04E-05
Biogenic C content-product	0.00E+00	0.00E+00
Biogenic C content-packaging	0.00E+00	0.00E+00

END OF LIFE STAGE		
Impact category indicator	a	b
GWP-total	5.31E-02	1.06E-05
GWP-fossil	3.80E-02	-3.44E-06
GWP-biogenic	1.55E-02	-8.48E-06
GWP-luluc	4.18E-05	3.28E-09
ODP	6.15E-10	-3.98E-14
AP	1.86E-04	4.67E-09
EP-freshwater	1.57E-05	-3.14E-09
EP-marine	6.97E-05	-4.26E-09
EP-terrestrial	7.53E-04	-1.86E-08
POCP	2.59E-04	-1.31E-07
ADPE	1.15E-07	1.40E-11
ADPF	5.69E-01	-2.69E-05
WDP	9.50E-03	8.23E-07
PM	4.91E-09	1.07E-12
IRP	5.40E-04	-7.07E-08
ETP-fw	4.57E-01	7.01E-05
HTP-c	4.14E-10	1.01E-14
HTP-nc	3.56E-10	9.10E-14
SQP	5.06E-01	-1.22E-05
PERE	8.87E-03	-1.03E-06
PERM	0.00E+00	0.00E+00
PERT	8.87E-03	-1.03E-06
PENRE	5.69E-01	-2.69E-05
PENRM	0.00E+00	0.00E+00
PENRT	5.69E-01	-2.69E-05
SM	0.00E+00	0.00E+00
RSF	0.00E+00	0.00E+00
NRSF	0.00E+00	0.00E+00
FW	2.40E-04	1.87E-07
HWD	4.03E-06	-4.84E-10
NHWD	2.70E-02	3.12E-06
RWD	1.33E-07	-2.31E-11
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
PE	5.78E-01	-3.35E-05
Biogenic C content-product	0.00E+00	0.00E+00
Biogenic C content-packaging	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

Product technical and Certification specifications can be found in the product catalogue on ABB's website.