epd-norge
Global program operator

Environmental product declaration

in accordance with ISO 14025 and EN 15804+A2

Tec-Flex 5G10 0,6/1,0kV RZ1-K Halogenfree

TECCON

The Norwegian EPD Foundation

Owner of the declaration:
TECCON Norge AS

Product:
Tec-Flex 5G10 0,6/1,0kV RZ1-K Halogenfree

Declared unit:
1 m

This declaration is based on Product Category Rules:
CEN Standard EN 15804:2012+A2:2019 serves as core PCR
NPCR 027:2020 Part B for Electrical cables and wires

Program operator:
The Norwegian EPD Foundation

Declaration number:
NEPD-9730-9649

Registration number:
NEPD-9730-9649

Issue date:
10.04.2025

Valid to:
10.04.2030

EPD software:
LCAno EPD generator ID: 864122

General information

Product

Tec-Flex 5G10 0,6/1,0kV RZ1-K Halogenfree

Owner of the declaration:

TECCON Norge AS
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Program operator:

The Norwegian EPD Foundation
Post Box 5250 Majorstuen, 0303 Oslo, Norway
Phone: +47 977 22 020
web: www.epd-norge.no

Manufacturer:

TECCON Norge AS
Mekjarvik 18
4072 Randaberg, Norway

Declaration number:

NEPD-9730-9649

Place of production:

Teccon production site Léon (Spain)

, Spain

This declaration is based on Product Category Rules:

CEN Standard EN 15804:2012+A2:2019 serves as core PCR
NPCR 027:2020 Part B for Electrical cables and wires

Management system:

Eco-lighthouse: 4247

Statement of liability:

The owner of the declaration shall be liable for the underlying information and evidence. EPD Norway shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

Organisation no:

986 452 125

Declared unit:

1 m Tec-Flex 5G10 0,6/1,0kV RZ1-K Halogenfree

Issue date:

10.04.2025

Declared unit with option:

A1, A2, A3, A4, A5, B6, C1, C2, C3, C4, D

Valid to:

10.04.2030

Year of study:

2024

Functional unit:

Comparability:

EPD of construction products may not be comparable if they not comply with EN 15804 and seen in a building context.

General information on verification of EPD from EPD tools:

Independent verification of data, other environmental information and the declaration according to ISO 14025:2010, § 8.1.3 and § 8.1.4. Verification of each EPD is made according to EPD-Norway's guidelines for verification and approval requiring that tools are i) integrated into the company's environmental management system, ii) the procedures for use of the EPD tool are approved by EPD-Norway, and iii) the process is reviewed annually by an independent third party verifier. See Appendix G of EPD-Norway's General Programme Instructions for further information on EPD tools

Development and verification of EPD:

The declaration is created using EPD tool lca.tools ver EPD2022.03, developed by LCA.no. The EPD tool is integrated in the company's management system, and has been approved by EPD Norway. Approval number: NEPDT155

Developer of EPD: Jan Vestergaard, Teccon Norge AS

Reviewer of company-specific input data and EPD: Jorulv Søbstad

Verification of EPD tool:

Independent third party verification of the EPD tool, background data and test-EPD in accordance with EPDNorway's procedures and guidelines for verification and approval of EPD tools. Approval number: NEPDT32.

Third party verifier:

Vito D'Incognito, Take Care International

(no signature required)

Approved:

Håkon Hauan, CEO EPD-Norge

Product

Product description:

Tec Flex RZ1-K 0,6/1 kV power cables - Halogenfree - are specially indicated for its use in distribution networks, power stations, industries or buildings, and electrical installations in steel ships.
For electrical energy transport and distribution, distribution networks, protected or not. For indoor and outdoor installations. Non-suitable for facilities of feeding of submerged pumps
Surface mounted (directly installed or on cable trays, cable ladders, cleats, brackets or in cable ducting (conduit, pipes or similar closed systems)).
Embedded (directly or in cable ducting).
In building voids and cavities (directly or on cable trays, cable ladders, in cable ducting).
Buried in ground (directly or in conduit)

Product specification

General: UNE 21123-4; IEC 60602-1
Flexible installation cable 0,6/1,0kV

Materials	kg	%
HFFR Polyolefin	0,11	20,84
Metal - Copper	0,40	72,084
Plastic - Polyethylene	0,040	7,067
Total	0,56	100,00

Packaging	kg	%
Packaging - Wood	0,09	100,00
Total incl. packaging	0,66	100,00

Technical data:

Cable
Standard IEC 60502-1; UNE 21123-4

Conductor Annealed electrolytic flexible multi-stranded copper conductor, class 5, IEC 60228

Insulation XLPE – according to standard IEC 60502-1
Coloured According to HD 308 S2
Colour code Cenelec. Yellow/Green; Blue, brown, Black, Grey
Bedding Extrusion material LSZH
Jacket Halogenfree poluolefin compound, green. UV stabilized. (Type ST8 according to IEC 60502-1)
Marking RZ1-K 0,6/1,0kV xx G mm² Year/lot
Rated Voltage U0/U 0,6/1,0kV
Volatge test 3500V
Service temp 90° C
Short circuit temp 250° C
Fire performance EN 50575:2014+A1:2016
Flame retardant EN 60332-1-2
CPR EN50575 Cca s1 (s1b), d1, a1
Dop MC1000RZ1K
Temperature – service -25- 60°
Temperature – installation 0 - 50°
Bending radius 10 x D

Marking – Approvals – directives
RohS
Low Voltage Directive
CPR compliant
Marine approval - BV 17390/BO BV
Registered for use in Swan Buildings

Market:

Nordic

Reference service life, product

30Y+

Reference service life, building or construction works

30Y+

LCA: Calculation rules

Declared unit:

1 m Tec-Flex 5G10 0,6/1,0kV RZ1-K Halogenfree

Cut-off criteria:

All major raw materials and all the essential energy is included. The production processes for raw materials and energy flows with very small amounts (less than 1%) are not included. These cut-off criteria do not apply for hazardous materials and substances.

All major materials have been included. Substance representing <1% have not been included. This include folio film for packaging!

Allocation:

The allocation is made in accordance with the provisions of EN 15804. Incoming energy and water and waste production in-house is allocated equally among all products through mass allocation. Effects of primary production of recycled materials is allocated to the main product in which the material was used. The recycling process and transportation of the material is allocated to this analysis. The allocation is made in accordance with the guidelines given in EN 15804.
Raw material - Information derived from manufactory and from a LCA generator
Processing: Derived from actual measurements during production of the individual units/stages

Data quality:

Specific data for the product composition are provided by the manufacturer. The data represent the production of the declared product and were collected for EPD development in the year of study. Background data is based on EPDs according to EN 15804 and different LCA databases. The data quality of the raw materials in A1 is presented in the table below.
Data from material supplier and the LCA generator has been accepted "As-Is"
Data from processing TECCON in-house has been repeated ongoingly without major deviations. Figures given in document are worst case values.

Materials	Source	Data quality	Year
HFFR Polyolefin	ecoinvent 3.6	Database	2019
Metal - Copper	ecoinvent 3.6	Database	2019
Packaging - Wood	Modified ecoinvent 3.6	Database	2019
Plastic - Polyethylene	ecoinvent 3.6	Database	2019

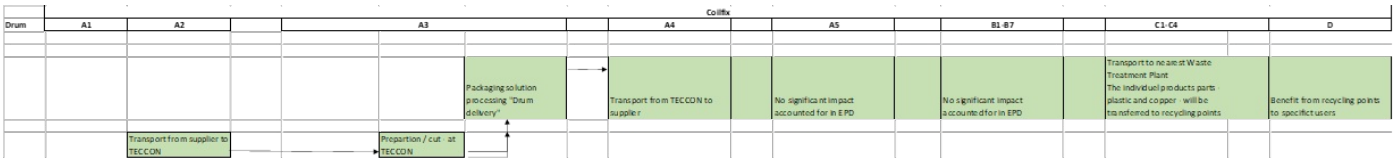
System boundaries (X=included, MND=module not declared, MNR=module not relevant)

Product stage			Construction installation stage		Use stage							End of life stage				Beyond the system boundaries
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	MND	MND	MND	MND	MND	X	MND	X	X	X	X	X

System boundary:

Cradle to Gate.
The following stages have been declared: A1-A4

The flowchart below illustrates the system boundaries of the analysis:



Additional technical information:

Article 1011989 Tec-Flex 5G10 0,6/1,0kV RZ1-K cable represent the maximum energy consumption from the product family below - from a production volume perspective as follow:
Tec-Flex 3G10 RZ1-K 1011967
Tec-Flex 3G16 RZ1-K 1011968
Tec-Flex 3G25 RZ1-K 1011969

Tec-Flex 4G10 RZ1-K 1011974
Tec-Flex 4G16 RZ1-K 1011975
Tec-Flex 4G25 RZ1-K 1011976
Tec-Flex 4G35 RZ1-K 1011977
Tec-Flex 4G50 RZ1-K 1011978
Tec-Flex 4G70 RZ1-K 1011979
Tec-Flex 4G95 RZ1-K 1011980
Tec-Flex 4G120 RZ1-K 1011981
Tec-Flex 4G150 RZ1-K 1011982
Tec-Flex 4G170 RZ1-K 1011983
Tec-Flex 4G240 RZ1-K 1011984

Tec-Flex 5G10 RZ1-K 1011989
Tec-Flex 5G16 RZ1-K 1011990
Tec-Flex 5G25 RZ1-K 1011991
Tec-Flex 5G35 RZ1-K 1011992
Tec-Flex 5G50 RZ1-K 1011993
Tec-Flex 5G70 RZ1-K 1011994
Tec-Flex 5G95 RZ1-K 1011995
If required individual EPD may be conducted accordingly!

LCA: Scenarios and additional technical information

The following information describe the scenarios in the different modules of the EPD.

Transport from production place to user (A4)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Truck, 16-32 tonnes, EURO 6 (km)	36,7 %	988	0,043	l/tkm	42,48

Assembly (A5)	Unit	Value			
Product loss during installation (percentage of cable)	Units/DU	0,020			
Waste, wood, to average treatment - A5 including transport (kg)	kg	0,090			

Transport to waste processing (C2)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Truck, 16-32 tonnes, EURO 6 (km)	36,7 %	300	0,043	l/tkm	12,90

Waste processing (C3)	Unit	Value			
Waste treatment of polyethylene (PE), incineration with energy recovery and fly ash extraction (kg)	kg	0,020			
Waste treatment of plastic mixture, incineration with energy recovery and fly ash extraction (kg)	kg	0,059			
Copper to recycling (kg)	kg	0,24			

Disposal (C4)	Unit	Value			
Landfilling of plastic mixture (kg)	kg	0,079			
Landfilling of ashes from incineration of Polyethylene (PE), process per kg ashes and residues (kg)	kg	0,00070			
Landfilling of ashes from incineration of Plastic mixture, process per kg ashes and residues (kg)	kg	0,0020			
Landfilling of copper (kg)	kg	0,16			

Benefits and loads beyond the system boundaries (D)	Unit	Value			
Substitution of electricity, in Norway (MJ)	MJ	0,12			
Substitution of thermal energy, district heating, in Norway (MJ)	MJ	1,95			
Substitution of primary copper with net scrap (kg)	kg	0,17			

LCA: Results

The LCA results are presented below for the declared unit defined on page 2 of the EPD document.

Environmental impact							
	Indicator	**Unit**	A1	A2	A3	A4	A5
	GWP-total	kg CO_2 -eq	1,93E+00	1,15E-01	1,57E-01	1,06E-01	1,89E-01
	GWP-fossil	kg CO_2 -eq	2,03E+00	1,15E-01	1,55E-01	1,06E-01	5,41E-02
	GWP-biogenic	kg CO_2 -eq	-9,56E-02	4,53E-05	4,47E-04	4,38E-05	1,35E-01
	GWP-luluc	kg CO_2 -eq	2,08E-03	4,63E-05	1,39E-03	3,77E-05	7,15E-05
	ODP	kg CFC11 -eq	1,70E-07	2,58E-08	1,70E-08	2,40E-08	5,02E-09
	AP	mol H+ -eq	9,37E-02	8,04E-04	1,40E-03	3,04E-04	1,94E-03
	EP-FreshWater	kg P -eq	7,63E-04	8,57E-07	7,41E-06	8,46E-07	1,55E-05
	EP-Marine	kg N -eq	6,22E-03	1,84E-04	1,99E-04	6,02E-05	1,42E-04
	EP-Terrestial	mol N -eq	9,17E-02	2,05E-03	2,25E-03	6,73E-04	2,03E-03
	POCP	kg NMVOC -eq	2,31E-02	6,09E-04	6,03E-04	2,58E-04	5,15E-04
	ADP-minerals&metals[1]	kg Sb-eq	8,60E-04	2,85E-06	1,27E-06	2,92E-06	1,74E-05
	ADP-fossil[1]	MJ	3,09E+01	1,70E+00	3,60E+00	1,60E+00	7,79E-01
	WDP[1]	m^3	1,44E+02	1,49E+00	-8,19E+01	1,55E+00	1,37E+00

	Indicator	**Unit**	B6	C1	C2	C3	C4	D
	GWP-total	kg CO_2 -eq	0	0	3,22E-02	2,00E-01	1,14E-02	-4,34E-01
	GWP-fossil	kg CO_2 -eq	0	0	3,21E-02	2,00E-01	1,14E-02	-4,31E-01
	GWP-biogenic	kg CO_2 -eq	0	0	1,33E-05	3,52E-06	8,28E-07	-1,98E-03
	GWP-luluc	kg CO_2 -eq	0	0	1,14E-05	6,38E-07	1,09E-06	-8,34E-04
	ODP	kg CFC11 -eq	0	0	7,28E-09	3,49E-10	9,06E-10	-8,27E-04
	AP	mol H+ -eq	0	0	9,24E-05	3,82E-05	2,45E-05	-7,06E-02
	EP-FreshWater	kg P -eq	0	0	2,57E-07	3,16E-08	5,12E-08	-4,76E-04
	EP-Marine	kg N -eq	0	0	1,83E-05	1,83E-05	1,81E-05	-2,93E-03
	EP-Terrestial	mol N -eq	0	0	2,04E-04	1,89E-04	9,83E-05	-4,52E-02
	POCP	kg NMVOC -eq	0	0	7,83E-05	4,56E-05	2,98E-05	-1,23E-02
	ADP-minerals&metals[1]	kg Sb-eq	0	0	8,88E-07	1,74E-08	2,40E-08	-3,95E-04
	ADP-fossil[1]	MJ	0	0	4,86E-01	2,31E-02	7,26E-02	-3,91E+00
	WDP[1]	m^3	0	0	4,70E-01	1,47E-01	1,56E+00	2,10E+01

GWP-total = Global Warming Potential total; 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 = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; 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 = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

1. The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator

Remarks to environmental impacts

Additional environmental impact indicators

Indicator		Unit	A1	A2	A3	A4	A5
	PM	Disease incidence	2,56E-07	6,06E-09	3,23E-09	6,48E-09	5,65E-09
	IRP[2]	kgBq U235 -eq	1,29E-01	7,41E-03	3,88E-02	7,00E-03	3,71E-03
	ETP-fw[1]	CTUe	1,14E+03	1,23E+00	2,99E+00	1,19E+00	2,49E+01
	HTP-c[1]	CTUh	2,06E-08	0,00E+00	7,70E-11	0,00E+00	4,17E-10
	HTP-nc[1]	CTUh	1,55E-06	1,21E-09	2,61E-09	1,30E-09	3,13E-08
	SQP[1]	dimensionless	2,51E+01	1,07E+00	7,75E-01	1,12E+00	5,75E-01

Indicator		Unit	B6	C1	C2	C3	C4	D
	PM	Disease incidence	0	0	1,97E-09	1,64E-10	4,39E-10	-1,47E-07
	IRP[2]	kgBq U235 -eq	0	0	2,12E-03	5,50E-05	4,52E-04	-5,70E-03
	ETP-fw[1]	CTUe	0	0	3,60E-01	3,07E-01	1,01E+02	-6,50E+02
	HTP-c[1]	CTUh	0	0	0,00E+00	9,00E-12	5,00E-12	-9,17E-09
	HTP-nc[1]	CTUh	0	0	3,94E-10	4,19E-10	9,60E-11	-7,85E-07
	SQP[1]	dimensionless	0	0	3,40E-01	3,98E-03	1,63E-01	-9,32E+00

PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Potential Soil Quality Index (dimensionless)

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

1. The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator
2. This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

Resource use

Indicator		Unit	A1	A2	A3	A4	A5
	PERE	MJ	6,48E+00	2,28E-02	9,46E-01	2,29E-02	1,50E-01
	PERM	MJ	1,25E+00	0,00E+00	0,00E+00	0,00E+00	-1,22E+00
	PERT	MJ	7,73E+00	2,28E-02	9,46E-01	2,29E-02	-1,07E+00
	PENRE	MJ	2,75E+01	1,70E+00	3,60E+00	1,60E+00	7,10E-01
	PENRM	MJ	3,62E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	PENRT	MJ	3,11E+01	1,70E+00	3,60E+00	1,60E+00	7,10E-01
	SM	kg	6,97E-02	0,00E+00	0,00E+00	0,00E+00	1,39E-03
	RSF	MJ	1,66E-01	8,00E-04	6,26E-03	8,20E-04	3,50E-03
	NRSF	MJ	4,25E-03	3,21E-03	1,68E-02	2,93E-03	7,25E-04
	FW	m^3	3,74E-02	1,71E-04	1,59E-03	1,71E-04	8,13E-04

Indicator		Unit	B6	C1	C2	C3	C4	D
	PERE	MJ	0	0	6,96E-03	1,18E-03	8,42E-03	-2,51E+00
	PERM	MJ	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	PERT	MJ	0	0	6,96E-03	1,18E-03	8,42E-03	-2,51E+00
	PENRE	MJ	0	0	4,86E-01	2,32E-02	7,26E-02	-3,91E+00
	PENRM	MJ	0	0	0,00E+00	-3,62E+00	0,00E+00	0,00E+00
	PENRT	MJ	0	0	4,86E-01	-3,60E+00	7,26E-02	-3,91E+00
	SM	kg	0	0	0,00E+00	0,00E+00	8,68E-06	1,23E-01
	RSF	MJ	0	0	2,49E-04	2,62E-05	1,75E-04	1,15E-02
	NRSF	MJ	0	0	8,90E-04	0,00E+00	1,07E-04	-3,42E-02
	FW	m^3	0	0	5,20E-05	1,74E-04	9,39E-05	-1,15E-02

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; SM = Use of secondary materials; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Net use of fresh water

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

End of life - Waste

Indicator		Unit	A1	A2	A3	A4	A5
	HWD	kg	2,27E-02	8,58E-05	2,01E-04	8,26E-05	5,97E-04
	NHWD	kg	8,61E-01	7,32E-02	1,42E-02	7,78E-02	1,15E-01
	RWD	kg	1,19E-04	1,16E-05	2,77E-05	1,09E-05	3,34E-06

Indicator		Unit	B6	C1	C2	C3	C4	D
	HWD	kg	0	0	2,51E-05	0,00E+00	6,77E-03	-4,76E-03
	NHWD	kg	0	0	2,36E-02	0,00E+00	2,45E-01	-2,06E-01
	RWD	kg	0	0	3,31E-06	0,00E+00	5,00E-07	-5,07E-06

HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

End of life - Output flow

Indicator		Unit	A1	A2	A3	A4	A5
	CRU	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	MFR	kg	5,05E-05	0,00E+00	0,00E+00	0,00E+00	4,90E-03
	MER	kg	1,18E-04	0,00E+00	0,00E+00	0,00E+00	9,16E-02
	EEE	MJ	2,20E-04	0,00E+00	0,00E+00	0,00E+00	6,52E-02
	EET	MJ	3,33E-03	0,00E+00	0,00E+00	0,00E+00	9,86E-01

Indicator		Unit	B6	C1	C2	C3	C4	D
	CRU	kg	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	MFR	kg	0	0	0,00E+00	2,45E-01	7,09E-06	-4,81E-03
	MER	kg	0	0	0,00E+00	7,90E-02	1,73E-07	-6,33E-04
	EEE	MJ	0	0	0,00E+00	1,29E-01	1,12E-05	-1,55E-03
	EET	MJ	0	0	0,00E+00	1,96E+00	1,70E-04	-2,35E-02

CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported energy electrical; EET = Exported energy thermal

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

Biogenic Carbon Content

Indicator	Unit	At the factory gate
Biogenic carbon content in product	kg C	0,00E+00
Biogenic carbon content in accompanying packaging	kg C	3,72E-02

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO2

Additional requirements

Greenhouse gas emissions from the use of electricity in the manufacturing phase

National production mix from import, low voltage (production of transmission lines, in addition to direct emissions and losses in grid) of applied electricity for the manufacturing process (A3).

Electricity mix	Source	Amount	Unit
Electricity, Spain (kWh)	ecoinvent 3.6	337,33	g CO2-eq/kWh

Dangerous substances

The product contains no substances given by the REACH Candidate list.

Indoor environment

No effect on in-door environment

Additional Environmental Information

Additional environmental impact indicators required in NPCR Part A for construction products						
Indicator	Unit	A1	A2	A3	A4	A5
GWPIOBC	kg CO_2 -eq	2,06E+00	1,15E-01	1,63E-01	1,06E-01	5,48E-02

Indicator	Unit	B6	C1	C2	C3	C4	D
GWPIOBC	kg CO_2 -eq	0	0	3,22E-02	2,00E-01	3,03E-03	-2,11E-01

GWP-IOBC: Global warming potential calculated according to the principle of instantaneous oxidation. In order to increase the transparency of biogenic carbon contribution to climate impact, the indicator GWP-IOBC is required as it declares climate impacts calculated according to the principle of instantaneous oxidation. GWP-IOBC is also referred to as GWP-GHG in context to Swedish public procurement legislation.

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