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Environmental product declaration

in accordance with ISO 14025 and EN 15804+A2

Sto Putsbruk

sto
Building with conscience.

EPD-Global

Owner of the declaration:
Sto SE & Co. KGaA

Product:
Sto Putsbruk

Declared unit:
1 kg

This declaration is based on Product Category Rules:
CEN Standard EN 15804:2012+A2:2019 serves as core PCR
NPCR 009:2021 Part B for Technical - Chemical products for building and construction industry

Program operator:
EPD-Global

Declaration number:
NEPD-8507-8172

Issue date:
16.12.2024

Latest revision
v1.0 Date: 05.10.2026

Valid to:
16.12.2029

EPD software:
LCAno EPD generator ID: 1805288

General information

Product

Sto Putsbruk

Owner of the declaration:

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Manufacturer:

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SE-582 77 Linköping, Sweden

Declaration number:

NEPD-8507-8172

Place of production:

Linköping
Gesällgatan 6
SE-582 77 Linköping, Sweden

This declaration is based on Product Category Rules:

CEN Standard EN 15804:2012+A2:2019 serves as core PCR
NPCR 009:2021 Part B for Technical - Chemical products for building and construction industry

Management system:

ISO 14001; ISO 50001; ISO 9001

Statement of liability:

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

Organisation no:

DE142834082

Declared unit:

1 kg Sto Putsbruk

Issue date:

16.12.2024

Declared unit with option:

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

Valid to:

16.12.2029

Year of study:

2023

Functional unit:

Comparability:

EPDs of construction products may not be comparable if they do not comply with EN 15804 and are not viewed 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-Global'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-Global, and iii) the process is reviewed annually by an independent third party verifier. See Appendix G of EPD-Global'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-Global. NEPDT143

Developer of EPD: Angelica Hultin

Reviewer of company-specific input data and EPD: Karin Bromoe

Verification of EPD tool:

Independent third party verification of the EPD tool, background data and test-EPD in accordance with EPD-Global's procedures and guidelines for verification and approval of EPD tools. NEPDT73

Third party verifier:

Linda Høibye, Life Cycle Assessment Consulting

(no signature required)

Approved:

Håkon Hauan, CEO EPD-Global

Product

Product description:

Sto Putsbruk is a cementitious mortar used on mineral surfaces. It can be used both in- and outdoors. The product is a dry mineral mortar that is mixed with water at the building site. It can be applied manually by hand or with a mixer pump and plaster gun. Sto Putsbruk is available in three variants; Sto Putsbruk A (class CS IV), Sto Putsbruk B (class CS III) and Sto Putsbruk C (class CS II). This EPD covers all three variants.

All products above are within ± 10% for the GWP-total indicator. The product with the highest GWP has been used as the basis for this EPD.

Product specification

The composition of the product is described in the following table:

Materials	Value	Unit
Cement	3-20	%
Pigments and Fillers	50-90	%
Binders	1-10	%
Packaging	1-5	%
Additives	<1	%

Technical data:

Sto Putsbruk fulfills technical specifications according to EN 998-1:2016 Specification for mortar for masonry - Part 1: Rendering and plastering mortar.

Market:

Main market is the Nordic countries.

Reference service life, product

50

A reference service life (RSL) as per ISO 15686-1, -2, - 7, and -8 is not declared. In this LCA an RSL of 50 years has been declared, equal to the useful life of the building (according to standard 15804+A2), since the mortar is incorporated in the building structure.

Reference service life, building

50

LCA: Calculation rules

Declared unit:

1 kg Sto Putsbruk

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.

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.

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.

Materials	Source	Data quality	Year
Additives	CEPE RM Database v3.0	Database	2016
Additives	Ecoinvent 3.6	Database	2019
Aggregate	ecoinvent 3.6	Database	2019
Cement	NEPD-5375-4689-EN	EPD	2023
Packaging - Paper	ecoinvent 3.6	Database	2019
Packaging - Plastic	ecoinvent 3.6	Database	2019
Packaging - Wood	Modified ecoinvent 3.6	Database	2019
Pigments and Fillers	CEPE RM Database v3.0	Database	2016

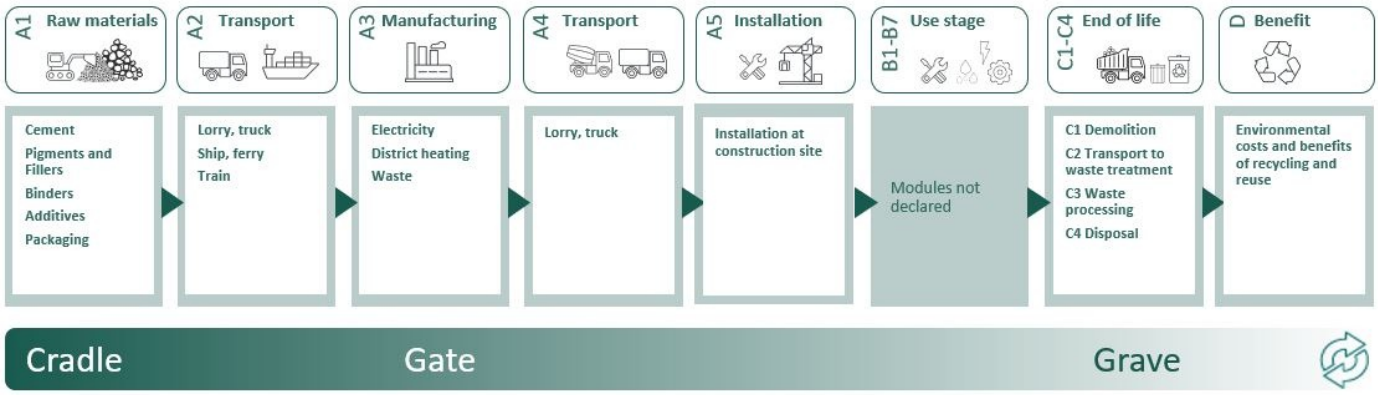
System boundaries (X=included, MND=module not declared, MNR=module not relevant)

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	MND	MND	X	X	X	X	X

System boundary:

The approach is "cradle-to-grave" but with exclusion of the use stage (B1-B7). Stage B1-B7 is not applicable for this cement based product. The product does not require any actions or maintenance operations during the use stages. The following modules have been considered:

A1, A2, A3 (Product stages): Extraction and transport of raw materials, including packaging, and manufacturing process
A4 (Transport to market): Transportation from manufacturing plant to customer
A5 (Assembly): Installation at construction site
C1, C2, C3, C4 (End of life stages): Deconstruction, demolition, transport to waste processing, waste processing for reuse, recovery and/or recycling and disposal
D (Benefits and loads beyond the system boundaries): Reuse/recovery/recycling potential



Additional technical information:

The waste code for unused product is 17 09 03* Other construction and demolition wastes (including mixed waste) containing hazardous substances. See MSDS section 13.

Hardened product is not classified as dangerous waste.

LCA: Scenarios and additional technical information

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

A4 (Transport to market/building site): Most of our transports are from the production site in Linköping to customers in Stockholm. We have therefore taken this distance as an average. This gives the value of 200 km. Transport method is Lorries (Trucks) in the tonnage range 16-32 t.

A5 (Installation): The product is used in a wet state, it is mixed with water at the building site according to specifications in the technical data sheet. Application of the mortar is either by hand or with a mixer pump together with a plaster gun. Electricity for application with machine has been taken into account in this LCA. Outputs are small amounts of waste from the product itself (assumed to be less than 5%) and waste from packaging materials.

C1 (De-construction, demolition): In this LCA we have assumed a scenario where the product is demolished together with the whole building.

C2 (Transport end of life): This stage includes the transportation effects of demolished waste to a waste processing area. The distance between the demolishing area and a waste processing area is assumed to be quite short (less than 100 km). The distance varies depending on the type of waste processing.

C3 (Waste processing): In this LCA we have assumed a typical waste scenario for concrete waste (cement-based products) that estimates that 10% of the product is recycled. The product can be used as filling masses in for instance road construction. The most part is assumed to be put on landfill (90%).

C4 (Final disposal): Mineral construction waste is categorized as non-hazardous waste. The product can therefore be used in landfills. The degree of landfill and possibility to recycle the mineral waste is taken into account when disposing of the product. The degree of landfill is assumed to be 90% and the rest is assumed to be recycled.

D (Environmental costs and benefits of recycling and reuse): It is preferable if mineral construction waste can be recycled, since this would save resources such as raw materials and also save energy during production. 10% of the product is estimated to be recycled.

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 (kgkm)	36.7 %	200.00	0.043	l/tkm	8.60

Assembly (A5)	Unit	Value			
Tap water (kg)	kg	0.184			
Material loss, including waste treatment (psc)	Units	0.05			
Electricity, Nordic (kWh)	kWh	0.0027			
Waste, packaging, plastic film (LDPE), to average treatment (kg)	kg	0.0001			
Waste, packaging, pallet, EUR wooden pallet, reusable, average treatment (kg)	kg	0.0234			
Waste, bag, 84% paper and 16% LDPE, to average treatment (kg)	kg	0.0031			

De-construction demolition (C1)	Unit	Value			
Demolition of building per kg of cement-based product, C1 (kg)	kg	1.00			

Transport to waste processing (C2)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Truck, 16-32 tonnes, EURO 6 (kgkm)	36.7 %	100.00	0.043	l/tkm	4.30

Waste processing (C3)	Unit	Value			
Waste treatment of cement-based product after demolition to recycling (kg)	kg	0.10			

Disposal (C4)	Unit	Value			
Waste, inert waste, to landfill (kg)	kg	0.90			

Benefits and loads beyond the system boundaries (D)	Unit	Value			
Substitution of electricity (MJ)	MJ	0.0008072			
Substitution of thermal energy, district heating (MJ)	MJ	0.01221			
Substitution of primary aggregates with crushed recycled cement-based products (kg)	kg	0.10			

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	C1	C2	C3	C4	D
GWP-total	kg CO_2 -eq	3.68E-01	3.80E-02	3.94E-04	3.63E-02	1.04E-01	0.00E+00	1.82E-02	7.75E-05	7.39E-03	-3.07E-04
GWP-fossil	kg CO_2 -eq	4.07E-01	3.79E-02	3.63E-04	3.63E-02	2.72E-02	0.00E+00	1.82E-02	7.10E-05	7.38E-03	-3.00E-04
GWP-biogenic	kg CO_2 -eq	-3.99E-02	1.68E-05	2.44E-05	1.50E-05	7.73E-02	0.00E+00	7.51E-06	6.12E-06	8.62E-06	-4.71E-06
GWP-luluc	kg CO_2 -eq	7.00E-05	1.76E-05	6.13E-06	1.29E-05	2.70E-05	0.00E+00	6.46E-06	9.83E-08	1.81E-06	-2.59E-06
ODP	kg CFC11 -eq	3.37E-09	8.36E-09	6.80E-11	8.23E-09	1.40E-09	0.00E+00	4.11E-09	1.40E-11	2.80E-09	-5.16E-06
AP	mol H+ -eq	7.78E-04	5.57E-04	2.01E-06	1.04E-04	8.13E-05	0.00E+00	5.22E-05	5.75E-07	6.57E-05	-2.64E-06
EP-FreshWater	kg P -eq	2.37E-06	2.93E-07	3.16E-08	2.90E-07	2.74E-07	0.00E+00	1.45E-07	4.49E-09	8.37E-08	-1.24E-08
EP-Marine	kg N -eq	2.45E-04	1.38E-04	6.06E-07	2.06E-05	2.29E-05	0.00E+00	1.03E-05	1.68E-07	2.44E-05	-9.05E-07
EP-Terrestial	mol N -eq	2.63E-03	1.53E-03	7.35E-06	2.31E-04	2.49E-04	0.00E+00	1.15E-04	1.94E-06	2.69E-04	-1.05E-05
POCP	kg NMVOC -eq	6.69E-04	4.20E-04	1.64E-06	8.85E-05	6.75E-05	0.00E+00	4.42E-05	5.20E-07	7.71E-05	-2.79E-06
ADP-minerals&metals[1]	kg Sb-eq	1.84E-06	5.18E-07	7.53E-09	1.00E-06	2.06E-07	0.00E+00	5.02E-07	9.01E-10	6.65E-08	-2.10E-08
ADP-fossil[1]	MJ	3.02E+00	5.62E-01	1.28E-02	5.49E-01	2.44E-01	0.00E+00	2.75E-01	2.21E-03	2.03E-01	-4.89E-03
WDP[1]	m^3	2.89E+01	4.34E-01	1.08E+00	5.31E-01	2.46E+00	0.00E+00	2.66E-01	2.43E-01	1.25E+00	-1.94E-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"

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

This EPD might use cement EPDs as input in which the Net approach* has been applied. See the Data Quality table on page 3.

*The Net approach excludes the emissions from waste incineration used to produce heat required in the cement manufacturing process.

Additional environmental impact indicators

Indicator		Unit	A1	A2	A3	A4	A5	C1	C2	C3	C4	D
	PM	Disease incidence	2.02E-06	2.49E-09	1.25E-07	2.22E-09	1.08E-07	0.00E+00	1.11E-09	9.00E-12	1.40E-09	-7.90E-11
	IRP[2]	kgBq U235 -eq	2.10E+01	2.47E-03	3.67E-04	2.40E-03	1.05E+00	0.00E+00	1.20E-03	3.70E-05	9.27E-04	-4.20E-05
	ETP-fw[1]	CTUe	9.24E-01	3.88E-01	5.91E-03	4.07E-01	1.22E-01	0.00E+00	2.03E-01	1.56E-03	1.11E-01	-9.49E-03
	HTP-c[1]	CTUh	1.33E-10	0.00E+00	0.00E+00	0.00E+00	7.00E-12	0.00E+00	0.00E+00	0.00E+00	5.00E-12	0.00E+00
	HTP-nc[1]	CTUh	2.19E-09	4.18E-10	4.00E-12	4.45E-10	1.96E-10	0.00E+00	2.22E-10	1.00E-12	8.00E-11	-1.00E-11
	SQP[1]	dimensionless	9.89E-01	4.35E-01	4.94E-03	3.84E-01	1.49E-01	0.00E+00	1.92E-01	1.25E-03	7.82E-01	2.02E-03

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"

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	C1	C2	C3	C4	D
	PERE	MJ	9.44E-01	7.57E-03	6.58E-03	7.86E-03	5.93E-02	0.00E+00	3.93E-03	1.14E-03	7.27E-03	-7.16E-03
	PERM	MJ	3.62E-01	0.00E+00	0.00E+00	0.00E+00	-7.03E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PERT	MJ	1.31E+00	7.57E-03	6.58E-03	7.86E-03	-6.43E-01	0.00E+00	3.93E-03	1.14E-03	7.27E-03	-7.16E-03
	PENRE	MJ	3.65E+00	5.62E-01	1.30E-02	5.49E-01	2.76E-01	0.00E+00	2.75E-01	2.21E-03	2.03E-01	-5.10E-03
	PENRM	MJ	2.53E-02	0.00E+00	0.00E+00	0.00E+00	-2.98E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PENRT	MJ	3.68E+00	5.62E-01	1.30E-02	5.49E-01	2.46E-01	0.00E+00	2.75E-01	2.21E-03	2.03E-01	-5.10E-03
	SM	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	RSF	MJ	6.53E-02	3.09E-04	2.01E-05	2.81E-04	3.43E-03	0.00E+00	1.41E-04	0.00E+00	1.51E-04	-1.96E-05
	NRSF	MJ	3.98E-01	6.33E-04	6.34E-05	1.01E-03	2.01E-02	0.00E+00	5.03E-04	0.00E+00	3.26E-04	-3.90E-04
	FW	m^3	4.30E-01	5.95E-05	1.21E-05	5.87E-05	2.18E-02	0.00E+00	2.94E-05	3.78E-06	2.50E-04	-1.50E-04

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"

End of life - Waste

Indicator		Unit	A1	A2	A3	A4	A5	C1	C2	C3	C4	D
	HWD	kg	9.46E-05	2.98E-05	5.32E-05	2.83E-05	1.33E-05	0.00E+00	1.42E-05	2.20E-07	0.00E+00	-9.81E-07
	NHWD	kg	1.50E+00	3.07E-02	6.19E-05	2.67E-02	1.28E-01	0.00E+00	1.34E-02	6.96E-06	9.00E-01	-5.22E-05
	RWD	kg	9.87E-06	3.85E-06	8.39E-07	3.74E-06	1.13E-06	0.00E+00	1.87E-06	2.33E-08	0.00E+00	-3.60E-08

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"

End of life - Output flow

Indicator		Unit	A1	A2	A3	A4	A5	C1	C2	C3	C4	D
	CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.33E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	MFR	kg	0.00E+00	0.00E+00	1.66E-02	0.00E+00	6.67E-03	0.00E+00	0.00E+00	1.00E-01	0.00E+00	0.00E+00
	MER	kg	0.00E+00	0.00E+00	1.00E-05	0.00E+00	1.22E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	EEE	MJ	0.00E+00	0.00E+00	1.47E-05	0.00E+00	8.49E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	EET	MJ	0.00E+00	0.00E+00	2.23E-04	0.00E+00	1.28E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

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"

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	1.09E-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, Sweden (kWh)	ecoinvent 3.6	54.94	g CO2-eq/kWh

Dangerous substances

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

Indoor environment

Emission tests have not been carried out for interior use.

Additional Environmental Information

Additional environmental impact indicators required in NPCR Part A for construction products											
Indicator	**Unit**	A1	A2	A3	A4	A5	C1	C2	C3	C4	D
GWPIOBC	kg CO_2 -eq	4.10E-01	3.80E-02	3.71E-04	3.63E-02	2.75E-02	0.00E+00	1.82E-02	7.11E-05	7.39E-03	-3.17E-04

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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ISO 14044:2006 Environmental management - Life cycle assessment - Requirements and guidelines.
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ISO 21930:2017 Sustainability in buildings and civil engineering works - Core rules for environmental product declarations of construction products.
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NPCR Part A: Construction products and services. Ver. 2.0, 24.03.2021 EPD Norway.
NPCR 009 Part B for Technical - Chemical products for building and construction industry, Ver. 3.0, 06.10.2021, EPD Norway.

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