

Environmental product declaration

in accordance with ISO 14025 and EN 15804+A2

StoPox SK 41



Owner of the declaration:

Sto SE & Co. KGaA

Product:

StoPox SK 41

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-14286-14664

Issue date:

01.12.2025

Valid to:

01.12.2030

EPD software:

LCAno EPD generator ID: 1339424

General information

Product

StoPox SK 41

Program operator:

EPD-Global
Post Box 5250 Majorstuen, 0303 Oslo, Norway
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web: www.epd-global.com

Declaration number:

NEPD-14286-14664

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

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.

Declared unit:

1 kg StoPox SK 41

Declared unit with option:

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

Functional unit:

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

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. NEPD73

Third party verifier:

Elisabet Amat, GREENIZE projects

(no signature required)

Owner of the declaration:

Sto SE & Co. KGaA
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Manufacturer:

Sto SE & Co. KGaA
Ehrenbachstraße 1
79780 Stühlingen, Germany

Place of production:

Rüsselsheim
Eisenstraße 38
65428 Rüsselsheim, Germany

Management system:

ISO 14001; ISO 50001; ISO 9001

Organisation no:

DE142834082

Issue date:

01.12.2025

Valid to:

01.12.2030

Year of study:

2023

Comparability:

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

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. NEPD73

Developer of EPD: Linus Kaltenbach

Reviewer of company-specific input data and EPD: Angelica Hultin

Approved:



Håkon Hauan, CEO EPD-Global

Product

Product description:

StoPox SK 41 is an EP adhesive in accordance with EN 1504-4. It can be used in accordance with the DAfStb guideline (German committee for reinforced concrete) for

- bonding CFRP composites onto concrete structures
- bonding steel reinforcement onto concrete
- bonding concrete elements

The national technical approval must be respected. StoPox SK 41 has to be prepared and mixed with a stirrer and applied in accordance with the technical data sheet.

StoPox SK 41 is delivered in two components, StoPox SK 41 Component A and StoPox SK 41 Component B, which have to be mixed as stated in the technical data sheet before use. This EPD calculates the environmental impact of the correctly mixed components at the construction site.

Product specification

The composition of the mixed product is stated in the following table:

Materials	Value	Unit
Binder, org.	< 20	%
Mineral filler	< 70	%
Pigments	< 2	%
Polyamine	< 6	%
Additive	< 5	%

Technical data:

Information on the technical data of StoPox SK 41 as well as the mixing and application process can be found in the Technical Data Sheet on www.sto.de for Germany or on the country specific product page.

Criterion	Standard / test specification	Value/ Unit
Density (mixture 23 °C)	ISO 2811	1,70 - 1,80 g/cm ³

Market:

The market is Europe with a focus on Germany.

Reference service life, product

The service life of the product is highly dependent on use, maintenance and exposure. As a bonding agent for concrete structures, it can be stated that the service life of StoPox SK 41 is at least 30 years.

A reference service life (RSL) in accordance with ISO 15686-1,-2,-7, and -8 is not declared.

Reference service life, building

LCA: Calculation rules

Declared unit:

1 kg StoPox SK 41

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.

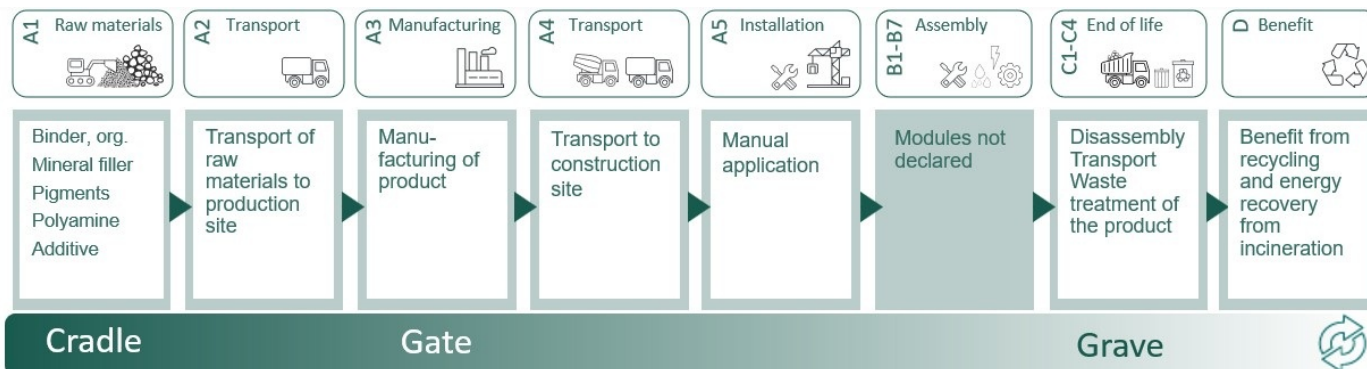
Materials	Source	Data quality	Year
Additives	CEPE RM Database v3.0	Database	2016
Binder	CEPE RM Database v3.0	Database	2016
Binder	ecoinvent 3.6	Database	2019
Binder	ecoinvent 3.6	Database	2020
Binders and Resins	ecoinvent 3.10	Database	2023
Fillers	ecoinvent 3.6	Database	2019
Packaging	ecoinvent 3.6	Database	2019
Packaging - Wood	Modified ecoinvent 3.6	Database	2019
Pigments	CEPE RM Database v3.0	Database	2016
Pigments and Fillers	CEPE RM Database v3.0	Database	2016
Thickener	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 scope of this EPD is cradle to gate with options, modules C1-C4 and module D. No actions are necessary during User stage.



Additional technical information:

The waste code for the unused product is 08 01 11* Paint and varnish waste containing organic solvents or other dangerous substances which is hazardous waste in terms of the European directive 2008/98/EG. After application, the product is considered as non-hazardous waste under the European Waste Catalogue (EWC), category 17.09 "Other Construction and Demolition Waste".

Even small quantities emptied into the soil can affect the quality of drinking water, a careful handling of the unused product is therefore needed.

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): Since the distance to the construction site can vary strongly, a distance of 300 km is used to allow simple scaling for individual projects.

A5 (Installation): The product is applied according to the specification in the technical data sheet at the building site. The mixing process of the two components is done with a slow running stirrer. Outputs are small amounts of waste from the product itself (assumed to be a maximum of 5 %) and waste from packaging materials.

C1 (De-construction, demolition): It is assumed that StoPox SK 41 is dismantled using machinery.

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, C4 (Waste processing): When used as recommended, StoPox Sk 41 is not classified as hazardous waste and treated as mixed construction waste since it is incorporated in the building structure. A typical End of life scenario for construction waste in Germany is a mix of recycling and landfill. Since an End-of-life scenario has to be declared according to the PCR, it is assumed as 90 % landfill and 10 % recycling.

D (Environmental costs and benefits of recycling and reuse): Energy credit related to energy recovery from the incineration is included in module D.

Stages not included:

Once installation is complete, no actions or technical operations are required during the use stage until the end of life stage. Stages B1-B7 are therefore not declared.

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 %	300.00	0.043	l/tkm	12.90
Assembly (A5)	Unit	Value			
Material loss, including waste treatment (psc)	Units	0.05			
Waste, packaging, metal, average treatment (kg)	kg	0.031			
Waste, packaging, pallet, EUR wooden pallet, reusable, average treatment (kg)	kg	0.095			
De-construction demolition (C1)	Unit	Value			
Diesel (L)	L	0.000756			
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 primary aggregates with crushed recycled cement-based products (kg)	kg	0.10			
Substitution of electricity (MJ)	MJ	0.003277			
Substitution of thermal energy, district heating (MJ)	MJ	0.04958			

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	1.89E+00	5.03E-02	2.24E-02	5.52E-02	2.47E-01	2.67E-03	1.84E-02	7.20E-05	7.39E-03	-5.32E-04
	GWP-fossil	kg CO ₂ -eq	2.02E+00	5.03E-02	2.00E-02	5.52E-02	1.09E-01	2.67E-03	1.84E-02	7.10E-05	7.38E-03	-5.16E-04
	GWP-biogenic	kg CO ₂ -eq	-1.38E-01	2.08E-05	7.27E-04	2.28E-05	1.37E-01	5.01E-07	7.61E-06	6.13E-07	8.62E-06	-5.16E-06
	GWP-luluc	kg CO ₂ -eq	1.18E-03	1.79E-05	1.67E-03	1.96E-05	1.45E-04	2.11E-07	6.55E-06	9.83E-08	1.81E-06	-1.01E-05
	ODP	kg CFC11-eq	1.33E-07	1.14E-08	2.49E-09	1.25E-08	8.46E-09	5.77E-10	4.17E-09	1.40E-11	2.80E-09	-2.09E-05
	AP	mol H ⁺ -eq	9.60E-03	1.45E-04	2.38E-05	1.59E-04	5.06E-04	2.80E-05	5.29E-05	5.75E-07	6.57E-05	-4.43E-06
	EP-FreshWater	kg P -eq	3.85E-04	4.02E-07	1.11E-07	4.41E-07	1.93E-05	9.73E-09	1.47E-07	4.49E-09	8.37E-08	-3.16E-08
	EP-Marine	kg N -eq	1.86E-03	2.86E-05	6.07E-06	3.14E-05	9.94E-05	1.23E-05	1.05E-05	1.68E-07	2.44E-05	-1.49E-06
	EP-Terrestrial	mol N -eq	1.95E-02	3.20E-04	6.03E-05	3.51E-04	1.05E-03	1.35E-04	1.17E-04	1.94E-06	2.69E-04	-1.68E-05
	POCP	kg NMVOC-eq	7.63E-03	1.23E-04	2.02E-05	1.34E-04	4.07E-04	3.72E-05	4.48E-05	5.20E-07	7.71E-05	-4.53E-06
	ADP-minerals&metals ¹	kg Sb-eq	6.38E-05	1.39E-06	8.20E-08	1.52E-06	3.38E-06	4.10E-09	5.08E-07	9.01E-10	6.65E-08	-2.32E-08
	ADP-fossil ¹	MJ	3.44E+01	7.61E-01	2.74E-01	8.34E-01	1.85E+00	3.68E-02	2.78E-01	2.21E-03	2.03E-01	-7.98E-03
	WDP ¹	m ³	2.89E+01	7.36E-01	1.45E+01	8.07E-01	2.35E+00	7.81E-03	2.69E-01	2.43E-01	1.25E+00	-2.33E-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

Additional environmental impact indicators

Indicator	Unit	A1	A2	A3	A4	A5	C1	C2	C3	C4	D
 PM	Disease incidence	3.08E-07	3.08E-09	1.54E-10	3.38E-09	1.60E-08	7.39E-10	1.13E-09	9.00E-12	1.40E-09	-1.87E-10
 IRP ²	kgBq U235 -eq	6.85E+01	3.32E-03	1.61E-04	3.65E-03	3.42E+00	1.58E-04	1.22E-03	3.70E-05	9.27E-04	-6.18E-05
 ETP-fw ¹	CTUe	8.06E+01	5.64E-01	1.04E-01	6.18E-01	4.12E+00	2.01E-02	2.06E-01	1.56E-03	1.11E-01	-2.63E-02
 HTP-c ¹	CTUh	1.67E-08	0.00E+00	7.00E-12	0.00E+00	8.38E-10	1.00E-12	0.00E+00	0.00E+00	5.00E-12	0.00E+00
 HTP-nc ¹	CTUh	1.03E-07	6.18E-10	1.11E-10	6.76E-10	5.27E-09	1.80E-11	2.25E-10	1.00E-12	8.00E-11	-2.70E-11
 SQP ¹	dimensionless	1.09E+01	5.32E-01	-2.87E-02	5.84E-01	6.53E-01	4.67E-03	1.95E-01	1.25E-03	7.82E-01	-1.87E-02

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 = $9.0 \cdot 10^{-3}$ = 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	2.71E+00	1.09E-02	1.66E-01	1.19E-02	1.46E-01	1.99E-04	3.98E-03	1.14E-03	7.27E-03	-2.63E-02
	PERM	MJ	1.32E+00	0.00E+00	0.00E+00	0.00E+00	-1.25E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PERT	MJ	4.03E+00	1.09E-02	1.66E-01	1.19E-02	-1.11E+00	1.99E-04	3.98E-03	1.14E-03	7.27E-03	-2.63E-02
	PENRE	MJ	3.42E+01	7.61E-01	2.74E-01	8.34E-01	1.84E+00	3.68E-02	2.78E-01	2.21E-03	2.03E-01	-8.20E-03
	PENRM	MJ	2.20E+00	0.00E+00	0.00E+00	0.00E+00	1.10E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PENRT	MJ	3.64E+01	7.61E-01	2.74E-01	8.34E-01	1.95E+00	3.68E-02	2.78E-01	2.21E-03	2.03E-01	-8.20E-03
	SM	kg	5.67E-03	0.00E+00	0.00E+00	0.00E+00	2.84E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	RSF	MJ	1.36E-02	3.90E-04	7.56E-05	4.27E-04	7.43E-04	4.89E-06	1.42E-04	0.00E+00	1.51E-04	-2.30E-05
	NRSF	MJ	2.93E-02	1.39E-03	2.76E-04	1.53E-03	1.69E-03	7.20E-05	5.09E-04	0.00E+00	3.26E-04	-1.52E-03
	FW	m ³	1.31E-01	8.13E-05	1.27E-03	8.92E-05	6.64E-03	1.89E-06	2.97E-05	3.78E-06	2.50E-04	-1.73E-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 = $9.0 \cdot 10^{-3}$ = 0.009"

End of life - Waste												
Indicator	Unit	A1	A2	A3	A4	A5	C1	C2	C3	C4	D	
	HWD	kg	7.48E-02	3.92E-05	1.89E-03	4.30E-05	3.84E-03	1.08E-06	1.43E-05	2.20E-07	0.00E+00	-1.13E-06
	NHWD	kg	2.33E+00	3.70E-02	2.07E-03	4.06E-02	2.02E-01	4.35E-05	1.35E-02	6.96E-06	9.00E-01	-1.25E-04
	RWD	kg	4.79E-05	5.18E-06	2.22E-07	5.68E-06	3.06E-06	2.55E-07	1.89E-06	2.33E-08	0.00E+00	-5.22E-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	9.03E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	MFR	kg	0.00E+00	0.00E+00	4.10E-04	0.00E+00	3.60E-02	0.00E+00	0.00E+00	1.00E-01	0.00E+00	0.00E+00
	MER	kg	0.00E+00	0.00E+00	3.95E-03	0.00E+00	4.91E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	EEE	MJ	0.00E+00	0.00E+00	2.06E-03	0.00E+00	3.38E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	EET	MJ	0.00E+00	0.00E+00	3.12E-02	0.00E+00	5.11E-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	3.93E-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, low voltage, 100% hydro, certificate, 01.01.2023-31.12.2023, Germany (kWh)	Modified ecoinvent 3.6	60.95	g CO ₂ -eq/kWh

Dangerous substances

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

Indoor environment

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	2.02E+00	5.03E-02	2.18E-02	5.52E-02	1.09E-01	2.67E-03	1.84E-02	7.11E-05	7.39E-03	-5.39E-04

GWPIOBC: 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.

Bibliography

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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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