Environmental Product Declaration

In accordance with ISO 14025:2006 for:

Spolsan® S

from

Spolana s.r.o.

Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
EPD registration number:	S-P-08837
Publication date:	2023-03-20
Valid until:	2028-03-19

Programme information

Programme:	The International EPD® System EPD International AB Box 210 60 SE-100 31 Stockholm Sweden www.environdec.com info@environdec.com

Accountabilities for PCR, LCA and independent, third-party verification
Product Category Rules (PCR)
PCR: Basic Chemicals, 2021:03, version 1.1., 2022-01-14
PCR review was conducted by: The Technical Committee of the International EPD® System. Chair of the PCR review is Lars-Gunnar Lindfors. The review panel may be contacted via info@environdec.com.
Life Cycle Assessment (LCA)
LCA accountability: LCA Studio s.r.o. Ing. et Ing. Tatiana Trecáková, Ph.D., prof. Ing. Vladimír Kočí, Ph.D., MBA Šárecká 1962/5, 16000 Prague 6, Czech Republic www.lcastudio.cz
Third-party verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: ☒ EPD verification by individual verifier Third-party verifier: Hüdai Kara, PhD., Metsims Sustainability Consulting, United Kingdom www.metsims.com Approved by: The International EPD® System
Procedure for follow-up of data during EPD validity involves third-party verifier: ☐ Yes ☒ No

Company information

Owner of the EPD: SPOLANA s.r.o. ,Práce 657, 277 11 Neratovice, Czech Republic, E-Mail: info@spolana.cz

Description of the organisation: Spolana is the only producer of PVC (sold under the brand name Neralit®) and caprolactam in the Czech Republic. It also produces hydrochloric acid, oleum and sulphuric acid. It also produces fertiliser, which is produced in the manufacture of caprolactam containing nitrogen in ammonium form and also sulphur in the form of sulphate anion. It also contains a small admixture of ammonium nitrate, the concentration of which does not exceed 1,5 %. It is used for direct fertilisation. The fertiliser is sold under the brand name Spolsan® and is available in crystalline and granular form.

Product-related or management system-related certifications: Certificates of Approvals for ISO 9001, ISO 14001, ISO 45001, ISO 50001, RESPONSIBLE CARE

Name and location of production site: Neratovice, Czech Republic

Product information

Product name: Spolsan® S

Product identification: Inorganic substance, sulphur compounds of non-metals, CAS 7783-20-2

Product description: Ammonium sulphate is created during caprolactam production and containing nitrogen in ammonium form and sulphur in the form of sulphuric anhydride. It also contains a small amount of ammonium nitrate, the concentration of which does not exceed 1.5 % (wt.). In recent years, ammonium sulphate has become an increasingly important fertiliser due to sulphur and ammoniacal nitrogen content. It is used mainly as raw material for production of the sulphur containing fertilizers with higher added value and also partly for direct fertilisation. The primary function of ammonium sulphate is as a fertilization for alkaline soils. In the soil, the ammonium ion is released and forms a small amount of acid, lowering the pH balance of the soil, while contributing essential nitrogen for plant growth. It comes in crystalline form and is applicable by spreading.

UN CPC code: 34231

Other codes for product classification: CZ-CPA 20.15.32

Geographical scope: Europe

LCA information

Functional unit / declared unit: Declared unit is 1 kg of Spolsan® S

Time representativeness: Site specific data from producer are based on 1 year average for process data (reference year 2021). Time scope less than 10-years were applied for background data. Time scope less than 2-years were applied for specific data.

Database(s) and LCA software used: GaBi software, GaBi database and ecoinvent database

Description of system boundaries: cradle-to-grave

In the following system diagram, boundaries using modules included in the study are visualized.

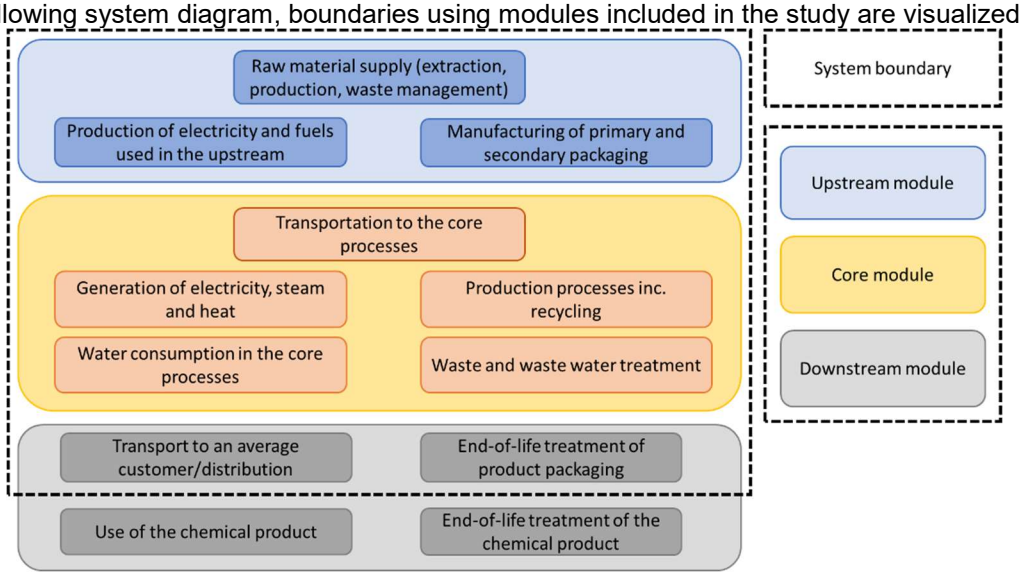

Figure 1 System boundary of the LCA study conducted on Spolsan® S produced by Spolana

Excluded lifecycle stages: End-of-life of the chemical product and use phase are excluded.
In accordance with PCR, end-of-life treatment of the chemical products is excluded, because all following criteria are fulfilled:

- the product is physically integrated with other products in subsequent life-cycle process so they cannot be physically separated from them at end of life,
- the product or material is no longer identifiable at end-of-life as a result of a physical or chemical transformation process,
- the product or material does not contain biogenic carbon, and
- the EPD shall not be used for business-to-consumer communication.

According to the PCR, it is not mandatory to declare any quantitative information about the use and end-of-life phases as most basic chemical products have many different applications and are often used as input materials to other production processes.

More information:

Cut off rules: The cut-off criterion was chosen based on the used PCR. According to the used PCR, more than 99 % of flows were included.

Allocations: All material and energy flows were assigned to one product. Allocation was not necessary. No secondary fuels or materials are used in production. Internally produced heat is use Generic process data for production of input materials and components were used.

Geographical scope: Europe, Global

Electricity consumption: Generation of electricity consumed within Spolana production was based on the Czech residual electricity grid mix.

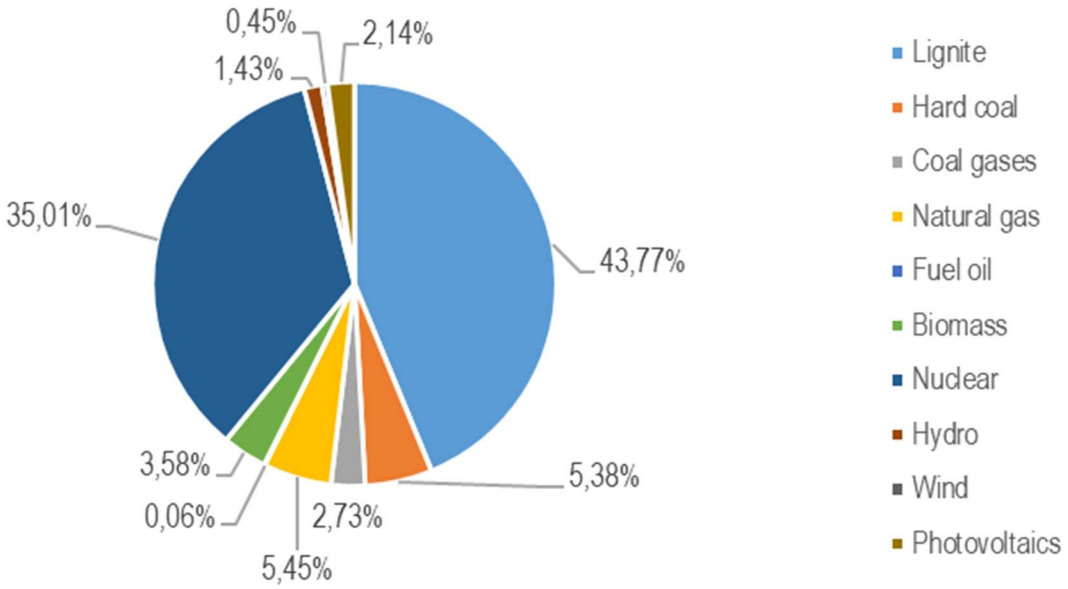

Figure 2 Residual grid mix from GaBi (Sphera, 2017)

Content declaration

Product

Product components	Unit	%	Environmental / hazardous properties
Ammonium sulphate	wt.	≥ 98,5	unassigned
Ammonium nitrate	wt.	≤ 1,5	
TOTAL	wt.	100	

Packaging

Distribution packaging: no packaging is used, product is distributed in tankers

Recycled material

Provenience of recycled materials (pre-consumer or post-consumer) in the product: no recycled materials used in the product

Environmental performance

The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.

Potential environmental impact

PARAMETER		UNIT	Upstream	Core	Downstream	TOTAL
Global warming potential (GWP)	Fossil	kg CO_2 eq.	8.19E-01	1.70E-01	2.24E-02	1.01E+00
	Biogenic	kg CO_2 eq.	1.87E-03	7.68E-04	-2.88E-05	2.61E-03
	Land use and land transformation	kg CO_2 eq.	2.56E-05	1.57E-05	1.19E-04	1.60E-04
	TOTAL	kg CO_2 eq.	8.21E-01	1.71E-01	2.25E-02	1.01E+00
Ozone layer depletion (ODP)		kg CFC 11 eq.	2.58E-12	2.86E-13	1.22E-14	2.88E-12
Acidification potential (AP)		kg mol H^+ eq.	5.27E-04	7.78E-04	2.55E-05	1.33E-03
Eutrophication potential (EP)	Aquatic freshwater	kg P eq.	6.72E-07	1.96E-07	6.40E-08	9.32E-07
	Aquatic marine	kg N eq.	4.69E-04	6.13E-05	8.68E-06	5.39E-04
	Aquatic terrestrial	mol N eq.	1.44E-03	6.70E-04	1.02E-04	2.21E-03
Photochemical oxidant creation potential (POCP)		kg NMVOC eq.	4.88E-04	2.66E-04	2.42E-05	7.78E-04
Abiotic depletion potential (ADP)	Metals and minerals	kg Sb eq.	4.59E-08	1.89E-08	1.91E-09	6.67E-08
	Fossil resources	MJ, net calorific value	1.42E+01	5.00E+00	3.08E-01	1.95E+01
Water deprivation potential (WDP)		m^3 world eq.	1.16E-02	3.78E-02	2.74E-04	4.97E-02

Use of resources

PARAMETER		UNIT	Upstream	Core	Downstream	TOTAL
Primary energy resources – Renewable	Use as energy carrier	MJ, net calorific value	5.48E-01	9.69E-02	1.96E-02	6.65E-01
	Used as raw materials	MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	TOTAL	MJ, net calorific value	5.48E-01	9.69E-02	1.96E-02	6.65E-01
Primary energy resources – Non-renewable	Use as energy carrier	MJ, net calorific value	1.42E+01	5.00E+00	3.09E-01	1.95E+01
	Used as raw materials	MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	TOTAL	MJ, net calorific value	1.42E+01	5.00E+00	3.09E-01	1.95E+01
Net use of fresh water		m^3	6.57E-04	2.02E-02	2.34E-05	2.09E-02

Waste production and output flows

Waste production

PARAMETER	UNIT	Upstream	Core	Downstream	TOTAL
Hazardous waste disposed	kg	1.59E-09	5.18E-10	3.04E-12	2.11E-09
Non-hazardous waste disposed	kg	2.85E-03	9.07E-04	4.58E-05	3.80E-03
Radioactive waste disposed	kg	1.09E-04	1.04E-04	4.25E-06	2.17E-04

Other environmental indicators

PARAMETER	UNIT	Upstream	Core	Downstream	TOTAL
Particulate matter	Dicease indices	3.85E-09	4.86E-09	1.73E-10	8.88E-09
Ionising radiation. human health	kBq U235 eq.	1.99E-02	8.10E-03	6.23E-04	2.86E-02
Ecotoxicity. freshwater	CTUe	4.77E+00	2.18E+00	2.05E-01	7.16E+00
Human toxicity. cancer	CTUh	1.05E-10	4.97E-11	4.11E-12	1.59E-10
Human toxicity. non-cancer	CTUh	4.93E-09	2.87E-09	2.14E-10	8.01E-09
Land use	Pt	3.09E-01	1.56E-01	1.00E-01	5.65E-01

References

General Programme Instructions of the International EPD® System. Version 4.0.
Product Category Rules (PCR) document for Basic Chemicals (PCR 2021:03 Version 1.1. 2022-01-14)
ISO 14020:2000 Environmental labels and declarations — General principles. 2000-09
ISO 14025: EN ISO 14025:2006-11: Environmental labels and declarations - Type III environmental declarations — Principles and procedures
ISO 14040:2006 Environmental management — Life cycle assessment — Principles and framework. 2006-07
ISO 14044:2006 Environmental management — Life cycle assessment — Requirements and guidelines. 2006-07
Ecoinvent: Ecoinvent Centre. www.Eco-invent.org
Sphera: GaBi software version 10. 2021. Sphera solutions
Spolana: www.spolana.cz

EPD®

www.environdec.com