

Environmental Product Declaration



In accordance with ISO 14025:2006 for:

Neralit[®] **652**

from

Spolana s.r.o.

The logo for Spolana s.r.o. is the word "Spolana" in a blue, italicized, serif font, enclosed within a black rectangular border.

Programme:

The International EPD[®] System, www.environdec.com

Programme operator:

EPD International AB

EPD registration number:

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2028-03-19



Programme information

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

Accountabilities for PCR, LCA and independent, third-party verification

Product Category Rules (PCR)

PCR: Plastics in Primary Forms, 2010:16, version 3.0.2., 2022-08-17

PCR review was conducted by: The Technical Committee of the International EPD® System. Chair of the PCR review is Paola Borla. 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: Neralit[®] 652

Product identification: Polymer, suspension polyvinyl chloride, CAS 9002-86-2

Product description: Medium molecular type of suspension PVC with the porous texture of grains (K value = 65). It is produced by suspension polymerisation of vinyl chloride in an aqueous medium in the presence of catalysts and suspension stabilisers. The resulting product is a fine, white, easily pourable powder made up of grains with narrow particle size distribution. The properties of suspension Neralit PVC powder depend on the additives used during polymerisation, on the temperature regime of polymerisation, on the method and intensity of mixing the suspension, and on a number of other factors at work during production. Suspension Neralit PVC is shipped in powder form to processors, who modify it for processing by adding the necessary additives to their own mixing or granulating equipment.

UN CPC code: 34730

Other codes for product classification: CZ-CPA 20.16.30

Geographical scope: Europe

LCA information

Functional unit / declared unit: Declared unit is 1 kg of Neralit[®] 652

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.

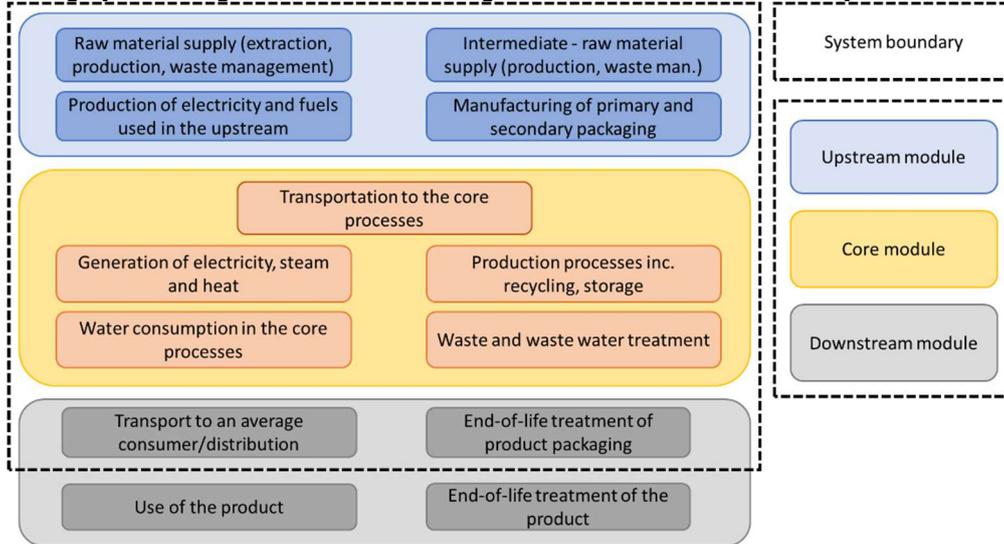


Figure 1 System boundary of the LCA study conducted on Neralit produced by Spolana

Excluded lifecycle stages: The following attributional processes are not a part of the product system as they are only optional:

- Use phase
- End of Life of Products.

It is not mandatory to declare any quantitative information about the use and end-of-life phases as most of these products have many different applications and are 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. 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.

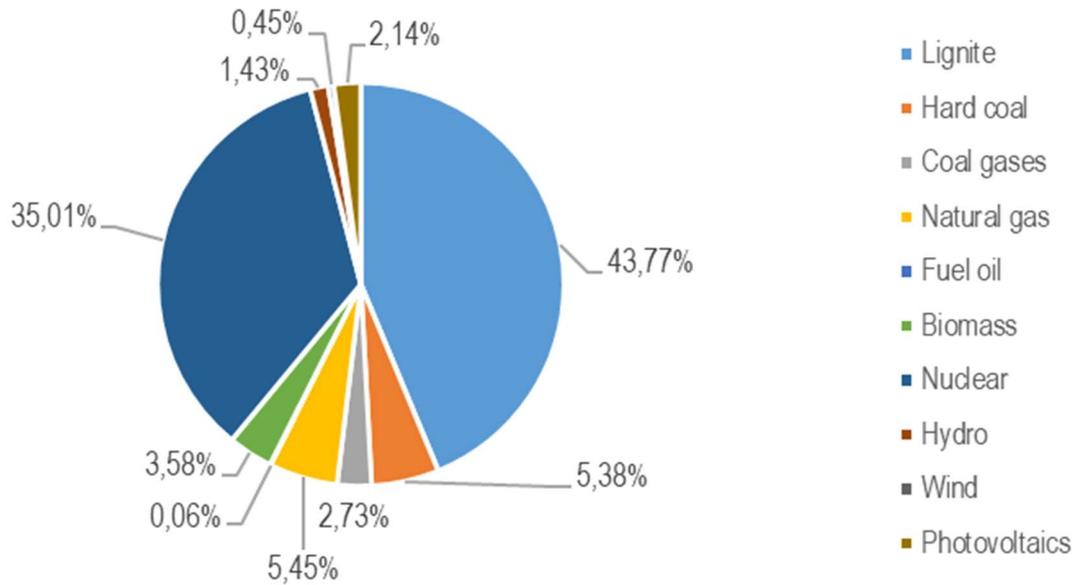


Figure 2 Residual grid mix from GaBi (Sphera, 2017)

Content declaration

Product

| Product components | Unit | % | Environmental / hazardous properties |
|--------------------|------|-----|--------------------------------------|
| Polyvinyl chloride | wt. | 100 | unassigned |

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. | 1.24E+00 | 1.07E+00 | 5.31E-02 | 2.36E+00 |
| | Biogenic | kg CO ₂ eq. | 2.64E-02 | 4.48E-03 | -7.31E-05 | 3.08E-02 |
| | Land use and land transformation | kg CO ₂ eq. | 9.84E-04 | 5.90E-05 | 2.95E-04 | 1.34E-03 |
| | TOTAL | kg CO ₂ eq. | 1.27E+00 | 1.08E+00 | 5.33E-02 | 2.40E+00 |
| Ozone layer depletion (ODP) | | kg CFC 11 eq. | 3.58E-07 | 8.27E-09 | 3.17E-15 | 3.66E-07 |
| Acidification potential (AP) | | kg mol H ⁺ eq. | 5.00E-03 | 2.94E-03 | 5.16E-05 | 7.99E-03 |
| Eutrophication potential (EP) | Aquatic freshwater | kg P eq. | 3.91E-04 | 7.70E-07 | 1.58E-07 | 3.92E-04 |
| | Aquatic marine | kg N eq. | 9.63E-04 | 4.22E-04 | 1.63E-05 | 1.40E-03 |
| | Aquatic terrestrial | mol N eq. | 9.66E-03 | 4.56E-03 | 1.96E-04 | 1.44E-02 |
| Photochemical oxidant creation potential (POCP) | | kg NMVOC eq. | 3.47E-03 | 1.63E-03 | 4.51E-05 | 5.15E-03 |
| Abiotic depletion potential (ADP) | Metals and minerals | kg Sb eq. | 1.90E-05 | 1.00E-07 | 4.43E-09 | 1.91E-05 |
| | Fossil resources | MJ, net calorific value | 4.08E+01 | 2.47E+01 | 7.08E-01 | 6.62E+01 |
| Water deprivation potential (WDP) | | m ³ world eq. | 9.55E-01 | 5.79E-02 | 4.75E-04 | 1.01E+00 |

Use of resources

| PARAMETER | | UNIT | Upstream | Core | Downstream | TOTAL |
|------------------------------------------|-----------------------|-------------------------|----------|----------|------------|----------|
| Primary energy resources – Renewable | Use as energy carrier | MJ, net calorific value | 1.65E+00 | 7.26E-01 | 4.02E-02 | 2.42E+00 |
| | 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 | 1.65E+00 | 7.26E-01 | 4.02E-02 | 2.42E+00 |
| Primary energy resources – Non-renewable | Use as energy carrier | MJ, net calorific value | 4.09E+01 | 2.47E+01 | 7.09E-01 | 6.63E+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 | 4.09E+01 | 2.47E+01 | 7.09E-01 | 6.63E+01 |
| Net use of fresh water | | m ³ | 2.25E-02 | 2.88E-02 | 4.55E-05 | 5.13E-02 |

Waste production and output flows

Waste production

| PARAMETER | UNIT | Upstream | Core | Downstream | TOTAL |
|------------------------------|------|----------|----------|------------|----------|
| Hazardous waste disposed | kg | 8.20E-10 | 3.73E-09 | 3.40E-12 | 4.55E-09 |
| Non-hazardous waste disposed | kg | 3.42E-03 | 5.92E-03 | 1.02E-04 | 9.44E-03 |
| Radioactive waste disposed | kg | 5.99E-05 | 1.05E-03 | 8.74E-07 | 1.11E-03 |

Other environmental indicators

| PARAMETER | UNIT | Upstream | Core | Downstream | TOTAL |
|----------------------------------|-----------------|----------|----------|------------|----------|
| Particulate matter | Disease indices | 3.36E-08 | 1.85E-08 | 3.07E-10 | 5.24E-08 |
| Ionising radiation. human health | kBq U235 eq. | 1.88E-01 | 7.09E-02 | 1.28E-04 | 2.59E-01 |
| Ecotoxicity. freshwater | CTUe | 2.57E+01 | 7.31E+00 | 4.91E-01 | 3.35E+01 |
| Human toxicity. cancer | CTUh | 8.65E-10 | 4.87E-10 | 9.90E-12 | 1.36E-09 |
| Human toxicity. non-cancer | CTUh | 3.38E-08 | 1.60E-08 | 5.14E-10 | 5.03E-08 |
| Land use | Pt | 2.98E+00 | 1.46E+00 | 2.44E-01 | 4.68E+00 |

References

General Programme Instructions of the International EPD® System. Version 4.0.

Product Category Rules (PCR) document for Plastics in Primary Forms (PCR 2010:16. Version 3.0.2. 2022-08-17)

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

