

## Sodium chlorate, 100% (as delivered, crystalline or in water)

### Product Carbon Footprint

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#### How to use the data:

The information herein is confidential and may only be disclosed to third parties upon written approval by Nouryon. This PCF should only be used for your internal carbon footprint accounting activities, such as assessing the carbon footprint of your final end products or your total organizational carbon footprint. Furthermore, the information is not intended to be used for comparative PCF studies without additional Nouryon involvement, as harmonization of methodology and data choices is critical for such studies. This PCF is based on information known to Nouryon and assessed fit for purpose at the date of this PCF. This PCF is subject to change as a consequence of changes in production and changes to data and PCF methodology, and Nouryon does not undertake to update this PCF to reflect any information made known to Nouryon, or any changes made to datasets or methodology, after this date.

## Information of the partial Product Carbon Footprint:

**Declared unit:** 1 kg Sodium chlorate, 100% (as delivered, crystalline or in water) at Nouryon factory gate

**Information on packaging:** Excluded

**System boundary:** Cradle-to-gate assessment including raw materials, inbound transportation, energy, utilities, own manufacturing, site-to-site transportation of intermediates and treatment of waste.

**Geographical scope of production:** North America

**Reference time period for data collection start:** 2024-01-01

**Reference time period for data collection end:** 2024-12-31

**Validity period end:** 2027-12-31

**Date of issue of the PCF:** 2026-01-11

**Declaration generated:** 2026-04-07

**Cut-off criteria:** <3%

**Standards and product or sector rules applied:** TfS PCF guideline v. 3.0 (December 2024) and ISO 14067:2018

**Data collection principles:** For the foreground system, company-specific activity data is used for each production site and production process. Data sources include the bill of materials, site production and environmental reporting systems, process technology experts and site personnel. For energy supplied to the foreground system, site specific energy mixes are used, and the market-based approach is used for electricity. For the background system, supplier specific data or secondary emission factors is used when available. Country, or region-specific secondary data is used if applicable and available. If no secondary data is available for the specific activity, proxy data will be used. If no meaningful proxy data can be collected from secondary databases, estimated data will be used. In case specific transport data is not used, a fixed default value for the impact of the transportation of raw materials and intermediates to the manufacturing sites is used as default using the following data: 5000 km container ship coastal with load factor 70% and 1000 km truck with load factor 60%.

**Data source for secondary data for background system:** Sphera LCA FE version 10.9.1.10 with MLC update 2025.1 and Ecoinvent version 3.11

**Information about CCS/BECCS:** N.A.

**Calculation approach used for material recycling:** N.A.

**Calculation approach used for CCU:** N.A.

**Allocation rules:** For the purpose of allocation, main products are defined as products that the process is operated for and optimized to produce. Waste is defined according to the TfS PCF guideline. By-products are all other products produced in the same process that consequently are neither defined as main products or waste. For the foreground system, the following allocation rules are used in the order listed:

1. If a TfS approved PCR exists for the same product systems the allocation rules prescribed in the PCR will be used.
2. Whenever applicable and possible, process subdivision is used to divide common processes to avoid the need for allocation.
3. System expansion may be used for by-products if all TfS PCF guideline requirements for using system expansion are assessed to be met. System expansion is used for energy by-products which are used within Nouryon's manufacturing gates to produce other products, and the energy e.g. steam is modelled to replace the standard steam or heat energy producing system at the same site. This means that a credit is given to the assessed product which is equal to the impact of producing the same amount of steam with the standard steam system (see also TfS system expansion list).
4. Economic allocation is used if the relation between the economic values of the products is  $> 5$  when using the economic values of the products with the highest and lowest economic values.
5. Stoichiometric relations is used where such can be established for raw materials that are incorporated in one or more products, and mass allocation is used for all other inputs and outputs such as energy and waste. The stoichiometric relation factor is calculated as the mass fraction in the product originating from the raw material. For the mass allocation, the mass output of products is calculated excluding solvents in products.
6. Mass allocation is used for all inputs and outputs based on the mass of products when excluding solvent content.

System expansion is applied for waste treatment with energy recovery only in the foreground system, and the energy is modelled to replace the standard steam or heat energy producing system at the same site. The cut off approach is used for all other waste treatment activities with material or energy recovery. All site wide data that is not covered by the product specific data set or that cannot be allocated to specific products by expert judgement are allocated using a mass-based attribution approach.

**Information about the mass balancing used in the foreground system:** N.A.

**Impact assessment:** The TfS climate impact categories and characterization factors included in LCA FE version 10.9.1.10 and MLC update 2025.1. The underlying method for all these impact categories is the 100-year Global Warming Potential (GWP) characterization factors (GWP100y) according to the Intergovernmental Panel on Climate Change (IPCC), based on the IPCC's Sixth Assessment Report (AR6).

**Assurance level:** This PCF is self-published with first party verification.

**Certification:** The Product Carbon Footprint Assessment method is scientifically based and reflects state-of-the-art, and complies with the requirements of ISO 14067:2018 as well as Together for Sustainability - The Product Carbon Footprint Guideline for the Chemical Industry, version 3.0 - December 2024 as certified by TÜV Rheinland (ID no. 0000089319: Nouryon AB - [www.certipedia.com](http://www.certipedia.com)).

**Assumptions and limitations:** No information.

**Additional information:** The PCF should be interpreted as a best estimate at the time of the last recalculation of the PCF. PCFs have varying degrees of data quality depending on data availability for the assessed product. We strive to continuously improve the data quality of the PCFs. Please contact your Nouryon representative in case further information is required.

## Partial Product Carbon Footprint result (Cradle-to-Gate)

| Category of impact <sup>1</sup>                       | Unit                      | Quantity <sup>4</sup> |
|-------------------------------------------------------|---------------------------|-----------------------|
| GWP total (incl. biogenic CO <sub>2</sub> )           | kg CO <sub>2</sub> eq./kg | 0.8                   |
| GWP total (excl. biogenic CO <sub>2</sub> )           | kg CO <sub>2</sub> eq./kg | 0.8                   |
| GWP fossil                                            | kg CO <sub>2</sub> eq./kg | 0.8                   |
| GWP biogenic CO <sub>2</sub> e-emissions <sup>2</sup> | kg CO <sub>2</sub> eq./kg | 0.0                   |
| GWP biogenic CO <sub>2</sub> -withdrawal <sup>3</sup> | kg CO <sub>2</sub> eq./kg | 0.0                   |
| GWP direct land use change (dLUC)                     | kg CO <sub>2</sub> eq./kg | 0.0                   |
| GWP land use (LU)                                     | kg CO <sub>2</sub> eq./kg | 0.0                   |
| GWP aviation emissions                                | kg CO <sub>2</sub> eq./kg | 0.0                   |

## Carbon content assessment

| Category                              | Unit        | Quantity |
|---------------------------------------|-------------|----------|
| Total carbon content                  | kg C/kg     | 0.00     |
| Biogenic carbon content <sup>5</sup>  | kg Bio-C/kg | 0.00     |
| Recycled carbon content <sup>5</sup>  | kg C/kg     | 0.00     |
| CCU-based carbon content <sup>5</sup> | kg C/kg     | 0.00     |

1) Tfs climate impact categories and characterization factors included in LCA FE version 10.9.1.10 and MLC update 2025.1. The underlying method for all these impact categories is the 100-year Global Warming Potential (GWP) characterization factors (GWP100y) according to the Intergovernmental Panel on Climate Change (IPCC), based on the IPCC's Sixth Assessment Report (AR6).

2) Only other GHG emissions than CO<sub>2</sub> – excludes biogenic CO<sub>2</sub>

3) Biogenic CO<sub>2</sub> contained in the product

4) There may be rounding errors when adding up the different impacts

5) Actual content