# ENVIRONMENTAL PRODUCT DECLARATION

## IN ACCORDANCE WITH EN 15804+A2 & ISO 14025

SpiroTop AB050 R002
Spirotech BV

**EPD HUB, HUB-7202**

Published on 17.08.2026, last updated on 17.08.2026, valid until 16.08.2031

Life Cycle Assessment study has been performed in accordance with the requirements of EN 15804, EPD Hub PCR version 1.2 (24 Mar 2025) and JRC characterization factors EF 3.1.

Created with One Click LCA

# GENERAL INFORMATION

## MANUFACTURER

| | |
|---|---|
| Manufacturer | Spirotech BV |
| Address | Postbus 207, 5700 AE Helmond, Nederland |
| Contact details | info@spirotech.com |
| Website | https://www.spirotech.com/ |

## EPD STANDARDS, SCOPE AND VERIFICATION

| | |
|---|---|
| Program operator | EPD Hub, hub@epdhub.com |
| Reference standard | EN 15804:2012+A2:2019/AC:2021 and ISO 14025 |
| PCR | EPD Hub Core PCR Version 1.2, 24 Mar 2025 |
| Sector | Manufactured product |
| Category of EPD | Sister EPD |
| Parent EPD number | HUB-7072 |
| Scope of the EPD | Cradle to gate with options, A4-A5, and modules C1-C4, D |
| EPD author | Lien De Coen & Johannes Spaas (both Mantis Consulting) |
| EPD verification | Independent verification of this EPD and data, according to ISO 14025:<br>☐ Internal verification ☑ External verification |
| EPD verifier | Afzal khan Peerukhan as an authorized verifier for EPD Hub |

This EPD is intended for business-to-business and/or business-to-consumer communication. The manufacturer has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but from different programs may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804 and if they are not compared in a building context.

## PRODUCT

| | |
|---|---|
| Product name | SpiroTop AB050 R002 |
| Additional labels | N/A |
| Product reference | AB050 R002; AB050 AR002 |
| Place(s) of raw material origin | Taiwan, China, Europe |
| Place of production | Helmond, the Netherlands |
| Place(s) of installation and use | Global, mainly Europe |
| Period for data | Calendar year 2024 |
| Averaging in EPD | No grouping |
| Variation in GWP-fossil for A1-A3 (%) | N/A |
| GTIN (Global Trade Item Number) | - |
| NOBB (Norwegian Building Product Database) | (coming soon) |
| A1-A3 Specific data (%) | 9,34 |

## ENVIRONMENTAL DATA SUMMARY

| | |
|---|---|
| **Declared unit** | 1 SpiroTop AB050/R002 |
| **Declared unit mass** | 0,617 kg |
| **Mass of packaging** | 0,063 kg |
| **GWP-fossil, A1-A3 ($kgCO_2e$)** | 3,64 |
| **GWP-total, A1-A3 ($kgCO_2e$)** | 3,54 |
| **Secondary material, inputs (%)** | 47,5 |
| **Secondary material, outputs (%)** | 98,0 |
| **Total energy use, A1-A3 (kWh)** | 14,7 |
| **Net freshwater use, A1-A3 ($m^3$)** | 0,24 |

# PRODUCT AND MANUFACTURER

## ABOUT THE MANUFACTURER

Spirotech is an expert and market leader in the field of system water quality in heating and cooling systems. Our products have been prescribed for many years by international boiler and heat pump manufacturers, installers and consultants in residential and non-residential projects.

As a Helmond family business, we were the first in the Netherlands to start developing air and dirt separators for use in heating and cooling installations/systems. With an air and dirt separator you not only save energy, but you also prevent wear and tear on the (often) expensive components in your system, such as the heating boiler or heat pump.

Our products are mostly produced in the Netherlands with high-quality materials such as brass and steel. In addition, we use high-quality magnets to remove all the harmful magnetite. We also produce and supply products for vacuum degassing, pressure maintenance, hydraulic distributors and additives. We also provide tailor-made advice on the basis of an extensive water analysis.

## PRODUCT DESCRIPTION

The SpiroTop is a fully automatic air vent with a ½" (Rp ½") connection, designed to quickly and effectively remove free air from heating and cooling systems. It is assembled from a stainless steel housing and a solid polypropylene float.

### SPIROTOP PRODUCT FAMILY

SpiroTop automatic air vents are placed at the highest points in the system (on boilers, heat exchangers, buffer tanks or wherever free air accumulates), and remove that air continuously without any maintenance. Unlike microbubble deaerators such as the SpiroVent, the SpiroTop targets free (bulk) air rather than dissolved microbubbles, making it the essential first line of defence against air locks that disrupt flow and reduce system efficiency. The SpiroTop range covers standard residential and commercial applications in brass as well as demanding high-temperature and high-pressure environments in stainless steel.

### FUNCTION OF THE SPIROTOP

The SpiroTop's solid polypropylene float cannot rupture. As air accumulates in the housing, the float drops, opening the valve; once the air is expelled and water refills the chamber, the float rises and the valve closes completely. A specially constructed valve seat ensures a long service life and a reliable, leak-free seal. The large air gap of at least 40 mm between the valve and the water surface prevents valve contamination — one of the primary causes of leaks in conventional air vents. The ½" connection prevents the pipette effect that can cause unwanted water discharge in standard thread-connected air vents.

### PRODUCT VARIATIONS

The SpiroTop range covers three performance tiers: the standard brass version (AB050) for systems up to 10 bar and 110°C; the high-pressure brass version (AB050/030) for systems up to 16 bar and 110°C; and stainless steel versions for systems up to 25 bar and 200°C, including solar and industrial applications. All variants share the same ½" connection and the same valve and float principle. This EPD only covers the stainless steel versions, with the the  standard version (AB050/R002) serving as the representative product for this EPD, and the other stainless steel versions being covered in the annex.

Further information can be found at:
https://www.spirotech.com/

## PRODUCT RAW MATERIAL MAIN COMPOSITION

| Raw material category | Amount, mass % | Material origin |
|---|---|---|
| Metals | 98,1 | Taiwan, Europe |
| Minerals | 0 | N/A |
| Fossil materials | 1,9 | Europe |
| Bio-based materials | 0 | N/A |

## BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

| | |
|---|---|
| Biogenic carbon content in product, kg C | 0 |
| Biogenic carbon content in packaging, kg C | 0,0253 |

## FUNCTIONAL UNIT AND SERVICE LIFE

| | |
|---|---|
| Declared unit | 1 SpiroTop AB050/R002 |
| Mass per declared unit | 0,617 kg |
| Functional unit | 1 SpiroTop AB050/R002 |
| Reference service life | 5 years |

## SUBSTANCES, REACH - VERY HIGH CONCERN

The product does not contain any REACH SVHC substances in amounts greater than 0,1 % (1000 ppm).

# PRODUCT LIFE-CYCLE

## SYSTEM BOUNDARY

This EPD covers the life-cycle modules listed in the following table.

| Product stage | | | Assembly stage | | Use stage | | | | | | | End of life stage | | | | Beyond the system boundaries | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A1 | A2 | A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D | | |
| x | x | x | x | x | ND | ND | ND | ND | ND | ND | ND | x | x | x | x | x | | |
| Raw materials | Transport | Manufacturing | Transport | Assembly | Use | Maintenance | Repair | Replacement | Refurbishment | Operational energy use | Operational water use | Deconstruction/ demolition | Transport | Waste processing | Disposal | Reuse | Recovery | Recycling |

*Not declared = ND.*

As such, the Use stage (modules B1-B7) were excluded.

## MANUFACTURING AND PACKAGING (A1-A3)

The environmental impacts considered for the product stage cover the manufacturing of raw materials used in the production as well as packaging materials and other ancillary materials. Also, fuels used by machines, and handling of waste formed in the production processes at the manufacturing facilities are included in this stage. The study also considers the material losses occurring during the manufacturing processes as well as losses during electricity transmission.

A market-based approach is used in modelling the electricity mix utilized in the factory.

This product is assembled from stainless steel, plastic, and rubber pieces. The components are partially sourced from Taiwan and partially within Europe. Components sourced from China are transported to the port by lorry (16-32 ton, EURO5), then to the port of Rotterdam by container ship, and finally from the port of Rotterdam to Helmond by lorry (16-32 ton, EURO6). Components sourced within Europe are transported by lorry (16-32 ton, EURO6).

The manufacturing process requires electricity (Dutch residual mix) for the different equipment, and only water is used as ancillary material. As the production concerns assembly, production losses are negligible. The only manufacturing waste is thus wastewater (average waste water treatment).

The product is packed with a manual (paper) in a cardboard box. Per 12 units, the products are packed in a larger cardboard box.

## TRANSPORT AND INSTALLATION (A4-A5)

Transportation impacts occurred from final products delivery to construction site (A4) cover fuel direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions.

The product is sold and installed globally, with the majority of products distributed within Europe. The average weighted distance of transportation from production plant to the retail site is 372 km and the transportation method is assumed to be lorry (16-32 tonnes, EURO6). Vehicle capacity utilization volume factor is smaller than 1. In reality, it may vary but as role of transportation emissions in total results is small, the variety in load is assumed to be negligible. To be conservative, empty returns are included in this study as implemented through an average load factor in the Ecoinvent transport datapoints. Transportation does not cause losses as product is packaged properly.

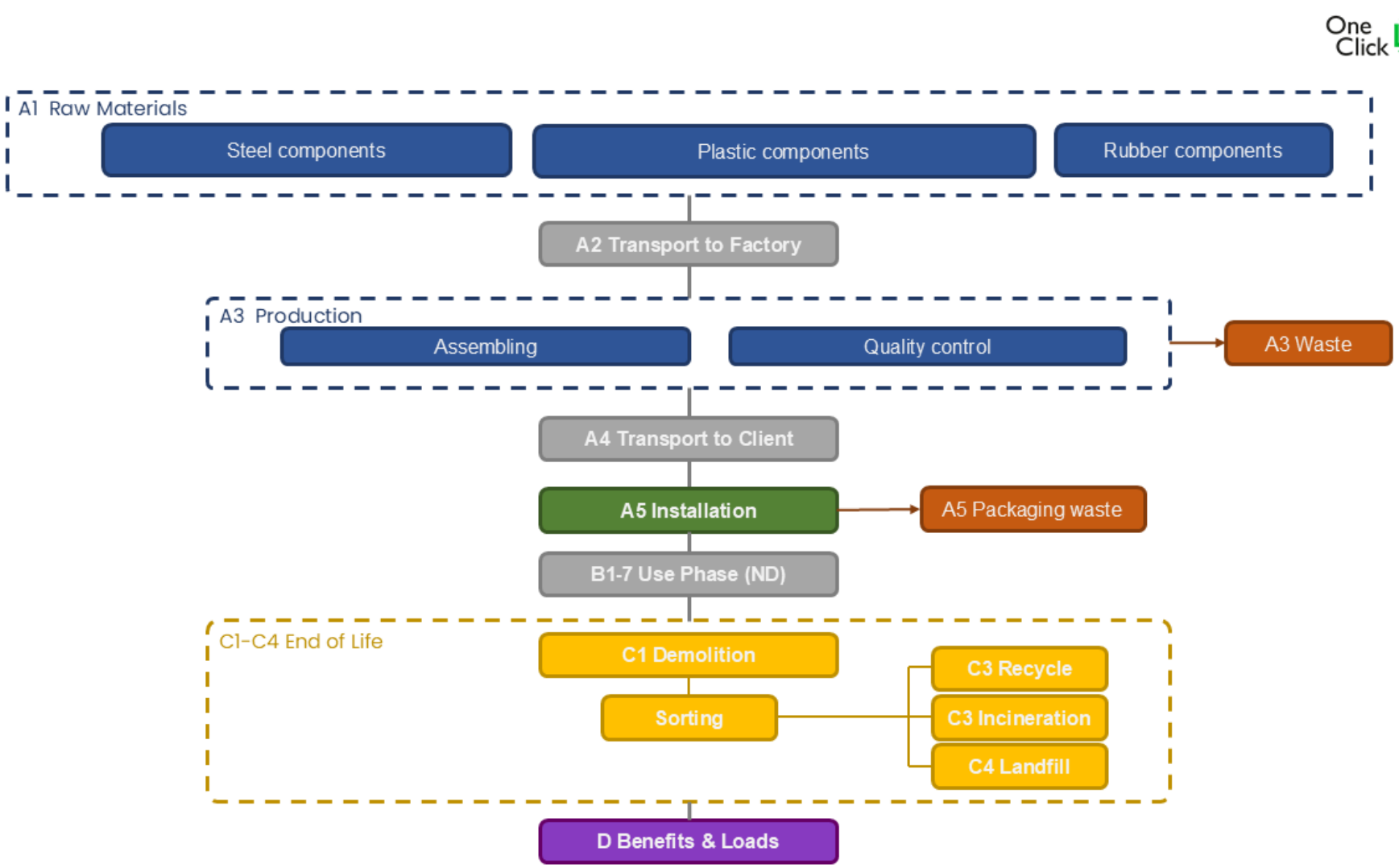
Environmental impacts from installation into the building include generation of waste packaging materials (A5). The impacts of material production, its processing and disposal as installation waste are also included.

## PRODUCT END OF LIFE (C1-C4, D)

As the majority of the products are installed in Europe, the end-of-life stage is modeled for Europe.

The consumption of energy for disassembling the product at EoL is assumed to be negligible (C1). The end-of-life product is assumed to be sent to the closest facilities by lorry (C2). 97% of the product is sent to recycling and 2% to incineration facilities (C3). 1% of the end-of-life product goes to landfill (C4). Due to the recycling and incineration potential of metals and plastics, the end-of-life product is converted into recycled materials, while energy and heat is produced from material incineration (D). The benefits and loads of waste packaging materials in A5 are also considered in module D.

# LIFE CYCLE FLOW DIAGRAM



# LIFE-CYCLE ASSESSMENT

## CUT-OFF CRITERIA

The study does not exclude any modules or processes which are stated mandatory in the reference standard and the applied PCR. The study does not exclude any hazardous materials or substances. The study includes all major raw material and energy consumption. All inputs and outputs of the unit processes, for which data is available for, are included in the calculation. There is no neglected unit process more than 1% of total mass or energy flows. The module specific total neglected input and output flows also do not exceed 5% of energy usage or mass.

The production of capital equipment, construction activities, and infrastructure, maintenance and operation of capital equipment, personnel-related activities, energy and water use related to company management and sales activities are excluded.

## VALIDATION OF DATA

Data collection for production, transport, and packaging was conducted using time and site-specific information, as defined in the general information section on page 1 and 2. Upstream process calculations rely on generic data as defined in the Bibliography section. Manufacturer-provided specific and generic data were used for the product's manufacturing stage. The analysis was performed in One Click LCA EPD Generator, with the 'Cut-Off, EN 15804+A2' allocation method, and characterization factors according to EN 15804:2012+A2:2019/AC:2021 and JRC EF 3.1.

## ALLOCATION, ESTIMATES AND ASSUMPTIONS

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation. All allocations are done as per the reference standards and the applied PCR. In this study, allocation has been done in the following ways:

| Data type | Allocation |
|---|---|
| Raw materials | No allocation |
| Packaging material | No allocation |
| Ancillary materials | Physical Properties |
| Manufacturing energy and waste | Physical Properties |

The product-specific raw material and packaging material inputs were determined based on actual consumption values per declared unit. Ancillary materials, manufacturing energy and waste were allocated based on annual consumption and production ratios at site-level.

## PRODUCT & MANUFACTURING SITES GROUPING

| | |
|---|---|
| Type of grouping | No grouping |
| Grouping method | Not applicable |
| Variation in GWP-fossil for A1-A3, % | N/A |

This EPD is product and factory specific.

## LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator for EPD Hub V3 and EPD Process Certification v3.2.5. The LCA and EPD have been prepared according to the reference standards and ISO 14040/14044. The EPD Generator uses Ecoinvent v3.10.1 and One Click LCA databases as sources of environmental data. Allocation used in Ecoinvent 3.10.1 environmental data sources follow the methodology 'allocation, Cut-off, EN 15804+A2'.

Default values for waste treatment scenarios associated with:

Installation waste (A5): One Click LCA Paper Packaging EU Scenario (EUROSTAT).

End-of-Life (C1-C4, D): Method for Determining the Environmental Performance of Buildings (Dutch title: Forfaitaire waarden voor verwerking-scenario's einde leven behorende bij: Bepalingsmethode Milieuprestatie Bouwwerken). NMD, 2024.

Environmental data sources:

ecoinvent v3, Allocation, cut-off by classification, Swiss Centre of Life Cycle Inventories.

ÖKOBAUDAT 2021-II, Allocation, German Federal Ministry for Housing, Urban Development and Building.

ProBas, German Federal Environment Agency.

One Click LCA, One Click LCA.

# ENVIRONMENTAL IMPACT DATA

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

## CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1

| Impact category | Unit | A1 | A2 | A3 | A1-A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GWP – total[1)] | kg $CO_2$e | 3,23E+00 | 2,91E-01 | 1,71E-02 | 3,54E+00 | 4,84E-02 | 9,51E-02 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 2,89E-02 | 4,13E-02 | 2,31E-04 | -6,28E-01 |
| GWP – fossil | kg $CO_2$e | 3,25E+00 | 2,91E-01 | 1,08E-01 | 3,64E+00 | 4,83E-02 | 2,26E-03 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 2,88E-02 | 4,13E-02 | 2,31E-04 | -5,54E-01 |
| GWP – biogenic | kg $CO_2$e | -1,96E-02 | 2,25E-04 | -9,28E-02 | -1,12E-01 | 1,08E-05 | 9,28E-02 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 6,43E-06 | -2,88E-05 | -1,30E-07 | -7,44E-02 |
| GWP – LULUC | kg $CO_2$e | 5,29E-03 | 1,28E-04 | 2,40E-03 | 7,82E-03 | 2,19E-05 | 1,24E-06 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 1,31E-05 | 1,67E-05 | 3,50E-08 | 4,28E-04 |
| Ozone depletion pot. | kg CFC-$_{11}$e | 1,91E-07 | 6,05E-09 | 4,14E-09 | 2,01E-07 | 7,17E-10 | 2,28E-11 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 4,28E-10 | 1,86E-10 | 1,63E-12 | -6,41E-10 |
| Acidification potential | mol $H^+$e | 5,11E-02 | 5,63E-03 | 4,57E-04 | 5,72E-02 | 1,11E-04 | 9,11E-06 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 6,60E-05 | 1,64E-04 | 4,15E-07 | -2,00E-03 |
| EP-freshwater[2)] | kg Pe | 5,94E-04 | 1,49E-05 | 3,99E-05 | 6,49E-04 | 3,79E-06 | 5,03E-07 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 2,26E-06 | 8,71E-06 | 5,27E-09 | -2,16E-04 |
| EP-marine | kg Ne | 3,45E-03 | 1,75E-03 | 1,70E-04 | 5,37E-03 | 2,57E-05 | 1,47E-05 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 1,53E-05 | 3,71E-05 | 5,30E-07 | -3,39E-04 |
| EP-terrestrial | mol Ne | 3,65E-02 | 1,93E-02 | 1,26E-03 | 5,71E-02 | 2,77E-04 | 2,88E-05 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 1,65E-04 | 4,18E-04 | 1,72E-06 | -5,61E-03 |
| POCP ("smog")[3)] | kg NMVOCe | 1,13E-02 | 5,32E-03 | 3,35E-04 | 1,70E-02 | 1,55E-04 | 1,10E-05 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 9,25E-05 | 1,23E-04 | 6,53E-07 | -1,65E-03 |
| ADP-minerals & metals[4)] | kg Sbe | 1,70E-04 | 9,43E-07 | 1,50E-04 | 3,20E-04 | 1,62E-07 | 1,46E-08 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 9,65E-08 | 9,55E-07 | 1,07E-10 | -8,43E-06 |
| ADP-fossil resources | MJ | 4,40E+01 | 3,60E+00 | 1,42E+00 | 4,90E+01 | 6,79E-01 | 2,06E-02 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 4,05E-01 | 1,84E-01 | 1,39E-03 | -4,34E+00 |
| Water use[5)] | $m^3$e depr. | 2,71E+00 | 1,36E-02 | 5,67E-01 | 3,29E+00 | 3,18E-03 | 5,64E-04 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 1,90E-03 | 4,18E-03 | 4,90E-06 | 1,25E-01 |

*1) GWP = Global Warming Potential; 2) EP = Eutrophication potential. Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO4e; 3) POCP = Photochemical ozone formation; 4) ADP = Abiotic depletion potential; 5) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.*

## ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1

| Impact category | Unit | A1 | A2 | A3 | A1-A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Particulate matter | Incidence | 2,32E-09 | 8,15E-09 | 2,92E-09 | 1,34E-08 | 3,60E-09 | 1,22E-10 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 2,15E-09 | 2,19E-09 | 9,43E-12 | -3,91E-08 |
| Ionizing radiation[6)] | kBq U235e | 5,49E-03 | 2,15E-03 | 1,39E-02 | 2,16E-02 | 5,56E-04 | 1,35E-04 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 3,32E-04 | 1,54E-03 | 1,03E-06 | 1,44E-02 |
| Ecotoxicity (freshwater) | CTUe | 4,33E-01 | 3,96E-01 | 5,61E-01 | 1,39E+00 | 1,08E-01 | 7,35E-02 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 6,44E-02 | 1,22E-01 | 6,72E-04 | 3,49E+00 |
| Human toxicity, cancer | CTUh | 1,12E-11 | 5,46E-11 | 2,20E-11 | 8,78E-11 | 8,09E-12 | 1,63E-12 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 4,82E-12 | 1,27E-11 | 1,69E-14 | 2,74E-10 |
| Human tox. non-cancer | CTUh | 3,91E-10 | 1,09E-09 | 6,13E-10 | 2,10E-09 | 4,29E-10 | 8,69E-11 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 2,56E-10 | 8,47E-10 | 2,01E-12 | 4,27E-08 |
| SQP[7)] | - | 2,11E-01 | 3,37E-01 | 3,20E+00 | 3,75E+00 | 4,12E-01 | 1,52E-02 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 2,46E-01 | 3,52E-01 | 2,90E-03 | -8,70E+00 |

*6) EN 15804+A2 disclaimer for Ionizing radiation, human health. 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; 7) SQP = Land use related impacts/soil quality.*

## USE OF NATURAL RESOURCES

| Impact category | Unit | A1 | A2 | A3 | A1-A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Renew. PER as energy[8)] | MJ | 8,71E+00 | 4,22E-02 | -8,60E-02 | 8,66E+00 | 9,44E-03 | -8,99E-01 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 5,63E-03 | 3,38E-02 | 1,61E-05 | -1,82E+00 |
| Renew. PER as material | MJ | 0,00E+00 | 0,00E+00 | 8,08E-01 | 8,08E-01 | 0,00E+00 | -8,08E-01 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 7,26E-01 |
| Total use of renew. PER | MJ | 8,71E+00 | 4,22E-02 | 7,22E-01 | 9,47E+00 | 9,44E-03 | -1,71E+00 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 5,63E-03 | 3,38E-02 | 1,61E-05 | -1,09E+00 |
| Non-re. PER as energy | MJ | 3,90E+01 | 3,60E+00 | 1,46E+00 | 4,41E+01 | 6,79E-01 | 2,06E-02 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 4,05E-01 | -1,79E-01 | -7,15E-02 | -4,36E+00 |
| Non-re. PER as material | MJ | 3,77E-01 | 0,00E+00 | 3,22E-03 | 3,80E-01 | 0,00E+00 | -3,22E-03 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 0,00E+00 | -3,15E-01 | -6,16E-02 | 3,50E-03 |
| Total use of non-re. PER | MJ | 3,94E+01 | 3,60E+00 | 1,46E+00 | 4,45E+01 | 6,79E-01 | 1,74E-02 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 4,05E-01 | -4,94E-01 | -1,33E-01 | -4,35E+00 |
| Secondary materials | kg | 2,93E-01 | 1,75E-03 | 5,57E-02 | 3,50E-01 | 3,09E-04 | 3,40E-05 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 1,85E-04 | 2,25E-04 | 4,00E-07 | 4,09E-01 |
| Renew. secondary fuels | MJ | 2,64E-02 | 6,60E-06 | 5,39E-03 | 3,18E-02 | 3,95E-06 | 1,92E-07 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 2,36E-06 | 1,03E-05 | 7,96E-09 | -8,29E-05 |
| Non-ren. secondary fuels | MJ | 1,02E-01 | 0,00E+00 | 0,00E+00 | 1,02E-01 | 0,00E+00 | 0,00E+00 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| Use of net fresh water | $m^3$ | 2,34E-01 | 3,29E-04 | 1,32E-03 | 2,36E-01 | 9,29E-05 | -1,16E-05 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 5,54E-05 | 1,07E-04 | -6,00E-06 | -1,68E-02 |

*8) PER = Primary energy resources.*

## END OF LIFE – WASTE

| Impact category | Unit | A1 | A2 | A3 | A1-A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hazardous waste | kg | 1,24E+00 | 7,07E-03 | 3,47E-03 | 1,25E+00 | 1,19E-03 | 3,49E-04 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 7,11E-04 | 1,60E-03 | 1,83E-06 | -3,27E-01 |
| Non-hazardous waste | kg | 3,52E+00 | 1,08E-01 | 1,08E-01 | 3,74E+00 | 2,24E-02 | 3,94E-02 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 1,33E-02 | 5,35E-02 | 9,36E-03 | 8,15E+00 |
| Radioactive waste | kg | 1,01E-02 | 5,29E-07 | 2,82E-06 | 1,01E-02 | 1,36E-07 | 3,44E-08 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 8,12E-08 | 3,94E-07 | 2,52E-10 | 3,53E-06 |

## END OF LIFE – OUTPUT FLOWS

| Impact category | Unit | A1 | A2 | A3 | A1-A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Components for re-use | kg | 3,92E-03 | 0,00E+00 | 0,00E+00 | 3,92E-03 | 0,00E+00 | 0,00E+00 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| Materials for recycling | kg | 7,70E-02 | 0,00E+00 | 4,00E-04 | 7,74E-02 | 0,00E+00 | 5,19E-02 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 0,00E+00 | 5,95E-01 | 0,00E+00 | 0,00E+00 |
| Materials for energy rec | kg | 1,66E-03 | 0,00E+00 | 1,15E-23 | 1,66E-03 | 0,00E+00 | 5,00E-03 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 0,00E+00 | 1,01E-02 | 0,00E+00 | 0,00E+00 |
| Exported energy | MJ | 2,23E-03 | 0,00E+00 | 0,00E+00 | 2,23E-03 | 0,00E+00 | 2,69E-02 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 0,00E+00 | 1,19E-01 | 0,00E+00 | 0,00E+00 |
| Exported energy – Electricity | MJ | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,12E-02 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 0,00E+00 | 5,02E-02 | 0,00E+00 | 0,00E+00 |
| Exported energy – Heat | MJ | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,56E-02 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 0,00E+00 | 6,90E-02 | 0,00E+00 | 0,00E+00 |

## ADDITIONAL INDICATOR – GWP-GHG

| Impact category | Unit | A1 | A2 | A3 | A1-A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GWP-GHG[9)] | kg $CO_2e$ | 3,25E+00 | 2,91E-01 | 1,10E-01 | 3,65E+00 | 4,84E-02 | 2,26E-03 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 2,89E-02 | 4,14E-02 | 2,31E-04 | -5,54E-01 |

*9) This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. In addition, the characterisation factors for the flows – CH4 fossil, CH4 biogenic and Dinitrogen monoxide – were updated. This indicator is identical to the GWP-total of EN 15804:2012+A2:2019 except that the characterisation factor for biogenic CO2 is set to zero*

## SCENARIO DOCUMENTATION

## DATA SOURCES

### Manufacturing energy scenario documentation

1. Natural gas space heating (2020), Netherlands, ProBas, 0,0737 kgCO2e/MJ
2. Electricity, Netherlands, residual mix, 2024, Netherlands, One Click LCA, 0,59 kgCO2e/kWh

### Transport scenario documentation - A4 (Transport resources)

### Transport to the building site (A4) - Scenario documentation

| Scenario parameter | Value |
|---|---|
| Capacity utilization (including empty return) % | 50 |
| Bulk density of transported products | 1.177 |
| Volume capacity utilization factor | <1 |

### Installation at the building site (A5) - Scenario documentation

Packaging waste recycling scenario: One Click LCA Paper Packaging EU Scenario (EUROSTAT).

| Scenario parameter | Value |
|---|---|
| Energy: type and consumption (MJ or kWh) | N/A |
| Water use ($m^3$) | N/A |
| Ancillary materials: type and mass (kg) | N/A |
| Waste materials: type and mass (kg) | Cardboard: 0,0565 kg;<br>Paper: 0,0060 kg |
| Waste materials: output routes | Paper and cardboard waste (83% recycling, 8% incineration with energy recovery, 9% landfill) |
| Direct emissions (kg) | N/A |

## End of life (C1-C4) - Scenario documentation

End-of-life recycling scenarios: Method for Determining the Environmental Performance of Buildings (Dutch title: Forfaitaire waarden voor verwerkingsscenario's einde leven behorende bij: Bepalingsmethode Milieuprestatie Bouwwerken). NMD, 2024.

| Scenario information | Value |
|---|---|
| Collection process: collected separately (kg) | 0,617 |
| Collection process: Mixed waste (kg) | N/A |
| Recovery: re-use (kg) | 0 |
| Recovery: recycling (kg) | 0,59 |
| Recovery: energy recovery (kg) | 0,01 |
| Disposal (kg) | 0,01 |
| Scenario assumptions e.g. transportation (mode, km) & other | Landfill, 50 km. Incineration, 150 km. Recycling, 250 km. |

# THIRD-PARTY VERIFICATION STATEMENT

EPD Hub declares that this EPD is verified in accordance with ISO 14025 by an independent, third-party verifier. The project report on the Life Cycle Assessment and the report(s) on features of environmental relevance are filed at EPD Hub. EPD Hub PCR and ECO Platform verification checklist are used.

EPD Hub is not able to identify any unjustified deviations from the PCR and EN 15804+A2 in the Environmental Product Declaration and its project report.

EPD Hub maintains its independence as a third-party body; it was not involved in the execution of the LCA or in the development of the declaration and has no conflicts of interest regarding this verification.

The company-specific data and upstream and downstream data have been examined as regards plausibility and consistency. The publisher is responsible for ensuring the factual integrity and legal compliance of this declaration.

The software used in creation of this LCA and EPD is verified by EPD Hub to conform to the procedural and methodological requirements outlined in ISO 14025:2010, ISO 14040/14044, EN 15804+A2, and EPD Hub Core Product Category Rules and General Program Instructions.

Verified tools

Tool verifier: Magaly Gonzalez Vazquez
Tool verification validity: 27 March 2025 - 26 March 2028

Afzal khan Peerukhan as an authorized verifier for EPD Hub Limited 17.08.2026

VERIFIED ISO 14025

# ANNEX

This EPD covers the SpiroTop AB050/R002 variants type AB050/R002: AB050/R002 and AB050/AR002, covering over 85% of the total sales of stainless steel variants.

In addition to the variants covered by this EPD, the SpiroTop product range also includes the following stainless steel variants:

- AB050/R004;
- Type AB050/R007: AB050/R007 and AB050RT8FRA01;

The EN 15804+A2 GWP indicators for each design variation within this product range are reported in the table below. Results for other life cycle impact categories are available from Spirotech on request.

| Impact category | Unit | A1-A3 | | |
|---|---|---|---|---|
| Product reference | / | AB050/(A)R002 | AB050/R004 | AB050/R007; AB050RT8FRA01 |
| Product weight | kg | 0,617 | 0,895 | 0,636 |
| Packaging mass | kg | 0,0625 | 0,0625 | 0,0625 |
| GWP-total | kg $CO_2$e | 3,54 | 5,19 | 3,64 |
| GWP-fossil | kg $CO_2$e | 3,64 | 5,30 | 3,75 |
| GWP-biogenic | kg $CO_2$e | -0,12 | -0,12 | -0,11 |
| GWP-luluc | kg $CO_2$e | 0,008 | 0,010 | 0,008 |