

# Environmental product declaration

in accordance with ISO 14025 and EN 15804+A2

## GRAFT FR Graphite (plastic cartridge) for Sweden





The Norwegian EPD Foundation

**Owner of the declaration:**

Polyseam AS

**Product:**

GRAFT FR Graphite (plastic cartridge) for Sweden

**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:**

The Norwegian EPD Foundation

**Declaration number:**

NEPD-8729-8406

**Registration number:**

NEPD-8729-8406

**Issue date:** 15.01.2025

**Valid to:** 15.01.2030

**EPD software:**

LCAno EPD generator ID: 748128

## General information

### Product

GRAFT FR Graphite (plastic cartridge) for Sweden

### Program operator:

The Norwegian EPD Foundation  
Post Box 5250 Majorstuen, 0303 Oslo, Norway  
Phone: +47 977 22 020  
web: [www.epd-norge.no](http://www.epd-norge.no)

### Declaration number:

NEPD-8729-8406

### 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 Norway shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

### Declared unit:

1 kg GRAFT FR Graphite (plastic cartridge) for Sweden

### 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-Norway'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-Norway, and iii) the process is reviewed annually by an independent third party verifier. See Appendix G of EPD-Norway'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 EPDNorway'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:

Polyseam AS  
Contact person: Andrea Bogstad  
Phone: +47 33 30 67 00  
e-mail: [post.no@polyseam.com](mailto:post.no@polyseam.com)

### Manufacturer:

Polyseam Ltd

### Place of production:

Polyseam Ltd  
St Andrews Road 15  
HD1 6SB Huddersfield, West Yorkshire, United Kingdom

### Management system:

ISO 9001, ISO 14001

### Organisation no:

986 426 051

### Issue date:

15.01.2025

### Valid to:

15.01.2030

### Year of study:

2022

### Comparability:

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

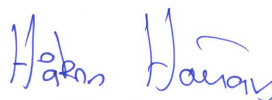
### Development and verification of EPD:

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 Norway.

Developer of EPD: Andrea Bogstad

Reviewer of company-specific input data and EPD: Jørn Davidsen

### Approved:



Håkon Hauan  
Managing Director of EPD-Norway

## Product

### Product description:

GRAFT FR Graphite is a high specification formulation designed to prevent the spread of fire, smoke and gases through openings in fire rated walls and floors. FR Graphite expands when it is subjected to fire and closes openings around penetrations when any combustible or low temperature melting materials have burnt away.

FR Graphite is designed to fire seal difficult services which traditional fire rated mastics do not achieve such as large plastic pipes.

FR Graphite can be used with a suitable filling material, i.e. stone wool or GRAFT Backing material in order to ensure correct width to depth ratio and to reduce the shrinking of the sealant during curing. Minimum depth and maximum width of the joints are included in the installation instructions. Thermal activation takes place at 150 °C when the material will expand (intumesce) to prevent the passage of fire and smoke for periods up to 4 hours.

### Product specification

| Materials             | Value | Unit |
|-----------------------|-------|------|
| MATERIALS             |       |      |
| Preservative          | 0,02  | %    |
| Filler                | 1-10  | %    |
| Binder                | 20-30 | %    |
| Chemical              | 10-20 | %    |
| Mineral               | 30-60 | %    |
| Solvent               | 10-15 | %    |
| PACKAGING             |       |      |
| Packaging - Cardboard | 0,03  | kg   |
| Packaging - Plastic   | 0,08  | kg   |
| Packaging - Wood      | 0,03  | kg   |

### Technical data:

The product has third-party verified ETAs issued in accordance with regulation (EU) No 305/2011 on the basis of EAD 350454-00-1104, tested to EN 1366-3 in conjunction with EN 1363-1. The product is CE-marked for Europe.

For more information, please see <https://www.graft.no/se/produkter/fr-grafit/>

### Market:

Sweden.

### Reference service life, product

The reference service life of the product depends on its application area.

### Reference service life, building

60 years.

## LCA: Calculation rules

### Declared unit:

1 kg GRAFT FR Graphite (plastic cartridge) for Sweden

### 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 |
|-----------------------|------------------------|--------------|------|
| Binder                | ecoinvent 3.6          | Database     | 2019 |
| Chemical              | ecoinvent 3.6          | Database     | 2019 |
| Chemical              | Modified ecoinvent 3.6 | Database     | 2019 |
| Filler                | ecoinvent 3.6          | Database     | 2019 |
| Mineral               | ecoinvent 3.6          | Database     | 2019 |
| Packaging - Cardboard | Modified ecoinvent 3.6 | Database     | 2019 |
| Packaging - Plastic   | ecoinvent 3.6          | Database     | 2019 |
| Packaging - Wood      | Modified ecoinvent 3.6 | Database     | 2019 |
| Preservative          | ecoinvent 3.6          | Database     | 2019 |
| Solvent               | ecoinvent 3.6          | Database     | 2019 |

## 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 life cycle analysis is a cradle-to-gate (A1 - A3) study, with optional modules A4-A5, C1-C4, and D. It includes the extraction and production of raw materials and packaging, transportation to the manufacturing site, the production process itself, transportation to the construction site, waste management during product installation, demolition of the building, transportation to waste treatment facilities, waste treatment, as well as potential recycling, reuse, repurposing, or energy recovery.

A4: Transportation from the factory in England to Sweden is included. Additionally, 300 km of transportation from our warehouse to the construction site is added according to the PCR.

A5: Manual installation is considered, without the use of electricity. A 3% material waste during installation is included. Emissions of VOCs during installation are also accounted for. All packaging is sent to average waste management.

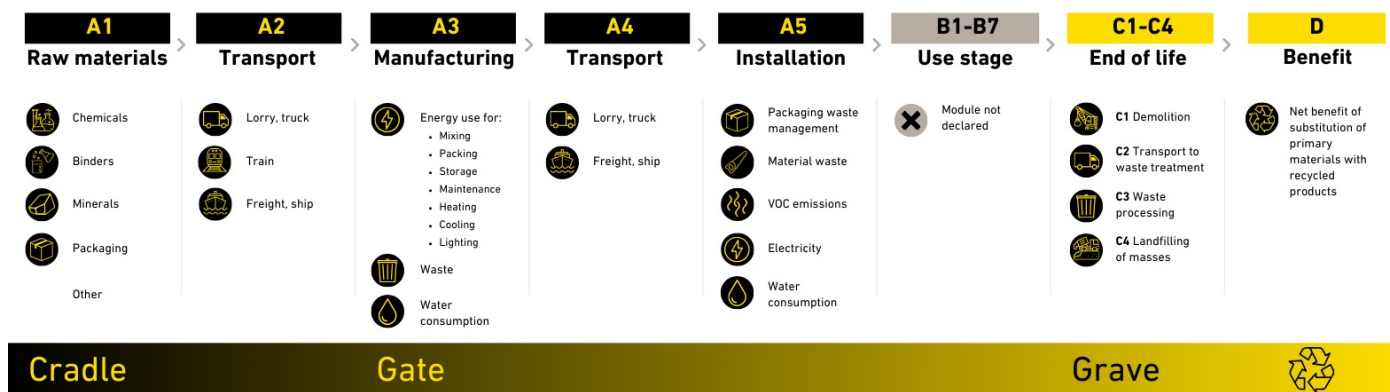
C1: Average datasets are used for demolition.

C2: 50 km transport to the nearest waste treatment facility is assumed.

C3: The entire product is assumed to be sent for incineration.

C4: Ash from incineration is sent to landfill.

D: Incineration generates energy for district heating and electricity production.



### Additional technical information:

GRAFT FR Graphite can be removed with a knife/scrapper and disposed of at an approved waste facility.

Polyseam's factory is certified according to the ISO 14001 Environmental Management Systems (EMS). It provides a framework for organisations to design and implement an EMS, and continually improve their environmental performance.

Learn more: <https://www.polyseam.com/sustainability/>

## LCA: Scenarios and additional technical information

The following information describe the scenarios in the different modules of the EPD.

| Transport from production place to user (A4)                                                   | Capacity utilisation (incl. return) % | Distance (km) | Fuel/Energy Consumption | Unit  | Value (Liter/tonne) |
|------------------------------------------------------------------------------------------------|---------------------------------------|---------------|-------------------------|-------|---------------------|
| Ship, Ferry, Sea (km)                                                                          | 50,0 %                                | 1322          | 0,034                   | l/tkm | 44,95               |
| Truck, 16-32 tonnes, EURO 6 (km) - Europe                                                      | 36,7 %                                | 457           | 0,043                   | l/tkm | 19,65               |
| Truck, 16-32 tonnes, EURO 6 (km) - Europe                                                      | 36,7 %                                | 300           | 0,043                   | l/tkm | 12,90               |
| Truck, 16-32 tonnes, EURO 6 (km) - Europe                                                      | 36,7 %                                | 138           | 0,043                   | l/tkm | 5,93                |
| Assembly (A5)                                                                                  | Unit                                  | Value         |                         |       |                     |
| Waste, packaging, cardboard, to average treatment (kg)                                         | kg                                    | 0,025         |                         |       |                     |
| Waste, packaging, Plastic cartridges, HDPE, to average treatment (kg)                          | kg                                    | 0,078         |                         |       |                     |
| Waste, packaging, plastic film (LDPE), to average treatment (kg)                               | kg                                    | 0,00040       |                         |       |                     |
| Material loss during instalation (kg)                                                          | Units/DU                              | 0,030         |                         |       |                     |
| Waste treatment of material lost during instalation (kg)                                       | kg/DU                                 | 0,030         |                         |       |                     |
| Waste, packaging, pallet, EUR wooden pallet, reusable, to average treatment (kg)               | kg                                    | 0,032         |                         |       |                     |
| Volatile organic compounds (VOCs) to air (kg)                                                  | kg/DU                                 | 0,00068       |                         |       |                     |
| De-construction demolition (C1)                                                                | Unit                                  | Value         |                         |       |                     |
| Demolition of building and mixed material collection, 0,012kWh per kg demolished material (kg) | kg                                    | 1,000000000   |                         |       |                     |
| Transport to waste processing (C2)                                                             | Capacity utilisation (incl. return) % | Distance (km) | Fuel/Energy Consumption | Unit  | Value (Liter/tonne) |
| Truck, over 32 tonnes, EURO 6 (km) - Europe                                                    | 53,3 %                                | 50            | 0,023                   | l/tkm | 1,15                |
| Waste processing (C3)                                                                          | Unit                                  | Value         |                         |       |                     |
| Waste treatment per kg Hazardous waste, incineration (kg)                                      | kg                                    | 1,000000000   |                         |       |                     |
| Disposal (C4)                                                                                  | Unit                                  | Value         |                         |       |                     |
| Landfilling of ashes from incineration of Hazardous waste, from incineration (kg)              | kg                                    | 0,18          |                         |       |                     |
| Benefits and loads beyond the system boundaries (D)                                            | Unit                                  | Value         |                         |       |                     |
| Substitution of electricity (MJ)                                                               | MJ                                    | 0,0012        |                         |       |                     |
| Substitution of thermal energy, district heating (MJ)                                          | MJ                                    | 0,018         |                         |       |                     |

## 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 <sub>2</sub> -eq | 1,36E+00  | 8,45E-02 | 5,40E-02 | 3,27E-01 | 1,37E-01 | 4,00E-03 | 4,89E-03 | 2,22E+00 | 8,26E-02 | -1,10E-04 |
|  | GWP-fossil                       | kg CO <sub>2</sub> -eq | 1,45E+00  | 8,44E-02 | 5,23E-02 | 3,27E-01 | 4,49E-02 | 4,00E-03 | 4,89E-03 | 2,22E+00 | 8,26E-02 | -1,06E-04 |
|  | GWP-biogenic                     | kg CO <sub>2</sub> -eq | -8,77E-02 | 2,87E-05 | 1,68E-03 | 1,10E-04 | 9,18E-02 | 7,50E-07 | 2,09E-06 | 5,56E-03 | 3,28E-05 | -2,18E-07 |
|  | GWP-luluc                        | kg CO <sub>2</sub> -eq | 1,14E-03  | 4,18E-05 | 5,97E-05 | 1,60E-04 | 2,65E-05 | 3,15E-07 | 1,49E-06 | 5,59E-04 | 7,95E-06 | -3,64E-06 |
|  | ODP                              | kg CFC 11-eq           | 1,32E-07  | 1,85E-08 | 4,67E-09 | 6,98E-08 | 4,36E-09 | 8,64E-10 | 1,18E-09 | 2,54E-07 | 4,00E-09 | -7,71E-06 |
|  | AP                               | mol H <sup>+</sup> -eq | 8,47E-03  | 1,61E-03 | 1,83E-04 | 5,81E-03 | 7,00E-05 | 4,19E-05 | 1,57E-05 | 3,26E-03 | 1,63E-04 | -8,72E-07 |
|  | EP-FreshWater                    | kg P -eq               | 5,36E-05  | 4,95E-07 | 1,34E-06 | 1,93E-06 | 8,82E-07 | 1,46E-08 | 3,89E-08 | 5,32E-05 | 8,00E-07 | -9,40E-09 |
|  | EP-Marine                        | kg N -eq               | 1,50E-03  | 4,10E-04 | 3,70E-05 | 1,43E-03 | 2,04E-05 | 1,85E-05 | 3,45E-06 | 6,73E-04 | 4,24E-05 | -2,85E-07 |
|  | EP-Terrestrial                   | mol N -eq              | 1,60E-02  | 4,55E-03 | 4,03E-04 | 1,58E-02 | 1,77E-04 | 2,00E-04 | 3,84E-05 | 7,59E-03 | 4,97E-04 | -3,08E-06 |
|  | POCP                             | kg NMVOC-eq            | 8,73E-03  | 1,21E-03 | 1,05E-04 | 4,23E-03 | 2,15E-04 | 5,57E-05 | 1,51E-05 | 2,13E-03 | 1,39E-04 | -8,50E-07 |
|  | ADP-minerals&metals <sup>1</sup> | kg Sb-eq               | 6,67E-04  | 1,19E-06 | 6,49E-07 | 5,63E-06 | 1,79E-07 | 6,14E-09 | 8,71E-08 | 7,74E-06 | 1,40E-07 | -1,05E-09 |
|  | ADP-fossil <sup>1</sup>          | MJ                     | 3,26E+01  | 1,19E+00 | 1,07E+00 | 4,56E+00 | 1,99E-01 | 5,51E-02 | 7,94E-02 | 9,30E+00 | 3,85E-01 | -1,51E-03 |
|  | WDP <sup>1</sup>                 | m <sup>3</sup>         | 6,11E+01  | 6,48E-01 | 4,62E+00 | 2,80E+00 | 7,55E-01 | 1,17E-02 | 6,09E-02 | 3,44E+01 | 9,87E+00 | -1,88E-02 |

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<sup>-3</sup> = 0,009"

\*INA Indicator Not Assessed

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 | 8,52E-08 | 4,01E-09 | 7,27E-10 | 1,45E-08 | 1,10E-09 | 5,07E-09 | 4,49E-10 | 5,00E-08 | 1,10E-09 | -5,20E-11 |
|  IRP <sup>2</sup>    | kgBq U235 -eq     | 5,42E-02 | 5,16E-03 | 1,72E-02 | 1,98E-02 | 8,39E-04 | 2,40E-04 | 3,47E-04 | 4,23E-02 | 2,14E-03 | -9,67E-06 |
|  ETP-fw <sup>1</sup> | CTUe              | 3,08E+01 | 7,87E-01 | 7,72E-01 | 3,03E+00 | 7,57E-01 | 3,01E-02 | 5,80E-02 | 4,51E+01 | 1,12E+00 | -8,23E-03 |
|  HTP-c <sup>1</sup>  | CTUh              | 2,66E-09 | 0,00E+00 | 1,90E-11 | 0,00E+00 | 4,10E-11 | 1,00E-12 | 0,00E+00 | 2,13E-09 | 6,00E-11 | 0,00E+00  |
|  HTP-nc <sup>1</sup> | CTUh              | 3,36E-08 | 6,82E-10 | 6,56E-10 | 3,49E-09 | 3,55E-10 | 2,80E-11 | 5,60E-11 | 1,30E-08 | 2,20E-09 | -8,00E-12 |
|  SQP <sup>1</sup>    | dimensionless     | 2,01E+01 | 6,90E-01 | 8,97E-01 | 2,00E+00 | 1,77E-01 | 6,69E-03 | 9,10E-02 | 3,67E+00 | 1,09E+00 | -1,01E-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\*10<sup>-3</sup> = 0,009"

\*INA Indicator Not Assessed

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             | 1,96E+00 | 1,21E-02 | 2,94E-01 | 4,86E-02 | 3,33E-02  | 3,00E-04 | 9,99E-04 | 1,68E+00 | 4,73E-02 | -9,35E-03 |
|  PERM  | MJ             | 8,49E-01 | 0,00E+00 | 0,00E+00 | 0,00E+00 | -8,49E-01 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00  |
|  PERT  | MJ             | 2,81E+00 | 1,21E-02 | 2,94E-01 | 4,86E-02 | -8,16E-01 | 3,00E-04 | 9,99E-04 | 1,68E+00 | 4,73E-02 | -9,35E-03 |
|  PENRE | MJ             | 2,95E+01 | 1,19E+00 | 1,07E+00 | 4,56E+00 | 1,99E-01  | 5,51E-02 | 7,94E-02 | 9,30E+00 | 3,85E-01 | -1,51E-03 |
|  PENRM | MJ             | 3,33E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | -3,33E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00  |
|  PENRT | MJ             | 3,28E+01 | 1,19E+00 | 1,07E+00 | 4,56E+00 | -3,13E+00 | 5,51E-02 | 7,94E-02 | 9,30E+00 | 3,85E-01 | -1,51E-03 |
|  SM    | kg             | 1,61E-02 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00  | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00  |
|  RSF   | MJ             | 5,32E-02 | 3,89E-04 | 4,26E-04 | 1,60E-03 | 5,82E-04  | 0,00E+00 | 3,49E-05 | 3,70E-02 | 8,58E-04 | -1,64E-06 |
|  NRSF  | MJ             | 8,58E-03 | 1,69E-03 | 4,96E-04 | 4,54E-03 | 1,88E-03  | 0,00E+00 | 1,17E-04 | 0,00E+00 | 8,48E-03 | -5,54E-04 |
|  FW    | m <sup>3</sup> | 3,44E-02 | 9,87E-05 | 4,30E-04 | 3,65E-04 | 1,57E-04  | 2,83E-06 | 9,03E-06 | 8,61E-03 | 6,85E-04 | -1,13E-05 |

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\*10<sup>-3</sup> = 0,009"

\*INA Indicator Not Assessed

| End of life - Waste                                                               |      |      |          |          |          |          |          |          |          |          |          |           |
|-----------------------------------------------------------------------------------|------|------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|
| Indicator                                                                         |      | Unit | A1       | A2       | A3       | A4       | A5       | C1       | C2       | C3       | C4       | D         |
|  | HWD  | kg   | 3,60E-03 | 5,71E-05 | 3,21E-03 | 2,12E-04 | 3,00E-02 | 1,62E-06 | 4,34E-06 | 0,00E+00 | 0,00E+00 | -7,11E-08 |
|  | NHWD | kg   | 1,26E-01 | 4,70E-02 | 6,31E-03 | 1,25E-01 | 1,05E-01 | 6,52E-05 | 6,90E-03 | 1,00E+00 | 1,89E-01 | -3,57E-05 |
|  | RWD  | kg   | 5,43E-05 | 8,20E-06 | 8,58E-06 | 3,14E-05 | 0,00E+00 | 3,82E-07 | 5,42E-07 | 0,00E+00 | 0,00E+00 | -7,92E-09 |

HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed

"Reading example: 9,0 E-03 =  $9,0 \cdot 10^{-3}$  = 0,009"

\*INA Indicator Not Assessed

| 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 | 3,09E-02 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
|  | MFR | kg   | 5,25E-04 | 0,00E+00 | 1,10E-02 | 0,00E+00 | 6,96E-02 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
|  | MER | kg   | 2,59E-05 | 0,00E+00 | 8,75E-08 | 0,00E+00 | 1,59E-02 | 0,00E+00 | 0,00E+00 | 1,00E+00 | 0,00E+00 | 0,00E+00 |
|  | EEE | MJ   | 1,68E-04 | 0,00E+00 | 8,41E-03 | 0,00E+00 | 3,06E-03 | 0,00E+00 | 0,00E+00 | 9,90E-04 | 0,00E+00 | 0,00E+00 |
|  | EET | MJ   | 2,54E-03 | 0,00E+00 | 1,27E-01 | 0,00E+00 | 4,63E-02 | 0,00E+00 | 0,00E+00 | 1,50E-02 | 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 =  $9,0 \cdot 10^{-3}$  = 0,009"

\*INA Indicator Not Assessed

| 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 | 2,50E-02            |

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO<sub>2</sub>

## 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, United Kingdom, Market mix (kWh) | ecoinvent 3.6 | 386,67 | g CO <sub>2</sub> -eq/kWh |
| Electricity, United Kingdom, Solar (kWh)      | ecoinvent 3.6 | 78,98  | g CO <sub>2</sub> -eq/kWh |

### Dangerous substances

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

### Indoor environment

GRAFT FR Graphite has been emission tested by Normec Product Testing. Meets the exemplary level criteria for indoor air quality as specified in BREEAM-SE Nybyggnad v6.0.

Properties for item FR Graphite have been declared in the Nordic Ecolabelling Building Products Portal (generation 3) and Supply Chain Declaration Portal (generation 4).

## 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 <sub>2</sub> -eq | 1,43E+00 | 8,45E-02 | 6,15E-02 | 3,27E-01 | 3,54E-02 | 4,00E-03 | 4,89E-03 | 2,22E+00 | 8,26E-02 | -1,08E-04 |

GWP-IOBC: 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.

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