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ECO PLATFORM EPD VERIFIED

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|---|---|
| Owner: | Plastmo A/S |
| No.: | MD-22036-EN_rev1 |
| Issued: | 03-03-2023 |
| Issued first time: | 20-12-2022 |
| Valid to: | 20-12-2027 |

3rd PARTY **VERIFIED**

# EPD

VERIFIED ENVIRONMENTAL PRODUCT DECLARATION | **ISO 14025 & EN 15804**

**Owner of declaration**
Plastmo A/S
Odinsvej 9-11
4100 Ringsted
Denmark
CVR-nr.: 33 05 16 62

**Programme**
EPD Danmark
www.epddanmark.dk

☐ Industry EPD
☒ Product EPD

**Declared product**
Steel Plus and Black Steel Rain Gutter System

Number of declared datasets/product variations: 1

Table with conversion factors included under adittional information for other sizes.

**Production site**
Odinsvej 9-11
4100 Ringsted
Denmark

**Product use**
Rain gutters for buildings

**Declared/ functional unit**
30 meter Steel Plus Rain Gutter System

**Year of production site data (A3)**
2021

**EPD version**
No. 2, first revision 03-03-2023: B modules with value 0 had been added instead of 'MNR' for clarification.

**Issued:** 03-03-2023
**Valid to:** 20-12-2027

**Basis of calculation**
This EPD is developed in accordance with the European standard EN 15804+A2.

**Comparability**
EPDs of construction products may not be comparable if they do not comply with the requirements in EN 15804. EPD data may not be comparable if the datasets used are not developed in accordance with EN 15804 and if the background systems are not based on the same database.

**Validity**
This EPD has been verified in accordance with ISO 14025 and is valid for 5 years from the date of issue.

**Use**
The intended use of an EPD is to communicate scientifically based environmental information for construction products, for the purpose of assessing the environmental performance of buildings.

**EPD type**
☐Cradle-to-gate with modules C1-C4 and D
☐Cradle-to-gate with options, modules C1-C4 and D
☒Cradle-to-grave and module D
☐Cradle-to-gate
☐Cradle-to-gate with options

CEN standard EN 15804 serves as the core PCR

Independent verification of the declaration and data, according to EN ISO 14025

☐ internal ☒ external

*Linda Højbye*
Third party verifier

*Martha Katrine Sørensen*
*EPD Danmark*

| Life cycle stages and modules (MND = module not relevant) | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Product | | | Construction process | | Use | | | | | | | End of life | | | | Beyond the system boundary |
| Raw material supply | Transport | Manufacturing | Transport | Installation process | Use | Maintenance | Repair | Replacement | Refurbishment | Operational energy use | Operational water use | De-construction demolition | Transport | Waste processing | Disposal | Re-use, recovery and recycling potential |
| A1 | A2 | A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
| x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x |

# Product information

### Product description

Steel Plus and Black Steel Rain gutters are produced in 0.7 mm quality steel. The surface is coated with a combination of zinc, aluminum and magnesium, this coating means that the surface looks like a zinc rain gutter. Inside the material has a painted layer, which ensures that no zinc particles are discharged to the groundwater. Available in both a quarter and half round dimension and in several sizes, and in the colors black and steel. The environmental impact result in this EPD is related to the Steel plus Rain Gutter System No. 11/ ø75. The number e.g. "No. 11" indicates the shape which for example can be half round or a quarter round. Ø75/Ø90 indicates the diameter, which can be 75mm or 90mm.

Conversion factors to other sizes can be found under additional information. Suitable for modern building design.

Since a gutter system consists of different parts, an average scenario has been chosen as functional unit for which components normally is used for 30 meter roof on a one story building and includes all parts e.g. rain gutter, down pipe etc. In case of another scenario, the environmental impacts can be calculated based on weight.

Steel Plus rain gutters are the perfect combination of the strength of the steel and the beautiful surface as known from patinated zinc. The surface of Steel Plus is so comparable to the original zinc look that it is indistinguishable to the naked eye.

The main product components are shown in the table below.

| Material | Weight-% of declared product |
|---|---|
| Primary Steel | 75% |
| Scrap Steel | 25% |

### Product packaging:

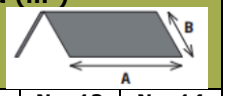
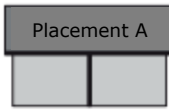
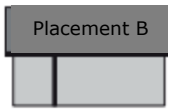
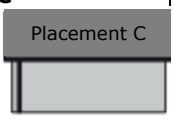
The composition of the sales- and transport packaging of the product is shown in the table below.

| Material | Weight-% of packaging |
|---|---|
| LDPE folie | 5-10 % |
| Cardboard | <1 % |
| EUR Pallet | 90-95 % |

### Essential characteristics

Normally a gutter system consists of different parts depending on the building. Therefore, an average scenario has been chosen as functional unit for which components normally is used for 30 meter roof on a one story building.

The system sizes are adapted to different house types. A size 10 gutter is installed on smaller buildings, such as holiday homes and terrace. Str. 11 is used for traditional house types, and size 12 is installed on larger buildings, such as rental properties as well as warehouse and industrial premises. To ensure that you have sufficient drainage capacity, you should calculate the roof area and decide on the placement of the down pipe. The drainage area for the different types of Steel Plus rain gutters (No. 10, 11, 12 and 14) depends on the placement of the down pipe.

| Rain gutter Placing | Drainage area ($m^2$)   | | | |
|---|---|---|---|---|
| | No. 10 | No. 11 | No. 12 | No. 14 |
| **A**   | 128 | 200 | 295 | 365 |
| **B**   | 85 | 128 | 195 | 262 |
| **C**   | 64 | 95 | 148 | 197 |

Further technical information about installation, use and disposal can be obtained by contacting the manufacturer or on the manufacturer's website: www.plastmo.dk

### Reference Service Life (RSL)

The reference service life is 25 years, which is set according to the guarantee Plastmo A/S gives on the product.

### Representativity

This declaration, including data collection and the modeled foreground system including results, represents the production of 30 meter Steel Plus Gutter System on the production site located in Denmark. Product specific data are based on average values collected in the period January to December 2021 and delivered by Plastmo and their suppliers. Background data are based on the GaBi database, EcoInvent and an EPD on steel delivered to Plastmo and are less than 10 years old. Generally, the used background datasets are of high quality, and the majority of the datasets are only a couple of years old.

### Picture of product

### Hazardous substances

The Steel Plus Rain Gutter System does not contain substances listed on the ”Candidate List of Substances of Very High Concern for authorization”

(http://echa.europa.eu/candidate-list-table)

# LCA background

### Declared unit

The LCI and LCIA results in this EPD relates to one item of "30 meter Steel Plus Rain Gutter System".

| Name | Value | Unit |
|---|---|---|
| Declared unit | 1 | item |
| Density | 67.2 | kg/item |
| Conversion factor to 1 kg. | 0.0149 | - |

### Functional unit

30 meter Steel Plus Rain Gutter System.

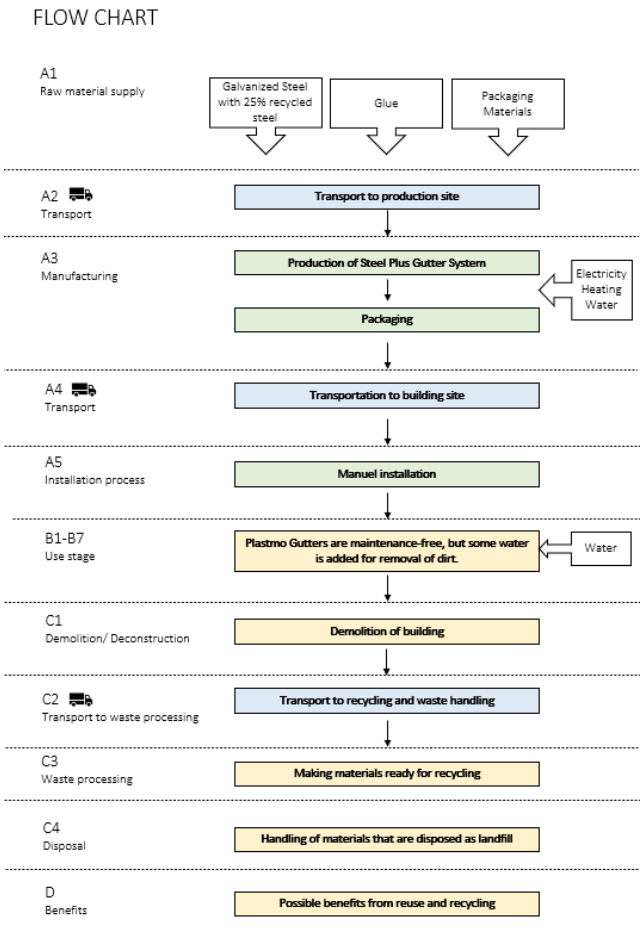
### PCR

This EPD is developed according to the core rules for the product category of construction products in PCR EN 15804:2012+A2:2019.

### Geographical area

The geographical area is EU.

### Flow diagram




The flow diagram with the system boundaries of the entire life cycle of the Steel Plus Rain Gutter System is divided into the relevant modules with the following color coding; White: inputs to the system, blue: transport, green: production and installation (A modules), yellow: modules after installation (B, C and D modules)

### System boundary

This EPD is based on a cradle-to-gate with options LCA, in which 100 weight-% of the product has been accounted for.

The cut-off criteria, which are the general rules for the exclusion of inputs and outputs, follows the requirements in EN 15804, 6.3.5, where the total of neglected input flows per module shall be a maximum of 5 % of energy usage and mass and 1 % of energy usage and mass for unit processes.

**Product stage (A1-A3) includes**:

A1 – Extraction and processing of raw materials

A2 – Transport to the production site

A3 – Manufacturing processes

To produce the Steel Plus Rain Gutter System, Plastmo A/S buy steel from their Danish and Norwegian suppliers, where all surface treatments are done before the steel is delivered at Plastmo A/S's production site. The average scrap content in the delivered steel is 25% and is based on cold-rolled steel manufactured via the primary route (blast furnace, BOF basic oxygen furnace) and hot dip galvanized. When Plastmo A/S receives the galvanized steel, it is pruned and shaped at Plastmo A/S's production site in Ringsted, Denmark. After production of the Steel Plus Rain Gutter System, it is packed and distributed. The product stage A1-A3 comprises the acquisition of all raw materials, products and energy, transport to the production site, packaging and waste processing.

Module A1 comprise impacts from extraction and processing of raw materials and production of the steel pre-product that are delivered to Plastmo A/S.

Module A2 comprise the impacts from transportation of raw materials to Plastmo A/S' production site, which includes extraction and

production of the fuel as well as the combustion of the fuel during the transport. The capacity utilization (including empty runs) is 61%.

Module A3 comprise the impacts related to the production that takes place at Plastmo A/S' production site including impacts related to production of electricity and natural gas used at the production site which are allocated to the product based on weight and total production at the site. 1% steel waste is sold as scrap steel. Module A3 also includes raw materials for packaging.

The LCA results are declared in aggregated form for the product stage, which means, that the sub-modules A1, A2 and A3 are declared as one module A1-A3.

**Construction process stage (A4-A5) includes:**

Module A4 includes impacts from transportation of the finished product to an assumed installation site in Denmark. The module includes extraction of the fuels and the combustion of the fuel during the transport. The capacity utilization (including empty runs) is 61%.

The Steel Plus Rain Gutter System is manually installed, so no inputs are included in Module A5. Module A5 also includes the end-of-life treatment of packaging including the benefits from recycling of packaging materials. Cardboard and LDPE folie are assumed to be recycled, whereas 1/20 of an EUR pallet is assumed sent to municipal waste incineration, from where energy and heat credit are reported in module D. The recycling of the EUR pallet is not reported to avoid double crediting, since 19/20 of the input for the EUR pallet is set to be secondary material due to the assumed 20-time reuse.

**Use stage (B1-B7) includes:**

The Steel Plus Rain Gutter System is maintenance free. If dirt and leaves accumulate in the gutter, it can be manually removed with a brush. Dirt on the outside of the rain gutters can for sight's sake be removed with water on a cloth. It is assumed that the rain gutters are washed every 5 year and 10L of water is used each time, given 50L of water over a 25 year period.

The municipal wastewater treatment of the water is also included in B2.

**End of Life (C1-C4) includes:**

No impacts from dismantling have been included in module C1 since it is done manually.

Module C2 comprise the impacts from transportation of waste from the deconstructed product after end-of-life to the waste handling site. An estimate of 50 km with truck are used.

Module C3 comprise the impacts from waste handling. It is assumed that 95% of the product are recycled.

The substitution potential of primary steel by a recycling scenario is declared in D. 95% of the product are assumed to be recycled.

Module C4 comprise of the impacts related to landfill. The 5% of the product that is not assumed recycled is assumed to be disposed as landfill.

**Re-use, recovery and recycling potential (D) includes:**

In module D potential benefits from re-use, recovery and recycling of steel and packaging is modeled.

# LCA results

## Environmental Impacts

| ENVIRONMENTAL IMPACTS PER [30 meter Steel Plus Rain Gutter System] | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Parameter** | **Unit** | **A1-A3** | **A4** | **A5** | **B2** | **B1, B3-B7** | **C1** | **C2** | **C3** | **C4** | **D** |
| GWP-total | [kg $CO_2$ eq.] | 1.93E+02 | 6.04E-01 | 2.35E+00 | 5.41E-02 | 0 | 0 | 4.82E-01 | 0 | 1.61E-01 | -1.09E+02 |
| GWP-fossil | [kg $CO_2$ eq.] | 1.95E+02 | 6.06E-01 | 1.23E-01 | 2.74E-02 | 0 | 0 | 4.80E-01 | 0 | 1.62E-01 | -1.09E+02 |
| GWP-biogenic | [kg $CO_2$ eq.] | -2.31E+00 | -5.94E-03 | 2.23E+00 | 2.67E-02 | 0 | 0 | -1.26E-03 | 0 | -1.70E-03 | 1.81E-01 |
| GWP-luluc | [kg $CO_2$ eq.] | 9.79E-02 | 4.10E-03 | 4.78E-06 | 5.97E-06 | 0 | 0 | 3.27E-03 | 0 | 9.77E-05 | -3.24E-03 |
| ODP | [kg CFC 11 eq.] | 1.00E-08 | 5.97E-14 | 1.85E-13 | 1.51E-13 | 0 | 0 | 4.76E-14 | 0 | 2.14E-13 | -4.40E-08 |
| AP | [mol $H^+$ eq.] | 4.21E-01 | 6.82E-04 | 5.66E-04 | 6.56E-05 | 0 | 0 | 1.72E-03 | 0 | 5.12E-04 | -2.36E-01 |
| EP-freshwater | [kg P eq.] | 2.11E-04 | 2.17E-06 | 4.53E-08 | 3.15E-05 | 0 | 0 | 1.73E-06 | 0 | 1.25E-07 | -1.78E-04 |
| EP-marine | [kg N eq.] | 9.67E-02 | 2.20E-04 | 2.22E-04 | 1.36E-04 | 0 | 0 | 7.93E-04 | 0 | 1.25E-04 | -4.21E-02 |
| EP-terrestrial | [mol N eq.] | 1.03E+00 | 2.63E-03 | 2.81E-03 | 1.94E-04 | 0 | 0 | 8.87E-03 | 0 | 1.37E-03 | -3.74E-01 |
| POCP | [kg NMVOC eq.] | 3.26E-01 | 5.87E-04 | 5.83E-04 | 4.92E-05 | 0 | 0 | 1.55E-03 | 0 | 3.95E-04 | -1.75E-01 |
| ADPm[1] | [kg Sb eq.] | 9.88E-04 | 6.13E-08 | 4.62E-09 | 3.28E-09 | 0 | 0 | 4.89E-08 | 0 | 1.13E-08 | -2.63E-04 |
| ADPf[1] | [MJ] | 2.23E+03 | 7.98E+00 | 5.42E-01 | 2.62E-01 | 0 | 0 | 6.36E+00 | 0 | 2.30E+00 | -1.09E+03 |
| WDP[1] | [$m^3$ world eq. deprived] | 5.54E+01 | 6.80E-03 | 2.46E-01 | 1.03E-02 | 0 | 0 | 5.42E-03 | 0 | -1.53E-03 | -2.34E+01 |
| Caption | GWP-total = Globale 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 = Ozone Depletion; AP = Acidification; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = Water Depletion Potential | | | | | | | | | | |
| | The numbers are declared in scientific notation, e.g., 1.95E+02. This number can also be written as: $1.95*10^2$ or 195, while 1.12E-11 is the same as $1.12*10^{-11}$ or 0.0000000000112. | | | | | | | | | | |
| Disclaimer | [1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator. | | | | | | | | | | |

## Additional Environmental Impacts

| ADDITIONAL ENVIRONMENTAL IMPACTS PER [30 meter Steel Plus Rain Gutter System] | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Parameter** | **Unit** | **A1-A3** | **A4** | **A5** | **B2** | **B1, B3-B7** | **C1** | **C2** | **C3** | **C4** | **D** |
| PM | [Disease incidence] | 5.28E-06 | 4.68E-09 | 2.27E-09 | 6.84E-10 | 0 | 0 | 9.96E-09 | 0 | 5.48E-09 | -3.30E-06 |
| IRP[2] | [kBq U235 eq.] | 1.58E+00 | 2.25E-03 | 4.77E-03 | 0.00395 | 0 | 0 | 1.79E-03 | 0 | 4.10E-03 | -1.52E+02 |
| ETP-fw[1] | [CTUe] | 3.94E+02 | 5.65E+00 | 2.27E-01 | 4.24 | 0 | 0 | 4.51E+00 | 0 | 6.83E-01 | -9.71E+01 |
| HTP-c[1] | [CTUh] | 9.06E-08 | 1.17E-10 | 2.24E-11 | 1.46E-10 | 0 | 0 | 9.29E-11 | 0 | 8.10E-11 | -7.93E-08 |
| HTP-nc[1] | [CTUh] | 2.72E-06 | 6.34E-09 | 1.42E-09 | 1.5E-08 | 0 | 0 | 5.82E-09 | 0 | 8.19E-09 | -1.45E-06 |
| SQP[1] | - | 8.07E+02 | 3.38E+00 | 1.47E-01 | 0.0712 | 0 | 0 | 2.69E+00 | 0 | 1.79E-01 | -2.24E+01 |
| Caption | 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 = Soil Quality (dimensionless) | | | | | | | | | | |
| | The numbers are declared in scientific notation, e.g., 1.95E+02. This number can also be written as: $1.95*10^2$ or 195, while 1.12E-11 is the same as $1.12*10^{-11}$ or 0.0000000000112. | | | | | | | | | | |
| Disclaimers | [1] The results of this environmental 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

| RESOURCE USE PER [30 meter Steel Plus Rain Gutter System] | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Parameter** | **Unit** | **A1-A3** | **A4** | **A5** | **B2** | **B1, B3-B7** | **C1** | **C2** | **C3** | **C4** | **D** |
| PERE | [MJ] | 1.20E+02 | 5.53E-01 | 1.17E-01 | 9.65E-02 | 0 | 0 | 4.41E-01 | 0 | 1.88E-01 | 4.87E+01 |
| PERM | [MJ] | 2.17E+01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| PERT | [MJ] | 1.42E+02 | 5.53E-01 | 1.17E-01 | 9.65E-02 | 0 | 0 | 4.41E-01 | 0 | 1.88E-01 | 4.87E+01 |
| PENRE | [MJ] | 2.23E+03 | 8.01E+00 | 5.42E-01 | 2.62E-01 | 0 | 0 | 6.39E+00 | 0 | 2.30E+00 | -1.09E+03 |
| PENRM | [MJ] | 4.76E+01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| PENRT | [MJ] | 2.28E+03 | 8.01E+00 | 5.42E-01 | 2.62E-01 | 0 | 0 | 6.39E+00 | 0 | 2.30E+00 | -1.09E+03 |
| SM | [kg] | 3.78E+01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| RSF | [MJ] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| NRSF | [MJ] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| FW | [$m^3$] | 1.37E+00 | 6.39E-04 | 5.79E-03 | 2.83E-04 | 0 | 0 | 5.09E-04 | 0 | 3.23E-05 | -5.33E-01 |
| Caption | 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 material; RSF = Use of renewable secondary fuels; NRSF = Use of non renewable secondary fuels; FW = Net use of fresh water | | | | | | | | | | |
| | The numbers are declared in scientific notation, e.g., 1.95E+02. This number can also be written as: $1.95*10^2$ or 195, while 1.12E-11 is the same as $1.12*10^{-11}$ or 0.0000000000112. | | | | | | | | | | |

### Waste Categories and Output Flows

| WASTE CATEGORIES AND OUTPUT FLOWS PER [30 meter Steel Plus Rain Gutter System] | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Parameter** | **Unit** | **A1-A3** | **A4** | **A5** | **B2** | **B1, B3-B7** | **C1** | **C2** | **C3** | **C4** | **D** |
| HWD | [kg] | 7.42E-06 | 4.24E-11 | 5.64E-11 | 2.19E-11 | 0 | 0 | 3.38E-11 | 0 | 3.48E-10 | -8.94E-09 |
| NHWD | [kg] | 7.34E+00 | 1.31E-03 | 1.88E-02 | 4.83E-02 | 0 | 0 | 1.04E-03 | 0 | 3.37E+00 | 1.46E+01 |
| RWD | [kg] | 2.18E-03 | 1.49E-05 | 2.93E-05 | 2.42E-05 | 0 | 0 | 1.19E-05 | 0 | 2.78E-05 | -8.80E-04 |
| CRU | [kg] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| MFR | [kg] | 6.72E-01 | 0 | 2.25E+01 | 0 | 0 | 0 | 0 | 6.39E+01 | 0 | 0 |
| MER | [kg] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EEE | [MJ] | 0 | 0 | 3.50E+00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EET | [MJ] | 0 | 0 | 6.29E+00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Caption | HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy | | | | | | | | | | |
| | The numbers are declared in scientific notation, e.g., 1.95E+02. This number can also be written as: $1.95*10^2$ or 195, while 1.12E-11 is the same as $1.12*10^{-11}$ or 0.0000000000112. | | | | | | | | | | |

### Biogenic Carbon Content

| BIOGENIC CARBON CONTENT PER [30 meter Steel Plus Rain Gutter System] | | |
|---|---|---|
| **Parameter** | **Unit** | **At the factory gate** |
| Biogenic carbon content in product | [kg C] | 0 |
| Biogenic carbon content in accompanying packaging | [kg C] | 0.5 |
| Note: 1 kg biogenic carbon is equivalent to 44/12 kg of $CO_2$ | | |

# Additional information

### LCA interpretation

The results in this EPD relate to 30 meter Steel Plus Rain Gutter System, produces with an average scrap content of 25% scrap steel. The calculated environmental impacts clearly reflect the environmental impacts from the production of primary steel in module A1 as the dominant source to impact.

### Conversion to other Steel Plus Rain Gutter Systems

The results are related to the rain gutter system size No.11/ø75. If other system sizes is used, the EPD results can be used by multiplying the environmental impact results with the conversion factor below.

| Rain gutter system size | Quantity (kg) | Conversion factor |
|---|---|---|
| **No. 10 / ø75** | 60.9 | 0.91 |
| **No. 11 / ø75** | 67.2 | 1 |
| **No. 11 / ø90** | 69.2 | 1.03 |
| **No. 12 / ø75** | 77.1 | 1.15 |
| **No. 12 / ø90** | 79.1 | 1.18 |
| **No. 14 / ø90** | 93.9 | 1.4 |

### Technical information on scenarios

**Transport to the building site (A4)**

| Scenario information | Value | Unit |
|---|---|---|
| Fuel type | Diesel | - |
| Vehicle type | EURO 6 truck, 20-26t gross weight with 17.3t payload capacity | - |
| Transport distance | 100 | km |
| Capacity utilisation (including empty runs) | 61 | % |
| Bulk density of transported products | 67.2 | Kg/item |
| Volumen capacity utilization factor | 1 | - |

**Installation of the product in the building (A5)**

| Scenario information | Value | Unit |
|---|---|---|
| Ancillary materials | <0.3 (glue and wipes) | kg |
| Water use | 0 | $m^3$ |
| Other resource use | 0 | kg |
| Energy type and consumption | 0 | kWh |
| Waste materials | 23.6 (packaging) | kg |
| Output materials | 0 | kg |
| Direct emissions to air, soil or water | 0 | kg |

**Reference service life**

| RSL information | | Unit |
|---|---|---|
| Reference service Life | 25 | Years |
| Declared product properties | 30 meter Steel Plus Rain Gutter System | - |
| Assumed quality of work | Instruction are available at www.plastmo.dk | - |

**End of life (C1-C4)**

| Scenario information | Value | Unit |
|---|---|---|
| Collected separately | 67.2 | kg |
| Collected with mixed waste | 0 | kg |
| For reuse | 0 | kg |
| For recycling | 63.9 | kg |
| For energy recovery | 0 | kg |
| For final disposal | 3.36 | kg |
| Assumptions for scenario development | 50 km with a EURO 6 truck to waste handling. | - |

**Re-use, recovery and recycling potential (D)**

| Scenario information/Materiel | Value | Unit |
|---|---|---|
| Product sent for recycling from module C3: The input I A1 added as burden free is removed before module D | 60.7 | kg |
| Packaging sent for recycling from module A5: Cardboard and LDPE film | 1.59 | kg |
| Incineration of the 1/10 pallet that reach end of life from module A5 | 1.1 | kg |
| Incineration of wipes from module A5 | 0.2 | kg |

### Indoor air

*The EPD does not give information on release of dangerous substances to indoor air because the horizontal standards on the relevant measurements are not available. Read more in EN15804+A2 chapter 7.4.1.*

### Soil and water

*Regarding the claim of no release of Zinc to groundwater, the Danish Technological Institute have done test on Zinc release to groundwater from the Steel Plus Rain Gutter System. For more information, contact Plastmo A/S.*

*Besides that, the EPD does not give information on release of dangerous substances to soil and water because the horizontal standards on the relevant measurements are not available. Read more in EN15804+A2 chapter 7.4.2.*

# References

| | |
|---|---|
| **Publisher** | epddanmark<br>www.epddanmark.dk |
| **Programme operator** | Danish Technological Institute<br>Buildings & Environment<br>Gregersensvej<br>DK-2630 Taastrup<br>www.teknologisk.dk |
| **LCA-practitioner** | *Rikke Zuwa Kempf Bernberg, Freja Jeppesen and Cinzia Giampieriand*<br><br>*COWI A/S*<br>*Parallelvej 2*<br>*2800 Kgs. Lyngby* |
| **LCA software /background data** | *GaBi Professional 2022 and ecoinvent 3.8* |
| **3rd party verifier** | *Linda Høibye*<br>*Life Cycle Assessment Consulting* |

**General programme instructions**
General Programme Instructions, version 2.0, spring 2020
www.epddanmark.dk

**EN 15804**
DS/EN 15804 + A2:2019 - "Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products"

**EN 15942**
DS/EN 15942:2011 – " Sustainability of construction works – Environmental product declarations – Communication format business-to-business"

**ISO 14025**
DS/EN ISO 14025:2010 – " Environmental labels and declarations – Type III environmental declarations – Principles and procedures"

**ISO 14040**
DS/EN ISO 14040:2008 – " Environmental management – Life cycle assessment – Principles and framework"

**ISO 14044**
DS/EN ISO 14044:2008 – " Environmental management – Life cycle assessment – Requirements and guidelines"

**GaBi Professional**
GaBi 2022 Professional Database, version 2022.2 http://www.gabi-software.com/nw-eu-danish/databases/gabi-databases/professional/

**EcoInvent**
Ecoinvent version 3.8

This appendix refers to the EPD MD-22036-EN, developed according to EN15804+A2:2019.
Results in the appendix communicates LCA results in the format described in EN15804+A1:2013, in order to accommodate a need in the transition period between the two standard revisions. The appendix cannot stand alone, as the reference EPD describes the basis of the assessment.

| ENVIRONMENTAL IMPACTS PER [30 meter Steel Plus Rain Gutter System] | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Parameter** | **Unit** | **A1-A3** | **A4** | **A5** | **B2** | **C1** | **C2** | **C3** | **C4** | **D** |
| GWP | [kg $CO_2$-eq.] | 1.86E+02 | 5.90E-01 | 2.35E+00 | 5.05E-02 | 0 | 4.70E-01 | 0 | 1.52E-01 | -1.04E+02 |
| ODP | [kg CFC11-eq.] | 1.01E-08 | 7.03E-14 | 2.18E-13 | 1.78E-13 | 0 | 5.60E-14 | 0 | 2.51E-13 | -3.95E-08 |
| AP | [kg $SO_2$-eq.] | 3.41E-01 | 4.97E-04 | 3.81E-04 | 5.11E-05 | 0 | 1.18E-03 | 0 | 4.11E-04 | -2.00E-01 |
| EP | [kg $PO_4^{3-}$-eq.] | 3.42E-02 | 1.02E-04 | 8.57E-05 | 2.28E-04 | 0 | 2.89E-04 | 0 | 4.39E-05 | -1.65E-02 |
| POCP | [kg ethene-eq.] | 5.55E-02 | -9.69E-06 | 2.74E-05 | 5.52E-06 | 0 | -4.20E-04 | 0 | 3.84E-05 | -5.15E-02 |
| ADPE | [kg Sb-eq.] | 9.87E-04 | 6.14E-08 | 4.80E-09 | 3.43E-09 | 0 | 4.89E-08 | 0 | 1.15E-08 | -2.63E-04 |
| ADPF | [MJ] | 2.17E+03 | 7.89E+00 | 4.65E-01 | 2.00E-01 | 0 | 6.29E+00 | 0 | 2.22E+00 | -1.11E+03 |
| Caption | GWP = Global warming potential; ODP = Ozone depletion potential; AP = Acidification potential of soil and water; EP = Eutrophication potential; POCP = Photochemical ozone creation potential; ADPE = Abiotic depletion potential for non fossil resources; ADPF = Abiotic depletion potential for fossil resources | | | | | | | | | |
| | The numbers are declared in scientific notation, e.g., 1.95E+02. This number can also be written as: $1.95*10^2$ or 195, while 1.12E-11 is the same as $1.12*10^{-11}$ or 0.0000000000112. | | | | | | | | | |

| RESOURCE USE PER [30 meter Steel Plus Rain Gutter System] | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Parameter** | **Unit** | **A1-A3** | **A4** | **A5** | **B2** | **C1** | **C2** | **C3** | **C4** | **D** |
| PERE | [MJ] | 1.20E+02 | 5.53E-01 | 1.17E-01 | 9.65E-02 | 0 | 4.41E-01 | 0 | 1.88E-01 | 4.87E+01 |
| PERM | [MJ] | 2.17E+01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| PERT | [MJ] | 1.42E+02 | 5.53E-01 | 1.17E-01 | 9.65E-02 | 0 | 4.41E-01 | 0 | 1.88E-01 | 4.87E+01 |
| PENRE | [MJ] | 2.23E+03 | 8.01E+00 | 5.42E-01 | 2.62E-01 | 0 | 6.39E+00 | 0 | 2.30E+00 | -1.09E+03 |
| PENRM | [MJ] | 4.76E+01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| PENRT | [MJ] | 2.28E+03 | 8.01E+00 | 5.42E-01 | 2.62E-01 | 0 | 6.39E+00 | 0 | 2.30E+00 | -1.09E+03 |
| SM | [kg] | 3.78E+01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| RSF | [MJ] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| NRSF | [MJ] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| FW | [$m^3$] | 1.37E+00 | 6.39E-04 | 5.79E-03 | 2.83E-04 | 0 | 5.09E-04 | 0 | 3.23E-05 | -5.33E-01 |
| Caption | 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 material; RSF = Use of renewable secondary fuels; NRSF = Use of non renewable secondary fuels; FW = Net use of fresh water | | | | | | | | | |
| | The numbers are declared in scientific notation, e.g., 1.95E+02. This number can also be written as: $1.95*10^2$ or 195, while 1.12E-11 is the same as $1.12*10^{-11}$ or 0.0000000000112. | | | | | | | | | |

| WASTE CATEGORIES AND OUTPUT FLOWS PER [30 meter Steel Plus Rain Gutter System] | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Parameter** | **Unit** | **A1-A3** | **A4** | **A5** | **B2** | **C1** | **C2** | **C3** | **C4** | **D** |
| HWD | [kg] | 7.42E-06 | 4.24E-11 | 5.64E-11 | 2.19E-11 | 0 | 3.38E-11 | 0 | 3.48E-10 | -8.94E-09 |
| NHWD | [kg] | 7.34E+00 | 1.31E-03 | 1.88E-02 | 4.83E-02 | 0 | 1.04E-03 | 0 | 3.37E+00 | 1.46E+01 |
| RWD | [kg] | 2.18E-03 | 1.49E-05 | 2.93E-05 | 2.42E-05 | 0 | 1.19E-05 | 0 | 2.78E-05 | -8.80E-04 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| CRU | [kg] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| MFR | [kg] | 6.72E-01 | 0 | 2.25E+01 | 0 | 0 | 0 | 6.39E+01 | 0 | 0 |
| MER | [kg] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EEE | [MJ] | 0 | 0 | 3.50E+00 | 0 | 0 | 0 | 0 | 0 | 0 |
| EET | [MJ] | 0 | 0 | 6.29E+00 | 0 | 0 | 0 | 0 | 0 | 0 |
| Caption | HWD = Hazardous waste disposed; NHWD = Non hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy | | | | | | | | | |
| | The numbers are declared in scientific notation, e.g., 1.95E+02. This number can also be written as: $1.95*10^2$ or 195, while 1.12E-11 is the same as $1.12*10^{-11}$ or 0.0000000000112. | | | | | | | | | |

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