

## ENVIRONMENTAL PRODUCT DECLARATION

in accordance with ISO 14025, ISO 21930 and EN 15804

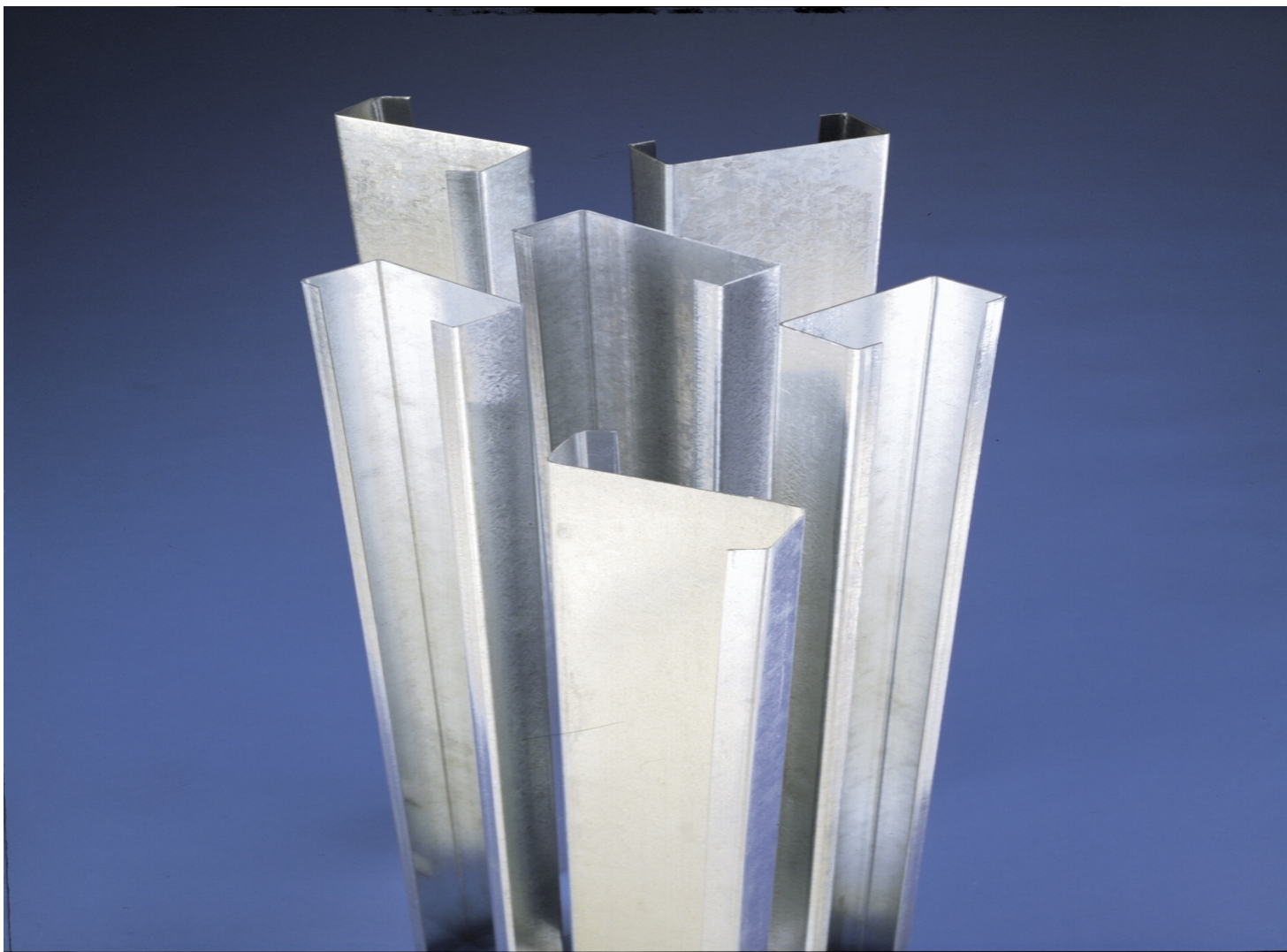
|                                |                              |
|--------------------------------|------------------------------|
| Owner of the declaration:      | Lindab Profil AB             |
| Program operator:              | The Norwegian EPD Foundation |
| Publisher:                     | The Norwegian EPD Foundation |
| Declaration number:            | NEPD-2269-1037-EN            |
| Registration number:           | NEPD-2269-1037-EN            |
| ECO Platform reference number: | -                            |
| Issue date:                    | 29.06.2020                   |
| Valid to:                      | 29.06.2025                   |

### Lindab Construline

Lindab Profil AB



[www.epd-norge.no](http://www.epd-norge.no)



## General information

### Product:

Lindab ConstruLine

### Program operator:

The Norwegian EPD Foundation  
Pb. 5250 Majorstuen, 0303 Oslo  
Phone: +47 23 08 80 00  
e-mail: [post@epd-norge.no](mailto:post@epd-norge.no)

### Declaration number:

NEPD-2269-1037-EN

### ECO Platform reference number:

### This declaration is based on Product Category Rules:

CEN Standard EN 15804:2012+A1:2013 serves as core PCR  
NPCR 013:2019 Part B for Steel and aluminium construction  
products

### 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 Lindab ConstruLine

### Declared unit with option:

A1,A2,A3,A4,A5,C2,C3,C4,D

### Functional unit:

### Owner of the declaration:

Lindab Profil AB  
Contact person: Lina Hedvall  
Phone: +46 (431) 85132  
e-mail: [lina.hedvall@lindab.com](mailto:lina.hedvall@lindab.com)

### Manufacturer:

Lindab Profil AB

### Place of production:

Lindab Profil Försilöv

### Management system:

SE006902-1 ISO 9001:2015 SE006898-1 ISO 14001:2015

### Organisation no:

556247-2273

### Issue date:

29.06.2020

### Valid to:

29.06.2025

### Year of study:

2020

### Comparability:

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

### Author of the Life Cycle Assessment:

The declaration is developed using eEPD v4.0 from LCA.no  
Approval:  
Company specific data are:

Collected/registered by: Carina Petersson

Internal verification by: Lina Hedvall

### Verification:

Independent verification of data, other environmental information  
and the declaration according to ISO 14025:2010, § 8.1.3 and §  
8.1.4

External

Third party verifier:

Sign



Fredrik Moltu Johnsen

(Independent verifier approved by EPD Norway)

### Approved:

Sign



Håkon Hauan  
Managing Director of EPD-Norway

## Product

### Product description:

Lindabs beams, battens, studs and runners are manufactured from hot dip galvanized steel with different surface treatment in order to obtain requested corrosion protection properties. The products connected to these systems are primarily used as a base or framework in the construction of interior walls, exterior walls and ceilings. This EPD covers the zinc coated products.

### Product specification

The steel grade used for this product is S350GD Z275 and FA Z100. The nominal thickness varies from 0,52 to 3,0mm depending on product and area of use.

| Materials | %     |
|-----------|-------|
| Packaging | 2,79  |
| Steel     | 97,21 |

### Technical data:

Declaration of Performance C-profiles:

<https://itsolution.lindab.com/lindabwebproductsdoc/pdf/documentation>

Declaration of Performance exterior and interior studs and runners:

<https://itsolution.lindab.com/lindabwebproductsdoc/pdf/documentation>

Declaration of Performance U-profiles:

<https://itsolution.lindab.com/lindabwebproductsdoc/pdf/documentation>

Declaration of Performance Z-profiles:

<https://itsolution.lindab.com/lindabwebproductsdoc/pdf/documentation>

### Market:

The beams, battens, studs and runners are mainly sold in Scandinavia.

### Reference service life, product

60 years

### Reference service life, building

60 years

## LCA: Calculation rules

### Declared unit:

1 kg Lindab Construline

### 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.

### Data quality:

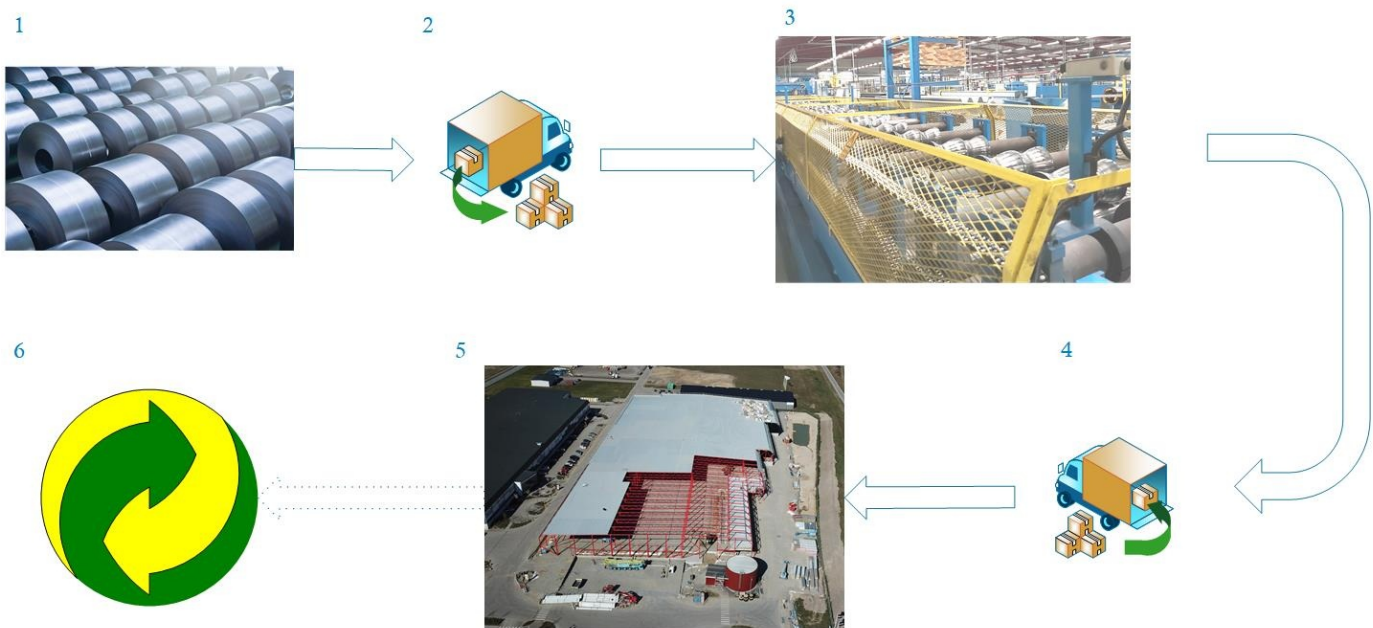
Specific data for the product composition are provided by the manufacturer. They represent the production of the declared product and were collected for EPD development in the year of study. Background data is based on registered EPDs according to EN 15804, Ostfold Research databases, ecoinvent and other LCA databases. The data quality of the raw materials in A1 is presented in the table below.

For A1-A4 the data is actual data or suggestions from the c-CPR. For the other modules conservative assumptions have been made.

| Materials | Source                   | Data quality | Year |
|-----------|--------------------------|--------------|------|
| Steel     | EPD-ARM-20170139-IBD1-EN | EPD          | 2017 |
| Packaging | ecoinvent 3.5            | Database     | 2018 |

### System boundary:

Module A1-A5, C2-C4 and D is included in the analysis. That means everything except the usage stage and assembly. That is excluded since the product has very limited effect on the environment during this phase of its lifetime. C1 is excluded since the work method varies greatly between different projects and the energy consumption is negotiable from a life cycle perspective. For the same reason energy consumption during construction has been excluded.



The steel coils (1) are produced at the steel manufacturer and transported to Lindab Profil Förslöv by truck (2). The Construline products are produced in a roll forming machine or a press-brake (3). The production is mainly a pull system (produced to customer order) to reduce waste in all parts of the life cycle. Transport to customers are done by truck (4) to the building site where the customer assemble the product (5). The usage phase is excluded in this EPD, this is why the next step is demolition and recycling (6).

### Additional technical information:

## LCA: Scenarios and additional technical information

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

The after life scenario assumes 100% recycling of steel. The same energy consumption has been assumed for assembly and deconstruction. During assembly no scrap has been assumed since the product is custom made in the right dimensions for each construction.

### Transport from production place to user (A4)

| Type                 | Capacity utilisation (incl. return) % | Type of vehicle                   | Distance km | Fuel/Energy consumption | Unit  | Value (l/t) |
|----------------------|---------------------------------------|-----------------------------------|-------------|-------------------------|-------|-------------|
| Truck                | 38,8 %                                | Truck, lorry 16-32 tonnes, EURO 5 | 300         | 0,044606                | l/tkm | 13,38       |
| Railway              |                                       |                                   |             |                         | l/tkm |             |
| Boat                 |                                       |                                   |             |                         | l/tkm |             |
| Other Transportation |                                       |                                   |             |                         | l/tkm |             |

### Assembly (A5)

| .                                     | Unit           | Value  |
|---------------------------------------|----------------|--------|
| Auxiliary                             | kg             |        |
| Water consumption                     | m <sup>3</sup> |        |
| Electricity consumption               | kWh            |        |
| Other energy carriers                 | MJ             |        |
| Material loss                         | kg             |        |
| Output materials from waste treatment | kg             | 0,0300 |
| Dust in the air                       | kg             |        |
| VOC emissions                         | kg             |        |

### End of Life (C1, C3, C4)

| .                                     | Unit | Value  |
|---------------------------------------|------|--------|
| Hazardous waste disposed              | kg   |        |
| Collected as mixed construction waste | kg   |        |
| Reuse                                 | kg   |        |
| Recycling                             | kg   | 1,0000 |
| Energy recovery                       | kg   |        |
| To landfill                           | kg   |        |

### Transport to waste processing (C2)

| Type                 | Capacity utilisation (incl. return) % | Type of vehicle                   | Distance km | Fuel/Energy consumption | Unit  | Value (l/t) |
|----------------------|---------------------------------------|-----------------------------------|-------------|-------------------------|-------|-------------|
| Truck                | 38,8 %                                | Truck, lorry 16-32 tonnes, EURO 5 | 100         | 0,044606                | l/tkm | 4,46        |
| Railway              |                                       |                                   |             |                         | l/tkm |             |
| Boat                 |                                       |                                   |             |                         | l/tkm |             |
| Other Transportation |                                       |                                   |             |                         | l/tkm |             |

..

### Benefits and loads beyond the system boundaries (D)

| .                                                                     | Unit  | Value |
|-----------------------------------------------------------------------|-------|-------|
| Substitution of primary construction steel, with net scrap steel (kg) | kg/DU | 0,92  |

## LCA: Results

### System boundaries (X=included, MND=module not declared, MNR=module not relevant)

| Product stage |           |               |           |          | Construction installation stage | User 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        | MNR                             | MNR         | MNR    | MNR         | MNR           | MNR                    | MNR                   | MNR                        | X                 | X                | X        | . | X                                  |

### Environmental impact

| Parameter | Unit                                 | A1-A3    | A4       | A5       | C2       | C3       | C4 | D         |
|-----------|--------------------------------------|----------|----------|----------|----------|----------|----|-----------|
| GWP       | kg CO <sub>2</sub> -eq               | 2,79E+00 | 4,88E-02 | 9,80E-04 | 1,63E-02 | 2,00E-04 | 0  | -1,54E+00 |
| ODP       | kg CFC11 -eq                         | 1,15E-08 | 9,00E-09 | 1,12E-10 | 3,00E-09 | 2,20E-11 | 0  | -6,34E-08 |
| POCP      | kg C <sub>2</sub> H <sub>4</sub> -eq | 8,02E-04 | 7,95E-06 | 2,00E-07 | 2,65E-06 | 5,48E-08 | 0  | -1,07E-03 |
| AP        | kg SO <sub>2</sub> -eq               | 5,39E-03 | 1,56E-04 | 5,13E-06 | 5,19E-05 | 1,25E-06 | 0  | -6,87E-03 |
| EP        | kg PO <sub>4</sub> <sup>3-</sup> -eq | 5,69E-04 | 2,58E-05 | 1,32E-06 | 8,61E-06 | 1,92E-07 | 0  | -2,29E-03 |
| ADPM      | kg Sb -eq                            | 1,45E-04 | 1,49E-07 | 1,72E-09 | 4,96E-08 | 1,50E-11 | 0  | -2,97E-05 |
| ADPE      | MJ                                   | 2,54E+01 | 7,35E-01 | 1,17E-02 | 2,45E-01 | 1,86E-03 | 0  | -1,45E+01 |

GWP Global warming potential; ODP Depletion potential of the stratospheric ozone layer; POCP Formation potential of tropospheric photochemical oxidants; AP Acidification potential of land and water; EP Eutrophication potential; ADPM Abiotic depletion potential for non fossil resources; ADPE Abiotic depletion potential for fossil resources

Reading example: 9,0 E-03 = 9,0\*10<sup>-3</sup> = 0,009

\*INA Indicator Not Assessed

## Resource use

| Parameter | Unit           | A1-A3    | A4       | A5       | C2       | C3       | C4 | D         |
|-----------|----------------|----------|----------|----------|----------|----------|----|-----------|
| RPEE      | MJ             | 2,43E+00 | 1,07E-02 | 2,69E-01 | 3,57E-03 | 1,55E-02 | 0  | -1,30E+00 |
| RPEM      | MJ             | 4,23E-01 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0  | 0,00E+00  |
| TPE       | MJ             | 2,85E+00 | 1,07E-02 | 2,69E-01 | 3,57E-03 | 1,55E-02 | 0  | -1,30E+00 |
| NRPE      | MJ             | 2,75E+01 | 7,53E-01 | 1,28E-02 | 2,51E-01 | 2,50E-03 | 0  | -1,37E+01 |
| NRPM      | MJ             | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0  | 0,00E+00  |
| TRPE      | MJ             | 2,75E+01 | 7,53E-01 | 1,28E-02 | 2,51E-01 | 2,50E-03 | 0  | -1,37E+01 |
| SM        | kg             | 8,38E-02 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0  | 0,00E+00  |
| RSF       | MJ             | 5,68E-04 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0  | 0,00E+00  |
| NRSF      | MJ             | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0  | 0,00E+00  |
| W         | m <sup>3</sup> | 9,00E-03 | 1,41E-04 | 7,17E-06 | 4,70E-05 | 1,03E-06 | 0  | -9,40E-03 |

RPEE Renewable primary energy resources used as energy carrier; RPEM Renewable primary energy resources used as raw materials; TPE Total use of renewable primary energy resources; NRPE Non renewable primary energy resources used as energy carrier; NRPM Non renewable primary energy resources used as materials; TRPE 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; W Use of net fresh water

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

\*INA Indicator Not Assessed

## End of life - Waste

| Parameter | Unit | A1-A3    | A4       | A5       | C2       | C3       | C4 | D         |
|-----------|------|----------|----------|----------|----------|----------|----|-----------|
| HW        | kg   | 1,50E-03 | 4,40E-07 | 1,51E-08 | 1,47E-07 | 6,18E-09 | 0  | -1,33E-04 |
| NHW       | kg   | 8,57E-02 | 3,96E-02 | 9,15E-04 | 1,32E-02 | 1,90E-04 | 0  | -2,64E+00 |
| RW        | kg   | INA*     | INA*     | INA*     | INA*     | INA*     | 0  | INA*      |

HW Hazardous waste disposed; NHW Non hazardous waste disposed; RW 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

| Parameter | Unit | A1-A3    | A4       | A5       | C2       | C3       | C4 | D        |
|-----------|------|----------|----------|----------|----------|----------|----|----------|
| CR        | kg   | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0  | 0,00E+00 |
| MR        | kg   | 4,70E-02 | 0,00E+00 | 1,08E-02 | 0,00E+00 | 0,00E+00 | 0  | 0,00E+00 |
| MER       | kg   | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0  | 0,00E+00 |
| EEE       | MJ   | INA*     | INA*     | INA*     | INA*     | INA*     | 0  | INA*     |
| ETE       | MJ   | INA*     | INA*     | INA*     | INA*     | INA*     | 0  | INA*     |

CR Components for reuse; MR Materials for recycling; MER Materials for energy recovery; EEE Exported electric energy; ETE Exported thermal energy

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

\*INA Indicator Not Assessed

## Additional Norwegian 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      | Data source             | Amount | Unit                       |
|----------------------|-------------------------|--------|----------------------------|
| El-mix, Sweden (kWh) | ecoinvent 3.4 Alloc Rec | 42,67  | g CO <sub>2</sub> -ekv/kWh |

### Dangerous substances

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

### Indoor environment

The product has no effect on the Indoor Environment.

## Bibliography

ISO 14025:2010 Environmental labels and declarations - Type III environmental declarations - Principles and procedures.  
 ISO 14044:2006 Environmental management - Life cycle assessment - Requirements and guidelines.  
 EN 15804:2012+A1:2013 Environmental product declaration - Core rules for the product category of construction products.  
 ISO 21930:2017 Sustainability in buildings and civil engineering works - Core rules for environmental product declarations of construction products.  
 ecoinvent v3, Allocation, cut-off by classification, Swiss Centre of Life Cycle Inventories.  
 Iversen et al., (2018) eEPD v3.0 - Background information for EPD generator system. LCA.no report number 04.18.  
 Vold et al., (2019) EPD generator for Norsk Stålförbund - Background information and LCA data, LCA.no report number 09.19.  
 NPCR Part A: Construction products and services. Ver. 1.0. April 2017, EPD-Norge.  
 NPCR 013 Part B for steel and aluminium construction products. Ver. 3.0 April 2019, EPD-Norge.

Bucht & Korhonen, Communication and knowledge for decreased energy consumption during the production phase, 2018, Jönköping University

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