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The Norwegian EPD Foundation

# ENVIRONMENTAL PRODUCT DECLARATION

in accordance with ISO 14025, ISO 21930 and EN 15804

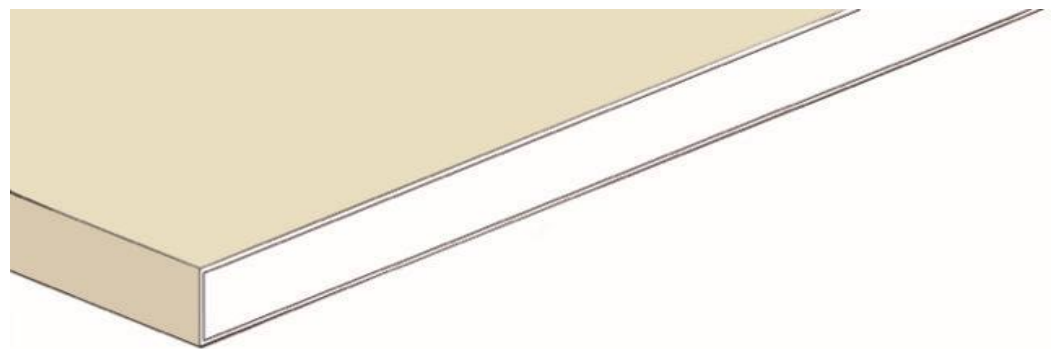
|                                |                              |
|--------------------------------|------------------------------|
| Owner of the declaration:      | Norgips Norge AS             |
| Program operator:              | The Norwegian EPD Foundation |
| Publisher:                     | The Norwegian EPD Foundation |
| Declaration number:            | NEPD-2139-966-EN             |
| Registration number:           | NEPD-2139-966-EN             |
| ECO Platform reference number: | -                            |
| Issue date:                    | 20.04.2020                   |
| Valid to:                      | 20.04.2025                   |

## Norgips Floorboard/Gulv type DIR

Norgips Norge AS

**NORGIPS**

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



**General information**

**Product:**

Norgips Floorboard/Gulv type DIR

**Program operator:**

The Norwegian EPD Foundation  
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**Declaration number:**

NEPD-2139-966-EN

**ECO Platform reference number:**

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

CEN Standard EN 15804 serves as core PCR  
 NPCR010 v3.0 Building boards (04/2019).

**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:**

**Declared unit with option:**

1 m2 of installed gypsum board, including waste treatment at end of life.

**Functional unit:**

**Verification:**

The CEN Norm EN 15804 serves as the core PCR.  
 Independent verification of the declaration and data, according to ISO14025:2010

- internal  external

Third party verifier:

*Ole M.K. Iversen*

Ole M. K. Iversen  
 (Independent verifier approved by EPD Norway)

**Owner of the declaration:**

Norgips Norge AS  
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**Manufacturer:**

Norgips Norge AS  
 Postboks 655 Strømsø  
 3003 Drammen

**Place of production:**

Svelvik, Norway

**Management system:**

NS-EN ISO 14001:2015

**Organisation no:**

NO 986034757 MVA

**Issue date:**

20.04.2020

**Valid to:**

20.04.2025

**Year of study:**

2019

**Comparability:**

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

**The EPD has been worked out by:**

Clara Valente & Lars G. F. Tellnes

*Clara Valente*

*Lars G. F. Tellnes*



Approved

*Håkon Hauan*

Håkon Hauan  
 Managing Director of EPD-Norway

**Product**

**Product description:**

Gypsum plasterboard composed of a reinforced plaster core with high density to achieve enhanced strength and surface hardness. The front and back paper liners are overlapped and glued together on the backside of the board. The board is particularly suitable for use as subfloor under ceramic tiles in dry conditions and as noise impact insulation for floor construction.

**Technical data:**

The product is in compliance with EN 520

Weight: 14 kg/m<sup>2</sup> ± 2 %,

Thickness: 12,5 mm ± 0.5 mm

For more information from the product data sheet, see

[www.norgips.no](http://www.norgips.no) / [www.norgips.se](http://www.norgips.se)

**Product specification:**

Gypsum board is produced in various width and length, but at the same thickness and it is therefore no variations of the product per square meter.

| Materials                 | kg    | %       |
|---------------------------|-------|---------|
| Gypsum                    | 11.44 | 81.73 % |
| Cardboard                 | 0.50  | 3.57 %  |
| Glass fibre reinforcement | 0.03  | 0.18 %  |
| Additives                 | 0.06  | 0.45 %  |
| Water                     | 1.97  | 14.07 % |
| Total for product         | 14.00 | 100 %   |
| Plastic packaging         | 0.003 |         |
| Wood packaging            | 0.016 |         |
| Wooden pallet             | 0.089 |         |
| Total product + packaging | 14.11 |         |

**Market:**

Norway and Sweden

**Reference service life, product:**

60

**Reference service life, building:**

60

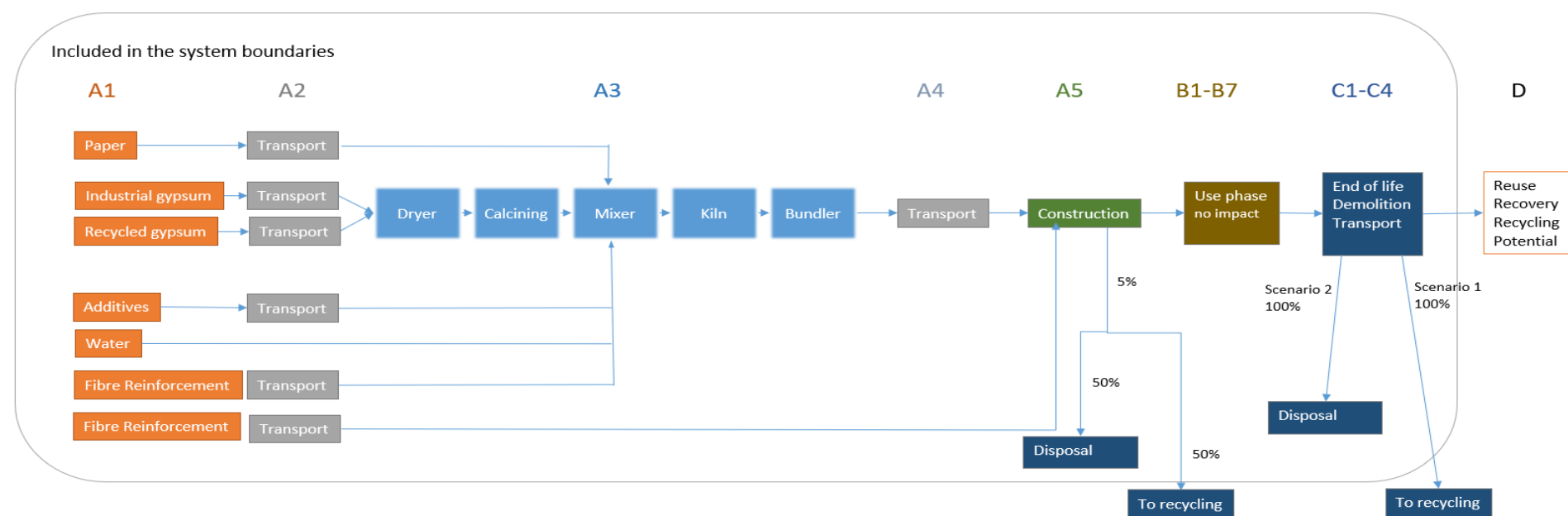
**LCA: Calculation rules**

**Declared unit:**

1 m<sup>2</sup> of installed gypsum board, including waste treatment at end of life.

**System boundary:**

Flow chart for the complete life cycle (A1-C4) with system boundaries are shown in the figure below. Modul D is also declared outside the life cycle with material and energy substitution from net recovery and is further explained in the scenarios.



Industrial gypsum and recycled gypsum are mixed and dried before the mixture is calcined. The calcined gypsum is transferred to the mixer where water and additives are added. The slurry is distributed to a plasterboard liner where the edges are folded and a new layer of plasterboard liner is glued on to form a sandwich. The board line is continuous transferred along the production line, cut to suitable lengths and dried in a kiln. The dried boards are cut to the correct lengths and stacked in pallets.

### Data quality:

The manufacturing data for Norgips was collected in 2019 and represents an average for 2018. Other data are from ecoinvent v3.5, released in 2018, but with some changes to improve representativeness.

### Cut-off criteria:

All major raw materials and all the essential energy is included. The production process for raw materials and energy flows that are included with very small amounts (<1%) are not included. This cut-off rule does not apply for hazardous materials and substances.

### Allocation:

The allocation is made in accordance with the provisions of EN 15804. Energy use is sub-divided between different process and allocated with physical relationships to the different types of boards. Packaging, water use and waste production is allocated equally among all products through mass allocation. Effects of primary production of recycled materials allocated to the main product in which the material was used. The recycling process and transportation of the material is allocated to this analysis.

### Calculation of biogenic carbon:

Uptake and emissions of biogenic carbon are calculated according to EN 16485:2014. This is based on the modularity principle in EN 15804:2012, where the emissions shall be accounted in the module where it occurs. Net contribution of biogenic carbon is calculated for each module on page 8.

## LCA: Scenarios and additional technical information

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

All products are either first transported to a building merchant or directly to a building site. It is included a scenario for directly to building site and with a distance of 360 km.

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

| Type  | Capacity utilisation (incl. return) % | Type of vehicle | Distance km | Fuel/Energy consumption | Unit  |
|-------|---------------------------------------|-----------------|-------------|-------------------------|-------|
| Truck | 55                                    | EURO6           | 360         | 0.0227                  | l/tkm |
| Truck |                                       |                 |             |                         |       |

It is assumed 0.0012 MJ of electricity use in assembly and 5 % wastage of the product, in addition to waste management of the packaging. Jointing compound and tape are also added to smooth the surface between boards.

There are no LCA-related environmental impacts during use.

### Assembly (A5)

|                                       | Unit           | Value  |
|---------------------------------------|----------------|--------|
| Auxiliary - jointing tape             | kg             | 0.0042 |
| Auxiliary - jointing compound         | kg             | 0.33   |
| Water consumption                     | m <sup>3</sup> | 0      |
| Electricity consumption               | MJ             | 0.0012 |
| Other energy carriers                 | MJ             | 0      |
| Material loss                         | kg             | 0.70   |
| Output materials from waste treatment | kg             | 0.108  |
| Dust in the air                       | kg             | 0      |

### Use (B1)

|                               | Unit | Value |
|-------------------------------|------|-------|
| Relevant emissions during use | kg   | 0     |
|                               |      |       |
|                               |      |       |
|                               |      |       |
|                               |      |       |
|                               |      |       |
|                               |      |       |

It is assumed no need for maintenance nor repair under a normal scenario.

### Maintenance (B2)/Repair (B3)

|                         | Unit           | Value |
|-------------------------|----------------|-------|
| Maintenance cycle*      |                |       |
| Auxiliary               | kg             | 0     |
| Other resources         | kg             | 0     |
| Water consumption       | m <sup>3</sup> | 0     |
| Electricity consumption | kWh            | 0     |
| Other energy carriers   | MJ             | 0     |
| Material loss           | kg             | 0     |

It is assumed no need for operational energy nor water under a normal scenario.

### Operational energy (B6) and water consumption (B7)

|                           | Unit           | Value |
|---------------------------|----------------|-------|
| Water consumption         | m <sup>3</sup> | 0     |
| Electricity consumption   | kWh            | 0     |
| Other energy carriers     | MJ             | 0     |
| Power output of equipment | kW             | 0     |
|                           |                |       |
|                           |                |       |

It is assumed no need for replacement nor refurbishment under a normal scenario.

### Replacement (B4)/Refurbishment (B5)

|                           | Unit | Value |
|---------------------------|------|-------|
| Replacement cycle*        |      |       |
| Electricity consumption   | kWh  | 0     |
| Replacement of worn parts | 0    | 0     |
|                           |      |       |
|                           |      |       |

\* Number or RSL (Reference Service Life)

The product is collected as gypsum. The most common treatment is recycling and landfilling. Both scenarios are declared as separate 100 % scenarios.

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

|                                       | Unit | Value |
|---------------------------------------|------|-------|
| Collected as gypsum waste             | kg   | 14.0  |
| Collected as mixed construction waste | kg   | 0.0   |
| Reuse                                 | kg   | 0.0   |
| Recycling - scenario 1                | kg   | 14.0  |
| Energy recovery                       | kg   | 0.0   |
| To landfill - scenario 2              | kg   | 14.0  |

The transport of gypsum waste is assumed to be 50 km for landfilling scenario and 300 km for recycling.

### Transport to waste processing (C2)

| Type                   | Capacity utilisation (incl. return) % | Type of vehicle | Distance km | Fuel/Energy consumption | Unit  |
|------------------------|---------------------------------------|-----------------|-------------|-------------------------|-------|
| Scenario 1 - recycling |                                       |                 |             |                         |       |
| Truck                  |                                       | Unspecified     | 300         | 0.027                   | l/tkm |
| Scenario 2 - landfill  |                                       |                 |             |                         |       |
| Truck                  |                                       | Unspecified     | 50          | 0.027                   | l/tkm |

The benefits and loads beyond system boundaries are calculated from the net flows shown in the tables below. The exported energy from municipal incineration was calculated from amounts in 2015 and that substitutes Norwegian electricity mix and district heating mix. The recycling output of gypsum is assumed at 90 % of the weight of the product and the raw material substitution is modelled with mined gypsum. The net output flow of gypsum is however negative and will give a net load in module D.

### Scenario 1 - Recycling - Benefits and loads beyond the system boundaries (D)

|                                 | Unit | Value |
|---------------------------------|------|-------|
| Substitution of electric energy | MJ   | 0.7   |
| Substitution of thermal energy  | MJ   | 5.1   |
| Substitution of raw materials   | kg   | -0.9  |
| Substitution of fuels           | kg   | 0.0   |
| Substitution of products        | kg   | 0.0   |

### Scenario 2 - Landfilling - Benefits and loads beyond the system boundaries (D)

|                                 | Unit | Value  |
|---------------------------------|------|--------|
| Substitution of electric energy | MJ   | 0      |
| Substitution of thermal energy  | MJ   | 0      |
| Substitution of raw materials   | kg   | -13.78 |
| Substitution of fuels           | kg   | 0      |
| Substitution of products        | kg   | 0      |

**LCA: Results**

The results for global warming of the different modules have a large contribution from uptake and emission of biogenic carbon. The net contribution of biogenic carbon to each module is shown on page 8.

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

| Product stage |           | Assembly 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        | X         | X           | X      | X           | X             | X                      | X                     | X                          | X         | X                | X                            | X                                  |

**Environmental impact**

| Parameter | Unit                                  | A1-A3    | A4       | A5       | B1-B7    | C1       |  |  |  |
|-----------|---------------------------------------|----------|----------|----------|----------|----------|--|--|--|
| GWP       | kg CO <sub>2</sub> -eqv               | 2.87E+00 | 4.16E-01 | 5.04E-01 | 0.00E+00 | 1.07E-05 |  |  |  |
| ODP       | kg CFC11-eqv                          | 2.96E-07 | 8.35E-08 | 2.70E-08 | 0.00E+00 | 9.97E-13 |  |  |  |
| POCP      | kg C <sub>2</sub> H <sub>4</sub> -eqv | 5.39E-04 | 7.85E-05 | 5.25E-04 | 0.00E+00 | 2.21E-09 |  |  |  |
| AP        | kg SO <sub>2</sub> -eqv               | 1.07E-02 | 1.37E-03 | 1.24E-02 | 0.00E+00 | 4.81E-08 |  |  |  |
| EP        | kg PO <sub>4</sub> <sup>3-</sup> -eqv | 2.11E-03 | 3.01E-04 | 3.38E-04 | 0.00E+00 | 1.20E-08 |  |  |  |
| ADPM      | kg Sb-eqv                             | 4.88E-06 | 1.73E-06 | 9.35E-07 | 0.00E+00 | 1.67E-10 |  |  |  |
| ADPE      | MJ                                    | 5.78E+01 | 7.06E+00 | 8.34E+00 | 0.00E+00 | 1.04E-04 |  |  |  |

**Environmental impact**

| Parameter | Unit                                  | Scenario 1 - Recycling |          |          |           | Scenario 2 - Landfill |          |          |          |
|-----------|---------------------------------------|------------------------|----------|----------|-----------|-----------------------|----------|----------|----------|
|           |                                       | C2                     | C3       | C4       | D         | C2                    | C3       | C4       | D        |
| GWP       | kg CO <sub>2</sub> -eqv               | 5.40E-01               | 8.69E-01 | 1.17E-02 | -4.90E-02 | 9.00E-02              | 5.63E-02 | 1.60E+00 | 3.78E-02 |
| ODP       | kg CFC11-eqv                          | 1.01E-07               | 1.36E-08 | 2.78E-09 | -4.80E-09 | 1.68E-08              | 1.00E-08 | 4.43E-08 | 4.86E-09 |
| POCP      | kg C <sub>2</sub> H <sub>4</sub> -eqv | 8.87E-05               | 1.73E-05 | 1.06E-03 | -3.90E-05 | 1.48E-05              | 1.15E-05 | 1.65E-02 | 9.57E-06 |
| AP        | kg SO <sub>2</sub> -eqv               | 1.76E-03               | 5.72E-04 | 2.65E-02 | -2.39E-04 | 2.93E-04              | 4.21E-04 | 4.08E-01 | 5.18E-04 |
| EP        | kg PO <sub>4</sub> <sup>3-</sup> -eqv | 2.90E-04               | 1.28E-04 | 1.29E-05 | -6.93E-05 | 4.84E-05              | 9.11E-05 | 5.93E-04 | 1.17E-04 |
| ADPM      | kg Sb-eqv                             | 1.49E-06               | 8.19E-08 | 1.38E-08 | -4.93E-07 | 2.49E-07              | 4.84E-08 | 2.22E-07 | 5.75E-08 |
| ADPE      | MJ                                    | 8.30E+00               | 9.11E-01 | 2.61E-01 | -5.24E-01 | 1.38E+00              | 8.06E-01 | 4.18E+00 | 4.73E-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

| Resource use |                |          |          |           |          |          |  |  |  |
|--------------|----------------|----------|----------|-----------|----------|----------|--|--|--|
| Parameter    | Unit           | A1-A3    | A4       | A5        | B1-B7    | C1       |  |  |  |
| RPEE         | MJ             | 1.52E+01 | 4.52E-01 | 3.37E+00  | 0.00E+00 | 1.37E-03 |  |  |  |
| RPEM         | MJ             | 8.75E+00 | 0.00E+00 | -1.25E+00 | 0.00E+00 | 0.00E+00 |  |  |  |
| TPE          | MJ             | 2.40E+01 | 4.52E-01 | 2.12E+00  | 0.00E+00 | 1.37E-03 |  |  |  |
| NRPE         | MJ             | 6.05E+01 | 7.22E+00 | 4.60E+00  | 0.00E+00 | 1.82E-04 |  |  |  |
| NRPM         | MJ             | 3.46E-01 | 0.00E+00 | 7.33E-01  | 0.00E+00 | 0.00E+00 |  |  |  |
| TRPE         | MJ             | 6.08E+01 | 7.22E+00 | 5.34E+00  | 0.00E+00 | 1.82E-04 |  |  |  |
| SM           | kg             | 1.11E+01 | 0.00E+00 | 5.53E-01  | 0.00E+00 | 0.00E+00 |  |  |  |
| RSF          | MJ             | 0.00E+00 | 0.00E+00 | 0.00E+00  | 0.00E+00 | 0.00E+00 |  |  |  |
| NRSF         | MJ             | 0.00E+00 | 0.00E+00 | 0.00E+00  | 0.00E+00 | 0.00E+00 |  |  |  |
| W            | m <sup>3</sup> | 5.77E-02 | 2.75E-03 | 5.01E-03  | 0.00E+00 | 7.51E-08 |  |  |  |

| Resource use |                | Recycling scenario |           |          |           | Landfill scenario |          |          |          |
|--------------|----------------|--------------------|-----------|----------|-----------|-------------------|----------|----------|----------|
| Parameter    | Unit           | C2                 | C3        | C4       | D         | C2                | C3       | C4       | D        |
| RPEE         | MJ             | 9.03E-02           | 8.25E+00  | 8.58E-03 | -5.14E+00 | 1.50E-02          | 2.16E-01 | 1.41E-01 | 1.91E-02 |
| RPEM         | MJ             | 0.00E+00           | -8.03E+00 | 0.00E+00 | 0.00E+00  | 0.00E+00          | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TPE          | MJ             | 9.03E-02           | 2.24E-01  | 8.58E-03 | -5.14E+00 | 1.50E-02          | 2.16E-01 | 1.41E-01 | 1.91E-02 |
| NRPE         | MJ             | 8.44E+00           | 9.45E-01  | 2.78E-01 | -7.62E-01 | 1.41E+00          | 8.26E-01 | 4.46E+00 | 5.00E-01 |
| NRPM         | MJ             | 0.00E+00           | 0.00E+00  | 0.00E+00 | 0.00E+00  | 0.00E+00          | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TRPE         | MJ             | 8.44E+00           | 9.45E-01  | 2.78E-01 | -7.62E-01 | 1.41E+00          | 8.26E-01 | 4.46E+00 | 5.00E-01 |
| SM           | kg             | 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             | 0.00E+00           | 0.00E+00  | 0.00E+00 | -1.50E-04 | 0.00E+00          | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| NRSF         | MJ             | 0.00E+00           | 0.00E+00  | 0.00E+00 | -1.54E-01 | 0.00E+00          | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| W            | m <sup>3</sup> | 1.61E-03           | 6.66E-04  | 2.62E-04 | -3.85E-04 | 2.68E-04          | 8.48E-05 | 4.17E-03 | 9.17E-05 |

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

| End of life - Waste |      |          |          |          |          |          |  |  |  |
|---------------------|------|----------|----------|----------|----------|----------|--|--|--|
| Parameter           | Unit | A1-A3    | A4       | A5       | B1-B7    | C1       |  |  |  |
| HW                  | kg   | 7.34E-05 | 6.31E-06 | 5.99E-05 | 0.00E+00 | 2.36E-10 |  |  |  |
| NHW                 | kg   | 1.05E+00 | 6.87E-01 | 5.53E-01 | 0.00E+00 | 1.23E-05 |  |  |  |
| RW                  | kg   | 1.12E-04 | 4.68E-05 | 1.13E-05 | 0.00E+00 | 1.34E-09 |  |  |  |

| End of life - Waste |      | Recycling scenario |          |          |           | Landfill scenario |          |          |          |
|---------------------|------|--------------------|----------|----------|-----------|-------------------|----------|----------|----------|
| Parameter           | Unit | C2                 | C3       | C4       | D         | C2                | C3       | C4       | D        |
| HW                  | kg   | 5.32E-06           | 7.50E-07 | 2.27E-07 | -1.00E-06 | 8.87E-07          | 4.33E-07 | 3.68E-06 | 5.41E-07 |
| NHW                 | kg   | 5.79E-01           | 1.39E-02 | 9.14E-01 | -4.24E-02 | 9.66E-02          | 6.13E-03 | 1.45E+01 | 1.01E-02 |
| RW                  | kg   | 5.70E-05           | 6.13E-06 | 1.67E-06 | -4.71E-06 | 9.50E-06          | 5.72E-06 | 2.66E-05 | 2.86E-06 |

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

| End of life - Output flow |      |          |          |          |          |          |  |  |  |
|---------------------------|------|----------|----------|----------|----------|----------|--|--|--|
| Parameter                 | Unit | A1-A3    | A4       | A5       | B1-B7    | C1       |  |  |  |
| CR                        | kg   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |  |  |  |
| MR                        | kg   | 1.68E-02 | 0.00E+00 | 3.27E-01 | 0.00E+00 | 0.00E+00 |  |  |  |
| MER                       | kg   | 3.38E-05 | 0.00E+00 | 3.23E-03 | 0.00E+00 | 0.00E+00 |  |  |  |
| EEE                       | MJ   | 1.48E-02 | 0.00E+00 | 1.88E-02 | 0.00E+00 | 0.00E+00 |  |  |  |
| ETE                       | MJ   | 1.56E-01 | 0.00E+00 | 1.32E-01 | 0.00E+00 | 0.00E+00 |  |  |  |

| End of life - Output flow |      | Recycling scenario |          |          |           | Landfill scenario |          |          |          |
|---------------------------|------|--------------------|----------|----------|-----------|-------------------|----------|----------|----------|
| Parameter                 | Unit | C2                 | C3       | C4       | D         | C2                | C3       | C4       | D        |
| CR                        | kg   | 0.00E+00           | 0.00E+00 | 0.00E+00 | 0.00E+00  | 0.00E+00          | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| MR                        | kg   | 0.00E+00           | 1.29E+01 | 0.00E+00 | 8.61E-01  | 0.00E+00          | 0.00E+00 | 0.00E+00 | 1.38E+01 |
| MER                       | kg   | 0.00E+00           | 0.00E+00 | 0.00E+00 | 0.00E+00  | 0.00E+00          | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| EEE                       | MJ   | 0.00E+00           | 7.22E-01 | 0.00E+00 | -7.40E-01 | 0.00E+00          | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ETE                       | MJ   | 0.00E+00           | 4.96E+00 | 0.00E+00 | -5.09E+00 | 0.00E+00          | 0.00E+00 | 0.00E+00 | 0.00E+00 |

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

## Additional Norwegian requirements

### Greenhous gas emission from the use of electricity in the manufacturing phase

National consumption mix with import on low voltage (production of transmission lines, in addition to direct emissions and losses in grid) are applied electricity for the manufacturing process (A3).

| Data source           | Amount | Unit                     |
|-----------------------|--------|--------------------------|
| Ecoinvent v3.5 (2018) | 31.7   | CO <sub>2</sub> -eqv/kWh |

### Dangerous substances

- The product contains no substances given by the REACH Candidate list or the Norwegian priority list
- The product contains substances given by the REACH Candidate list or the Norwegian priority list that are less than 0,1 % by weight.
- The product contain dangerous substances, more then 0,1% by weight, given by the REACH Candidate List or the Norwegian Priority list, see table.
- The product contains no substances given by the REACH Candidate list or the Norwegian priority list. The product is classified as hazardous waste (Avfallsforskiten, Annex III), see table.

### Indoor environment

Emissions to indoor air are tested by RISE in 2020 and evaluated according to EN 16516. The summary of the test results are listed below for Norgips Standard 12,5 mm Type A.

|                       |      |                     |  |
|-----------------------|------|---------------------|--|
| TVOC                  | <10  | µg/m <sup>2</sup> h |  |
| Sum carcinogenic VOCs | <1   | µg/m <sup>2</sup> h |  |
| Sum VOC with LCI      | <2   | µg/m <sup>2</sup> h |  |
| Sum VOC without LCI   | <2   | µg/m <sup>2</sup> h |  |
| Sum VVOC              | 3    | µg/m <sup>2</sup> h |  |
| Formaldehyde          | 3    | µg/m <sup>2</sup> h |  |
| Sum SVOC              | <2   | µg/m <sup>2</sup> h |  |
| R= Sum Ci/LCI         | 0.07 |                     |  |

### Carbon footprint

In order to increase the transparency of biogenic carbon contribution to climate impact, the indicator for GWP has been sub-divided into the following:

- GWP-IOBC Climate impacts calculated according to the principle of instantanious oxidation
- GWP-BC Climate impacts from the net uptake and emission of biogenic carbon from each module.

### Climate impacts




| Parameter | Unit                    | A1-A3     | A4       | A5       | B1-B7    | C1       |  |  |  |
|-----------|-------------------------|-----------|----------|----------|----------|----------|--|--|--|
| GWP-IOBC  | kg CO <sub>2</sub> -eqv | 3.73E+00  | 4.16E-01 | 3.44E-01 | 0.00E+00 | 1.07E-05 |  |  |  |
| GWP-BC    | kg CO <sub>2</sub> -eqv | -8.54E-01 | 0.00E+00 | 1.60E-01 | 0.00E+00 | 0.00E+00 |  |  |  |
| GWP       | kg CO <sub>2</sub> -eqv | 2.87E+00  | 4.16E-01 | 5.04E-01 | 0.00E+00 | 1.07E-05 |  |  |  |

| Climate impacts |                         | Recycling scenario |          |          |           | Landfill scenario |          |          |          |
|-----------------|-------------------------|--------------------|----------|----------|-----------|-------------------|----------|----------|----------|
| Parameter       | Unit                    | C2                 | C3       | C4       | D         | C2                | C3       | C4       | D        |
| GWP-IOBC        | kg CO <sub>2</sub> -eqv | 5.40E-01           | 6.78E-02 | 1.17E-02 | -4.90E-02 | 9.00E-02          | 5.63E-02 | 7.96E-01 | 3.78E-02 |
| GWP-BC          | kg CO <sub>2</sub> -eqv | 0.00E+00           | 8.02E-01 | 0.00E+00 | 0.00E+00  | 0.00E+00          | 0.00E+00 | 8.02E-01 | 0.00E+00 |
| GWP             | kg CO <sub>2</sub> -eqv | 5.40E-01           | 8.69E-01 | 1.17E-02 | -4.90E-02 | 9.00E-02          | 5.63E-02 | 1.60E+00 | 3.78E-02 |



## Bibliography

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| ISO 14044:2006           | <i>Environmental management - Life cycle assessment - Requirements and guidelines</i>  |
| EN 15804:2012+A1:2013    | <i>Sustainability of construction works - Environmental product declaration - Core rules for the product category of construction products</i>     |
| ISO 21930:2007           | <i>Sustainability in building construction - Environmental declaration of building products</i>  |
| EN 16485:2014            | <i>Round and sawn timber - Environmental Product Declaration - Product category rules for wood and wood-based products for use in construction</i> |
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