

Environmental Product Declaration

according to ISO 14025 and EN 15804



This declaration is for:
Sneldek Classic

Provided by:
BMI



program operator
Stichting MRPI®
publisher
Stichting MRPI®
www.mrpi.nl

MRPI® registration
1.1.00445.2023
date of first issue
13-07-2023
date of this issue
13-07-2023
expiry date
13-07-2028





COMPANY INFORMATION



BMI
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BE

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<https://www.bmigroup.com/be/>

PRODUCT

Sneldek Classic

DECLARED UNIT/FUNCTIONAL UNIT

m²

DESCRIPTION OF PRODUCT

Een vierkante meter dakbedekking toegepast op een hellend dak, die minimaal voldoet aan de eisen van het Bouwbesluit. Panlatten, tengels en bevestigingsmiddelen moeten worden meegenomen. Exclusief isolatiemateriaal en de dakconstructie.

VISUAL PRODUCT



MRPI® REGISTRATION

1.1.00445.2023

DATE OF ISSUE

13-07-2023

EXPIRY DATE

13-07-2028

MORE INFORMATION

<https://www.bmigroup.com/be/p/sneldek-dakpan-antraciet-novo-3730496727/?pathname=%2Fbe%2Fhellend-dak%2Fbetondakpannen%2Fsneldek-vernieuwd%2F>

SCOPE OF DECLARATION

This MRPI®-EPD certificate is verified by **Kamiel Jansen, Aveco de Bondt**.

The LCA study has been done by **Wouter Jan van den Berg, BMI Group**.

The certificate is based on an LCA-dossier according to ISO14025 and EN15804+A2/Bepalingsmethode. It is verified according to the 'MRPI®-EPD verification protocol November 2020.v4.0'. EPDs of construction products may not be comparable if they do not comply with EN15804+A2/Bepalingsmethode. Declaration of SVHC that are listed on the 'Candidate List of Substances of Very High Concern for authorisation' when content exceeds the limits for registration with ECHA.

PROGRAM OPERATOR

Stichting MRPI®
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ir. J-P den Hollander, Managing director MRPI®

DEMONSTRATION OF VERIFICATION

CEN standard EN15804 serves as the core PCR[a]

Independent verification of the declaration and data,
according to EN ISO 14025:2010:
internal: external: X

Third party verifier:

Kamiel Jansen, Aveco de Bondt

[a] PCR = Product Category Rules

DETAILED PRODUCT DESCRIPTION

Concrete roof tiles are made from the natural raw materials: sand, cement and water. We color that mixture with natural iron oxide, so that the color is retained for a long time. Tiles are extruded using aluminium pallets. After curing, we finish the concrete roof tiles with an innovative top layer developed by our own research department. In recent decades, concrete roof tiles have developed enormously in terms of quality and offer aesthetic reliability for many years. For concrete roof tiles with a Glazuron finish, we apply a thin extra layer, which consists of fine sand, provided with coloring based on iron oxides.

| COMPONENT > 1% of total mass | [%] |
|------------------------------|--------------|
| Sand | confidential |
| Cement | confidential |
| Water | confidential |
| Pigment | confidential |
| Paint | confidential |
| Others | confidential |

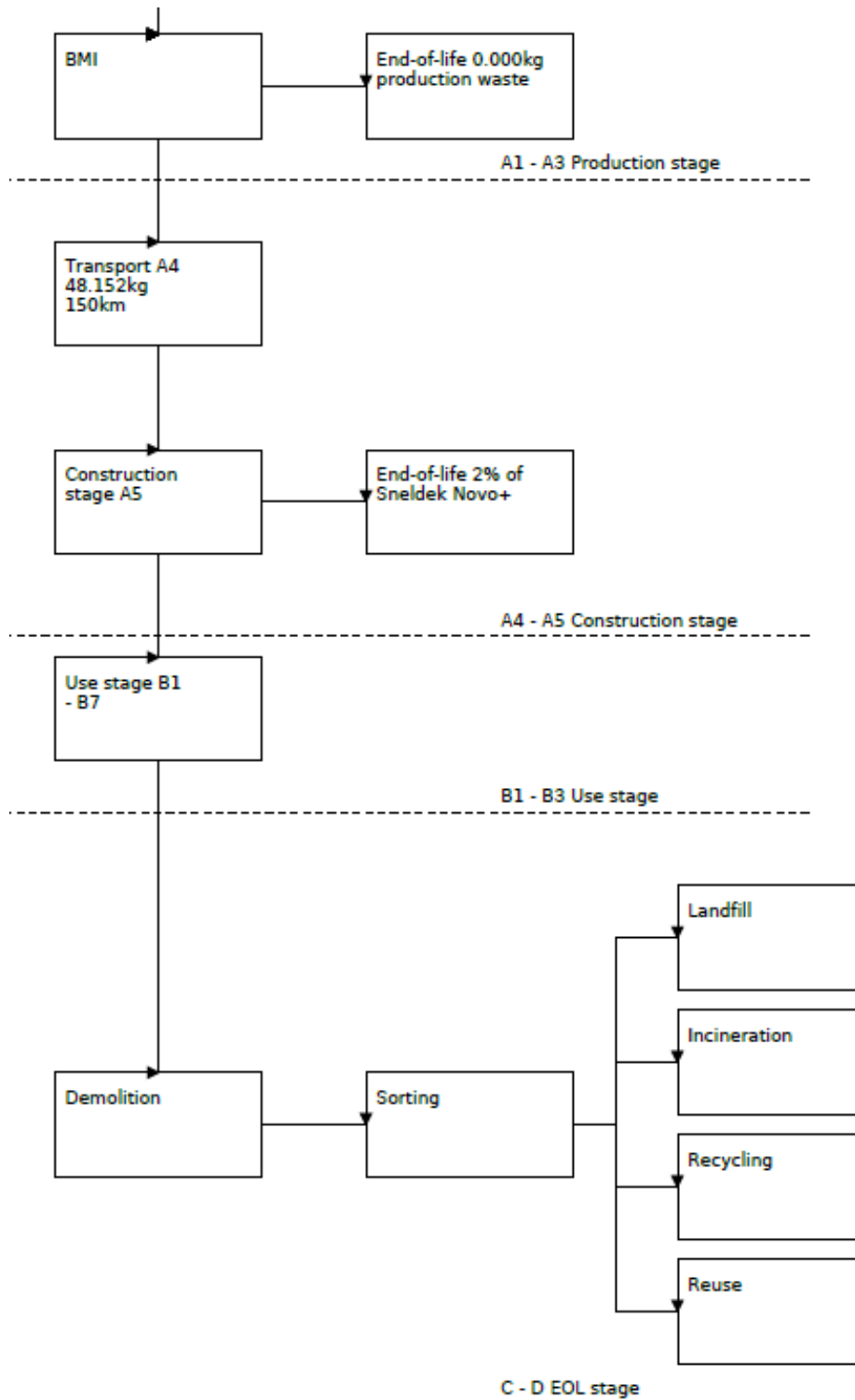
SCOPE AND TYPE

This specific EPD is relevant for Sneldek Classic, a product from BMI Monier Tessenderlo, to be sold at the European market. Backgrounddatabase is Eco Invent 3.6. For end of life we have used the waste scenario concrete (i.a. elements, brickwork, reinforced concrete)

| PRODUCT STAGE | | | CONSTRUCTION | | | USE STAGE | | | | | | | END OF LIFE | | | | BENEFITS AND | |
|---------------------|-----------|---------------|------------------------|----------|-----|-------------|--------|-------------|---------------|------------------------|-----------------------|----------------------------|-------------|------------------|----------|------------------------------------|-------------------|--|
| | | | PROCESS | | | | | | | | | | STAGE | | | | LOADS BEYOND THE | |
| | | | STAGE | | | | | | | | | | | | | | SYSTEM BOUNDARIES | |
| Raw material supply | Transport | Manufacturing | Transport gate to site | 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 | ND | ND | ND | ND | x | x | x | x | x | | |

X = Modules Assessed

ND = Not Declared



LCA process diagram according to EN 15804 (7.2.1)

REPRESENTATIVENESS

The data are representative for Sneldek Classic, a product from BMI Monier Tessenderlo, to be sold at the European market.

ENVIRONMENTAL IMPACT per functional unit or declared unit (indicators A1)

| | UNIT | A1 | A2 | A3 | A1-A3 | A4 | A5 | B1 | B2 | B3 | C1 | C2 | C3 | C4 | D |
|------|----------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|--------------|
| ADPE | kg Sb eq. | 4.18 E-5 | 9.30 E-6 | 4.02 E-5 | 9.13 E-5 | 2.47 E-5 | 2.50 E-3 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 8.30 E-6 | 2.18 E-7 | 2.32 E-8 | -1.23 E-5 |
| ADPF | MJ | 2.22 E+1 | 5.56 E+0 | 2.58 E+1 | 5.35 E+1 | 1.48 E+1 | 2.09 E+1 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 4.97 E+0 | 1.13 E+0 | 7.04 E-2 | -8.41 E+0 |
| GWP | kg CO2 eq. | 1.46 E+0 | 3.64 E-1 | 1.41 E+0 | 3.24 E+0 | 9.67 E-1 | 1.42 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 3.25 E-1 | 7.66 E-2 | 2.49 E-3 | -6.42 E-1 |
| ODP | kg CFC11 eq. | 1.91 E-7 | 6.45 E-8 | 1.15 E-7 | 3.70 E-7 | 1.71 E-7 | 1.43 E-7 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 5.77 E-8 | 8.38 E-9 | 8.28 E-10 | -6.51 E-8 |
| POCP | kg ethene eq. | 1.14 E-3 | 2.20 E-4 | 4.94 E-4 | 1.85 E-3 | 5.83 E-4 | 1.38 E-3 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 1.96 E-4 | 4.37 E-5 | 2.65 E-6 | -1.25 E-3 |
| AP | kg SO2 eq. | 1.22 E-2 | 1.60 E-3 | 3.07 E-3 | 1.69 E-2 | 4.25 E-3 | 1.57 E-2 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 1.43 E-3 | 3.54 E-4 | 1.82 E-5 | -4.85 E-3 |
| EP | kg (PO4)3- eq. | 4.48 E-3 | 3.14 E-4 | 5.00 E-4 | 5.30 E-3 | 8.35 E-4 | 3.15 E-3 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 2.81 E-4 | 7.89 E-5 | 3.51 E-6 | -1.19 E-3 |

Toxicity indicators for Dutch market

| | | | | | | | | | | | | | | | |
|-------|------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|
| HTP | kg DCB eq. | 7.36 E-1 | 1.53 E-1 | 3.58 E-1 | 1.25 E+0 | 4.07 E-1 | 4.14 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 1.37 E-1 | 1.82 E-2 | 1.12 E-3 | -5.20 E-1 |
| FAETP | kg DCB eq. | 1.82 E-1 | 4.47 E-3 | 8.41 E-3 | 1.95 E-1 | 1.19 E-2 | 2.70 E-2 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 3.99 E-3 | 3.14 E-4 | 2.67 E-5 | -3.76 E-3 |
| MAETP | kg DCB eq. | 1.13 E+2 | 1.61 E+1 | 2.19 E+1 | 1.51 E+2 | 4.27 E+1 | 5.95 E+1 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 1.44 E+1 | 1.18 E+0 | 9.53 E-2 | -1.03 E+1 |
| TETP | kg DCB eq. | 3.66 E-2 | 5.41 E-4 | 4.85 E-3 | 4.19 E-2 | 1.44 E-3 | 1.31 E-2 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 4.84 E-4 | 2.23 E-4 | 2.82 E-6 | 1.46 E-2 |
| ECI | Euro | 2.52 E-1 | 4.38 E-2 | 1.25 E-1 | 4.21 E-1 | 1.16 E-1 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 3.92 E-2 | 7.91 E-3 | 0.00 E+0 | 0.00 E+0 |
| ADPF | kg Sb. eq. | 1.07 E-2 | 2.68 E-3 | 1.24 E-2 | 2.57 E-2 | 7.11 E-3 | 1.00 E-2 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 2.39 E-3 | 5.42 E-4 | 3.39 E-5 | -4.04 E-3 |

ADPE = Abiotic Depletion Potential for non-fossil resources

ADPF = Abiotic Depletion Potential for fossil resources

GWP = Global Warming Potential

ODP = Depletion potential of the stratospheric ozone layer

POCP = Formation potential of tropospheric ozone photochemical oxidants

AP = Acidification Potential of land and water

EP = Eutrophication Potential

HTP = Human Toxicity Potential

FAETP = Fresh water aquatic ecotoxicity potential

MAETP = Marine aquatic ecotoxicity potential

TETP = Terrestrial ecotoxicity potential

ECI = Environmental Cost Indicator

ADPF = Abiotic Depletion Potential for fossil resources expressed in [kg Sb-eq.]

ENVIRONMENTAL IMPACT per functional unit or declared unit (core indicators A2)

| | UNIT | A1 | A2 | A3 | A1-A3 | A4 | A5 | B1 | B2 | B3 | C1 | C2 | C3 | C4 | D |
|-----------------------|-------------------------|-------------|-------------|-------------|-------------|-------------|--------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|
| GWP-total | kg CO2 eq. | 9.41 E+0 | 3.67 E-1 | 1.56 E+0 | 1.13 E+1 | 9.76 E-1 | 1.54 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 3.28 E-1 | 7.79 E-2 | 2.54 E-3 | -6.84 E-1 |
| GWP-fossil | kg CO2 eq. | 9.13 E+0 | 3.67 E-1 | 1.55 E+0 | 1.10 E+1 | 9.75 E-1 | 1.59 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 3.28 E-1 | 7.75 E-2 | 2.53 E-3 | -6.72 E-1 |
| GWP-biogenic | kg CO2 eq. | 1.40 E-1 | 1.69 E-4 | 3.01 E-3 | 1.43 E-1 | 4.50 E-4 | -5.81 E-2 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 1.51 E-4 | 4.48 E-4 | 5.02 E-6 | -1.06 E-2 |
| GWP-luluc | kg CO2 eq. | 1.40 E-1 | 1.34 E-4 | 2.60 E-3 | 1.43 E-1 | 3.57 E-4 | 7.33 E-3 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 1.20 E-4 | 1.47 E-5 | 7.06 E-7 | -1.44 E-3 |
| ODP | kg CFC11 eq. | 2.70 E-7 | 8.10 E-8 | 1.26 E-7 | 4.77 E-7 | 2.15 E-7 | 1.64 E-7 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 7.23 E-8 | 1.00 E-8 | 1.04 E-9 | -6.60 E-8 |
| AP | mol H+ eq. | 3.57 E-2 | 2.13 E-3 | 4.17 E-3 | 4.20 E-2 | 5.65 E-3 | 2.55 E-2 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 1.90 E-3 | 4.86 E-4 | 2.40 E-5 | -6.94 E-3 |
| EP-freshwater | kg PO4 eq. | 9.83 E-4 | 3.70 E-6 | 6.02 E-5 | 1.05 E-3 | 9.83 E-6 | 9.54 E-5 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 3.31 E-6 | 2.41 E-6 | 2.84 E-8 | -3.26 E-5 |
| EP-marine | kg N eq. | 5.12 E-3 | 7.50 E-4 | 7.75 E-4 | 6.64 E-3 | 1.99 E-3 | 3.16 E-3 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 6.70 E-4 | 1.93 E-4 | 8.27 E-6 | -1.88 E-3 |
| EP-terrestrial | mol N eq. | 5.04 E-2 | 8.27 E-3 | 9.67 E-3 | 6.83 E-2 | 2.20 E-2 | 9.87 E-2 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 7.38 E-3 | 2.15 E-3 | 9.12 E-5 | -2.77 E-2 |
| POCP | kg NMVOC eq. | 1.47 E-2 | 2.36 E-3 | 2.84 E-3 | 1.99 E-2 | 6.27 E-3 | 9.23 E-3 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 2.11 E-3 | 5.84 E-4 | 2.65 E-5 | -6.79 E-3 |
| ADP-minerals & metals | kg Sb eq. | 5.91 E-5 | 9.30 E-6 | 4.04 E-5 | 1.09 E-4 | 2.47 E-5 | 2.50 E-3 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 8.30 E-6 | 2.18 E-7 | 2.32 E-8 | -1.23 E-5 |
| ADP-fossil | MJ, net calorific value | 4.29 E+1 | 5.53 E+0 | 2.34 E+1 | 7.19 E+1 | 1.47 E+1 | 1.93 E+1 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 4.94 E+0 | 1.04 E+0 | 7.08 E-2 | -6.45 E+0 |
| WDP | m3 world eq. deprived | 3.68 E+0 | 1.98 E-2 | 2.48 E-1 | 3.95 E+0 | 5.26 E-2 | 3.83 E-1 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 1.77 E-2 | 4.72 E-3 | 3.17 E-3 | -3.00 E+0 |

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 Exceedence

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 Exceedence

POCP = Formation potential of tropospheric ozone photochemical oxidants

ADP-minerals&metals = Abiotic Depletion Potential for non fossil resources [2]

ADP-fossil = Abiotic Depletion for fossil resources potential [2]

WDP = Water (user) deprivation potential, deprivation-weighted water consumption [2]

Disclaimer [2]

- 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 experience with the indicator.

ENVIRONMENTAL IMPACT per functional unit or declared unit (additional indicators A2)

| | UNIT | A1 | A2 | A3 | A1-A3 | A4 | A5 | B1 | B2 | B3 | C1 | C2 | C3 | C4 | D |
|--------|-------------------|-------------|--------------|--------------|-------------|--------------|-------------|-------------|-------------|-------------|-------------|--------------|--------------|--------------|---------------|
| PM | Disease incidence | 2.87 E-7 | 3.30 E-8 | 2.73 E-8 | 3.48 E-7 | 8.77 E-8 | 3.39 E-7 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 2.95 E-8 | 1.07 E-8 | 4.67 E-10 | -1.01 E-7 |
| IRP | kBq U235 eq. | 1.13 E-1 | 2.32 E-2 | 3.04 E-2 | 1.66 E-1 | 6.16 E-2 | 7.14 E-2 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 2.07 E-2 | 3.30 E-3 | 2.90 E-4 | -1.09 E-2 |
| ETP-fw | CTUe | 1.33 E+2 | 4.93 E+0 | 1.86 E+1 | 1.57 E+2 | 1.31 E+1 | 6.29 E+1 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 4.41 E+0 | 8.43 E-1 | 4.59 E-2 | -5.59 E+1 |
| HTP-c | CTUh | 2.65 E-9 | 1.60 E-10 | 7.83 E-10 | 3.60 E-9 | 4.25 E-10 | 1.52 E-8 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 1.43 E-10 | 2.00 E-11 | 1.06 E-12 | -6.58 E-10 |
| HTP-nc | CTUh | 5.76 E-8 | 5.40 E-9 | 1.69 E-8 | 7.99 E-8 | 1.43 E-8 | 7.79 E-8 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 4.82 E-9 | 5.65 E-10 | 3.26 E-11 | 4.48 E-8 |
| SQP | --- | 2.06 E+1 | 4.80 E+0 | 5.91 E+0 | 3.13 E+1 | 1.27 E+1 | 6.10 E+2 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 4.29 E+0 | 1.74 E-1 | 1.48 E-1 | -1.62 E+2 |

PM = Potential incidence of disease due to PM emissions

IRP = Potential Human exposure efficiency relative to U235 [1]

ETP-fw = Potential Comparative Toxic Unit for ecosystems [2]

HTP-c = Potential Comparative Toxic Unit for humans [2]

HTP-nc = Potential Comparative Toxic Unit for humans, non-cancer [2]

SQP = Potential soil quality index [2]

Disclaimer [1]

- 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.

Disclaimer [2]

- 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 experience with the indicator.

RESOURCE USE per functional unit or declared unit (A1 / A2)

| | UNIT | A1 | A2 | A3 | A1-A3 | A4 | A5 | B1 | B2 | B3 | C1 | C2 | C3 | C4 | D |
|-------|------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|
| PERE | MJ | 3.58 E+0 | 6.93 E-2 | 1.22 E+0 | 4.87 E+0 | 1.84 E-1 | 5.25 E+1 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 6.19 E-2 | 5.92 E-2 | 5.72 E-4 | -3.33 E+1 |
| PERM | MJ | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 3.22 E+1 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 |
| PERT | MJ | 3.58 E+0 | 6.93 E-2 | 1.22 E+0 | 4.87 E+0 | 1.84 E-1 | 8.46 E+1 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 6.19 E-2 | 5.92 E-2 | 5.72 E-4 | -3.33 E+1 |
| PENRE | MJ | 3.99 E+1 | 5.87 E+0 | 2.27 E+1 | 6.85 E+1 | 1.56 E+1 | 2.04 E+1 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 5.25 E+0 | 1.11 E+0 | 7.52 E-2 | -6.80 E+0 |
| PENRM | MJ | 4.63 E+0 | 0.00 E+0 | 2.69 E+0 | 7.32 E+0 | 0.00 E+0 | 1.46 E-1 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 |
| PENRT | MJ | 4.46 E+1 | 5.87 E+0 | 2.54 E+1 | 7.58 E+1 | 1.56 E+1 | 2.06 E+1 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 5.25 E+0 | 1.11 E+0 | 7.52 E-2 | -6.80 E+0 |
| SM | kg | 1.20 E-4 | 0.00 E+0 | 7.80 E-6 | 1.28 E-4 | 0.00 E+0 | 1.01 E-1 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 4.08 E-4 |
| RSF | MJ | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 |
| NRSF | MJ | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 |
| FW | m3 | 9.36 E-2 | 6.74 E-4 | 9.50 E-3 | 1.04 E-1 | 1.79 E-3 | 1.35 E-2 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 6.02 E-4 | 3.48 E-4 | 7.56 E-5 | -7.01 E-2 |

PERE = Use of renewable energy excluding renewable primary energy resources

PERM = Use of renewable energy resources used as raw materials

PERT = Total use of renewable primary energy resources

PENRE = Use of non-renewable primary energy resources excluding non-renewable 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 = Use of net fresh water

OUTPUT FLOWS AND WASTE CATEGORIES per functional unit or declared unit (A1 / A2)

| | UNIT | A1 | A2 | A3 | A1-A3 | A4 | A5 | B1 | B2 | B3 | C1 | C2 | C3 | C4 | D |
|------|------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|
| HWD | kg | 2.40 E-1 | 1.40 E-5 | 3.62 E-3 | 2.43 E-1 | 3.73 E-5 | 5.24 E-3 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 1.25 E-5 | 1.81 E-6 | 1.06 E-7 | -5.14 E-5 |
| NHWD | kg | 3.86 E+0 | 3.51 E-1 | 1.62 E-1 | 4.37 E+0 | 9.33 E-1 | 8.95 E-1 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 3.14 E-1 | 1.45 E-1 | 4.81 E-1 | -1.20 E-1 |
| RWD | kg | 1.15 E-4 | 3.63 E-5 | 3.16 E-5 | 1.83 E-4 | 9.65 E-5 | 7.82 E-5 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 3.25 E-5 | 4.67 E-6 | 4.65 E-7 | -1.90 E-5 |
| CRU | kg | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 |
| MFR | kg | 4.52 E-5 | 0.00 E+0 | 7.14 E-1 | 7.14 E-1 | 0.00 E+0 | 1.21 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 4.76 E+1 | 0.00 E+0 | 0.00 E+0 |
| MER | kg | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 |
| EEE | MJ | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 5.50 E+0 |
| ETE | MJ | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 9.48 E+0 |

HWD = Hazardous Waste Disposed

RWD = Radioactive Waste Disposed

MFR = Materials for recycling

EEE = Exported Electrical Energy

NHWD = Non Hazardous Waste Disposed

CRU = Components for reuse

MER = Materials for energy recovery

ETE = Exported Thermal Energy

BIOGENIC CARBON CONTENT per functional unit or declared unit (A1 / A2)

| | UNIT | A1 | A2 | A3 | A1-A3 | A4 | A5 | B1 | B2 | B3 | C1 | C2 | C3 | C4 | D |
|-------|------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| BCCpr | kg C | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 |
| BCCpa | kg C | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 | 0.00 E+0 |

BCCpr = Biogenic carbon content in product

BCCpa = Biogenic carbon content in packaging

CALCULATION RULES

Applicable time period collected data

2019-2021

SCENARIOS AND ADDITIONAL TECHNICAL INFORMATION

Product Stage (A1-A3)

The production stage consists of the extraction of raw materials, transportation of the raw materials, processing the raw materials into materials and the production of the product. The required energy for production, external treatments, ancillary materials, packaging material and production emissions are included.

Construction process stage (A4-A5)

This stage consists the transport of the product from production plant to the construction site. It also includes the loss of material during construction. The additional needed production, transport and end-of-life of the lost material during construction is included. The end-of-life of packaging material up to the end-of-waste state or disposal of final residues is also included. The installation of the product including manufacture, transportation and end-of-life of ancillary materials and any energy or water use required for installation or operation of the construction site are taken into account.

Use stage (B1-B3)

This stage consists of the impacts arising from components of the building and construction works during their use. The stage also covers the combination of all planned technical and associated administrative maintenance actions during the service life to maintain the product installed in a building, in a construction works or its parts in a state in which it can perform its required functional and technical performance, as well as preserve the aesthetic qualities of the product. This will include preventative and regular maintenance activities. Product replacement (B4) and renovation (B5) only apply when the product is considered in a lifespan (of a building, work, etc.). Operational water and energy use are not considered.

End of life stage (C1-C4)

When the end of the life stage of the building is reached, the de-construction/demolition begins. This EPD includes de-construction/demolition (C1), the necessary transport (C2) from the demolition site to the sorting location and distance to final disposal. The end of life stage includes the final disposal to landfill (C4), incineration (C3) and needed recycling processes up to the end-of-waste point (C3). Loads and benefits of recycling, re-use and exported energy are part of module D. The default end-of-life scenarios of the annex (March 2022) to the NMD Determination method v1.1 have been used for the various materials in the product.

Benefits and Loads beyond the system boundary (Module D)

This stage contains the potential loads and benefits of recycling and re-use of raw materials/products. The loads contain the needed recycling processes from end-of-waste-point up to the point-of-equivalence of the substituted primary raw material and a load for secondary material that will be lost at the end-of-life stage. The loads and benefits of recycling and reuse are included in this module. The benefits are calculated based on the primary content and the primary equivalent. In addition, the benefits of energy recovery are granted at this stage. The amount of avoided energy is based on the Lower Heating Values of the materials and the efficiencies of the incinerators as mentioned in the NMD Determination method v1.1 or EcoInvent 3.6 (2019).

DECLARATION OF SVHC

No substances that are listed in the latest Candidate List of substances of Very High Concern for authorisation" are included in the product the exceeds the limit for registration.

REFERENCES

ISO 14040 - DIN EN ISO 14040:2006-10, Environmental management - Life cycle assessment - Principles and framework; EN ISO 14040:2006

ISO 14044 - DIN EN ISO 14044:2006-10, Environmental management - Life cycle assessment - Requirements and guidelines; EN ISO 14040:2006

ISO 14025 - DIN EN ISO 14025:2011-10: Environmental labels and declarations – Type III environmental declarations – Principles and procedures

EN 15804- EN 15804:2012+A2:2019: Sustainability of construction works – Environmental Product PCR for roofs - PCR

https://www.epd-norge.no/getfile.php/138986-1528284889/PCRer/NPCR_022_Part_B_for_Roof_wat_erproofing_060618.pdf

NMD Determination method Environmental performance Construction works v1.1 March 2022

REMARKS

none