

Environmental Profile

This LCA is calculated according to: ISO 14044, ISO 14040 and EN 15804

Ecochain v4.3.1



Product: CEM III/B 42.5 N-LH/SR
 Unit: 1 ton
 Manufacturer: Cemminerals - update 2023

LCA standard: NMD Bepalingsmethode 1.1 (2022)
 Standard database: Dutch - Nationale Milieudatabase v3.8 (obv Ecoinvent 3.6)
 Externally verified: Yes
 Issue date: 03-12-2024
 End of validity: 03-12-2029
 Verifier: Ulbert Hofstra - SGS Intron

De getoetste LCA's van Cemmineralsvoldoen aan het gestelde in NMD Bepalingsmethode 'Milieuprestatie Bouwwerken', versie 1.1, maart 2022 en amendementen (zonder NL-PCR cement).

The LCA background information and project dossier have been registered in the online Ecochain application in the account Cemminerals - update 2023 (2023). (☑ = module declared, MND = module not declared).

| A1 | A2 | A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| ☑ | ☑ | ☑ | MND | MND | MND | MND | MND | MND | MND | MND | MND | MND | MND | MND | MND | MND |

Product stage

A1 Raw material supply A2 Transport A3 Manufacturing

Construction process stage

A4 Transport gate to site
 A5 Assembly / Construction installation process

Use stage

B1 Use B2 Maintenance B3 Repair B4 Replacement B5 Refurbishment
 B6 Operational energy use B7 Operational water use

End-of-Life stage

C1 De-construction demolition C2 Transport C3 Waste processing
 C4 Disposal

Benefits and loads beyond the system boundaries

D Reuse- Recovery- Recycling- potential

Environmental impacts and parameters

ECI = Environmental Costs Indicator [euro]; **ADPE** = Abiotic depletion potential for non-fossil resources [kg Sb-eq]; **ADPF** = Abiotic depletion potential for fossil resources [kg Sb-eq]; **GWP** = Global warming potential [kg CO2-eq]; **ODP** = Depletion potential of the stratospheric ozone layer [kg CFC-11-eq]; **POCP** = Formation potential of tropospheric ozone photochemical oxidants [kg ethene-eq]; **AP** = Acidification potential of land and water [kg SO2-eq]; **EP** = Eutrophication potential [kg PO4 3--eq]; **HTP** = Human toxicity potential [kg 1,4-DB-eq]; **FAETP** = Freshwater aquatic ecotoxicity potential [kg 1,4-DB-eq]; **MAETP** = Marine aquatic ecotoxicity potential [kg 1,4-DB-eq]; **TETP** = Terrestrial ecotoxicity potential [kg 1,4-DB-eq]; **GWP-total** = EF EN15804+A2 Climate Change [kg CO2 eq]; **GWP-f** = EF Climate change - Fossil [kg CO2 eq]; **GWP-b** = EF EN15804+A2 Climate Change - Biogenic [kg CO2 eq]; **GWP-luluc** = EF EN15804+A2 Climate Change - Land use and LU change [kg CO2 eq]; **ODP** = EF Ozone depletion [kg CFC11 eq]; **AP** = EF Acidification [mol H+ eq]; **EP-fw** = EF Eutrophication, freshwater [kg P eq]; **EP-m** = EF Eutrophication, marine [kg N eq]; **EP-T** = EF Eutrophication, terrestrial [mol N eq]; **POCP** = EF Photochemical ozone formation [kg NMVOC eq]; **ADP-mm** = EF Resource use, minerals and metals [kg Sb eq]; **ADP-f** = EF Resource use, fossils [MJ]; **WDP** = EF Water use [m3 depriv.]; **PM** = EF Particulate matter [disease inc.]; **IR** = EF Ionising radiation [kBq U-235 eq]; **ETP-fw** = EF Ecotoxicity, freshwater [CTUe]; **HTP-c** = EF Human toxicity, cancer [CTUh]; **HTP-nc** = EF Human toxicity, non-cancer [CTUh]; **SQP** = EF Land use [Pt]; **PERE** = Use of renewable primary energy excluding non-renewable primary energy resources used as raw materials [MJ]; **PERM** = Use of renewable primary energy resources used as raw materials [MJ]; **PERT** = Total use of renewable primary energy resources [MJ]; **PENRE** = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials [MJ]; **PENRM** = Use of non-renewable primary energy resources used as raw materials [MJ]; **PENRT** = Total use of non-renewable primary energy resources [MJ]; **PET** = Total energy [MJ]; **SM** = Use of secondary material [kg]; **RSF** = Use of renewable secondary fuels [MJ]; **NRSF** = Use of non-renewable secondary fuels [MJ]; **FW** = Use of net fresh water [m3]; **HWD** = Hazardous waste disposed [kg]; **NHWD** = Non-hazardous waste disposed [kg]; **RWD** = Radioactive waste disposed [kg]; **CRU** = Components for re-use [kg]; **MFR** = Materials for recycling [kg]; **MER** = Materials for energy recovery [kg]; **EE** = Exported energy [MJ]; **EET** = Exported energy thermic [MJ]; **EEE** = Exported energy electric [MJ]

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Results

| Environmental impact SBK set 1 | Unit | A1 | A2 | A3 | A1-A3 | Total |
|--------------------------------|--------------|----------|----------|----------|----------|----------|
| ECI | euro | 14.353 | 1.284 | 1.357 | 16.995 | 16.995 |
| ADPE | kg Sb-eq | 3.122E-4 | 6.729E-5 | 1.294E-4 | 5.089E-4 | 5.089E-4 |
| ADPF | kg Sb-eq | 4.266E-1 | 4.929E-2 | 1.272E-1 | 6.030E-1 | 6.030E-1 |
| GWP | kg CO2-eq | 2.072E+2 | 8.027E+0 | 1.752E+1 | 2.327E+2 | 2.327E+2 |
| ODP | kg CFC-11-eq | 5.302E-6 | 1.197E-6 | 4.185E-6 | 1.068E-5 | 1.068E-5 |
| POCP | kg ethene-eq | 1.886E-2 | 6.893E-3 | 3.747E-3 | 2.950E-2 | 2.950E-2 |
| AP | kg SO2-eq | 3.620E-1 | 1.076E-1 | 2.948E-2 | 4.991E-1 | 4.991E-1 |
| EP | kg PO4 3--eq | 7.029E-2 | 1.524E-2 | 4.843E-3 | 9.037E-2 | 9.037E-2 |
| HTP | kg 1,4-DB-eq | 1.513E+1 | 2.975E+0 | 2.843E+0 | 2.094E+1 | 2.094E+1 |
| FAETP | kg 1,4-DB-eq | 3.979E+0 | 5.878E-2 | 7.842E-2 | 4.116E+0 | 4.116E+0 |
| MAETP | kg 1,4-DB-eq | 2.254E+3 | 2.292E+2 | 2.549E+2 | 2.738E+3 | 2.738E+3 |
| TETP | kg 1,4-DB-eq | 1.691E+0 | 1.128E-2 | 1.365E-1 | 1.839E+0 | 1.839E+0 |
| Environmental impact | Unit | A1 | A2 | A3 | A1-A3 | Total |
| GWP-total | kg CO2 eq | 2.140E+2 | 8.108E+0 | 1.791E+1 | 2.400E+2 | 2.400E+2 |
| GWP-f | kg CO2 eq | 2.079E+2 | 8.089E+0 | 1.772E+1 | 2.337E+2 | 2.337E+2 |
| GWP-b | kg CO2 eq | 6.029E+0 | 6.692E-3 | 1.642E-1 | 6.200E+0 | 6.200E+0 |
| GWP-luluc | kg CO2 eq | 6.579E-2 | 1.202E-2 | 2.638E-2 | 1.042E-1 | 1.042E-1 |
| ODP | kg CFC11 eq | 6.452E-6 | 1.495E-6 | 3.281E-6 | 1.123E-5 | 1.123E-5 |
| AP | mol H+ eq | 4.874E-1 | 1.388E-1 | 3.781E-2 | 6.641E-1 | 6.641E-1 |
| EP-fw | kg P eq | 1.927E-3 | 7.509E-5 | 3.027E-4 | 2.305E-3 | 2.305E-3 |
| EP-m | kg N eq | 1.762E-1 | 4.139E-2 | 9.394E-3 | 2.270E-1 | 2.270E-1 |
| EP-T | mol N eq | 1.960E+0 | 4.585E-1 | 1.105E-1 | 2.529E+0 | 2.529E+0 |
| POCP | kg NMVOC eq | 4.834E-1 | 1.195E-1 | 3.015E-2 | 6.331E-1 | 6.331E-1 |
| ADP-mm | kg Sb eq | 3.122E-4 | 6.729E-5 | 1.294E-4 | 5.089E-4 | 5.089E-4 |
| ADP-f | MJ | 7.674E+2 | 1.027E+2 | 5.436E+2 | 1.414E+3 | 1.414E+3 |
| WDP | m3 depriv. | 2.999E+1 | 3.703E-1 | 4.252E+0 | 3.461E+1 | 3.461E+1 |
| PM | disease inc. | 1.940E-6 | 2.071E-7 | 2.946E-7 | 2.442E-6 | 2.442E-6 |
| IR | kBq U-235 eq | 2.256E+0 | 4.428E-1 | 5.022E+0 | 7.721E+0 | 7.721E+0 |
| ETP-fw | CTUe | 1.580E+3 | 8.254E+1 | 2.015E+2 | 1.864E+3 | 1.864E+3 |
| HTP-c | CTUh | 1.491E-8 | 4.401E-9 | 5.152E-9 | 2.446E-8 | 2.446E-8 |
| HTP-nc | CTUh | 4.615E-7 | 6.034E-8 | 1.329E-7 | 6.547E-7 | 6.547E-7 |
| SQP | Pt | 2.004E+2 | 5.411E+1 | 1.179E+2 | 3.725E+2 | 3.725E+2 |

| Resource use | Unit | A1 | A2 | A3 | A1-A3 | Total |
|-----------------------------------|------|----------|----------|----------|----------|----------|
| PERE | MJ | 2.346E+0 | 1.804E+0 | 4.886E+1 | 5.301E+1 | 5.301E+1 |
| PERM | MJ | 0 | 0 | 0 | 0 | 0 |
| PERT | MJ | 2.346E+0 | 1.804E+0 | 4.886E+1 | 5.301E+1 | 5.301E+1 |
| PENRE | MJ | 5.064E+1 | 1.090E+2 | 5.665E+2 | 7.261E+2 | 7.261E+2 |
| PENRM | MJ | 0 | 0 | 0 | 0 | 0 |
| PENRT | MJ | 5.064E+1 | 1.090E+2 | 5.665E+2 | 7.261E+2 | 7.261E+2 |
| PET | MJ | 5.298E+1 | 1.108E+2 | 6.153E+2 | 7.791E+2 | 7.791E+2 |
| SM | kg | 0 | 0 | 0 | 0 | 0 |
| RSF | MJ | 0 | 0 | 0 | 0 | 0 |
| NRSF | MJ | 0 | 0 | 0 | 0 | 0 |
| FW | m3 | 7.736E-1 | 1.458E-2 | 1.331E-1 | 9.213E-1 | 9.213E-1 |
| Output flows and waste categories | Unit | A1 | A2 | A3 | A1-A3 | Total |
| HWD | kg | 6.308E-4 | 2.038E-4 | 4.829E-4 | 1.318E-3 | 1.318E-3 |
| NHWD | kg | 4.167E+0 | 4.084E-1 | 8.138E-1 | 5.389E+0 | 5.389E+0 |
| RWD | kg | 3.138E-3 | 6.819E-4 | 4.325E-3 | 8.145E-3 | 8.145E-3 |
| CRU | kg | 0 | 0 | 0 | 0 | 0 |
| MFR | kg | 0 | 0 | 0 | 0 | 0 |
| MER | kg | 0 | 0 | 0 | 0 | 0 |
| EE | MJ | 0 | 0 | 0 | 0 | 0 |
| EET | MJ | 0 | 0 | 0 | 0 | 0 |
| EEE | MJ | 0 | 0 | 0 | 0 | 0 |



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