



Global GreenTagEPD Program:
Compliant to EN15804+A2 2019





Compact Laminate
13mm Multipurpose & Multipurpose Impressions
332 Bay Rd, Cheltenham
Victoria 3192, Australia

Laminex[®]





Laminex[®]

Compact Laminate

Mandatory Disclosures

| | | | |
|---------------------------|---|--|-------------------|
| EPD type | Cradle to grave A1 to C4 + D | Issue Date | 29 July 2023 |
| Product Range | Compact Laminate | Valid Until | 29 July 2028 |
| EPD Number | LGLP04 2023EP | | LGLP05 2023EP |
| Code Name | Multipurpose Impressions 13mm | | Multipurpose 13mm |
| Product Photograph |  |  | |

Demonstration of Verification

| | | | |
|---|--|--|--|
| PCR | Standard EN 15804+A2 2019 serves as core Product Category Rules (PCR) [1]. Wall and Ceiling Linings Sub-PCR WCL:2023 as well as Fitted Cabinetry Sub-PCR FIC:2023 also applies [2 and 3]. | | |
| <input checked="" type="checkbox"/> Internal |  | LCA Developed by Delwyn Jones, The Evah Institute | |
| |  25.07.2023 | LCA Reviewed by Direskhi Naiker The Evah Institute | |
| |  20/12/2023 | EPD Reviewed by David Baggs, Global GreenTag International Pty Ltd | |
| <input checked="" type="checkbox"/> External |  | Third Party Verifier ^a Mathilde Vlieg Malaika LCT | |
| | a. Independent external verification of the declaration and data, mandatory for business-to-consumer communication according to ISO 14025:2010 [2]. | | |
| Communication | This EPD discloses potential environmental outcomes compliant with EN 15804 for business-to-business communication. | | |
| Comparability | Construction product EPDs may not be comparable if not EN15804 compliant. Different program EPDs may not be comparable. Comparability is further dependent on the product category rules and data source used. | | |
| Reliability | LCIA results are relative expressions that do not predict impacts on category endpoints, exceeding of thresholds, safety margins or risks. | | |
| Owner | This EPD is the property of the declared manufacturer. | | |
| Explanations | Further explanatory information is available at info@globalgreentag.com or by contacting epd@globalgreentag.com . | | |

| EPD Program Operator | LCA and EPD Producer | Declaration Owner |
|--|--|---|
| Global GreenTag International Pty Ltd L38, 71 Eagle St., Brisbane City QLD 4000 Australia Phone: +61 (0)7 33 999 686 http://www.globalgreentag.com | Ecquate Pty Ltd PO Box 123 Thirroul NSW 2515 Australia Phone: +61 (0)7 5545 0998 http://www.ecquate.com | Laminex Industries 90-94 Tram Road, Doncaster VIC 3108 Australia Phone: +61 132 136 http://www.laminex.com.au |





Program Description

| | | | | | | | | | | | | | | | | | | | |
|--|--|-----------|-------------|-----------|-----------|-----|----------|--------|---------|-----------|------------|-----------|-------------|-----------|---------------|------------------------------|-------|----------|-----------|
| EPD type | Cradle to grave A1 to C4 + D as defined by EN 15804 [1] | | | | | | | | | | | | | | | | | | |
| System boundary | The system boundary with nature includes material and energy acquisition, processing, manufacture, transport, installation, use plus waste arising to end of life. | | | | | | | | | | | | | | | | | | |
| Stages included | Stages A1-3 A4-5, B1-4, C1 to C2 and C4 D1 to D3 | | | | | | | | | | | | | | | | | | |
| Stages excluded | No stage was excluded but flows and results for B5-B7, C3 and D3 were all zero. | | | | | | | | | | | | | | | | | | |
| Scope Depiction | Figure 1 depicts all modules being declared including some with zero results. Any module not declared (MND) does not indicate a zero result. | | | | | | | | | | | | | | | | | | |
| Model Information | Actual Scenarios Potential | | | | | | | | | | | | | | | | | | |
| Stages | Building Life Cycle Assessment Supplementary | | | | | | | | | | | | | | | | | | |
| Data Modules | Product | | | Construct | | Use | | | | | | | End-of-Life | | | Benefit & load beyond system | | | |
| Unit Operations | A1 | A2 | A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D1 | D2 | D3 |
| Cradle to Gate+ Options & Grave | Resources | Transport | Manufacture | Transport | Construct | Use | Maintain | Repair | Replace | Refurbish | Energy use | Water use | Demolish | Transport | Process Waste | Disposal | Reuse | Recovery | Recycling |

Figure 1 EPD Life Cycle Modules Cradle to Grave

Data Sources

| | |
|-------------------------------|---|
| Primary Data | Data was collected from primary sources 2019 to 2022 including the manufacturer and suppliers' standards, locations, logistics, technology, market share, management system in accordance with EN ISO 14044:2006, 4.3.2, [4]. All are biochemical-physical allocated none are economically allocated. |
| A1-A3 Stage inclusions | Operations include all known raw material acquisition, refining, processing plus scrap or material reuse from prior systems; electricity generated from all sources with extraction, refining & transport plus secondary fuel energy and recovery processes. Also, transport to factory gate; manufacture of inputs, ancillary material, product, packaging, maintenance, replacement plus flows leaving at end-of-waste boundary and fate of all flows at end of life. |
| Variability | Significant differences of average LCIA results are declared. |
| Chemicals of Concern | Contains no substances in the European Chemicals Agency "Authorised or Candidate Lists of Substances of Very High Concern" (SVHCs). |

Data Quality

Data cut-off & quality criteria complies with EN 15804 [1] The LCA used background data aged <10 years and quality parameters tabled below.

| Background | Data Quality | Parameters and Uncertainty (U) | | | |
|--------------------|---------------------|--|---------------|------------|------------|
| Correlation | Metric σ | U ±0.01 | U ±0.05 | U ±0.10 | U ±0.20 |
| Reliability | Reporting | Site Audit | Expert verify | Region | Sector |
| | Sample | >66% trend | >25% trend | >10% batch | >5% batch |
| Completion | Including | >50% | >25% | >10% | >5% |
| | Cut-off | 0.01%w/w | 0.05%w/w | 0.1%w/w | 0.5%w/w |
| Temporal | Data Age | <3 years | ≤5 years | <7.5 years | <10 years |
| | Duration | >3 years | <3 years | <2 years | 1 year |
| Technology | Typology | Actual | Comparable | In Class | Convention |
| Geography | Focus | Process | Line | Plant | Corporate |
| | Range | Continent | Nation | Plant | Line |
| | Jurisdiction | Representation is Global. Africa, North America, Europe, Pacific Rim | | | |



Compact Laminate

Product Information

The Laminex Group is a leading manufacturer, distributor and marketer of decor board and surfaces.

| | | |
|------------------------------|---|------------------------|
| Range Names | Compact Laminate | |
| Brand Name & Code | Multipurpose Impressions 13mm | Multipurpose 13mm |
| Coverage | 18.46kg/m ² | 18.46kg/m ² |
| Factory warranty | 10 years interior residential and commercial use | |
| Manufacturer address | Laminex Industries 332 Bay Rd., Cheltenham VIC 3192 Australia | |
| Site representation | Australasia | |
| Geographical Area | Use and disposal as for Australasia | |
| Application | Benchtops, Cabinetry & Wall Linings | |
| Function in Building | Benchtop, Cabinetry & Wall Linings | |
| Lifetime [5,6] | 20 years Reference Service Life (RSL) [ISO 15686] | |
| Declared unit | Compact Laminate product inside buildings | |
| Functional unit | 20 years interior use of declared product/kg cradle to grave | |

Product Components

This section summarises factory components, functions, source nation and % mass share. In product content listed below the % mass has a $\pm 5\%$ range and a confidence interval that is 90% certain to contain true population means at any time. Listing such 90 $\pm 5\%$ certainty considers normal resource acquisition, supply chain, sedimentation, seasonal, manufacturing and product variation over this EPD's validity period. This also allows for intellectual property protection whilst ensuring fullest possible transparency.

| Function | Component | Cradle | Impressions % | Multipurpose % |
|--------------------------|--|-----------|---------------|----------------|
| Filler | Cellulose Fibre | Global | >66 <67 | >66 <68 |
| Binder | Phenol Formaldehyde | Germany | >31 <32 | >30 <32 |
| Other Agents | Plasticiser, catalyst, biocide, wetting & release agents | Global | each <1.0 | each <1.0 |
| Packaging | | | | |
| Crate | Timber | Australia | >3.0 <4.0 | |
| Pallet | Timber | Australia | >1.5 <2.0 | |
| Wrapping etc | Polymers | Global | >1.0 <1.5 | |
| Coverboards | Medium density fibreboard | Australia | >0.1 <0.2 | |
| Straps & Tape | Polyester | Global | >0.05 <0.10 | |

Product Functional & Technical Performance Information

This section provides manufacturer specifications and additional information.

| | |
|---|---|
| Specifications, Maintenance, Fire, Safety & Installation | https://www.laminex.com.au/trade |
| AS/NZS standard classification | Group 3 |
| Panel dimensions length*width ± 10mm | 3.6*1.5m or 3.6*0.75m |
| VOC Specific Area Emission Rate | 0.5mg/m ² /hr |

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System Analysis Scope and Boundaries

Stages A1 to 3 model actual operations. Stage A4 to C4 are model scenarios.

Typical scenarios are assumed to forecast unit operations as described in the next section.

Figure 2. shows included processes in a cradle to grave system boundary to end of life fates to unshown beyond the boundary reuse, recycling or landfill grave.

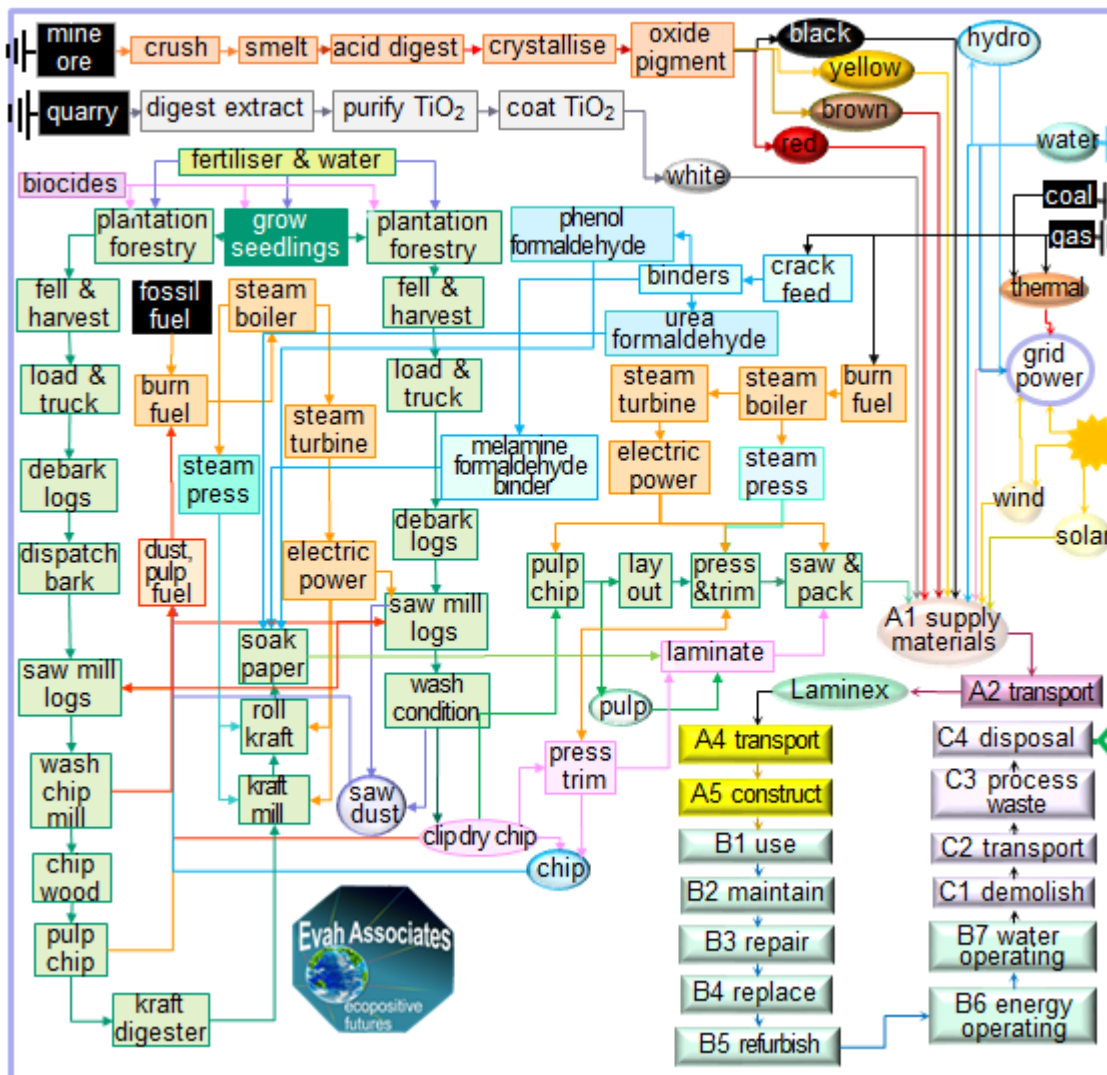


Figure 2. Product Process Flow Chart

Scenarios for Modules/Functional Unit

Stages A1 to A3 model actual operations. This section defines scenarios A4 to D3. C3 Waste Treatment has no flows.

| Phase | Operation | Type specified | Amount | Type specified | Amount |
|-----------------------|--------------------------|--------------------|------------|--------------------|----------------|
| A4 Transport | Transport to Site | 25t semi-trailer | 60 km | 85% Capacity | Full back load |
| | Long distance road | 25t semi-trailer | 600km | 85% Capacity | Full back load |
| | Continental freight rail | Diesel train | 600km | 85% Capacity | Full back load |
| | Container shipping | Factory to CBD | 1,200km | 85% Capacity | Full back load |
| | Volume capacity (<1 ≥1) | Utilisation factor | 1 | Uncompressed | Un-nested |
| A5 Construct | Ancillaries | Adhesive | 0.025kg | Edge trim | 0.0001kg |
| | Packing | Cardboard | 0.005kg | Polymer | 0.00001kg |
| | Water & Energy | Town water | 0.5litre | Grid power | 0.0002 MJ |
| | Waste on site | Trims | 0.05kg | All packaging | As shown kg |
| | Scrap collection & route | 25t semi-trailer | 60 km | to landfill | In LCA report |
| B2 Maintain | Emissions | Nil to air & water | 0.0kg | All from landfill | In LCA report |
| | Maker's specification | URL Declared | Specified | Clean cycle | Weekly |
| | Ancillaries | Wipes | Negligible | Detergent | 0.007kgpa |
| B3 Repair | Surface Washdown | Town water | 1.95kgpa | Net to drain | 1.90kgpa |
| | Typical practice | Damaged parts | 0.05kg | Worn parts | Same 5% |
| | Maker's specification | As per website | Specified | Freight to site | As A5 |
| C1 Demolish | Energy input & source | No excess | 0.0MJpa | Packaging | As A5 |
| | Typical practice | Remove worn | 0.05kg | Collect Separate | 0.05kg |
| C2 Transport | Collection process | In site waste | 0.40kg | Separate to reuse | 0.0kg |
| | Typical practice | 25t truck road | 50km | 85% capacity | No back load |
| C3 Waste Treatment | Typical practice | No waste treated | 0.0kg | Not for energy | 0.0kg |
| C4 Dispose | Typical practice | Product specific | 0.05kg | Collect separately | 0.05kg |
| | Typical practice | Worn to landfill | 5% | All emissions | mass share |
| | Recovery system | No recycling | 0.0kg | Not for energy | 0.0kg |
| D1 Reuse | Typical practice | Reuse | 95% | Patch 5% | 0.05kg |
| D2 Recover | Typical practice | Recover | 100% | Cleaning | sweep |
| D3 Recycle | None typically | At 60 years | Nil | None | 0% |

Environmental Impact Terminology

The United Nations reports only a few decades are left to resolve accelerating climate emergency and extinction crises. It is a call to action to all people to reverse the loss of climate and biodiversity security from human development in all activity [16]. Key environmental damages contributing to risks of ecological and community loss and collapse are tabled below with common names and remedies for each indicator.

| | |
|--|---|
| <p>Climate change from anthropogenic infrared forced global warming</p> | <p>Greenhouse gases absorb infra-red radiation. This heat reduces thermal energy differentials, from equator to poles, forcing ocean current and wind circulation to blend and regulate climate. Weakly blended “lumpier” weather has more frequent, extreme heat wave, fire-storm, cyclone, rain-storm, flood and blizzard events. Accumulation of carbon dioxide, natural gas methane, nitrous oxides and volatile organic compounds from burning fossil fuels causes global warming. Forest and wilderness growth absorbing air-borne carbon in biomass can drawdown such accumulation. Urgent renewable energy reliance is vital in time to avoid imminent tipping points and the worsening “climate emergency”.</p> |
| <p>Ozone layer depletion</p> | <p>Stratospheric ozone loss weakens the planet’s solar shield so more shorter wavelength ultraviolet (UVB) light reaching earth damages plants and increases malignant melanoma and skin cancer in humans and animals. Chlorofluorocarbons, hydrochlorofluorocarbons (HCFC), hydrobromofluorocarbons, carbon tetrachloride, chlorobromomethane, methyl chloroform, methyl bromide and halon gas cause ozone layer loss. To repair the “ozone hole” reliance on ozone-safe refrigerants, aerosols and solvents is essential to avoid further its depletion and enable accumulation of naturally-formed ozone.</p> |
| <p>Acidification of air, land and waters</p> | <p>Acidification in the atmosphere reduces soil and waterway pH, impedes nitrogen fixation vital for plant growth and inhibits natural decomposition. It increases rates and incidence of fish kills, forest loss and deterioration of buildings and materials. Chief synthetic causes of “acid rain” are emissions of sulphur and nitrogen oxides, hydrochloric and hydrofluoric acids and ammonia from burning fossil fuels polluting precipitation of rain and snow world-wide.</p> |
| <p>Eutrophication of terrestrial, freshwater and marine life</p> | <p>Eutrophication from excessively high macronutrient levels added to natural waters promotes excessive plant growth that severely reduces oxygen, water and habitat security for aquatic and terrestrial organisms across related ecosystems. Chief synthetic cause of “algal blooms” is nitrogen (N, NO_x, NH₄) and phosphorus (P, PO₄³⁻) in rain run-off over-fertilised land catchments.</p> |
| <p>Photochemical ozone creation</p> | <p>Tropospheric photochemical ozone, called “summer smog” near ground level, is created from natural and synthetic compounds in UV sunlight. Low concentration smog damages vegetation and crops. High concentration smog is hazardous to human health. Chief synthetic causes are nitrogen oxides, carbon monoxide and volatile organic compounds (VOC) pollutants. Avoiding reliance on dirtiest coal fuel and volatile chemicals has reduced smog incidence in many areas globally.</p> |
| <p>Depletion of minerals, metals & water</p> | <p>Abiotic depletion of finite mineral resources increases time, effort and money required to obtain more resources to the point of extinction of naturally viable reserves. This can limit access to available, valuable and scarce elements vital for human-life. The youth movement “extinction rebellion” calls on adults to secure climate, material reserves and biodiversity for current and future generations.</p> |
| <p>Depletion of fossil fuel reserves</p> | <p>Abiotic depletion of resources by consuming finite oil, natural gas, coal and yellowcake fossil fuel reserves leaves current and future generations suffering limited available, accessible, plentiful, essential valuable as well as scarce raw material, medicinal, chemical, feedstock and fuel stock. Approaching “peak oil” acknowledged fossil fuel reserves are finite and the need for decision-makers to act to avoid market instability, insecurity and or oil and gas wars.</p> |

Glossary of Impact Assessment Terms, Methods and Units

Acronyms, methods and units of impact potentials plus inventory inputs and outputs, are defined below

| Impact Potentials | Acronym | Description of Methods | Units |
|--|----------------------|------------------------------------|----------------------------------|
| Climate Change biogenic | GWP _{bio} | GWP biogenic [7] | kg CO _{2eq} |
| Climate Change luluc | GWP _{luluc} | GWP land use & change [7] | kg CO _{2eq} |
| Climate Change fossil | GWP _{ff} | GWP fossil fuels [7] | kg CO _{2eq} |
| Climate Change total | GWP _t | Global Warming Potential [7] | kg CO _{2eq} |
| Stratospheric Ozone Depletion | ODP | Stratospheric Ozone Loss [8] | kg CFC _{11eq} |
| Photochemical Ozone Creation | POCP | Summer Smog [9] | kg NMOC _{eq} |
| Acidification Potential | AP | Accumulated Exceedance [10] | mol H ⁺ _{eq} |
| Eutrophication Freshwater | EP _{fresh} | Excess nutrients freshwater [11] | kg P _{eq} |
| Eutrophication Marine | EP _{marine} | Excess marine nutrients [11] | kg N _{eq} |
| Eutrophication Terrestrial | EP _{land} | Excess Terrestrial nutrients [11] | mol N _{eq} |
| Mineral & Metal Depletion | ADP _{min} | Abiotic Depletion minerals [12] | kg Sb _{eq} |
| Fossil Fuel Depletion | ADP _{ff} | Abiotic Depletion fossil fuel [13] | MJ _{ncv} |
| Water Depletion | WDP | Water Deprivation Scarcity [14,15] | m ³ _{WDP eq} |
| Fresh Water Net | FW | Lake, river, well & town water | m ³ |
| Secondary Material | SM | Post-consumer recycled (PCR) | kg |
| Secondary Renewable Fuel | RSF | PCR biomass burnt | MJ _{ncv} |
| Primary Energy Renewable Material | PERM | Biomass retained material | MJ _{ncv} |
| Primary Energy Renewable Not Feedstock | PERE | biomass fuels burnt | MJ _{ncv} |
| Primary Energy Renewable Total | PERT | Biomass burnt + retained | MJ _{ncv} |
| Secondary Non-renewable Fuel | NRSF | PCR fossil-fuels burnt | MJ _{ncv} |
| Primary Energy Non-renewable Material | PENRM | Fossil feedstock retained | MJ _{ncv} |
| Primary Energy Non-renewable Not Feedstock | PENRE | fossil-fuel used or burnt | MJ _{ncv} |
| Primary Energy Non-renewable Total | PENRT | Fossil feedstock & fuel use | MJ _{ncv} |
| Hazardous Waste Disposed | HWD | Reprocessed to contain risks | kg |
| Non-hazardous Waste Disposed | NHWD | Municipal landfill facility waste | kg |
| Radioactive Waste Disposed | RWD | Mostly ex nuclear power stations | kg |
| Components For Reuse | CRU | Product scrap for reuse as is | kg |
| Material For Recycling | MFR | Factory scrap to remanufacture | kg |
| Material For Energy Recovery | MER | Factory scrap use as fuel | kg |
| Exported Energy Electrical | EEE | Uncommon for building products | MJ _{ncv} |
| Exported Energy Thermal | EET | Uncommon for building products | MJ _{ncv} |

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Results Module A Cradle to Site

Table 1 shows results of A1 resourcing, A2 transport, A3 manufacture, A4 delivery and A5 construct.

Table 1 A1 to A5 Impact & Inventory Results/Functional Unit

| Result | A1-3 | A4 | A5 |
|--|---------|----------|----------|
| Climate Change biogenic | -1.4 | -1.1E-06 | -7.5E-02 |
| Climate Change luluc | 5.7E-02 | 1.0E-09 | 2.8E-03 |
| Climate Change fossil | 9.2 | 1.9E-02 | 0.47 |
| Climate Change total | 7.9 | 1.9E-02 | 0.40 |
| Stratospheric Ozone Depletion | 1.2E-07 | 1.7E-13 | 9.1E-09 |
| Photochemical Ozone Creation | 3.9E-02 | 1.2E-04 | 2.1E-03 |
| Acidification Potential | 1.8E-02 | 1.2E-05 | 9.1E-04 |
| Eutrophication Freshwater | 3.3E-05 | 5.6E-10 | 1.9E-06 |
| Eutrophication Marine | 4.1E-03 | 2.3E-06 | 2.1E-04 |
| Eutrophication Terrestrial | 3.7E-02 | 7.7E-06 | 1.9E-03 |
| Mineral and Metal Depletion | 2.3E-03 | 7.2E-06 | 1.2E-04 |
| Fossil Depletion | 5.2 | 2.2E-02 | 0.26 |
| Water Scarcity Depletion | 9.0E-02 | 3.0E-06 | 4.4E-03 |
| Net Fresh Water Use | 0.54 | 1.8E-05 | 2.7E-02 |
| Secondary Material | 0.32 | 2.3E-06 | 2.7E-03 |
| Secondary Renewable Fuel | 27 | 6.8E-06 | 1.4 |
| Primary Renewable Material | 6.2 | 3.0E-04 | 3.1E-03 |
| Primary Energy Renewable Not Feedstock | 5.0E-02 | 2.4E-03 | 0.33 |
| Primary Energy Renewable Total | 33 | 2.7E-03 | 1.8 |
| Secondary Non-renewable Fuel | 0.26 | 7.4E-04 | 1.0E-02 |
| Primary Energy Non-renewable Material | 17 | 0.11 | 0.92 |
| Primary Non-renewable Energy Not Feedstock | 83 | 0.19 | 4.2 |
| Primary Energy Non-renewable Total | 100 | 0.30 | 5.2 |
| Hazardous Waste Disposed | 2.2E-03 | 3.7E-05 | 1.2E-04 |
| Non-hazardous Waste Disposed | 0.71 | 3.1E-04 | 4.1E-02 |
| Radioactive Waste Disposed | 2.2E-15 | 1.1E-31 | 1.1E-16 |
| Components For Reuse | 0 | 4.4E-3 | 0 |
| Material For Recycling | 8.0E-02 | 5.7E-06 | 6.0E-03 |
| Material For Energy Recovery | 1.9E-04 | 2.3E-07 | 2.1E-05 |
| Exported Energy Electrical | 0 | 0 | 0 |
| Exported Energy Thermal | 0 | 0 | 0 |



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Results Module B: Building Fabric and Operations

Table 2 shows results of B1 use, B2 maintain, B3 repair, B4 replace, B5 refurbish, B6 energy use and B7 water use.

Table 2 B1 to B7 Impact & Inventory Results/Functional Unit

| Result | B1 | B2 | B3 | B4 | B5 | B6 | B7 |
|--|----|---------|----------|----|----|----|----|
| Climate Change biogenic | 0 | -0.10 | -7.5E-02 | 0 | 0 | 0 | 0 |
| Climate Change luluc | 0 | 6.5E-06 | 2.8E-03 | 0 | 0 | 0 | 0 |
| Climate Change fossil | 0 | 0.72 | 0.47 | 0 | 0 | 0 | 0 |
| Climate Change total | 0 | 0.62 | 0.40 | 0 | 0 | 0 | 0 |
| Stratospheric Ozone Depletion | 0 | 3.2E-09 | 9.1E-09 | 0 | 0 | 0 | 0 |
| Photochemical Ozone Creation | 0 | 3.0E-03 | 2.1E-03 | 0 | 0 | 0 | 0 |
| Acidification Potential | 0 | 1.3E03 | 9.1E-04 | 0 | 0 | 0 | 0 |
| Eutrophication Freshwater | 0 | 6.5E-07 | 1.9E-06 | 0 | 0 | 0 | 0 |
| Eutrophication Marine | 0 | 2.1E-04 | 2.1E-04 | 0 | 0 | 0 | 0 |
| Eutrophication Terrestrial | 0 | 1.5E-03 | 1.9E-03 | 0 | 0 | 0 | 0 |
| Mineral and Metal Depletion | 0 | 3.2E-04 | 1.2E-04 | 0 | 0 | 0 | 0 |
| Fossil Depletion | 0 | 0.52 | 0.26 | 0 | 0 | 0 | 0 |
| Water Scarcity Depletion | 0 | 1.1E-02 | 4.4E-03 | 0 | 0 | 0 | 0 |
| Net Fresh Water Use | 0 | 6.6E-02 | 2.7E-02 | 0 | 0 | 0 | 0 |
| Secondary Material | 0 | 2.7E-03 | 2.7E-03 | 0 | 0 | 0 | 0 |
| Secondary Renewable Fuel | 0 | 1.4 | 1.4 | 0 | 0 | 0 | 0 |
| Primary Renewable Material | 0 | 3.1E-03 | 3.1E-03 | 0 | 0 | 0 | 0 |
| Primary Energy Renewable Not Feedstock | 0 | 0.33 | 0.33 | 0 | 0 | 0 | 0 |
| Primary Energy Renewable Total | 0 | 1.8 | 1.8 | 0 | 0 | 0 | 0 |
| Secondary Non-renewable Fuel | 0 | 1.0E-02 | 1.0E-02 | 0 | 0 | 0 | 0 |
| Primary Energy Non-renewable Material | 0 | 0.92 | 0.92 | 0 | 0 | 0 | 0 |
| Primary Non-renewable Energy Not Feedstock | 0 | 4.2 | 4.2 | 0 | 0 | 0 | 0 |
| Primary Energy Non-renewable Total | 0 | 5.2 | 5.2 | 0 | 0 | 0 | 0 |
| Hazardous Waste Disposed | 0 | 9.9E-04 | 1.2E-04 | 0 | 0 | 0 | 0 |
| Non-hazardous Waste Disposed | 0 | 0.11 | 0.40 | 0 | 0 | 0 | 0 |
| Radioactive Waste Disposed | 0 | 2.7E-17 | 1.1E-16 | 0 | 0 | 0 | 0 |
| Components For Reuse | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Material For Recycling | 0 | 7.6E-02 | 6.0E-03 | 0 | 0 | 0 | 0 |
| Material For Energy Recovery | 0 | 3.6E-05 | 2.1E-05 | 0 | 0 | 0 | 0 |
| Exported Energy Electrical | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exported Energy Thermal | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

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Results Module C: End-of-life

Table 3 shows results for C1 demolish, C2 transport C3 waste processing and C4 disposal.

Table 3 C1 to C4 Impact & Inventory Results/Functional Unit

| Result | C1 | C2 | C3 | C4 |
|--|----------|----------|----|----------|
| Climate Change biogenic | -7.0E-06 | -5.4E-07 | 0 | -3.4E-07 |
| Climate Change luluc | 1.0E-08 | 8.0E-10 | 0 | 5.1E-10 |
| Climate Change fossil | 1.9E-03 | 6.2E-03 | 0 | 6.1E-03 |
| Climate Change total | 1.9E-03 | 6.2E-03 | 0 | 6.1E-03 |
| Stratospheric Ozone Depletion | 2.3E-13 | 1.1E-13 | 0 | 8.8E-14 |
| Photochemical Ozone Creation | 7.6E-06 | 6.0E-05 | 0 | 1.4E-04 |
| Acidification Potential | 3.5E-06 | 5.1E-06 | 0 | 1.8E-05 |
| Eutrophication Freshwater | 7.3E-13 | 3.1E-10 | 0 | 2.6E-10 |
| Eutrophication Marine | 6.4E-07 | 9.4E-07 | 0 | 3.3E-06 |
| Eutrophication Terrestrial | 4.1E-06 | 3.2E-06 | 0 | 6.3E-06 |
| Mineral and Metal Depletion | 3.8E-09 | 4.2E-06 | 0 | 4.0E-06 |
| Fossil Depletion | 9.2E-04 | 7.5E-03 | 0 | 7.2E-03 |
| Water Scarcity Depletion | 2.5E-07 | 1.4E-06 | 0 | 1.2E-06 |
| Net Fresh Water Use | 1.5E-06 | 8.7E-06 | 0 | 7.5E-06 |
| Secondary Material | 1.5E-05 | 1.7E-06 | 0 | 1.2E-06 |
| Secondary Renewable Fuel | 7.4E-08 | -5.3E-17 | 0 | 3.3E-17 |
| Primary Renewable Material | 2.3E-03 | 2.9E-04 | 0 | 2.1E-04 |
| Primary Energy Renewable Not Feedstock | 1.4E-07 | 1.6E-03 | 0 | 1.3E-03 |
| Primary Energy Renewable Total | 2.3E-03 | 1.9E-03 | 0 | 1.5E-03 |
| Secondary Non-renewable Fuel | 1.4E-08 | 4.8E-04 | 0 | 3.9E-04 |
| Primary Energy Non-renewable Material | 2.0E-02 | 6.3E-02 | 0 | 6.0E-02 |
| Primary Non-renewable Energy Not Feedstock | 2.5E-04 | 3.7E-02 | 0 | 4.0E-02 |
| Primary Energy Non-renewable Total | 2.0E-02 | 0.10 | 0 | 0.10 |
| Hazardous Waste Disposed | 7.3E-08 | 1.2E-05 | 0 | 1.2E-05 |
| Non-hazardous Waste Disposed | 5.6E-06 | 9.6E-05 | 0 | 5.0E-02 |
| Radioactive Waste Disposed | 4.4E-21 | 8.5E-32 | 0 | 5.4E-32 |
| Components For Reuse | 0 | 0 | 0 | 0 |
| Material For Recycling | 2.2E-05 | 4.0E-06 | 0 | 3.0E-06 |
| Material For Energy Recovery | 2.9E-10 | 1.5E-07 | 0 | 1.2E-07 |
| Exported Energy Electrical | 0 | 0 | 0 | 0 |
| Exported Energy Thermal | 0 | 0 | 0 | 0 |



Multipurpose Impressions 13mm LGLP04 2023EP

Results Module D: Beyond System Boundaries

Table 4 has results for benefit and loads in D1 reuse, D3 recycling and D2 recovery.

Table 4 D1 to D3 Impact & Inventory Results/Functional Unit

| Result | D1 | D2 | D3 |
|--|----------|----------|----------|
| Climate Change biogenic | -0.43 | -1.8E-05 | -1.3E-03 |
| Climate Change luluc | -1.5E-02 | 1.8E-09 | 2.8E-03 |
| Climate Change fossil | -2.8 | 2.5E-04 | 0.47 |
| Climate Change total | -2.4 | 2.3E-04 | 0.40 |
| Stratospheric Ozone Depletion | -3.4E-08 | 5.9E-13 | 9.1E-09 |
| Photochemical Ozone Creation | -1.3E-02 | 1.0E-06 | 2.1E-03 |
| Acidification Potential | -5.3E-03 | 4.4E-07 | 9.1E-04 |
| Eutrophication Freshwater | -9.9E-06 | 1.2E-10 | 1.9E-06 |
| Eutrophication Marine | -1.2E-03 | 7.7E-08 | 2.1E-04 |
| Eutrophication Terrestrial | -1.1E-02 | 5.2E-07 | 1.9E-03 |
| Mineral and Metal Depletion | -7.2E-04 | 5.8E-08 | 1.2E-04 |
| Fossil Depletion | -1.6 | 1.5E-04 | 0.26 |
| Water Scarcity Depletion | -2.5E-02 | 1.8E-05 | 4.4E-03 |
| Net Fresh Water Use | -0.16 | 1.1E-04 | 2.7E-02 |
| Secondary Material | -7.4E-03 | 0 | 2.7E-03 |
| Secondary Renewable Fuel | -8.0 | 1.7E-04 | 1.8E-03 |
| Primary Renewable Material | -1.7 | 2.7E-04 | 0.20 |
| Primary Energy Renewable Not Feedstock | -6.7E-02 | 3.0E-05 | 4.3E-03 |
| Primary Energy Renewable Total | -10.0 | 4.7E-04 | 0.21 |
| Secondary Non-renewable Fuel | -8.0E-02 | 7.7E-06 | 1.5E-03 |
| Primary Energy Non-renewable Material | -26 | 2.4E-03 | 1.9 |
| Primary Non-renewable Energy Not Feedstock | -6.0 | 3.2E-04 | 0.14 |
| Primary Energy Non-renewable Total | -32 | 2.7E-03 | 2.0 |
| Hazardous Waste Disposed | -1.0E-03 | 1.9E-07 | 1.2E-04 |
| Non-hazardous Waste Disposed | -6.1E-02 | 2.0E-05 | 4.1E-02 |
| Radioactive Waste Disposed | -6.0E-16 | 4.9E-21 | 1.1E-16 |
| Components For Reuse | 0 | 0 | 0 |
| Material For Recycling | -4.9E-02 | 1.5E-05 | 6.0E-03 |
| Material For Energy Recovery | -8.3E-05 | 6.5E-09 | 2.1E-05 |
| Exported Energy Electrical | 0 | 0 | 0 |
| Exported Energy Thermal | 0 | 0 | 0 |

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Results Module A Cradle to Site

Table 5 shows results of A1 resourcing, A2 transport, A3 manufacture, A4 delivery and A5 construct.

Table 5 A1 to A5 Impact & Inventory Results/Functional Unit

| Result | A1-3 | A4 | A5 |
|--|---------|----------|----------|
| Climate Change biogenic | -1.4 | -1.1E-06 | -7.5E-02 |
| Climate Change luluc | 5.8E-02 | 1.0E-09 | 2.8E-03 |
| Climate Change fossil | 9.2 | 1.9E-02 | 0.47 |
| Climate Change total | 8.0 | 1.9E-02 | 0.40 |
| Stratospheric Ozone Depletion | 1.2E-07 | 1.7E-13 | 9.1E-09 |
| Photochemical Ozone Creation | 4.1E-02 | 1.2E-04 | 2.1E-03 |
| Acidification Potential | 1.8E-02 | 1.2E-05 | 9.1E-04 |
| Eutrophication Freshwater | 3.5E-05 | 5.6E-10 | 1.9E-06 |
| Eutrophication Marine | 4.2E-03 | 2.3E-06 | 2.1E-04 |
| Eutrophication Terrestrial | 3.8E-02 | 7.7E-06 | 1.9E-03 |
| Mineral and Metal Depletion | 2.2E-03 | 7.2E-06 | 1.2E-04 |
| Fossil Depletion | 5.2 | 2.2E-02 | 0.26 |
| Water Scarcity Depletion | 9.0E-02 | 3.0E-06 | 4.4E-03 |
| Net Fresh Water Use | 0.54 | 1.8E-05 | 2.7E-02 |
| Secondary Material | 0.32 | 2.3E-06 | 2.7E-03 |
| Secondary Renewable Fuel | 27 | 6.8E-06 | 1.4 |
| Primary Renewable Material | 6.1 | 3.0E-04 | 3.1E-03 |
| Primary Energy Renewable Not Feedstock | 5.0E-02 | 2.4E-03 | 0.33 |
| Primary Energy Renewable Total | 33 | 2.7E-03 | 1.8 |
| Secondary Non-renewable Fuel | 0.26 | 7.4E-04 | 1.0E-02 |
| Primary Energy Non-renewable Material | 17 | 0.11 | 0.92 |
| Primary Non-renewable Energy Not Feedstock | 82 | 0.19 | 4.2 |
| Primary Energy Non-renewable Total | 99 | 0.30 | 5.2 |
| Hazardous Waste Disposed | 2.2E-03 | 3.7E-05 | 1.2E-04 |
| Non-hazardous Waste Disposed | 0.72 | 3.1E-04 | 4.1E-02 |
| Radioactive Waste Disposed | 2.2E-15 | 1.1E-31 | 1.1E-16 |
| Components For Reuse | 0 | 4.4E-3 | 0 |
| Material For Recycling | 8.0E-02 | 5.7E-06 | 6.0E-03 |
| Material For Energy Recovery | 2.0E-04 | 2.3E-07 | 2.1E-05 |
| Exported Energy Electrical | 0 | 0 | 0 |
| Exported Energy Thermal | 0 | 0 | 0 |



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Results Module B: Building Fabric and Operations

Table 6 shows results of B1 use, B2 maintain, B3 repair, B4 replace, B5 refurbish, B6 energy use and B7 water use.

Table 6 B1 to B7 Impact & Inventory Results/Functional Unit

| Result | B1 | B2 | B3 | B4 | B5 | B6 | B7 |
|--|----|---------|----------|----|----|----|----|
| Climate Change biogenic | 0 | -0.10 | -7.5E-02 | 0 | 0 | 0 | 0 |
| Climate Change luluc | 0 | 6.5E-06 | 2.8E-03 | 0 | 0 | 0 | 0 |
| Climate Change fossil | 0 | 0.72 | 0.47 | 0 | 0 | 0 | 0 |
| Climate Change total | 0 | 0.62 | 0.40 | 0 | 0 | 0 | 0 |
| Stratospheric Ozone Depletion | 0 | 3.2E-09 | 9.1E-09 | 0 | 0 | 0 | 0 |
| Photochemical Ozone Creation | 0 | 3.0E-03 | 2.1E-03 | 0 | 0 | 0 | 0 |
| Acidification Potential | 0 | 1.3E03 | 9.1E-04 | 0 | 0 | 0 | 0 |
| Eutrophication Freshwater | 0 | 6.5E-07 | 1.9E-06 | 0 | 0 | 0 | 0 |
| Eutrophication Marine | 0 | 2.1E-04 | 2.1E-04 | 0 | 0 | 0 | 0 |
| Eutrophication Terrestrial | 0 | 1.5E-03 | 1.9E-03 | 0 | 0 | 0 | 0 |
| Mineral and Metal Depletion | 0 | 3.2E-04 | 1.2E-04 | 0 | 0 | 0 | 0 |
| Fossil Depletion | 0 | 0.52 | 0.26 | 0 | 0 | 0 | 0 |
| Water Scarcity Depletion | 0 | 1.1E-02 | 4.4E-03 | 0 | 0 | 0 | 0 |
| Net Fresh Water Use | 0 | 6.6E-02 | 2.7E-02 | 0 | 0 | 0 | 0 |
| Secondary Material | 0 | 2.7E-03 | 2.7E-03 | 0 | 0 | 0 | 0 |
| Secondary Renewable Fuel | 0 | 1.4 | 1.4 | 0 | 0 | 0 | 0 |
| Primary Renewable Material | 0 | 3.1E-03 | 3.1E-03 | 0 | 0 | 0 | 0 |
| Primary Energy Renewable Not Feedstock | 0 | 0.33 | 0.33 | 0 | 0 | 0 | 0 |
| Primary Energy Renewable Total | 0 | 1.8 | 1.8 | 0 | 0 | 0 | 0 |
| Secondary Non-renewable Fuel | 0 | 1.0E-02 | 1.0E-02 | 0 | 0 | 0 | 0 |
| Primary Energy Non-renewable Material | 0 | 0.92 | 0.92 | 0 | 0 | 0 | 0 |
| Primary Non-renewable Energy Not Feedstock | 0 | 4.2 | 4.2 | 0 | 0 | 0 | 0 |
| Primary Energy Non-renewable Total | 0 | 5.2 | 5.2 | 0 | 0 | 0 | 0 |
| Hazardous Waste Disposed | 0 | 9.9E-04 | 1.2E-04 | 0 | 0 | 0 | 0 |
| Non-hazardous Waste Disposed | 0 | 0.11 | 0.40 | 0 | 0 | 0 | 0 |
| Radioactive Waste Disposed | 0 | 2.7E-17 | 1.1E-16 | 0 | 0 | 0 | 0 |
| Components For Reuse | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Material For Recycling | 0 | 7.6E-02 | 6.0E-03 | 0 | 0 | 0 | 0 |
| Material For Energy Recovery | 0 | 3.6E-05 | 2.1E-05 | 0 | 0 | 0 | 0 |
| Exported Energy Electrical | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exported Energy Thermal | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

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Results Module C: End-of-life

Table 7 shows results for C1 demolish, C2 transport C3 waste processing and C4 disposal.

Table 7 C1 to C4 Impact & Inventory Results/Functional Unit

| Result | C1 | C2 | C3 | C4 |
|--|----------|----------|----|----------|
| Climate Change biogenic | -7.0E-06 | -5.4E-07 | 0 | -3.4E-07 |
| Climate Change luluc | 1.0E-08 | 8.0E-10 | 0 | 5.1E-10 |
| Climate Change fossil | 1.9E-03 | 6.2E-03 | 0 | 6.1E-03 |
| Climate Change total | 1.9E-03 | 6.2E-03 | 0 | 6.1E-03 |
| Stratospheric Ozone Depletion | 2.3E-13 | 1.1E-13 | 0 | 8.8E-14 |
| Photochemical Ozone Creation | 7.6E-06 | 6.0E-05 | 0 | 1.4E-04 |
| Acidification Potential | 3.5E-06 | 5.1E-06 | 0 | 1.8E-05 |
| Eutrophication Freshwater | 7.3E-13 | 3.1E-10 | 0 | 2.6E-10 |
| Eutrophication Marine | 6.4E-07 | 9.4E-07 | 0 | 3.3E-06 |
| Eutrophication Terrestrial | 4.1E-06 | 3.2E-06 | 0 | 6.3E-06 |
| Mineral and Metal Depletion | 3.8E-09 | 4.2E-06 | 0 | 4.0E-06 |
| Fossil Depletion | 9.2E-04 | 7.5E-03 | 0 | 7.2E-03 |
| Water Scarcity Depletion | 2.5E-07 | 1.4E-06 | 0 | 1.2E-06 |
| Net Fresh Water Use | 1.5E-06 | 8.7E-06 | 0 | 7.5E-06 |
| Secondary Material | 1.5E-05 | 1.7E-06 | 0 | 1.2E-06 |
| Secondary Renewable Fuel | 7.4E-08 | 5.3E-17 | 0 | 3.3E-17 |
| Primary Renewable Material | 2.3E-03 | 2.9E-04 | 0 | 2.1E-04 |
| Primary Energy Renewable Not Feedstock | 1.4E-07 | 1.6E-03 | 0 | 1.3E-03 |
| Primary Energy Renewable Total | 2.3E-03 | 1.9E-03 | 0 | 1.5E-03 |
| Secondary Non-renewable Fuel | 1.4E-08 | 4.8E-04 | 0 | 3.9E-04 |
| Primary Energy Non-renewable Material | 2.0E-02 | 6.3E-02 | 0 | 6.0E-02 |
| Primary Non-renewable Energy Not Feedstock | 2.5E-04 | 3.7E-02 | 0 | 4.0E-02 |
| Primary Energy Non-renewable Total | 2.0E-02 | 0.10 | 0 | 0.10 |
| Hazardous Waste Disposed | 7.3E-08 | 1.2E-05 | 0 | 1.2E-05 |
| Non-hazardous Waste Disposed | 5.6E-06 | 9.6E-05 | 0 | 5.0E-02 |
| Radioactive Waste Disposed | 4.4E-21 | 8.5E-32 | 0 | 5.4E-32 |
| Components For Reuse | 0 | 0 | 0 | 0 |
| Material For Recycling | 2.2E-05 | 4.0E-06 | 0 | 3.0E-06 |
| Material For Energy Recovery | 2.9E-10 | 1.5E-07 | 0 | 1.2E-07 |
| Exported Energy Electrical | 0 | 0 | 0 | 0 |
| Exported Energy Thermal | 0 | 0 | 0 | 0 |

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Results Module D: Beyond System Boundaries

Table 8 has results for benefit and loads in D1 reuse, D3 recycling and D2 recovery.

Table 8 D1 to D3 Impact & Inventory Results/Functional Unit

| Result | D1 | D2 | D3 |
|--|----------|----------|----------|
| Climate Change biogenic | -0.43 | -1.8E-05 | -1.3E-03 |
| Climate Change luluc | -1.5E-02 | 1.8E-09 | 2.8E-03 |
| Climate Change fossil | -2.8 | 2.5E-04 | 0.47 |
| Climate Change total | -2.4 | 2.3E-04 | 0.40 |
| Stratospheric Ozone Depletion | -3.4E-08 | 5.9E-13 | 9.1E-09 |
| Photochemical Ozone Creation | -1.3E-02 | 1.0E-06 | 2.1E-03 |
| Acidification Potential | -5.3E-03 | 4.4E-07 | 9.1E-04 |
| Eutrophication Freshwater | -9.9E-06 | 1.2E-10 | 1.9E-06 |
| Eutrophication Marine | -1.2E-03 | 7.7E-08 | 2.1E-04 |
| Eutrophication Terrestrial | -1.1E-02 | 5.2E-07 | 1.9E-03 |
| Mineral and Metal Depletion | -7.2E-04 | 5.8E-08 | 1.2E-04 |
| Fossil Depletion | -1.6 | 1.5E-04 | 0.26 |
| Water Scarcity Depletion | -2.5E-02 | 1.8E-05 | 4.4E-03 |
| Net Fresh Water Use | -0.16 | 1.1E-04 | 2.7E-02 |
| Secondary Material | -7.4E-03 | 0 | 2.7E-03 |
| Secondary Renewable Fuel | -8.0 | 1.7E-04 | 1.8E-03 |
| Primary Renewable Material | -1.7 | 2.7E-04 | 0.20 |
| Primary Energy Renewable Not Feedstock | -6.7E-02 | 3.0E-05 | 4.3E-03 |
| Primary Energy Renewable Total | -10.0 | 4.7E-04 | 0.21 |
| Secondary Non-renewable Fuel | -8.0E-02 | 7.7E-06 | 1.5E-03 |
| Primary Energy Non-renewable Material | -26 | 2.4E-03 | 1.9 |
| Primary Non-renewable Energy Not Feedstock | -6.0 | 3.2E-04 | 0.14 |
| Primary Energy Non-renewable Total | -32 | 2.7E-03 | 2.0 |
| Hazardous Waste Disposed | -1.0E-03 | 1.9E-07 | 1.2E-04 |
| Non-hazardous Waste Disposed | -6.1E-02 | 2.0E-05 | 4.1E-02 |
| Radioactive Waste Disposed | -6.0E-16 | 4.9E-21 | 1.1E-16 |
| Components For Reuse | 0 | 0 | 0 |
| Material For Recycling | -4.9E-02 | 1.5E-05 | 6.0E-03 |
| Material For Energy Recovery | -8.3E-05 | 6.5E-09 | 2.1E-05 |
| Exported Energy Electrical | 0 | 0 | 0 |
| Exported Energy Thermal | 0 | 0 | 0 |



Compact Laminate

Interpretation Cradle to Gate A1 to A3

The first interpretation section discusses Compact product results cradle to gate A1 to A3. Their names are Chemical resistant 13mm (Lab13) Chemical resistant 16mm (Lab16) Multipurpose Impressions 13mm (MultiImp) Multi-purpose 13mm (MultiP) Alfresco 13mm (Alfre) Aquapanel 2.7mm (AquaP) and Aquapanel CustomArt 2.7mm (AquaCA).

Figure 3 charts their component mass kg/kg product A1-3. Figure 4 charts energy and feedstock input (MJ), versus filler, binder and greenhouse emissions (GWP) (kg)/kg product A1-3.

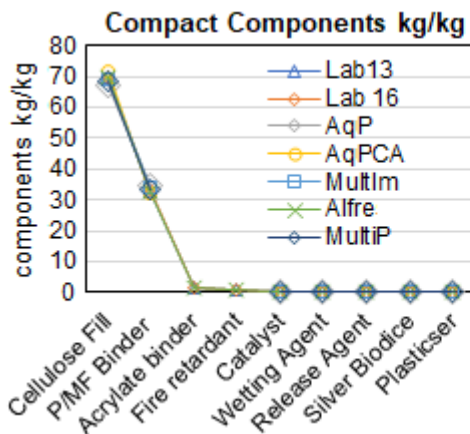


Figure 3 Material Component Share kg/kg

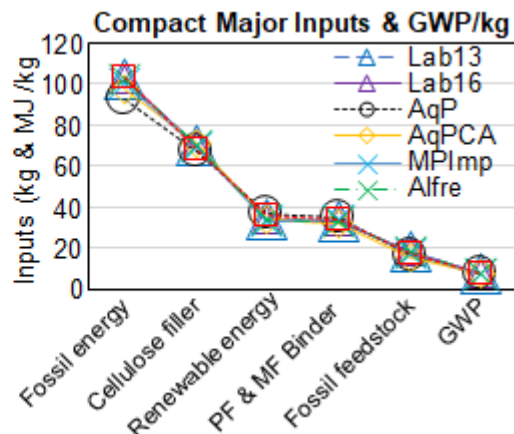


Figure 4 Input Share (MJ & kg) Vs CO_{2e} kg/kg

Figure 3 shows cellulose filler and binders of Phenol or Melamine Formaldehyde were the main components with others having very low mass share. Figure 4 charts all products' reliance on fossil energy then renewable cellulose fill renewable energy use then formaldehyde binders and fossil feedstock and low GWP. Renewable cellulose feedstock fill and renewable energy use reduced GWP.

Interpretation Cradle to Grave and Beyond the System Boundary A1 to D3

The next section discusses product results cradle to fate A1 to C4 and to D3 beyond the system boundary/kg Functional Unit. Figure 5 charts GWP versus fossil and renewable energy and feedstock use. Figure 6 charts Water Deprivation (DepW) Vs Acidification (AP) and Eutrophication terrestrial (EP)/kg.

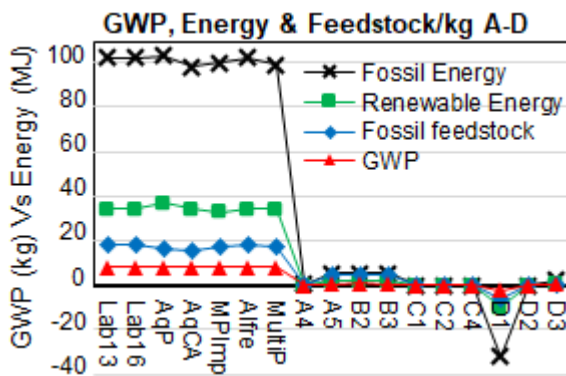


Figure 5 GWP vs Energy & Feedstock A1-D3/kg

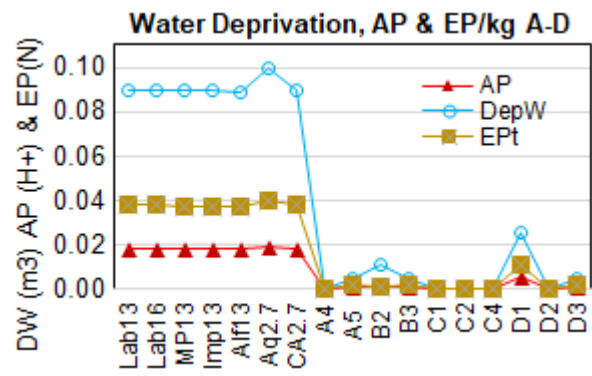


Figure 6 FW Vs AP, EP & A1-D3/kg

Figure 5 shows low GWP overall. It shows flows with minor credits in energy reuse beyond 20-years. Chart 6 shows Acidification and EP peak with cleaning in D1 reuse beyond 20-years.

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