

## Environmental Product Declaration

# Corbin Russwin IN100 Aperio® Mortise Lock

Wireless Access Control



## ASSA ABLOY

ASSA ABLOY is committed to providing products and services that are environmentally sound throughout the entire production process and the product lifecycle. Our unconditional aim is to make sustainability a central part of our business philosophy and culture, but even more important is the job of integrating sustainability into our business strategy. The employment of EPDs will help architects, designers and LEED-APs select environmentally preferable door openings.

ASSA ABLOY will continue our efforts to protect the environment and health of our customers/end users and will utilize the EPD as one means to document those efforts.



The Corbin Russwin IN100 lock offers the convenience and flexibility of Aperio wireless technology with the real-time communication of online access control.

# Environmental Product Declaration

Corbin Russwin IN100 Aperio® Mortise Lock

Door Hardware

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According to  
ISO 14025

This declaration is an environmental product declaration (EPD) in accordance with ISO 14025. EPDs rely on Life Cycle Assessment (LCA) to provide information on a number of environmental impacts of products over their life cycle. Exclusions: EPDs do not indicate that any environmental or social performance benchmarks are met, and there may be impacts that they do not encompass. LCAs do not typically address the site-specific environmental impacts of raw material extraction, nor are they meant to assess human health toxicity. EPDs can complement but cannot replace tools and certifications that are designed to address these impacts and/or set performance thresholds – e.g. Type 1 certifications, health assessments and declarations, environmental impact assessments, etc. Accuracy of Results: EPDs regularly rely on estimations of impacts, and the level of accuracy in estimation of effect differs for any particular product line and reported impact. Comparability: EPDs are not comparative assertions and are either not comparable or have limited comparability when they cover different life cycle stages, are based on different product category rules or are missing relevant environmental impacts. EPDs from different programs may not be comparable.

|                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                            |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PROGRAM OPERATOR                                                                                                                                                                            | UL Environment                                                                                                                                                                                                                                                                                                             |
| DECLARATION HOLDER                                                                                                                                                                          | ASSA ABLOY/Corbin Russwin                                                                                                                                                                                                                                                                                                  |
| DECLARATION NUMBER                                                                                                                                                                          | 478714321.148.1                                                                                                                                                                                                                                                                                                            |
| DECLARED PRODUCT                                                                                                                                                                            | Corbin Russwin IN100 Aperio® Mortise Lock                                                                                                                                                                                                                                                                                  |
| REFERENCE PCR                                                                                                                                                                               | Builders Hardware PCR UL 9004                                                                                                                                                                                                                                                                                              |
| DATE OF ISSUE                                                                                                                                                                               | October 17, 2017                                                                                                                                                                                                                                                                                                           |
| PERIOD OF VALIDITY                                                                                                                                                                          | 5 Years                                                                                                                                                                                                                                                                                                                    |
| CONTENTS OF THE DECLARATION                                                                                                                                                                 | Product definition and information about building physics<br>Information about basic material and the material's origin<br>Description of the product's manufacturing<br>Indication of product processing<br>Information about the in-use conditions<br>Life cycle assessment results<br>Testing results and verifications |
| The PCR review was conducted by                                                                                                                                                             | epd@ulenvironment.com                                                                                                                                                                                                                                                                                                      |
| This declaration was independently verified in accordance with ISO 14025 by Underwriters Laboratories<br><br><input type="checkbox"/> INTERNAL <input checked="" type="checkbox"/> EXTERNAL | <br>Wade Stout, UL Environment                                                                                                                                                                                                                                                                                             |
| This life cycle assessment was independently verified in accordance with ISO 14044 and the reference PCR by                                                                                 | <br>Thomas P. Gloria, Industrial Ecology Consultants                                                                                                                                                                                                                                                                       |

<sup>1</sup> **Exclusions:** EPDs do not indicate that any environmental or social performance benchmarks are met, and there may be impacts that they do not encompass. LCAs do not typically address the site-specific environmental impacts of raw material extraction, nor are they meant to assess human health toxicity. EPDs can complement but cannot replace tools and certifications that are designed to address these impacts and/or set performance thresholds, e.g., Type 1 certifications, health assessments and declarations, environmental impact assessments, etc. **Accuracy of Results:** EPDs regularly rely on estimations of impacts, and the level of accuracy in estimation of effect differs for any particular product line and reported impact. **Comparability:** EPDs are not comparative assertions and are either not comparable or have limited comparability when they cover different life cycle stages, are based on different product category rules or are missing relevant environmental impacts. EPDs from different programs may not be comparable.



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Door Hardware

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## Product Definition and Information

### Product Description

Product name: Corbin Russwin IN100 Aperio® Mortise Lock

Product characteristic: Wireless Access Control Lock

The Corbin Russwin IN100 Mortise Lock with Aperio Technology makes access control easy and affordable. This next generation lock offers the convenience and flexibility of Aperio wireless technology with the real-time communication of online access control. As part of the Aperio family of wireless locks, the IN100 offers easy expansion of existing access control systems to bring a new level of control to your facility.

Additional features include:

- Quick, easy wireless deployment that eliminates the cost and inconvenience of complex wireless site surveys.
- Integrated reader, monitoring and short range wireless radio simplifies installation and reduces material costs.
- Real-time door status monitoring with REX, DPS, tamper and low battery signals.
- Lockdown capability.
- Support for passage mode scheduling offers convenience for offices, conference rooms and other common areas.
- Features multiCLASS SE® technology from HID Global®, offering easy migration to higher security credentials and HID Mobile Access® powered by Seos®.
- High security standardized communications ensures data security between lock and hub.
- Several small installation screws and instructions are included with the product. Otherwise, no accessory materials are required or included.

### Application

The Corbin Russwin IN100 Mortise Lock is ideal for a wide range of applications, including but not limited to offices, boardrooms, schools, and classrooms.

### Technical Data

For the declared product, the following technical data in the delivery status must be provided with reference to the test standard:

| Technical Data           |                                             |
|--------------------------|---------------------------------------------|
| Length                   | Mortise cylinder                            |
| Width                    | Steel                                       |
| Height                   | Connects to existing network infrastructure |
| Metal Finish             | Corbin Russwin                              |
| Gasket                   | Multiple credential types                   |
| Construction             | Fits any standard door                      |
| Installation             | 2 years                                     |
| Mechanical Compatibility | Multiple finishes                           |



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## Delivery Status

IN100 Mortise Locks are delivered in a cardboard box along with installation and operational instructions.

## Base Materials / Ancillary Materials

| Material              | Percentage in mass (%) |
|-----------------------|------------------------|
| Brass                 | 27.33%                 |
| Stainless Steel       | 14.06%                 |
| Steel                 | 39.68%                 |
| Aluminum              | 0.13%                  |
| Electronics/Mechanics | 0.00%                  |
| Plastics              | 5.42%                  |
| Other                 | 13.38%                 |
| Total                 | 100.00%                |

## Manufacture

The primary manufacturing processes are made by Tier 1 suppliers and the final manufacturing processes occur in New Haven, CT. The components come from processes like stamped steel, turning, and aluminum extrusion.

## Environmental and Health During Manufacturing

ASSA ABLOY is committed to producing and distributing door opening solutions with minimal environmental impact, where health & safety is the primary focus for all employees and associates.

- Environmental operations, GHG, energy, water, waste, VOC, surface treatment and H&S are being routinely monitored. Inspections, audits, and reviews are conducted periodically to ensure that applicable standards are met and environment management program effectiveness is evaluated.
- Code of Conduct covers human rights, labor practices and decent work. Management of ASSA ABLOY is aware of their environmental roles and responsibilities, providing appropriate training, supporting accountability and recognizing outstanding performance.
- Any waste metals during machining are separated and recycled. The waste from the water-based painting process is delivered to waste treatment plant.
- The factory in Berlin, CT have certification of Environmental Management to ISO 14001:2004 and Occupational Health and Safety to OHSAS 18001:2007.

## Product Processing / Installation

IN100 Mortise Locks are distributed through and installed by trained installation technicians, such as locksmiths, carpenters etc. adhering to local/national standards and requirements.



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## Packaging

IN100 Mortise Locks are delivered in a cardboard box along with installation and operational instructions.

| Material     | Quantity (% By Weight) |
|--------------|------------------------|
| Cardboard    | 98%                    |
| Other        | 2%                     |
| <b>Total</b> | <b>100%</b>            |

## Conditions of Use

No cleaning or annual maintenance is required.

## Environmental and Health During Use

There is no harmful emissive potential. No damage to health or impairment is expected under normal use corresponding to the intended use of the product.

## Reference Service Life

The reference service life is 2 years

## Extraordinary Effects

### Fire

No negative environmental impact will result from exposure to fire.

### Water

Contains no substances that have any impact on water in case of flood. Electronic operation of the device will be

### Mechanical Destruction

No danger to the environment can be anticipated during mechanical destruction.

## Re-use Phase

The product can be moved from one door to another during the reference service life, thus enabling re-use.

## Disposal

The product can be mechanically disassembled to separate the different materials. 95% of the materials used are recyclable. The remainder of components are disposed of according to standard municipal solid waste deposition.

## Further Information

Corbin Russwin, ASSA ABLOY  
225 Episcopal Road  
Berlin, CT 06037-4004

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## Life Cycle Assessment

### Declared Unit

The declaration refers to the functional unit of 1 unit (or piece) of Corbin Russwin IN100 Aperio® Mortise Lock, as specified in the Builders Hardware PCR

| Name                      | Value | Unit |
|---------------------------|-------|------|
| Declared unit             | 1     | Lock |
| Mass                      | 3.158 | kg   |
| Conversion factor to 1 kg | 0.317 | -    |

### System Boundary

This is a cradle to gate with options Environmental Product Declaration. The following life cycle phases were considered:

| Product Stage       |           |               | Construction Process Stage      |                                    | Use Stage |             |        |             |               |                        |                       | End of Life Stage*         |           |                  |          | Benefits and Loads Beyond the System Boundaries |
|---------------------|-----------|---------------|---------------------------------|------------------------------------|-----------|-------------|--------|-------------|---------------|------------------------|-----------------------|----------------------------|-----------|------------------|----------|-------------------------------------------------|
| Raw material supply | Transport | Manufacturing | Transport from gate to the site | Construction/ installation process | Use       | Maintenance | Repair | Replacement | Refurbishment | Operational energy use | Operational water use | Deconstruction /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                                  | MND       | MND         | MND    | MND         | MND           | MND                    | MND                   | MND                        | X         | X                | X        | X                                               |

Description of the System Boundary Stages Corresponding to the PCR

(X = Included; MND = Module Not Declared)

\*This includes provision of all materials, products and energy, packaging processing and its transport, as well as waste processing up to the end-of waste state or disposal of final residues.

### Estimates and Assumptions

#### End of Life

In the End of Life phase, for all the materials which can be recycled, a recycling scenario with 100% collection rate was assumed.

#### Cut-off Criteria

In the assessment, all available data from the production process are considered, i.e. all raw materials used, auxiliary materials (e.g. lubricants), thermal energy consumption and electric power consumption - including material and energy flows contributing less than 1% of mass or energy (if available). In case a specific flow contributing less than 1% in mass or energy is not available, worst case assumption proxies are selected to represent the respective environmental impacts. Impacts relating to the production of machines and facilities required during production are out of the scope of this assessment.

#### Background data

For life cycle modeling of the considered products, the GaBi 8 Software System for Life Cycle Engineering, developed by thinkstep, is used. The GaBi-database contains consistent and documented datasets which are documented in the online GaBi-documentation. To ensure comparability of results in the LCA, the basic data of GaBi database were used for energy, transportation and auxiliary materials.



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## Data Quality

The data sources used are complete and representative of North America in terms of the geographic and technological coverage and are a recent vintage (i.e. less than ten years old). The data used for primary data are based on direct information sources of the manufacturer. Secondary data sets were used for raw materials extraction and processing, end of life, transportation, and energy production flows. Wherever secondary data is used, the study adopts critically reviewed data for consistency, precision, and reproducibility to limit uncertainty.

## Period Under Review

The period under review is the full calendar year of 2016.

## Allocation

Allocation was determined on a per unit basis.

## Comparability

A comparison or an evaluation of EPD data is only possible if all data sets to be compared were created according to EN 15804 and the building context, respectively the product-specific characteristics of performance, are taken into account. Environmental declarations from different programs may not be comparable. Full conformance with the PCR for North American Builders Hardware products allows EPD comparability only when all stages of a Builders Hardware product's life cycle have been considered. However, variations and deviations are possible.

## LCA: Modeling Scenarios and Additional Technical Information

The following technical information is a basis for the declared modules or can be used for developing specific scenarios in the context of a building assessment if modules are not declared.

| Installation into the building (A5)                |       |                |
|----------------------------------------------------|-------|----------------|
| Name                                               | Value | Unit           |
| Auxiliary                                          | -     | kg             |
| Water consumption                                  | -     | m <sup>3</sup> |
| Other resources                                    | -     | kg             |
| Electricity consumption                            | -     | kWh            |
| Other energy carriers                              | -     | MJ             |
| Material loss                                      | -     | kg             |
| Output substance following waste treatment on-site | 0.55  | kg             |
| Dust in the air                                    | -     | kg             |
| VOC in the air                                     | -     | kg             |

| Reference Service Life |       |       |
|------------------------|-------|-------|
| Name                   | Value | Unit  |
| Reference Service Life | 5     | years |

| End of life (C1-C4)                   |       |      |
|---------------------------------------|-------|------|
| Name                                  | Value | Unit |
| Collected separately                  | 3.16  | kg   |
| Collected as mixed construction waste | 0.00  | kg   |
| Reuse                                 | 0.00  | kg   |
| Recycling                             | 2.05  | kg   |
| Energy recovery                       | 0.22  | kg   |
| Landfilling                           | 0.89  | kg   |



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## LCA Results

Results shown below were calculated using TRACI 2.1 Methodology.

| TRACI 2.1 Impact Assessment |                                                      |                         |         |         |         |         |         |         |          |
|-----------------------------|------------------------------------------------------|-------------------------|---------|---------|---------|---------|---------|---------|----------|
| Parameter                   | Parameter                                            | Unit                    | A1-A3   | A4      | A5      | C2      | C3      | C4      | D        |
| GWP                         | Global warming potential                             | kg CO <sub>2</sub> -Eq. | 1.6E+01 | 2.3E-01 | 1.0E-01 | 1.5E-02 | 2.8E-03 | 7.2E-03 | -3.4E+00 |
| ODP                         | Depletion potential of the stratospheric ozone layer | kg CFC-11 Eq.           | 1.6E-07 | 8.9E-12 | 2.4E-13 | 5.5E-13 | 9.5E-14 | 8.4E-15 | 1.1E-07  |
| AP Air                      | Acidification potential for air emissions            | kg SO <sub>2</sub> -Eq. | 6.8E-02 | 1.4E-03 | 5.6E-04 | 8.8E-05 | 1.7E-05 | 3.3E-05 | -7.9E-03 |
| EP                          | Eutrophication potential                             | kg N-Eq.                | 6.3E-03 | 7.8E-05 | 9.8E-05 | 4.9E-06 | 8.2E-07 | 1.2E-05 | -6.6E-05 |
| SP                          | Smog formation potential                             | kg O <sub>3</sub> -Eq.  | 7.9E-01 | 3.9E-02 | 5.2E-03 | 2.4E-03 | 4.1E-04 | 1.3E-04 | -7.9E-02 |
| FFD                         | Fossil Fuel Depletion                                | MJ-surplus              | 2.6E+01 | 4.1E-01 | 3.4E-02 | 2.6E-02 | 4.5E-03 | 1.1E-03 | 2.1E-01  |

Results shown below were calculated using CML 2001 - April 2013 Methodology.

| CML 4.1 Impact Assessment |                                                                  |                                        |         |         |         |         |         |         |          |
|---------------------------|------------------------------------------------------------------|----------------------------------------|---------|---------|---------|---------|---------|---------|----------|
| Parameter                 | Parameter                                                        | Unit                                   | A1-A3   | A4      | A5      | C2      | C3      | C4      | D        |
| GWP                       | Global warming potential                                         | kg CO <sub>2</sub> -Eq.                | 1.5E+01 | 2.3E-01 | 6.2E-01 | 1.5E-02 | 2.8E-03 | 8.2E-03 | -3.4E+00 |
| ODP                       | Depletion potential of the stratospheric ozone layer             | kg CFC-11 Eq.                          | 1.4E-07 | 8.8E-12 | 2.3E-13 | 5.5E-13 | 9.5E-14 | 7.9E-15 | 1.0E-07  |
| AP Air                    | Acidification potential for air emissions                        | kg SO <sub>2</sub> -Eq.                | 7.0E-02 | 1.2E-03 | 3.7E-04 | 7.2E-05 | 1.5E-05 | 1.3E-05 | -7.8E-03 |
| EP                        | Eutrophication potential                                         | kg(PO <sub>4</sub> ) <sup>3</sup> -Eq. | 5.3E-03 | 2.1E-04 | 1.4E-04 | 1.3E-05 | 2.2E-06 | 1.4E-05 | -2.4E-04 |
| POCP                      | Formation potential of tropospheric ozone photochemical oxidants | kg ethane-Eq.                          | 5.8E-03 | 1.3E-04 | 8.1E-05 | 8.4E-06 | 1.7E-06 | 3.3E-06 | -1.7E-03 |
| ADPE                      | Abiotic depletion potential for non-fossil resources             | kg Sb-Eq.                              | 1.1E-03 | 9.7E-11 | 1.9E-08 | 6.1E-12 | 4.8E-12 | 3.4E-10 | -3.3E-05 |
| ADPF                      | Abiotic depletion potential for fossil resources                 | MJ                                     | 2.3E+02 | 3.0E+00 | 2.9E-01 | 1.9E-01 | 3.6E-02 | 8.7E-03 | -3.6E+01 |





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Results below contain the resource use throughout the life cycle of the product.

| Resource Use |                                                            |                |         |         |         |         |         |         |          |
|--------------|------------------------------------------------------------|----------------|---------|---------|---------|---------|---------|---------|----------|
| Parameter    | Parameter                                                  | Unit           | A1-A3   | A4      | A5      | C2      | C3      | C4      | D        |
| PERE         | Renewable primary energy as energy carrier                 | MJ             | 2.8E+01 | 0.0E+00 | 3.7E-02 | 0.0E+00 | 0.0E+00 | 7.4E-04 | 1.7E+00  |
| PERM         | Renewable primary energy resources as material utilization | MJ             | 1.0E+01 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00  |
| PERT         | Total use of renewable primary energy resources            | MJ             | 3.8E+01 | 0.0E+00 | 3.7E-02 | 0.0E+00 | 0.0E+00 | 7.4E-04 | 1.7E+00  |
| PENRE        | Nonrenewable primary energy as energy carrier              | MJ             | 2.6E+02 | 3.0E+00 | 3.1E-01 | 1.9E-01 | 3.7E-02 | 9.1E-03 | -3.2E+01 |
| PENRM        | Nonrenewable primary energy as material utilization        | MJ             | 1.0E+01 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00  |
| PENRT        | Total use of nonrenewable primary energy resources         | MJ             | 2.7E+02 | 3.0E+00 | 3.1E-01 | 1.9E-01 | 3.7E-02 | 9.1E-03 | -3.2E+01 |
| SM           | Use of secondary material                                  | MJ             | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00  |
| RSF          | Use of renewable secondary fuels                           | MJ             | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00  |
| NRSF         | Use of nonrenewable secondary fuels                        | MJ             | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00  |
| FW           | Use of net fresh water                                     | m <sup>3</sup> | 7.6E+00 | 0.0E+00 | 1.9E-02 | 0.0E+00 | 0.0E+00 | 4.0E-04 | -8.0E-03 |

Results below contain the output flows and wastes throughout the life cycle of the product.

| Output Flows and Waste Categories |                               |      |         |         |         |         |         |         |          |
|-----------------------------------|-------------------------------|------|---------|---------|---------|---------|---------|---------|----------|
| Parameter                         | Parameter                     | Unit | A1-A3   | A4      | A5      | C2      | C3      | C4      | D        |
| HWD                               | Hazardous waste disposed      | kg   | 8.9E-03 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | -1.7E-03 |
| NHWD                              | Non-hazardous waste disposed  | kg   | 5.5E-03 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 8.0E-02  |
| RWD                               | Radioactive waste disposed    | kg   | 9.7E-03 | 0.0E+00 | 7.3E-06 | 0.0E+00 | 0.0E+00 | 1.5E-07 | 1.1E-03  |
| CRU                               | Components for re-use         | kg   | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00  |
| MFR                               | Materials for recycling       | kg   | 1.1E+00 | 0.0E+00 | 5.4E-01 | 0.0E+00 | 2.7E-02 | 0.0E+00 | 1.6E-02  |
| MER                               | Materials for energy recovery | kg   | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00  |
| EEE                               | Exported electrical energy    | MJ   | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00  |
| EEE                               | Exported thermal energy       | MJ   | 1.2E-02 | 0.0E+00 | 5.2E-01 | 0.0E+00 | 0.0E+00 | 2.6E-03 | 0.0E+00  |



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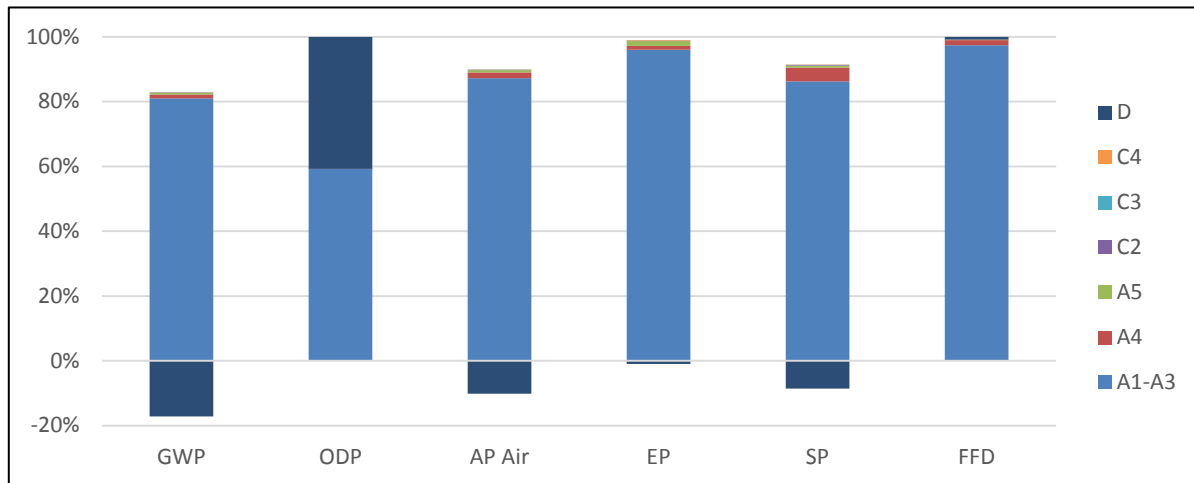
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The production life cycle stage (A1-A3) dominates the impacts across all impact categories, with the exception of ozone depletion. This is due to the upstream production of metals used in the product, along with electricity use in the manufacturing of the product. Potential benefits are due to the potential avoided burden of recycled materials after disposal.



## References

- PCR Part A UL Environment and Institut Bauen und Umwelt e.V., Königswinter (pub.): Product Category Rules for Construction Products from the range of Environmental Product Declarations of Institut Bauen und Umwelt (IBU), Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Background Report. July 2014, version 1.3
- PCR Part B UL Environment and Institut Bauen und Umwelt e.V. (IBU). Product Category Rules Part B: Requirements on the Environmental Product Declaration for Builders Hardware
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- ISO 14025 ISO 14025:2011-10, Environmental labels and declarations — Type III environmental declarations — Principles and procedures.
- ISO 14040 ISO 14040:2009-11, Environmental management — Life cycle assessment — Principles and framework.
- ISO 14044 ISO 14044:2006-10, Environmental management — Life cycle assessment — Requirements and guidelines.
- EN 15804 EN 15804:2012-04: Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction product
- ULE 2013 UL Environment, General Program Instructions, 2013.
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- CML 2001 Center of Environmental Science of Leiden University impact categories and characterisation methods for impact assessment (CML)

