

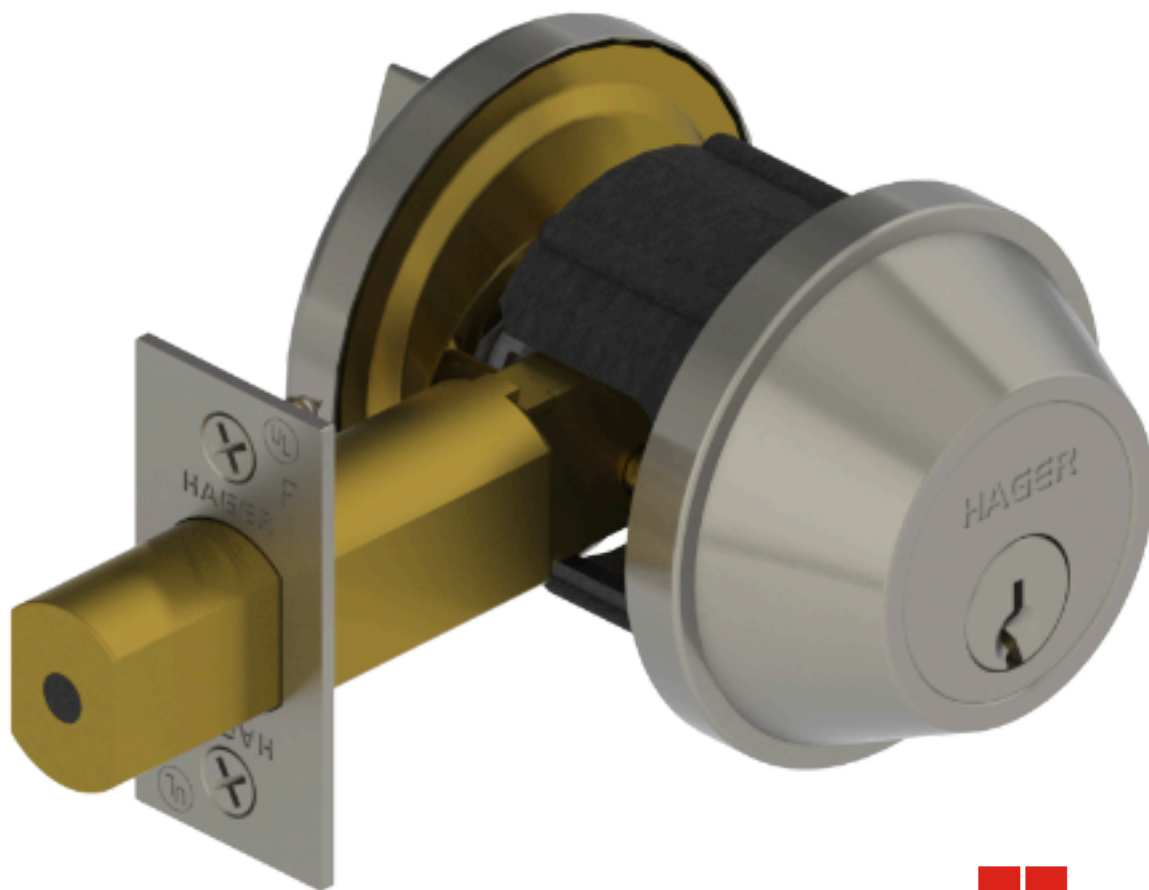


Environmental Product Declaration

Program Operator: Smart EPD®

www.smartepd.com

IN ACCORDANCE WITH ISO 14025:2006, ISO 21930:2017, EN 15804+A2:2019+AC:2021



SmartEPD-2026-147-0967-01

3100-3200 - Deadlocks

Date of Issue

Jun 29, 2026

Expiration Date

Jun 29, 2031

Last Updated

Jun 29, 2026



Refer to the EPD Library at www.smartepd.com for the latest EPD listing information

General Information

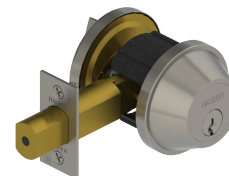
Hager Companies

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Product Name:	3100-3200 - Deadlocks
Declared Unit:	1 piece per standard door leaf
Declaration Number:	SmartEPD-2026-147-0967-01
Date of Issue:	June 29, 2026
Expiration:	June 29, 2031
Last updated:	June 29, 2026
EPD Scope:	Cradle to gate with options A1 - A3, A4, A5, C1 - C4
Market(s) of Applicability:	North America

General Organization Information

Hager Companies Founded in 1849, St. Louis-based Hager Companies offers more than 6,000 full-line quality door hardware products under one brand name. With 13 product lines including, commercial hinges, residential hinges, Roton® continuous geared hinges, stainless steel continuous hinges, exit devices, locks, door controls, auxiliary, threshold and weatherstripping, sliding door hardware, electrified hardware, access control products and Euroline, our European hardware line. Hager focuses on architectural hardware that exceeds today's building standards that are built to last.

Further information can be found at: <http://www.hagerco.com>

Limitations, Liability and Ownership

Environmental declarations from different programs (ISO 14025) may not be comparable. Comparison of the environmental performance of products using EPD information shall be based on the product's use and impacts at the building level, and therefore EPDs may not be used for comparability purposes when not considering the whole building life cycle. EPD comparability is only possible when all stages of a life cycle have been considered. However, variations and deviations are possible. Example of variations: Different LCA software and background LCI datasets may lead to differences results for upstream or downstream of the life cycle stages declared. The EPD owner has sole ownership, liability, and responsibility for the EPD.

Reference Standards

Standard(s):	ISO 14025:2006, ISO 21930:2017, EN 15804+A2:2019+AC:2021
Core PCR:	UL Part A PCR for Building-Related Products and Services v3.2 Date of issue: December 12, 2018
Sub-category PCR:	UL Part B: Builders Hardware EPD Requirements v.2 Date of issue: August 19, 2025

Valid until: August 19, 2030

Sub-category PCR review panel:

 Contact Smart EPD for more information.

General Program Instructions:

 Smart EPD General Program Instructions v.2.0, March 2025

Verification Information

LCA Author/Creator:

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Verification:

Independent critical review of the LCA and data, according to ISO 14044 and ISO 14071:

 Arka Pandit |  pandit_arka@outlook.com

External

Independent external verification of EPD, according to ISO 14025 and reference PCR(s):

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External

Product Information

Declared Unit:

1 piece per standard door leaf

Mass:

1.29 kg

Reference Service Life:

25 Years

Product Specificity:

 Product Average

 Product Specific

 Representative Product EPD

Product Description

Hager deadlocks are engineered to provide reliable security solutions across a range of commercial applications, offering durability, performance, and long-term value. The Hager 3100 Series Grade 1 deadlocks are designed for high-performance applications in demanding environments, delivering exceptional durability and resistance to heavy use. These deadlocks provide an added layer of security and are well-suited for use in combination with Hager 3400 Series locksets to enhance protection against forced entry. The 3100 Series is backed by a lifetime warranty, reinforcing its reliability for long-term use. The Hager 3200 Series Grade 2 deadlocks offer a balanced combination of performance and cost-efficiency, making them an ideal choice for standard commercial applications where Grade 1 performance is not required. As a practical alternative, they pair effectively with Hager 3500 Series locksets to strengthen protection against break-ins. Like the 3100 Series, the 3200 Series is also supported by a lifetime warranty, ensuring dependable performance over time.

Further information can be found at: <https://www.hagerco.com/products-portal/locks>

Product Specifications

Product Classification Codes: EC3 - Accessories -> DoorsHardware

Material Composition

Material/Component Category	Origin	% Mass
Brass	TW	22.43
Steel	TW	70.9
Zinc Alloy	TW	6.67

Packaging Material	Origin	kg Mass
Corrugated board box		0.05
Plastic packaging		0.01
Wood pallet		0.04

Biogenic Carbon Content	kg C per piece
Biogenic carbon content in product	0None
Biogenic carbon content in accompanying packaging	0.04

Hazardous Materials
No regulated hazardous or dangerous substances are included in this product.

EPD Data Specificity

Primary Data Year: 2025

Manufacturing Specificity:

✗

 Industry Average

✗

 Manufacturer Average

✓

 Facility Specific

Averaging:

A weighted average calculated across multiple product models within the 3100-3200 - Deadlocks Series using sales volumes as weighting factors.

System Boundary

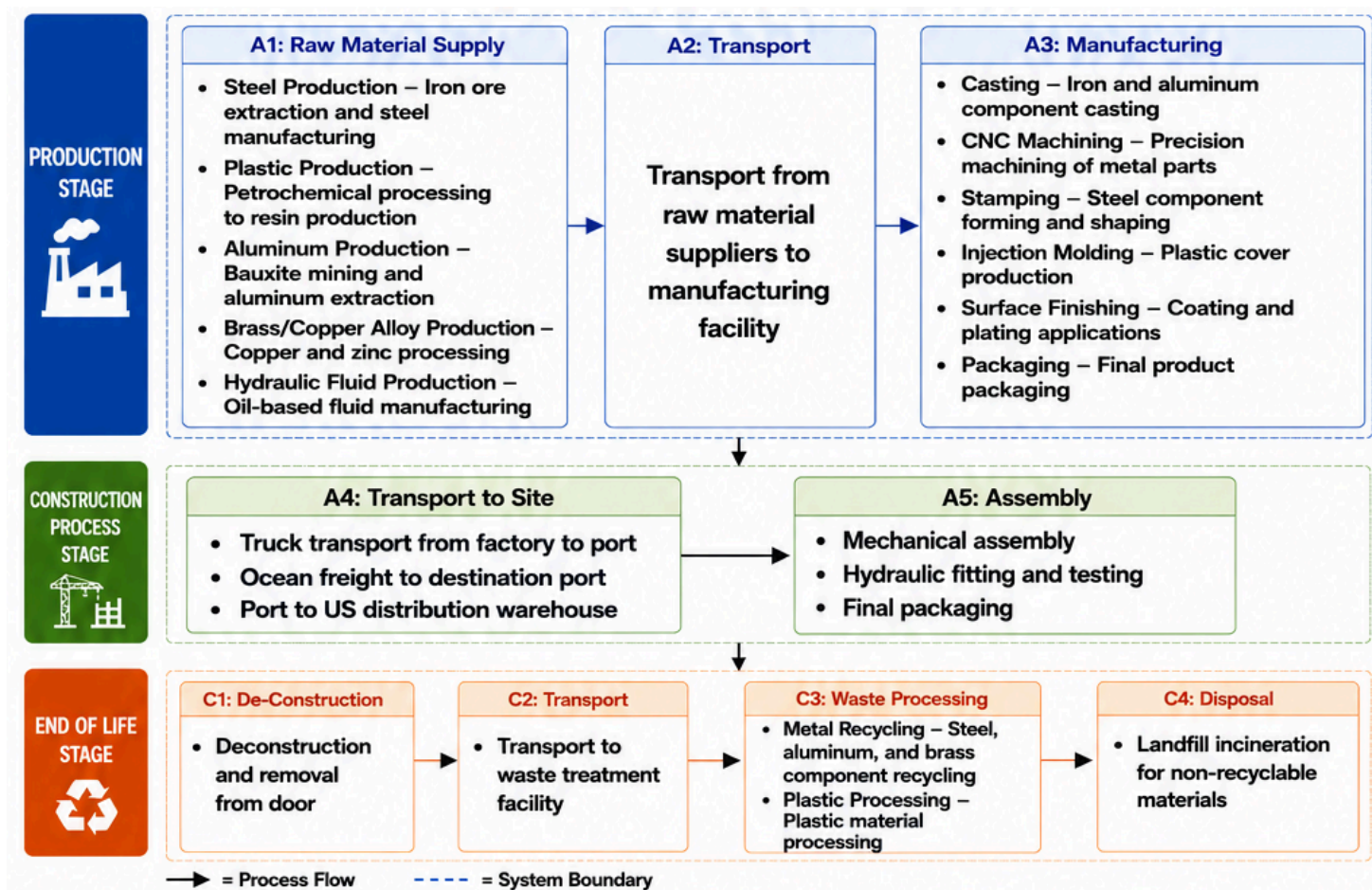
Production	A1	Raw material supply	✓
	A2	Transport	✓
	A3	Manufacturing	✓
Construction	A4	Transport to site	✓
	A5	Assembly / Install	✓
Use	B1	Use	ND
	B2	Maintenance	ND
	B3	Repair	ND
	B4	Replacement	ND
	B5	Refurbishment	ND
	B6	Operational Energy Use	ND
	B7	Operational Water Use	ND
End of Life	C1	Deconstruction	✓
	C2	Transport	✓
	C3	Waste Processing	✓
	C4	Disposal	✓
Benefits & Loads Beyond System Boundary	D	Recycling, Reuse Recovery Potential	ND

Note:
ND = Module not declared

Plants

 Chiayi City, Taiwan Chiayi City, Taiwan

Product Flow Diagram



Software And Database

LCA Software:

Simapro v. 10.2

LCI Foreground Database(s):

Ecoinvent v. 3.11

Cut-off by Classification

LCI Background Database(s):

Ecoinvent v. 3.11

Cut-off by Classification

A foreground LCI database is the database used to model the primary, site-specific data collected for this EPD. A background LCI database is the database used to model generic or non-specific data.

Data Quality

Precision & Completeness

- Precision:** Inventory data were directly measured, calculated, or conservatively estimated from primary sources provided by Hager Companies using consistent units and QA checks. Background processes from ecoinvent v3.11 were adopted with their documented uncertainty/precision metadata where available, preserving a transparent record of data quality.

- **Completeness:** The product system's mass balance and inventory completeness were thoroughly checked. Some exclusions were made in line with the PCR requirements, such as personnel impacts, R&D activities, business travel, and point-of-sale infrastructure. However, no data were intentionally omitted.

Consistency and Reproducibility

- **Consistency:** Primary data for all modules were consistently gathered from Hager Companies' manufacturing operations, aiming at the highest level of detail possible. Background processes were modeled mainly with the ecoinvent database. The same allocation rules, cut-off criteria, and impact assessment methods were applied throughout, ensuring methodological coherence and consistent data quality across the entire LCA model.
- **Reproducibility:** This study ensures reproducibility by providing comprehensive disclosure of input-output data, dataset choices, and modeling approaches. A knowledgeable third party should be able to approximate the results using the same data and modeling methods.

Representativeness

- **Temporal:** Primary data were collected for a 12-month period representing the most recent full year of production available from Hager Companies to ensure temporal representativeness. Secondary data from the ecoinvent v3.11 database are typically representative of recent years.
- **Geographical:** Primary data represent Hager Companies' production facilities in China and Taiwan. Where applicable, differences in electric grid mix were considered using appropriate secondary data. The use of country-specific data ensures high geographical representativeness, and proxy data were only used when country-specific data were unavailable.
- **Technological:** Both primary and secondary data were tailored to the specific technologies used by Hager Companies, ensuring high technological representativeness.

Life Cycle Module Description

Modules A1–A3: The LCA model covers the manufacture of raw materials and components for Hager Companies products (A1) which are then transported to Hager Companies facilities by truck (A2). The manufacturing stage (A3) begins with receipt of these materials, which are cast, machined, stamped, and assembled into finished door locksets. When required, additional components such as springs, fasteners are incorporated during assembly.

Modules A4–A5: Once manufacture is completed, products are shipped to distribution centers and then to the end user by truck and ocean freight (A4). For installation (A5), a 0% material installation loss was assumed. This module includes disposal of that waste and of the product packaging.

Modules C1–C4: At end of life (C1–C4), the product is assumed to be collected, and each waste stream (e.g., steel, aluminum, brass, plastic) is handled separately—landfilled, recycled, or incinerated with energy recovery.

LCA Discussion

Allocation Procedure

Allocation of co-products was avoided wherever possible in accordance with ISO 14044:2006, Section 4.3. In cases where allocation could not be avoided, allocation was applied using a mass-based approach consistent with UL PCR Part A requirements. Energy consumption at Hager Companies' manufacturing facilities was allocated to the studied products based on production volume. Inputs and outputs, including emissions to air, water, and soil, were accounted for in accordance with ISO 21930 and UL PCR guidance, primarily arising from upstream processes and energy use. Solid waste generation was estimated based on material losses and packaging flows, and waste treatment processes were modeled in accordance with the polluter pays principle, with no allocation of environmental credits within the system boundary.

Cut-off Procedure

The system boundary was defined in accordance with ISO 21930 and UL PCR Part A requirements, based on relevance to the goal and scope of the study. For Modules A1–A3, all relevant material and energy inputs, as well as associated outputs, were included in the model to the extent that data were available and met the defined data quality criteria. No material or energy flows known to be significant were intentionally excluded, and cut-off criteria were applied consistently in accordance with UL PCR guidance.

Renewable Electricity

Energy Attribute Certificates (EACs) such as Renewable Energy Certificates (RECs) or Power Purchase Agreements (PPAs) are included in the baseline reported results:

✗ No

Scenarios

Transport to the building/construction site (A4)

A4 Module

Fuel Type:	Diesel
Vehicle Type:	Truck and Trailer
Transport Distance:	22250 km
Capacity Utilization:	33 %
Packaging Mass:	0.1032 kg
Weight of products transported:	1.393 kg
Capacity utilization volume factor:	1
Assumptions for scenario development:	Transport distance includes finished product to distribution center and distribution center to point of sale.

Installation in to the building/construction site (A5)

A5 Module

Mass of Packaging Waste Specified by Type:	0.1032 kg
Biogenic Carbon Contained in Packaging (kg C):	0.04341 kg
Assumptions for scenario development:	Installation impacts limited to packaging waste disposal, no significant material losses assumed.

End of Life (C1 - C4)

C1 - C4 Modules

Collection Process

Collected with Mixed Construction Waste:	1.29 kg
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Recovery

Recycling:	1.051 kg
Landfill:	0.2392 kg

Assumptions for scenario development:
Disposal/Recycling rates as per Part A PCR

Results

Environmental Impact Assessment Results

IPCC AR5 GWP 100, TRACI 2.2, CML 2016 V4.8

per 1 piece of product per standard door leaf.

LCIA results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins or risks.

Impact Category	Unit	Method	A1 - A3	A4	A5	C1	C2	C3	C4
GWP-total	kg CO2 eq	IPCC AR5 GWP 100	5.61e+0	3.35e-1	7.43e-3	0	7.17e-3	0	6.93e-4
GWP-fossil	kg CO2 eq	IPCC AR5 GWP 100	5.59e+0	3.34e-1	6.36e-3	0	7.17e-3	0	6.93e-4
GWP-biogenic	kg CO2 eq	IPCC AR5 GWP 100	1.14e-2	5.27e-5	1.08e-3	0	1.68e-6	0	9.33e-8
GWP-luluc	kg CO2 eq	IPCC AR5 GWP 100	8.07e-3	1.78e-4	7.79e-7	0	3.24e-6	0	7.55e-8
ODP	kg CFC-11 eq	TRACI 2.2	5.65e-8	4.96e-9	3.23e-11	0	1.02e-10	0	1.03e-11
AP	kg SO2 eq	TRACI 2.2	1.12e-1	7.93e-3	1.33e-5	0	2.25e-5	0	5.57e-6
SFP	kg O3 eq	TRACI 2.2	6.08e-1	1.48e-1	3.63e-4	0	5.01e-4	0	1.73e-4
EP-freshwater	kg P eq	TRACI 2.2	5.95e-3	8.07e-6	2.71e-5	0	5.10e-7	0	1.99e-8
EP-marine	kg N eq	TRACI 2.2	6.46e-3	1.26e-3	6.48e-6	0	4.29e-6	0	1.45e-6
ADP-fossil	MJ	CML 2016 V4.8	6.19e+1	4.10e+0	2.20e-2	0	1.01e-1	0	8.77e-3

Note:

Not all abbreviated indicators listed below may be present in the results above. The inclusion of indicators varies based on PCR requirements.

Abbreviations:

GWP = Global Warming Potential, 100 years (may also be denoted as GWP-total, GWP-fossil (fossil fuels), GWP-biogenic (biogenic sources), GWP-luluc (land use and land use change)), ODP = Ozone Depletion Potential, AP = Acidification Potential, EP = Eutrophication Potential, SFP = Smog Formation Potential, POCP = Photochemical oxidant creation potential, ADP-Fossil = Abiotic depletion potential for fossil resources, ADP-Minerals&Metals = Abiotic depletion potential for non-fossil resources, WDP = Water deprivation potential, PM = Particulate Matter Emissions, IRP = Ionizing radiation, human health, ETP-fw = Eco-toxicity (freshwater), HTP-c = Human toxicity (cancer), HTP-nc = Human toxicity (non-cancer), SQP = Soil quality index.

Comparisons cannot be made between product-specific or industry average EPDs at the design stage of a project, before a building has been specified. Comparisons may be made between product-specific or industry average EPDs at the time of product purchase when product performance and specifications have been established and serve as a functional unit for comparison. Environmental impact results shall be converted to a functional unit basis before any comparison is attempted. Any comparison of EPDs shall be subject to the requirements of ISO 21930 or EN 15804. EPDs are not comparative assertions and are either not comparable or have limited comparability when they have different system boundaries. EPDs are not comparative assertions and are either not comparable or have limited comparability when they have different system boundaries, are based on different product category rules or are missing relevant environmental impacts. Such comparison can be inaccurate, and could lead to erroneous selection of materials or products which are higher-impact, at least in some impact categories.

Resource Use Indicator

per 1 piece of product per standard door leaf.

Indicator	Unit	A1 - A3	A4	A5	C1	C2	C3	C4
RPRE	MJ	9.45e+0	3.19e-2	5.38e-4	0	1.37e-3	0	7.41e-5
RPRM	MJ	1.60e+0	0	0	0	0	0	0
RPRT	MJ	1.10e+1	3.19e-2	5.38e-4	0	1.37e-3	0	7.41e-5
NRPRE	MJ	6.19e+1	4.10e+0	2.20e-2	0	1.01e-1	0	8.77e-3
NRPRM	MJ	0	0	0	0	0	0	0
NRPRT	MJ	6.19e+1	4.10e+0	2.20e-2	0	1.01e-1	0	8.77e-3
SM	kg	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0
RE	MJ	0	0	0	0	0	0	0
FW	m3	3.88e+0	1.03e-2	-1.71e-3	0	5.38e-4	0	1.99e-5

Note:

Not all abbreviated indicators listed below may be present in the results above. The inclusion of indicators varies based on PCR requirements.

Abbreviations:

RPRE or PERE = Renewable primary resources used as energy carrier (fuel), RPRM or PERM = Renewable primary resources with energy content used as material, RPRT or PERT = Total use of renewable primary resources with energy content, NRPRE or PENRE = Non-renewable primary resources used as an energy carrier (fuel), NRPRM or PENRM = Non-renewable primary resources with energy content used as material, NRPRT or PENRT = Total non-renewable primary resources with energy content, SM = Secondary materials, RSF = Renewable secondary fuels, NRSF = Non-renewable secondary fuels, RE = Recovered energy, ADPF = Abiotic depletion potential, FW = Use of net freshwater resources, VOCs = Volatile Organic Compounds.

Waste and Output Flow Indicators

per 1 piece of product per standard door leaf.

Indicator	Unit	A1 - A3	A4	A5	C1	C2	C3	C4
HWD	kg	0	0	0	0	0	0	0
NHWD	kg	2.58e-2	0	3.67e-2	0	0	0	2.39e-1
HLLRW	kg	0	0	0	0	0	0	0
ILLRW	kg	0	0	0	0	0	0	0
CRU	kg	0	0	0	0	0	0	0
MR	kg	8.57e-2	0	3.86e-2	0	0	1.05e+0	0
MER	kg	2.48e-3	0	8.60e-3	0	0	0	0
EE	MJ	6.50e-2	0	1.64e-1	0	0	0	0

Note:

Not all abbreviated indicators listed below may be present in the results above. The inclusion of indicators varies based on PCR requirements.

Abbreviations:

HWD = Hazardous waste disposed, NHWD = Non-hazardous waste disposed, RWD = Radioactive waste disposed, HLRW = High-level radioactive waste, ILLRW = Intermediate- and low-level radioactive waste, CRU = Components for re-use, MFR or MR = Materials for recycling, MER = Materials for energy recovery, MNER = Materials for incineration, no energy recovery, EE or EEE = Recovered energy exported from the product system, EET = Exported thermal energy.

Carbon Emissions and Removals

per 1 piece of product per standard door leaf.

Indicator	Unit	A1 - A3	A4	A5	C1	C2	C3	C4
Bio Carbon Removal from Product	kg CO2	0	0	0	0	0	0	0
Bio Carbon Emission from Product	kg CO2	0	0	0	0	0	0	0
Bio Carbon Removal from Packaging	kg CO2	-2.16e-1	0	0	0	0	0	0
Bio Carbon Emission from Packaging	kg CO2	5.67e-2	0	1.59e-1	0	0	0	0
Bio Carbon Emission from Waste during Manufacturing (renewable source)	kg CO2	0	0	0	0	0	0	0
Calcination Carbon Removal	kg CO2	0	0	0	0	0	0	0
Carbonation Carbon Emission	kg CO2	0	0	0	0	0	0	0
Carbon Emission from Waste during Manufacturing (non-renewable source)	kg CO2	0	0	0	0	0	0	0

Note:

Not all abbreviated indicators listed below may be present in the results above. The inclusion of indicators varies based on PCR requirements.

Abbreviations:

BCRP = Biogenic Carbon Removal from Product, BCEP = Biogenic Carbon Emission from Product, BCRK = Biogenic Carbon Removal from Packaging, BCEK = Biogenic Carbon Emission from Packaging, BCEW = Biogenic Carbon Emission from Combustion of Waste from Renewable Sources Used in Production Processes, CCE = Calcination Carbon Emissions, CCR = Carbonation Carbon Removals, CWNr = Carbon Emissions from Combustion of Waste from Non-Renewable Sources used in Production Processes, GWP-luc = Carbon Emissions from Land-use Change.

Interpretation

This study developed representative Life Cycle Assessment (LCA) models and Environmental Product Declarations (EPDs) for the company's product lines, covering raw material extraction, manufacturing, transportation, assembly, packaging, distribution, and end-of-life stages. Results show that most environmental impacts occur during the product stage (A1–A3), primarily from raw material production, metal processing, transportation, and manufacturing energy use, while end-of-life impacts depend largely on recycling and disposal assumptions. Opportunities for impact reduction include increasing renewable energy use, improving material efficiency, reducing packaging, increasing recycled content, and sourcing from lower-impact suppliers.



■ Production (A1 - A3) ■ Construction (A4 - A5) ■ End of Life (C1 - C4)

Additional Environmental Information

None

References

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