

Ives Architectural Hinges



ALLEGION – LCA Optimization Action Plan

Product Category Rules

UL PCR Part A V3.2, 2018



UL PCR Part B: Builders Hardware EPD Requirements, V1, 2019

Functional Unit

Three hinges for a standard door leaf

Creation Date: July 13, 2023

Expiration Date: July 13, 2026

Manufacturer Name and Address	Allegion Plc Gee Tuck Building, Sheung Wan Hong Kong
Declared Product	Ives Architectural Hinges
Product Name	Door Hardware
Product Description	Door control device
Action Plan ID Number	AGHK01
Functional Unit as Defined by PCR	Three hinges for a standard door leaf
LCA/EPD Action Plan is Based On	EPD – Ives Architectural Hinges https://spot.ul.com/main-app/products/detail/61956d63ec45280acb1a10b5?page_type=Products%20Catalog EPD Number: 4789828313.113.1
LCA/EPD Type	<input type="checkbox"/> Publicly available, critically reviewed LCA <input type="checkbox"/> Internally verified LCA with a product specific EPD <input checked="" type="checkbox"/> Externally verified Product specific Type III EPD
LCA/EPD Reviewer	Original LCA was reviewed by Thomas P. Gloria, Industrial Ecology Consultants. Original EPD was certified by UL Environment.
Program Operator	UL Environment, 333 Pfingsten Road, Northbrook, IL, 60611 https://www.ul.com
Reference PCR(s) for LCA/EPD	UL PCR Part A V3.2, 2018 UL PCR Part B: Builders Hardware EPD Requirements, V1, 2019
LCA/EPD Scope	Cradle-to-Building with End of Life LCA
Date of LCA/EPD Issue	October 1, 2021
Date of LCA/EPD Expiration	October 1, 2026
Markets of Applicability	North America
LCA Software and Version Number	GaBi 10.0.0.71
LCI Database and Version Number	GaBi Database Version 2020.2
LCIA Methodology and Version Number	TRACI 2.1
Action Plan Creation Date	July 13, 2023
Action Plan Expiration Date	July 13, 2026
Action Plan Type	Product Specific
Is the action plan applicable to all products listed in the corresponding LCA/EPD or only a subset?	All products specified in the EPD
This Action Plan was prepared by an expert in product specific LCAs/EPDs:	Matt Van Duinen, LCACP Sustainability Director WAP Sustainability 
This Action Plan was confirmed by an executive of the manufacturer:	Tim Weller Manager of Codes, Standards and Sustainability Allegion Plc 

Product Description

Ives Architectural hinges are available in a variety of sizes and finishes. Products are cold rolled steel and include small plastic bearings. Brass and stainless-steel substrate options are available as well. This product is a typical architectural hinge that weighs 15.5 oz. with dimensions of 4.5" by 4.5". This product was chosen as a representative average from a single manufacturing plant. The standard application is three hinges per standard 3' x 7' door leaf. This action plan presents results for this application. The relevant ANSI/BHMA standard is ANSI/BHMA A156.12-2013. The CSI Master format division for this product is 08 71 00.

LCA Description

The cradle-to-building with end of life stage, product-specific life cycle assessment and subsequent EPD were created according to the following standards: Builder's Hardware Manufacturing Association (BHMA) Hardware PCR (UL9004), and ISO 14025/40/44. The assessment was performed using the GaBi LCA software. Both the LCA report and EPD were externally reviewed and verified against the previous standards by UL Environment. Allegion's supplier's associates collected the bill of materials data for the product which was utilized in the model. Additionally, facility level utility data was not made available due to the proprietary nature of supplier data. The median of electricity consumed per unit by other Allegion products in various other facilities was used as a proxy for manufacturing of Ives hinges. Finally, transportation data was collected via supplier locations and utilized to generate these impacts.

LCA Results

The cradle-to-building with end of life stage results for the product are shown below using TRACI v2.1 indicators. The dominance analysis shows that the raw material sourcing and extraction module (A1-A3) of the life cycle is responsible for the majority of impacts (95-100%) across all impact categories. This is followed by A4 which is transport to customer which contributes around 2% to overall GWP impacts. Most of the A1-A3 impacts can be attributed to the energy intensive processes of sourcing, melting, and forming of steel.

LCA Results from EPD							
Impact Category	A1-A3	A4	A5	B1	B2	B3	B4
AP [kg SO2 eq]	1.44E-02	2.63E-04	3.04E-05	MND	MND	MND	MND
EP [kg N eq]	1.09E-03	3.85E-05	5.97E-06	MND	MND	MND	MND
GWP [kg CO2 eq]	7.21E+00	1.39E-01	1.25E-02	MND	MND	MND	MND
ODP [kg CFC 11 eq]	1.04E-10	1.79E-17	1.80E-18	MND	MND	MND	MND
Resources [MJ]	5.94E+00	2.64E-01	2.25E-03	MND	MND	MND	MND
POCP [kg O3 eq]	2.30E-01	5.78E-03	1.73E-04	MND	MND	MND	MND

Impact Category	B5	B6	B7	C1	C2	C3	C4	D
AP [kg SO2 eq]	MND	MND	MND	0.00E+00	3.01E-05	0.00E+00	2.82E-05	MND
EP [kg N eq]	MND	MND	MND	0.00E+00	3.51E-06	0.00E+00	3.38E-06	MND
GWP [kg CO2 eq]	MND	MND	MND	0.00E+00	1.02E-02	0.00E+00	4.96E-03	MND
ODP [kg CFC 11 eq]	MND	MND	MND	0.00E+00	1.31E-18	0.00E+00	1.70E-17	MND
Resources [MJ]	MND	MND	MND	0.00E+00	1.93E-02	0.00E+00	1.03E-02	MND
POCP [kg O3 eq]	MND	MND	MND	0.00E+00	6.77E-04	0.00E+00	4.06E-04	MND

The results presented in the table above are equivalent to those presented in the EPD. Values are for three hinges.

Below is a summary of the largest life cycle impacts and their contribution to the full life cycle results for each option of the product , which occur in life cycle stages A1-A3.

Summary of Largest Impacts			
Impact Category	Module	Impact	Contribution %
AP [kg SO2 eq]	A1-A3	1.44E-02	98%
EP [kg N eq]	A1-A3	1.09E-03	96%
GWP [kg CO2 eq]	A1-A3	7.21E+00	98%
ODP [kg CFC 11 eq]	A1-A3	1.04E-10	100%
Resources [MJ]	A1-A3	5.94E+00	95%
POCP [kg O3 eq]	A1-A3	2.30E-01	97%

Impact Reduction Action Plan

At an organizational level, Allegion is pioneering safety by protecting people where they live and work and protecting the environment at the same time. Allegion promotes the health and safety of its employees, customers, and local community members worldwide through its commitment to conducting business in a safe and environmentally responsible manner.

Allegion operates with principles that support its proactive commitment. The set of principles includes making continuous improvements in environmental, health, safety (EHS) and sustainability management systems and performance through a reduction of usage of natural resources, waste minimization, and prevention of pollution. Additionally, Allegion is dedicated to designing and operating facilities in a manner that minimizes negative EHS and sustainability impacts. For more information Allegion's sustainability efforts, please visit:

<https://us.allegion.com/en/home/trade/architect/resources/sustainable-building.html>

As indicated by the results on the previous page, the vast majority of the GWP impacts, and more than 40% of all other impact categories, across the cycle stage are due to the materials chosen for use in the product. Since Allegion does not have direct control over manufacturing of these materials as they are manufactured by an external supplier and sold through Allegion, there are various challenges in determining which impact reduction steps to take. That being said, the following items have been identified as steps that Allegion will be taking over the course of the next three years to reduce the GWP impacts and other impacts of our products, listed in decreasing order of priority.

Impact Reduction Steps	Target Impact Area	Expected Outcomes	Responsible Team(s)	Due Date
Logistics optimization	Distribution (A4)	Supply chain map with shipping criteria to reduce impacts	Sourcing/ Logistics	1/1/2025
Consider moving manufacturing to one of Allegion's facilities in the US	Manufacturing (A3)	Feasibility report on moving manufacturing to the US	Operations/ Supply Chain	4/1/2025
Request that distributors implement take back programs for customers to return product at end of life for recycling	End of Life (C1-C4)	Decrease contributions to landfill by >10%	Operations/ Distribution/ Sales	4/1/2025
Consider process efficiencies and work with engineering team to reduce energy consumption in production process	Manufacturing (A3)	Report of various considerations on how to make production more energy efficient with a plan to trial some of these solutions	Engineering/ Operations	4/1/2025