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SmartEPD-2025-007-0340-01

HP LaserJet Pro MFP

4101dw/4101dwe/4101fdn/4101fdne/4101fdw/4101fdwe/4102dw/4102dwe

Date of Issue

Mar 07, 2025

Expiration date

Mar 07, 2030

Last updated

Mar 07, 2025



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

General Information

HP Inc.

1501 Page Mill Road, Palo Alto, CA 94304, United States

1-650-857-1501

info@hp.com hp.com



Product Name:	HP LaserJet Pro MFP 4101dw/4101dwe/4101fdn/4101fdne/4101fdw/4101fdwe/4102dw/4102dwe/4102fdn/4102fdne/4102fdw/4102fdwe/4103d
Functional Unit:	1 unit
Declaration Number:	SmartEPD-2025-007-0340-01
Date of Issue:	March 07, 2025
Expiration:	March 07, 2030
Last updated:	March 07, 2025
EPD Scope:	Cradle to grave A1 - A3, A4, B1, C2, C4
Market(s) of Applicability:	North America

General Organization Information

We are a technology company born of the belief that companies should do more than just make a profit. They should make the world a better place. Our efforts in climate action, human rights, and digital equity prove that we are doing everything in our power to make it so. With over 80 years of actions that prove our intentions, we have the confidence to envision a world where innovation drives extraordinary contributions to humanity. And our technology a product and service portfolio of personal systems, printers, and 3D printing solutions was created to inspire this meaningful progress. We know that thoughtful ideas can come from anyone, anywhere, at any time. And all it takes is one to change the world.

Further information can be found at: <https://www.hp.com/us-en/hp-information.html>

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 products 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 and ISO 21930:2017

Core PCR:	SuMPO Product Category Rule for Imaging Input and/or Output Equipment v.08 Date of issue: September 01, 2023 Valid until: September 01, 2028
Sub-category PCR review panel:	 Contact Smart EPD for more information.
General Program Instructions:	 Smart EPD General Program Instructions v.1.0, November 2022

Verification Information

LCA Author/Creator:	 Sin Che Tham  HP Inc.  info@hp.com
EPD Program Operator:	 Smart EPD  info@smartepd.com  www.smartepd.com  585 Grove St., Ste. 145 PMB 966, Herndon, VA 20170, USA
Verification:	Independent critical review of the LCA and data, according to ISO 14044 and ISO 14071:  Juanita Barrera R  juanita@earthshiftglobal.com Independent external verification of EPD, according to ISO 14025 and reference PCR(s):  Juanita Barrera R  juanita@earthshiftglobal.com

External

External

Product Information

Functional Unit:	1 unit
Mass:	8.22 kg
Reference Service Life:	5 Years
Product Specificity:	 Product Average  Product Specific

Product Description

Color multi-function printer

Further information can be found at: <https://support.hp.com/si-en/product/details/hp-laserjet-pro-mfp-4101-4104dw-fdn-fdw-printer-series/model/2100721883>

Product Specifications

Product SKU(s):	2-Z620F,2Z620E,2Z618F,2Z618E,2Z619F,2Z619E,2Z622F,2Z622E,2Z623F,2Z623E,2Z624F,2Z624E,2Z635A,2Z627A,2Z636A
Product Classification Codes:	UNSPSC - 43212105 - Laser Printers
Device type:	Multifunction Device, Printer
Method:	Electrophotography (EP)
Color:	Color

Printing speed:

N/A ppm

Options:

✓

Print

✓

Copy

✓

Fax

Material Composition

Material/Component Category	Origin	% Mass
Metals	Asia	21
Plastics	Asia	40
Packaging (Corrugate, Wood & Plastics)	Asia	19
Glass (non-CRT)	Asia	5
EU WEEE Directive (Separate Annex II Materials)	Asia	4
Wires/Cables	Asia	<1
Other Miscellaneous Materials	Asia	11

Hazardous Materials

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

EPD Data Specificity

Primary Data Year:

2023

Manufacturing Specificity:

✗

Industry Average

✓

Manufacturer Average

✗

Facility Specific

Averaging:

Averaging was not conducted for this EPD



System Boundary

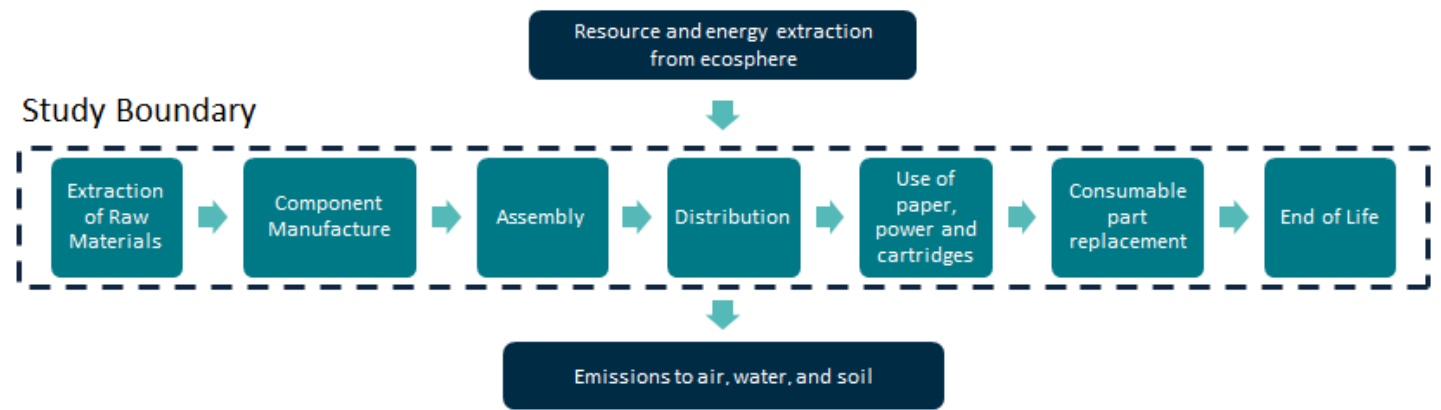
Production	A1	Raw material supply	✓
	A2	Transport	✓
	A3	Manufacturing	✓
Construction	A4	Transport to site	✓
	A5	Assembly / Install	ND
Use	B1	Use	✓
	B2	Maintenance	ND
	B3	Repair	ND
	B4	Replacement	ND
	B5	Refurbishment	ND
	B6	Operational Energy Use	ND
	B7	Operational Water Use	ND
End of Life	C1	Deconstruction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

Plants



Asia Manufacturing Operations
1150 Depot Road, Singapore 109673

Product Flow Diagram



Software and Database

LCA Software:	 GaBi v. 10.0
LCI Foreground Database(s):	 GaBi Professional Database v. 2020  North America
LCI Background Database(s):	 GaBi Professional Database v. 2020  North America

Data Quality

A description of all of the methodological decisions made in modeling the life cycle impacts of office paper, including descriptions of the approach to modeling carbon sequestration and paper recycling, are described in the American Forestry and Paper Association report on printing and writing papers.

Life Cycle Module Descriptions

This document describes the lifetime use of the printer, including production of all materials and components, assembly in the final configuration, delivery to the customer, use of the product, and expected end-of-life scenarios. All packaging, in-box accessories, and all consumables (paper, cartridges, and replacement parts) are considered, including associated end-of-life treatment. Printing is considered the main function of the product, and the impacts of other functions (scanning, copying, etc.) are not considered.

LCA Discussion

Allocation Procedure

No significant allocations have been considered for the production of the printer. Allocation of production or use impacts across the various functions of a multi-function system is not included (i.e. allocation of production impacts to the provision of scanning services), and the impacts from all life cycle stages are considered within the system boundaries for the printing system. The study does not incorporate any reused products or parts.

Cut-off Procedure

Credits for end-of-life material and energy recovered are excluded from the inventory, following the cut-off approach.

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

Results

Environmental Impact Assessment Results

IPCC AR5 GWP 100, ReCiPe 2016 v1.1
per 1 unit of product .
LCIA results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins or risks.

Impact Category	Method	Unit	A1A2A3	A4	B1	C2	C4	Total
GWP-total	IPCC AR5 GWP 100	kg CO2 eq	91	4.87	13800	0.0957	16.3	1.39e+4
ODP	ReCiPe 2016 v1.1	kg CFC-11 eq	0.0000251	0.00000101	0.00183	2.41e-8	2.69e-7	1.86e-3
AP	ReCiPe 2016 v1.1	kg SO2 eq	0.459	0.0321	52.2	0.000561	0.0041	5.27e+1
EP-fw	ReCiPe 2016 v1.1	kg P eq	0.000327	0.00003	1.3	2.97e-7	0.000141	1.30e+0
FW	ReCiPe 2016 v1.1	m3	0.47	0.0116	456	0.0000848	0.0476	4.57e+2
ADP-minerals&metals	ReCiPe 2016 v1.1	kg Cu eq	2.75	0.00377	155	0.000138	0.0674	1.58e+2

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 = Particular 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 Indicators

per 1 unit of product .

Indicator	Unit	A1A2A3	A4	B1	C2	C4	Total
PERE	MJ	ND	ND	ND	ND	ND	0.00e+0
PERM	MJ	ND	ND	ND	ND	ND	0.00e+0
PERT	MJ	ND	ND	ND	ND	ND	0.00e+0
PENRE	MJ	ND	ND	ND	ND	ND	0.00e+0
PENRM	MJ	ND	ND	ND	ND	ND	0.00e+0
PENRT	MJ	ND	ND	ND	ND	ND	0.00e+0
RPRE	MJ	ND	ND	ND	ND	ND	0.00e+0
RPRM	MJ	ND	ND	ND	ND	ND	0.00e+0
RPRT	MJ	ND	ND	ND	ND	ND	0.00e+0
NRPRE	MJ	ND	ND	ND	ND	ND	0.00e+0
NRPRM	MJ	ND	ND	ND	ND	ND	0.00e+0
NRPRT	MJ	ND	ND	ND	ND	ND	0.00e+0
ADP-fossil	MJ	ND	ND	ND	ND	ND	0.00e+0
SM	kg	ND	ND	ND	ND	ND	0.00e+0
RSF	MJ	ND	ND	ND	ND	ND	0.00e+0
NRSF	MJ	ND	ND	ND	ND	ND	0.00e+0
FW	m3	ND	ND	ND	ND	ND	0.00e+0

Note:

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

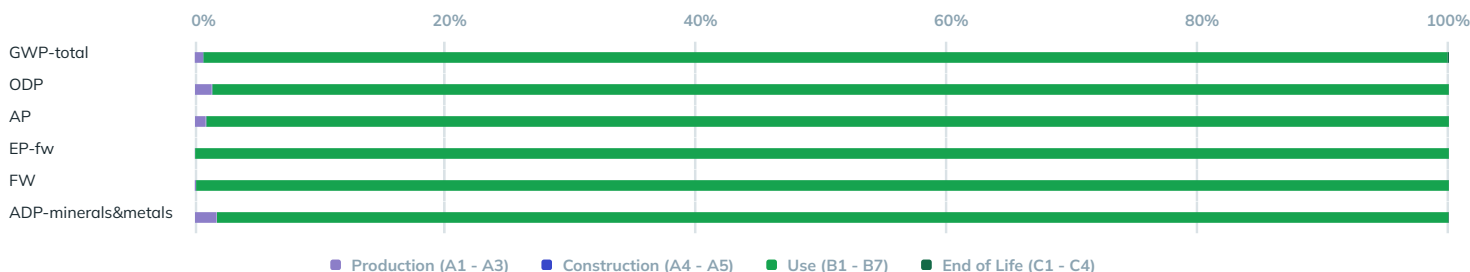
Abbreviations:

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.



Interpretation

The model assumes a printer lifetime of 5 years. The printer is assumed to print an average of 2.29E005 images per year, or 882 images per day (5 days/week). This unit has built-in functionality for automatic duplexing. As such, a 25% reduction in paper use has been reflected. Power consumption figures are based on Energy Star testing of the printer in each power mode, using this average job load. The LCA data for office paper is based on the uncoated freesheet paper developed by the American Forest & Paper Association, and models paper production, transportation, and end-of-life treatment. This paper dataset assumes that average office paper contains 4% recycled content and is recycled 72% of the time. A paper weight of 20 lb. (75 g/m²) is assumed when paper (rather than an alternative material) is the chosen printing media. The end-of-life treatment for the printer and mechanical consumables represents a best case for electronics recycling, considering that the device enters the general electronics waste stream for US and modeled using end-of-life models for recycling, incineration and landfilling in the US, i.e. separation of bulk parts, shredding, and incineration of electronics. (No credits are applied for materials or energy recovered at end of life, consistent with the recycled content, a.k.a. cut-off EoL allocation methodology.) As LCI models for uncontrolled recycling/disposal of products are not available, this case was not considered in this study. A default distance of 100 km by truck is set to account for the end-of-life transportation, from device use location to waste management facilities.



References

- (2020). GaBi 2020, GaBi 10: Software and Database for Life Cycle Engineering, Sphera, LeinfeldenEchterdingen. <http://www.gabi-software.com>
- (2010). Printing and Writing Papers, Life-Cycle Assessment Summary Report. American Forest & Paper Association, <http://www.afandpa.org> (2006). ISO 14040: Environmental management - Life cycle assessment Principles and framework.
- (2006). ISO 14044: Environmental management - Life cycle assessment Requirements and guidelines.
- (2006). ISO 14025: Environmental labels and declarations - Environmental labels and declarations Principles and procedures.
- (1999). ISO/IEC 10561: Information technology -- Office equipment -- Printing devices -- Method for measuring throughput -- Class 1 and Class 2 printers Sustainable Management Promotion Organization (SuMPO) environmental label program
- (2023). Product Category Rule for "Imaging input and/or output equipment, PA -590,000 -AI-08.