

✓ Third party verified

Environmental Product Declaration

In conformance with
ISO14025 | ISO14040 | ISO14044



Panasonic Connect Co., Ltd.

TOUGHBOOK FZ-40

FZ-40JZ001BM



Main specifications of the product

• CPU:

Intel® Core™ Ultra 5 Processor 235H (Intel vPro® platform), Operating Frequency: P-core—Max Turbo Frequency 5.0 GHz, E-core—Max Turbo Frequency 4.4 GHz

• Main Memory Capacity: 16 GB (16 GB × 1) DDR5 SO-DIMM

• Storage Capacity: 512 GB SSD (PCIe)

• Display: 14.0-inch FHD (1920 × 1080 pixels) (16:9) capacitive multi-touch panel (anti-reflective coating)

Expected usage life : 5 years

*This product is sold for overseas and is for business use.

Registration number

SuMPO-EPD-2609-241-1

Verification date

9/2/2026

Publication date

9/16/2026

Expiration date

9/1/2031

EPD type

Single Product EPD

* First publication date

Additional standards in conformance

None

EPD can be updated or withdrawn during the validity period. To confirm the validity of this EPD, check the following website:
<https://ecoleaf-label.jp/epd/search>

● General Information

> Programme

Programme name	SuMPO EPD Japan
Programme operator	Sustainable Management Promotion Organization (SuMPO)
Address	KANDA SQUARE GATE 4F, 14-8, Uchikanda 1-chome, Chiyoda-ku, Tokyo, 101-0047, Japan
Website	https://ecoleaf-label.jp

> GPI and PCR

GPI	SuMPO EPD Japan General Program Instructions v.2.2.0
PCR name	Product Category Rule for "IT equipments equipments"
PCR registration number	PA-520000-BF-04
PCR publication date	8/15/2023
PCR review panel chair	Ken Yamagihi (Sustainable Management Promotion Organization)
PCR valid until	8/15/2028
PCR issuer	Sustainable Management Promotion Organization (SuMPO)

> Verification

Verification Type	Third-party verification in conformance with ISO14025 and ISO21930:2017		
	☐ Internal	☒ External	
Verifier	☒ Third-party verification by individual verifier	☐ Third-party verification by verification body	☐ Third-party verification by system certification
	Hiroyuki Nakamura (Herb Professional Engineer Office) The reviewer holds Professional Engineer and APEC Engineer qualifications in the environmental field and has been active globally in the field of LCA for 16 years. Independent verification of data & declaration in accordance with ISO 14025		

> Standards

Standards in conformance with;	☒ ISO14040:2006	☒ ISO14044:2006	☐ ISO14067:2018
	☒ ISO14025:2006	☐ ISO21930:2007	☐ ISO21930:2017
	☐ EN15804+A2	☐ EN50693:2019	☐ ISO/IEC63366:2025

EPD owner is responsible for the information contained in the EPD and for environmental claims related to the information. For any inquiries or requests regarding the content of the EPD, please contact the EPD owner.

EPDs are comparable only if they comply with this document, use the same sub-PCR where applicable, include all relevant information and are based on equivalent scenarios. Comparability of EPDs is limited to those applying a functional unit.

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

When using weighted averages for calculation, the life cycle impact assessment results, life cycle inventory analysis-related information, waste-related information, and environmental information on output flows do not correspond to information about a specific product.

● EPD Owner's Information

Name of company and dept.	Panasonic Connect Co., Ltd. Mobile Solutions Business Division
Address	ytv Kyobashi Building, 2-2-33 Shiromi, Chuo-ku, Osaka 540-8553, Japan
Contact	080-9591-9806
LCA practitioner	TCO2 Co. Ltd.
Company description	Development, manufacture and sale of devices, and provision of solutions, including system integration, installation, maintenance and repair services for the supply chain, public service, infrastructure, and entertainment sectors.

Environmental Product Declaration for **FZ-40JZ001BM**

●Product Information

Product name		TOUGHBOOK FZ-40	
Product /model number		FZ-40JZ001BM	
Product specification	Mass	4.93kg	Conversion factor 4.93 kg/unit
	Function	A 14.0-inch rugged PC with expandability and comfort features, designed for operation in harsh environments thanks to its rugged design, long battery life, and security features	
	Applications	Harsh on-site work, including all-weather operations designed to handle heavy rain.	
	TS*	Shock Resistance: In addition to tests based on MIL standards, shock resistance tests were conducted under our own, more stringent conditions. Vibration Resistance: Vibration tests were conducted in accordance with MIL-STD-810H.	
Service life	Service life	5 year	
	In-use conditions	Operating environment conditions specified in the Product Specifications Table	
	reference	The product is designed for enhanced durability with long-term use in mind, and its maximum warranty period is five years. Therefore, the assumed service life was set at five years.	
Manufacturing site(s)		Panasonic Connect Co., Ltd. Taiwan Factory	
Product description		•CPU: Intel® Core™ Ultra 5 Processor 235H (Intel vPro® platform), Operating Frequency: P-core—Max Turbo Frequency 5.0 GHz, E-core—Max Turbo Frequency 4.4 GHz •Main Memory Capacity: 16 GB (16 GB × 1) DDR5 SO-DIMM •Storage Capacity: 512 GB SSD (PCIe) •Display: 14.0-inch FHD (1920 × 1080 pixels) (16:9) capacitive multi-touch panel (anti-reflective coating) *This product is sold for overseas and is for business use.	
Website		https://connect.panasonic.com/jp-ja/products-services/tough/lineup/40-j	

* TS: technical specifications,

●Product Content

Product components	Proportion (%)	Mass (unit)	
Solid-state drive	0.4	1.5E-02	kg
Printed circuit board	4.3	1.7E-01	kg
Insulated wire	1.4	5.3E-02	kg
Battery	0.1	4.6E-03	kg
Liquid crystal display device	25.8	1.0E+00	kg
Other components	45.2	1.8E+00	kg
AC adapter	9.2	3.6E-01	kg
Battery pack	7.0	2.7E-01	kg
Instruction manual	0.5	2.0E-02	kg
Stylus pen	0.6	2.4E-02	kg
AC cable	5.5	2.2E-01	kg
Packaging materials	Proportion (%)	Mass (unit)	
Corrugated cardboard box	71.6	7.3E-01	kg
Corrugated cardboard sheet	26.2	2.7E-01	kg
Inner packaging bag	2.1	2.2E-02	kg
Protective sheet	0.0	1.8E-04	kg

●Biogenic Carbon Content

Item	Content (kg-C)	Content (kg-CO ₂ eq)
Biogenic carbon content per product	-	-
Biogenic carbon content in packaging	-	-

Environmental Product Declaration for **FZ-40JZ001BM**● **LCA-related Information**> **EPD Type Information**

EPD type	Product type	☒ Single product EPD	☐ Multiple products EPD	☐ Industry-wide EPD
	Site type	☒ Single site	☐ Multiple sites	
Geographical coverage		United States of America		
Description of representativeness for multiple-products/sites EPD		-		
Description of variation for multiple-products/sites EPD		-		
Description of products covered in the multiple products EPD		-		

> **LCA Information**

Declared unit		Per unit of product		
Mass per declared unit (Conversion factor to mass)		4.93kg		
Reference flow (number of products required to fulfil the function)		-		
System boundary		☐ Cradle-to Gate	☐ Cradle-to-Gate with options	☒ Cradle-to-Grave
LCA software		MiLCA ver 1.2.2.2		
LCI database		AIST-IDEA v3.5.1		
Characterization model		Climate Change: IPCC Sixth Assessment Report (IPCC, 2021) Other Impact categories: LIME2		
Use of other background data		-		
Secondary data quality		The calculation was performed using data that met the secondary data quality requirements specified by GPI.		
Primary data collection sites		Panasonic Connect Co., Ltd. Taiwan Factory		
Primary data collection period		April 1, 2025–March 31, 2026		
Biogenic carbon		☒ 0/0 approach	☐ -1/+1 approach	
Information about electricity	Use	☒ Average consumption mix	☐ Others	
	Type	-		
	Purchase date	-		
	Issuing body	-		

> **Life Cycle Stages**

Raw materials acquisition stage	Production stage	Distribution stage	Use stage	End of life stage
☒	☒	☒	☒	☒

■ : declared stage - : stage not declared

Environmental Product Declaration for FZ-40JZ001BM

> Allocation

In this assessment, process subdivision and allocation were considered in accordance with the procedures specified in the GPI.

Primary data for inputs and outputs arising at the production stage, such as electricity and water consumption and waste generation, were collected at the factory level. The factory manufactures not only the product covered by this assessment but also other products, including notebook computers and tablets. However, because there are numerous combinations of expansion modules and several thousand product models and part numbers, further subdivision of the manufacturing processes is impracticable.

These inputs and outputs arise from manufacturing activities at the factory and are not directly related to the market value of the products. Therefore, physical allocation, which reflects the physical relationship with production activities, was considered more appropriate than allocation based on economic value. Accordingly, for the following production-stage processes, allocation among products was performed based on the number of units produced.

- Electricity consumption
- Detergent consumption
- Solvent consumption
- Water consumption
- Wastewater treatment volume
- Evaporation volume
- Waste generation

> Cut-off rules

No cut-offs other than those specified as cut-off items in the PCR were applied.

> System Boundary

In accordance with the GPI and PCR, the following life cycle stages were included.

- Raw material acquisition stage
- Production stage
- Distribution stage
- Use and maintenance stage
- Disposal and recycling stage

In accordance with the GPI, the following processes were classified as processes outside the system boundary.

Target Processes

- Loading of pallets commonly used in the distribution stage

However, since pallets are used during transportation, their weight was included in the transportation weight.

No processes other than those specified as being outside the system boundary in the GPI and PCR were excluded from the system boundary.

The temporal system boundary is 100 years.

> Scenario

In accordance with the PCR, scenarios were applied to the following stages.

- Waste transportation at the production stage
- Overseas land transportation, international air transportation, and domestic land transportation at the distribution stage
- Waste transportation at the final stage (disposal and recycling)
- Disposal and recycling treatment of end-of-life products and end-of-life accessories at the final stage (disposal and recycling)

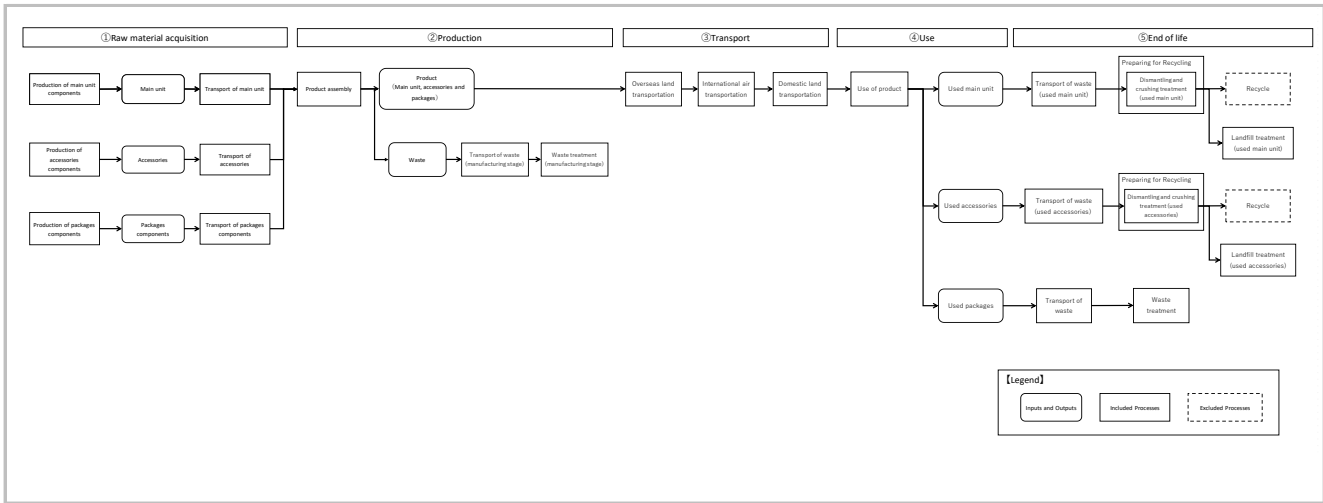
> Electricity Modelling

At the production stage, the assessment was conducted using the 2022 average grid electricity data for Taiwan available in IDEA 3.5.1. As use in the United States was assumed, the use stage was assessed using the 2022 average grid electricity data for the United States available in IDEA 3.5.1.

The following are the names of the data sets used at each stage.

- Production stage: AIST-IDEA ver3.5.1 electricity, Ember, Taiwan, CY2022, TWN
- Use stage: AIST-IDEA ver3.5.1 electricity, Ember, United States, CY2022, USA

> Life Cycle Sytem Diagram



Environmental Product Declaration for **FZ-40JZ001BM**● **LCA Result**> **LCIA Indicators**

		Raw materials acquisition stage	Production stage	Distribution stage	Use stage	End of life stage
GWP - total	kg-CO ₂ eq	2.88E+02	9.72E+00	6.41E+01	2.61E+01	1.34E+00
GWP - fossil	kg-CO ₂ eq	2.87E+02	9.70E+00	6.41E+01	2.60E+01	1.05E+00
GWP - biogenic	kg-CO ₂ eq	2.14E-01	1.05E-02	8.23E-04	9.10E-03	2.89E-01
GWP - land use and land use change	kg-CO ₂ eq	5.72E-01	8.46E-03	1.51E-02	1.07E-01	1.60E-03
ODP: Ozone depletion potential	kg-CFC-11eq	7.08E-06	2.52E-08	4.17E-10	4.46E-08	1.58E-09
EP: Eutrophication potential	kg-PO ₄ ³⁻ -eq	8.65E-03	4.07E-03	2.71E-07	4.51E-06	7.20E-06
AP: Acidification potential	kg-SO ₂ eq	7.60E-01	2.27E-02	9.66E-03	4.95E-02	1.84E-03
POCP: Photochemical oxidant creation potential	kg-C ₂ H ₄ eq	9.01E-03	9.35E-05	6.12E-03	3.23E-04	1.38E-05

Optional indicators

ADP - elements	kg-Sbeq	4.14E-02	2.89E-05	1.19E-07	2.38E-04	1.98E-06
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> **LCI - Primary Resource Use**

		Raw materials acquisition stage	Production stage	Distribution stage	Use stage	End of life stage
RPR _E *	MJ	1.31E+03	3.20E+01	1.01E-01	4.10E+02	3.59E+00
RPR _M *	MJ	5.93E+00	3.20E+01	6.22E-04	6.30E-03	8.34E-04
NRPR _E *	MJ	5.94E+03	2.86E+02	7.16E+02	2.00E+03	1.54E+01
NRPR _M *	MJ	7.93E+02	2.23E-01	1.49E-03	3.32E-01	6.75E-01

*RPRE: Renewable primary resources used as an energy carrier, RPRM: Renewable primary resources with energy content used as material, NRPRE: Non-renewable primary resources used as an energy carrier, NRPRM: Non-renewable primary resources with energy content used as material.

> **LCI- Secondary Resources Use**

		Raw materials acquisition stage	Production stage	Distribution stage	Use stage	End of life stage
SM : Use of secondary material	kg	4.71E+00	6.80E-03	2.41E-04	5.50E-02	7.43E-04
RSF : Renewable secondary fuels	MJ	6.37E+00	1.52E-02	2.83E-04	4.49E-02	2.12E-03
NRSF : Non-renewable secondary fuels	MJ	2.86E-07	0.00E+00	0.00E+00	0.00E+00	1.08E-03
RE : Use of recovered energy	MJ	4.05E-02	4.37E-06	6.71E-06	8.25E-06	3.81E-02

> **LCI - ADP-fossil and Consumption of freshwater**

		Raw materials acquisition stage	Production stage	Distribution stage	Use stage	End of life stage
ADP - fossil	MJ	4.32E+03	1.27E+02	8.85E+02	3.79E+02	1.12E+01
Consumption of freshwater resources	m ³	5.72E+00	8.45E-01	3.39E-02	1.46E-02	5.55E-03

Environmental Product Declaration for FZ-40JZ001BM

> Waste Indicators

		Raw materials acquisition stage	Production stage	Distribution stage	Use stage	End of life stage
Hazardous waste disposed	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Non-hazardous waste disposed	kg	4.45E+00	5.21E-02	2.18E-02	7.62E-02	2.50E-01
High-level radioactive waste	m ³	4.98E-09	2.81E-10	3.92E-13	2.68E-09	1.08E-11
Intmd. and low-level radioactive waste	m ³	5.09E-06	2.87E-07	4.00E-10	2.73E-06	1.10E-08

> Output Flow Indicators

		Raw materials acquisition stage	Production stage	Distribution stage	Use stage	End of life stage
Components for reuse	kg	—	—	—	—	—
Materials for recycling	kg	—	—	—	—	—
Material for energy recovery	kg	—	—	—	—	—
Exported energy from waste (energy recovery efficiency $\geq 60\%$)	MJ	—	—	—	—	—
Incineration of waste (energy recovery efficiency $< 60\%$)	Waste disposed	kg	—	—	—	—
	Recovered energy	MJ	—	—	—	—
Waste disposed in landfill and energy recoved from landfill gas	Waste disposed	kg	—	—	—	—
	Recovered energy	MJ	—	—	—	—

> Description of LCA Results

- Product name: ToughBook FZ-40JZ001BM
- model number: FZ-40JZ001BM
- Product type of scenario used: Notebook personal computer, Tablet terminal
- Measurement conditions: Measurements were made according to the measurement method specified in the "Computers Specification Version 9.0".
- The estimated usage period was determined based on the product's expected service life.
- Annex E of the PCR was followed for the disposal and recycling scenarios.

● Additional Environmental Information

> Additional Environmental Information not related to LCA

The product complies with the EU's RoHS Directive.

EU Declaration of Conformity, Document Number MSBD-D25C05-02

<https://www.ptc.panasonic.eu/compliance-documents?category=53520&type=>

This product and its main components are manufactured in an ISO 14001 certified factory.

Certification ID, LRQA 10589567

https://holdings.panasonic.jp/corporate/sustainability/pdf/eco_isolist2024.pdf

> Information on Hazardous Substances

Hazardous materials name	CAS No.	Standards or regulations
-	-	-
-	-	-
-	-	-

● Definitions of Terms

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● References

- ISO14025:2006 Environmental labels and declarations — Type III environmental declarations — Principles and procedures
- ISO14040:2006 Environmental management - Life Cycle Assessment - Principles and framework
- ISO14044:2006 Environmental management - Life Cycle Assessment - Requirements and guidelines

● Version History