

ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804+A2

Owner of the Declaration	KONE Corporation
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-KON-20230579-CBA2-EN
Issue date	22.12.2023
Valid to	29.06.2028

Folding door system 50 / 50E
KONE

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General Information

KONE

Programme holder

IBU – Institut Bauen und Umwelt e.V.
Hegelplatz 1
10117 Berlin
Germany

Declaration number

EPD-KON-20230579-CBA2-EN

This declaration is based on the product category rules:

Automatic doors, automatic gates, and revolving door systems,
01.08.2021
(PCR checked and approved by the SVR)

Issue date

22.12.2023

Valid to

29.06.2028



Dipl.-Ing. Hans Peters
(Chairman of Institut Bauen und Umwelt e.V.)



Florian Pronold
(Managing Director Institut Bauen und Umwelt e.V.)

Folding door system 50 / 50E

Owner of the declaration

KONE Corporation
Keilasatama 3
02150 ESPOO
Finland

Declared product / declared unit

1 piece of the product: KONE folding door 50, consisting of the following items:

- Drive unit
- Pairs of folding panels
- Hold-open columns
- Floor rail
- Product packaging

Scope:

This Environmental Product Declaration refers to the KONE folding door 50. This EPD is also representative for the folding door 50E. The production site is located in Germany. Green electricity is being used at this production site.

Data represents the year 2022.

The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

The EPD was created according to the specifications of EN 15804+A2. In the following, the standard will be simplified as *EN 15804*.

Verification

The standard EN 15804 serves as the core PCR		
Independent verification of the declaration and data according to ISO 14025:2011		
<input type="checkbox"/>	internally	<input checked="" type="checkbox"/> externally



Dr.-Ing. Wolfram Trinius,
(Independent verifier)

Product

Product description/Product definition

The folding doors 50 and 50E are thermally separated, with particularly slim profiles and a silent, dynamic drive system. Both versions are particularly suitable where space is restricted. Maximum heights of up to 2.5 metres are possible.

The folding doors avail of highly efficient thermal separation with very good thermal transmittance values (UD values) ranging from 1.7 to max. 2.4 (thermal coefficient) which can be calculated individually for each door system. In combination with ISO glass, the folding doors ensure good thermal insulation of external doors.

For the use and application of the product the representative national provisions apply. The standards which can be applied are the following:

- EN 18650-1
- EN 18650-2
- EN 16005
- EN 60335-1
- ISO 13849-1
- 2011/65/EU ROHS3 Directive
- Machinery Directive 2006/42/EC

The CE marking takes into account the proof of conformity with the respective harmonized standards based on the legal provisions above.

Application

The folding doors 50 / 50E are used when a large opening width needs to be achieved despite small wall opening dimensions. They are suitable for external and internal doors in narrow passageways, barrier-free access points in public buildings as well as escape routes and emergency exits. While opening, the door panel is simultaneously folded and automatically moved to the side.

Bi-parting opening

Both pairs of door panels are synchronously swivelled to the side and in opposing directions while opening, thereby permitting a maximum opening width of 2.4 metres.

Unilateral opening

For smaller applications: the folding door comprising a single pair of panels permits a maximum opening width of 1.2 metres.

Technical Data

The automatic folding doors have the following technical properties:

Name	Value	Unit
Opening and closing force maximum	150	N
Opening speed incremental adjustment	10-75	cm/s
Closing speed incrementally variable	10-50	cm/s
Hold-open time	0-180	s
Installed load, frequency	230	V
Power consumption	250	W
Type of protection	20	IP
Clear opening width maximum	900-2400	mm
Panel pair weight maximum	90	kg
Clear passage height	2100-2500	mm
Double glazing	28	ISO

Performance data of the product with respect to its characteristics in accordance with the relevant technical provision which can be applied are mentioned above.

Base materials/Ancillary materials

The major material composition including the packaging of the product is listed below.

Name	Value	Unit
Glass	42	%
Aluminium	27	%
Steel	19	%
Plastic	6	%
Plastic packaging	4	%
Electronics	1	%
Zinc	1	%

The folding doors include partial articles which contain substances listed in the Candidate List of REACH Regulation 1907/2006/EC (date: 17.01.2023) exceeding 0.1 percentage by mass: yes

- Lead (Pb): 7439-92-1 (CAS-No.) is used in some of the alloys. The concentration of lead in each individual alloy does not exceed 4.0% (by mass).

The Candidate List can be found on the ECHA website address: <https://echa.europa.eu/de/home>.

Reference service life

The reference service life of folding doors amounts to 10 years and depends on the application and frequency of use. Regular maintenance is advised to ensure the life expectancy of 10 years. For repairs and renewals, suitable spare parts are available. The folding doors are tested and certified to EN 16005, meaning they are designed to withstand a minimum of 1.000.000 cycles.

LCA: Calculation rules

Declared Unit

The declared unit is 1 piece of the product:

Name	Value	Unit
Declared unit	1	pce.
Mass of the entire system	223.03	kg

System boundary

The type of EPD is: cradle to gate with options, modules C1–C4, and module D (A1–A3 + C + D and additional modules: A4 + A5 + B6)

Production - Module A1-A3

The product stage includes:

— A1, raw material extraction, processing and mechanical treatments, processing of secondary material input (e.g. recycling processes),

- A2, transport to the manufacturer,
- A3, manufacturing and assembly including provision of all materials, products and energy, as well as waste processing up to the end-of waste state.

Construction stage - Modules A4-A5

The construction process stage includes:

- A4, transport to the building site;
- A5, installation into the building; including provision of all materials, products and energy, as well as waste processing up to the end-of waste state or disposal of final residues during the construction process stage.

Use stage - Module B6

The use stage related to the operation of the building includes:

- B6, operational energy use

End-of-life stage– Modules C1-C4 and D

The end-of-life stage includes:

- C1, deconstruction, demolition;
- C2, transport to waste processing;

- C3, waste processing for reuse, recovery and/or recycling;
- C4, disposal; including provision and all transport, provision of all materials, products and related energy and water use. Module D (Benefits and loads beyond the system boundary) includes:

- D, recycling potentials, expressed as net impacts and benefits.

Geographic Representativeness

Land or region, in which the declared product system is manufactured, used or handled at the end of the product's lifespan: Global

Comparability

Basically, a comparison or an evaluation of EPD data is only possible if all the 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. Background database: GaBi, SP40

LCA: Scenarios and additional technical information

Characteristic product properties of biogenic carbon

Information on describing the biogenic carbon content at factory gate

Name	Value	Unit
Biogenic carbon content in product	0.05	kg C
Biogenic carbon content in accompanying packaging	0.08	kg C

Note: 1 kg of biogenic carbon is equivalent to 44/12 kg of CO₂.

Transport to the building site (A4)

Name	Value	Unit
Litres of fuel (per 1kg)	0.00276	l/100km
Capacity utilisation (including empty runs)	55	%
Transport distance via medium truck	100	km

The product is transported via truck. The main distribution region is Europe. In order to allow scaling to a specific point of installation 100 km are declared.

Installation into the building (A5)

Name	Value	Unit
Waste packaging (paper and plastic)	9,198	kg

Reference service life

Name	Value	Unit
Life Span according to the manufacturer	10	a

Operational energy use (B6)

Name	Value	Unit
Electricity consumption for 1 year	224.65	kWh
Days per year in use	365	days
Active mode per day	1,80	h
Idle mode per day	22,20	h
Active mode power	16,33	W
Idle mode power	26,40	W

End of life (C1-C4)

C1: The product expansion depends on the building. The product share is so low that no environmental burden is assumed.

C2: Transport to waste management 50 km.

Name	Value	Unit
Collected separately waste type	214	kg
Recycling	106	kg
Energy recovery	13	kg
Landfilling	94.8	kg

The product is disassembled in a recycling process. Material recycling is then assumed for the metals and electronics. The plastic components are assumed to be incinerated with energy recovery. Electromechanics and minor proportions of residues arising from the recycling process are landfilled.

Region for the End of Life is: Global.

Reuse, recovery and/or recycling potentials (D), relevant scenario information

Name	Value	Unit
Recycling	100	%

The collection rate is 100%.

LCA: Results

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE OR INDICATOR NOT DECLARED; MNR = MODULE NOT RELEVANT)

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 the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction 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	MNR	MNR	MNR	X	MND	X	X	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 piece Folding Door 50 / 50E

Parameter	Unit	A1-A3	A4	A5	B6	C1	C2	C3	C4	D
GWP-total	kg CO ₂ eq	5.05E+02	1.95E+00	2.32E+01	0	0	9.34E-01	3.35E+01	1.45E+00	-1.61E+02
GWP-fossil	kg CO ₂ eq	5.04E+02	1.87E+00	2.29E+01	0	0	8.93E-01	3.33E+01	1.44E+00	-1.6E+02
GWP-biogenic	kg CO ₂ eq	8.28E-01	8.6E-02	3.17E-01	0	0	4.1E-02	2.23E-01	5E-03	-1.52E-01
GWP-luluc	kg CO ₂ eq	3.15E-01	4.44E-05	1E-03	0	0	2.13E-05	2E-03	4E-03	-1.04E-01
ODP	kg CFC11 eq	1.67E-09	1.97E-16	1.16E-14	0	0	9.43E-17	1.68E-14	5.33E-15	-6.06E-10
AP	mol H ⁺ eq	2.58E+00	2E-03	4E-03	0	0	8.94E-04	6E-03	1E-02	-5.49E-01
EP-freshwater	kg P eq	5.68E-04	3.99E-07	1.85E-06	0	0	1.91E-07	2.68E-06	2.47E-06	-1.26E-04
EP-marine	kg N eq	5.41E-01	5.94E-04	9.34E-04	0	0	2.84E-04	1E-03	3E-03	-8.3E-02
EP-terrestrial	mol N eq	6.03E+00	7E-03	1.9E-02	0	0	3E-03	2.7E-02	2.9E-02	-8.9E-01
POCP	kg NMVOC eq	1.4E+00	2E-03	3E-03	0	0	8.04E-04	4E-03	8E-03	-2.62E-01
ADPE	kg Sb eq	1.3E-02	5.59E-08	1.59E-07	0	0	2.68E-08	2.31E-07	1.29E-07	-4E-03
ADPF	MJ	7.26E+03	2.64E+01	1.07E+01	0	0	1.27E+01	1.55E+01	1.89E+01	-2.19E+03
WDP	m ³ world eq deprived	4.89E+01	4E-03	2.38E+00	0	0	2E-03	3.43E+00	1.51E-01	-2.33E+01

GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources; WDP = Water (user) deprivation potential

RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1 piece Folding Door 50 / 50E

Parameter	Unit	A1-A3	A4	A5	B6	C1	C2	C3	C4	D
PERE	MJ	1.28E+03	8.3E-02	5.35E+00	0	0	4E-02	5.51E+00	2.47E+00	-7.01E+02
PERM	MJ	4.06E+00	0	-2.57E+00	0	0	0	-1.49E+00	0	0
PERT	MJ	1.28E+03	8.3E-02	2.77E+00	0	0	4E-02	4.02E+00	2.47E+00	-7.01E+02
PENRE	MJ	6.62E+03	2.65E+01	3.98E+02	0	0	1.27E+01	2.68E+02	1.89E+01	-2.19E+03
PENRM	MJ	6.39E+02	0	-3.87E+02	0	0	0	-2.52E+02	0	0
PENRT	MJ	7.26E+03	2.65E+01	1.07E+01	0	0	1.27E+01	1.55E+01	1.89E+01	-2.19E+03
SM	kg	7.83E+01	0	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0
FW	m ³	2.95E+00	1.5E-04	5.7E-02	0	0	7.16E-05	8.2E-02	5E-03	-1.66E+00

PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water

RESULTS OF THE LCA - WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2: 1 piece Folding Door 50 / 50E

Parameter	Unit	A1-A3	A4	A5	B6	C1	C2	C3	C4	D
HWD	kg	2.35E-05	2.57E-09	4.05E-08	0	0	1.23E-09	5.89E-08	2.88E-07	-2.29E-05
NHWD	kg	5.94E+01	3E-03	2.38E+00	0	0	1E-03	3.46E+00	9.49E+01	-2.2E+01
RWD	kg	2.07E-01	2.84E-05	3.98E-04	0	0	1.36E-05	5.76E-04	2.15E-04	-1.58E-01
CRU	kg	0	0	0	0	0	0	0	0	0
MFR	kg	0	0	0	0	0	0	5.65E+01	0	0
MER	kg	0	0	0	0	0	0	0	0	0
EEE	MJ	0	0	4.28E+01	0	0	0	6.2E+01	0	0
EET	MJ	0	0	9.81E+01	0	0	0	1.42E+02	0	0

HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy

RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional: 1 piece Folding Door 50 / 50E

Parameter	Unit	A1-A3	A4	A5	B6	C1	C2	C3	C4	D
PM	Disease incidence	2.25E-05	9.81E-09	5.23E-08	0	0	4.7E-09	7.58E-08	1.28E-07	-9.14E-06
IR	kBq U235 eq	3.26E+01	4E-03	3.6E-02	0	0	2E-03	5.2E-02	2.2E-02	-2.99E+01
ETP-fw	CTUe	5.35E+03	1.87E+01	4.02E+00	0	0	8.98E+00	5.81E+00	1.08E+01	-7.63E+02
HTP-c	CTUh	1.9E-05	3.53E-10	3.48E-10	0	0	1.69E-10	5.03E-10	1.6E-09	-7.25E-08
HTP-nc	CTUh	6.75E-06	1.51E-08	3.51E-08	0	0	7.22E-09	5.08E-08	1.76E-07	1.64E-06
SQP	SQP	7.19E+02	6.8E-02	3.2E+00	0	0	3.3E-02	4.64E+00	3.93E+00	-1.58E+02

PM = Potential incidence of disease due to PM emissions; IR = Potential Human exposure efficiency relative to U235; ETP-fw = Potential comparative Toxic Unit for ecosystems; HTP-c = Potential comparative Toxic Unit for humans (cancerogenic); HTP-nc = Potential comparative Toxic Unit for humans (not cancerogenic); SQP = Potential soil quality index

Disclaimer 1 – for the indicator “Potential Human exposure efficiency relative to U235”. This impact category deals mainly with the eventual impact of low-dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure or radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, radon and from some construction materials is also not measured by this indicator.

Disclaimer 2 – for the indicators “abiotic depletion potential for non-fossil resources”, “abiotic depletion potential for fossil resources”, “water (user) deprivation potential, deprivation-weighted water consumption”, “potential comparative toxic unit for ecosystems”, “potential comparative toxic unit for humans – cancerogenic”, “Potential comparative toxic unit for humans - not cancerogenic”, “potential soil quality index”. The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high as there is limited experience with the indicator.

This EPD was created using a software tool.

References

EN 18650

EN 18650-1:2010, Powered pedestrian doors Part 1: Product requirements and test methods

EN 18650

EN 18650-2:2010, Powered pedestrian doors Part 2: Safety at powered pedestrian doors

EN 16005

EN 16005: 2013-01, Power operated pedestrian doorsets - Safety in use Requirements and test methods

EN 60335

EN 60335-1, 2103:2020-08, Household and similar electrical appliances - Safety - Part 1: General requirements

EN 61000

EN 61000-1-2: 2017-07, Electromagnetic compatibility (EMC) Part 1-2: General - Methodology for the achievement of functional safety of electrical and electronic systems including equipment with regard to electromagnetic phenomena

ISO 13849

DIN EN ISO 13849-1:2021-08, Safety of machinery - Safety-related parts of control systems - Part 1: General principles for design

REACH

Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), Regulation (EC) No 1907/2006

2011/65/EU ROHS3 Directive

Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment

Machinery Directive

Directive 2006/42/EC of the European Parliament and of the Council on machinery, and amending Directive 95/16/EC

Further References

IBU 2021

General Instructions for the EPD programme of Institut Bauen und Umwelt e.V. Version 2.0, Berlin: Institut Bauen und Umwelt e.V., 2021. www.ibu-epd.com

GaBi

Sphera Solutions GmbH Gabi Software System and Database for Life Cycle Engineering 1992-2020 Version 10.0.0.71 University of Stuttgart Leinfelden Echterdingen

GaBi ts documentation

GaBi life cycle inventory data documentation (<https://www.gabisoftware.com/support/gabi/gabidatabase/2020lifecycledocumentation/>)

LCA-tool dormakaba

LCA tool, ENS doors Tool No.: IBU-DOR-202108-LT1-EN Developed by Sphera Solutions GmbH

PCR Part A

PCR – Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Project Report according to EN 15804+A2:2019, Version 1.0, Institut Bauen und Umwelt e.V., www.ibu-epd.com.

PCR Part B

PCR – Part B: Requirements on the EPD for Automatic doors, automatic gates, and revolving door systems, 08.2021, Institut Bauen und Umwelt e.V., www.ibu-epd.com.



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