

ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804+A2

Owner of the Declaration	dormakaba International Holding GmbH
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-DOR-20220166-CBA1-EN
Issue date	17.10.2022
Valid to	16.10.2027

**Kentaur
Dormakaba**

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General Information

Dormakaba

Programme holder

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

Declaration number

EPD-DOR-20220166-CBA1-EN

This declaration is based on the product category rules:

Electronic and physical Access Control Systems, 01.08.2021
(PCR checked and approved by the SVR)

Issue date

17.10.2022

Valid to

16.10.2027



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



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

Kentaur

Owner of the declaration

dormakaba International Holding GmbH
DORMA Platz 1
58256 Ennepetal
Germany

Declared product / declared unit

1 piece of the product: one (1) dormakaba Kentaur Full-Height Turnstile (FTS-E02), consisting of the following items:
- drive and control unit
- ground kit
- key for cylinder casing
- floor bearing for Full-height Turnstiles
- cement for Full-height Turnstiles
- maintenance flaps - fastening material - packaging material

Scope:

This EPD is a specific product declaration for the Kentaur Full-Height Turnstiles (FTS-E02).
The underlying life cycle assessment is based on the entire life cycle of this specific Kentaur Full-Height Turnstile.
The products are manufactured at the dormakaba production facility in Bühl (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 robust Kentaur Full-Height Turnstiles are especially suitable for securing the perimeter of buildings and property. Versatile versions enable individual combinations of multiple units to be put together. The end point locking system developed by dormakaba prevents people from being trapped in the gates.

Versatility

The Kentaur product series offers a modular design. Two, three and four-winged units with straight or U-shaped bars can be combined with each other. The same applies for units with bicycle doors, integrated doors, an emergency exit function of resistance class RC2. The roofs fit with any of the single, multiple or space-saving double units.

Minimal power consumption

The low-energy drive consumes little energy.

Safe passage

The end point locking implemented in Kentaur turnstiles prevents people from becoming trapped or jammed. After release the turnstile may be stopped at any time and rotated backwards as long as it has not yet completed half of its rotation.

Once the turnstile has completed half of its rotary motion, the unit can only be exited in the released direction. For the placing on the market in the European Union/European Free Trade Association (EU/EFTA) (with the exception of Switzerland) the following legal provisions apply:

- Machinery Directive 2006/42/EC
- 2014/30/EU Electromagnetic Compatibility Directive
- 2011/65/EU ROHS2 Directive
- DIN EN ISO 12100:2011-03 Safety of machinery
- DIN EN 16005: 2013-01 and Amendment 2015-10 Power operated pedestrian doorsets
- DIN EN ISO 13849- 1:2016-06 Safety of machinery
- DIN EN ISO 13849- 2:2013-02 Safety of machinery
- DIN EN 60335-2-103: 2016-05 Household and similar electrical appliances
- DIN EN 61000-3-2:2015-03 Electromagnetic compatibility (EMC)
- DIN EN 61000-6-2: 2005 and Amendment:2011 Electromagnetic Compatibility (EMC)
- DIN EN 61000-6-3:2007 and A1:2011 Electromagnetic Compatibility (EMC)

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

For the application and use the respective national provisions apply.

Application

For reliable security at:

- Manufacturing plants
- Company sites
- Airports and ports
- Power plants
- Car parks
- Bicycle stands
- Correctional facilities
- Military installations
- Educational centres
- Stadiums
- Amusement parks

Technical Data

Following technical data apply for the Kentaur Full-Height Turnstile (FTS-E02):

Technical data

Name	Value	Unit
Column diameter	1300	mm
Portal width	1540	mm
Total height (without opt. roof)	2270	mm
Passage height	2060	mm
Passage width	646	mm
Power supply	253	VA
Standby power consumption	20	VA
Protection classes Housing	33	IP
Protection classes Components conducting supply voltage	43	IP

Kentaur Full-Height Turnstiles include the following components:

- drive and control unit
- ground kit
- key for cylinder casing
- floor bearing for Full-Height Turnstiles
- cement for Full-Height Turnstiles
- maintenance flaps - fastening material - packaging material

The total weight of all components is 302,95 kg, including packaging (among others wooden pallets) 418,40 kg.

Product not harmonised in accordance with the CPR but in accordance with other provisions for harmonisation of the EU:

- Machinery Directive 2006/42/EC
- 2014/30/EU Electromagnetic Compatibility Directive
- 2011/65/EU ROHS2 Directive
- DIN EN ISO 12100:2011-03 Safety of machinery
- DIN EN 16005: 2013-01 and Amendment 2015-10 Power operated pedestrian doorsets
- DIN EN ISO 13849- 1:2016-06 Safety of machinery
- DIN EN ISO 13849- 2:2013-02 Safety of machinery
- DIN EN 60335-2-103: 2016-05 Household and similar electrical appliances
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Base materials/Ancillary materials

For the main Kentaur Full-Height Turnstiles (FTS-E02) product components the composition is the following:

Name	Value	Unit
Steel	79,57	%
Aluminium	2,2	%
Electric components	0,65	%
Plastic	1,59	%
Paper	0,69	%
Cement	15,3	%

The product includes partial articles which contain substances listed in the Candidate List of REACH Regulation

1907/2006/EC (date: 10.06.2022) exceeding 0.1 percentage by mass: no

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

LCA: Calculation rules

Declared Unit

The declared unit is 1 piece of product: 302,95 kg

Declared unit

Name	Value	Unit
Declared unit	1	pce.
Mass (total system excluding packaging)	306.49	kg

System boundary

Type of EPD: 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

Reference service life

The reference service life amounts to 15 years according to *EN 16005*.

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

- B6, operational energy use

The potential use of electricity from the grid is declared in module B6.

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

The end-of-life stage includes:

- C1, de-construction, 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: Germany

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	0.41	kg C
Biogenic carbon content in accompanying packaging	0.37	kg C

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

The following technical scenario information is required for the declared modules

Transport to the building site (A4)

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

Transport distance is declared for a distance of 100km by truck in order to allow scaling to a specific point of installation.

Installation into the building (A5)

Name	Value	Unit
Waste packaging (paper and plastic)		kg

Reference service life

Name	Value	Unit
Life Span according to the manufacturer	15	a

Operational energy use (B6)

The use stage is declared for 15 years

Name	Value	Unit
Days per year in use	365	days
On mode per day	1	hours
Idle mode per day	23	hours
On mode power	47	W
Idle mode power	9	W
Electricity consumption per 1 year	92,71	kWh

End of life (C1-C4)

C1: The product dismantling from the building is done manually without environmental burden.

Name	Value	Unit
Collected separately waste type waste type	306.49	kg
Recycling	252	kg
Energy recovery	3.69	kg
Landfilling	50.8	kg
Transport to waste management	50	km

The product is disassembled in a recycling process.

Material recycling is then assumed for the metals, electronics and electromechanics. The plastic components are assumed to be incinerated with energy recovery. Minor proportions of residues arising from the recycling process are landfilled.

The region for the End of Life is: Europe.

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

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	X	MNR	MNR	MNR	X	MND	X	X	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 piece Kentaur Full-Height Turnstiles

Parameter	Unit	A1-A3	A4	A5	B2	B6	C1	C2	C3	C4	D
GWP-total	kg CO ₂ eq	6.79E+02	2.68E+00	3.07E+00	0	5.62E+02	0	1.34E+00	1.14E+01	7.75E-01	-2.9E+02
GWP-fossil	kg CO ₂ eq	6.81E+02	2.56E+00	1.69E+00	0	5.6E+02	0	1.28E+00	9.41E+00	7.7E-01	-2.91E+02
GWP-biogenic	kg CO ₂ eq	-3.45E+00	1.18E-01	1.38E+00	0	1.87E+00	0	5.9E-02	1.99E+00	3E-03	1.11E+00
GWP-luluc	kg CO ₂ eq	1.06E+00	6.1E-05	1.17E-04	0	8.11E-01	0	3.05E-05	5.5E-04	2E-03	-4.95E-01
ODP	kg CFC11 eq	2.87E-10	2.71E-16	1.09E-15	0	1.23E-11	0	1.35E-16	4.98E-15	2.86E-15	-3.34E-10
AP	mol H ⁺ eq	3.09E+00	3E-03	6.91E-04	0	1.24E+00	0	1E-03	2E-03	6E-03	-1.28E+00
EP-freshwater	kg P eq	1.16E-03	5.48E-07	1.83E-07	0	1E-03	0	2.74E-07	7.91E-07	1.32E-06	-2.4E-04
EP-marine	kg N eq	4.43E-01	8.16E-04	2.1E-04	0	2.75E-01	0	4.08E-04	4.71E-04	1E-03	-1.95E-01
EP-terrestrial	mol N eq	4.79E+00	9E-03	3E-03	0	2.88E+00	0	5E-03	9E-03	1.6E-02	-2.12E+00
POCP	kg NMVOC eq	1.38E+00	2E-03	5.64E-04	0	7.52E-01	0	1E-03	1E-03	4E-03	-5.82E-01
ADPE	kg Sb eq	3.1E-02	7.68E-08	1.55E-08	0	1.62E-04	0	3.84E-08	6.88E-08	6.92E-08	-8E-03
ADPF	MJ	8.83E+03	3.63E+01	1.21E+00	0	9.84E+03	0	1.82E+01	4.78E+00	1.01E+01	-3.66E+03
WDP	m ³ world eq deprived	1.95E+02	5E-03	3.45E-01	0	1.22E+02	0	3E-03	1.17E+00	8.1E-02	-1.03E+02

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 Kentaur Full-Height Turnstiles

Parameter	Unit	A1-A3	A4	A5	B2	B6	C1	C2	C3	C4	D
PERE	MJ	2.57E+03	1.15E-01	1.23E+01	0	4.36E+03	0	5.7E-02	1.45E+01	1.32E+00	-9.33E+02
PERM	MJ	2.53E+01	0	-1.2E+01	0	0	0	0	-1.33E+01	0	0
PERT	MJ	2.6E+03	1.15E-01	2.81E-01	0	4.36E+03	0	5.7E-02	1.21E+00	1.32E+00	-9.33E+02
PENRE	MJ	8.65E+03	3.64E+01	2.92E+01	0	9.84E+03	0	1.82E+01	1.6E+02	1.01E+01	-3.66E+03
PENRM	MJ	1.83E+02	0	-2.8E+01	0	0	0	0	-1.55E+02	0	0
PENRT	MJ	8.84E+03	3.64E+01	1.21E+00	0	9.84E+03	0	1.82E+01	4.79E+00	1.01E+01	-3.66E+03
SM	kg	2.28E+02	0	0	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0	0
FW	m ³	7.79E+00	2.06E-04	8E-03	0	5.04E+00	0	1.03E-04	2.8E-02	3E-03	-4.48E+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 Kentaur Full-Height Turnstiles

Parameter	Unit	A1-A3	A4	A5	B2	B6	C1	C2	C3	C4	D
HWD	kg	3.22E-05	3.53E-09	3.58E-09	0	4.07E-06	0	1.76E-09	1.69E-08	1.54E-07	-1.59E-06
NHWD	kg	6.3E+01	4E-03	2.16E-01	0	6.98E+00	0	2E-03	9.89E-01	5.08E+01	-3.53E+01
RWD	kg	3.01E-01	3.9E-05	5.2E-05	0	1.49E+00	0	1.95E-05	1.86E-04	1.15E-04	-8.7E-02
CRU	kg	0	0	0	0	0	0	0	0	0	0
MFR	kg	0	0	0	0	0	0	0	2.51E+02	0	0
MER	kg	0	0	0	0	0	0	0	0	0	0
EEE	MJ	0	0	5.21E+00	0	0	0	0	0	0	0

EET	MJ	0	0	1.09E+01	0	0	0	0	0	0	0
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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 Kentaur Full-Height Turnstiles**

Parameter	Unit	A1-A3	A4	A5	B2	B6	C1	C2	C3	C4	D
PM	Disease incidence	4.85E-05	1.35E-08	5.95E-09	0	1.04E-05	0	6.74E-09	2.28E-08	6.84E-08	-2.5E-05
IR	kBq U235 eq	4.01E+01	6E-03	6E-03	0	2.45E+02	0	3E-03	1.8E-02	1.2E-02	-1.63E+01
ETP-fw	CTUe	3.81E+03	2.58E+01	5E-01	0	4.21E+03	0	1.29E+01	1.82E+00	5.78E+00	-1.83E+03
HTP-c	CTUh	7.97E-05	4.84E-10	3.61E-11	0	1.16E-07	0	2.42E-10	1.54E-10	8.56E-10	-5.27E-07
HTP-nc	CTUh	1.23E-05	2.07E-08	3.01E-09	0	4.28E-06	0	1.04E-08	1.48E-08	9.43E-08	-1.56E-06
SQP	SQP	2.13E+03	9.3E-02	3.48E-01	0	3.13E+03	0	4.7E-02	1.42E+00	2.11E+00	-4.66E+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.

References

DIN EN 16005

DIN EN 16005: 201301 and Amendment 2015-10 Power operated pedestrian doorsets

DIN EN 60335-2

DIN EN 603352103: 201605 Household and similar electrical appliances

DIN EN 61000-3-2

DIN EN 6100032: 201503 Electromagnetic

compatibility (EMC)

DIN EN 61000-6-2

DIN EN 6100062: 2005 and Amendment:2011 Electromagnetic Compatibility (EMC)

DIN EN 61000-6-3

DIN EN 6100063: 2007 and A1:2011 Electromagnetic Compatibility (EMC)

DIN EN ISO 12100

DIN EN ISO 12100:201103 Safety of machinery

DIN EN ISO 13849- 1

DIN EN ISO 138491: 201606 Safety of machinery

DIN EN ISO 13849- 2

DIN EN ISO 138492: 201302 Safety of machinery

EN 15804

EN 15804 + A2:2019, Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products.

ISO 9001

ISO 9001:201509 Quality management systems Requirements

ISO 14025

DIN EN ISO 14025:2011-10, Environmental labels and declarations — Type III environmental declarations — Principles and procedures.

Electromagnetic Compatibility Directive 2014/30/EU
DIRECTIVE 2014/30/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 26 February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility

European Waste Catalogue (EWC)
COMMISSION DECISION of 18 December 2014 amending Decision 2000/532/EC on the list of waste pursuant to Directive 2008/98/EC of the European Parliament and of the Council

Machinery Directive 2006/42/EC
DIRECTIVE 2006/42/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 17 May 2006 on machinery, and amending Directive 95/16/EC

REACH
Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) **ROHS2 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

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 ts software
Sphera Solutions GmbH Gabi Software System and Database

for Life Cycle Engineering 19922020 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\[1\]2020lcidocumentation/](https://www.gabisoftware.com/support/gabi/gabidatabase[1]2020lcidocumentation/)).

LCA-tool dormakaba

LCA tool, ESC (Entrance System Control) Tool No.: IBU-DOR-202109-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 electronic and physical Access Control Systems, version 1.2, Institut Bauen und Umwelt e.V., www.ibuepd.com, 2019.



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