ENVIRONMENTAL PRODUCT DECLARATION

as per *ISO 14025* and *EN 15804+A2*

Owner of the Declaration	DORMA Hüppe Raumtrennsysteme GmbH
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-DHR-20240217-IBA1-EN
Issue date	03.07.2024
Valid to	02.07.2029

VARIFLEX 88/100 Movable Wall System

DORMA Hüppe

Institut Bauen und Umwelt e.V.

ECO PLATFORM EPD VERIFIED

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General Information

DORMA Hüppe

Programme holder

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

Declaration number

EPD-DHR-20240217-IBA1-EN

This declaration is based on the product category rules:

Room partition systems, 01.08.2021
(PCR checked and approved by the SVR)

Issue date

03.07.2024

Valid to

02.07.2029

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

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

VARIFLEX 88/100 Movable Wall System

Owner of the declaration

DORMA Hüppe Raumtrennsysteme GmbH
Industriestraße 5
26655 Westerstede/ Ocholt
Germany

Declared product / declared unit

1 m2 of the product: VARIFLEX 100 consisting of the following items:

- Wall element
- Particle board with finish
- Product packaging

Scope:

This Environmental Product Declaration refers to a specific movable wall system manufactured by DORMA Hüppe. The production site is located in Westerstede/Ocholt (Germany).

Green electricity with Guarantee of Origin (GoO) is being used at this production site.

The data represents the year 2023.

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			
☐	internally	☒	externally

Matthias Klingler,
(Independent verifier)

Product

Product description/Product definition

The VARIFLEX 88/100 room partition system is a horizontally movable sound insulated partition wall system made of steel and aluminum, comprising individual elements which can be moved independently. A wide variety of design options is possible. The cover panels are acoustically self-supporting. An element height of up to 14.5 meters can be realized.

For the Variflex 88/100 the standards which can be applied are the following:

- *DIN 18032-3*
- *EN 16516*
- *ISO 6946*
- *ISO 9001*
- *ISO 10140*
- *ISO 14001*
- *ISO 22196*
- *2001/118/EC*
- *AgBB 2021*
- *WECOBIS 2012*

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

Application

Areas of application include:

- Offices
- Hotels
- Conference centers
- Trade fairs
- Schools
- Religious institutions
- Ateliers

Technical Data

The VARIFLEX 88/100 has following technical properties:

Name	Value	Unit
Sound reduction index to ISO 10140	39-59	dB
Heat transition coefficient to ISO 6946	0.4 - 0.59	W/(m²K)
Load from wall weight	0.36- 0.59	kN/m²

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 (m2) is listed below:

Name	Value	Unit
Particle board	50	%
Bitumen foil	21	%
Steel	17	%
Aluminum	5	%
Glass wool	2	%
Plastics	3	%
Cast zinc	1	%
Paper	1	%

The Variflex 88/100 Movable Wall Systems include partial articles which contain substances listed in the *Candidate List of REACH Regulation 1907/2006/EC* (date: 23.01.2024) exceeding 0.1 percentage by mass: no

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 the VARIFLEX 88/100 is about 25 years, depending on the application and frequency of use (approx. 50 closing cycles per year). For repairs and renewals, suitable spare parts are available.

LCA: Calculation rules

Declared Unit

The declared unit is 1 m^2 of the product: VARIFLEX 88/100 including packaging.

Name	Value	Unit
Declared unit	1	m^2
Grammage	48.27	kg/m^2
Layer thickness	0.1	m
Mass of declared Product	48,27	kg/m²

Other declared units are allowed if the conversion is shown transparently.

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)

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 (green electricity with Guarantee of Origin (GoO)), 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.

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: 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

Name	Value	Unit
Biogenic carbon content in product	12.2	kg C
Biogenic carbon content in accompanying packaging	12.2	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	0.00276	l/100km
Transport distance	100	km
Capacity utilization (including empty runs)	55	%

The product is transported via truck. The product is produced project specific in the DORMA Hüppe factory in Westerstede/Ocholt in Germany. The main distribution regions are Germany, Austria, UK, France and Switzerland. 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)	33,7	Kg

Reference service life

Name	Value	Unit
Life Span according to the manufacturer	25	a

End of life (C1-C4)

C1: The product dismantling from the building is done manually without environmental burden.
C2: Transport to waste management is 50 km.

Name	Value	Unit
Collected separately waste type waste type	48.27	kg
Recycling	8.97	kg
Energy recovery	31.5	kg
Landfilling	1.55	kg

The product is disassembled in a recycling process. Material recycling is then assumed for metals. The plastic components and wood are assumed to be incinerated with energy recovery. Glass wool is sent to landfill. 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	MND	MND	X	X	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 m2 Variflex 88/100 Movable Wall System

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq	2.5E+01	7.17E-01	5.82E+01	0	2.11E-01	7.75E+01	2.37E-02	-7.92E+01
GWP-fossil	kg CO_2 eq	1.06E+02	6.85E-01	1.31E+01	0	2.02E-01	3.16E+01	2.35E-02	-7.9E+01
GWP-biogenic	kg CO_2 eq	-8.12E+01	3.17E-02	4.51E+01	0	9.33E-03	4.59E+01	8.03E-05	-2.01E-01
GWP-luluc	kg CO_2 eq	1.19E-01	1.63E-05	1.3E-03	0	4.8E-06	2.19E-03	6.77E-05	-4.72E-02
ODP	kg CFC11 eq	6.43E-10	7.23E-17	1.31E-14	0	2.13E-17	2.12E-14	8.72E-17	-7.11E-11
AP	mol H^+ eq	4.97E-01	6.86E-04	1.07E-02	0	2.02E-04	1.22E-02	1.69E-04	-1.91E-01
EP-freshwater	kg P eq	4.43E-04	1.47E-07	2.22E-06	0	4.32E-08	3.33E-06	4.04E-08	-1.22E-04
EP-marine	kg N eq	9.17E-02	2.18E-04	3.05E-03	0	6.43E-05	3.41E-03	4.34E-05	-3.47E-02
EP-terrestrial	mol N eq	1.07E+00	2.43E-03	4.53E-02	0	7.14E-04	5.65E-02	4.77E-04	-3.72E-01
POCP	kg NMVOC eq	2.75E-01	6.17E-04	8.32E-03	0	1.82E-04	9.33E-03	1.31E-04	-1.11E-01
ADPE	kg Sb eq	2.12E-02	2.06E-08	1.94E-07	0	6.05E-09	3.04E-07	2.11E-09	-7.82E-03
ADPF	MJ	2.07E+03	9.72E+00	1.77E+01	0	2.86E+00	2.43E+01	3.08E-01	-1.24E+03
WDP	m^3 world eq deprived	1.12E+02	1.34E-03	6.4E+00	0	3.95E-04	7.96E+00	2.46E-03	-9.26E+00

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 m2 Variflex 88/100 Movable Wall System

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	MJ	8.17E+02	3.06E-02	3.75E+02	0	9.02E-03	4.65E+02	4.04E-02	-2.93E+02
PERM	MJ	8.3E+02	0	-3.71E+02	0	0	-4.59E+02	0	0
PERT	MJ	1.65E+03	3.06E-02	3.72E+00	0	9.02E-03	5.58E+00	4.04E-02	-2.93E+02
PENRE	MJ	1.84E+03	9.73E+00	2.24E+02	0	2.86E+00	5E+01	3.09E-01	-1.24E+03
PENRM	MJ	2.32E+02	0	-2.06E+02	0	0	-2.57E+01	0	0
PENRT	MJ	2.07E+03	9.73E+00	1.77E+01	0	2.86E+00	2.43E+01	3.09E-01	-1.24E+03
SM	kg	1.93E+00	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0
FW	m^3	2.87E+00	5.5E-05	1.51E-01	0	1.62E-05	1.88E-01	7.78E-05	-4.39E-01

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 m2 Variflex 88/100 Movable Wall System

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
HWD	kg	7.14E-06	9.43E-10	3.67E-08	0	2.78E-10	6.15E-08	4.7E-09	-7.98E-06
NHWD	kg	7.55E+00	9.94E-04	2.25E+00	0	2.93E-04	3.54E+00	1.55E+00	-2.09E+00
RWD	kg	6.82E-02	1.04E-05	8.75E-04	0	3.07E-06	1.1E-03	3.51E-06	-8.93E-02
CRU	kg	0	0	0	0	0	0	0	0
MFR	kg	0	0	0	0	0	8.97E+00	0	0
MER	kg	0	0	0	0	0	0	0	0
EEE	MJ	0	0	8.74E+01	0	0	1.24E+02	0	0
EET	MJ	0	0	1.69E+02	0	0	2.52E+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 m2 Variflex 88/100 Movable Wall System

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PM	Disease incidence	8.91E-06	3.61E-09	8.29E-08	0	1.06E-09	1.04E-07	2.09E-09	-2.25E-06
IR	kBq U235 eq	8.18E+00	1.49E-03	1.23E-01	0	4.39E-04	1.38E-01	3.61E-04	-1.45E+01
ETP-fw	CTUe	1.41E+03	6.89E+00	7.83E+00	0	2.03E+00	9.73E+00	1.76E-01	-3.34E+02
HTP-c	CTUh	2.11E-07	1.3E-10	5.97E-10	0	3.81E-11	7.54E-10	2.61E-11	6.45E-08
HTP-nc	CTUh	4.25E-06	5.54E-09	4.34E-08	0	1.63E-09	5.72E-08	2.88E-09	8.3E-06
SQP	SQP	7.51E+03	2.5E-02	5.01E+00	0	7.35E-03	7.07E+00	6.43E-02	-1.48E+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 15804
EN 15804+A2:2019+AC:2021, Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products

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ISO 14025
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REACH
Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH)

Further References

DIN 18032
DIN 18032-3:1997-04, Testing of safety against ball throwing

EN 16516
EN 16516 - 2020-10 Construction products: Testing and evaluation of the release of dangerous substances - Determination of emissions into indoor air

ISO 6946
ISO 6946:2008-04, Thermal resistance and thermal transmittance - Calculation method

ISO 9001
ISO 9001:2015-11, Quality management systems - Requirements

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ISO 14001
ISO 14001:2015 Environmental Management System

ISO 22196
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AgBB 2021
AgBB 2021 Health-related Evaluation of Volatile Organic Compounds (VVOC, VOC and SVOC) from Building Products

WECOBIS 2012
WECOBIS 2012 Ecological building material information system, German Ministry of Transport, Building and Urban Affairs

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GaBi
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-2020-lci documentation/)

dormakaba LCA-tool
LCA tool, Tool No.: IBU--DOR--202106--LT1--EN, developed by SpheraSolutions GmbH

PCR Part APCR – Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Project Re-port according to EN 15804+A2:2019, Version 1.0, 2020, Institut Bauen und Umwelt e.V., www.ibu-epd.com

PCR Part B
PCR – Part B: Requirements on the EPD for Room partition systems, version 08/2021, Institut Bauen und Umwelt e.V., www.ibu-epd.com

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