ENVIRONMENTAL PRODUCT DECLARATION

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

Owner of the Declaration	MMFA - Multilayer Modular Flooring Association
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-MMF-20240106-CBG1-EN
Issue date	04.06.2024
Valid to	03.06.2029

Vinyl- HDF- floor covering

MMFA (Multilayer Modular Flooring Association)

Institut Bauen und Umwelt e.V.

ECO PLATFORM EPD VERIFIED

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General Information

MMFA (Multilayer Modular Flooring Association)

Programme holder

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

Declaration number

EPD-MMF-20240106-CBG1-EN

This declaration is based on the product category rules:

Floor coverings, 01.08.2021
(PCR checked and approved by the SVR)

Issue date

04.06.2024

Valid to

03.06.2029

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

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Vinyl- HDF- floor covering

Owner of the declaration

MMFA - Multilayer Modular Flooring Association
Mittelstrasse 50
33602 Bielefeld
Germany

Declared product / declared unit

1 m² of Vinyl-HDF floor covering

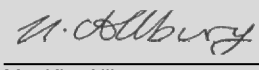
Scope:

This Environmental Product Declaration (EPD) is an association EPD and refers to a representative Vinyl-HDF floor covering produced by European manufacturers that are members of MMFA®.
Data are based upon production during 2022 in Europe. Data have been provided by 4 companies of MMFA which represent 66% percent of MMFA members.
The declared Vinyl-HDF floor covering represents a weighted average of best-selling products withing the thickness range of 9,1 - 10 mm, that meets the requirements of the use classes: 21-23, 31-34 according to EN ISO 20326 or EN 16511, ISO 10874.
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



Mrs Kim Allbury,
(Independent verifier)

Product

Product description/Product definition

Vinyl-HDF floor coverings described in this EPD are produced by member companies of MMFA®. The floor coverings meet the requirements of EN ISO 20326 or EN 16511.
Vinyl-HDF floorings consist of a number of layers. On the top side there is a PVC-decor with a transparent, wear-resistant contact surface which is varnished; in the middle there is a core layer made of high-density wood fibres (HDF) and on the back side there is a stabilizing layer to guarantee floor stability. Certain product constructions offer as well integrated impact sound insolation.
The decorative layer of a Vinyl-HDF floor covering can be printed with any design and gives the floor its individual appearance. For the placing on the market of the product in the European Union/European Free Trade Association (EU/EFTA) (with the exception of Switzerland) Regulation (EU) No. 305/2011 (CPR) applies. The product needs a declaration of performance taking into consideration EN 14041:2004+AC:2005+AC:2006 Resilient, textile and laminate floor coverings – Essential characteristics and the CE-marking. For the application and use the respective national provisions apply.

Application

The Vinyl-HDF floor covering described in this EPD is intended to be used within a building and meets the requirements of the use classes: 21-23, 31-34 according to EN ISO 20326 or EN 16511, EN ISO 10874.
For the application and use the respective national provisions apply.

Technical Data

The following table contains the construction data of the declared product group:

Constructional data

Name	Value	Unit
Product thickness	9.1 - 10	mm
Grammage	850 - 980	g/m^2
Product Form	Panel	-
Length of the surface layer	300 - 2500	mm
Width of the surface layer	70 - 600	mm
Length and width of squared elements	250 - 700	mm
Density	930 - 970	kg/m^3

Performance data of the product in accordance with the declaration of performance with respect to its essential characteristics according to EN 14041:2004+AC:2005+AC:2006.

Base materials/Ancillary materials

The composition of a Vinyl floor covering in mass % is:

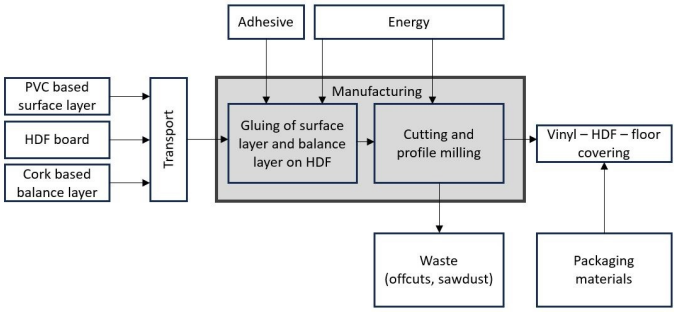
- 64 % High Density Fibre board (HDF)
- 31 % PVC
- 3 % Cork
- 2 % Adhesives

HDF (high-density fibreboard)
The core board is a HDF board composed of wood fibres and a thermosetting resin, mainly MUF (melamine-urea-formaldehyde) resin.
PVC based surface layer The surface layer consists of a transparent wear layer and a decorative layer.
Balance layer
The balance layer can consist of different material e.g. cork**.**

This product contains substances listed in the candidate list (date: 25.08.2023) exceeding 0.1 percentage by mass: **NO.**

Manufacturing

The illustration below describes the manufacturing process of the floor covering (simplified).



Packaging

As packaging materials mainly wooden pallets, cardboard and polyethylene-film are used. Wooden pallets can be used several times and can be recycled at the end of life. Cardboards and polyethylene-films can be fed into the recycling cycle in accordance with local regulations and possibilities and thus be reused.

Reference service life

The estimated service life of a floor covering depends e.g. on the type of floor covering and the area of application, the user and the maintenance of the product. Comparisons of different floor coverings are only allowed if these parameters are considered in a consistent way. A minimum service life of 20 years can be assumed, technical service life can be considerably longer (BNB refers to a service life of 20 years). The use stage is declared in this EPD for a one-year usage.

Extraordinary effect

Vinyl-HDF-floor coverings are normally in the reaction to fire class Cfl-s1 according to EN 13501-1.

Re-use phase

Vinyl-HDF-panels are installed loose laid and do have a high light resistance that delays a change in the decorative surface. They can thus be re-used in another flooring installation in case of careful and selective dismantling (damaged planks should be sorted out in any case).
Recycling solutions of the panels are not known in the moment. But all panels can be used for energy recovery in specific recovery facilities. A landfill of the material is not known.

Disposal

The European waste code is 17 02 03 (plastics).
If repeated use as floor coverings is no longer possible, the product can be sent for energy recovery to generate heat and electricity.
Open burning in a chimney is not possible, as the combustion of plastics leads to harmful emissions. Incineration should take place in a plant with a connected flue gas cleaning system, such as a waste incineration plant.
Dispose of in any case accordance with Federal, State and Local Waste Disposal Regulations.

LCA: Calculation rules

Declared Unit

Declared is 1 m^2 Vinyl- HDF- floor covering with the specifications listed in the table below.

Name	Value	Unit
Declared unit	1	m^2
Grammage	9.11	kg/m^2
Layer thickness	0.0095	m
Gross density	944	kg/m^3

The EPD declares an average of a specific product from factories of several manufacturers of floor coverings. The averaging was done by weighting according to the total production quantities of the manufacturers. The EPD is representative for the association MMFA. Regarding the variability of production data of the individual manufacturers, slight fluctuations can occur due to different production technologies, supply-chains and locations.

System boundary

Type of EPD: cradle to gate with options, modules A4, A5, B2, modules C1–C3, module D.

Modules A1-A3 include processes that provide materials and energy input for the system, manufacturing and transport processes up to the factory gate, as well as waste processing.

Module A4 includes transport of the floor covering to the place of installation (100km - truck diesel Euro 6).

Module A5 includes the incineration of packaging material. Installation efforts in form of offcuts or auxiliaries are not declared in the EPD.
For a simplified calculation of the environmental impact of 1 m² flooring including a certain amount of installation offcuts the values for the product stage (A1-A3), delivery (A4) and end of life (C, D) have to be multiplied with the amount of waste (e.g. 3% installation waste, factor 1.03).

Module B2 is including provision of cleaning agent, energy and water consumption for the cleaning of the floor covering incl. wastewater treatment. The LCA results in this EPD are declared for a one-year usage.

Module C1 considers manual deconstruction/ dismantling.

Module C2 includes transportation of post-consumer waste to a waste processing plant (50km - truck diesel Euro 6).

Module C3: 100% Incineration in a waste incineration plant in EU. The collection rate is set to 100%.

Module C4: As the product is incinerated at its end-of-life, this module is not relevant for this study and therefore not declared.

Module D includes potential benefits from all net flows given in modules A5 and C3 that leave the product boundary system after having passed the end-of-waste state in the form of recovery potential.

Geographic Representativeness

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

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. The used database is LCA FE (GaBi) 2023, version 2023.1.

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	2.719	kg C
Biogenic carbon content in accompanying packaging	0.086	kg C

Note: 1 kg of biogenic carbon is equivalent to 44/12 kg of CO_2.

Transport to the construction site (A4)

Name	Value	Unit
Litres of fuel	0.03	l/100km
Transport distance	100	km
Capacity utilisation (including empty runs)	55	%

Maintenance (B2) per year

Name	Value	Unit
Water consumption	0.0068	m^3
Auxiliary (Detergent)	0.051	kg
Electricity consumption	0.0739	kWh

End of Life (C1-C3)

Name	Value	Unit
Collected separately waste type	9.11	kg
Waste materials for energy recovery	9,11	kg

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

In module D, potential benefits from incineration processes in module A3, A5 and C3 are declared.

LCA: Results

The following tables display the LCA-results for 1 m² Vinyl- HDF- floor covering with a total thickness of 9.5 mm and a surface weight of 9.11 kg/m². LCA-results for module B2 declare a one-year usage.
The LCA-results are representative for MMFA Vinyl- HDF- floor coverings with the described product characteristics, including product composition and geographical scope, and a thickness within the range of the collected data (9.1 - 10 mm).

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	MND	MND	X	X	X	MND	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 m² Vinyl- HDF- floor covering

Parameter	Unit	A1-A3	A4	A5	B2	C1	C2	C3	D
GWP-total	kg CO_2 eq	5.73E+00	9.19E-02	3.42E-01	8.1E-02	0	3.9E-02	1.54E+01	-4.37E+00
GWP-fossil	kg CO_2 eq	1.56E+01	8.79E-02	4.84E-02	7.72E-02	0	3.73E-02	5.43E+00	-4.35E+00
GWP-biogenic	kg CO_2 eq	-9.82E+00	4.02E-03	2.94E-01	3.74E-03	0	1.7E-03	9.97E+00	-2.31E-02
GWP-luluc	kg CO_2 eq	9.84E-03	1.8E-06	2.06E-06	6.43E-06	0	7.61E-07	9.89E-04	-2.67E-04
ODP	kg CFC11 eq	5.73E-11	6.8E-15	4.07E-14	3.66E-13	0	2.88E-15	4.92E-12	-3.07E-11
AP	mol H^+ eq	4.28E-02	1.02E-04	6.73E-05	1.15E-04	0	4.53E-05	7.2E-03	-5.11E-03
EP-freshwater	kg P eq	3.47E-05	1.91E-08	1.18E-08	4.41E-06	0	8.1E-09	1.97E-06	-6.35E-06
EP-marine	kg N eq	1.3E-02	3.71E-05	2.17E-05	5.08E-05	0	1.69E-05	3.13E-03	-1.53E-03
EP-terrestrial	mol N eq	1.26E-01	4.21E-04	2.94E-04	3.75E-04	0	1.91E-04	3.78E-02	-1.64E-02
POCP	kg NMVOC eq	3.49E-02	9.64E-05	5.86E-05	1.4E-04	0	4.3E-05	8.07E-03	-4.28E-03
ADPE	kg Sb eq	1.88E-06	9.49E-10	3.74E-10	6.01E-09	0	4.02E-10	4.66E-08	-2.85E-07
ADPF	MJ	2.31E+02	1.27E+00	1.02E-01	1.78E+00	0	5.37E-01	1.04E+01	-7.85E+01
WDP	m^3 world eq deprived	2.56E+00	1.61E-04	3.86E-02	1.36E-02	0	6.8E-05	1.66E+00	-3.72E-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 m² Vinyl- HDF- floor covering

Parameter	Unit	A1-A3	A4	A5	B2	C1	C2	C3	D
PERE	MJ	6.15E+01	5.34E-03	3.53E+00	1.39E-01	0	2.26E-03	1.03E+02	-2.1E+01
PERM	MJ	1.04E+02	0	-3.5E+00	0	0	0	-1E+02	0
PERT	MJ	1.65E+02	5.34E-03	2.49E-02	1.39E-01	0	2.26E-03	2.78E+00	-2.1E+01
PENRE	MJ	1.93E+02	1.27E+00	4.87E-01	1.8E+00	0	5.39E-01	4.89E+01	-7.86E+01
PENRM	MJ	3.9E+01	0	-3.86E-01	0	0	0	-3.86E+01	0
PENRT	MJ	2.32E+02	1.27E+00	1.02E-01	1.8E+00	0	5.39E-01	1.04E+01	-7.86E+01
SM	kg	0	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	7.72E-02	6.95E-06	9.09E-04	4.7E-04	0	2.94E-06	3.99E-02	-1.7E-02

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 Vinyl- HDF- floor covering

Parameter	Unit	A1-A3	A4	A5	B2	C1	C2	C3	D
HWD	kg	3.45E-06	3.07E-12	2.35E-12	8.69E-11	0	1.3E-12	1.27E-10	-5E-09
NHWD	kg	3.31E-01	1.16E-04	1.11E-02	7.12E-03	0	4.9E-05	1.88E+00	-3.73E-02
RWD	kg	6.86E-03	1.44E-06	5.23E-06	1.22E-04	0	6.1E-07	4.29E-04	-5.56E-03
CRU	kg	0	0	0	0	0	0	0	0
MFR	kg	0	0	0	0	0	0	0	0

MER	kg	0	0	0	0	0	0	0	0
EEE	MJ	1.15E+00	0	5.09E-01	0	0	0	1.68E+01	0
EET	MJ	2.37E+00	0	9.17E-01	0	0	0	3.6E+01	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 Vinyl- HDF- floor covering

Parameter	Unit	A1-A3	A4	A5	B2	C1	C2	C3	D
PM	Disease incidence	6.8E-07	6.31E-10	4.41E-10	9.78E-10	0	3.42E-10	4.05E-08	-4.34E-08
IR	kBq U235 eq	9.25E-01	2.05E-04	8.18E-04	1.76E-02	0	8.67E-05	6.05E-02	-9.24E-01
ETP-fw	CTUe	7.83E+01	8.88E-01	5.04E-02	1.13E+00	0	3.76E-01	5.55E+00	-1.58E+01
HTP-c	CTUh	5.42E-08	1.64E-11	3.57E-12	3.13E-11	0	6.93E-12	3.29E-10	-8.47E-10
HTP-nc	CTUh	1.46E-07	6.74E-10	2.32E-10	2.49E-09	0	2.85E-10	2.59E-08	-2.69E-08
SQP	SQP	4.59E+02	4.04E-03	2.92E-02	1.19E-01	0	1.71E-03	2.96E+00	-1.38E+01

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

Standards

EN ISO 10874
EN ISO 10874:2012 + A1:2020, Resilient, textile and laminate floor coverings - Classification.

EN 13501-1

EN 13501-1:2019-01-14;Fire classification of construction products and building elements.

EN 14041
EN 14041:2004+AC:2005+AC:2006, Resilient, textile and laminate floor coverings – Essential characteristics.

EN 15804
EN 15804:2012+A1 2013, Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products.

EN 15804
EN 15804:2012+A2:2019+AC:2021, Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products.

EN 16511
EN 16511:2023; Modular mechanical locked floor coverings (MMF) – Specification, requirements and test method for multilayer modular panels for floating installation.

EN ISO 20326
EN ISO 20326:2018 + A1:2020, Resilient floor coverings – Specification for floor panels/assembly for loose laying.

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

Further References

BNB
BBSR table (german): 'Nutzungsdauern von Bauteilen zur Lebenszyklusanalyse nach BNB', Bundesinstitut für Bau-, Stadt- und Raumforschung, Referat II Nachhaltiges Bauen; online available under: https://www.nachhaltigesbauen.de/austausch/nutzungsdauern-von-bauteilen/, 2017.

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IBU PCR Part A
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