ENVIRONMENTAL PRODUCT DECLARATION

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

Owner of the Declaration	Alloc AS
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-BAC-20220057-CBA1-EN
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Valid to	31.01.2028

BerryAlloc HPF
High Pressure Laminate Floor Covering

Institut Bauen und Umwelt e.V.

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ECO PLATFORM EPD VERIFIED

General Information

BerryAlloc	BerryAlloc HPF
Programme holder IBU – Institut Bauen und Umwelt e.V. Hegelplatz 1 10117 Berlin Germany	**Owner of the declaration** Alloc AS Fiboveien 26 4580 Lyngdal Norway
Declaration number EPD-BAC-20220057-CBA1-EN	**Declared product / declared unit** 1 m² high pressure laminate floor covering (9 mm, 8.67 kg/m²)
This declaration is based on the product category rules: Floor coverings, 09.2022 (PCR checked and approved by the SVR)	**Scope:** This Environmental Product Declaration refers to 1 m² HPF floor covering with a thickness of 9 mm and a grammage of 8.67 kg/m². The production site is located in Lyngdal, Norway. The data is based on production during 2019/2020. In order to enable the user of this EPD to calculate the LCA results for different product variances this EPD contains the respective calculation factors: • Additional thickness: 10.3 mm • Product including underlayment: for thickness 9 mm and 10.3 mm
Issue date 01.02.2023	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*.
Valid to 31.01.2028	**Verification** The standard *EN 15804* serves as the core PCR Independent verification of the declaration and data according to *ISO 14025:2011* ☐ internally ☒ externally
Dipl. Ing. Hans Peters (chairman of Institut Bauen und Umwelt e.V.)	Dipl. Natw. ETH Sascha Iqbal (Independent verifier)
Dr. Alexander Röder (Managing Director Institut Bauen und Umwelt e.V.))	

Product

Product description/Product definition
BerryAlloc HPF is a durable high pressure laminate floor covering performing according to the product standard *EN 13329* and *Regulation (EU) No 305/2011*, taking into consideration *EN 14041*. The complete manufacturing process is located in Lyngdal, Norway.
The surface consists of several paper layers. The top layer has a transparent wear-resistant surface above a decorative paper. The body of the top layer is made of Kraft papers with a more flexible performance.
The core consists of an impregnated high-density fiberboard (HDF).
The backing layer consists of a balancing paper with PE.
Optionally the product contains an underlayment. This underlayment (HEPS, High Elastified Polystyrene) is pre-attached to the backside of the floorboard.

The declared product has a thickness of 9 mm. In order to enable the user of this EPD to calculate the LCA results for different product variances this EPD contains the respective calculation factors:

- Additional thickness: 10.3 mm
- Product including underlayment: for thickness 9 mm and 10.3 mm

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 13329* and the CE-marking.

For the application and use the respective national provisions apply.

Application
The HPF floor covering described in this EPD is intended to be used within a building, for the classes 21-23 and 31-34 described in the accompanying descriptions, according to *EN 13329* and *ISO 10 874*.

Technical Data

Constructional data

Name	Value	Unit
Product thickness (thickness of the element) acc. to EN 13329	9 - 10.3	mm
Grammage (9 mm)	8670	g/m^2
Abrasion Class acc. to AC EN 13329	AC6	-
Product Form	Panel	-
Length of the surface layer acc. to EN 13329	1207 - 2410	mm
Width of the surface layer acc. to EN 13329	198 - 303	mm
Density acc. to EN 323	930 - 1030	kg/m^3
Layer thickness (top layer) EN 324-1	0.6	mm

For detailed technical data: Technical datasheet for each individual product are available.

Performance data of the product in accordance with the declaration of performance with respect to its essential characteristics according to *EN 13329.*

Base materials/Ancillary materials

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

- 83 % High-Density Fibre-board (HDF)
- 7 % paper
- 4,5 % resin
- 3,5 % aluminium (locking system)
- 1,5 % plastic
- <1 % corundum

HDF (high-density fibreboard)
The core board is an HDF board composed of wood fibres and a thermosetting resin, mainly MUF (melamine-urea-formaldehyde) resin.
Paper
The renewable resource wood is the main raw material for paper production.
Resins
The used amino resins are melamine-urea-formaldehyde and phenol
resins. Amino resins are thermosetting
resins that are cured using heat and pressure.
Aluminium
Mechanical locking system that allows planks to be precisely aligned and joined without using glue or special tools.
Plastic
HEPS underlayment for step-sound reduction.
Corundum
Bauxite is the mineral resource of corundum. By using aluminium oxide (Al_2O_3) the surface layer of a HPF floor covering obtains abrasion and wear resistance.
HPF floor coverings do not contain substances that are listed in the "Candidate List of Substances of Very High Concern for Authorisation" *REACH* (version as of 10-Jun-2022, 224 list entry results).

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 himself and the maintenance of the product. Comparisons of different floor coverings are only allowed if these parameters are considered in a consistent way.
According to Bundesinstitut für Bau, Stadt und Raumforschung *(BBSR)*, a reference service life of 20 years can be assumed for laminate floor coverings. Technical service life can be considerably longer.
20 years is the minimum reference service life for HPF floor coverings. For residential use, BerryAlloc offers a warranty for a lifetime > 20 years, while for commercial use BerryAlloc offers a warranty of 10 years (www.berryalloc.com).
The use stage is declared in this EPD for a one year usage assuming a 90 % domestic and 10 % commercial level of use.

Factors for different thicknesses
The LCA results for the HPF floor covering declared in this EPD refer to a laminate floor covering with the chosen thickness of 9 mm, which meets the requirements of the use class 34 according to *EN 13329* and *EN ISO 10874*. In order to enable the user of the EPD to calculate the results for a thickness of 10.3 mm and use class 34 the factors in the following table can be used for the calculation. For A1-A3, A4, A5, B2 and D the LCA results of the declared product (thickness 9 mm) have to be multiplied by these factors.

Factors to calculate the results for a **10.3 mm HPF flooring**:

thickness	10,3 mm							
Use class	34							
Parameter	Factors for A1-A3	Factors for A4	Factors for A5	Factors for B1	Factors for B2	Factors for C2	Factors for C3	Factors for D
GWP – total	1,32	1,17	1,32	1,00	1,00	1,16	1,17	1,17
GWP – fossil	1,12							
GWP – biogenic	1,18							
GWP – luluc	1,16							
ODP	1,05							
AP	1,09							
EP – freshwater	1,10							
EP – marine	1,09							
EP – terres-trial	1,08							
POCP	1,08							
ADPE	1,12							
ADPF	1,11							
PERT	1,18							
PENRT	1,12							

Factors to calculate the results for a **9 mm HPF flooring with underlayment**:

thickness	9 mm with underlayment							
Use class	34							
Parameter	Factors for A1-A3	Factors for A4	Factors for A5	Factors for B1	Factors for B2	Factors for C2	Factors for C3	Factors for D
GWP – total	0,92	1,01	1,00	1,00	1,01	1,01	1,02	1,01
GWP – fossil	1,04						3,64	
GWP – biogenic	1,00						1,00	
GWP – luluc	1,01						1,09	
ODP	1,00						1,15	
AP	1,01						1,01	
EP – freshwater	1,02						1,12	
EP – marine	1,01						1,01	
EP – terrestrial	1,01						1,02	
POCP	1,01						1,01	
ADPE	1,03						1,15	
ADPF	1,05						1,22	
PERT	1,01						1,19	
PENRT	1,05						1,22	

Factors to calculate the results for **10.3 mm HPF flooring with underlayment**:

thickness	10,3 mm with underlayment							
Use class	34							
Parameter	Factors for A1-A3	Factors for A4	Factors for A5	Factors for B1	Factors for B2	Factors for C2	Factors for C3	Factors for D
GWP – total	1,24	1,18	1,32	1,00	1,00	1,17	1,20	1,18
GWP – fossil	1,16						4,21	
GWP – biogenic	1,18						1,17	
GWP – luluc	1,18						1,26	
ODP	1,05						1,33	
AP	1,10						1,17	
EP – freshwater	1,12						1,29	
EP – marine	1,10						1,18	
EP – terrestrial	1,09						1,18	
POCP	1,10						1,18	
ADPE	1,14						1,34	
ADPF	1,17						1,41	
PERT	1,18						1,38	
PENRT	1,17						1,41	

LCA: Calculation rules

Declared Unit
The functional unit is 1 m² HPF floor covering (8.67 kg/m², thickness 9 mm).

Declared unit

Name	Value	Unit
Declared unit	1	m^2
Grammage	8.67	kg/m^2
Layer thickness	0.009	m

System boundary
Type of EPD: cradle-to-gate - with options, modules C1–C4, and module D (A1–A3, C, D and additional modules, namely A4, A5, B1 and B2).

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 the transport to the point of installation.

Module A5 includes packaging waste processing during the construction process. Waste treatment in a waste incineration plant is assumed. Credits from energy substitution are declared in module D.

Module B1 includes the Volatile Organic Compounds (VOC) and formaldehyde emissions occurring during the lifetime of the product.

Module B2 includes the cleaning of the floor covering. Provision of water, cleaning agent and electricity for the cleaning of the floor covering is considered, incl. wastewater treatment. The LCA results in this EPD are declared for a one year usage assuming 90 % domestic and 10 % commercial level of use.

Modules C1 - C3 include manual dismantling, the transport to the end of life as well as the incineration of the product in a European biomass CHP plant. The release of biogenic carbon from incineration of the wood fraction (biogenic carbon) of the HPF floor covering is also covered by module C3.

Module D includes benefits from all net flows that leave the product boundary system.

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.

LCA Software: *GaBi ts software*

LCA: Scenarios and additional technical information

Characteristic product properties
Information on biogenic carbon
Note: 1 kg biogenic carbon is equivalent to 44/12 kg of CO_2

Information on describing the biogenic Carbon Content at factory gate

Name	Value	Unit
Biogenic carbon content in product	2.8	kg C
Biogenic carbon content in accompanying packaging	0.174	kg C

The following technical information is a basis for the declared modules or can be used for developing specific scenarios in the context of a building assessment.

Transport to the construction site (A4)

Name	Value	Unit
Litres of fuel (consumption per kg)	0.00159	l/100km
Transport distance	250	km
Capacity utilisation (including empty runs)	85	%

For the calculation of a transport distance to a specific point of installation, the declared value for 250 km should be multiplied accordingly.

Installation in the building (A5)

Name	Value	Unit
Output substances following waste treatment on site (packaging material)	0.45	kg

The amount of installation waste varies and is not declared in this EPD. For the calculation of the environmental impact of 1 m² HPF floor covering including a certain amount of installation waste, the values for the production stage (A1-A3), delivery (A4), installation (A5) and end-of-life (D) have to be multiplied with the amount of waste (e.g. 3% installation waste, factor 1.03).
No installation auxiliaries are considered in the installation scenario.

Use (B1)

Environmental impacts from the use of the installed HDF results from emissions into the air. The following emissions are considered in Module B1.

Name	Value	Unit
Formaldehyde emissions (for the RSL)	139	mg/m²
VOC emissions (for the RSL)	37	mg/m²

Maintenance (B2)

The common cleaning method for HPF floor coverings is damp mopping. Loose dirt should be removed by means of a dry mop or a vacuum cleaner.

In case of higher requirements on hygiene (e.g. hospitals, care homes) or strongly frequented areas (shops) a need for a higher cleaning frequency is possible.

Name	Value	Unit
Maintenance cycle (cleaning frequency per year)	120	Number/RSL
Water consumption	0.0068	m^3
Auxiliary (generic detergent)	0.0507	kg
Electricity consumption	0.074	kWh

Reference service life

Name	Value	Unit
Reference service life	20	a

End of Life (C1-C4)
The end-of-life scenarios are as follows:
C1 – The deconstruction of the HDF is assumed to be done manually
C2 – Transport to treatment/disposal site: average transport distance from the demolition site to waste treatment is assumed as 50 km.
C3 – Waste treatment: the HDF flooring is 100 % combusted in a European biomass CHP plant. The efficiency of energy recovery from HDF waste during incineration exceeds the R1 value of 0.6.

Name	Value	Unit
Collected separately	8.67	kg
Energy recovery	8.67	kg

Reuse, recovery and/or recycling potentials (D), relevant scenario information
For the thermal and electrical energy generated in Module A5 (treatment of packaging) and Module C3 (treatment of HDF product), avoided burdens have been calculated by the inversion of electricity grid mix and thermal energy from natural gas, using European datasets.

LCA: Results

The results for module B2 refer to a period of one year.
The module D contains the loads and benefits beyond the system boundaries.

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; ND = 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	X	X	MNR	MNR	MNR	ND	ND	X	X	X	ND	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 m² HPF floor covering (9 mm, 8.67 kg/m²)

Core Indicator	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	D
GWP-total	[kg CO_2-Eq.]	-3.58E+0	1.12E-1	6.43E-1	0.00E+0	7.43E-2	0.00E+0	2.66E-2	1.04E+1	-8.23E+0
GWP-fossil	[kg CO_2-Eq.]	7.03E+0	1.11E-1	9.57E-2	0.00E+0	7.02E-2	0.00E+0	2.64E-2	8.43E-2	-8.18E+0
GWP-biogenic	[kg CO_2-Eq.]	-1.06E+1	0.00E+0	5.47E-1	0.00E+0	4.03E-3	0.00E+0	0.00E+0	1.03E+1	-4.41E-2
GWP-luluc	[kg CO_2-Eq.]	8.42E-3	9.18E-4	8.57E-6	0.00E+0	6.78E-5	0.00E+0	2.18E-4	2.23E-5	-6.33E-3
ODP	[kg CFC11-Eq.]	9.83E-12	1.47E-17	9.93E-17	0.00E+0	8.32E-16	0.00E+0	3.40E-18	1.91E-16	-1.05E-13
AP	[mol H^+-Eq.]	3.76E-2	6.35E-4	8.97E-5	0.00E+0	2.42E-4	0.00E+0	1.53E-4	1.68E-2	-1.14E-2
EP-freshwater	[kg P-Eq.]	2.06E-5	3.33E-7	1.41E-8	0.00E+0	4.44E-6	0.00E+0	7.91E-8	3.79E-8	-1.20E-5
EP-marine	[kg N-Eq.]	1.59E-2	3.10E-4	2.88E-5	0.00E+0	6.14E-5	0.00E+0	7.51E-5	4.13E-3	-3.15E-3
EP-terrestrial	[mol N-Eq.]	1.64E-1	3.44E-3	4.25E-4	0.00E+0	4.91E-4	0.00E+0	8.32E-4	4.56E-2	-3.37E-2
POCP	[kg NMVOC-Eq.]	3.83E-2	5.98E-4	7.88E-5	1.71E-4	1.47E-4	0.00E+0	1.45E-4	1.34E-2	-8.81E-3
ADPE	[kg Sb-Eq.]	1.29E-6	8.61E-9	1.49E-9	0.00E+0	8.46E-8	0.00E+0	2.03E-9	3.26E-9	-1.48E-6
ADPF	[MJ]	1.48E+2	1.49E+0	1.54E-1	0.00E+0	1.60E+0	0.00E+0	3.55E-1	2.79E-1	-1.42E+2
WDP	[m^3 world-Eq deprived]	6.60E-1	9.77E-4	6.62E-2	0.00E+0	2.05E-2	0.00E+0	2.31E-4	4.55E-1	-7.05E-1

Caption	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 HPF floor covering (9 mm, 8.67 kg/m²)

Indicator	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	D
PERE	[MJ]	4.60E+1	8.34E-2	6.32E+0	0.00E+0	2.86E-1	0.00E+0	1.98E-2	1.10E+2	-3.61E+1
PERM	[MJ]	1.16E+2	0.00E+0	-6.29E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	-1.10E+2	0.00E+0
PERT	[MJ]	1.62E+2	8.34E-2	3.07E-2	0.00E+0	2.86E-1	0.00E+0	1.98E-2	4.66E-2	-3.61E+1
PENRE	[MJ]	1.09E+2	1.50E+0	1.66E+0	0.00E+0	1.60E+0	0.00E+0	3.55E-1	3.73E+1	-1.42E+2
PENRM	[MJ]	3.85E+1	0.00E+0	-1.51E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	-3.70E+1	0.00E+0
PENRT	[MJ]	1.48E+2	1.50E+0	1.54E-1	0.00E+0	1.60E+0	0.00E+0	3.55E-1	2.79E-1	-1.42E+2
SM	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
RSF	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
NRSF	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
FW	[m^3]	3.66E-2	9.55E-5	1.56E-3	0.00E+0	6.08E-4	0.00E+0	2.27E-5	1.06E-2	-3.52E-2

Caption	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 HPF floor covering (9 mm, 8.67 kg/m²)

Indicator	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	D
HWD	[kg]	2.15E-7	7.55E-11	2.78E-11	0.00E+0	3.51E-6	0.00E+0	1.79E-11	6.61E-10	-3.26E-8
NHWD	[kg]	1.72E-1	2.23E-4	1.24E-2	0.00E+0	7.32E-3	0.00E+0	5.28E-5	7.42E-2	-7.08E-2
RWD	[kg]	6.84E-3	1.85E-6	7.99E-6	0.00E+0	9.60E-5	0.00E+0	4.30E-7	6.60E-6	-1.16E-2
CRU	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
MFR	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
MER	[kg]	0.00E+0	0.00E+0	3.40E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	8.67E+0	0.00E+0
EEE	[MJ]	0.00E+0	0.00E+0	9.92E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	3.86E+1	0.00E+0
EET	[MJ]	0.00E+0	0.00E+0	1.78E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	5.47E+1	0.00E+0

Caption	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 HPF floor covering (9 mm, 8.67 kg/m²)

Indicator	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	D
PM	[Disease Incidence]	3.61E-7	2.19E-9	5.52E-10	0.00E+0	1.89E-9	0.00E+0	5.35E-10	7.20E-8	-9.78E-8
IRP	[kBq U235-Eq.]	9.40E-1	2.66E-4	1.23E-3	0.00E+0	1.57E-2	0.00E+0	6.15E-5	6.70E-4	-1.91E+0
ETP-fw	[CTUe]	4.57E+1	1.08E+0	7.63E-2	7.85E-3	1.49E+0	0.00E+0	2.56E-1	3.51E-1	-3.33E+1
HTP-c	[CTUh]	6.75E-8	2.18E-11	4.81E-12	4.89E-10	3.54E-11	0.00E+0	5.17E-12	9.93E-10	-1.40E-9
HTP-nc	[CTUh]	8.78E-8	1.20E-9	2.67E-10	1.47E-11	2.58E-9	0.00E+0	2.86E-10	8.65E-8	-5.47E-8
SQP	[-]	8.09E+2	5.13E-1	4.12E-2	0.00E+0	2.04E-1	0.00E+0	1.22E-1	4.64E-2	-2.47E+1

Caption	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 323
EN 323: 1993: Wood-based panels; determination of density

EN 324-1
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