

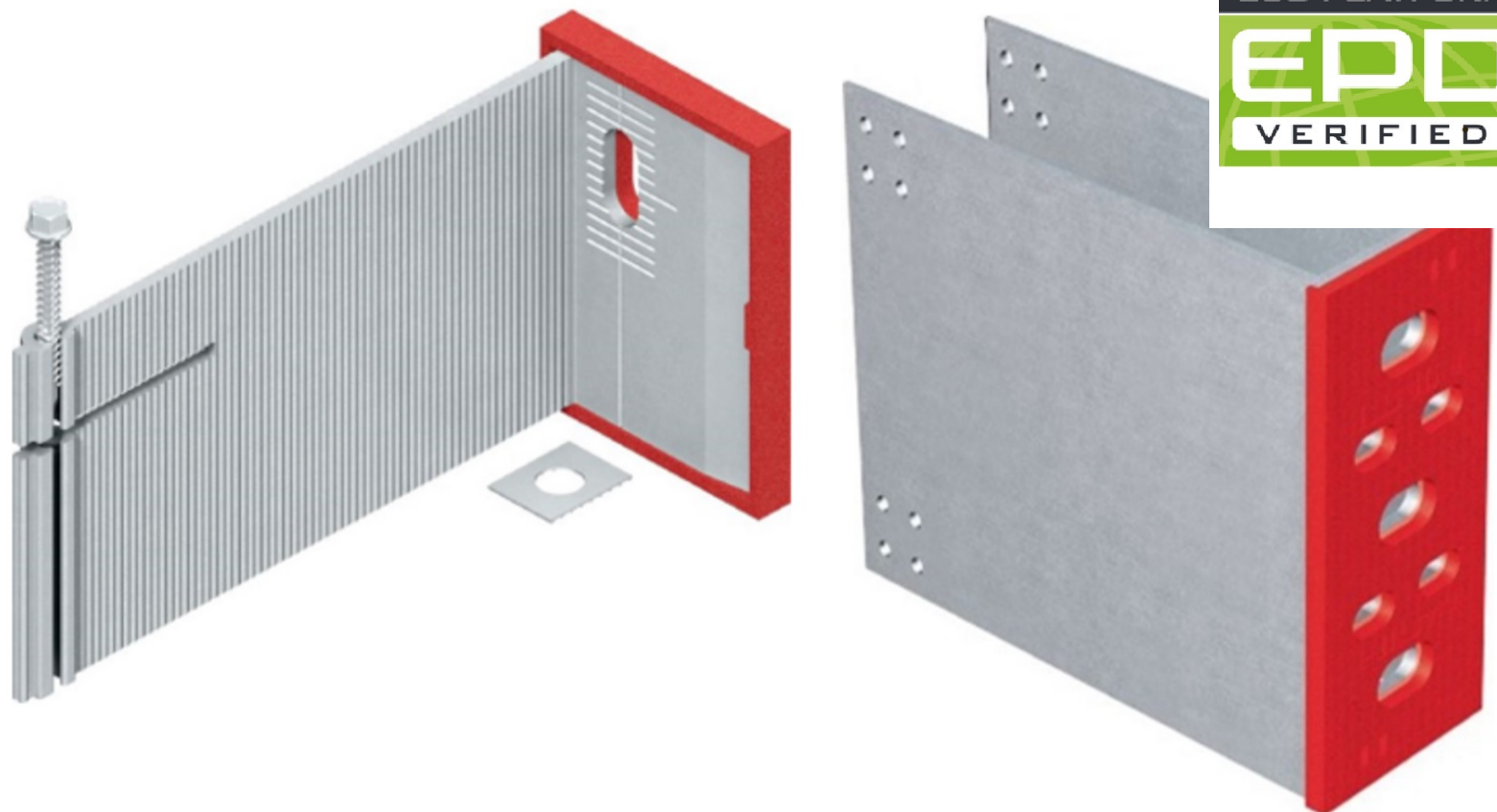
ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804+A2

Owner of the Declaration	Hilti Aktiengesellschaft
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-HIL-20230439-IBA1-EN
Issue date	18.12.2023
Valid to	17.12.2028

MFT FOX H & MFT S2S
Hilti AG

www.ibu-epd.com | <https://epd-online.com>



General Information

Hilti AG

Programme holder

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

Declaration number

EPD-HIL-20230439-IBA1-EN

This declaration is based on the product category rules:

Building metals, 01.08.2021
(PCR checked and approved by the SVR)

Issue date

18.12.2023

Valid to

17.12.2028

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

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

MFT FOX H & MFT S2S

Owner of the declaration

Hilti Aktiengesellschaft
Feldkircher Strasse 100
9494 Schaan
Liechtenstein

Declared product / declared unit

The declared product is the MFT-FOX HI 300 M 11 as a representative product for the MFT-FOX H and MFT-S2S portfolio. The declared unit is 1 kg of product. The packaging is also included in the calculation.

Scope:

This document relates to the MFT-FOX HI 300 M 11 as a representative product for the MFT-FOX H and the MFT-S2S products. FOX H and S2S products cover the same applications and are very similar in material constitution and therefore, have been summarized in this EPD. Both portfolios can be divided into two classes per bracket size. The first class contains the products without the isolator of Polypropylene and a pre-assembled screw. The second class contains the same products but with an additional plastic part of polypropylene named isolator. The declared product for this EPD is chosen from the second class, because it can be assumed that the environmental impacts are higher with the isolator and the steel screw that is included in the MFT-FOX H product line. Moreover, FOX HI 300 M is chosen as a representative because it displays the highest weight of the product group. 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

Prof. Dr. Birgit Grahl,
(Independent verifier)

Product

Product description/Product definition

MFT-FOX HI and MFT FOX-S2S are designed as an aluminium substructure system. The brackets are suitable for all façade cladding.

The products are used for fastening ventilated façade substructure to

concrete, masonry, steel frame structure and wood. They enable

mounting façade substructures on the primary structure

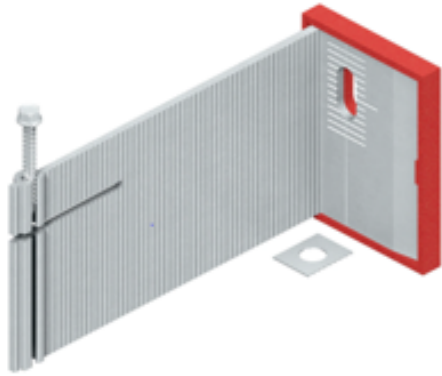
as a helping hand bracket and can be used to install vertical

and horizontal support rails.

Product according to the CPR based on a hEN:

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 1090-1:2009+A1:2011.

FOX H



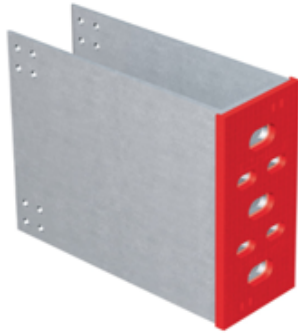
Name	Article number	weight/item [kg]
MFT-FOX HI 120 M 6,5	2084329	0,14
MFT-FOX HI 100 M 6,5	2084326	0,13
MFT-FOX HI 80 M 11	2084324	0,12
MFT-FOX HI 80 M 6,5	2084323	0,12
MFT-FOX HI 60 M 11	2084321	0,11
MFT-FOX HI 300 M 5	2084355	0,34
MFT-FOX HI 280 M 5	2084352	0,32
MFT-FOX HI 140 M 5	2084331	0,18
MFT-FOX HI 160 M 5	2084334	0,20
MFT-FOX HI 180 M 5	2084337	0,22
MFT-FOX HI 200 M 5	2084340	0,23
MFT-FOX HI 220 M 5	2084343	0,27
MFT-FOX HI 100 M 5	2084325	0,13
MFT-FOX HI 80 M 5	2084322	0,12
MFT-FOX HI 60 M 5	2084229	0,11
MFT-FOX HI 240 M 5	2084346	0,29
MFT-FOX HI 260 M 5	2084349	0,31
MFT-FOX HI 120 M 11	2084330	0,14
MFT-FOX HI 140 M 11	2084333	0,18
MFT-FOX HI 160 M 6,5	2084335	0,20
MFT-FOX HI 180 M 6,5	2084338	0,21
MFT-FOX HI 180 M 11	2084339	0,22
MFT-FOX HI 200 M 6,5	2084341	0,23
MFT-FOX HI 200 M 11	2084342	0,23
MFT-FOX HI 220 M 11	2084345	0,27
MFT-FOX HI 240 M 11	2084348	0,29
MFT-FOX HI 260 M 11	2084351	0,30
MFT-FOX HI 280 M 11	2084354	0,32
MFT-FOX HI 140 M 6,5	2084332	0,18
MFT-FOX HI 220 M 6,5	2084344	0,27
MFT-FOX HI 300 M 11	2084357	0,35
MFT-FOX HI 260 M 6,5	2084350	0,30
MFT-FOX HI 280 M 6,5	2084353	0,32
MFT-FOX HI 60 M 6,5	2084320	0,11
MFT-FOX HI 240 M 6,5	2084347	0,28
MFT-FOX HI 300 M 6,5	2084356	0,34
MFT-FOX HI 160 M 11	2084336	0,20
MFT-FOX HI 120 M 5	2084328	0,15
MFT-FOX HI 100 M 11	2084327	0,13

with Isolator

Name	Article number	weight/item [kg]
MFT-FOX H 2084386		0,29
MFT-FOX H 2084383		0,27
MFT-FOX H 2084389		0,30
MFT-FOX H 2084392		0,32
MFT-FOX H 2084380		0,25
MFT-FOX H 2084377		0,21
MFT-FOX H 2084374		0,20
MFT-FOX H 2084371		0,18
MFT-FOX H 2084368		0,16
MFT-FOX H 2084365		0,13
MFT-FOX H 2084362		0,11
MFT-FOX H 2084096		0,09
MFT-FOX H 2084099		0,10
MFT-FOX H 2084363		0,11
MFT-FOX H 2084097		0,09
MFT-FOX H 2084366		0,12
MFT-FOX H 2084379		0,21
MFT-FOX H 2084364		0,11
MFT-FOX H 2084369		0,16
MFT-FOX H 2084370		0,16
MFT-FOX H 2084367		0,12
MFT-FOX H 2084360		0,10
MFT-FOX H 2084387		0,28
MFT-FOX H 2084393		0,32
MFT-FOX H 2084390		0,30
MFT-FOX H 2084378		0,21
MFT-FOX H 2084361		0,10
MFT-FOX H 2084375		0,19
MFT-FOX H 2084372		0,18
MFT-FOX H 2084384		0,26
MFT-FOX H 2084382		0,25
MFT-FOX H 2084394		0,32
MFT-FOX H 2084381		0,25
MFT-FOX H 2084385		0,27
MFT-FOX H 2084388		0,28
MFT-FOX H 2084391		0,31
MFT-FOX H 2084376		0,19
MFT-FOX H 2084373		0,18
MFT-FOX H 2084098		0,09

without Isolator

S2S - Large Bracket



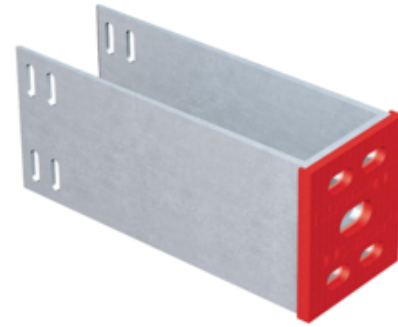
Name	Article number	weight/item [kg]
MFT-S2S UI 200 L	2158382	0,77
MFT-S2S UI 120 L	2157968	0,48
MFT-S2S UI 080 L	2157966	0,38
MFT-S2S UI 140 L	2157969	0,59
MFT-S2S UI 160 L	2158380	0,65
MFT-S2S UI 280 L	2158386	1,01
MFT-S2S UI 300 L	2158387	1,07
MFT-S2S UI 260 L	2158385	0,95
MFT-S2S UI 240 L	2158384	0,89
MFT-S2S UI 220 L	2158383	0,83
MFT-S2S UI 100 L	2157967	0,42
MFT-S2S UI 180 L	2158381	0,67

with Isolator

Name	Article number	weight/item [kg]
MFT-S2S U 155 L	2158392	0,60
MFT-S2S U 215 L	2158396	0,78
MFT-S2S U 195 L	2158395	0,72
MFT-S2S U 235 L	2158397	0,84
MFT-S2S U 075 L	2158388	0,33
MFT-S2S U 115 L	2158390	0,45
MFT-S2S U 135 L	2158391	0,49
MFT-S2S U 295 L	2158394	1,03
MFT-S2S U 175 L	2158393	0,66
MFT-S2S U 255 L	2158398	0,91
MFT-S2S U 275 L	2158399	0,97
MFT-S2S U 095 L	2158389	0,39

without Isolator

S2S - Medium Bracket



Name	Article number	weight/item [kg]
MFT-S2S UI 180 M	2158411	0,38
MFT-S2S UI 080 M	2158286	0,20
MFT-S2S UI 140 M	2158289	0,32
MFT-S2S UI 160 M	2158410	0,35
MFT-S2S UI 100 M	2158287	0,22
MFT-S2S UI 200 M	2158412	0,42
MFT-S2S UI 280 M	2158416	0,55
MFT-S2S UI 260 M	2158415	0,52
MFT-S2S UI 240 M	2158414	0,45
MFT-S2S UI 300 M	2158417	0,58
MFT-S2S UI 220 M	2158413	0,45
MFT-S2S UI 120 M	2158288	0,25

with Isolator

Name	Article number	weight/item [kg]
MFT-S2S U 295 M	2158429	0,56
MFT-S2S U 175 M	2158423	0,36
MFT-S2S U 115 M	2158420	0,25
MFT-S2S U 155 M	2158422	0,33
MFT-S2S U 135 M	2158421	0,30
MFT-S2S U 275 M	2158428	0,53
MFT-S2S U 255 M	2158427	0,50
MFT-S2S U 235 M	2158426	0,46
MFT-S2S U 215 M	2158425	0,43
MFT-S2S U 095 M	2158419	0,21
MFT-S2S U 195 M	2158424	0,40
MFT-S2S U 075 M	2158418	0,18

without Isolator

Application

MFT-FOX H & MFT-S2S are developed to be fixed on base materials like concrete, masonry, steel frame structure and wood. This product is used as a substructure for ventilated façade (rainscreen) applications. The brackets are supplied with pre-assembled isolators and, according to the method of installation to the base material – anchors, screws or direct fastening can be used – with different hole geometries in the base plate. The brackets are designed with both fixed and flexible points to allow for thermal expansion of the profile. The fixed point takes the weight of the panels and substructure and the proportional wind loads, while the flexible point only assumes the proportional wind loads.

For MFT FOX H:

During the application the horizontal profiles are connected to the brackets with specially designed screws, which combine the fixed and flexible points in one connection point. Due to thermal expansion of the profile the brackets take over this movement.

For MFT S2S:

During the application the vertical profiles are connected to the brackets with specially designed screws for fixed and flexible points. The fixed points do not allow the profiles vertical

movement against the brackets, while the flexible points allow virtually frictionless sliding of the profiles against the brackets. The flexible points make sure that there are no additional loads on the substructure from the profile's expansion forces. With this system, wall tolerances of up to 40 mm can be balanced.

Technical Data

Technical documentation according to *EN 1090-3*.

Constructional data

Name	Value	Unit
Thickness Baseplate	4	mm
Length	60 -300	mm
Height	80	mm
Width	62	mm
Thickness Isolator	5	mm

Performance data of the product in accordance with the declaration of performance with respect to its essential characteristics according to EN 1090- 1:2009+A1:2011 Standard for the execution of steel structures and aluminium structures. The structural parts made of aluminium correspond to the following harmonized standards: EN 1090-1, DIN EN 1999-1-1 + DIN EN 1991-1-4 incl. national annexes, DIN 18516-1. The product has a CE-marking Hilti MFT CPR-1346.

Base materials/Ancillary materials

FOX H:

The raw material used for the production of this product is aluminium alloy according to the standard *EN AW-6063-T66* with 320g (92% of product weight). The alloy is a widely used extrusion alloy, suitable for various applications. The material used for the isolator is polypropylene with 2g (6% of the product weight).

This product/article contains substances listed in the candidate list exceeding 0.1 percentage by mass in accordance with Article 59(10) of the *REACH Regulation*: **no**

This product/article/at least one partial article contains other carcinogenic, mutagenic, reprotoxic (CMR) substances in categories 1A or 1B which are not on the candidate list,

exceeding 0.1 percentage by mass: **no**

Biocide products were added to this construction product or it has been treated with biocide products (this then concerns a treated product as defined by the *Regulation on Biocide Products No. 528/2012*): **no**

Packaging:

The packaging of this product is carton. This cardboard packaging can be recycled.

Reference service life

The MFT-FOX H and MFT-S2S systems have a minimum service life of 35 years when used as prescribed according to the *BBA Certificate (British Board of Agreement)*. However, the actual service life can be considerably longer.

LCA: Calculation rules

Declared Unit

The declared product here is an aluminium profile from HILTI AG with the designation MFT Fox HI 300 M11 as a representative product from the MFT Fox-H and MFT S2S portfolio. It is the heaviest product with the additional screw in the portfolio. The declared unit refers to 1 kg of aluminium profile. The packaging, related to 1 kg aluminium profile, is additionally included in the calculation with 0.0348 kg. The following table shows the data of the declared unit.

Declared unit and mass reference

Name	Value	Unit
Declared unit	1	kg
Gross density	2.7	kg/m ³

System boundary

Type of EPD: Cradle to factory gate with options. The following information modules are defined as system boundaries in this study:

Production stage (A1- A3):

- A1, raw material extraction,
- A2, transport to the manufacturer,
- A3, production.

End of life (C1- C4):

- C1, deconstruction/demolition,
- C2, transport,
- C3, waste treatment ,
- C4, disposal.

Reuse, recovery and recycling potential (D).

In order to accurately capture the indicators and environmental impacts of the declared unit, a total of 8 information modules are considered. The information modules A1 to A3 describe the material provision, the transport to the production site, as well as the production processes of the product itself.

The primary products are sourced from the European Union

and Asia. The transport is carried out by lorry and ship. The following flow charts illustrate the underlying production process.

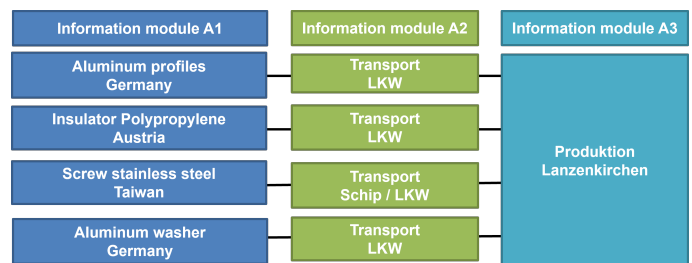


Figure Information modules A 1 to A3 of the product

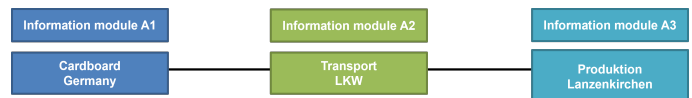


Figure Information modules A 1 to A3 of the packaging

In the information modules C1 to C4, the deconstruction or demolition from the building, the transport to waste disposal, the waste treatment and disposal of the product are recorded. Furthermore, reuse, recovery and recycling potentials are reported in information module D.

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 database referred to in this study is LCA for Experts by Sphera. (V1 2023)

LCA: Scenarios and additional technical information



Characteristic product properties of biogenic carbon

The declared product does not contain any biogenic Carbon.

Information on describing the biogenic carbon content at factory gate

Name	Value	Unit
Biogenic carbon content in accompanying packaging	0.0037	kg C

End of life (C1 - C4)

In information module C1, the demolition of the assembly system from the building is calculated. The demolition is carried out by means of an electric screwdriver. The electrical energy consumption for the tool is assumed to be 0.012MJ for the declared unit. The electricity consumption is calculated with a European electricity mix.

Name	Value	Unit
Collected separately waste type waste type	-	kg
Collected as mixed construction waste	1	kg
Reuse	-	kg
Recycling	0.9565	kg
Energy recovery	0.0435	kg
Landfilling	-	kg

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

In Module D, the metallic components are added to the primer material data sets through a recycling scenario of 85% and the plastic components are thermally utilised, thereby generating thermal and electrical energy.

Name	Value	Unit
Stainless Steel	0,024	kg
Aluminium	0,902	kg

LCA: Results

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	MND	MND	MND	MND	MNR	MNR	MNR	MND	MND	X	X	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 kg MFT FOX HI 300 M11

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
Global Warming Potential total (GWP-total)	kg CO ₂ eq	1.03E+01	1.45E-03	7.81E-03	1.35E-01	0	-6.94E+00
Global Warming Potential fossil fuels (GWP-fossil)	kg CO ₂ eq	1.03E+01	1.45E-03	7.47E-03	1.35E-01	0	-6.94E+00
Global Warming Potential biogenic (GWP-biogenic)	kg CO ₂ eq	6.7E-03	7.23E-07	3.38E-04	0	0	-1.27E-03
Global Warming Potential luluc (GWP-luluc)	kg CO ₂ eq	3.34E-03	1.33E-07	4.7E-07	1.94E-05	0	-1.83E-03
Depletion potential of the stratospheric ozone layer (ODP)	kg CFC11 eq	1.34E-11	1.43E-14	8.82E-16	1.05E-14	0	-9.51E-12
Acidification potential of land and water (AP)	mol H ⁺ eq	4.58E-02	2.21E-06	8.82E-06	2.64E-05	0	-3.19E-02
Eutrophication potential aquatic freshwater (EP-freshwater)	kg P eq	8.32E-06	1.44E-09	1.81E-09	1.02E-08	0	-4.05E-06
Eutrophication potential aquatic marine (EP-marine)	kg N eq	6.97E-03	6.23E-07	3.15E-06	8.85E-06	0	-4.65E-03
Eutrophication potential terrestrial (EP-terrestrial)	mol N eq	7.58E-02	6.59E-06	3.56E-05	1.29E-04	0	-5.06E-02
Formation potential of tropospheric ozone photochemical oxidants (POCP)	kg NMVOC eq	2.1E-02	1.72E-06	8.34E-06	2.47E-05	0	-1.41E-02
Abiotic depletion potential for non fossil resources (ADPE)	kg Sb eq	5.94E-06	7.03E-11	9.25E-11	2.79E-09	0	-4.81E-06
Abiotic depletion potential for fossil resources (ADPF)	MJ	1.39E+02	3.19E-02	1.07E-01	6.6E-02	0	-9.25E+01
Water use (WDP)	m ³ world eq deprived	1.46E+00	1.22E-04	1.8E-05	1.27E-02	0	-1.03E+00

RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1 kg MFT FOX HI 300 M11

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
Renewable primary energy as energy carrier (PERE)	MJ	5.73E+01	4.37E-03	6.93E-04	8.68E-03	0	-4.05E+01
Renewable primary energy resources as material utilization (PERM)	MJ	5.2E-01	0	0	0	0	0
Total use of renewable primary energy resources (PERT)	MJ	5.73E+01	4.37E-03	6.93E-04	8.68E-03	0	-4.05E+01
Non renewable primary energy as energy carrier (PENRE)	MJ	1.4E+02	3.19E-02	1.08E-01	6.61E-02	0	-9.27E+01
Non renewable primary energy as material utilization (PENRM)	MJ	0	0	0	0	0	0
Total use of non renewable primary energy resources (PENRT)	MJ	1.4E+02	3.19E-02	1.08E-01	6.61E-02	0	-9.27E+01
Use of secondary material (SM)	kg	3.83E-02	0	0	0	0	0
Use of renewable secondary fuels (RSF)	MJ	0	0	0	0	0	0
Use of non renewable secondary fuels (NRSF)	MJ	0	0	0	0	0	0
Use of net fresh water (FW)	m ³	1.36E-01	7.31E-06	8.05E-07	3E-04	0	-9.61E-02

RESULTS OF THE LCA - WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2:

1 kg MFT FOX HI 300 M11

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
Hazardous waste disposed (HWD)	kg	1.04E-08	1.85E-12	1.98E-13	2.23E-13	0	-5.91E-09
Non hazardous waste disposed (NHWD)	kg	2.71E+00	7.03E-06	1.07E-05	5.37E-04	0	-1.93E+00
Radioactive waste disposed (RWD)	kg	7.98E-03	4.97E-06	1.8E-07	1.62E-06	0	-5.71E-03
Components for re-use (CRU)	kg	0	0	0	0	0	0
Materials for recycling (MFR)	kg	0	0	0	0	0	0
Materials for energy recovery (MER)	kg	0	0	0	0	0	0
Exported electrical energy (EEE)	MJ	0	0	0	0	0	0
Exported thermal energy (EET)	MJ	0	0	0	0	0	0

RESULTS OF THE LCA - additional impact categories according to EN 15804+A2-optional:

1 kg MFT FOX HI 300 M11

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
Incidence of disease due to PM emissions (PM)	Disease incidence	ND	ND	ND	ND	ND	ND
Human exposure efficiency relative to U235 (IR)	kBq U235 eq	ND	ND	ND	ND	ND	ND
Comparative toxic unit for ecosystems (ETP-fw)	CTUe	ND	ND	ND	ND	ND	ND
Comparative toxic unit for humans (carcinogenic) (HTP-c)	CTUh	ND	ND	ND	ND	ND	ND
Comparative toxic unit for humans (noncarcinogenic) (HTP-nc)	CTUh	ND	ND	ND	ND	ND	ND

Soil quality index (SQP)	SQP	ND	ND	ND	ND	ND	ND
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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 1090-1

Standard for execution of steel structures and aluminium structures

DIN EN 1999-1-1 + DIN EN 1991-1-4

Eurocode 9: Design of aluminum structures - Part 1-4: General design rules

DIN 18516-1

DIN 18516-1:2010-06 Cladding for external walls, ventilated at rear facades – Part 1: Requirements, principles of testing

EN 1090-1:2009+A1:2011

Standard for execution of steel structures and aluminium structures

EN AW-6063-T66

Type of aluminium alloy

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.

ISO 14025

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