

ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804+A2

Owner of the Declaration	Max Frank GmbH & Co. KG
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-MAX-20230260-IBA1-EN
Issue date	14.07.2023
Valid to	13.07.2028

Thermal break balcony connector Max Frank Egcoibox® MM/MXL Max Frank GmbH & Co. KG

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



ECO PLATFORM

EPD
VERIFIED



1. General Information

Max Frank GmbH & Co. KG

Programme holder

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

Declaration number

EPD-MAX-20230260-IBA1-EN

This declaration is based on the product category rules:

Load-bearing thermal insulation elements, 01.08.2021
(PCR checked and approved by the SVR)

Issue date

14.07.2023

Valid to

13.07.2028



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



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

Thermal break balcony connector Max Frank Egcobox® MM/MXL

Owner of the declaration

Max Frank GmbH & Co. KG
Mitterweg 1
94339 Leiblfing
Germany

Declared product / declared unit

1 m (linear meter) Max Frank Egcobox® MM30-VS-C35-H200-REI120-SW

Scope:

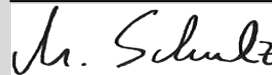
The EPD refers to a specific load-bearing thermal insulation element from Max Frank GmbH & Co. KG. Both the production of the semi-finished products and the assembly of all required components take place at the MAX FRANK plant in Pressig. The production data was collected at the factory in Pressig and refers to the year 2022. The EPD results for the Egcobox® MM30-VS-C35-H200-REI120-SW are applicable to other mounts of the Egcobox® MM or MXL series using the factors specified in chapter 6.

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



Matthias Schulz,
(Independent verifier)

2. Product

2.1 Product description/Product definition

The Egcoibox® cantilever plate connection is a load bearing, thermal insulating connecting element for connecting cantilevered reinforced concrete plates/reinforced concrete components to ceiling structures. The Egcoibox® is used to improve building physics properties while at the same time taking over static requirements. The Egcoibox MM30-VS-C35-H200-REI120-SW consists of an 80 mm thick insulating layer of mineral wool, which also serves the REI120 fire protection classification of the Egcoibox®, and a statically effective bar truss made of steel rods. The tension rods, thrust bearings and shear force rods are made of steel with increased corrosion resistance in the insulation joint and are also made of reinforcing steel B-500 B. The forces are transmitted to the adjacent components by bonding or impact and surface pressure.

The configuration of the declared Egcoibox® MM30-VS-C35-H200-REI120-SW is listed in section 2.3. The results of the EPD for the production of the Egcoibox® MM30-VS-C35-H200-REI120-SW are applicable to other support levels and the insulation thickness 120 mm (MXL), using the factors specified in chapter 6. The manufacturing processes for the MM and MXL series are identical. The support level designations for each MM and MXL are freely selected (MM/MXL20 to MM/MXL80) and depend on the respective load transmission. Both the load-bearing capacities and the steel rod assembly per type can be found in the technical brochure under www.maxfrank.com.

The Egcoibox® MM/MXL is available in variants:

- Insulation: mineral wool or polystyrene
- Insulation thickness: 80 mm (Egcoibox MM), 100 mm (Egcoibox® ML), 120 mm (Egcoibox® MXL)
- Support levels according to static requirements; determined by the number of steel rods
- Element heights: 160 mm to 300 mm
- Element lengths: maximum 1000 mm
- Concrete cover: 30 mm to 100 mm, depending on requirements

The respective design of the Egcoibox® is clearly described in the product labelling.

The materials used are recyclable and are made to a considerable extent from recycled materials.

Regulation (EU) No. 305/2011 applies to placing on the market in the EU/EFTA (except for Switzerland). The product requires a declaration of performance considering ETA-19/0046 as well as a CE marking.

The respective national regulations apply to the use.

2.2 Application

The Egcoibox® MM/MXL is used for the static transmission of bending moments and shear forces in reinforced concrete structures, such as balconies. It is arranged linearly between the outer and inner reinforced concrete structure in the thermal insulation plane (e.g., external insulation with external thermal insulation composite system), so that the heat flow is locally minimized, and thermal bridges are reduced. The assessment of the thermal insulation property of the Egcoibox® MM/MXL is determined based on the equivalent thermal conductivity (λ_{eq}) determined in accordance with ETA-19/0046, Annex C10.

2.3 Technical Data

Structural data

Name	Value	Unit
Description of product types Egcoibox® MM30-VS-C35-H200-REI120-SW	-	-
Insulation thickness M	80	mm
Concrete covering	35	mm
Height	200	mm
Length	1000	mm
Zugstäbe (Anzahl; Durchmesser)	6 Ø 12	mm
Querkraftstäbe (Anzahl; Durchmesser)	4 Ø 6	mm
Druckelemente (Anzahl; Durchmesser)	4 Ø 12	mm
Fire resistance class / EN 13501-2	120	-
Equivalent thermal conductivity λ_{eq}	0.104	W/(mK)
Thermal conductivity Mineralwolle / DIN EN 13162	0.037	W/(mK)
Moment resistance bei C25/30 / EN 1992-1-1	-33	kNm/m
Shear resistance bei C25/30 / EN 1992-1-1	48.7	kN/m

Performance values of the product correspond to the performance declaration in reference to its substantial characteristics according to ETA-19/0046, January 2022, "Max Frank Egcoibox® MM/ML/MXL/MXXL".

2.4 Delivery status

The Egcoibox® MM30-VS-C35-H200-REI120-SW with a length of 1000 mm and a height of 200 mm is manufactured with a unique type designation.

2.5 Base materials/Ancillary materials

Name	Value	Unit
Concrete steel B500 B	46,7	%
Stainless steel B500 NR	25,6	%
Insulation material mineral wool	24,2	%
Polyethylene (PE) fuse cover Sicherungsabdeckung	2,2	%
Hot-melt adhesive	1,3	%

The product weight of the Egcoibox® MM30-VS-C35-H200-REI120-SW is 11.86 kg.

The product contains substances on ECHA's list of substances of very high concern (SVHC) (date 21.02.2023) above 0,1% by mass: no.

The product contains other CMR substances of category 1A or 1B, which are not on the candidate list, above 0,1% by mass in at least one sub-product: no.

Biocidal products have been added to the construction product in question or it has been treated with biocidal products (it is therefore a treated article within the meaning of the Biocidal Products Regulation (EU) No 528/2012): no.

2.6 Manufacture

The following is a step-by-step description of the main raw material processing methods:

The tension rods are made of a reinforcing steel stainless steel connection. The stainless reinforcing steel (B500 NR) of the butt-welded tension rod is unwound from the coil, straightened,

and cut to the required length. The reinforcing steel (B500 B) is already supplied in the required length. In automatic welding machines, the individual rods are produced using the flash butt welding process (Pressig site).

The shear force rods are made of stainless steel (B500 NR), which is unwound from the coil, straightened, bent into the required shape, and cut to length (Pressig site).

The pressure elements are made of stainless steel (B500 NR), which is unwound, straightened, and cut to length from the coil. The pressure plates are sawn off from off-the-shelf stock and welded with a circumferential fillet weld stainless on the reinforcing steel (B500 NR) in the automatic welding machine. The thrust bearings are manufactured at the Pressig site. Sandblasting (external) is used to remove tarnish.

The insulating body is cut from large-format panels of the required thickness to the required size (200 mm x 1000 mm), including all necessary cut-outs for the tension rods, shear force rods and compression elements.

The individual components as well as the PE cover are inserted into the insulation, fixed by hot-melt bonding and additional fastening rods/fastening brackets, and provided with the product marking. The individual components are assembled using digital production processes including approved production drawings and the corresponding quality regulations at the Pressig site.

2.7 Environment and health during manufacturing

The production of the Max Frank Egcoibox® is carried out in accordance with the requirements regarding the occupational health and safety in approved facilities. Max Frank GmbH & Co. KG has a quality management system in accordance with ISO 9001 and an environmental management system in accordance with ISO 14001.

In addition to in-house quality control, external monitoring is carried out by KIT, KIWA, BBA, BTI, and ITB.

The types of waste generated, such as steel, stainless steel, and mineral wool, are collected separately and returned to the material cycle by being reused externally in the form of recycling.

2.8 Product processing/Installation

The Egcoibox® MM/MXL is supplied as a ready-to-install element with a length of 1000 mm. If necessary, the element can be shortened to the desired length with a standard hand saw. The Egcoibox® is brought into position with or after the reinforcement installation of the slab and/or balcony reinforcement without the use of hoists, integrated into the on-site reinforcement and secured for the concreting process. During installation, attention must be paid to the direction of installation (marking of the external component). There is no need to take any special environmental protection measures when using the Egcoibox® MM/MXL.

2.9 Packaging

Delivery is stacked on wooden pallets, strapped with steel straps to secure the position and, if necessary, wrapped in stretch film. The packaging material can be easily separated and recycled if necessary. The packaging material can be collected by type and delivered to regional recycling providers. Residual materials must be disposed of in accordance with the

respective national regulations.

2.10 Condition of use

All materials supplied are protected against external influences when installed and designed for the service life of the respective construction. When used as intended, there is no danger to water, air and soil.

2.11 Environment and health during use

With normal use in accordance with the intended use, no effects on the environment or health are to be expected. The product does not contain any harmful substances and does not cause any emissions.

2.12 Reference service life

The Egcoibox® MM/MXL has a service life of at least 50 years, confirmed by testing and evaluation methods and ETA-19/0046. This corresponds to the average building planning and building use. The actual use for building can be significantly longer. The resistance of the cantilever plate connection to common stresses, e.g., resulting from forces and environmental influences, has been experimentally proven in such a way that it is ensured for a period of at least 50 years. The prerequisite for the service life is that the Egcoibox® cantilever plate connection is properly inserted in the intended application. The RSL (Reference Service Life) according to ISO 15686 is not declared.

2.13 Extraordinary effects

Fire

According to fire tests and ETA-19/0046, the Egcoibox® MM/MXL achieves a fire resistance of 120 minutes. According to EN 13501, the Egcoibox® in the mineral wool version (and as a combi-element mineral wool/EPS or with cement-bonded fire protection boards – both not rated in this EPD) is classified in fire resistance class REI120.

Fire protection

Name	Value
Building material class	A1

Water

The use of stainless steels B500 NR in the insulation level, as required by ETA-19/0046, as well as compliance with the intended concrete cover of the reinforcement of the Egcoibox®, eliminates the risk of corrosion. There are no dangers to the environment when exposed to water.

Mechanical destruction

Not relevant

2.14 Re-use phase

The steel components of the Egcoibox® can be returned to the material cycle and recycled by proper dismantling. To ensure an efficient recycling process, care should be taken to ensure that the dismantling is sorted by type.

2.15 Disposal

Non-recyclable parts of the Egcoibox® can be disposed of as construction and demolition waste under the waste code number 170904.

2.16 Further information

Further information can be found at www.maxfrank.com.

3. LCA: Calculation rules

3.1 Declared Unit

The declaration refers to 1 m (linear meter) specific load-bearing thermal insulation element of the company Max Frank GmbH & Co. KG – Max Frank Egcoibox® MM30-VS-C35-H200-REI120- SW

Declared unit

Name	Value	Unit
Declared unit	1	m
Weight per unit length	11.86	kg/m

3.2 System boundary

Type of EPD: from cradle to factory gate with options, modules C1-C4 and module D (A1-A3 + C + D and additional module A5.

Module A1 to A3: The manufacturing phase includes the provision of all materials, products, and energy, as well as waste treatment until the end of the waste status or the disposal of waste during the manufacturing phase.

These modules consider the production of all raw materials used (in particular steel, stainless steel [Translator's note: 'Original text contains spelling mistake for stainless steel'], stone wool, etc.), transport to the production sites (Pressig) and the production processes of the product under investigation.

Module A5: This module comprises the treatment and disposal of packaging material.

Modules C1 to C4:

Module C1: machine-assisted expansion with diesel-powered construction machinery.

Module C2: 50 km transport by diesel truck

Module C3: Waste processing for the incineration of plastic components, recycling of metals

Module C4: Landfilling of inert materials

Module D: Module D includes: Material recovery potentials from metal recycling and energy recovery potentials from the thermal recycling of plastic waste.

3.3 Estimates and assumptions

Renewable electricity from 100% hydropower is used to produce the Max Frank Egcoibox® MM30-VS-C35-h200-REI120-SW cantilever plate connection.

3.4 Cut-off criteria

The assessment considers all available data from the production process, i.e., all raw materials used, thermal energy used and electricity consumption using the most appropriate LCI data sets available. It also considers material and energy

flows that represent less than 1 % of the mass or energy. The study did not consider the production of capital goods, equipment and infrastructure required for manufacturing. The transport from the thrust bearings for further processing is not considered and the energy consumption for sandblasting to remove tarnish is considered.

3.5 Background data

All background data used was taken from the databases of the LCA FE (GaBi) software. The consistent datasets contained in the LCA FE (GaBi) databases are documented online in the LCA FE (GaBi) documentation.

3.6 Data quality

For modelling the product stage of the company Max Frank GmbH & Co. KG – Max Frank Egcoibox® MM30-VS-C35-H200-REI120-SW data collected on the 2022 production year by the company Max Frank GmbH & Co. KG was used.

The last revision of the LCA FE (GaBi) background data used was in 2018. The quality of the data collected can be considered high.

3.7 Period under review

The observation period is the year 2022.

3.8 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

3.9 Allocation

Information on the allocation procedures for individual datasets is documented in the respective datasets. The documentation of the datasets can be found online:

<https://gabi.sphera.com/databases/gabi-data-search/>.

Allocation of foreground data

The production process does not provide any by-products. The software model used does not include an allocation.

3.10 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 background database used is LCA FE (GaBi) software 2023, version 2023.1

4. LCA: Scenarios and additional technical information

Characteristic product properties of biogenic carbon

Information on the description of the biogenic carbon content at the factory gate

Name	Value	Unit
Biogenic carbon content in product	0.086	kg C
Biogenic carbon content in accompanying packaging	0.447	kg C

Installation in the building (A5)

Module A5 comprises the treatment and disposal of packaging material.

Credits for potentially avoided strains due to energy substitution of electricity and thermal energy production are stated in Module D. Metal is recycled.

Name	Value	Unit
Output substances following waste treatment on site (Stretchfolie, Stahlband, Holzpalette)	1.29	kg

End of life (C1-C4)

Name	Value	Unit
Diesel for demolition	0.00204	kg
Transport distance (C2)	50	km
Collected separately waste type Abfalltyp	-	kg
Collected as mixed construction waste	11.86	kg
Recycling (Stahl & Edelstahl)	8.57	kg
Energy recovery	0.42	kg
Landfilling	2.87	kg

Reuse, recovery, and recycling potential (D), relevant scenario information

Name	Value	Unit
Collection rate	100	%

5. LCA: Results

The results of the indicators of impact assessment, resource use and waste and other output streams for the declared product are presented below.

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

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1m Max Frank Egcoibox® MM30-VS-C35-H200-REI120-SW

Parameter	Unit	A1-A3	A5	C1	C2	C3	C4	D
GWP-total	kg CO ₂ eq	1.76E+01	1.98E+00	7.67E-03	5.12E-02	1.14E+00	4.18E-02	-8.19E+00
GWP-fossil	kg CO ₂ eq	1.94E+01	3.41E-01	7.66E-03	5.11E-02	8.18E-01	4.31E-02	-8.22E+00
GWP-biogenic	kg CO ₂ eq	-1.87E+00	1.64E+00	9.84E-06	6.68E-05	3.17E-01	-1.43E-03	3.78E-02
GWP-luluc	kg CO ₂ eq	7.88E-03	8.84E-06	4.54E-07	3.08E-06	1.3E-06	1.34E-04	-9.07E-03
ODP	kg CFC11 eq	1.31E-10	3.45E-13	8.53E-16	5.79E-15	6.22E-14	1.1E-13	-2.07E-11
AP	mol H ⁺ eq	1.17E-01	4.12E-04	3.63E-05	6.54E-05	1.28E-04	3.05E-04	-5.33E-02
EP-freshwater	kg P eq	1.2E-04	9.07E-08	1.75E-09	1.19E-08	1.48E-08	8.67E-08	-6.35E-06
EP-marine	kg N eq	1.37E-02	1.01E-04	1.72E-05	2.45E-05	2.71E-05	7.89E-05	-5.74E-03
EP-terrestrial	mol N eq	2.07E-01	1.79E-03	1.89E-04	2.76E-04	6.05E-04	8.68E-04	-6.54E-02
POCP	kg NMVOC eq	4.46E-02	2.66E-04	4.87E-05	6.2E-05	8.06E-05	2.38E-04	-1.76E-02
ADPE	kg Sb eq	4.45E-04	2.65E-09	8.94E-11	6.07E-10	5.8E-10	1.99E-09	-2.23E-04
ADPF	MJ	2.63E+02	5.83E-01	1.04E-01	7.04E-01	1.56E-01	5.73E-01	-1.11E+02
WDP	m ³ world eq deprived	2.73E+00	2.21E-01	1.74E-05	1.18E-04	1.2E-01	4.73E-03	-2.85E+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: 1m Max Frank Egcoibox® MM30-VS-C35-H200-REI120-SW

Parameter	Unit	A1-A3	A5	C1	C2	C3	C4	D
PERE	MJ	8.45E+01	1.63E+01	6.7E-04	4.54E-03	5.16E+00	9.34E-02	-2.54E+01
PERM	MJ	2.12E+01	-1.61E+01	0	0	-5.12E+00	0	0
PERT	MJ	1.06E+02	1.69E-01	6.7E-04	4.54E-03	3.98E-02	9.34E-02	-2.54E+01
PENRE	MJ	2.47E+02	4.99E+00	1.04E-01	7.07E-01	1.21E+01	5.74E-01	-1.11E+02
PENRM	MJ	1.64E+01	-4.41E+00	0	0	-1.2E+01	0	0
PENRT	MJ	2.63E+02	5.84E-01	1.04E-01	7.07E-01	1.56E-01	5.74E-01	-1.11E+02
SM	kg	8.21E+00	0	0	0	0	0	3.61E-01
RSF	MJ	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0
FW	m ³	1.49E-01	5.21E-03	7.79E-07	5.29E-06	2.82E-03	1.45E-04	-9.15E-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: 1m Max Frank Egcoibox® MM30-VS-C35-H200-REI120-SW

Parameter	Unit	A1-A3	A5	C1	C2	C3	C4	D
HWD	kg	1.71E-08	2.75E-12	1.92E-13	1.3E-12	3.52E-12	1.25E-11	-3.65E-09
NHWD	kg	3.09E+00	2.69E-02	1.04E-05	7.04E-05	5.19E-03	2.87E+00	-8.95E-01
RWD	kg	7.39E-03	1.75E-05	1.74E-07	1.18E-06	9.41E-06	6.54E-06	-2.03E-03
CRU	kg	0	0	0	0	0	0	0
MFR	kg	3.1E-01	1.12E-01	0	0	8.57E+00	0	0
MER	kg	0	0	0	0	0	0	0

EEE	MJ	0	2.63E+00	0	0	2.77E+00	0	0
EET	MJ	0	6.18E+00	0	0	4.93E+00	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:
1m Max Frank EgcoBox® MM30-VS-C35-H200-REI120-SW**

Parameter	Unit	A1-A3	A5	C1	C2	C3	C4	D
PM	Disease incidence	1.82E-06	2.73E-09	4.12E-10	5.28E-10	7.51E-10	3.76E-09	-8.14E-07
IR	kBq U235 eq	7.75E-01	1.85E-03	2.56E-05	1.74E-04	1.52E-03	7.56E-04	-3.72E-01
ETP-fw	CTUe	1.02E+02	2.57E-01	7.39E-02	5.02E-01	7.18E-02	3.13E-01	-8.67E+01
HTP-c	CTUh	4.81E-06	2.01E-11	1.37E-12	9.32E-12	8.42E-12	4.82E-11	-1.48E-08
HTP-nc	CTUh	3.7E-07	1.07E-09	6.9E-11	3.9E-10	2.52E-10	5.3E-09	-3.4E-08
SQP	SQP	3.68E+02	1.8E-01	6.48E-04	4.4E-03	4.93E-02	1.39E-01	-1.53E+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

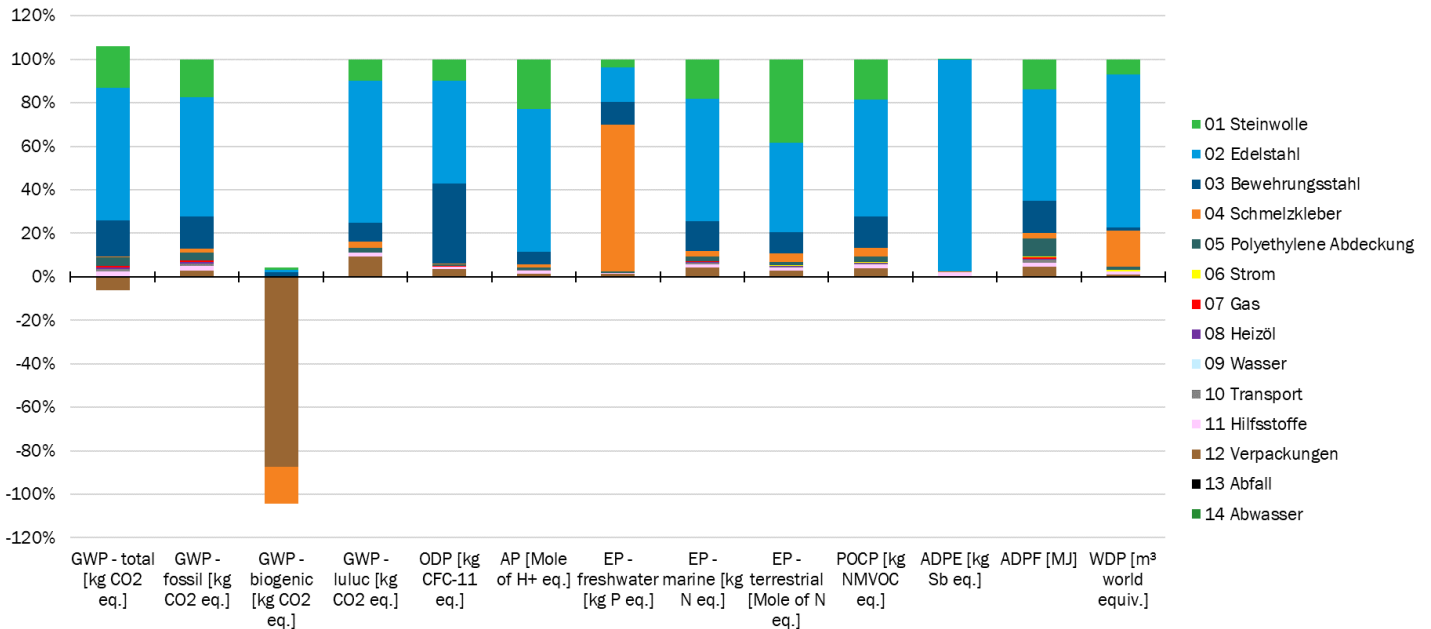
Disclaimer 1 – for the indicator “Potential Human exposure efficiency relative to U235”. This impact category deals mainly with the eventual impact of low-dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure 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.

6. LCA: Interpretation

The following figure shows a detailed evaluation of the LCA results for the production phase (A1- A3).

Umweltwirkungen: Hot Spot Analyse der Herstellungsphase (Module A1-A3) - 1 m - EgcoBox® MM30-VS-C35-h200-REI120-SW



The figure shows that stainless steel makes the largest share of the total LCIA results (A1- A3): GWP-total (~ 61 %), GWP-fossil (~ 55 %), GWP-luluc (~ 65 %), ODP (~ 47 %), AP (~ 66 %), EP-marine (~ 56 %), EP-terrestrial (~ 41 %), POCP (~ 54%), ADPE (~98%), ADPF (~51%), and WDP (~70%). The selected data set considers the production of stainless steel in the electric arc furnace (EAF); So the most important process step is the melting of stainless steel scrap in the EAF, and the energy consumed is mainly electricity. Due to the required high temperatures (1400- 1500 °C) and the use of fossil fuels, stone

wool (after stainless steel) led to high impacts in the following environmental impact categories: GWP-total (19 %), GWP-fossil (17 %),GWP-luluc (10 %), AP (23 %), EP-marine (18 %), EP-terrestrial (38 %), and POCP (19 %). The biogenic global warming potential is shown by the uptake of atmospheric carbon dioxide during plant growth in conjunction with the packaging (wooden pallet). Packaging has some influence on GWP-biogenic (-87%). Since the hot-melt adhesive is based on natural rubber, it contributed greatly to the overall results of EP-freshwater (68%)

due to the use of fertilizers in rubber cultivation. Lastly, the use of green electricity from 100% hydropower has a negligible impact (1%) on the water use indicator (WDP).

Conversion factors

The EPD results for the production of the Max Frank Egcoibox® MM30-VS-C35-H200-REI120-SW are applicable to all other mounts of this Egcoibox® type (MM20 to MXL80) as well as on all mounts of the Max Frank Egcoibox® (MM20 to MXL80) using the following factors.

The following tables show the conversion factors for each of the declared life cycle phases to determine the variant specific LCA results. To do this, the factors must be multiplied by the indicator values of the Egcoibox® MM30-VS-C35-h200-REI120-SW variant shown in the table in chapter 5.

A table for module A5 is not shown below because all product variants use the same proportion of packaging materials; therefore, the factors for module A5 have a value of 1.

Conversion factors for Max Frank Egcoibox® MM20 to MXL80

Conversion factors LCA results module A1-A3											
	MM20	MM50	MM60	MM70	MM80	MXL20	MXL30	MXL50	MXL60	MXL70	MXL80
GWP - total	0.86	1.25	1.64	1.89	2.14	1.01	1.16	1.43	1.85	2.13	2.40
GWP - fossil	0.87	1.22	1.58	1.80	2.02	1.01	1.15	1.40	1.78	2.02	2.27
GWP - biogenic	1.01	0.99	0.98	0.97	0.96	1.09	1.08	1.07	1.05	1.04	1.03
GWP - luluc	0.88	1.23	1.61	1.84	2.06	1.00	1.13	1.38	1.79	2.04	2.29
ODP	0.81	1.26	1.64	1.91	2.17	0.90	1.09	1.38	1.77	2.06	2.34
AP	0.89	1.22	1.59	1.81	2.02	1.05	1.17	1.41	1.81	2.06	2.30
EP - freshwater	0.94	1.08	1.20	1.29	1.37	1.31	1.37	1.46	1.59	1.68	1.76
EP - marine	0.88	1.22	1.57	1.79	2.01	1.02	1.15	1.39	1.77	2.01	2.25
EP - terrestrial	0.91	1.16	1.42	1.58	1.73	1.13	1.22	1.40	1.67	1.85	2.02
POCP	0.88	1.21	1.55	1.77	1.98	1.03	1.16	1.40	1.76	1.99	2.23
ADPE	0.87	1.29	1.82	2.11	2.40	0.94	1.09	1.43	1.99	2.32	2.65
ADPF	0.88	1.21	1.55	1.76	1.98	1.03	1.16	1.40	1.76	1.99	2.22
WDP	0.90	1.22	1.60	1.82	2.03	1.07	1.19	1.43	1.84	2.09	2.33
PERE	0.82	1.26	1.64	1.90	2.16	0.90	1.09	1.37	1.77	2.05	2.33
PERM	1.00	1.00	1.00	1.00	1.00	1.12	1.12	1.12	1.12	1.12	1.12
PERT	0.86	1.21	1.51	1.72	1.93	0.94	1.09	1.32	1.64	1.86	2.08
PENRE	0.87	1.23	1.59	1.81	2.04	1.01	1.15	1.40	1.78	2.03	2.28
PENRM	1.00	1.00	1.00	1.00	1.00	1.37	1.37	1.37	1.37	1.37	1.37
PENRT	0.88	1.21	1.55	1.76	1.98	1.03	1.16	1.40	1.76	1.99	2.22
SM	0.73	1.32	1.71	2.03	2.36	0.75	1.03	1.36	1.76	2.10	2.43
RSF	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NRSF	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FW	0.90	1.17	1.44	1.61	1.78	1.14	1.25	1.43	1.72	1.90	2.09
HWD	1.04	0.97	0.94	0.91	0.87	1.57	1.54	1.50	1.48	1.45	1.41
NHWD	0.93	1.14	1.40	1.54	1.69	1.15	1.23	1.39	1.66	1.83	1.99
RWD	0.83	1.25	1.61	1.86	2.11	0.93	1.11	1.38	1.76	2.03	2.30
CRU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MFR	0.77	1.31	1.74	2.06	2.37	0.81	1.05	1.38	1.83	2.17	2.50
MER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EEE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EET	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PM	0.89	1.22	1.61	1.84	2.06	1.00	1.12	1.37	1.78	2.04	2.28
IR	0.83	1.25	1.61	1.86	2.10	0.93	1.11	1.38	1.75	2.02	2.29
ETF-fw	0.88	1.21	1.54	1.75	1.95	1.05	1.17	1.40	1.76	1.98	2.21
HTP-c	0.87	1.29	1.82	2.11	2.40	0.94	1.09	1.43	1.99	2.32	2.65
HTP-nc	0.86	1.21	1.52	1.73	1.94	1.01	1.16	1.39	1.71	1.94	2.17
SQP	0.97	1.04	1.10	1.13	1.17	1.08	1.11	1.15	1.21	1.25	1.30

Conversion factors LCA results module C1

	MM20	MM50	MM60	MM70	MM80	MXL20	MXL30	MXL50	MXL60	MXL70	MXL80
GWP - total	0.81	1.23	1.52	1.75	1.98	0.95	1.14	1.38	1.69	1.93	2.17
GWP - fossil	0.81	1.23	1.52	1.75	1.98	0.95	1.14	1.38	1.69	1.93	2.17
GWP - biogenic	0.81	1.23	1.52	1.75	1.98	0.95	1.14	1.38	1.69	1.93	2.17
GWP - luluc	0.81	1.23	1.52	1.75	1.98	0.95	1.14	1.38	1.69	1.93	2.17
ODP	0.81	1.23	1.52	1.75	1.98	0.95	1.14	1.38	1.69	1.93	2.17
AP	0.81	1.23	1.52	1.75	1.98	0.95	1.14	1.38	1.69	1.93	2.17
EP - freshwater	0.81	1.23	1.52	1.75	1.98	0.95	1.14	1.38	1.69	1.93	2.17
EP - marine	0.81	1.23	1.52	1.75	1.98	0.95	1.14	1.38	1.69	1.93	2.17
EP - terrestrial	0.81	1.23	1.52	1.75	1.98	0.95	1.14	1.38	1.69	1.93	2.17
POCP	0.81	1.23	1.52	1.75	1.98	0.95	1.14	1.38	1.69	1.93	2.17
ADPE	0.81	1.23	1.52	1.75	1.98	0.95	1.14	1.38	1.69	1.93	2.17
ADPF	0.81	1.23	1.52	1.75	1.98	0.95	1.14	1.38	1.69	1.93	2.17
WDP	0.81	1.23	1.52	1.75	1.98	0.95	1.14	1.38	1.69	1.93	2.17
PERE	0.81	1.23	1.52	1.75	1.98	0.95	1.14	1.38	1.69	1.93	2.17
PERM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PERT	0.81	1.23	1.52	1.75	1.98	0.95	1.14	1.38	1.69	1.93	2.17
PENRE	0.81	1.23	1.52	1.75	1.98	0.95	1.14	1.38	1.69	1.93	2.17
PENRM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PENRT	0.81	1.23	1.52	1.75	1.98	0.95	1.14	1.38	1.69	1.93	2.17
SM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RSF	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NRSF	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FW	0.81	1.23	1.52	1.75	1.98	0.95	1.14	1.38	1.69	1.93	2.17
HWD	0.81	1.23	1.52	1.75	1.98	0.95	1.14	1.38	1.69	1.93	2.17
NHWD	0.81	1.23	1.52	1.75	1.98	0.95	1.14	1.38	1.69	1.93	2.17
RWD	0.81	1.23	1.52	1.75	1.98	0.95	1.14	1.38	1.69	1.93	2.17
CRU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MFR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EEE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EET	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PM	0.81	1.23	1.52	1.75	1.98	0.95	1.14	1.38	1.69	1.93	2.17
IR	0.81	1.23	1.52	1.75	1.98	0.95	1.14	1.38	1.69	1.93	2.17
ETF-fw	0.81	1.23	1.52	1.75	1.98	0.95	1.14	1.38	1.69	1.93	2.17
HTP-c	0.81	1.23	1.52	1.75	1.98	0.95	1.14	1.38	1.69	1.93	2.17
HTP-nc	0.81	1.23	1.52	1.75	1.98	0.95	1.14	1.38	1.69	1.93	2.17
SQP	0.81	1.23	1.52	1.75	1.98	0.95	1.14	1.38	1.69	1.93	2.17

Conversion factors LCA results module C2

	MM20	MM50	MM60	MM70	MM80	MXL20	MXL30	MXL50	MXL60	MXL70	MXL80
GWP - total	0.81	1.23	1.52	1.75	1.98	0.95	1.14	1.38	1.69	1.93	2.17
GWP - fossil	0.81	1.23	1.52	1.75	1.98	0.95	1.14	1.38	1.69	1.93	2.17
GWP - biogenic	0.81	1.23	1.52	1.75	1.98	0.95	1.14	1.38	1.69	1.93	2.17
GWP - luluc	0.81	1.23	1.52	1.75	1.98	0.95	1.14	1.38	1.69	1.93	2.17
ODP	0.81	1.23	1.52	1.75	1.98	0.95	1.14	1.38	1.69	1.93	2.17
AP	0.81	1.23	1.52	1.75	1.98	0.95	1.14	1.38	1.69	1.93	2.17
EP - freshwater	0.81	1.23	1.52	1.75	1.98	0.95	1.14	1.38	1.69	1.93	2.17
EP - marine	0.81	1.23	1.52	1.75	1.98	0.95	1.14	1.38	1.69	1.93	2.17
EP - terrestrial	0.81	1.23	1.52	1.75	1.98	0.95	1.14	1.38	1.69	1.93	2.17
POCP	0.81	1.23	1.52	1.75	1.98	0.95	1.14	1.38	1.69	1.93	2.17
ADPE	0.81	1.23	1.52	1.75	1.98	0.95	1.14	1.38	1.69	1.93	2.17
ADPF	0.81	1.23	1.52	1.75	1.98	0.95	1.14	1.38	1.69	1.93	2.17
WDP	0.81	1.23	1.52	1.75	1.98	0.95	1.14	1.38	1.69	1.93	2.17
PERE	0.81	1.23	1.52	1.75	1.98	0.95	1.14	1.38	1.69	1.93	2.17
PERM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PERT	0.81	1.23	1.52	1.75	1.98	0.95	1.14	1.38	1.69	1.93	2.17
PENRE	0.81	1.23	1.52	1.75	1.98	0.95	1.14	1.38	1.69	1.93	2.17
PENRM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PENRT	0.81	1.23	1.52	1.75	1.98	0.95	1.14	1.38	1.69	1.93	2.17
SM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RSF	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NRSF	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FW	0.81	1.23	1.52	1.75	1.98	0.95	1.14	1.38	1.69	1.93	2.17
HWD	0.81	1.23	1.52	1.75	1.98	0.95	1.14	1.38	1.69	1.93	2.17
NHWD	0.81	1.23	1.52	1.75	1.98	0.95	1.14	1.38	1.69	1.93	2.17
RWD	0.81	1.23	1.52	1.75	1.98	0.95	1.14	1.38	1.69	1.93	2.17
CRU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MFR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EEE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EET	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PM	0.81	1.23	1.52	1.75	1.98	0.95	1.14	1.38	1.69	1.93	2.17
IR	0.81	1.23	1.52	1.75	1.98	0.95	1.14	1.38	1.69	1.93	2.17
ETF-fw	0.81	1.23	1.52	1.75	1.98	0.95	1.14	1.38	1.69	1.93	2.17
HTP-c	0.81	1.23	1.52	1.75	1.98	0.95	1.14	1.38	1.69	1.93	2.17
HTP-nc	0.81	1.23	1.52	1.75	1.98	0.95	1.14	1.38	1.69	1.93	2.17
SQP	0.81	1.23	1.52	1.75	1.98	0.95	1.14	1.38	1.69	1.93	2.17

Conversion factors LCA results module C3

	MM20	MM50	MM60	MM70	MM80	MXL20	MXL30	MXL50	MXL60	MXL70	MXL80
GWP - total	1.00	1.00	1.00	1.00	1.00	1.50	1.50	1.50	1.50	1.50	1.50
GWP - fossil	1.00	1.00	1.00	1.00	1.00	1.50	1.50	1.50	1.50	1.50	1.50
GWP - biogenic	1.00	1.00	1.00	1.00	1.00	1.50	1.50	1.50	1.50	1.50	1.50
GWP - luluc	1.00	1.00	1.00	1.00	1.00	1.50	1.50	1.50	1.50	1.50	1.50
ODP	1.00	1.00	1.00	1.00	1.00	1.50	1.50	1.50	1.50	1.50	1.50
AP	1.00	1.00	1.00	1.00	1.00	1.50	1.50	1.50	1.50	1.50	1.50
EP - freshwater	1.00	1.00	1.00	1.00	1.00	1.50	1.50	1.50	1.50	1.50	1.50
EP - marine	1.00	1.00	1.00	1.00	1.00	1.50	1.50	1.50	1.50	1.50	1.50
EP - terrestrial	1.00	1.00	1.00	1.00	1.00	1.50	1.50	1.50	1.50	1.50	1.50
POCP	1.00	1.00	1.00	1.00	1.00	1.50	1.50	1.50	1.50	1.50	1.50
ADPE	1.00	1.00	1.00	1.00	1.00	1.50	1.50	1.50	1.50	1.50	1.50
ADPF	1.00	1.00	1.00	1.00	1.00	1.50	1.50	1.50	1.50	1.50	1.50
WDP	1.00	1.00	1.00	1.00	1.00	1.50	1.50	1.50	1.50	1.50	1.50
PERE	1.00	1.00	1.00	1.00	1.00	1.50	1.50	1.50	1.50	1.50	1.50
PERM	1.00	1.00	1.00	1.00	1.00	1.50	1.50	1.50	1.50	1.50	1.50
PERT	1.00	1.00	1.00	1.00	1.00	1.50	1.50	1.50	1.50	1.50	1.50
PENRE	1.00	1.00	1.00	1.00	1.00	1.50	1.50	1.50	1.50	1.50	1.50
PENRM	1.00	1.00	1.00	1.00	1.00	1.50	1.50	1.50	1.50	1.50	1.50
PENRT	1.00	1.00	1.00	1.00	1.00	1.50	1.50	1.50	1.50	1.50	1.50
SM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RSF	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NRSF	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FW	1.00	1.00	1.00	1.00	1.00	1.50	1.50	1.50	1.50	1.50	1.50
HWD	1.00	1.00	1.00	1.00	1.00	1.50	1.50	1.50	1.50	1.50	1.50
NHWD	1.00	1.00	1.00	1.00	1.00	1.50	1.50	1.50	1.50	1.50	1.50
RWD	1.00	1.00	1.00	1.00	1.00	1.50	1.50	1.50	1.50	1.50	1.50
CRU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MFR	0.74	1.32	1.72	2.04	2.36	0.77	1.03	1.37	1.79	2.12	2.45
MER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EEE	1.00	1.00	1.00	1.00	1.00	1.50	1.50	1.50	1.50	1.50	1.50
EET	1.00	1.00	1.00	1.00	1.00	1.50	1.50	1.50	1.50	1.50	1.50
PM	1.00	1.00	1.00	1.00	1.00	1.50	1.50	1.50	1.50	1.50	1.50
IR	1.00	1.00	1.00	1.00	1.00	1.50	1.50	1.50	1.50	1.50	1.50
ETF-fw	1.00	1.00	1.00	1.00	1.00	1.50	1.50	1.50	1.50	1.50	1.50
HTP-c	1.00	1.00	1.00	1.00	1.00	1.50	1.50	1.50	1.50	1.50	1.50
HTP-nc	1.00	1.00	1.00	1.00	1.00	1.50	1.50	1.50	1.50	1.50	1.50
SQP	1.00	1.00	1.00	1.00	1.00	1.50	1.50	1.50	1.50	1.50	1.50

Conversion factors LCA results module C4

	MM20	MM50	MM60	MM70	MM80	MXL20	MXL30	MXL50	MXL60	MXL70	MXL80
GWP - total	1.00	1.00	0.99	0.99	0.99	1.42	1.42	1.42	1.41	1.41	1.41
GWP - fossil	1.00	1.00	0.99	0.99	0.99	1.42	1.42	1.42	1.41	1.41	1.41
GWP - biogenic	1.00	1.00	0.99	0.99	0.99	1.42	1.42	1.42	1.41	1.41	1.41
GWP - luluc	1.00	1.00	0.99	0.99	0.99	1.42	1.42	1.42	1.41	1.41	1.41
ODP	1.00	1.00	0.99	0.99	0.99	1.42	1.42	1.42	1.41	1.41	1.41
AP	1.00	1.00	0.99	0.99	0.99	1.42	1.42	1.42	1.41	1.41	1.41
EP - freshwater	1.00	1.00	0.99	0.99	0.99	1.42	1.42	1.42	1.41	1.41	1.41
EP - marine	1.00	1.00	0.99	0.99	0.99	1.42	1.42	1.42	1.41	1.41	1.41
EP - terrestrial	1.00	1.00	0.99	0.99	0.99	1.42	1.42	1.42	1.41	1.41	1.41
POCP	1.00	1.00	0.99	0.99	0.99	1.42	1.42	1.42	1.41	1.41	1.41
ADPE	1.00	1.00	0.99	0.99	0.99	1.42	1.42	1.42	1.41	1.41	1.41
ADPF	1.00	1.00	0.99	0.99	0.99	1.42	1.42	1.42	1.41	1.41	1.41
WDP	1.00	1.00	0.99	0.99	0.99	1.42	1.42	1.42	1.41	1.41	1.41
PERE	1.00	1.00	0.99	0.99	0.99	1.42	1.42	1.42	1.41	1.41	1.41
PERM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PERT	1.00	1.00	0.99	0.99	0.99	1.42	1.42	1.42	1.41	1.41	1.41
PENRE	1.00	1.00	0.99	0.99	0.99	1.42	1.42	1.42	1.41	1.41	1.41
PENRM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PENRT	1.00	1.00	0.99	0.99	0.99	1.42	1.42	1.42	1.41	1.41	1.41
SM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RSF	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NRSF	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FW	1.00	1.00	0.99	0.99	0.99	1.42	1.42	1.42	1.41	1.41	1.41
HWD	1.00	1.00	0.99	0.99	0.99	1.42	1.42	1.42	1.41	1.41	1.41
NHWD	1.00	1.00	0.99	0.99	0.99	1.42	1.42	1.42	1.41	1.41	1.41
RWD	1.00	1.00	0.99	0.99	0.99	1.42	1.42	1.42	1.41	1.41	1.41
CRU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MFR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EEE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EET	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PM	1.00	1.00	0.99	0.99	0.99	1.42	1.42	1.42	1.41	1.41	1.41
IR	1.00	1.00	0.99	0.99	0.99	1.42	1.42	1.42	1.41	1.41	1.41
ETF-fw	1.00	1.00	0.99	0.99	0.99	1.42	1.42	1.42	1.41	1.41	1.41
HTP-c	1.00	1.00	0.99	0.99	0.99	1.42	1.42	1.42	1.41	1.41	1.41
HTP-nc	1.00	1.00	0.99	0.99	0.99	1.42	1.42	1.42	1.41	1.41	1.41
SQP	1.00	1.00	0.99	0.99	0.99	1.42	1.42	1.42	1.41	1.41	1.41

Conversion factors LCA results module D

	MM20	MM50	MM60	MM70	MM80	MXL20	MXL30	MXL50	MXL60	MXL70	MXL80
GWP - total	0.91	1.24	1.71	1.95	2.20	1.02	1.12	1.41	1.91	2.19	2.47
GWP - fossil	0.91	1.24	1.71	1.96	2.20	1.01	1.12	1.41	1.91	2.19	2.47
GWP - biogenic	0.85	1.34	1.97	2.31	2.66	0.90	1.07	1.46	2.13	2.53	2.91
GWP - luluc	0.87	1.29	1.81	2.11	2.39	0.95	1.10	1.43	1.99	2.32	2.65
ODP	0.93	1.16	1.47	1.63	1.80	1.08	1.16	1.35	1.68	1.87	2.05
AP	0.88	1.28	1.80	2.09	2.37	0.97	1.10	1.43	1.99	2.31	2.63
EP - freshwater	0.91	1.21	1.58	1.79	2.00	1.05	1.14	1.38	1.79	2.02	2.26
EP - marine	0.89	1.27	1.76	2.03	2.30	0.98	1.11	1.42	1.95	2.26	2.57
EP - terrestrial	0.89	1.27	1.77	2.04	2.31	0.98	1.11	1.42	1.95	2.26	2.57
POCP	0.89	1.27	1.77	2.04	2.31	0.99	1.11	1.42	1.96	2.27	2.58
ADPE	0.87	1.29	1.82	2.12	2.41	0.95	1.10	1.43	2.00	2.33	2.66
ADPF	0.91	1.23	1.66	1.89	2.12	1.02	1.13	1.39	1.86	2.13	2.39
WDP	0.89	1.28	1.80	2.08	2.36	0.97	1.10	1.43	1.98	2.30	2.62
PERE	0.90	1.22	1.62	1.84	2.07	1.02	1.13	1.39	1.81	2.07	2.32
PERM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PERT	0.90	1.22	1.62	1.84	2.07	1.02	1.13	1.39	1.81	2.07	2.32
PENRE	0.91	1.23	1.66	1.89	2.12	1.02	1.13	1.39	1.86	2.13	2.39
PENRM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PENRT	0.91	1.23	1.66	1.89	2.12	1.02	1.13	1.39	1.86	2.13	2.39
SM	1.06	1.25	1.96	2.21	2.46	1.21	1.18	1.51	2.29	2.63	2.95
RSF	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NRSF	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FW	0.89	1.27	1.78	2.06	2.33	0.98	1.11	1.42	1.97	2.28	2.59
HWD	0.92	1.18	1.51	1.69	1.87	1.05	1.14	1.34	1.70	1.91	2.11
NHWD	0.86	1.29	1.80	2.09	2.38	0.93	1.09	1.42	1.96	2.29	2.61
RWD	0.97	1.06	1.16	1.22	1.28	1.20	1.22	1.29	1.41	1.47	1.54
CRU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MFR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EEE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EET	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PM	0.88	1.29	1.81	2.10	2.39	0.96	1.10	1.43	1.99	2.32	2.65
IR	0.96	1.08	1.22	1.30	1.38	1.16	1.21	1.30	1.45	1.54	1.63
ETF-fw	0.88	1.28	1.78	2.06	2.33	0.97	1.10	1.42	1.96	2.28	2.59
HTP-c	0.88	1.29	1.81	2.10	2.38	0.96	1.10	1.43	1.99	2.32	2.64
HTP-nc	0.95	1.22	1.67	1.89	2.11	1.08	1.15	1.41	1.90	2.16	2.42
SQP	0.91	1.21	1.60	1.82	2.04	1.03	1.14	1.38	1.80	2.05	2.29

7. Requisite evidence

When used as intended, no negative effects on the environment and health are to be expected. The product is embedded in concrete and has no contact with the indoor air or

to the outer shell of the building. By law, no proof of the product is required.

8. References

Norms

BBA

BBA - British Board of Agrément: Construction Product Certification, Watford, UK.

BTI

BTI - Bautechnisches Institut GmbH, Linz, Austria.

DIN 1045-1

DIN 1045-1: 2008-08, Structures made of concrete, reinforced concrete and prestressed concrete - Part 1: Design and construction.

ISO 9001

DIN EN ISO 9001:2015-11, quality management systems.

ISO 14001

DIN EN ISO 14001:2015-09, environmental management systems.

EAD 050001-00-0301

EAD 050001-00-0301: 2008-02, Load bearing thermal insulating elements which form a thermal break between balconies and internal floors.

EN 1992-1-1

EN 1992-1-1:2004/A1:2014, Eurocode 2: Design and construction of reinforced concrete and prestressed concrete structures – Part 1-1: General design rules and rules for building construction.

EN 13162

EN 13162:2012+A2:2015, Thermal insulation products for buildings - Factory made mineral wool (MW) products - specification.

EN 13163

EN 13163:2012+A2:201g, Thermal insulation products for buildings - Factory made expanded polystyrene (EPS) products - specification.

EN 13501-1

EN 13501-1:2018, Classification of construction products and construction methods about their reaction to fire – Part 1: Classification with the results of the reaction to fire tests of construction products.

EN 13501-2

EN 13501-2:2016, Classification of construction products and construction methods about their reaction to fire – Part 2: Classification with the results of the fire resistance tests, with the exception of ventilation systems.

EN 15804

EN 15804:2012+A2:2019+AC:2021, Sustainability of construction works – Environmental product declarations basic rules for the product category construction products.

EN ISO 10211

EN ISO 10211:2017, Components - Thermal bridges in building construction - Heat fluxes and surface temperatures - Detailed calculations (ISO 10211:2017).

EN ISO 6946

EN ISO 1946:2017, Components - Thermal resistance and heat transfer coefficient - Calculation method (ISO 6946:2017).

ETA-19/0046

ETA-19/0046:2022-01, Max Frank EgcoBox MM/ML/MXL/MXXL.

ISO 14025

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

ISO 15686

ISO 15686-1:2011-05, Building construction and construction - Life cycle planning.

ITB

ITB - Building Research Institute, Warsaw, Poland.

KIT

KIT - Karlsruhe Institute of Technology, Karlsruhe, Germany.

KIWA

Kiwa Netherland NV, Rijswijk, Niederlande.

Waste code number

Waste catalogue based on the European Waste List, 2002, Chapter 170904: mixed construction and demolition waste, except for that covered by 170901, 170902 and 170903.

Further Sources

Candidate List

List of candidates eligible for admission in substances of very high concern (ECHA Candidate List), dated 21.02.2023, published in accordance with Article 59(10) of the REACH Regulation. Helsinki: European Chemicals Agency.

LCA FE (GaBi) documentation

GaBi life cycle inventory data documentation (<https://sphera.com/product-sustainability-gabi-data-search/>).

LCA FE (GaBi)-Software

Sphera Solutions GmbH: GaBi Software System and Database for Life Cycle Engineering, CUP Version: 2023.1. University of Stuttgart, Leinfelden Echterdingen.

IBU 2021

General EPR program instructions of the Institut Bauen und Umwelt e.V. (IBU). Version 2.0, Institut Bauen und Umwelt e.V., Berlin 2021.

PCR part A

Product category rules for building-related products and services.

Part A: Calculation rules for life cycle assessment and requirements for the project report, Berlin: Institut Bauen und Umwelt e.V. (ed.), Version 1.3, 08/2022 (www.ibu-epd.com).

PCR: Tragende Wärmedämmelemente

Product category rules for building-related products and

services. Part B: Requirements for the EPD for load-bearing thermal insulation elements. Institute for Building and Environment e.V. (Hrsg.), www.ibu-epd.com, Version 1, 04/2023.



Publisher

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

+49 (0)30 3087748- 0
info@ibu-epd.com
www.ibu-epd.com



Programme holder

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

+49 (0)30 3087748- 0
info@ibu-epd.com
www.ibu-epd.com



Author of the Life Cycle Assessment

Sphera Solutions GmbH
Hauptstraße 111- 113
70771 Leinfelden-Echterdingen
Germany

+49 711 341817-0
info@sphera.com
www.sphera.com



Owner of the Declaration

Max Frank GmbH & Co. KG
Mitterweg 1
94339 Leiblfing
Germany

+49 9427 189-0
info@maxfrank.de
www.maxfrank.com