ENVIRONMENTAL PRODUCT DECLARATION

as per /ISO 14025/ and /EN 15804/

Owner of the Declaration	TAIM e.V. - Verband Industrieller Metalldeckenhersteller (Association of Industrial Metal Ceiling Manufacturers)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-TAI-20180163-IBG2-EN
Issue date	30.01.2019
Valid to	29.01.2024

Metal ceiling systems made of steel as heating and cooling ceilings

TAIM e.V. - Verband Industrieller Metalldeckenhersteller (Association of Industrial Metal Ceiling Manufacturers)

Institut Bauen und Umwelt e.V.

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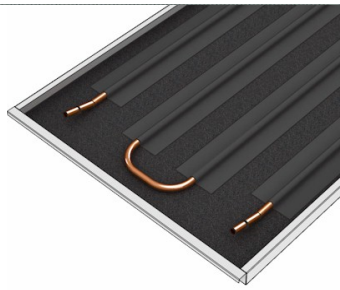


1. General Information

TAIM e.V. - Verband Industrieller Metalldeckenhersteller (Association of Industrial Metal Ceiling Manufacturers)

Programme holder
IBU - Institut Bauen und Umwelt e.V.
Panoramastr. 1
10178 Berlin
Germany

Declaration number
EPD-TAI-20180163-IBG2-EN

This declaration is based on the product category rules:
Metal ceilings, 07.2014
(PCR checked and approved by the SVR)

Issue date
30.01.2019

Valid to
29.01.2024

Prof. Dr.-Ing. Horst J. Bossenmayer
(President of Institut Bauen und Umwelt e.V.)

Dipl. Ing. Hans Peters
(Head of Board IBU)

Metal ceiling systems made of steel as heating and cooling ceilings

Owner of the declaration
TAIM e.V.
Osloer Str. 100
13359 Berlin

Declared product / declared unit
The declared unit is 1 kg metal ceiling systems made of steel as heating and cooling ceilings. The area density kg/m² is calculated product-specifically.

Scope:
This declaration applies to all production manufacturers of the following TAIM e.V. members. The data of this Life Cycle Assessment is based on annual data from 2017, which were collected at the factory.

- DAMPA ApS: www.dampa.com
- durlum Group GmbH: www.durlum.com
- FURAL Systeme in Metall GmbH: www.fural.com
- Geipel® GENEX- Vertrieb Ltd. & Co. KG: www.geipel-genex.de
- Linder AG: www.Lindner-Group.com

After the publication this document was subsequently adjusted in chapter 2.5 on May 27, 2020.

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.

Verification

The standard /EN 15804/ serves as the core PCR
Independent verification of the declaration and data according to /ISO 14025:2010/
☐ internally ☒ externally

Matthias Schulz
(Independent verifier appointed by SVR)

2. Product

2.1 Product description / Product definition

Heating and cooling ceiling systems are manufactured from folded, rollformed and partially stamped steel as complete kits or as individual components. The construction set comprises a top layer, e.g. linear panel or strip panel ceilings, as well as the substructure for fastening the metal ceiling. The substructure is predominantly made of steel. It can be attached directly to the raw ceiling, can have various suspension heights and depends in its design on the shape, functional requirements and the weight of the linear panel.

For the placing on the market of the product in the EU/EFTA (with the exception of Switzerland), Regulation (EU) No. /305/2011/ (CPR) applies. The products require a declaration of performance taking into consideration the harmonized /EN 13964/, Suspended ceilings - Requirements and test methodsand, the CE-marking.
For the use and application of the product, the respective national provisions apply. Metal ceilings according to the technical regulations of the TAIM e.V. /THM/ are fastened by hangers directly to the load-

bearing component substructure or to the ceiling trim profile connected with a distance to the ceiling above.

2.2 Application

The metal ceiling systems made of steel as heating and cooling ceilings are used for indoor purposes as a rectangular panel (also as special shape), panel ceiling, square cassette, expanded metal ceiling, grid ceiling or canopy ceiling used for ceiling cladding. The product is manufactured in accordance with the respective customer's requirements.

2.3 Technical Data

The following technical data apply to metal ceiling systems made of steel as heating and cooling ceilings. The standard /EN 13964/ applies. The standard for the cooling output /EN14240/, the heating output in accordance with /EN 14037-2/ applies.

Constructional data

Name	Value	Unit
average Grammage	10,82	kg/m²
Heating output (EN ISO 14037) 15 K	123	W/m²
Cooling output (EN 14240) 10 K	120	W/m²
Durability class (EN 13964)	A	-
Sound absorption coefficient (EN ISO 354, EN ISO 11654)	not relevant	%
Airborne sound reduction (EN 20140-9, ISO 140-3)	not relevant	dB

Performance data of the product in accordance with the declaration of performance with respect to its essential characteristics according to /EN 13964:2014-08/ Suspended ceilings - Requirements and test methods.

2.4 Delivery status

The metal ceiling systems, construction kits and components are produced in individual sizes and can be delivered with or without substructure. Packaging is usually on pallets and/or packed in cardboard. Weight per area (kg/m²) depends on the specific product and manufacturer. A conversion table is helpful for converting the declared unit (kg/m²) and can be requested from the respective manufacturer. Conversion is possible by means of simple multiplication of the results per kg by the specific basis weight.

2.5 Base materials / Ancillary materials

The base material of metal ceilings made of steel as heating and cooling ceilings are:

Name	Value	Unit
Steel	> 70	%
Aluminium	< 15	%
Stainless steel pipe/ copper pipe	< 14	%
Mineral wool	< 3	%
Surface coating	< 2	%
Acoustic tissue	< 1	%

This product/ at least one partial article contains substances listed in the candidate list (27.06.2018) exceeding 0.1 percentage by mass: no. *A subsequent examination was carried out on May 27, 2020 with the ECHA candidate list of January 16, 2020.*

This product/ at least one partial article contains other 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 (EU) Ordinance on Biocide Products No. 528/2012): no.

2.6 Manufacture

The system components for metal ceilings are manufactured in a continuous manufacturing process. The steel sheets are mainly uncoiled, perforated (optional), stamped (optionally aligned) clipped and folded or pressed. If not made of precoated material, the top layers are usually provided after the cleaning process with a powder or wet coating. Subsequently, an acoustic fleece insert can be applied to the back by means of heat in a continuous process. By adding heat, a hot melt adhesive embedded in the fleece is activated, which produces the adhesion of the fleece to the back of the sheet. Stamped and perforated waste is gathered, collected by local disposal companies and sent to the recycling loop. All production steps are carried out in compliance with the requirements and test specifications according to /EN 13964/ and the technical regulations of the TAIM e.V. /THM/.

2.7 Environment and health during manufacturing

Manufacturing conditions do not require any special health and safety protection measures other than those provided by the authorities for the specific work area, e.g. safety vest, safety shoes, dust mask.
The DFG Commission for the investigation of Chemical Compounds in the Work Area – better known as MAK values (national regulations) are not exceeded at any point of the production process. Noise-intensive installations, such as punching and straightening systems are correspondingly insulated by structural measures.
The statutory health and safety regulations for metal and dry construction trades as well as the respective provisions of the construction industry, apply. The production-related exhaust air is cleaned in accordance with legal regulations.
Water/Ground: No contamination of water or soil occurs. All values determined inside and outside the production facilities are below the applicable national requirements for noise protection. /EN ISO 14001/ certificates and other manufacturer-specific documents on environmental and health protection can be requested from the manufacturer.

2.8 Product processing/Installation

The membrane of the metal ceiling system is attached to a substructure. The installation is to be carried out by trained personnel, usually from the area of drywall construction. The manufacturer's instructions must be observed.

2.9 Packaging

For packaging the metal ceiling systems and components wooden pallets, cardboard, polystyrene, plastic sheeting, steel and plastic straps are used. The packaging material is easily separable and can be reused if necessary. It can be collected, sorted and sent to the regional recycling services. Residual

material must be disposed of in accordance with the respective national guidelines.

2.10 Condition of use

Due to the many product variants no general cleaning and maintenance recommendation can be given. Conditions for a long service life are based on regular maintenance, care and repair of the product. The material composition does not change during service life. Documents can be requested from the respective metal ceiling system manufacturer.

2.11 Environment and health during use

There are no known interactions between the product, the environment and health. Volatile organic compounds (VOC) are below the valuation limit according to healt-related Evaluation of Emissions of Volatile Organic Compounds from Building Products (AgBB) /AgBB evaluation scheme/.

2.12 Reference service life

Based on the useful lives of building components according to the Sustainable Building Assessment System /BBSR-Table 2017/, Service Lives of components for life cycle assessment according to Assessment System for Sustainable Building (BNB), the reference service life of metal ceilings exceeds 50 years.

2.13 Extraordinary effects

Fire

The metal ceiling systems made of steel as heating and cooling ceilings declared here correspond to the class A of building products regarding their fire performance, according to /EN 13501-1/. The class of flaming droplets is d0 and the class for smoke density is pre-defined as s1.

Fire protection

Name	Value
Building material class	A2
Smoke gas development	s1
Burning droplets	d0

Water

There are no known effects on the environment in the event of unforeseen ingress of water.

Mechanical destruction

In the case of mechanical destruction, all of the substances remain bound. It is to be assumed that in the case of coated ceilings, lacquer chippings occur in such a small amount that there are no negative impacts on the environment.

2.14 Re-use phase

The metal ceiling systems can be removed and re-used without damaging the product.

2.15 Disposal

In accordance with the Waste Classification Ordinance (AVV) and the European Waste List (EWL), the waste code for steel is:
17 04 05 – Iron and steel.
17 04 02 – Aluminium.
17 04 01 – Copper, bronze, brass.
17 04 03 – Lead.

2.16 Further information

- DAMPA ApS: www.dampa.com
- durlum GmbH: www.durlum.de
- FURAL Systeme in Metall GmbH: www.fural.com
- Geipel® Genex-Vertrieb Ltd. & Co. KG: www.geipel-genex.de
- Linder AG: www.Lindner-Group.com

3. LCA: Calculation rules

3.1 Declared Unit

The declaration applies to 1 kg metal ceiling systems made of steel as heating and cooling ceilings.

Declared unit

Name	Value	Unit
Conversion factor to 1 kg	0.0924	-
Declared unit	1	kg
Grammage	10.82	kg/m²

3.2 System boundary

The Life Cycle Assessment consideres the system boundaries "cradle to grave" and follows the modular construction system described by /EN 15804/. The LCA takes into account the following modules:

- A1: Raw material supply (Production of precursors, packaging)
- A2: Transport of precursors
- A3: Manufacturing (Energy usage, utilization of production residues)
- A4: Transport from the gate to the site
- A5: Assembly (Installation, recycling of packaging)
- B1: Use
- B4: Replacement
- B5: Refurbishment
- C1: De-construction demolition
- C2: Transport to waste-processing facility
- C3: Waste processing for reuse, recovery and/or recycling
- D: Potential for reuse, recovery and/or recycling as net flows and benefit

3.3 Estimates and assumptions

Specific data regarding the production process was provided by the members of TAIM e.V.. Missing data was supplemented by estimates based on comparable substitutes or data used from the secondary literature and the database /GaBi 8:2018/. Missing data set were modeled by the auditor. The thermal utilization of the packaging in the assembly stage was modeled with an

R1 factor of the waste incineration plant (MVA) with R1 value > 0.6.

3.4 Cut-off criteria

All relevant data, i.e. all applied materials according to the recipe and the energy used originate from the production data acquisition and have been considered within the inventory analysis. For the considered in- and outputs the actual transport distances were used. Material- and energyflows with a proportion of less than 1 % were collected. Waste of upstream products, which accumulate in small quantities (<1 %) during the manufacturing process, was neglected. It can be assumed, that the sum of the neglected processes does not exceed 5 % of the impact categories.

3.5 Background data

Primary data has been provided by members of the TAIM e.V. All background data required for the Life Cycle Assessment originates form the database of the GaBi-Software /GaBi 8:2018/.

3.6 Data quality

For modelling the Life Cycle of metal ceiling systems made of steel, data has been collected by members of the TAIM e.V. from the production year 2017. All other database of the /GaBi 8:2018/ software. For the Life Cycle Inventory all input and output flows have been respected. The background data is not older than 4 years, relate almost exclusively to the reference year 2017 and are all valid until at least 2020. The representativeness and data quality is therefore classified as good. Since the primary products make up the majority of the environmental impact and the production processes are mostly the same for all manufacturers, the variability of the results is mainly determined by the country-specific electricity mixes used and has a variability of 3.98-7.65 % in the GWP factor within the production module.

3.7 Period under review

The Life Cycle Assessment for metal ceiling systems made of steel as heating and cooling ceilings was compiled on the basis of production data from 2017. The LCA is thus representative of the average metal ceiling systems produced.

3.8 Allocation

Co-product allocation does not exist in the manufacturing process.
Incidental waste is sent to incineration. The energy generated in waste incineration plants is calculated taking into account the elementary composition and calorific value. The requisite volume of secondary materials included in production waste and end-of-life waste incurred by the system is initially returned to production or upstream chains ("closed loop"). The net volume of scrap comprises the volume of scrap collected during the end-of-life stage plus the scrap output from production and/or the upstream chains as more scrap is generated during production than required in the upstream chains. A credit is allocated for the net volume of scrap in Module D (substitution of primary materials).

3.9 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 /GaBi 8:2018/ was used.

4. LCA: Scenarios and additional technical information

The following technical information models the basis for the declared modules or can be used for developing specific scenarios within the context of a building appraisal if modules are not declared (MND).

The reference service life according to /ISO 15686-1/ could not have been determined. The declaration of the reference service life underlies the assessment system of the Federal Institute for Research on Building, Urban Affairs and Spatial Development /BBSR/.

Transport to the building site (A4)

Name	Value	Unit
Transport distance	100	km
Capacity utilisation (including empty runs)	50	%
Payload	27	t
Vehicle type	34-40t	truck, Diesel, Euro 4

Installation into the building (A5)

The installation is largely manual and by hand, so no further energy expenses are needed for the assembly.

Use or application of the installed product (B1)

The metal ceiling systems made of steel are durable. Metal ceilings need during the service life usually no maintenance measures. Therefore during the use phase no further environmental effects are to be expected.

Replacement (B4) / Refurbishment (B5)

Name	Value	Unit
Replacement cycle	0	Number/ RSL

The replacement in a cycle of 50 years is zero, as specified in /BBSR Table 2017/ in conjunction with the reference life from the Sustainable Building Assessment System.

Reference service life

Name	Value	Unit
Life Span (according to BBSR)	≥ 50	a

End of life (C1-C4)

Name	Value	Unit
Recycling	0.9585	kg
Energy recovery	0.001	kg
Landfilling	0.0303	kg

5. LCA: Results

The table displayed below summarizes the results of the Life Cycle Assessment (LCA). The results of the impact assessment do not provide any information on endpoints of the impact categories, exceedances of thresholds, safety margins or risks. The results refer to the declared unit of 1 kg metal ceiling systems made of steel as heating and cooling ceilings. The LCA and Life Cycle Impact Assessment are based on the specifications of the European Standard using the CML method 2001 – April 2015.

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE NOT DECLARED)

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	MND	MNR	X	X	MND	MND	MND	X	X	MND	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: 1 kg metal ceiling systems made of steel as heating and cooling ceilings

Parameter	Unit	A1-A3	A4	A5	B1	B4	B5	C2	C3	D
GWP	[kg CO_2-Eq.]	4.16E+0	7.12E-3	4.67E-2	0.00E+0	0.00E+0	0.00E+0	7.31E-3	1.74E-3	-2.40E+0
ODP	[kg CFC11-Eq.]	2.74E-8	1.51E-16	1.57E-15	0.00E+0	0.00E+0	0.00E+0	1.55E-16	1.52E-16	6.41E-9
AP	[kg SO_2-Eq.]	1.63E-2	2.94E-5	1.98E-5	0.00E+0	0.00E+0	0.00E+0	2.80E-5	3.37E-6	-8.28E-3
EP	[kg $(PO_4)^{3-}$-Eq.]	1.18E-3	7.48E-6	3.73E-6	0.00E+0	0.00E+0	0.00E+0	7.10E-6	4.89E-7	-5.19E-4
POCP	[kg ethene-Eq.]	1.04E-3	-1.13E-5	7.18E-7	0.00E+0	0.00E+0	0.00E+0	-1.05E-5	2.52E-7	-8.57E-4
ADPE	[kg Sb-Eq.]	2.91E-5	7.43E-10	2.15E-9	0.00E+0	0.00E+0	0.00E+0	7.63E-10	2.43E-10	-1.01E-5
ADPF	[MJ]	4.29E+1	9.59E-2	2.23E-2	0.00E+0	0.00E+0	0.00E+0	9.85E-2	6.74E-3	-2.47E+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

RESULTS OF THE LCA - RESOURCE USE: 1 kg metal ceiling systems made of steel as heating and cooling ceilings

Parameter	Unit	A1-A3	A4	A5	B1	B4	B5	C2	C3	D
PERE	[MJ]	1.26E+1	6.48E-3	1.85E-1	0.00E+0	0.00E+0	0.00E+0	6.66E-3	2.02E-1	-6.28E+0
PERM	[MJ]	3.82E-1	0.00E+0	-1.81E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	-2.01E-1	0.00E+0
PERT	[MJ]	1.30E+1	6.48E-3	3.49E-3	0.00E+0	0.00E+0	0.00E+0	6.66E-3	8.89E-4	-6.28E+0
PENRE	[MJ]	4.80E+1	9.62E-2	6.18E-1	0.00E+0	0.00E+0	0.00E+0	9.88E-2	2.05E-2	-2.69E+1
PENRM	[MJ]	6.06E-1	0.00E+0	-5.93E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	-1.35E-2	0.00E+0
PENRT	[MJ]	4.86E+1	9.62E-2	2.52E-2	0.00E+0	0.00E+0	0.00E+0	9.88E-2	7.06E-3	-2.69E+1
SM	[kg]	2.35E-1	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]	2.22E-2	7.51E-6	1.38E-4	0.00E+0	0.00E+0	0.00E+0	7.72E-6	4.97E-6	-1.68E-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 – OUTPUT FLOWS AND WASTE CATEGORIES: 1 kg metal ceiling systems made of steel as heating and cooling ceilings

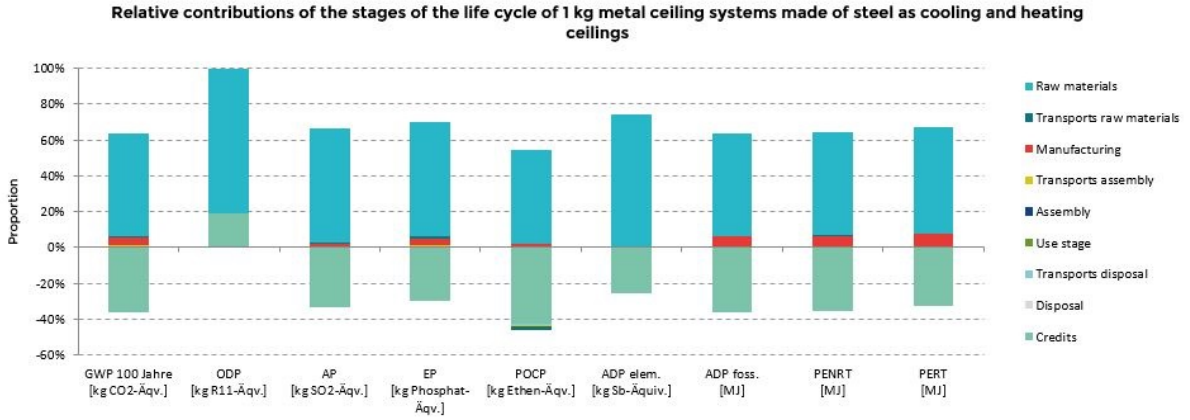
Parameter	Unit	A1-A3	A4	A5	B1	B4	B5	C2	C3	D
HWD	[kg]	-5.83E-8	6.17E-9	3.33E-10	0.00E+0	0.00E+0	0.00E+0	6.34E-9	1.14E-10	-7.64E-7
NHWD	[kg]	1.58E+1	5.19E-4	9.24E-3	0.00E+0	0.00E+0	0.00E+0	5.33E-4	3.17E-2	-1.88E+0
RWD	[kg]	2.21E-3	1.16E-7	1.12E-6	0.00E+0	0.00E+0	0.00E+0	1.19E-7	1.24E-7	-1.03E-3
CRU	[kg]	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	9.39E-1
MER	[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
EEE	[MJ]	0.00E+0	0.00E+0	5.16E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.40E-3	0.00E+0
EET	[MJ]	0.00E+0	0.00E+0	9.68E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.63E-3	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; EEE = Exported thermal energy

*MND: Module not declared
**MDR: Module not relevant

6. LCA: Interpretation

The following figure shows the relative contributions of different Life Cycle processes and the primary energy demand in the form of a dominance analysis.



Indicators of the impact assessment

The contributions from module A1 (raw materials) dominate in almost all environmental impact categories, except Depletion potential of the stratospheric ozone layer (ODP). Contributions from transport throughout the life cycle are below 1% for all environmental impact categories. The credits in module D originate from the avoided environmental effects in other product systems and arise almost exclusively through the recycling of steel scrap.

Global warming potential (GWP)
The global warming potential is mainly determined by the supply of raw materials, i.e. by the primary products. Within these, the production of primary products such as steel, copper and stainless steel and small amounts of aluminium, has the greatest influence on the GWP factor of > 97%. However, at the end of life, the cost of providing the steel precursors is offset by the environmental benefits in the form of credits for the recycling of steel products. Along the entire life cycle, approximately 50 % of GWP emissions are credited by metal recycling at the end of life.

Depletion potential of the stratospheric ozone layer (ODP)
The Ozone depletion potential is dominated with 80 % by the metal precursors. By contrast, 20 % are attributable to steel recyling at the end of life, which appears as an additional burden in module D.

Acidification potential of land and water (AP)
The Acidification potential is triggered to 96 % in the production stage by the raw material supply (mainly steel). The remaining 4 % is caused by the production of the metal ceiling systems itself. A credit of approximately 43 % of the total AP emissions along the life cycle is credited mainly by steel recycling.

Eutrophication potential (EP)
The greatest contribution to the EP arises from the provision of raw materials with 92 %, in particular due to the high energy demand in the form of natural gas and electricity. A total of 6 % results from the production of metal ceilings and 2 % from the transport of primary products and auxiliary materials.

Potential of tropospheric ozone photochemical oxidants (POCP)
About 97 % of the POCP value is generated in the production stage by the provision of raw materials. Another 3 % arise from the metal ceiling manufacturing process.

Abiotic depletion potential for non-fossil resources (ADPE)
The ADPE value is predominantly conditioned by the production stage module A1. Here, mainly the upstream chain of the steel sheet contributes almost 100 % to the overall ADPE. A credit of 34 % can be given at the end of the product life for the recycling of metal scrap.

Abiotic depletion potential for fossil resources (ADPF)
Within the production (A1-3), the ADPF value mainly results from the upstream chains in module A1 (about 88 %). Almost 12 % is attributable to the production of the metal ceiling systems. A credit of about 50 % is obtained mainly through the recycling of the steel.

Within the production (A1-3), the total primary energy demand is divided between approx. 79 % non-renewable energy sources and approx. 21 % renewable energies.

Total use of non-renewable primary energy resources (PENRT)
The upstream chains associated with manufacturing of the preliminary products (Module A1) contribute with 88 % to the production caused by the steel sheet. The production of the metal ceiling systems contributes about 9 % to non-renewable energy consumption. A credit is issued at the end of life (48 %), which is generated by the recycling of the preliminary products.

Total use of renewable primary energy resources (PERT)
The PERT value along the entire life cycle results to 89 % from the upstream chains associated with the preliminary products (A1), and the production of the metal ceiling systems (A3) with 11 %. Another 37 % is attributable to the credit (module D) from steel recycling.

7. Requisite evidence

VOC emissions

For the declared product the test procedure according to AgBB-scheme was carried out by the measuring agency eco-INSTITUT GmbH on 05.12.2013. The results of the laboratory report (test No. 4244-001 (II) were provided by the member company durlum GmbH as a reference for the TAIM e.V.

The test report is based on the "Assessment basis for the health assessment of VOC and SVOC of construction products (as of 2010) of the Committee for the Health Assessment of Construction Products AgBB". The summary assessment of the test procedure yields the result that the product meets the emission requirements of the AgBB evaluation scheme.

	Testing after 3 days [µg/m³]		Testing after 7 days [µg/m³]	
	Results	Requirement	Results	Requirement
Sum VOC (C6C16)	16	≤ 10000	12	≤ 1000
Sum SVOC (C16-C22)	< 1	-	< 1	100
R (dimensionsless)	0,01	-	0	≤ 1
Sum VOC o. LCI	9	-	8	≤ 100
Sum carcinogenic substances (EU- Kat 1 und 2)	< 1	≤ 10	< 1	≤ 1

8. References

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Publisher
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