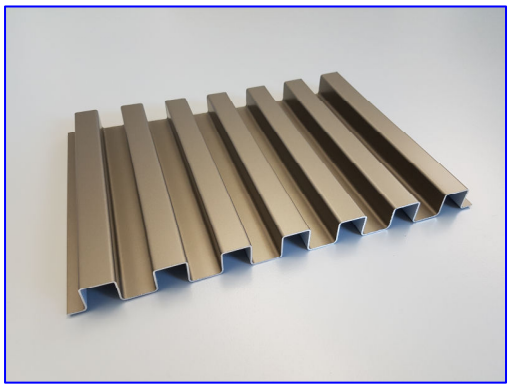
Environmental Product Declaration (EPD)

Deklarationsnummer: EPD-MNF-GB-41.1



MN Metall GmbH

External wall claddings

Façade claddings

Basis:

DIN EN ISO 14025
EN 15804 + A2

Company-EPD
Environmental
Product **D**eclaration

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Testing + Calibration – EN ISO/IEC 17025
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Programme operator	ift Rosenheim GmbH Theodor-Gietl-Straße 7-9 D-83026 Rosenheim		
Practitioner of the LCA	People Planet Profit GmbH & Co. KG Gerberstraße 7 D-88250 Weingarten		
Declaration holder	MN Metall GmbH Industrieweg 34 D-23730 Neustadt www.mn-metall.de		
Declaration code	EPD-MNF-GB-41.1		
Designation of declared product	Façade claddings		
Scope	Façade cladding for ventilated curtain wall (VCW).		
Basis	This EPD was prepared on the basis of EN ISO 14025:2011 and DIN EN 15804:2012+A2:2019. In addition, the “Allgemeiner Leitfaden zur Erstellung von Typ III Umweltproduktdeklarationen” (Guidance on preparing Type III Environmental Product Declarations) applies. The Declaration is based on the PCR documents EN 18001 „PCR for curtain walls (in accordance with), "PCR Part A" PCR-A-2.0:2025 und "Façades" PCR-FA-4.0:2023.		
Validity	Publication date: 05.03.2026	Last revision: 03.06.2026	Valid until: 05.03.2031
	This verified company Environmental Product Declaration applies solely to the specified products and is valid for a period of five years from the date of publication in accordance with DIN EN 15804.		
LCA basis	The LCA was prepared in accordance with DIN EN ISO 14040 and DIN EN ISO 14044. The base data includes both the data collected at the production site of MN Metall GmbH and the generic data from the ”LCA for Experts 10“ database. LCA calculations were carried out for the included “cradle to grave” life cycle including all upstream chains (e.g. raw material extraction, etc.).		
Notes	The “Conditions and Guidance on the Use of ift Test Documents” apply. The declaration holder assumes full liability for the underlying data, certificates and verifications. ift Rosenheim GmbH is not liable for manufacturer information, life cycle assessment data, and evidence.		
Assessment committee	Dr. Torsten Mielecke Chairman of Expert Committee ift-EPD und PCR		
External Verification	Susanne Volz, External verifier		

1 General product information

Product definition

The EPD relates to the product group External wall claddings and applies to:

1 m² * 1 mm façade cladding
made by MN Metall GmbH

The declared unit is obtained as follows:

Assessed products	Declared unit	Weight per unit area
SQ-20/20-R40 Product group (PG) 1	1 m² * 1 mm	5.07 kg/m²
SQ-20/20-R40 Product group (PG) 2	1 m² * 1 mm	14.60 kg/m²
SQ-20/20-R40 Product group (PG) 3	1 m² * 1 mm	14.90 kg/m²

Table 1: Assessed products

The average unit is declared as follows:
Directly used material flows are determined using average masses (kg) ermittelt and assigned to the declared unit based on the respective weight per unit area. Raw materials were determined with direct reference to the reference area. All other inputs and outputs in the production are assigned to the declared unit in their entirety because they cannot be related to the average size. The reference period is the year 2024.

The validity of the EPD is restricted to the following models:

Product group	Related products
Product group (PG) 1	Aluminium sheets - blank - powder-coated - **anodized*** - coil-coated
Product group (PG) 2	**Steel sheets***
Product group (PG) 3	**Stainless steel sheets*** Brass sheets Copper sheets Zinc sheets

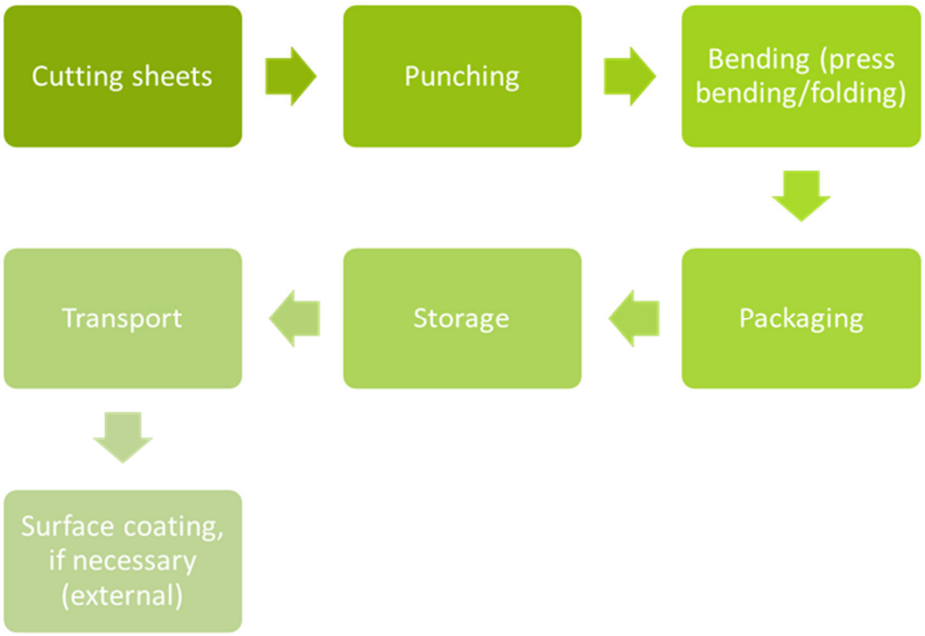
Table 2: Product groups
*** Worst-case products per PG in bold print**

Product description

Multi-metal façade claddings of the wellTEC®, planTEC® and colTEC® brands in different designs. Customised to the client's requirements by mechanical press bending, folding and deep drawing. Sheet metal thickness options from 0.5 to 3.00 mm or on request.

For a detailed product description refer to the manufacturer specifications or the product specifications of the respective offer/quotation.

Product manufacture



Scope

Façade cladding sheets made of different materials in different designs for ventilated curtain walls for office buildings, production halls, schools, kindergartens and private homes.

Verifications

The following verifications are held:

- product quality to EN 14782:2006

For further and updated verifications (incl. other national approvals) refer to www.mn-metall.de.

Management systems

The following management systems are in place:

- quality management system to DIN EN ISO 9001:2015

Additional information

For additional evidence of fitness for use or certificates of conformity, if applicable, please refer to the CE marking and the documents accompanying the product.

2 Materials used

Primary materials

The primary materials used are specified in section 6.2 Inventory analysis (Inputs).

Declarable substances

The product contains no substances from the REACH candidate list (declaration dated 17. November 2025).

All relevant safety data sheets are available from MN Metall GmbH .

3 Construction process stage

Processing recommendations, installation	Observe the instructions for mounting/installation, operation, maintenance and disassembly, provided by the manufacturer. See www.mn-metall.de

4 Use stage

Emissions to the environment	No emissions to indoor air, water or soil are known.
Reference service life (RSL)	The RSL information was provided by the manufacturer. The RSL shall be specified under defined reference in-use conditions and shall refer to the declared technical and functional performance of the product within the building. It shall be established in accordance with any specific rules given in European product standards, or, if not available, in accordance with a c-PCR. It shall also take into account ISO 15686-1, -2, -7 and -8. Where European product standards or a c-PCR provide guidance on deriving the RSL, such guidance shall have priority. If it is not possible to determine the service life as the RSL in accordance with ISO 15686, the BBSR table “Nutzungsdauer von Bauteilen zur Lebenszyklusanalyse nach BNB” (service life of building components for life cycle assessment in accordance with the sustainable construction evaluation system) can be used. For further information and explanations refer to www.nachhaltigesbauen.de. For this EPD the following applies: For the “Cradle to grave” EPD and module D (A + B + C + D), a reference service life (RSL) shall be stated . According to the BBSR table (No. 335.811.25), a service life of 50 years is specified for Façade claddings made by MN Metall GmbH . The service life is dependent on the characteristics of the product and the in-use conditions. The in-use conditions described in the EPD are applicable, in particular the characteristics listed below: • Outdoor environment: Climatic influences may have a negative impact on the service life • Indoor environment: not relevant, as only for external use The service life applies solely to the characteristics specified in this EPD or the corresponding references. The RSL does not reflect the actual life span, which is usually determined by the service life and the refurbishment of a building. It does not give any information on the useful life, warranty referring to performance characteristics or guarantees.

5 End-of-life stage

Possible end-of-life stages

The Façade claddings are shipped to central collection points. Dort werden die Produkte in der Regel geschreddert und sortenrein getrennt. There the products are generally shredded and sorted into their original constituents. The end-of-life stage depends on the site where the products are used and is therefore subject to the local regulations. Observe the locally applicable regulatory requirements.

This EPD shows the end-of-life modules according to the market situation.
The metals are 100% recycled.

Disposal routes

The LCA includes the average disposal routes.

All life cycle scenarios are detailed in the Annex.

6 Life Cycle Assessment (LCA)

Environmental product declarations are based on life cycle assessments (LCAs) which use material and energy flows for the calculation and subsequent representation of environmental impacts.

Such life cycle assessments were developed for Façade claddings , serving as the basis. The LCAs are in conformity with the requirements set out in DIN EN 15804 and the international standards DIN EN ISO 14040, DIN EN ISO 14044 and EN ISO 14025 as well as based on ISO 21930.

The LCA is representative of the products presented in the Declaration and the specified reference period.

6.1 Definition of goal and scope

Goal

The goal of the LCA is to demonstrate the environmental impacts of the products. In accordance with DIN EN 15804, the environmental impacts covered by this Environmental Product Declaration are presented for the entire product life cycle in the form of basic information. Apart from these, no other environmental impacts are specified.

Data quality, data availability and geographical and time-related system boundaries

The specific data originate exclusively from the 2024 fiscal year. They were collected on-site at the plant located in D-23730 Neustadt in Holstein and come from company records. Primary data on energy, water, packaging, auxiliary materials, and waste/offcuts was collected from the company's own data management system. At the time of the plausibility check on 09.02.2026, data on energy, water, packaging, auxiliary materials, and waste/offcuts was complete and checked for validity.

The generic data come from the “LCA for Experts 10” professional and building materials databases. The last update of both databases was in 2025. Data from before this date come also from these databases and are not more than three years old. No other generic data were used for the calculation.

The generic data selected are as accurate as possible in terms of geographical reference. If no country-specific datasets are available or regional reference cannot be established, European or global datasets are used.

Data gaps were either filled with comparable data or conservative assumptions, or the data were cut off in compliance with the 1% rule.

The life cycle was modelled using the sustainability software tool "LCA for Experts" version 10.9.4.13 with database version 2025.2 for the development of life cycle assessments. The LCA was evaluated using the EF3.1 impact assessment method.
The data quality complies with the requirements of EN15941:2024-10.

Scope / system boundaries

The system boundaries refer to the supply of raw materials and purchased parts, manufacture/production, use and end-of-life stage of Façade claddings .
No additional data from pre-suppliers/subcontractors or other sites were taken into consideration.

Cut-off criteria

All the data that the company records, i.e. all commodities/input and raw materials used, the thermal energy used and electricity consumption, were taken into consideration.

The boundaries cover only the product-relevant data. Building sections/parts of facilities that are not relevant to the manufacture of the products, were excluded.

The transport distances of the pre-products were taken into consideration as a function of 100% of the mass of the products.

In addition to the transport distances for pre-products, the transport distances for waste were also taken into consideration. The transport of waste in A3 was presented by the following standard scenario:

- Transport to collection point using 28-32 t truck (Euro 5), diesel, 22 t payload, 50% capacity used, 80 km (GLO).

The criteria for the exclusion of inputs and outputs as set out in DIN EN 15804 are fulfilled. From the data analysis it can be assumed that the total of negligible processes per life cycle stage does not exceed 1% of the mass/primary energy. All in all, the total of negligible processes does not exceed 5% of the energy and mass input. The life cycle calculation also includes material and energy flows that account for less than 1%.

6.2 Inventory analysis

Goal

All material and energy flows are described below. The processes covered are presented as input and output parameters and refer to the declared unit.

Life cycle stages

The Annex shows the entire life cycle of Façade claddings .The “Product stage” (A1 - A3), “Construction process stage” (A4 - A5), “Use stage” (B1 - B7), “End-of-life stage” (C1 - C4) and the “Benefits and loads beyond the system boundaries” (D) are considered.

Benefits

The below benefits have been defined in accordance with DIN EN 15804:

- Benefits from recycling
- Benefits (thermal and electrical) from incineration

Allocation of co-products

No co-products are allocated during production.

Allocations for reuse, recycling and recovery

If the products are reused/recycled and recovered during the product stage (rejects) the components are shredded/broken if necessary and then sorted into their single constituents.

The system boundaries were set following their disposal, reaching the end-of-waste state.

Allocations beyond life cycle boundaries

The use of recycled materials in the manufacturing process was based on the current market-specific situation. A recycling potential that reflects the economic value of the product after recycling (recyclate) was also taken into account .
The system boundary set for the recycled material refers to collection.

Secondary material

The use of secondary material by MN Metall GmbH was considered in module A3. Secondary material was not used.

Inputs

The LCA includes the following production-relevant inputs per 1 m² * 1 mm of façade cladding:

Energie
For the input material natural gas, “DE: Thermal energy from natural gas” was assumed. For the electricity mix, the “Residualmix Deutschland” (2024) was assumed (market-based approach).

Electricity mix / gas mix used PG1-PG3	Total	Unit
Electricity mix Germany	0.834	kg CO2-eq. / kWh
Natural gas mix Germany	0.257	kg CO2-eq. / kWh

Table 3: Greenhouse gas emissions from the use of electricity and gas in the manufacturing phase

A portion of the process heat is used for space heating. This can, however, not be quantified and a “worst case” figure was taken into account for the product.

Water
3,7E-03 l (PG1), 1,0E-02 l (PG2), 9,6E-03 l (PG3) per m² of the element water consumed by the individual process steps for the production.
The consumption of freshwater specified in Section 6.3 originates (among others) from the process chain of the pre-products and the process water used for cooling.

Raw material/pre-products

The chart below shows the share of raw materials/pre-products in %.

Figure 1: Percentage of individual materials per declared unit

No.	Material	Mass in %		
		PG 1	PG 2	PG 3
1	Aluminium	100	-	-
2	Steel	-	100	-
3	Stainless steel	-	-	100

Table 4: Representation of individual materials in %

Ancillary materials and consumables

Around 0,15 kg (PG1), 0,44 kg (PG2), 0,46 kg (PG3) of ancillary materials and consumables are used.

Product packaging

The amounts used for product packaging are as follows:

No.	Material	Mass in kg/m²		
		PG 1	PG 2	PG 3
1	Styrofoam	6.02E-04	1.73E-03	1.77E-03
2	Wooden packaging	0.61	1.77	1.80
3	Cardboard boxes	1.16E-04	3.33E-04	3.40E-04
4	Metals (screws, staples)	2.55E-03	7.34E-03	7.49E-03

Table 4: Darstellung der Verpackung in kg je deklarierte Einheit

Biogenic carbon content

Only the biogenic carbon content of the associated packaging is specified, as the total mass of substances containing biogenic carbon is less than 5% of the total mass of the product and asso-ciated packaging. In accord-ance with EN 16449, packaging pro-duces the following amounts of bio-genic carbon:

No.	Component	Content in kg C per m²		
		PG1	PG2	PG3
1	Associated packaging	0.240	0.691	0.705

Note: 1 kg C corresponds to 44/12 kg CO2 eq. of biogenic carbon

Table 5: Biogenic carbon content of packaging at gate

GWP-b values resulting from the sequestration and release of biogenic carbon were calculated specifically for each life cycle module and are

listed in Table 6. The overall results table presented in this document, issued by "LCA for Experts", has not been changed.

Binding and release of CO_2 emissions in kg CO_2-eqv. / m²						
Component		A1-A3	A5	C3	C4	D
PG 1	Product	0	0	0	0	0
	Packaging	- 0.880	+ 0.880	0	0	0
PG 2	Product	0	0	0	0	0
	Packaging	- 2.534	+ 2.534	0	0	0
PG 3	Product	0	0	0	0	0
	Packaging	- 2.586	+ 2.586	0	0	0

Note: 1 kg C corresponds to 44/12 kg CO_2-eqv. of biogenic carbon

Table 6: Binding and release of biogenic CO_2 emissions in kg CO_2-eqv. from product and packaging per life cycle module

Outputs

The LCA includes the following production-relevant outputs per 1 m² * 1 mm of façade cladding:

Waste
Secondary raw materials were included in the benefits.
See Section 6.3 Impact assessment.

Waste water
The manufacture does not produce any waste water.

6.3 Impact assessment

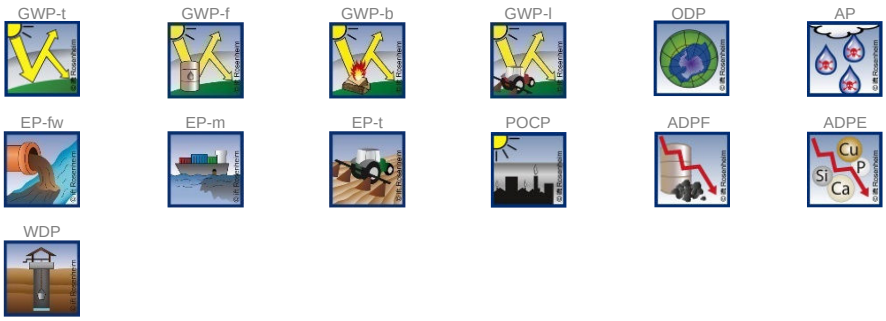
Goal

The impact assessment covers both inputs and outputs. The impact categories applied are named below:

Core indicators

The models for impact assessment were applied as described in DIN EN 15804+A2.
The impact categories presented in the EPD as core indicators are as follows:

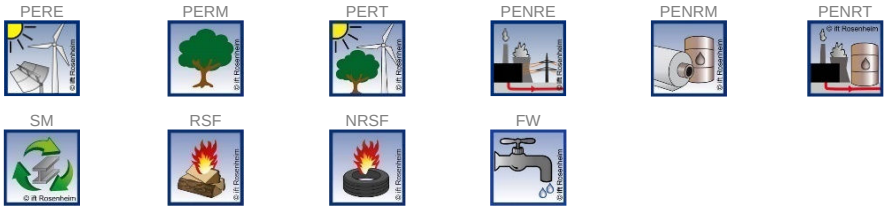
- Climate change – total (GWP-t)
- Climate change – fossil (GWP-f)
- Climate change – biogenic (GWP-b)
- Climate change - land use and land use change (GWP-l)
- Ozone depletion (ODP)
- Acidification (AP)
- Eutrophication aquatic freshwater (EP-fw)
- Eutrophication aquatic marine (EP-m)
- Eutrophication terrestrial (EP-t)
- Photochemical ozone creation (POCP)
- Depletion of abiotic resources - fossil fuels (ADPF)
- Depletion of abiotic resources - minerals and metals (ADPE)
- Water use (WDP)



Use of resources

The models for impact assessment were applied as described in DIN EN 15804-A2.
The following parameters for the use of resources are shown in the EPD:

- Renewable primary energy as energy source (PERE)
- Renewable primary energy for material use (PERM)
- Total use of renewable primary energy (PERT)
- Non-renewable primary energy as energy resource (PENRE)
- Non-renewable primary energy for material use (PENRM)
- Total use of non-renewable primary energy (PENRT)
- Use of secondary materials (SM)
- Use of renewable secondary fuels (RSF)
- Use of non-renewable secondary fuels (NRSF)
- Net use of freshwater resources (FW)

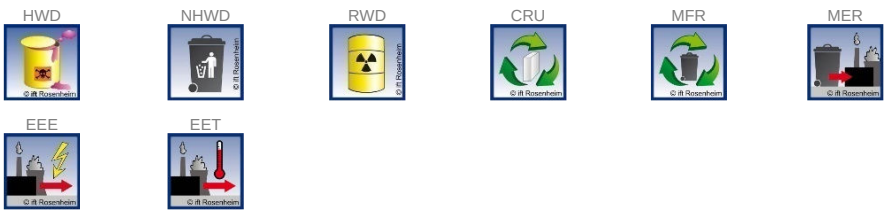


Waste

The waste generate during the production of 1 m² * 1 mm façade cladding is evaluated and shown separately for the fractions trade wastes, special wastes and radioactive wastes. Since waste handling is modelled within the system boundaries, the amounts shown refer to the deposited wastes. A portion of the waste indicated is generated during the manufacture of the pre-products.

The models for impact assessment were applied as described in DIN EN 15804-A2.
The waste categories and indicators for output material flows presented in the EPD are as follows:

- Hazardous waste disposed (HWD)
- Non-hazardous waste disposed (NHWD)
- Radioactive waste disposed (RWD)
- Components for reuse (CRU)
- Materials for recycling (MFR)
- Materials for energy recovery (MER)
- Exported electrical energy (EEE)
- Exported thermal energy (EET)



Additional environmental impact indicators

The models for impact assessment were applied as described in DIN EN 15804-A2.
The additional impact categories presented in the EPD are as follows:

- Particulate matter emissions (PM)
- Ionising radiation, human health (IRP)
- Ecotoxicity – freshwater (ETP-fw)
- Human toxicity - cancer effect (HTP-c)
- Human toxicity - non-cancer effect (HTP-nc)
- Land use related impacts / soil quality (SQP)

PM 

IRP 

ETP-fw 

HTP-c 

HTP-nc 

SQP 

Conversion of results

Since product groups were formed and identified reference products were balanced, a conversion table was created for all other covered products. The environmental impact results obtained for the reference products can be scaled to other products for each impact indicator using the specified factor.

Conversion factors per brand product wellTEC®					
Corrugated profiles		Trapezoidal profiles		Zigzag profiles	
W-4/10	0.652	T-2,5/82	0.538	Z-10/30	0.631
W-6/15	0.688	T-10/30	0.679	Z-13/26	0.752
W-6/32	0.567	T-15/45	0.679	Z-15/45	0.635
W-8/25	0.637	T-20/60	0.699	Z-20/40	0.748
W-8/120	0.539	T-25/75	0.704	Z-20/60	0.655
W-10/60	0.563	T-26/167	0.596	Z-25/80	0.633
W-15/40	0.674	T-50/150	0.740	Z-50/120	0.716
W-20/40	0.774	T-100/275	0.741		
W-20/50	0.690				
W-20/80	0.615				
W-27/100	0.607				
W-27/111	0.626				
W-30/135	0.590				
W-40/125	0.616				
W-45/60	0.951				
W-45/129	0.645				
W-45/150	0.732				
W-48/100	0.645				

Special profiles					
Group S				Group SP	
SQ-5/5-R10	0.872	SR-15/22-R57	0.694	SP 1-40/50-R100	0.992
SQ-12/12-R24	0.936	SR-15/40-R60	0.651	SP 2-40/50-R100	0.797
SQ-20/20-R40*	1.000			SP 3-50/60-R100	0.781
SQ-23/23-R46	0.983				
SQ 30/30-R60	1.016				

* Reference products assessed per product group

The conversion factors were calculated based on the ratio of the area weights to the assessed product SQ-20/20-R40 for each product group. The assessed reference product is marked in yellow in the table and shows a conversion factor of 1.
For the calculation, the environmental impact results of the reference products per impact indicator must be multiplied by the specified factor of the desired product. Since the assessment is based on a sheet thickness of 1 mm, any desired deviation from this sheet thickness must also be included as a factor.

Sample calculation:
Conversion to the desired product: W-4/10 in sheet steel design,
2 mm sheet thickness
Factor: 0.652 (profile factor) and 2 (sheet thickness)
GWP A1-A3 for the sheet steel product group: 44.1 kg CO2 equiv.
Calculation: 44.1 kg CO2 equiv. * 0.652 * 2 = 57.5 kg CO2 equiv.

The exact weights per unit area are included in the conversion factors, but can also be requested from the manufacturer (info@mn-metall.de) if required.

Unlike the wellTEC® brand, the colTEC® (column cladding) and planTEC® (perforated and embossed sheets) brands comprise flat processed metal sheets that are only curved, so that the angle of curvature remains unchanged. Based on the balanced reference profile SQ-20/20-R40 of the wellTEC® brand, a conversion for the colTEC® and planTEC® brands can be performed using the conversion factors in Table 7 to obtain the environmental impacts for 1 m² * 1 mm of colTEC® and planTEC® brand products. For different sheet thicknesses, the environmental impacts must also be multiplied by the sheet thickness in millimeters.

Conversion factors for brand products colTEC® and planTEC®			
Product group	PG 1	PG 2	PG 3
Conversion factor	0.556	0.538	0.530

Table 7: Conversion factors for brand products colTEC® and planTEC®

Results per 1 m² * 1 mm façade cladding made of anodised aluminium sheet

	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Core indicators																
GWP-t	kg CO_2 eq.	9.81E+01	1.54E-01	1.01E+00	0	0	0	0	0	0	0	2.68E-04	4.43E-02	5.52E-03	3.79E-03	-3.82E+01
GWP-f	kg CO_2 eq.	9.81E+01	1.56E-01	2.90E-02	0	0	0	0	0	0	0	3.61E-04	4.48E-02	6.22E-03	3.80E-03	-3.81E+01
GWP-b	kg CO_2 eq.	-2.62E-01	-3.42E-03	9.79E-01	0	0	0	0	0	0	0	-1.11E-04	-9.80E-04	-8.50E-04	-2.61E-05	-9.04E-02
GWP-l	kg CO_2 eq.	1.87E-01	1.59E-03	1.31E-04	0	0	0	0	0	0	0	1.80E-05	4.56E-04	1.54E-04	2.28E-05	-7.24E-03
ODP	kg CFC-11 eq.	1.42E-09	3.00E-14	1.27E-13	0	0	0	0	0	0	0	2.91E-16	8.61E-15	7.86E-14	1.03E-14	-2.53E-10
AP	mol H^+ eq.	3.06E-01	2.30E-04	2.08E-04	0	0	0	0	0	0	0	1.73E-06	1.91E-04	2.11E-05	2.69E-05	-1.47E-01
EP-fw	kg P eq.	1.22E-04	4.19E-07	4.71E-08	0	0	0	0	0	0	0	4.73E-09	1.20E-07	4.47E-08	8.65E-09	-4.98E-05
EP-m	kg N eq.	8.06E-02	9.39E-05	6.79E-05	0	0	0	0	0	0	0	6.25E-07	9.30E-05	6.72E-06	6.94E-06	-3.41E-02
EP-t	mol N eq.	7.97E-01	9.80E-04	9.06E-04	0	0	0	0	0	0	0	6.24E-06	1.00E-03	6.93E-05	7.64E-05	-3.71E-01
POCP	kg NMVOC eq.	2.03E-01	2.05E-04	1.70E-04	0	0	0	0	0	0	0	1.50E-06	1.75E-04	1.63E-05	2.12E-05	-9.75E-02
ADPF*²	MJ	1.31E+03	2.00E+00	3.89E-01	0	0	0	0	0	0	0	2.25E-02	5.74E-01	2.47E-01	5.00E-02	-4.56E+02
ADPE*²	kg Sb eq.	1.40E-05	1.03E-08	2.10E-09	0	0	0	0	0	0	0	1.17E-10	2.97E-09	1.62E-09	2.46E-10	-3.57E-06
WDP*²	m^3 world eq. deprived	7.09E+00	7.76E-04	1.10E-01	0	0	0	0	0	0	0	8.02E-06	2.22E-04	9.03E-04	4.33E-04	-5.93E+00
Use of resources																
PERE	MJ	7.13E+02	1.52E-01	1.09E+01	0	0	0	0	0	0	0	1.69E-03	4.34E-02	6.01E-02	8.76E-03	-2.67E+02
PERM	MJ	1.08E+01	0	-1.08E+01	0	0	0	0	0	0	0	0	0	0	0	0
PERT	MJ	7.24E+02	1.52E-01	8.22E-02	0	0	0	0	0	0	0	1.69E-03	4.34E-02	6.01E-02	8.76E-03	-2.67E+02
PENRE	MJ	1.31E+03	2.00E+00	4.13E-01	0	0	0	0	0	0	0	2.25E-02	5.74E-01	2.47E-01	5.00E-02	-4.56E+02
PENRM	MJ	2.45E-02	0	-2.45E-02	0	0	0	0	0	0	0	0	0	0	0	0
PENRT	MJ	1.31E+03	2.00E+00	3.89E-01	0	0	0	0	0	0	0	2.25E-02	5.74E-01	2.47E-01	5.00E-02	-4.56E+02
SM	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FW	m^3	3.88E-01	7.78E-05	2.59E-03	0	0	0	0	0	0	0	8.37E-07	2.23E-05	4.29E-05	1.32E-05	-1.82E-01
Waste categories																
HWD	kg	1.14E-06	8.46E-11	1.48E-10	0	0	0	0	0	0	0	9.01E-13	2.43E-11	9.64E-11	1.26E-11	-2.90E-07
NHWD	kg	2.15E+01	2.84E-04	1.96E-02	0	0	0	0	0	0	0	3.14E-06	8.15E-05	7.78E-05	2.54E-01	-1.59E+01
RWD	kg	6.30E-02	3.93E-06	1.50E-05	0	0	0	0	0	0	0	4.24E-08	1.13E-06	1.11E-05	5.18E-07	-2.71E-02
Output material flows																
CRU	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MFR	kg	1.63E+00	0	2.55E-03	0	0	0	0	0	0	0	0	0	4.82E+00	0	0
MER	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EEE	MJ	4.80E-01	0	1.39E+00	0	0	0	0	0	0	0	0	0	0	0	0
EET	MJ	1.11E+00	0	2.51E+00	0	0	0	0	0	0	0	0	0	0	0	0

Key:
GWP-t – climate change - total **GWP-f** – climate change - fossil **GWP-b** – climate change - biogenic **GWP-l** – climate change - land use and land use change **ODP** – ozone depletion **AP** - acidification **EP-fw** - eutrophication - aquatic freshwater **EP-m** - eutrophication - aquatic marine **EP-t** - eutrophication - terrestrial **POCP** - photochemical ozone formation **ADPF*²** - depletion of abiotic resources – fossil fuels **ADPE*²** - depletion of abiotic resources – minerals and metals **WDP*²** – water use **PERE** - use of renewable primary energy **PERM** - use of renewable primary energy resources used as raw materials **PERT** - total use of renewable primary energy **PENRE** - use of non-renewable primary energy **PENRM** - use of non-renewable primary energy resources used as raw materials **PENRT** - total use of non-renewable primary energy **SM** - use of secondary materials **RSF** - use of renewable secondary fuels **NRSF** - use of non-renewable secondary fuels **FW** - net use of freshwater **HWD** - hazardous waste disposed **NHWD** - non-hazardous waste disposed **RWD** - radioactive waste disposed **CRU** - components for reuse **MFR** - materials for recycling **MER** - materials for energy recovery **EEE** - exported electrical energy **EET** - exported thermal energy

Results per 1 m² * 1 mm façade cladding made of anodised aluminium sheet															
	Unit	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Additional environmental impact indicators																
PM	Disease incidence	4.48E-06	2.08E-09	1.38E-09	0	0	0	0	0	0	0	1.88E-11	1.19E-09	2.10E-10	3.38E-10	-2.79E-06
IRP*[1]	kBq U235 eq.	6.23E+00	5.58E-04	2.38E-03	0	0	0	0	0	0	0	6.09E-06	1.60E-04	1.83E-03	5.90E-05	-2.78E+00
ETP-fw*[2]	CTUe	4.23E+02	2.58E+00	2.71E-01	0	0	0	0	0	0	0	2.92E-02	7.41E-01	2.44E-01	2.88E-02	-1.38E+02
HTP-c*[2]	CTUh	5.30E-08	3.49E-11	1.26E-11	0	0	0	0	0	0	0	3.94E-13	1.00E-11	4.22E-12	6.81E-13	-2.74E-08
HTP-nc*[2]	CTUh	5.28E-07	1.95E-09	6.60E-10	0	0	0	0	0	0	0	2.20E-11	5.60E-10	1.98E-10	2.63E-11	-3.31E-07
SQP*[2]	Dimensionless.	3.99E+02	8.78E-01	1.37E-01	0	0	0	0	0	0	0	9.93E-03	2.52E-01	1.06E-01	1.43E-02	-8.50E+01

Key:
PM – particulate matter emissions **IRP*[1]** – ionising radiation – human health **ETP-fw*[2]** - ecotoxicity – aquatic freshwater **HTP-c*[2]** - human toxicity potential – cancer effect **HTP-nc*[2]** - human toxicity potential – non-cancer effect **SQP*[2]** – land use related impacts / soil quality

Disclaimers

*1 This impact category deals mainly with the eventual impact of low-dose ionising radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionising radiation from the soil, from radon and from some building materials is also not measured by this indicator

*2 The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator

Results per 1 m² * 1 mm façade cladding made of steel sheet

	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Core indicators																
GWP-t	kg CO_2 eq.	4.41E+01	4.45E-01	2.90E+00	0	0	0	0	0	0	0	7.71E-04	1.27E-01	1.59E-02	1.09E-02	-6.53E+00
GWP-f	kg CO_2 eq.	4.63E+01	4.50E-01	8.36E-02	0	0	0	0	0	0	0	1.04E-03	1.29E-01	1.79E-02	1.09E-02	-6.53E+00
GWP-b	kg CO_2 eq.	-2.33E+00	-9.85E-03	2.82E+00	0	0	0	0	0	0	0	-3.20E-04	-2.82E-03	-2.45E-03	-7.51E-05	4.80E-03
GWP-l	kg CO_2 eq.	4.20E-02	4.59E-03	3.77E-04	0	0	0	0	0	0	0	5.20E-05	1.31E-03	4.45E-04	6.56E-05	-3.92E-03
ODP	kg CFC-11 eq.	3.73E-11	8.65E-14	3.67E-13	0	0	0	0	0	0	0	8.38E-16	2.48E-14	2.26E-13	2.98E-14	9.82E-12
AP	mol H^+ eq.	8.98E-02	6.62E-04	5.98E-04	0	0	0	0	0	0	0	4.99E-06	5.51E-04	6.08E-05	7.76E-05	-1.40E-02
EP-fw	kg P eq.	3.20E-05	1.21E-06	1.36E-07	0	0	0	0	0	0	0	1.36E-08	3.46E-07	1.29E-07	2.49E-08	-1.31E-06
EP-m	kg N eq.	2.46E-02	2.70E-04	1.96E-04	0	0	0	0	0	0	0	1.80E-06	2.68E-04	1.94E-05	2.00E-05	-3.44E-03
EP-t	mol N eq.	2.66E-01	2.82E-03	2.61E-03	0	0	0	0	0	0	0	1.80E-05	2.89E-03	2.00E-04	2.20E-04	-3.73E-02
POCP	kg NMVOC eq.	7.88E-02	5.90E-04	4.91E-04	0	0	0	0	0	0	0	4.32E-06	5.03E-04	4.69E-05	6.11E-05	-1.12E-02
ADPF*²	MJ	4.63E+02	5.77E+00	1.12E+00	0	0	0	0	0	0	0	6.47E-02	1.65E+00	7.11E-01	1.44E-01	-5.84E+01
ADPE*²	kg Sb eq.	2.91E-06	2.98E-08	6.05E-09	0	0	0	0	0	0	0	3.36E-10	8.54E-09	4.67E-09	7.09E-10	-6.63E-07
WDP*²	m^3 world eq. deprived	6.45E-01	2.23E-03	3.17E-01	0	0	0	0	0	0	0	2.31E-05	6.40E-04	2.60E-03	1.25E-03	-1.42E-01
Use of resources																
PERE	MJ	2.46E+01	4.36E-01	3.13E+01	0	0	0	0	0	0	0	4.88E-03	1.25E-01	1.73E-01	2.52E-02	2.58E+00
PERM	MJ	3.11E+01	0	-3.11E+01	0	0	0	0	0	0	0	0	0	0	0	0
PERT	MJ	5.56E+01	4.36E-01	2.37E-01	0	0	0	0	0	0	0	4.88E-03	1.25E-01	1.73E-01	2.52E-02	2.58E+00
PENRE	MJ	4.63E+02	5.77E+00	1.19E+00	0	0	0	0	0	0	0	6.47E-02	1.65E+00	7.11E-01	1.44E-01	-5.84E+01
PENRM	MJ	7.06E-02	0	-7.06E-02	0	0	0	0	0	0	0	0	0	0	0	0
PENRT	MJ	4.63E+02	5.77E+00	1.12E+00	0	0	0	0	0	0	0	6.47E-02	1.65E+00	7.11E-01	1.44E-01	-5.84E+01
SM	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FW	m^3	3.05E-02	2.24E-04	7.47E-03	0	0	0	0	0	0	0	2.41E-06	6.42E-05	1.24E-04	3.81E-05	-7.81E-03
Waste categories																
HWD	kg	4.69E-08	2.44E-10	4.27E-10	0	0	0	0	0	0	0	2.60E-12	6.99E-11	2.78E-10	3.62E-11	9.67E-09
NHWD	kg	5.57E-01	8.19E-04	5.66E-02	0	0	0	0	0	0	0	9.03E-06	2.35E-04	2.24E-04	7.31E-01	6.00E-01
RWD	kg	2.13E-03	1.13E-05	4.32E-05	0	0	0	0	0	0	0	1.22E-07	3.24E-06	3.20E-05	1.49E-06	-4.53E-04
Output material flows																
CRU	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MFR	kg	1.68E+00	0	7.34E-03	0	0	0	0	0	0	0	0	0	1.39E+01	0	0
MER	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EEE	MJ	1.38E+00	0	4.01E+00	0	0	0	0	0	0	0	0	0	0	0	0
EET	MJ	3.20E+00	0	7.23E+00	0	0	0	0	0	0	0	0	0	0	0	0

Key:
GWP-t – climate change - total **GWP-f** – climate change - fossil **GWP-b** – climate change - biogenic **GWP-l** – climate change - land use and land use change **ODP** – ozone depletion **AP** - acidification **EP-fw** - eutrophication - aquatic freshwater **EP-m** - eutrophication - aquatic marine **EP-t** - eutrophication - terrestrial **POCP** - photochemical ozone formation **ADPF*²** - depletion of abiotic resources – fossil fuels **ADPE*²** - depletion of abiotic resources – minerals and metals **WDP*²** – water use **PERE** - use of renewable primary energy **PERM** - use of renewable primary energy resources used as raw materials **PERT** - total use of renewable primary energy **PENRE** - use of non-renewable primary energy **PENRM** - use of non-renewable primary energy resources used as raw materials **PENRT** - total use of non-renewable primary energy **SM** - use of secondary materials **RSF** - use of renewable secondary fuels **NRSF** - use of non-renewable secondary fuels **FW** - net use of freshwater **HWD** - hazardous waste disposed **NHWD** - non-hazardous waste disposed **RWD** - radioactive waste disposed **CRU** - components for reuse **MFR** - materials for recycling **MER** - materials for energy recovery **EEE** - exported electrical energy **EET** - exported thermal energy

Results per 1 m² * 1 mm façade cladding made of steel sheet															
	Unit	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Additional environmental impact indicators																
PM	Disease incidence	1.61E-06	5.99E-09	3.97E-09	0	0	0	0	0	0	0	5.41E-11	3.42E-09	6.04E-10	9.73E-10	-1.99E-07
IRP*[1]	kBq U235 eq.	2.03E-01	1.61E-03	6.85E-03	0	0	0	0	0	0	0	1.75E-05	4.60E-04	5.26E-03	1.70E-04	-1.11E-01
ETP-fw*[2]	CTUe	7.81E+01	7.44E+00	7.80E-01	0	0	0	0	0	0	0	8.41E-02	2.13E+00	7.02E-01	8.30E-02	-7.89E+00
HTP-c*[2]	CTUh	5.87E-08	1.00E-10	3.64E-11	0	0	0	0	0	0	0	1.13E-12	2.88E-11	1.21E-11	1.96E-12	-9.04E-09
HTP-nc*[2]	CTUh	1.45E-07	5.62E-09	1.90E-09	0	0	0	0	0	0	0	6.34E-11	1.61E-09	5.70E-10	7.58E-11	5.18E-09
SQP*[2]	Dimensionless.	4.52E+02	2.53E+00	3.94E-01	0	0	0	0	0	0	0	2.86E-02	7.25E-01	3.06E-01	4.10E-02	1.07E+00

Key:
PM – particulate matter emissions **IRP*[1]** – ionising radiation – human health **ETP-fw*[2]** - ecotoxicity – aquatic freshwater **HTP-c*[2]** - human toxicity potential – cancer effect **HTP-nc*[2]** - human toxicity potential – non-cancer effect **SQP*[2]** – land use related impacts / soil quality

Disclaimers

*1 This impact category deals mainly with the eventual impact of low-dose ionising radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionising radiation from the soil, from radon and from some building materials is also not measured by this indicator

*2 The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator

Results per 1 m² * 1 mm façade cladding made of stainless steel sheet

	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Core indicators																
GWP-t	kg CO_2 eq.	6.50E+01	4.54E-01	2.96E+00	0	0	0	0	0	0	0	7.87E-04	1.30E-01	1.62E-02	1.11E-02	-3.77E+01
GWP-f	kg CO_2 eq.	6.73E+01	4.59E-01	8.53E-02	0	0	0	0	0	0	0	1.06E-03	1.32E-01	1.83E-02	1.12E-02	-3.79E+01
GWP-b	kg CO_2 eq.	-2.35E+00	-1.01E-02	2.88E+00	0	0	0	0	0	0	0	-3.27E-04	-2.88E-03	-2.50E-03	-7.66E-05	2.45E-01
GWP-l	kg CO_2 eq.	6.66E-02	4.68E-03	3.85E-04	0	0	0	0	0	0	0	5.30E-05	1.34E-03	4.54E-04	6.69E-05	-7.12E-02
ODP	kg CFC-11 eq.	3.54E-10	8.82E-14	3.75E-13	0	0	0	0	0	0	0	8.55E-16	2.53E-14	2.31E-13	3.04E-14	-7.69E-11
AP	mol H^+ eq.	4.12E-01	6.76E-04	6.10E-04	0	0	0	0	0	0	0	5.10E-06	5.63E-04	6.20E-05	7.92E-05	-2.08E-01
EP-fw	kg P eq.	1.02E-04	1.23E-06	1.39E-07	0	0	0	0	0	0	0	1.39E-08	3.53E-07	1.31E-07	2.54E-08	-2.52E-05
EP-m	kg N eq.	4.34E-02	2.76E-04	2.00E-04	0	0	0	0	0	0	0	1.84E-06	2.73E-04	1.98E-05	2.04E-05	-2.48E-02
EP-t	mol N eq.	4.82E-01	2.88E-03	2.66E-03	0	0	0	0	0	0	0	1.83E-05	2.95E-03	2.04E-04	2.24E-04	-2.78E-01
POCP	kg NMVOC eq.	1.38E-01	6.02E-04	5.01E-04	0	0	0	0	0	0	0	4.41E-06	5.13E-04	4.79E-05	6.24E-05	-7.95E-02
ADPF*²	MJ	8.44E+02	5.89E+00	1.14E+00	0	0	0	0	0	0	0	6.60E-02	1.69E+00	7.25E-01	1.47E-01	-4.57E+02
ADPE*²	kg Sb eq.	2.41E-03	3.04E-08	6.17E-09	0	0	0	0	0	0	0	3.43E-10	8.71E-09	4.77E-09	7.24E-10	-9.96E-04
WDP*²	m^3 world eq. deprived	1.06E+01	2.28E-03	3.23E-01	0	0	0	0	0	0	0	2.36E-05	6.53E-04	2.65E-03	1.27E-03	-1.32E+01
Use of resources																
PERE	MJ	1.97E+02	4.45E-01	3.20E+01	0	0	0	0	0	0	0	4.98E-03	1.28E-01	1.77E-01	2.57E-02	-8.39E+01
PERM	MJ	3.17E+01	0	-3.17E+01	0	0	0	0	0	0	0	0	0	0	0	0
PERT	MJ	2.29E+02	4.45E-01	2.42E-01	0	0	0	0	0	0	0	4.98E-03	1.28E-01	1.77E-01	2.57E-02	-8.39E+01
PENRE	MJ	8.44E+02	5.89E+00	1.22E+00	0	0	0	0	0	0	0	6.60E-02	1.69E+00	7.25E-01	1.47E-01	-4.57E+02
PENRM	MJ	7.20E-02	0	-7.20E-02	0	0	0	0	0	0	0	0	0	0	0	0
PENRT	MJ	8.44E+02	5.89E+00	1.14E+00	0	0	0	0	0	0	0	6.60E-02	1.69E+00	7.25E-01	1.47E-01	-4.57E+02
SM	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FW	m^3	3.01E-01	2.29E-04	7.62E-03	0	0	0	0	0	0	0	2.46E-06	6.55E-05	1.26E-04	3.89E-05	-4.09E-01
Waste categories																
HWD	kg	3.72E-07	2.49E-10	4.36E-10	0	0	0	0	0	0	0	2.65E-12	7.13E-11	2.83E-10	3.69E-11	-4.37E-08
NHWD	kg	7.91E+00	8.36E-04	5.78E-02	0	0	0	0	0	0	0	9.22E-06	2.39E-04	2.29E-04	7.46E-01	-2.16E+00
RWD	kg	1.51E-02	1.16E-05	4.40E-05	0	0	0	0	0	0	0	1.25E-07	3.31E-06	3.27E-05	1.52E-06	-2.31E-03
Output material flows																
CRU	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MFR	kg	2.70E+00	0	7.49E-03	0	0	0	0	0	0	0	0	0	1.42E+01	0	0
MER	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EEE	MJ	1.41E+00	0	4.09E+00	0	0	0	0	0	0	0	0	0	0	0	0
EET	MJ	3.27E+00	0	7.37E+00	0	0	0	0	0	0	0	0	0	0	0	0

Key:
GWP-t – climate change - total **GWP-f** – climate change - fossil **GWP-b** – climate change - biogenic **GWP-l** – climate change - land use and land use change **ODP** – ozone depletion **AP** - acidification **EP-fw** - eutrophication - aquatic freshwater **EP-m** - eutrophication - aquatic marine **EP-t** - eutrophication - terrestrial **POCP** - photochemical ozone formation **ADPF*²** - depletion of abiotic resources – fossil fuels **ADPE*²** - depletion of abiotic resources – minerals and metals **WDP*²** – water use **PERE** - use of renewable primary energy **PERM** - use of renewable primary energy resources used as raw materials **PERT** - total use of renewable primary energy **PENRE** - use of non-renewable primary energy **PENRM** - use of non-renewable primary energy resources used as raw materials **PENRT** - total use of non-renewable primary energy **SM** - use of secondary materials **RSF** - use of renewable secondary fuels **NRSF** - use of non-renewable secondary fuels **FW** - net use of freshwater **HWD** - hazardous waste disposed **NHWD** - non-hazardous waste disposed **RWD** - radioactive waste disposed **CRU** - components for reuse **MFR** - materials for recycling **MER** - materials for energy recovery **EEE** - exported electrical energy **EET** - exported thermal energy

Results per 1 m² * 1 mm façade cladding made of stainless steel sheet															
	Unit	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Additional environmental impact indicators																
PM	Disease incidence	7.26E-06	6.11E-09	4.05E-09	0	0	0	0	0	0	0	5.52E-11	3.49E-09	6.17E-10	9.93E-10	-3.48E-06
IRP*[1]	kBq U235 eq.	1.59E+00	1.64E-03	6.99E-03	0	0	0	0	0	0	0	1.79E-05	4.70E-04	5.37E-03	1.73E-04	-3.69E-01
ETP-fw*[2]	CTUe	2.35E+02	7.59E+00	7.96E-01	0	0	0	0	0	0	0	8.58E-02	2.18E+00	7.16E-01	8.47E-02	-2.33E+02
HTP-c*[2]	CTUh	2.61E-05	1.03E-10	3.72E-11	0	0	0	0	0	0	0	1.16E-12	2.94E-11	1.24E-11	2.00E-12	-6.58E-08
HTP-nc*[2]	CTUh	4.96E-07	5.74E-09	1.94E-09	0	0	0	0	0	0	0	6.47E-11	1.65E-09	5.82E-10	7.73E-11	-1.31E-07
SQP*[2]	Dimensionless.	5.86E+02	2.58E+00	4.02E-01	0	0	0	0	0	0	0	2.92E-02	7.39E-01	3.12E-01	4.19E-02	-5.69E+01

Key:
PM – particulate matter emissions **IRP*[1]** – ionising radiation – human health **ETP-fw*[2]** - ecotoxicity – aquatic freshwater **HTP-c*[2]** - human toxicity potential – cancer effect **HTP-nc*[2]** - human toxicity potential – non-cancer effect **SQP*[2]** – land use related impacts / soil quality

Disclaimers

*1 This impact category deals mainly with the eventual impact of low-dose ionising radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionising radiation from the soil, from radon and from some building materials is also not measured by this indicator

*2 The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator

6.4 Additional Environmental Information

Additional environmental impacts based on the ECOproduct certificate from Byggtjeneste

In addition to the results for the product groups described above, environmental impact results are also provided for facade cladding made of mill-finished aluminum sheet. The aluminum input is supplied 100% by mill-finished aluminum sheet from the upstream supplier Aluminium Duffel BVBA and is represented by the supplier's product EPD "Mill finished aluminum sheet" from the program owner European Aluminium (Declaration number: EPD-2026-0001).
This additional environmental information is based on the ECOproduct certificate issued by Byggtjeneste, a Norwegian environmental assessment and documentation system for construction products, which evaluates the environmental and sustainability characteristics of a building material based on environmental product declarations and additional technical documentation.
The calculation of the environmental impact results for facade cladding made of mill-finished aluminum sheet is based on Product Group 1 (Anodized Aluminum Sheets), whose life cycle assessment model was used and adapted as follows:

- Replacement of the aluminum input R1 with data from the pre-product EPD "Mill-finished aluminum sheet" for 1 mm sheet thickness with reference to the underlying basis weight of 2.70 kg/m² in Module A1
- Removal of the downstream anodizing process in Module A3
- Net calculation of the aluminum output from Module C3 to calculate the recycling potential based on primary material content (75%)

The calculated environmental impact results refer to the declared unit (1 m²) of the defined reference profile SQ-20/20-R40. An adjustment of the weight per unit area of the anodized aluminum sheet (5.07 kg/m²) to the weight per unit area of the mill-finished aluminum sheet (5.05 kg/m²) was not made due to its insignificance and in favor of a conservative approach.

The environmental impact results can be extrapolated to other profiles from the same manufacturer in the same way as for the product groups included in the assessment.

Results per 1 m² * 1 mm façade cladding made of mill-finished aluminum sheet

	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Core indicators																
GWP-t	kg CO_2 eq.	4,49E+01	1,54E-01	1,01E+00	0	0	0	0	0	0	0	2,65E-04	4,42E-02	5,68E-03	3,79E-03	-2,87E+01
GWP-f	kg CO_2 eq.	4,48E+01	1,56E-01	2,92E-02	0	0	0	0	0	0	0	3,59E-04	4,47E-02	6,38E-03	3,80E-03	-2,87E+01
GWP-b	kg CO_2 eq.	-4,11E-01	-2,52E-03	9,79E-01	0	0	0	0	0	0	0	-1,01E-04	-7,21E-04	-7,67E-04	-2,61E-05	-6,82E-02
GWP-l	kg CO_2 eq.	5,63E-01	6,53E-04	1,24E-04	0	0	0	0	0	0	0	7,40E-06	1,87E-04	6,93E-05	2,28E-05	-5,51E-03
ODP	kg CFC-11 eq.	2,82E-12	7,65E-14	2,40E-13	0	0	0	0	0	0	0	8,18E-16	2,19E-14	1,60E-13	1,03E-14	-1,93E-10
AP	mol H^+ eq.	2,74E-01	2,24E-04	2,09E-04	0	0	0	0	0	0	0	1,66E-06	1,90E-04	2,16E-05	2,69E-05	-1,10E-01
EP-fw	kg P eq.	3,37E+02	3,89E-07	4,18E-08	0	0	0	0	0	0	0	4,39E-09	1,11E-07	3,86E-08	8,65E-09	-3,73E-05
EP-m	kg N eq.	4,02E-02	8,94E-05	6,85E-05	0	0	0	0	0	0	0	5,74E-07	9,17E-05	6,61E-06	6,94E-06	-2,56E-02
EP-t	mol N eq.	4,43E-01	9,48E-04	9,14E-04	0	0	0	0	0	0	0	5,87E-06	9,94E-04	7,08E-05	7,64E-05	-2,79E-01
POCP	kg NMVOC eq.	1,25E-01	2,05E-04	1,71E-04	0	0	0	0	0	0	0	1,50E-06	1,75E-04	1,67E-05	2,12E-05	-7,32E-02
ADPF*²	MJ	5,85E+02	2,01E+00	3,84E-01	0	0	0	0	0	0	0	2,26E-02	5,77E-01	2,46E-01	5,00E-02	-3,43E+02
ADPE*²	kg Sb eq.	4,84E-07	1,11E-08	2,84E-09	0	0	0	0	0	0	0	1,25E-10	3,19E-09	1,87E-09	2,46E-10	-2,74E-06
WDP*²	m^3 world eq. deprived	7,95E-02	6,88E-04	1,10E-01	0	0	0	0	0	0	0	7,03E-06	1,97E-04	7,39E-04	4,33E-04	-4,45E+00
Use of resources																
PERE	MJ	2,36E+02	1,44E-01	1,09E+01	0	0	0	0	0	0	0	1,61E-03	4,12E-02	6,32E-02	8,76E-03	-2,01E+02
PERM	MJ	1,08E+01	0	-1,08E+01	0	0	0	0	0	0	0	0	0	0	0	0
PERT	MJ	2,47E+02	1,44E-01	8,75E-02	0	0	0	0	0	0	0	1,61E-03	4,12E-02	6,32E-02	8,76E-03	-2,01E+02
PENRE	MJ	5,85E+02	2,01E+00	4,09E-01	0	0	0	0	0	0	0	2,26E-02	5,77E-01	2,46E-01	5,00E-02	-3,43E+02
PENRM	MJ	2,45E-02	0	-2,45E-02	0	0	0	0	0	0	0	0	0	0	0	0
PENRT	MJ	5,85E+02	2,01E+00	3,84E-01	0	0	0	0	0	0	0	2,26E-02	5,77E-01	2,46E-01	5,00E-02	-3,43E+02
SM	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FW	m^3	4,31E-03	4,83E-05	2,59E-03	0	0	0	0	0	0	0	5,02E-07	1,38E-05	3,58E-05	1,32E-05	-1,36E-01
Waste categories																
HWD	kg	1,24E-02	9,66E-11	1,63E-10	0	0	0	0	0	0	0	1,04E-12	2,77E-11	1,07E-10	1,26E-11	-2,19E-07
NHWD	kg	9,94E+00	3,91E-04	1,96E-02	0	0	0	0	0	0	0	4,35E-06	1,12E-04	9,19E-05	2,54E-01	-1,20E+01
RWD	kg	1,97E-02	3,33E-06	1,25E-05	0	0	0	0	0	0	0	3,56E-08	9,55E-07	9,38E-06	5,18E-07	-2,04E-02
Output material flows																
CRU	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MFR	kg	2,14E+00	0	2,55E-03	0	0	0	0	0	0	0	0	0	3,61E+00	0	0
MER	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EEE	MJ	4,80E-01	0	1,39E+00	0	0	0	0	0	0	0	0	0	0	0	0
EET	MJ	1,11E+00	0	2,51E+00	0	0	0	0	0	0	0	0	0	0	0	0

Key:
GWP-t – climate change - total **GWP-f** – climate change - fossil **GWP-b** – climate change - biogenic **GWP-l** – climate change - land use and land use change **ODP** – ozone depletion **AP** - acidification **EP-fw** - eutrophication - aquatic freshwater **EP-m** - eutrophication - aquatic marine **EP-t** - eutrophication - terrestrial **POCP** - photochemical ozone formation **ADPF*²** - depletion of abiotic resources – fossil fuels **ADPE*²** - depletion of abiotic resources – minerals and metals **WDP*²** – water use **PERE** - use of renewable primary energy **PERM** - use of renewable primary energy resources used as raw materials **PERT** - total use of renewable primary energy **PENRE** - use of non-renewable primary energy **PENRM** - use of non-renewable primary energy resources used as raw materials **PENRT** - total use of non-renewable primary energy **SM** - use of secondary materials **RSF** - use of renewable secondary fuels **NRSF** - use of non-renewable secondary fuels **FW** - net use of freshwater **HWD** - hazardous waste disposed **NHWD** - non-hazardous waste disposed **RWD** - radioactive waste disposed **CRU** - components for reuse **MFR** - materials for recycling **MER** - materials for energy recovery **EEE** - exported electrical energy **EET** - exported thermal energy

Results per 1 m² * 1 mm façade cladding made of mill-finished aluminum sheet

	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Additional environmental impact indicators																
PM	Disease incidence	1,64E-07	2,13E-09	1,40E-09	0	0	0	0	0	0	0	1,94E-11	1,20E-09	2,22E-10	3,38E-10	-2,09E-06
IRP*[1]	kBq U235 eq.	4,33E+00	4,29E-04	1,88E-03	0	0	0	0	0	0	0	4,64E-06	1,23E-04	1,43E-03	5,90E-05	-2,08E+00
ETP-fw*[2]	CTUe	8,98E+00	1,72E+00	2,75E-01	0	0	0	0	0	0	0	1,94E-02	4,93E-01	1,70E-01	2,88E-02	-1,03E+02
HTP-c*[2]	CTUh	4,18E-09	3,41E-11	1,26E-11	0	0	0	0	0	0	0	3,85E-13	9,76E-12	4,10E-12	6,81E-13	-2,06E-08
HTP-nc*[2]	CTUh	8,78E-09	1,77E-09	6,77E-10	0	0	0	0	0	0	0	2,00E-11	5,06E-10	1,92E-10	2,63E-11	-2,49E-07
SQP*[2]	Dimensionless.	2,17E+02	5,36E-01	1,34E-01	0	0	0	0	0	0	0	6,06E-03	1,54E-01	7,56E-02	1,43E-02	-6,40E+01

Key:
PM – particulate matter emissions **IRP*[1]** – ionising radiation – human health **ETP-fw*[2]** - ecotoxicity – aquatic freshwater **HTP-c*[2]** - human toxicity potential – cancer effect **HTP-nc*[2]** - human toxicity potential – non-cancer effect **SQP*[2]** – land use related impacts / soil quality

Disclaimers

*1 This impact category deals mainly with the eventual impact of low-dose ionising radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionising radiation from the soil, from radon and from some building materials is also not measured by this indicator

*2 The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator

6.5 Interpretation, LCA presentation and critical review

Evaluation

The environmental impacts of

- Anodised aluminium sheets
- Steel sheets
- Stainless steel sheets

differ greatly. The differences in the environmental impact of the products lie in the different metal sheets used (pre-products/raw materials) for each type of façade cladding.

The main environmental impacts during production arise from the respective metal sheet (anodised aluminium (PG1), steel (PG2), stainless steel (PG3)). For anodised aluminium, the environmental impacts are divided between the use of bare aluminium sheet and the subsequent anodisation of the surface, with the bare sheet accounting for an average of 67% of the environmental impacts. Since each façade sheet consists of a single metal, it was to be expected that the use of metal would be the main driver of environmental impacts. For steel sheets, the evaluation also showed a moderate influence on the environmental impact due to the residual mix used and the use of wooden packaging.

By recycling aluminium, steel and stainless steel sheet metal at the end of the product life cycle, around 32% for aluminium (PG1), 5% for steel (PG2) and 47% for stainless steel (PG3) can be credited for the environmental impacts arising over the life cycle (average value across the core indicators without WDP, as not supported by software).

Differences in the life cycle assessment results compared to the previous EPD five years ago are due to the selection of more suitable ‘LCA for Experts’ data sets and the updating of the background data in ‘LCA for Experts’ as well as the software itself. In addition, new/improved data collection was carried out by the manufacturer.
In addition, average products (weighted average based on the sales shares of all metal sheets used in the period under review) were presented in the previous EPD. The current worst-case scenario excludes the comparability of the two EPDs.

Continuous data collection is still recommended for the revision of data in five years. Product-specific direct measurements are preferable to recorded total production data.

The charts below show the distribution of the main environmental impacts.

The values obtained from the LCA calculation are suitable for the certification of buildings.

Charts

The diagrams below show the nine key environmental indicators:

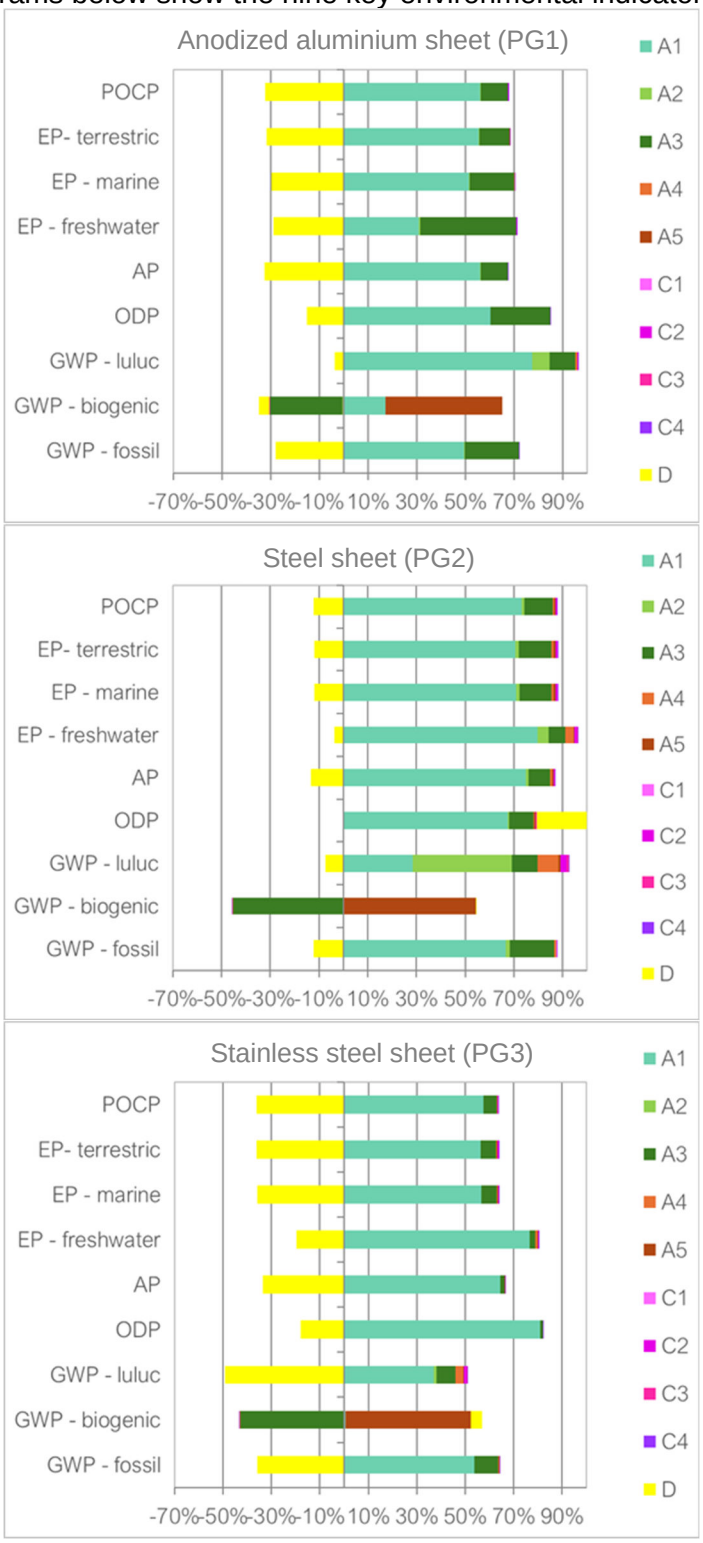


Figure 2: Percentage shares of the modules in selected environmental impact indicators

Report	The LCA report underlying this EPD was developed according to the requirements of DIN EN ISO 14040 and DIN EN ISO 14044 as well as DIN EN 15804 and DIN EN ISO 14025. It is not addressed to third parties for reasons of confidentiality. It is deposited with the ift Rosenheim. The results and conclusions reported to the target group are complete, correct, without bias and transparent. The results of the study are not designed to be used for comparative statements intended for publication.
Critical review	The critical review of the LCA and the report took place in the course of verification of the EPD and was carried out by Dipl.-Wi.Jur. (FH), M. Sc. Susanne Volz, an external verifier.

7 General information regarding the EPD

Vergleichbarkeit

This EPD was prepared in accordance with DIN EN 15804 and is therefore only comparable to those EPDs that also comply with the requirements set out in DIN EN 15804.
Any comparison must refer to the building context and the same boundary conditions of the various life cycle stages.
For comparing EPDs of construction products, the rules set out in DIN EN 15804 (Clause 5.3) apply.

The reference products included in the assessment were identified using the worst-case approach and deemed representative of the product group. The results for individual products within the product group differ from the results for the reference products. The identification of the product groups and the resulting variants are documented in the background report.

Communication

The communications format of this EPD meets the requirements of EN 15942:2012 and is therefore the basis for B2B communication. Only the nomenclature has been changed according to DIN EN 15804.

Verification

Verification of the Environmental Product Declaration is documented in accordance with the ift "Richtlinie zur Erstellung von Typ III Umweltproduktdeklarationen" (Guidance on preparing Type III Environmental Product Declarations) in accordance with the requirements set out in DIN EN ISO 14025.

The Declaration is based on the PCR documents EN 18001 „PCR for curtain walls (in accordance with), "PCR Part A" PCR-A-2.0:2025 und "Façades" PCR-FA-4.0:2023.

The European standard EN 15804 serves as the core PCR [a)]
Independent external verification of the Declaration and statement according to EN ISO 14025:2010
Independent third party verifier: [b)] [Susanne Volz]
[a)] Product category rules [b)] Optional for business-to-business communication Mandatory for business-to-consumer communication (see EN ISO 14025:2010, 9.4)

Revisions of this document

No.	Date	Note:	Practitioner	Verifier
1	05.03.2026	External verification	L. Ludwig	S. Volz
2	03.06.2026	Inclusion of additional environmental impacts	L. Ludwig	S. Volz

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30. **EPD International AB.** *Product Category Rules (PCR) - Construction Products (PCR 2019:14, Version 2.0.1).* 2025.

9 Annex

Description of life cycle scenarios for Façade claddings

Product stage			Con-struction process stage		Use stage*							End-of-life stage				Benefits and loads from beyond the system boundaries
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Raw material supply	Transport	Manufacture	Transport	Construction/installation process	Use	Maintenance	Repair	Replacement	Modification/refurbishment	Operational energy use	Operational water use	Deconstruction/demolition	Transport	Waste processing	Disposal	Reuse Recovery Recycling potential
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

* For the declared B modules, the calculation of the results is based on the specified RSL related to one year.

Table 8: Overview of applied life cycle stages

Calculation of the scenarios was based on a defined RSL (see Section 4 Use stage).

Manufacturer specifications were used for the scenarios, and the PCR ‘Construction Products’ from EPD International AB was also used as the basis for the scenarios.

Note: The standard scenarios selected are presented in bold type. They were also used for calculating the indicators in the summary table.

✓ Included in the LCA
— Not included in the LCA

A4 Transport

No.	Scenario	Description
A4	Major national projects Manufacturer-specific scenario	34-40 t truck (Euro mix), diesel, 72 t payload, 50 % capacity used[1], about 150 km to site and empty return, total 300 km

[1] capacity used: used loading capacity of truck

A4 Transport to the construction site	Transport weight [kg/m²]	Density [kg/m³]	Volume capacity utilisation factor[2]
PG1	5,905	5905	< 1
PG2	16,752	16752	< 1
PG3	15,496	15496	< 1

[2] Volume capacity utilisation factor:
= 1 product completely fills packaging (without air inclusion)
< 1 packaging contains unused volume (e.g.: air, filling material
> 1 product is packed in compressed form

Since only one scenario is used, the results are shown in the relevant summary table.

A5 Construction/installation process

No.	Scenario	Description
A5	Manual	According to the manufacturer the products are installed without using additional lifting and auxiliary devices

In case of deviating consumption during installation/assembly of the products which forms part of the site management, they are covered at the construction works level.

Ancillary materials, consumables, use of energy and water, use of other resources, material losses, direct emissions as well as waste materials during installation are negligible.

It is assumed that the packaging material is sent for waste treatment in the construction/installation module. Packaging waste (cardboard/paper, plastic packaging, wooden packaging) is exclusively thermally recycled in accordance with the conservative approach. Metal packaging waste (screws, staples) is recycled. Credits from A5 are reported in module D. Credits from waste incineration plant: Electricity replaces ‘RER: Electricity grid mix’ (RER), thermal energy replaces ‘RER: Thermal energy from natural gas’ (RER).

Transport is taken into account (GLO: 28-32 t truck (Euro 5), diesel, 22t payload, 80km, 50% capacity used).

Since only one scenario is used, the results are shown in the relevant summary table.

B1 Use (not relevant)

See Chapter 4 Use phase – Emissions to the environment. Emissions to soil and water cannot be quantified. See EN 15804 Chapter 5.4.4 and Chapter 6.3.5.4.2. There are no horizontal standards with harmonised test methods.

Due to the above exclusion and as no further environmental aspects and impacts are known in connection with components and structures during their normal use (in accordance with their intended use), no further values are given and all contributions not taken into account are considered zero in this assessment. There is no direct contact with indoor air.

Since only one scenario is used, the results are shown in the relevant summary table.

B2 Cleaning, servicing and maintenance (not relevant)

Since only one scenario is used, the results are shown in the relevant summary table.

B2.1 Cleaning (not relevant)

According to the manufacturer, cleaning of the elements is not required.

Information on refurbishment/renovation/refurbishment can be found in the manufacturer's ‘Installation, Operation and Maintenance Instructions’.

Ancillary materials, consumables, use of energy and water, material losses and waste as well as transport distances during cleaning are negligible.

Since only one scenario is used, the results are shown in the relevant summary table.

B2.2 Servicing and maintenance (not relevant)

According to the manufacturer, no maintenance of the elements is required.

Information on refurbishment/renovation/refurbishment can be found in the manufacturer's ‘Installation, Operation and Maintenance Instructions’.

Ancillary materials, consumables, use of energy and water, material losses and waste as well as transport distances during cleaning are negligible.

Since only one scenario is used, the results are shown in the relevant summary table.

B3 Repair (not relevant)

In accordance with EN 18001 the following scenario applies:
Repair of accidental damage (e.g. broken glass panes or damaged building hardware) shall only be considered if the place of installation is known and justification is pro-vided for expecting accidental damage (e.g. schools).

B4 Replacement

No	Scenario	Description
B4.1	**No replacement**	**No replacement provided according to BBSR-Table.**
B4.2	Use case	Informative: one-time replacement

The statements made in this EPD are only informative to allow evaluation at the construction works level.

With an RSL of 50 years and an estimated building service life of 50 years, no replacement is necessary. The results were calculated on an annual basis, taking into account the RSL.

For updated information refer to the respective instructions for assembly/installation, operation and maintenance from MN Metall GmbH .

Ancillary materials, consumables, use of energy and water, material losses, waste as well as transport distances during installation are negligible.

façade cladding PG1			
B4 Exchange / Replacement	**Unit**	**B4.1**	B4.2
Core indicators			
GWP-t	kg CO_2 eq.	**0.00**	9.93E+01
GWP-f	kg CO_2 eq.	**0.00**	9.83E+01
GWP-b	kg CO_2 eq.	**0.00**	7.11E-01
GWP-l	kg CO_2 eq.	**0.00**	1.89E-01
ODP	kg CFC-11 eq.	**0.00**	1.42E-09
AP	mol H^+ eq.	**0.00**	3.06E-01
EP-fw	kg P eq.	**0.00**	1.23E-04
EP-m	kg N eq.	**0.00**	8.08E-02
EP-t	mol N eq.	**0.00**	8.00E-01
POCP	kg NMVOC eq.	**0.00**	2.04E-01
ADPF	MJ	**0.00**	1.40E-05
ADPE	kg Sb eq.	**0.00**	1.31E+03
WDP	m^3 world eq. deprived	**0.00**	7.20E+00
Use of resources			
PERE	MJ	**0.00**	7.24E+02
PERM	MJ	**0.00**	0.00
PERT	MJ	**0.00**	7.24E+02
PENRE	MJ	**0.00**	1.31E+03
PENRM	MJ	**0.00**	0.00E+00
PENRT	MJ	**0.00**	1.31E+03
SM	kg	**0.00**	0.00
RSF	MJ	**0.00**	0.00
NRSF	MJ	**0.00**	0.00
FW	m^3	**0.00**	3.91E-01
Waste categories			
HWD	kg	**0.00**	1.14E-06
NHWD	kg	**0.00**	2.18E+01
RWD	kg	**0.00**	6.30E-02
Output material flows			
CRU	kg	**0.00**	0.00
MFR	kg	**0.00**	6.45E+00
MER	kg	**0.00**	0.00
EEE	MJ	**0.00**	1.87E+00
EET	MJ	**0.00**	3.62E+00
Additional environmental impact indicators			
PM	Disease incidence	**0.00**	4.48E-06
IRP	kBq U235 eq.	**0.00**	6.24E+00
ETPfw	CTUe	**0.00**	4.27E+02
HTPc	CTUh	**0.00**	5.31E-08
HTPnc	CTUh	**0.00**	5.32E-07
SQP	Dimensionless	**0.00**	4.00E+02

façade cladding PG2			
B4 Exchange / Replacement	**Unit**	**B4.1**	B4.2
Core indicators			
GWP-t	kg CO_2 eq.	**0.00**	4.76E+01
GWP-f	kg CO_2 eq.	**0.00**	4.70E+01
GWP-b	kg CO_2 eq.	**0.00**	4.75E-01
GWP-l	kg CO_2 eq.	**0.00**	4.88E-02
ODP	kg CFC-11 eq.	**0.00**	3.80E-11
AP	mol H^+ eq.	**0.00**	9.18E-02
EP-fw	kg P eq.	**0.00**	3.38E-05
EP-m	kg N eq.	**0.00**	2.53E-02
EP-t	mol N eq.	**0.00**	2.75E-01
POCP	kg NMVOC eq.	**0.00**	8.05E-02
ADPF	MJ	**0.00**	2.96E-06
ADPE	kg Sb eq.	**0.00**	4.72E+02
WDP	m^3 world eq. deprived	**0.00**	9.68E-01
Use of resources			
PERE	MJ	**0.00**	5.67E+01
PERM	MJ	**0.00**	0.00
PERT	MJ	**0.00**	5.66E+01
PENRE	MJ	**0.00**	4.72E+02
PENRM	MJ	**0.00**	0.00E+00
PENRT	MJ	**0.00**	4.72E+02
SM	kg	**0.00**	0.00
RSF	MJ	**0.00**	0.00
NRSF	MJ	**0.00**	0.00
FW	m^3	**0.00**	3.84E-02
Waste categories			
HWD	kg	**0.00**	4.80E-08
NHWD	kg	**0.00**	1.35E+00
RWD	kg	**0.00**	2.22E-03
Output material flows			
CRU	kg	**0.00**	0.00
MFR	kg	**0.00**	1.56E+01
MER	kg	**0.00**	0.00
EEE	MJ	**0.00**	5.39E+00
EET	MJ	**0.00**	1.04E+01
Additional environmental impact indicators			
PM	Disease incidence	**0.00**	1.62E-06
IRP	kBq U235 eq.	**0.00**	2.18E-01
ETPfw	CTUe	**0.00**	8.93E+01
HTPc	CTUh	**0.00**	5.89E-08
HTPnc	CTUh	**0.00**	1.55E-07
SQP	Dimensionless	**0.00**	4.56E+02

façade cladding PG3			
B4 Exchange / Replacement	**Unit**	**B4.1**	B4.2
Core indicators			
GWP-t	kg CO_2 eq.	**0.00**	6.85E+01
GWP-f	kg CO_2 eq.	**0.00**	6.80E+01
GWP-b	kg CO_2 eq.	**0.00**	5.15E-01
GWP-l	kg CO_2 eq.	**0.00**	7.36E-02
ODP	kg CFC-11 eq.	**0.00**	3.55E-10
AP	mol H^+ eq.	**0.00**	4.14E-01
EP-fw	kg P eq.	**0.00**	1.04E-04
EP-m	kg N eq.	**0.00**	4.42E-02
EP-t	mol N eq.	**0.00**	4.91E-01
POCP	kg NMVOC eq.	**0.00**	1.40E-01
ADPF	MJ	**0.00**	2.41E-03
ADPE	kg Sb eq.	**0.00**	8.54E+02
WDP	m^3 world eq. deprived	**0.00**	1.09E+01
Use of resources			
PERE	MJ	**0.00**	2.30E+02
PERM	MJ	**0.00**	0.00
PERT	MJ	**0.00**	2.30E+02
PENRE	MJ	**0.00**	8.54E+02
PENRM	MJ	**0.00**	0.00
PENRT	MJ	**0.00**	8.54E+02
SM	kg	**0.00**	0.00
RSF	MJ	**0.00**	0.00
NRSF	MJ	**0.00**	0.00
FW	m^3	**0.00**	3.09E-01
Waste categories			
HWD	kg	**0.00**	3.73E-07
NHWD	kg	**0.00**	8.72E+00
RWD	kg	**0.00**	1.52E-02
Output material flows			
CRU	kg	**0.00**	0.00
MFR	kg	**0.00**	1.69E+01
MER	kg	**0.00**	0.00
EEE	MJ	**0.00**	5.50E+00
EET	MJ	**0.00**	1.06E+01
Additional environmental impact indicators			
PM	Disease incidence	**0.00**	7.28E-06
IRP	kBq U235 eq.	**0.00**	1.60E+00
ETPfw	CTUe	**0.00**	2.46E+02
HTPc	CTUh	**0.00**	2.61E-05
HTPnc	CTUh	**0.00**	5.06E-07
SQP	Dimensionless	**0.00**	5.91E+02

B5 Modification/refurbishment (not relevant)

According to the manufacturer, the elements are not included in the improvement / modernisation activities for buildings.

For updated information refer to the respective instructions for assembly/installation, operation and maintenance from MN Metall GmbH .

Ancillary materials, consumables, use of energy and water, material losses, waste as well as transport distances during replacement are negligible.

Since only one scenario is used, the results are shown in the relevant summary table.

B6 Operational energy use (not relevant)

No.	Scenario	Description
B6	Hand-operated / static component	No energy consumed when used

There is no energy consumption during normal use.

There is no transport consumption during the energy use in buildings. Ancillary materials, consumables and water, waste materials and other scenarios are negligible.

Since only one scenario is used, the results are shown in the relevant summary table.

B7 Operational water use (not relevant)

No water consumption when used as intended.

There is no transport consumption during water use in buildings. Ancillary materials, consumables, waste materials and other scenarios are negligible.

Since only one scenario is used, the results are shown in the relevant summary table.

C1 Deconstruction, demolition

No.	Scenario	Description
C1	Deconstruction	**95 % deconstruction** **5 % residues (landfill)** Energy consumption: 1.10E-03 kWh/kg (Energy source: diesel)

No relevant inputs or outputs apply to the scenario selected. The energy consumed for deconstruction is negligible. Any arising consumption is marginal.

Since only one scenario is used, the results are shown in the relevant summary table.

In case of deviating consumption, the removal of the products forms part of the site management and is covered at the construction works level.

C2 Transport

No.	Scenario	Description
C2	Transport	**Transport to collection point using 28-32 t truck (Euro 5), diesel, 22 t payload, 50 % capacity used, 80 km.**

Since only one scenario is used, the results are shown in the relevant summary table.

C3 Waste management

No.	Scenario	Description
C3	**Current market situation** **In accordance with EN 18001**	**Share for recirculation of materials:** **metals 100 % recycling**

Electricity consumption of incineration plant: 1,14E-02 kWh/kg.

As the products are placed on the European market, the disposal scenario is based on average European datasets.

Since only one scenario is used, the results are shown in the summary table.

The table below describes the disposal processes and their percentage by mass/weight. The calculation is based on the above mentioned proportions in percent related to the declared unit of the product system.

C3 Disposal	Unit	PG1	PG2	PG3
Collection process, collected separately	kg	4.817	13.870	14.155
Collection process, collected as mixed construction waste	kg	0.254	0.730	0.745
Recovery system, for reuse	kg	0.000	0.000	0.000
Recovery system, for recycling	kg	4.817	13.870	14.155
Recovery system, for energy recovery	kg	0.000	0.000	0.000
Disposal	kg	0.254	0.730	0.745

C4 Disposal

No.	Scenario	Description
C4	**Disposal**	**The non-recordable amounts and losses within the re-use/recycling chain (C1 and C3) are modelled as "dis-posed" (DE).**

The consumption in scenario C4 results from physical pre-treatment, waste recycling and management of the disposal site. The benefits obtained here from the substitution of primary material production are allocated to module D, e.g. electricity and heat from waste incineration.

Since only one scenario is used, the results are shown in the summary table.

D Benefits and loads from beyond the system boundaries

No.	Scenario	Description[1]
D	**Recycling potential**	**Aluminium scrap from C3 replaces 70.2% of aluminium; Steel scrap from C3 replaces 70.2% of steel; Zinc scrap from C3 replaces 60% of zinc; Benefits from waste incineration: electricity replaces electricity mix (RER); thermal energy replaces thermal energy from natural gas (RER).**

[1] Value correction factor 70.2% according to metal specific data set, 60% according to standard data set for other materials.

The values in module "D" result from recycling of the packaging material in module A5 and from deconstruction at the end of service life.

Since only one scenario is used, the results are shown in the summary table.

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Notes
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