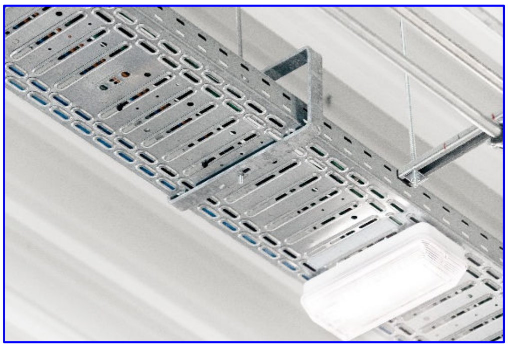
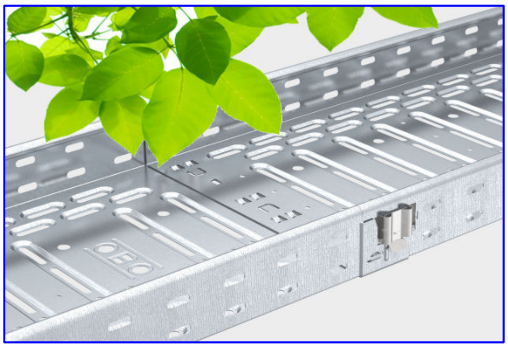
Environmental Product Declaration (EPD)

ROSENHEIM

Declaration Code: EPD-KTO-GB-17.0





OBO BETTERMANN

OBO Bettermann Produktion Deutschland GmbH & Co. KG

ECO PLATFORM EPD VERIFIED

Cable support systems

cable tray, mesh cable tray, cable ladder and wide-span systems

Basis:

DIN EN ISO 14025
EN 15804 + A2

Company EPD
Environmental
Product **D**eclaration

Publication date:
10.07.2024

Valid until:
10.07.2029

www.ift-rosenheim.de/
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Declaration Code: EPD-KTO-GB-17.0

Programme operator	ift Rosenheim GmbH Theodor-Gietl-Straße 7-9 D-83026 Rosenheim
Practitioner of the LCA	Life Cycle Engineering Experts GmbH Birkenweg 24 D-64295 Darmstadt
Declaration holder	OBO Bettermann Produktion Deutschland GmbH & Co. KG Hüingser Ring 52 D-58710 Menden www.obo.de Note:Additional declaration holders are stated on page 3.
Declaration code	EPD-KTO-GB-17.0
Designation of declared product	cable tray, mesh cable tray, cable ladder and wide-span systems
Scope	The cable tray systems are used for the safe routing of cables and lines.
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 “PCR Part A” PCR-A-1.0:2023 and "Routing systems for cables and wires” PCR-KTS-2.0:2021.
Validity	Publication date: 10.07.2024 — Last revision: 10.07.2024 — Valid until 10.07.2029 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 OBO Bettermann Produktion Deutschland GmbH & Co. KG and OBO Bettermann Kft in 2347 Bugyi Magyarorszag (Hungary), the generic data from the ”LCA for Experts 10“ database. LCA calculations were carried out for the included “cradle to gate” 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.

Christoph Seehauser Deputy Head of Sustainability	Dr. Torsten Mielecke Chairman of Expert Committee ift-EPD and PCR	Vivien Zwick External verifier

Additional declaration holders:

- OBO Bettermann Kft
  Alsóráda 2
  2347 Bugyi, Magyarország (Hungary)

1 General product information

Product definition

The EPD relates to the product group Cable support systems and applies to:

1 m of cable tray, mesh cable tray, cable ladder and wide span system made by OBO Bettermann Produktion Deutschland GmbH & Co. KG

The declared unit is obtained as follows:

Designation	Declared unit	Channel/ Ladder	Studs	Canti-levers	Length weight
Cable tray system	1 m	12,51 kg	18,33 kg	11,53 kg	42,37 kg/m
Mesh cable tray system	1 m	6,42 kg	18,33 kg	11,53 kg	36,27 kg/m
Cable ladder system	1 m	7,58 kg	18,33 kg	11,53 kg	37,43 kg/m
Wide span system	1 lfm	13,80 kg	18,33 kg	11,53 kg	43,66 kg/m

Table 1: Product groups

The average unit is declared as follows:
Directly used material flows were allocated to the declared unit. All other inputs and outputs during production are allocated in their entirety to the declared unit, as there is no typical functional unit due to the high number of variants. The reference period is the year 2022, with the exception of mesh cable tray systems with the reference year 2019. The year 2019 was selected as the reference year for mesh cable tray systems, as the worst-case product was not produced in 2022. A different reference year was selected for the mesh cable tray systems in order to be able to include it.

The validity of the EPD is limited to the following series the worst-case products included in the balance are marked in red in the following tables:

Cable tray system			
Type	**Heights [mm]**	**Widths [mm]**	**Materials**
RKSM	35, 60	100 - 600	FS, FT, A2, A4
RKS	35, 60	50, 75	FS, FT
LKS	60	100 - 400	FS
MKS	35, 60, 85, 110	100 - 600	FS, FT, A2
MKSU	60, 85	50 - 600	FS, FT
MKSM	60, 85, 110	100 - 600	FS, FT, A2
MKSMU	60, 85, 110	100 - 600	FS, FT, A2
SKS	60, 85, 110	50 - 600	FS, FT, A2, A4
SKSM	60, 85, 110	100 - 600	FS, FT, A2, A4
SKSMU	60, 85, 110	100 - 600	FS, FT, A2
SKSU	60, 110	100 - 600	FS, FT
EKS	60	100 - 900	FS, FT
EKSU	60	100 - 600	FT
DKS	60, 85	100 - 600	FS, FT
IKS	60	100 - 400	FS
BKRS	100, 110	100 - 600	FS
AZK	50	50 - 300	FS, FT, A2, A4
LTR	60	70	FS, FT
LTS	50	50 - 100	FS, FT

Mesh cable tray system			
Type	**Heights [mm]**	**Widths [mm]**	**Materials**
GR	35, 55, 105	100 - 600	G, FT, A2
GRM	35, 55, 105	50 - 600	G, FT, A2, A4
G-GRM	50, 75, 125, 150	50 - 100	G, FT, A2, A4
SGR	55, 105, 155	100 - 600	G, FT, A2
CGR	50	50 - 400	FT, A2
LTG	80	100	A2

Cable ladder system			
Type	**Heights [mm]**	**Widths [mm]**	**Materials**
LG	60, 110	200 - 600	FS, FT, A2, A4
LCIS	60, 110	100 - 600	FS, FT, A2, A4
SLCS	110	200 – 1200 (900)	FT
SLL	45, 60	200 - 600	FS, FT
SLM	50	200 - 1200	FT

Wide span system			
Type	**Heights [mm]**	**Widths [mm]**	**Materials**
WKSG	110, 160	200 - 600	FS, FT, A2
WKLG	110, 160, 200	200 - 600	FS, FT, A2, A4
WKL	200	200 - 600	FT

Mounting systems - cantilevers		
Type	**Length [mm]**	**Materials**
MWA 12	110 - 410	FS, A2, A4
MWAG 12	110 - 410	FS, A2, A4
AW 15	110 - 610	FT, A2, A4
AW 30	110 - 710	FT, A2, A4
AW 55	210 - 1010	FT, A2, A4
AW 80	210 - 810	FT
AWG 15	110 - 610	FT, A2, A4
AW 15 2L	110 - 610	FT
AWV	210 - 610	FT
AS 15	110 - 610	FT
AS 30	110 - 710	FT
AS 55	210 - 1010	FT
AWSS	210 - 1010	FT, A2, A4
TPSA	145 - 395	FS, FT, A2
TPSAG	145 - 345	FS, FT, A2

Mounting systems - studs		
Typ	**Length [mm]**	**Materials**
US 3 K	200 - 1200	FT, A2, A4
US 5 K	150 - 1200	FT, A2, A4
US 7 K	200 - 3000	FT, A2, A4
IS 8 K	200 - 3000	FT

Product description

Cable tray systems:
Support structure for cables and electrical lines made of sheet metal, often perforated or slotted and folded.
Depending on type and application, available in side heights 35, 50, 60, 85, 100 and 110 for support distances of up to 4m.
Available in steel and stainless steel with galvanized or hot-dip galvanized surfaces.
Thanks to the different materials and surface finishes, all applications and atmospheres can be covered.

Mesh cable tray systems:
Support structure for cables and electrical lines made of welded wires.
Depending on type and application, available in side heights of 35, 50, 55, 75, 105, 125, 150 and 155mm for support distances of up to 4m.
Available in steel and stainless steel with galvanized and hot-dip galvanized surfaces.
Thanks to the different materials and surface finishes, all applications and atmospheres can be covered.

Cable ladder systems:
Supporting structure for cables and electrical lines, usually made of sheet steel or stainless steel, consisting of two spars with rungs, welded or riveted. The individual components are often perforated or slotted and folded.
Depending on type and application, available in side heights of 45, 50, 60 and 110mm for support distances of up to 6m. Available in steel and stainless steel with galvanized or hot-dip galvanized surfaces.
Thanks to the different materials and surface finishes, all applications and atmospheres can be covered.

Wide-span systems:
Supporting structure for cables and electrical lines, usually made of sheet steel or stainless steel, consisting of two uprights with rungs or two uprights and base plate, the individual components are often perforated or slotted and folded.
Depending on the type and application, available in side heights of 110, 160 and 200 mm for large support distances of up to 10 m. Available in steel and stainless steel with galvanized or hot-dip galvanized surfaces.
Thanks to the different materials and surface finishes, all applications and atmospheres can be covered.

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

Product manufacture

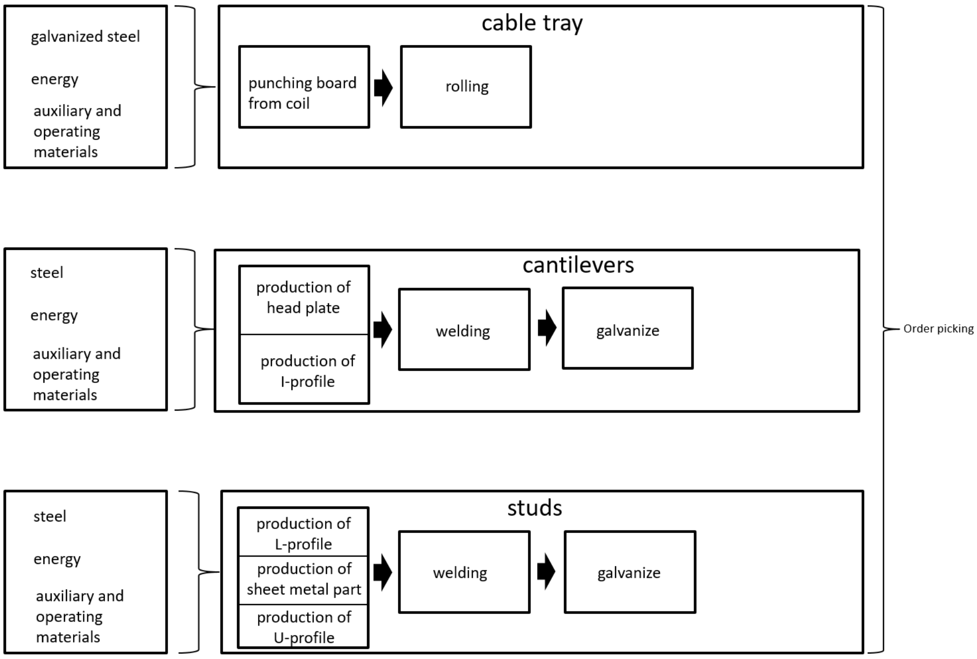


Figure 1: Product manufacturing: Cable tray systems

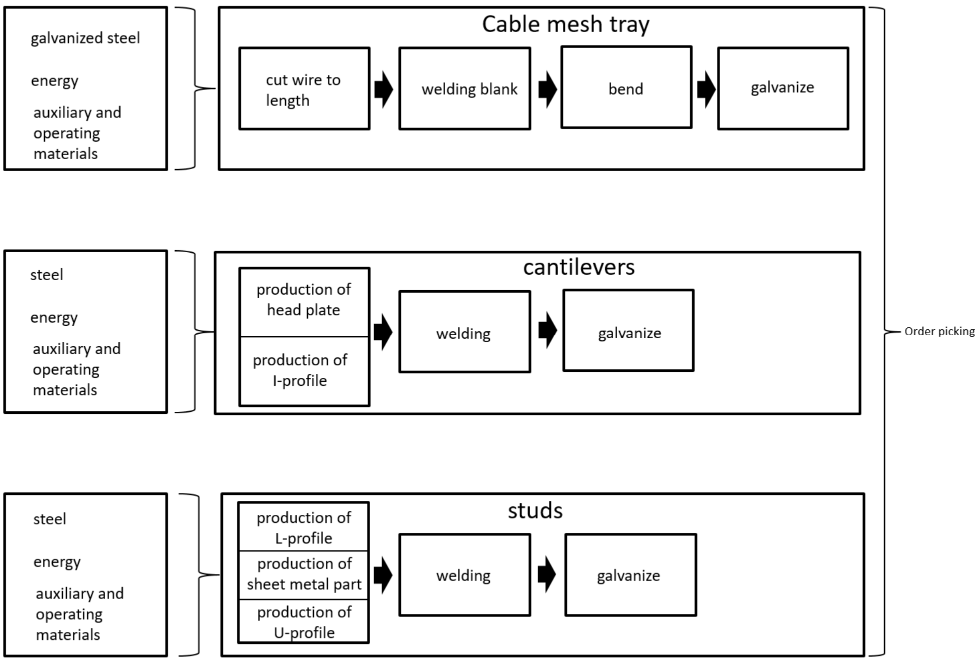


Figure 2: Product manufacturing: Mesh cable tray systems

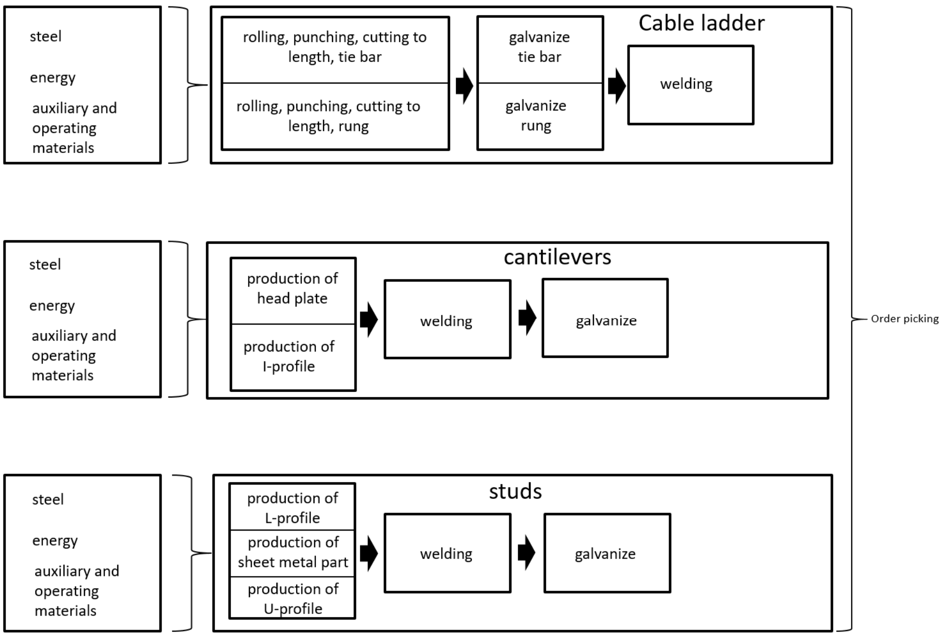


Figure 3: Product manufacturing: Cable ladder system

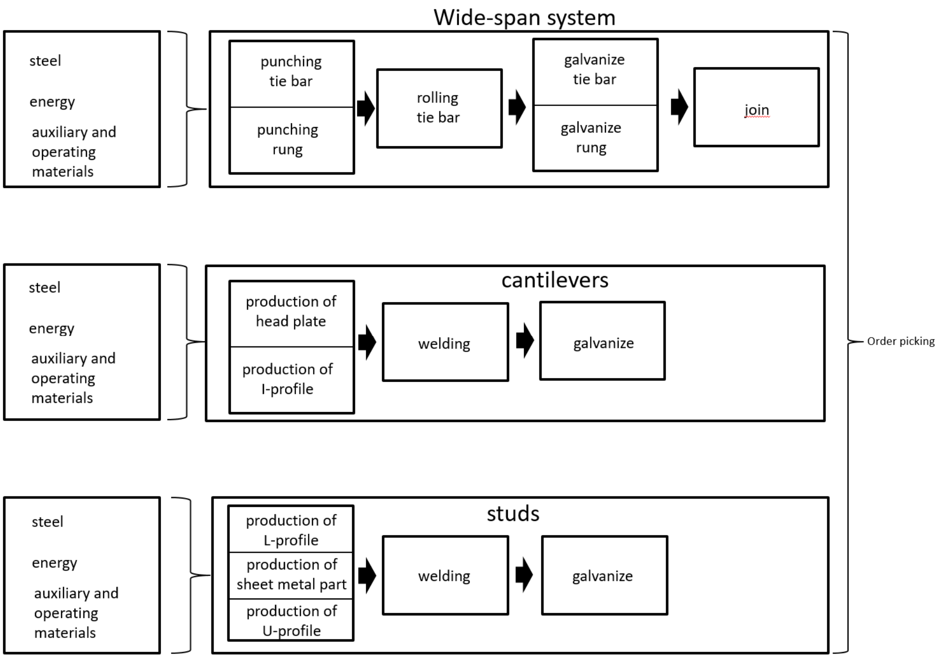


Figure 4: Product manufacturing: Wide-span systems

Scope

The cable tray, mesh cable tray, cable ladder and wide span systems are used for the safe routing of cables and lines in electrical installations in various industrial and private sectors.

Management systems

The following management systems are in place:

- Quality management system in accordance with DIN EN ISO 9001:2015
- Environmental management system in accordance with DIN EN ISO 14001:2015

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 0**

Inventory analysis (Inputs).

Declarable substances The product contains no substances from the REACH candidate list: Cable tray systems: Declaration of June 29, 2022
Mesh cable tray systems: Declaration of August 13, 2021
Cable ladder systems: Declaration dated September 11, 2023
Wide span cable tray: Declaration of October 13, 2021
Cantilevers: Declaration dated December 06, 2021
Studs: Declaration dated October 13, 2021

All relevant safety data sheets are available from OBO Bettermann Produktion Deutschland GmbH & Co. KG

3 Construction process stage

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

4 Use stage

Emissions to the environment No emissions to indoor air, water or soil are known. There may be VOC emissions.

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 a “Cradle to gate” EPD with the modules C1-C4 and module D (A1-A3 + C + D), no reference service life (RSL) can be determined because no reference in-use conditions are specified.
The reference service life (RSL) of cable tray, mesh cable tray, cable ladder and wide-span systems made by OBO Bettermann Produktion Deutschland GmbH & Co. KG is not specified.

5 End-of-life stage

Possible end-of-life stages

The cable tray, mesh cable tray, cable ladder and wide-span systems are shipped to central collection points. 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. Specific components of steel are recycled. Residual fractions are sent to landfill.

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 a life cycle assessment was developed for cable tray, mesh cable tray, cable ladder and wide-span systems, serving as the basis. The LCA is 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 originates exclusively from the 2022 financial year (with the exception of the mesh cable tray system, which originates from 2019). These are recorded at the OBO Bettermann Produktion Deutschland GmbH plant in 58710 Menden (Germany) and OBO Bettermann Kft in 2347 Bugyi

Magyarorszag (Hungary) and come partly from account books and partly from direct readings.
The generic data come from the “LCA for Experts 10” professional and building materials databases. The last update of both databases was in 2023. Data from before this date come also from these databases and are not more than ten 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" for the development of life cycle assessments.

The data quality complies with the requirements of prEN15941:2022.

Scope / system boundaries

The system boundaries refer to the supply of raw materials and purchased parts, manufacture/production and end-of-life stage of cable tray, mesh cable tray, cable ladder and wide-span systems.
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 packaging materials were cut off in compliance with the 1% rule.

The transportation route for raw materials was taken into account.

Transport routes for waste and auxilary materials were not taken into account.

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 cable tray, mesh cable tray, cable ladder and wide-span systems. The “Product stage” (A1 - A3), “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

Allocation of co-products

The manufacture does not give rise to allocations:

Allocations for reuse, recycling and recovery

If the products are recycled and recovered during the product stage (rejects) the components are shredded if necessary and then sorted into their single constituents. This is done by various process plants, e.g. magnetic separators. 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.
The system boundary set for the recycled material refers to collection.

Secondary material

The use of secondary material by OBO Bettermann Produktion Deutschland GmbH & Co. KG was considered. Secondary material was not used.

Inputs

The LCA includes the following production-relevant inputs per 1 m of cable tray, mesh cable tray, cable ladder and wide span system:

Energy
“Thermal energy from natural gas Germany" and " Thermal energy from natural gas Hungary" are assumed for the gas input material. The "Hungarian electricity mix" is used for the electricity mix at the Hungarian plant. The "Dresden.Strom.Natur 2019/2022" green electricity mix (DREWAG- Stadtwerke Dresden GmbH) is used for the electricity mix at the plant in Germany.

Assumed green electricity mix 2019 (source: BMWI Renewable Energies in Figures based on AGEE.Stat)

Electricity supplier's electricity label	Shares in %
Photovoltaics	39,1
Hydropower	4,5
Wind energy	48,5
Solid biomass	2,1
Biogas	5,8

Table 2: Ernergy Mix " Assumed green electricity mix 2019"

Projected green electricity composition 2022 (source: Federal Environment Agency (UBA) based on AGEE-Stat/status 09/2023):

Electricity supplier's electricity label	Shares in %
Photovoltaics	24,0
Hydropower	7,0
Wind energy	49,0
Solid biomass	20,0

Table 3: Ernergy Mix " Assumed green electricity mix 2022"

Process heat is partly used for hall heating. However, this cannot be quantified and was added to the product as a "worst case".

Water

1,1 l per m water is 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.

Raw material/pre-products

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

No.	Material	Weight in kg per meter	Mass in % per meter
1	Steel	35,17	83,00
2	Zinc	0,84	2,00
3	Sheet steel	6,36	15,00

Table 4: Representation of the individual materials in kg and % per declared unit – cable tray system

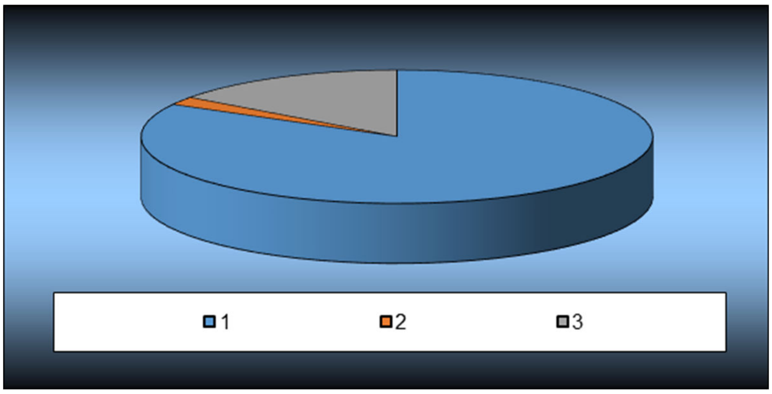


Figure 5: Percentage representation of the individual materials per declared unit (1 meter of cable tray system)

No.	Material	Weight in kg per meter	Mass in % per meter
1	Steel	28,88	79,62
2	Zinc	1,03	2,84
3	Sheet steel	6,36	17,54

Table 5: Representation of the individual materials in kg and % per declared unit – mesh cable tray system

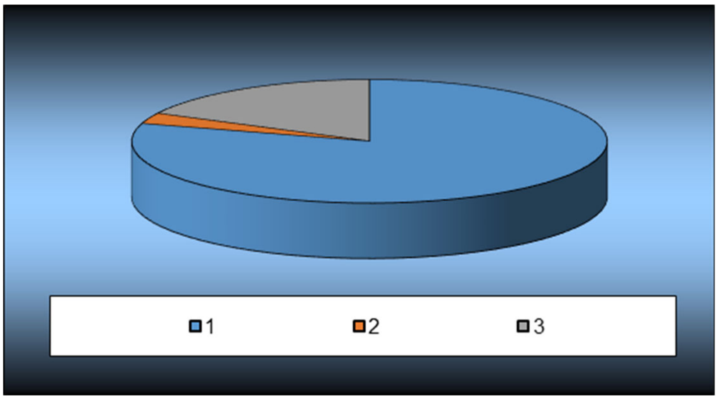


Figure 6: Percentage representation of the individual materials per declared unit (1 meter of mesh cable tray system)

No.	Material	Weight in kg per meter	Mass in % per meter
1	Steel	29,89	79,81
2	Zinc	1,20	3,20
3	Sheet steel	6,36	16,98

Table 6: Representation of the individual materials in kg and % per declared unit – cable ladder system

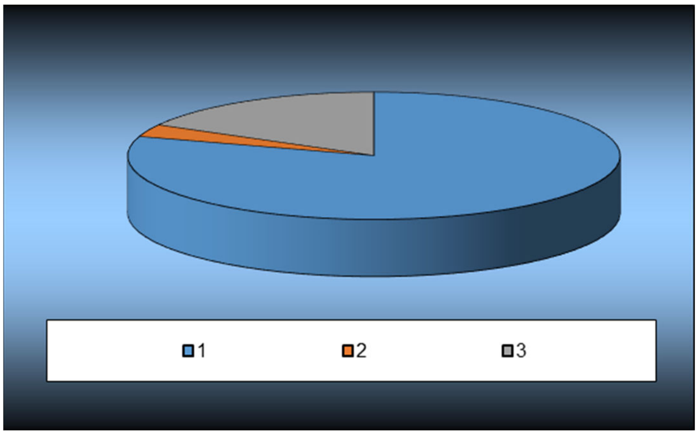


Figure 7: Percentage representation of the individual materials per declared unit (1 meter of cable ladder system)

No.	Material	Weight in kg per meter	Mass in % per meter
1	Steel	19,41	44,48
2	Zinc	1,58	3,60
3	Sheet steel	22,67	51,92

Table 7: Representation of the individual materials in kg and % per declared unit – wide-span system

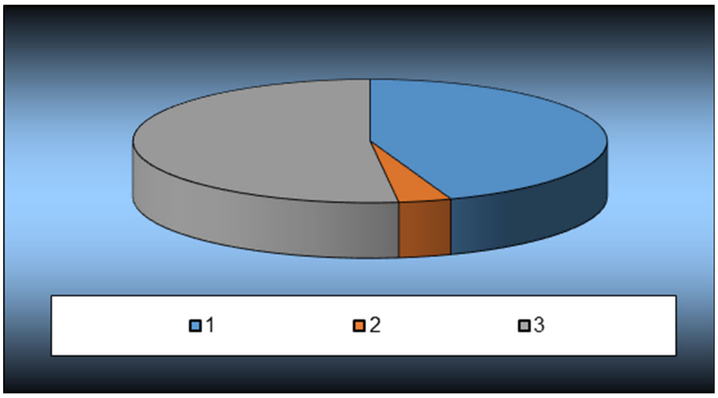


Figure 8: Percentage representation of the individual materials per declared unit (1 meter of wide-span system)

Ancillary materials and consumables
There are 0.64 kg (PG1), 0.88 kg (PG2), 0.92 kg (PG3) and 1.14 kg (PG4) of auxiliary and consumable materials. Other auxiliary and consumable materials were cut off in compliance with the 1% rule.

Product packaging
Product packaging has been cut off in compliance with the 1% rule.

Biogenic carbon content
It can be assumed that the biogenic carbon content is negligible. The total mass of the substances containing biogenic carbon is less than 5% of the total mass of the product. The biogenic carbon content of the packaging was not considered, as the packaging was cut off in compliance with the 1% rule.

Outputs

The LCA includes the following production-relevant outputs per 1 m of cable tray, mesh cable tray, cable ladder and wide-span system:

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

Waste water
The manufacture produces 1,1 l of 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:

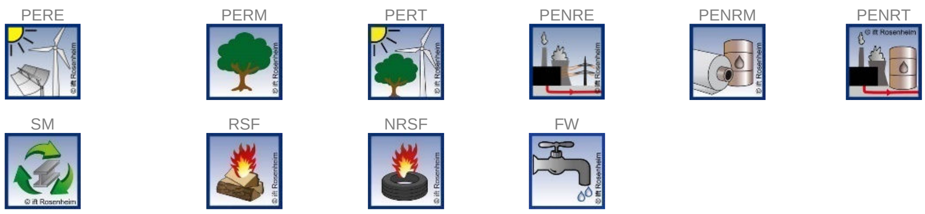
- Climate change – total (GWP-t)
- Climate change – fossil (GWP-f)
- Climate change – biogenic (GWP-b)
- Climate change - land use and land use change (GWP-l)
- Ozone depletion (ODP)
- Acidification (AP)
- Eutrophication aquatic freshwater (EP-fw)
- Eutrophication aquatic marine (EP-m)
- Eutrophication 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)
- 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 m of cable tray, mesh cable tray, cable ladder and wide span system 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)

Results per 1 m of cable tray system

	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.	81,32	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	0,19	1,77	0,01	-15,83
GWP-f	kg CO_2 eq.	81,03	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	0,19	1,76	0,01	-15,92
GWP-b	kg CO_2 eq.	0,24	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	8,16E-04	0,015	4,32E-04	0,09
GWP-l	kg CO_2 eq.	0,05	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	1,10E-03	2,00E-04	3,97E-05	-2,11E-03
ODP	kg CFC-11 eq.	5,16E-10	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	3,18E-14	3,70E-11	3,28E-14	-2,14E-11
AP	mol H^+ eq.	0,45	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	2,27E-04	5,67E-03	9,06E-05	-0,04
EP-fw	kg P eq.	1,51E-04	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	4,23E-07	7,59E-06	2,58E-08	-3,71E-06
EP-m	kg N eq.	0,05	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	8,38E-05	9,77E-04	2,34E-05	-6,25E-03
EP-t	mol N eq.	0,65	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	9,97E-04	0,01	2,57E-04	-0,05
POCP	kg NMVOC eq.	0,18	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	1,97E-04	2,68E-03	7,06E-05	-0,02
ADPF*2	MJ	1009,19	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	2,47	37,69	0,17	-158,36
ADPE*2	kg Sb eq.	3,45E-03	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	1,29E-08	3,64E-07	5,92E-10	-9,02E-05
WDP*2	m^3 world eq. deprived	9,95	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	8,08E-04	0,35	1,20E-03	-1,07
Use of resources																
PERE	MJ	288,51	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	0,16	25,87	0,027	-6,25
PERM	MJ	0,00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	0,00	0,00	0,00	0,00
PERT	MJ	288,51	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	0,16	25,87	0,027	-6,25
PENRE	MJ	1011,71	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	2,47	37,70	0,17	-158,38
PENRM	MJ	0,00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	0,00	0,00	0,00	0,00
PENRT	MJ	1011,71	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	2,47	37,70	0,17	-158,38
SM	kg	0,00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	0,00	0,00	0,00	0,00
RSF	MJ	0,00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	0,00	0,00	0,00	0,00
NRSF	MJ	0,00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	0,00	0,00	0,00	0,00
FW	m^3	-0,87	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	1,45E-04	0,02	4,29E-05	-1,61
Waste categories																
HWD	kg	3,61E-05	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	6,59E-12	3,55E-09	3,66E-12	-1,18E-06
NHWD	kg	10,02	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	3,60E-04	0,03	0,85	-1,91
RWD	kg	0,04	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	2,57E-06	5,92E-03	1,91E-06	-1,74E-05
Output material flows																
CRU	kg	0,00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	0,00	0,00	0,00	0,00
MFR	kg	7,29	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	0,00	42,37	0,00	0,00
MER	kg	0,00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	0,00	0,00	0,00	0,00
EEE	MJ	0,00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	0,00	0,00	0,00	0,00
EET	MJ	0,00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	0,00	0,00	0,00	0,00

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 **ND** – Nicht betrachtet

Disclaimers

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	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Results per 1 m of mesh cable tray system																
Core indicators																
GWP-t	kg CO_2 eq.	42,27	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	0,16	1,57	0,01	-10,63
GWP-f	kg CO_2 eq.	42,02	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	0,16	1,56	0,01	-10,69
GWP-b	kg CO_2 eq.	0,22	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	6,98E-04	0,013	3,71E-04	0,06
GWP-l	kg CO_2 eq.	0,02	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	1,49E-03	1,70E-04	3,41E-05	-1,42E-03
ODP	kg CFC-11 eq.	3,33E-10	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	2,72E-14	2,88E-11	2,82E-14	-1,44E-11
AP	mol H^+ eq.	0,14	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	2,21E-04	3,32E-03	7,78E-05	-0,03
EP-fw	kg P eq.	9,38E-05	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	3,72E-07	5,84E-06	2,22E-08	-2,49E-06
EP-m	kg N eq.	0,03	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	7,,20E5	7,96E-04	2,01E-05	-4,20E-03
EP-t	mol N eq.	0,33	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	8,62E-04	8,32E-03	2,21E-04	-0,04
POCP	kg NMVOC eq.	0,09	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	1,73E-04	2,12E-03	6,06E-05	-0,02
ADPF*[2]	MJ	514,68	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	2,12	32,74	0,14	-106,38
ADPE*[2]	kg Sb eq.	1,80E-03	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	1,11E-08	2,41E-07	5,08E-10	-6,06E-05
WDP*[2]	m^3 world eq. deprived	2,10	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	8,14E-04	0,34	1,20E-03	-0,72
Use of resources																
PERE	MJ	181,07	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	0,13	19,60	0,024	-4,20
PERM	MJ	0,00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	0,00	0,00	0,00	0,00
PERT	MJ	181,07	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	0,13	19,60	0,024	-4,20
PENRE	MJ	516,97	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	2,12	32,75	0,14	-106,39
PENRM	MJ	0,00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	0,00	0,00	0,00	0,00
PENRT	MJ	516,97	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	2,12	32,75	0,14	-103,39
SM	kg	0,00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	0,00	0,00	0,00	0,00
RSF	MJ	0,00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	0,00	0,00	0,00	0,00
NRSF	MJ	0,00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	0,00	0,00	0,00	0,00
FW	m^3	0,92	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	1,24E-04	0,02	3,68E-05	-1,08
Waste categories																
HWD	kg	4,52E-05	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	5,66E-12	2,56E-09	3,15E-12	-7,96E-07
NHWD	kg	4,20	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	3,10E-04	0,02	0,73	-1,28
RWD	kg	0,03	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	2,22E-06	5,19E-03	1,64E-06	-1,17E-05
Output material flows																
CRU	kg	0,00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	0,00	0,00	0,00	0,00
MFR	kg	6,54	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	0,00	36,27	0,00	0,00
MER	kg	0,00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	0,00	0,00	0,00	0,00
EEE	MJ	0,00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	0,00	0,00	0,00	0,00
EET	MJ	0,00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	0,00	0,00	0,00	0,00

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 **ND** – Nicht betrachtet

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	Results per 1 m of cable ladder system															
	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.	64,36	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	0,17	1,57	0,01	-13,64
GWP-f	kg CO_2 eq.	64,11	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	0,17	1,56	0,01	-13,72
GWP-b	kg CO_2 eq.	0,22	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	7,31E-04	0,013	3,82E-04	0,08
GWP-l	kg CO_2 eq.	0,04	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	9,58E-04	1,77E-04	3,50E-05	-1,82E-03
ODP	kg CFC-11 eq.	4,47E-10	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	2,82E-14	3,27E-11	2,90E-14	-1,84E-11
AP	mol H^+ eq.	0,31	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	2,04E-04	5,01E-03	7,99E-05	-0,03
EP-fw	kg P eq.	1,22E-05	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	3,75E-07	6,71E-06	2,28E-08	-3,20E-06
EP-m	kg N eq.	0,04	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	7,42E-05	8,64E-04	2,07E-05	-5,39E-03
EP-t	mol N eq.	0,52	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	8,81E-04	9,06E-03	2,27E-04	-0,05
POCP	kg NMVOC eq.	0,14	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	1,74E-04	2,37E-03	6,23E-05	-0,02
ADPF*²	MJ	793,32	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	2,18	33,31	0,15	-136,43
ADPE*²	kg Sb eq.	3,00E-03	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	1,14E-08	3,22E-07	5,22E-10	-7,77E-05
WDP*²	m^3 world eq. deprived	6,84	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	8,33E-04	0,30	1,23E-03	-0,92
Use of resources																
PERE	MJ	243,45	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	0,14	22,87	0,024	-5,38
PERM	MJ	0,00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	0,00	0,00	0,00	0,00
PERT	MJ	243,45	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	0,14	22,87	0,024	-5,38
PENRE	MJ	795,82	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	2,18	33,32	0,15	-136,44
PENRM	MJ	0,00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	0,00	0,00	0,00	0,00
PENRT	MJ	795,82	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	2,18	33,32	0,15	-136,44
SM	kg	0,00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	0,00	0,00	0,00	0,00
RSF	MJ	0,00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	0,00	0,00	0,00	0,00
NRSF	MJ	0,00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	0,00	0,00	0,00	0,00
FW	m^3	-0,84	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	1,29E-04	0,01	3,78E-05	-1,38
Waste categories																
HWD	kg	5,18E-05	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	5,83E-12	3,23E-09	3,15E-12	-1,02E-06
NHWD	kg	7,84	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	3,18E-04	0,03	0,75	-1,65
RWD	kg	0,03	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	2,27E-06	5,23E-03	1,69E-06	-1,49E-05
Output material flows																
CRU	kg	0,00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	0,00	0,00	0,00	0,00
MFR	kg	6,77	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	0,00	37,43	0,00	0,00
MER	kg	0,00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	0,00	0,00	0,00	0,00
EEE	MJ	0,00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	0,00	0,00	0,00	0,00
EET	MJ	0,00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	0,00	0,00	0,00	0,00

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Results per 1 m of wide-span system

	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.	70,61	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	0,19	1,82	0,01	-29,54
GWP-f	kg CO_2 eq.	70,36	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	0,19	1,81	0,01	-29,71
GWP-b	kg CO_2 eq.	0,21	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	8,58E-04	0,015	4,43E-04	0,18
GWP-l	kg CO_2 eq.	0,03	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	1,13E-03	2,06E-04	4,06E-05	-3,95E-03
ODP	kg CFC-11 eq.	3,72E-10	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	3,28E-14	3,81E-11	3,36E-14	-3,99E-11
AP	mol H^+ eq.	0,21	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	2,36E-04	5,84E-03	9,27E-05	-0,07
EP-fw	kg P eq.	1,07E-04	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	4,37E-07	7,82E-06	2,64E-08	-6,92E-06
EP-m	kg N eq.	0,05	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	8,65E-05	1,00E-03	2,40E-05	-1,16E-02
EP-t	mol N eq.	0,52	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	1,04E-03	0,01	2,63E-04	-0,10
POCP	kg NMVOC eq.	0,15	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	2,08E-04	2,76E-03	7,23E-05	-0,04
ADPF*2	MJ	766,07	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	2,63	38,83	0,17	-295,49
ADPE*2	kg Sb eq.	2,34E-03	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	1,35E-08	3,75E-07	6,06E-10	-1,68E-04
WDP*2	m^3 world eq. deprived	2,94	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	9,72E-04	0,35	1,41E-03	-2,00
Use of resources																
PERE	MJ	197,74	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	0,16	26,65	0,028	-11,66
PERM	MJ	0,00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	0,00	0,00	0,00	0,00
PERT	MJ	197,74	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	0,16	26,65	0,028	-11,66
PENRE	MJ	770,63	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	2,63	38,84	0,17	-295,52
PENRM	MJ	0,00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	0,00	0,00	0,00	0,00
PENRT	MJ	770,63	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	2,63	38,84	0,17	-295,52
SM	kg	0,00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	0,00	0,00	0,00	0,00
RSF	MJ	0,00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	0,00	0,00	0,00	0,00
NRSF	MJ	0,00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	0,00	0,00	0,00	0,00
FW	m^3	-1,04	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	1,45E-04	0,01	4,39E-05	-3,00
Waste categories																
HWD	kg	6,86E-05	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	6,81E-12	3,66E-09	3,75E-12	-2,21E-06
NHWD	kg	5,59	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	3,71E-04	0,04	0,87	-3,57
RWD	kg	0,03	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	2,65E-06	6,10E-03	1,96E-06	-3,24E-05
Output material flows																
CRU	kg	0,00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	0,00	0,00	0,00	0,00
MFR	kg	7,54	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	0,00	43,66	0,00	0,00
MER	kg	0,00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	0,00	0,00	0,00	0,00
EEE	MJ	0,00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	0,00	0,00	0,00	0,00
EET	MJ	0,00	ND	ND	ND	ND	ND	ND	ND	ND	ND	0,00	0,00	0,00	0,00	0,00

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 **ND** – Nicht betrachtet

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 Interpretation, LCA presentation and critical review

Evaluation

The environmental impacts during the production stage are almost exclusively caused by the raw materials steel and sheet steel used in all environmental categories of all the cable and wire routing systems examined (cable tray, mesh cable tray, cable ladder and wide-span systems). Production (primarily the gas requirement) and the zinc content play a subordinate role.
The environmental impact of transporting the raw materials is very marginal

The environmental impacts of the considered mesh cable tray system are primarily dominated by the steel sheet portion of the arm and secondarily by the steel portion of the arm.
The environmental impact of the cable ladder system is determined by the steel strip component of the ladder and the steel sheet component of the support arm.
In the balanced cable tray system, the steel strip portion of the tray causes the highest environmental impacts.
The environmental impacts of the wide span system are primarily dominated by the steel part of the tray.
The environmental impacts in the production phase, which are caused by production, the zinc content and transportation, are low to marginal for all four guide systems included in the balance.

The environmental impacts in the disposal stage (module C1-C4) of the guide systems under consideration compared to the production stage (modules A1-A3) are very low in all environmental categories when looking at the results tables.
When recycling the products, approx. 20 - 40 % of the environmental impacts occurring in the life cycle can be credited for the steel/steel sheet portion in scenario D, depending on the system. It should be noted that credits were only shown and applied for the net scrap quantities.

Compared to the EPD five years ago (of the mesh cable tray systems and cable tray systems), the LCA results differ considerably. The reasons for this are that other, more suitable "LCA for Experts" data sets were used, the background data in "LCA for Experts" has changed and due to the declaration holder. The main reason, however, is that the mass per running meter of the two previously mentioned cable tray systems has increased in the course of the EPD update (see also explanation under point 3.1 Declared unit).
In addition, the environmental impacts cannot be compared with each other due to the change in standard and the resulting new calculation methodology.

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 percentage environmental impacts during the production stage (modules A1-A3) of the respective declared cable and wire routing systems.

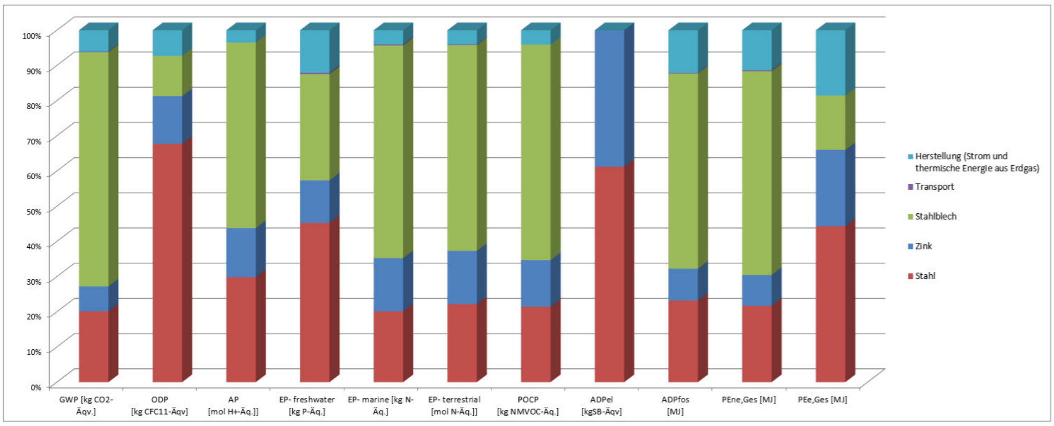

Figure 9: Percentage shares of selected components of production and transport in the production stage based on selected environmental impact categories (Cable tray system)

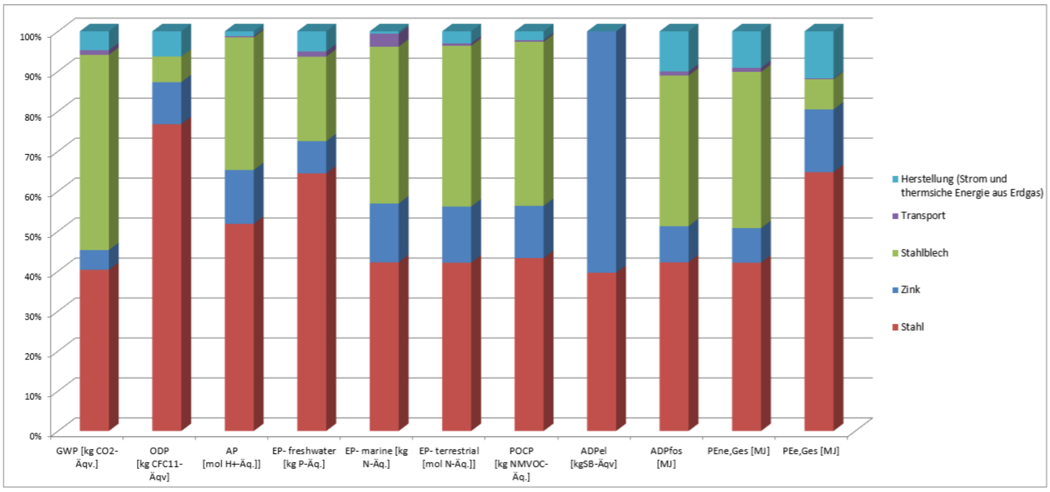

Figure 10: Percentage shares of selected components of production and transport in the production stage based on selected environmental impact categories (Mesh cable tray system)

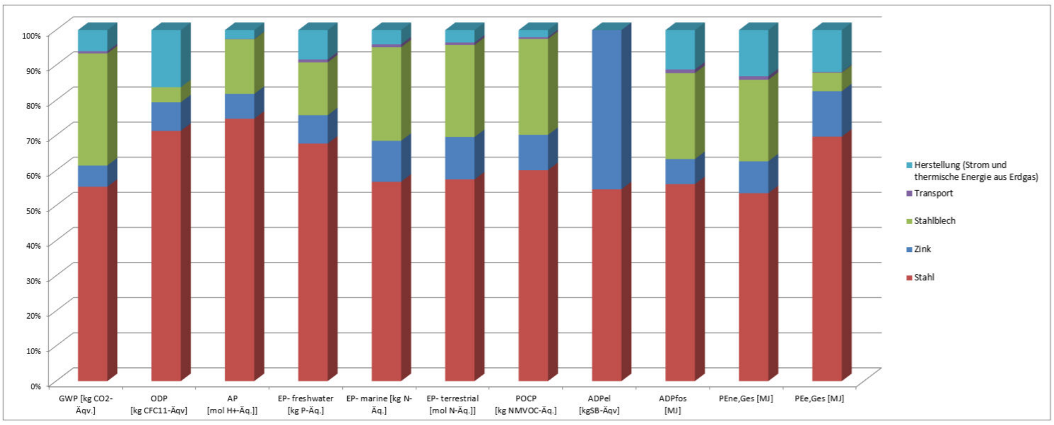

Figure 11: Percentage shares of selected components of production and transport in the production stage based on selected environmental impact categories (Cable ladder system)

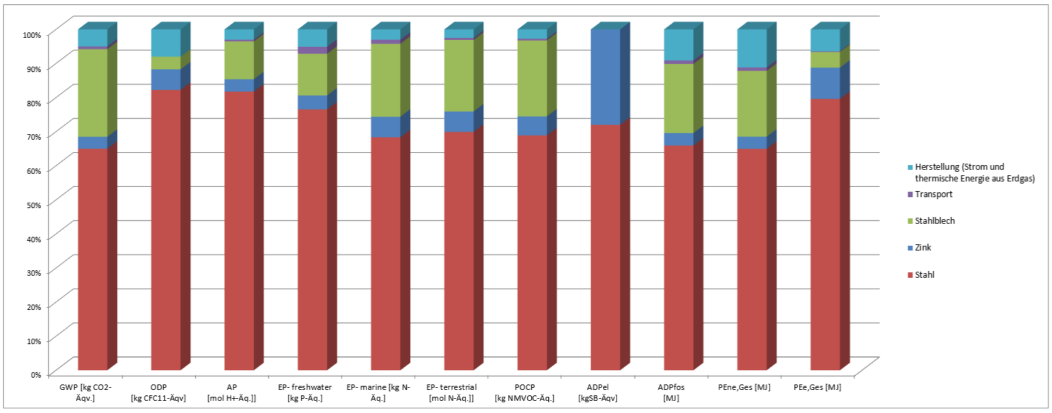

Figure 12: Percentage shares of selected components of production and transport in the production stage based on selected environmental impact categories (Wide-span system)

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 Vivien Zwick, an external verifier.

7 General information regarding the EPD

Comparability

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 balanced reference products were identified using the worst-case approach and considered representative of the product group. The results of individual products within the product group differ from the results of the reference products. The determination 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 "PCR Teil A" PCR-A-1.0:2023 and “Routing systems for cables and wires” PCR-KTS-2.0:2021.

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)] [Vivien, Zwick]
[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	10.07.2024	External verification	Dumproff	Zwick

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9 Annex

Description of life cycle scenarios for cable tray, mesh cable tray, cable ladder and wide-span systems

Product stage			Construction 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

The scenarios were based on information provided by the manufacturer.

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

C1 Deconstruction, demolition

No.	Scenario	Description
C1	Deconstruction	**By hand and partly with small construction machines** **Collection rate 100 %** **Further dismantling quotas possible, justify accordingly.**

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 28t-32t truck (Euro 6), diesel, 22 t payload, 85% capacity used, 50 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	**Share for recirculation of materials:** • **Steel 98% in melt** (UBA, 2017) • **Remainder to landfill**

Electricity consumption of incineration plant 0.5 MJ/kg.

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

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 Waste management	Unit	C3
Collection process, collected separately	kg	43,22
Collection process, collected as mixed construction waste	kg	0,00
Recovery system, for reuse	kg	0,00
Recovery system, for recycling	kg	42,37
Recovery system, for energy recovery	kg	0,00
Disposal	kg	0,85

Table 9: Module C3 waste management cable tray system

C3 Waste management	Unit	C3
Collection process, collected separately	kg	37,00
Collection process, collected as mixed construction waste	kg	0,00
Recovery system, for reuse	kg	0,00
Recovery system, for recycling	kg	36,27
Recovery system, for energy recovery	kg	0,00
Disposal	kg	0,73

Table 10: Module C3 waste management mesh cable tray system

C3 Waste management	Unit	C3
Collection process, collected separately	kg	38,18
Collection process, collected as mixed construction waste	kg	0,00
Recovery system, for reuse	kg	0,00
Recovery system, for recycling	kg	37,43
Recovery system, for energy recovery	kg	0,00
Disposal	kg	0,75

Table 11: Module C3 waste management cable ladder system

C3 Waste management	Unit	C3
Collection process, collected separately	kg	44,53
Collection process, collected as mixed construction waste	kg	0,00
Recovery system, for reuse	kg	0,00
Recovery system, for recycling	kg	43,66
Recovery system, for energy recovery	kg	0,00
Disposal	kg	0,87

Tabelle 12: Module C3 waste management wide-span system

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

C4 Disposal

No.	Scenario	Description
C4	**Disposal**	**The non-recordable amounts and losses within the reuse/re-cycling chain (C1 and C3) are modelled as "disposed" (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
D	**Recycling potential**	**Steel (galvanized) and sheet steel excluding landfill shares from C3 and steel scrap shares in the data sets used from A1 (secondary material share). Consequently, only credits for net scrap quantities were taken into account.**

The values in module "D" result from recycling of the packaging material 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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Layout
ift Rosenheim GmbH – 2021

Photographs (front page)
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