ENVIRONMENTAL PRODUCT DECLARATION

Tate Strut 4×4 with 2×4 infill

In accordance with: ISO 14025:2006, EN 15804:2012+A2:2019/AC:2021, ISO 21930:2017

Products included in the EPD:

Tate Strut 4×4 with 2×4 infill

An EPD may be updated or depublished if conditions change. To find the latest version of the EPD and to confirm its validity, see www.environdec.com

EPD of a single product from a manufacturer/service provider

EPD Owner
Tate North America

Programme
International EPD System
www.environdec.com

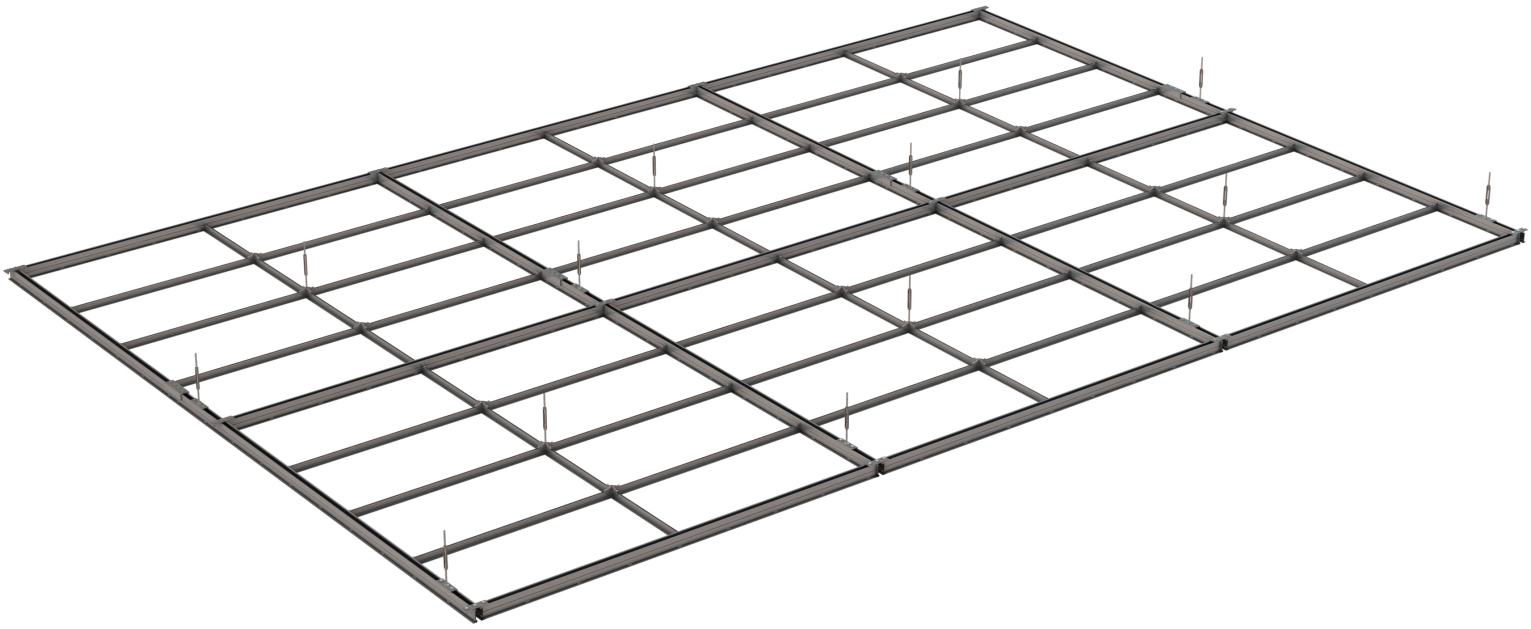
Programme operator
EPD International AB

Licensee
EPD-North America

Registration number
EPD-IES-0019965:002

Version date
2025-09-19

Validity date
2030-09-15



NORTH AMERICA EPD
INTERNATIONAL EPD SYSTEM

ECO PLATFORM EPD VERIFIED

Tate.

GENERAL INFORMATION

Programme information

Programme	International EPD System
Address	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Website	www.environdec.com
E-mail	support@environdec.com

Product category rules

CEN standard EN 15804 and ISO standard ISO 21930 serve as the core Product Category Rules (PCR)	
Product Category Rules (PCR)	2019:14 Construction products (EN 15804+A2) 2.0.1
PCR review was conducted by	The Technical Committee of the International EPD System. See www.environdec.com for a list of members. Review chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat www.environdec.com/support.

Verification

LCA accountability	zoe@hhc.earth, zoe@hhc.earth, Tate North America
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via	☑ EPD verification through an individual EPD verification ☐ EPD verification through EPD Process Certification* ☐ EPD verification through a fully pre-verified tool
Third-party verifier	Marie Bellemare (Marie Bellemare Consulting)
Approved by	International EPD System
Procedure for follow-up of data during EPD validity involves third party verifier	☐ Yes ☑ No

*EPD Process Certification involves an accredited certification body certifying and periodically auditing the EPD process and conducting external and independent verification of EPDs that are regularly published. More information can be found in the General Programme Instructions on www.environdec.com. International EPD System.

Ownership and limitations on use of EPD

Limitations

EPDs within the same product category but published in different EPD programmes, may not be comparable. For two EPDs to be comparable, they shall be based on the same PCR (including the same first-digit version number) or be based on fully aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have identical scope in terms of included life-cycle stages (unless the excluded life-cycle stage is demonstrated to be insignificant); apply identical impact assessment methods (including the same version of characterisation factors); and be valid at the time of comparison.

Ownership

The EPD Owner has the sole ownership, liability, and responsibility for the EPD.

INFORMATION ABOUT EPD OWNER

EPD Owner	Tate North America
Contact person name	Emma Johnson
Contact person e-mail	ejohnson@tateinc.com
Organisation address	USA Columbia 21046 7001 Columbia Gateway Dr. Suite 500

Description of the organisation of the EPD Owner

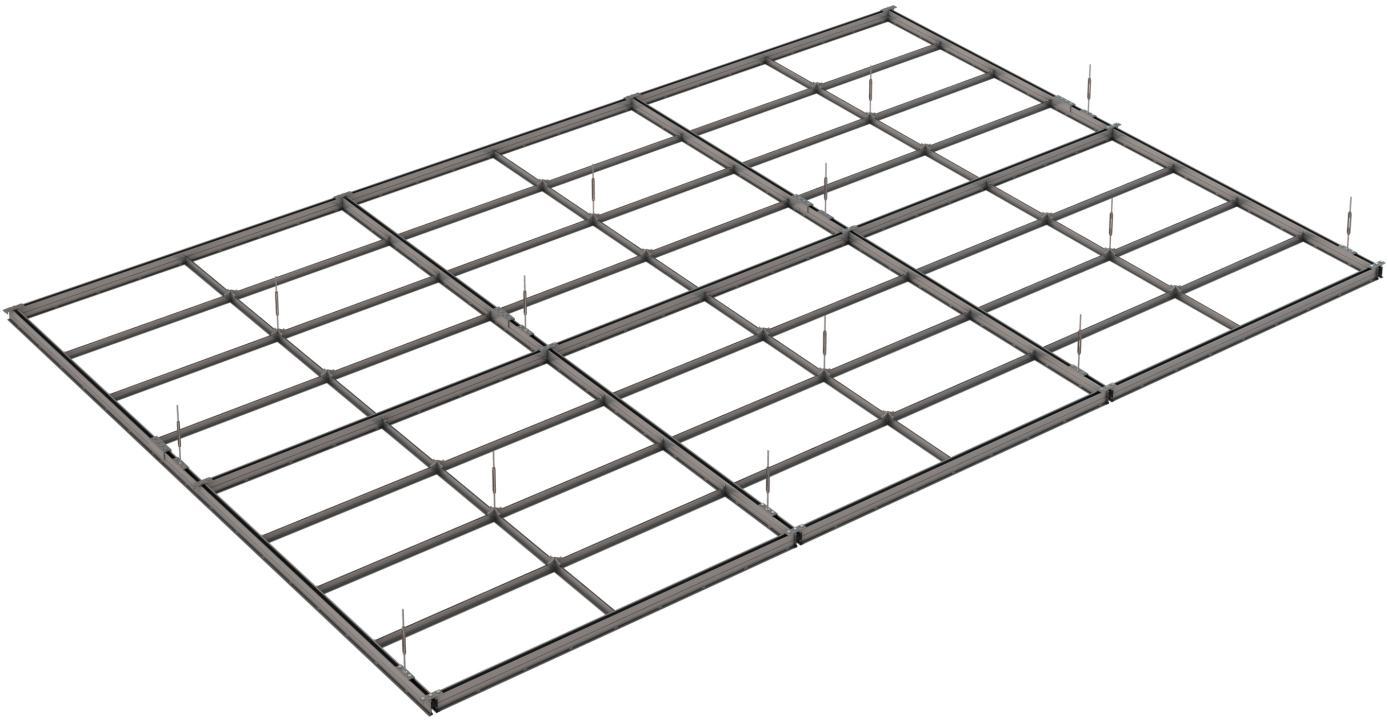
For over 60 years, Tate has been an industry leading global manufacturer of data center solutions. We work collaboratively with our data center clients to provide structural ceilings, containment systems, airflow grills and security cages that are reliable, innovative, and high performing. Our team of professional and highly qualified technical engineers are on hand to support our clients with their specific data centre project requirements.
We have a long-term commitment to delivering a sustainable agenda as part of Kingspan Group's 10-year Planet Passionate program, that addresses climate change, circularity and protection of our natural world. We believe these can only be met through true collaboration and partnership, and are delighted that together our initiatives have been recognized by global environmental impact non-profit CDP since 2016, for driving climate change. Tate is actively pursuing 100% renewable electricity: part of this is already produced by on-site solar panels. Tate purchases Renewable Energy Certificates (RECs) to offset residual grid electricity. For conservativeness, the LCA model applies the US RFC residual mix (78 %). On-site photovoltaic panels supply 22 % of the electricity used in manufacturing. The REC purchases reflect Tate's renewable energy commitment but are not included in the LCA calculation.

PRODUCT INFORMATION

Product name	Tate Strut 4×4 with 2×4 infill
Product identification	UN CPC class 42195, Other structures and parts of structures, of iron, steel or aluminium, n.e.c.
Product description	Tate Strut is a strong, galvanized steel profile with a white painted finish. Uniquely integrated welded flanges support tiles, light fixtures and return air grilles—removing the need for two separate ceiling systems. The continuous open channel slot allows for full flexibility when suspending cable trays, bus bars, and other heavy accessories from the structural ceiling. Both strut main runners and structural tees are pre-drilled for infill connections based upon application specifications. Influence on operational aspects and restrictions: The Strut is designed for interior installation and installation in similarly conditioned environments. It is not suitable for outdoor installations. Tate Engineering confirms that the product is inert during the use phase and does not require energy, water, or ancillary materials for operation, maintenance, or repair. The product's design does not impose specific maintenance requirements during the product lifespan, and any such activities are determined solely by the end user. A Health Product Declaration (HPD) was developed using the Proprietary Ingredient Due Diligence Exception. In this approach, data is entered directly without verifiability of CAS numbers or other chemical identifiers, which limits the ability to confirm the presence or absence of specific hazardous substances. The Tate Strut ceiling grid system is composed exclusively of metals—including iron, aluminum, chromium, nickel, and other structural alloys—with no adhesives, sealants, or coatings designed for active emission. Given the inherent stability of these metals and the absence of organic-based treatments, the potential for volatile organic compound (VOC) emissions is negligible. Accordingly, emissions to indoor air are considered not relevant for this product type. In addition a declaration of conformity is supplied for the coating. This Declaration of Conformity certifies that their product complies with TSCA and HMIRA restrictions. The document states that the cured coating does not emit or leach Prop 65 chemicals, SVHCs, or substances with CLP hazard classifications. The declaration is in possession of Tate and is provided to the third party verifier. Finally, the product does not contain any fire retardants. If this status changes, and any such additives qualify as SVHCs, they must be declared in the HPD content inventory.
Technical purpose of product	Tate Strut is a strong, galvanized steel profile with a white painted finish. Uniquely integrated welded flanges support tiles, light fixtures and return air grilles—removing the need for two separate ceiling systems. The continuous open channel slot allows for full flexibility when suspending cable trays, bus bars, and other heavy accessories from the structural ceiling. Both strut main runners and structural tees are pre-drilled for infill connections based upon application specifications.

Manufacturing or service provision description	Tate purchases parts from their suppliers. Strut production occurs mainly in Tate's Red Lion Annex facility. The steel and aluminum strut parts are powder coated at Surtech Industries in York, Pennsylvania. They are transported from Red Lion to York to receive the powder coating. Then, the parts are shipped back to Red Lion before being distributed to the customer. The scraps value and its revenue is assumed to be negligible, compared to the revenue generated by the Strut. Therefore, no environmental burden (or benefit) was allocated to the scrap that leaves the product system in A3. All environmental burdens in A3 were allocated to the primary product under study, the Strut. The Strut structural ceilings are packaged in cardboard material and shipped on a wooden pallet.
Material properties	Conversion factor to mass: 0.88 LCA results per 1 kg Area density: 12.499 kg/m^2 Thickness: 0.086 m
Manufacturing site	Red Lion USA Red Lion 17356 100 Redco Ave
UN CPC code	4219. Other structures (except prefabricated buildings) and parts of structures, of iron, steel or aluminium; plates, rods, angles, shapes, sections, profiles, tubes and the like, prepared for use in structures, of iron, steel or aluminium; props and similar eq
Geographical scope(s)	USA
Geographical scope description	The production takes place in the USA. The LCA assumed distribution and end-of-life scenarios based on data of the USA.
Actual or technical lifespan	30 year(s)
Hazardous and toxic substances	The product does not contain any substances from the SVHC candidate list in concentrations exceeding 0.1% of its weight.

PRODUCT IMAGES



TECHNICAL CHARACTERISTICS AND PERFORMANCE

Technical performance

Product name	Width (m)	Height (m)	Depth (m)	Weight (kg)
Strut 4×4 with 2×4 infill	1	1	0.086	12.499

CONTENT DECLARATION

PRODUCT CONTENT					
Content name	**Mass, kg**	**Post-consumer recycled material, mass-% of product**	**Biogenic material, mass-% of product**	**Biogenic material[1], kg C/declared unit**	**Biogenic material kg CO_2, eq./declared unit**
Hot rolled carbon steel	10.52	29.79	0	0	0
Extruded aluminium	0.66	1.55	0	0	0
Powder coating	0.18	0	0	0	0
Installation material - hot rolled carbon steel	0.59	1.23	0	0	0
Installation material - Stainless steel	0.03	0.12	0	0	0
Installatoin material - Forged steel	0.35	0.73	0	0	0
Installation material - Low carbon steel	0.13	0.27	0	0	0
Installation material - mild steel	0.21	0.44	0	0	0
Total	**12.67**	**34.12**	**0**	**0**	**0**
Note 1	1 kg biogenic carbon is equivalent to 44/12 kg of CO_2				

PACKAGING MATERIALS				
Material name	**Mass, kg**	**Mass-% (versus the product)**	**Biogenic material[1], kg C/declared unit**	**Biogenic material kg CO_2, eq./declared unit**
Cardboard	0.1	0.8	0.05	0.18
Wooden pallet	1.23	9.86	0.57	2.09
Plastic film	0.01	0.05	0	0
Total	**1.34**	**10.71**	**0.62**	**2.27**
Note 1	1 kg biogenic carbon is equivalent to 44/12 kg of CO_2			

OTHER HAZARDOUS AND TOXIC SUBSTANCES IF REQUIRED BY NORMATIVE STANDARDS OR REGULATION			
Hazardous/Toxic substances	**EC No.**	**CAS No.**	**Mass per functional or declared unit %**
Metallic nickel	231-111-4	7440-02-0	0
2-Mercaptobenzothiazole	205-736-8	149-30-4	0

LCA INFORMATION

EPD based on declared or functional unit	Declared unit
Declared unit and reference flow	Strut 4×4 with 2×4 infill Area: 1 m^2
Conversion factor to mass	0.88
Are infrastructure or capital goods included in any upstream, core or downstream processes?	☑ Yes ☐ No
Do infrastructure and capital goods contribute more than 10% to the A1-A3 (A1-A5 for services) results of any environmental impact indicator declared in the EPD?	☐ Yes ☑ No
Data sources used for this EPD	ecoinvent database (general) ecoinvent 3.11 database
LCA Software	SimaPro SimaPro 9.6
Additional information about the underlying LCA-based information	The model uses ecoinvent, cut-off database. This database does not fully align with the allocation principles. The ecoinvent cut-off system model assigns zero burden to secondary materials. EN 15804 / ISO 21930, on the other hand, requires economic allocation for co-products and a specific approach to recycling in Module D (benefits and burdens of recycling). An appropriate dataset is chosen to ensure correct allocation of benefit/burden in foreground processes in A1 and module D. The production of secondary steel was modelled with environmental burdens for recycling and transport processes, although the scrap material itself is burden free. The benefits of recycling in module D are calculated manually and the substituted material is modelled in the LCA software. However, for some general datasets, it is not feasible to check and adjust the background processes. Any non-aligning secondary datasets in the background processes have a minor impact on the results. All inputs and outputs for which data is available are included in the LCA. Data gaps are filled with conservative assumptions and average, generic or proxy data. The cut-off criteria for data gaps is 1% of renewable and nonrenewable energy usage and 1% of the total mass input of that unit process. The total of excluded input floss per module does not exceed 5% of energy usage and mass input. This LCA uses expert judgment and conservative considerations to determine which inputs comply with these criteria. The following processes were excluded: - The production of machinery and equipment used in manufacturing was left out, as its environmental impact over the lifetime of the product is considered negligible. - The construction and upkeep of factory buildings and related infrastructure were not included. These impacts are spread over long periods and many products, making their contribution per unit negligible. - Travel to and from work by employees is considered outside the scope of the product system

	and was therefore excluded. - Any emissions linked to R&D activities were excluded, as their contribution is small and generally shared across a broad product portfolio. - Any losses between the end-of-waste point and the point of substitution are considered negligible, and therefore are excluded from this LCA.
Version of the EN 15804 reference package	EF Reference Package 3.1
Characterisation methods	The characterization factors from EC-JRD are used to calculate the EN15804+A2 indicators. Long-term (>100 years) emissions are excluded. Landfill emissions are calculated without a time limit. The GWP-biogenic indicator is calculated in line with Annex 2 of PCR 2019:14 v.2.0.1. The renewable primary energy use indicators (PERE, PERM, PERT, PENRE, PENRM, PENRT) are calculated as described in option A in Annex 3 in PCR 2019:14 v2.0.1. The waste categories are calculated in SimaPro with the impact assessment method EDIP 2003 V1.07
Technology description including background system	The Strut consists of aluminum and steel components. The materials are sawed to size during the manufacturing process. The relevant parts are powder coated. The aluminum consists of 30.5% post-consumer scrap. The installation requires ancillary materials made from various types of steel.
Scrap (recycled material) inputs contribution level	Less than 10% of the GWP-GHG results in modules A1-A3 come from scrap inputs

Data quality assessment

Description of data quality assessment and reference years	The time representativeness of the used references for secondary data is accurate, since the difference between the reference year (2024) and the time period for which the data is representative (2024) is <3 years. Data was collected over a period of one year. The geographical and technological data quality level ranges from good to very good.

DATA QUALITY ASSESSMENT

Process name	Source type	Source	Reference year	Data category	Share of primary data, of GWP-GHG results for A1-A3
Manufacturing of Strut	Collected data	EPD owner	2024	Primary data	
Generation of electricity used in manufacturing of Strut	Database	Ecoinvent 3.11	2024	Primary data	
Transport of materials	Collected data	EPD owner	2024	Primary data	
Production of powder coated steel	Database	Ecoinvent 3.11	2024	Primary/Secondary data	
Production of aluminum	Database	Supplier	2022	Primary data	17%
Production of packaging	Database	Ecoinvent 3.11	2024	Primary/Secondary data	
Total share of primary data, of GWP-GHG results for A1-A3					**17%**
Note	The share of primary data is calculated based on GWP-GHG results. It is a simplified indicator for data quality that supports the use of more primary data to increase the representativeness of and comparability between EPDs. Note that the indicator does not capture all relevant aspects of data quality and is not comparable across product categories.				

ELECTRICITY USED IN THE MANUFACTURING PROCESS IN A3 (A5 FOR SERVICES)

Type of electricity mix	Specific electricity mix as generated, or purchased from an electricity supplier, demonstrated by a contractual instrument	
Energy sources	Hydro	0%
	Wind	0%
	Solar	22%
	Biomass	0%

	Geothermal	0%
	Waste	0%
	Nuclear	0%
	Natural gas	71%
	Coal	6%
	Oil	0%
	Peat	0%
	Other	1%
Climate impact (GWP-GHG):	0.6 kg CO_2 eq./kWh	

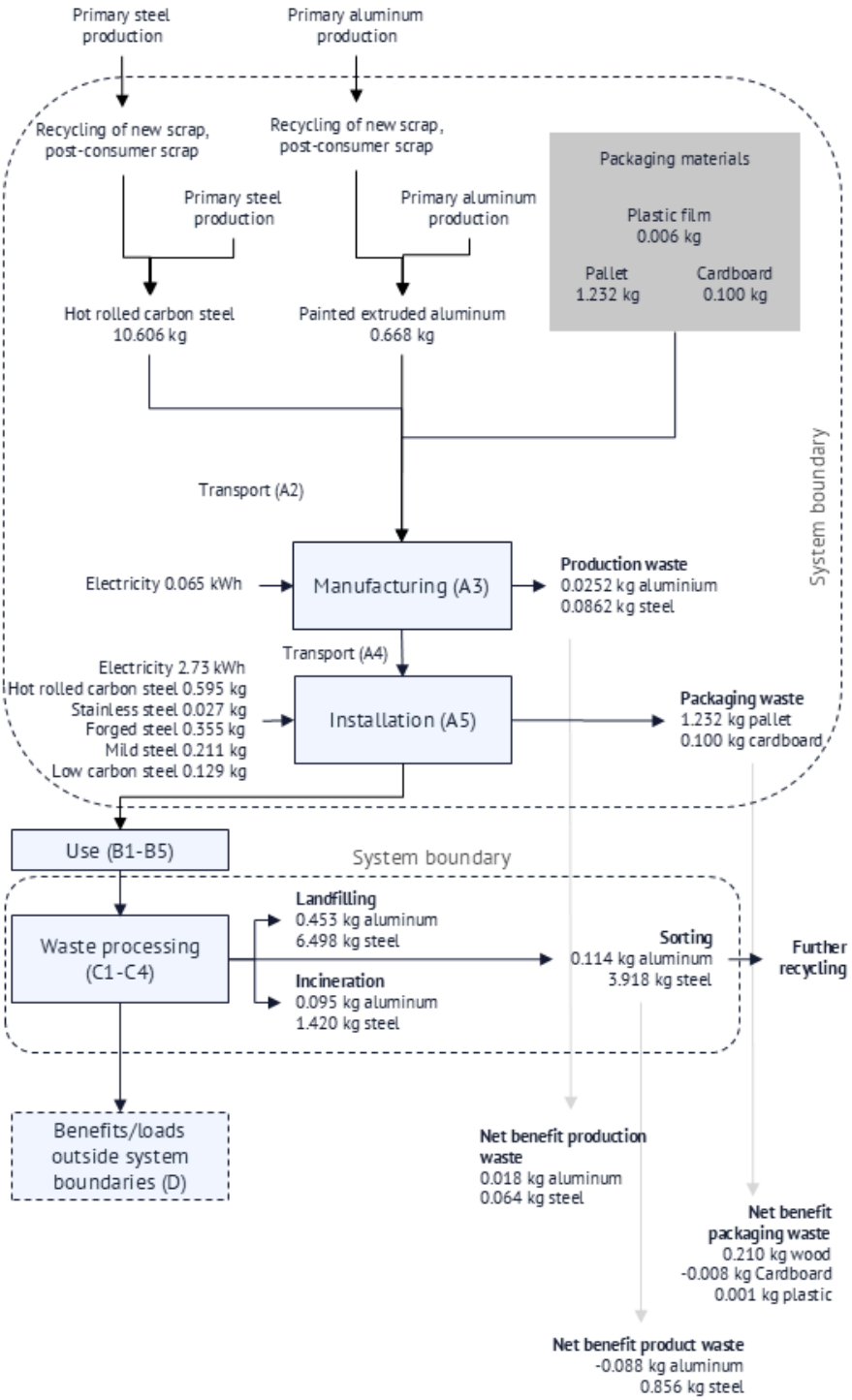
Method used to calculate residual electricity mix	The grid mix without renewable energy sources, also called residual mix, is modelled based on the most recent eGRID data from 2023. This data includes the total grid mix for Pennsylvania. For the residual mix, all renewable sources were removed from the mix. The share per fossil source is extrapolated.

SYSTEM BOUNDARY

Description of the System boundary	b) Cradle to gate with options, modules C1-C4, module D and with optional modules (A1-A3 + C + D and additional modules).
Excluded modules	Yes, there is an excluded module, or there are excluded modules
Justification for omission of modules	Module B (Use phase) is not included. The Tate Strut ceiling grid system is composed exclusively of metals with no adhesives, sealants, or coatings designed for active emission. Therefore, there are no expected emissions in the use phase. The LCA includes production (A1-A3), installation (A4-A5), end-of-life (C1-C4) and module D.

	Product stage			Construction process stage		Use stage							End of life stage				Beyond product life cycle
	Raw material supply	Transport	Manufacturing	Transport to site	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules declared	X	X	X	X	X	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	Global	Global	USA	Global	USA	N/A	N/A	N/A	N/A	N/A	N/A	N/A	USA	USA	USA	USA	USA
Share of specific data	100%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation - products	0%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation - sites	0%			-	-	-	-	-	-	-	-	-	-	-	-	-	-

Process flow diagram(s) related images



SCENARIOS

Name of the default scenario	Default (Waste processing - US)
Description of the default scenario	The default scenario contains a waste processing scenario based on WARM documentation of waste processing in the US.

Module A4: Transport to the building site

Explanatory name of the default scenario in module A4	Average US distribution
Description of the default scenario in module A4	The strut is shipped to clients across the United States. The transportation distance varies greatly within the US. It is estimated by Tate that half of the products are transported to clients within 150 km. The other half is transported to clients 2500-3000 km from the production site. This LCA studies one scenario, a (weighed) average distance of 1450 km. The strut is transported by 16-32t EURO6 lorry.

Module A4 information	Value	Unit
Distance	1450	km
Capacity utilization (including empty returns)	50	%
Bulk density of transported products	8.99	kg/m^3
Volume capacity utilization factor (factor: =1 or <1 or ≥1 for compressed or nested packaged products)	1	N/A
Vehicle type	EURO6	N/A

Module A5: Installation in the building

Explanatory name of the default scenario in module A5	Installation in the US
Description of the default scenario in module A5	Installation based on real data, for US. Installation requires ancillary materials. Packaging waste is processed according to US scenario. The exported energy from this waste incineration affects output flows EET and EEE. Module D contains the benefits from waste processing of the packaging.

Module A5 information	Value	Unit
Net fresh water consumption during installation	0	m^3
Hot rolled carbon steel	0.595	kg
Stainless steel	0.027	kg
Forged steel	0.355	kg
Low carbon steel	0.129	kg
Mild steel, cold rolled	0.211	kg
Electricity, US grid	2.727	kWh/cycle
Waste for landfill, wooden pallet	0.828	kg
Waste for incineration, wooden pallet	0.193	kg
Waste for recycling, wooden pallet	0.210	kg
Waste for landfill, cardboard	0.026	kg
Waste for incineration, cardboard	0.006	kg
Waste for recycling, cardboard	0.068	kg
Waste for landfill, plastic film	0.005	kg
Waste for incineration, plastic film	0.001	kg
Waste for recycling, plastic film	0.001	kg

Module C: End-of-life

Explanatory name of the default scenario in module C	Waste processing US
Description of the default scenario in module C	The electricity consumption mix on the US market is used to model the same amount of energy for C1 as for construction (2.7 kWh). Waste treatment distribution and distance (32 km) to treatment facilities in the US are collected from U.S. EPA [7]. The specific vehicle is unknown, thus 'Transport, freight, lorry, unspecified {GLO}' is used as it represents a market average. This study assumes that the incineration takes place in a Combined Heat and Power plant with 44% thermal and 36% electric efficiency.

Module C information	Value	Unit
Aluminum, collected separate	0.663	kg
Steel, collected separate	11.837	kg
Aluminum, landfill	0.453	kg
Aluminum, incineration	0.0954	kg
Aluminum, recycling	0.114	kg
Steel, landfill	6.498	kg
Steel, incineration	1.420	kg
Steel, recycling	3.918	kg
Transport to waste processing	32	km
Capacity utilization (including empty returns)	50	%
Bulk density of transported products	8.99	kg/m^3
Volume capacity utilization factor (factor: =1 or <1 or ≥1 for compressed or nested packaged products)	1	N/A
Vehicle type	Unspecified	N/A

Module D: Beyond product life cycle

Explanatory name of the default scenario in module D	Module D - US
Description of the default scenario in module D	No benefits were calculated for the incineration of steel or aluminum, since these are usually not completely oxidized. Instead, it is collected from the bottom of the incinerator. No energy benefits are attributed to this. The incineration of cardboard (15.92 MJ/kg), plastic (42.47 MJ/kg) and wood (13.99 MJ/kg) packaging materials does produce energy. The CHP has 36% electric and 44% thermal efficiency. The avoided products are Pig iron {RoW} (for steel) and Aluminium, primary, ingot {RoW} (for aluminum).

Module D information	Value	Unit
Energy recovery from wood, cardboard and plastic - electricity	1.01	MJ/cycle
Energy recovery from wood, cardboard and plastic - heat	1.25	MJ/cycle
Burden primary aluminum ingot	0.088	kg
Benefit pig iron	0.856	kg
Benefit wood	0.210	kg
Burden cardboard	0.008	kg
Benefit plastic	0.001	kg

ADDITIONAL SCENARIOS

Name of the additional scenario	100% landfill
Description of the additional scenario	This scenario assumes 100% landfill for modules C1-C4. Module D is adjusted accordingly.

Module A4: Transport to the building site

Description of the additional scenario in module A4	Same as default scenario

Module A5: Installation in the building

Description of the additional scenario in module A5	Same as default scenario

Module C: End-of-life

Description of the additional scenario in module C	100% landfill in end of life stage

Module C information	Value	Unit
Aluminum, collected separate	0.663	kg
Steel, collected separate	11.837	kg
Aluminum, landfill	0.663	kg
Steel, landfill	11.837	kg
Distance to landfill	32	km

Module D: Beyond product life cycle

Description of the additional scenario in module D	Based on 100% landfill in end of life stage

Module D information	Value	Unit
Burden primary aluminum ingot	0.202	kg
Burden pig iron	3.063	kg
Benefit wood	0.210	kg
Benefit cardboard	0.068	kg
Benefit plastic	0.001	kg
Energy recovery from wood, cardboard and plastic - electricity	1.01	MJ/cycle
Energy recovery from wood, cardboard and plastic - heat	1.25	MJ/cycle

ADDITIONAL SCENARIOS

Name of the additional scenario	100% incineration
Description of the additional scenario	This scenario assumes 100% incineration for modules C1-C4. Module D is adjusted accordingly.

Module A4: Transport to the building site

Description of the additional scenario in module A4	Same as default scenario

Module A5: Installation in the building

Description of the additional scenario in module A5	Same as default scenario

Module C: End-of-life

Description of the additional scenario in module C	Based on hypothetical scenario with 100% incineration.

Module C information	Value	Unit
Aluminum, collected separate	0.663	kg
Steel, collected separate	11.837	kg
Aluminum, incineration	0.663	kg
Steel, incineration	11.837	kg
Distance to incinerator	32	km

Module D: Beyond product life cycle

Description of the additional scenario in module D	Based on 100% incineration in end of life stage

Module D information	Value	Unit
Burden primary aluminum ingot	0.202	kg
Burden pig iron	3.062	kg
Benefit wood	0.210	kg
Benefit cardboard	0.068	kg
Benefit plastic	0.001	kg
Energy recovery from wood, cardboard and plastic - electricity	1.01	MJ/cycle
Energy recovery from wood, cardboard and plastic - heat	1.25	MJ/cycle

ADDITIONAL SCENARIOS

Name of the additional scenario	100% recycling
Description of the additional scenario	This scenario assumes 100% recycling for modules C1-C4. Module D is adjusted accordingly.

Module A4: Transport to the building site

Description of the additional scenario in module A4	Same as default scenario

Module A5: Installation in the building

Description of the additional scenario in module A5	Same as default scenario

Module C: End-of-life

Description of the additional scenario in module C	Based on hypothetical scenario with 100% recycling.

Module C information	Value	Unit
Aluminum, collected separate	0.663	kg
Steel, collected separate	11.837	kg
Aluminum, recycling	0.663	kg
Steel, recycling	11.837	kg
Distance to recycling site	32	km

Module D: Beyond product life cycle

Description of the additional scenario in module D	Based on 100% recycling in end of life stage

Module D information	Value	Unit
Benefit primary aluminum ingot	0.461	kg
Benefit pig iron	8.775	kg
Benefit wood	0.210	kg
Benefit cardboard	0.068	kg
Benefit plastic	0.001	kg
Energy recovery from wood, cardboard and plastic - electricity	1.01	MJ/cycle
Energy recovery from wood, cardboard and plastic - heat	1.25	MJ/cycle

ENVIRONMENTAL PERFORMANCE

The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.

Mandatory environmental performance indicators according to EN 15804

Impact category	Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Climate change - total	GWP-total	kg CO_2 eq.	3.77E+1	3.21E+0	7.59E+0	ND	ND	ND	ND	ND	ND	ND	1.27E+0	4.88E-2	3.67E-1	2.44E-2	3.14E-1
Climate change - fossil	GWP-fossil	kg CO_2 eq.	3.98E+1	3.21E+0	5.33E+0	ND	ND	ND	ND	ND	ND	ND	1.27E+0	4.87E-2	3.66E-1	2.44E-2	3.12E-1
Climate change - biogenic	GWP-biogenic	kg CO_2 eq.	-2.18E+0	0.00E+0	2.25E+0	ND	ND	ND	ND	ND	ND	ND	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Climate change - land use and land-use change	GWP-luluc	kg CO_2 eq.	4.72E-2	1.72E-4	6.09E-3	ND	ND	ND	ND	ND	ND	ND	5.73E-4	1.84E-4	5.41E-4	7.77E-6	2.11E-3
Ozone depletion	ODP	kg CFC-11 eq.	3.34E-7	4.13E-8	3.42E-8	ND	ND	ND	ND	ND	ND	ND	3.17E-9	7.55E-10	2.70E-9	3.98E-10	4.22E-9
Acidification	AP	mol H^+ eq.	2.27E-1	4.94E-3	2.10E-2	ND	ND	ND	ND	ND	ND	ND	3.25E-3	2.07E-4	1.44E-3	2.01E-4	6.46E-3
Eutrophication aquatic freshwater	EP-freshwater	kg P eq.	2.12E-3	2.17E-5	3.63E-4	ND	ND	ND	ND	ND	ND	ND	1.11E-4	3.11E-7	5.71E-6	1.39E-7	6.87E-6
Eutrophication aquatic marine	EP-marine	kg N eq.	4.57E-2	9.93E-4	4.19E-3	ND	ND	ND	ND	ND	ND	ND	4.67E-4	8.66E-5	5.65E-4	9.08E-5	6.15E-4
Eutrophication terrestrial	EP-terrestrial	mol N eq.	5.03E-1	1.11E-2	4.46E-2	ND	ND	ND	ND	ND	ND	ND	5.23E-3	9.34E-4	5.54E-3	9.71E-4	4.90E-3
Photochemical ozone formation	POCP	kg NMVOC eq.	1.69E-1	7.28E-3	1.59E-2	ND	ND	ND	ND	ND	ND	ND	2.22E-3	2.96E-4	1.75E-3	2.99E-4	1.58E-3
Depletion of abiotic resources - minerals and metals	ADP-minerals&metals[1, 2]	kg Sb eq.	2.36E-4	2.58E-7	3.73E-5	ND	ND	ND	ND	ND	ND	ND	6.55E-8	3.98E-9	3.86E-7	1.89E-9	-1.29E-7
Depletion of abiotic resources - fossil fuels	ADP-fossil[1]	MJ, net calorific value	4.62E+2	4.20E+1	6.80E+1	ND	ND	ND	ND	ND	ND	ND	2.27E+1	6.36E-1	2.71E+0	3.58E-1	2.55E+0
Water use	WDP[1]	m^3 world eq. deprived	1.10E+1	5.46E-2	1.35E+0	ND	ND	ND	ND	ND	ND	ND	1.93E-1	8.42E-4	-3.14E-3	-7.36E-2	6.72E-2
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption																
General disclaimer	The results of the end-of-life stage (modules C1-C4) should be considered when using the results of the product stage (modules A1-A3/A1-A5 for services).																
Disclaimer 1	The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator																
Disclaimer 2	The results of the impact categories abiotic depletion of minerals and metals may be highly uncertain in LCAs that include capital goods/infrastructure in generic datasets, in case infrastructure/capital goods contribute greatly to the total results. This is because the LCI data of infrastructure/capital goods used to quantify these indicators in currently available generic datasets sometimes lack temporal, technological and geographical representativeness. Caution should be exercised when using the results of these indicators for decision-making purposes.																

Additional mandatory environmental performance indicators

Impact category	Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Climate change - GWP-GHG	GWP-GHG[1]	kg CO_2 eq.	3.70E+1	3.21E+0	5.33E+0	ND	ND	ND	ND	ND	ND	ND	1.22E+0	4.85E-2	4.97E-1	2.42E-2	1.30E+0
Acronyms	GWP-GHG = Global warming potential greenhouse gas.																
General disclaimer	The results of the end-of-life stage (modules C1-C4) should be considered when using the results of the product stage (modules A1-A3/A1-A5 for services).																
Disclaimer 1	The GWP-GHG indicator is termed GWP-IOBC/GHG in the ILCD+EPD+ data format. The indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO_2 is set to zero.																

Additional voluntary environmental performance indicators according to EN 15804

Impact category	Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Particulate matter emissions	PM	Disease incidence	3.43E-6	1.85E-7	3.68E-7	ND	ND	ND	ND	ND	ND	ND	1.59E-8	4.05E-9	4.12E-8	5.38E-9	5.46E-10
Ionizing radiation - human health	IRP[1]	kBq U235 eq.	6.39E-1	3.21E-3	2.51E-1	ND	ND	ND	ND	ND	ND	ND	1.87E-1	4.93E-5	1.72E-3	8.73E-5	1.07E-3
Eco-toxicity - freshwater	ETP-fw[2, 3]	CTUe	2.24E+2	4.14E+0	3.16E+1	ND	ND	ND	ND	ND	ND	ND	1.92E+0	7.47E-2	3.22E+0	5.82E+1	-6.09E-1
Human toxicity - cancer effects	HTP-c[2, 3]	CTUh	4.12E-8	2.10E-10	4.96E-9	ND	ND	ND	ND	ND	ND	ND	8.79E-11	8.17E-12	6.97E-10	4.69E-12	-1.33E-9
Human toxicity - non-cancer effects	HTP-nc[2, 3]	CTUh	5.27E-7	2.07E-8	7.81E-8	ND	ND	ND	ND	ND	ND	ND	5.44E-9	3.95E-10	4.92E-9	7.86E-10	5.80E-9
Land-use related impacts/soil quality	SQP[2, 3]	Dimensionless	3.28E+2	4.30E-1	1.61E+1	ND	ND	ND	ND	ND	ND	ND	1.95E+0	2.26E-2	4.30E-1	5.17E-1	-3.24E+1
Acronyms	PM = Potential incidence of disease due to particulate matter emissions; IRP = Potential human exposure efficiency relative to U235; ETP-fw = Potential comparative toxic unit for ecosystems; HTP-c = Potential comparative toxic unit for humans; HTP-nc = Potential comparative toxic unit for humans; SQP = Potential soil quality index.																
General disclaimer	The results of the end-of-life stage (modules C1-C4) should be considered when using the results of the product stage (modules A1-A3/A1-A5 for services).																
Disclaimer 1	This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.																
Disclaimer 2	The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.																
Disclaimer 3	The results of the impact categories land use, human toxicity (cancer), human toxicity, noncancer and ecotoxicity (freshwater) may be highly uncertain in LCAs that include capital goods/infrastructure in generic datasets, in case infrastructure/capital goods contribute greatly to the total results. This is because the LCI data of infrastructure/capital goods used to quantify these indicators in currently available generic datasets sometimes lack temporal, technological and geographical representativeness. Caution should be exercised when using the results of these indicators for decision-making purposes.																

Additional voluntary environmental performance indicators

Impact category	Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Ozone depletion	ODP	kg CFC-11 eq	3.58E-7	4.35E-8	3.66E-8	ND	ND	ND	ND	ND	ND	ND	3.41E-9	7.95E-10	2.85E-9	4.19E-10	4.23E-9
Global warming	GWP	kg CO2 eq	3.95E+1	3.17E+0	5.39E+0	ND	ND	ND	ND	ND	ND	ND	1.25E+0	4.82E-2	4.61E-1	2.40E-2	3.11E-1
Smog	POCP	kg O3 eq	2.82E+0	6.31E-2	2.45E-1	ND	ND	ND	ND	ND	ND	ND	2.92E-2	5.42E-3	3.22E-2	5.59E-3	4.03E-2
Acidification	AP	kg SO2 eq	2.77E-1	4.40E-3	1.79E-2	ND	ND	ND	ND	ND	ND	ND	2.73E-3	1.91E-4	1.38E-3	2.12E-4	5.56E-3
Carcinogenics	HTC	CTUh	1.14E-6	1.18E-9	1.55E-7	ND	ND	ND	ND	ND	ND	ND	4.44E-9	2.23E-11	2.16E-8	2.39E-11	7.19E-9
Non carcinogenics	HTNC	CTUh	5.94E-6	3.85E-7	8.94E-7	ND	ND	ND	ND	ND	ND	ND	5.92E-8	6.35E-9	7.62E-8	7.52E-9	-8.30E-8
Respiratory effects	PM	kg PM2.5 eq	4.98E-2	9.77E-4	8.16E-3	ND	ND	ND	ND	ND	ND	ND	3.10E-3	2.03E-5	2.53E-4	2.61E-5	9.68E-5
Ecotoxicity	ETP	CTUe	3.48E+1	7.80E+0	4.95E+0	ND	ND	ND	ND	ND	ND	ND	1.59E-1	1.30E-1	2.17E+0	1.56E-2	-4.62E-2
Freshwater eutrophication	EP-f	kg P eq	1.11E-3	1.02E-5	1.87E-4	ND	ND	ND	ND	ND	ND	ND	4.95E-5	1.46E-7	3.93E-6	7.58E-8	3.19E-6
Marine eutrophication	EP-m	kg N eq	2.47E-2	5.43E-4	2.23E-3	ND	ND	ND	ND	ND	ND	ND	2.55E-4	4.58E-5	3.00E-4	4.78E-5	2.47E-4
Acronyms																	
General disclaimer		The results of the end-of-life stage (modules C1-C4) should be considered when using the results of the product stage (modules A1-A3/A1-A5 for services).															

Justification for inclusion	These impact categories are calculated with TRACI 2.2, in order to comply with ISO 21930.

Resource use indicators according to EN 15804

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ, net calorific value	4.21E+1	8.31E-2	7.50E+0	ND	ND	ND	ND	ND	ND	ND	3.05E+0	2.74E-3	7.20E-2	3.19E-3	-5.46E+0
PERM	MJ, net calorific value	1.88E+1	0.00E+0	0.00E+0	ND	ND	ND	ND	ND	ND	ND	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PERT	MJ, net calorific value	6.09E+1	8.31E-2	7.50E+0	ND	ND	ND	ND	ND	ND	ND	3.05E+0	2.74E-3	7.20E-2	3.19E-3	-5.46E+0
PENRE	MJ, net calorific value	4.61E+2	4.20E+1	6.80E+1	ND	ND	ND	ND	ND	ND	ND	2.27E+1	6.36E-1	2.71E+0	3.58E-1	2.55E+0
PENRM	MJ, net calorific value	2.55E-1	0.00E+0	0.00E+0	ND	ND	ND	ND	ND	ND	ND	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PENRT	MJ, net calorific value	4.62E+2	4.20E+1	6.80E+1	ND	ND	ND	ND	ND	ND	ND	2.27E+1	6.36E-1	2.71E+0	3.58E-1	2.55E+0
SM	kg	0.00E+0	0.00E+0	0.00E+0	ND	ND	ND	ND	ND	ND	ND	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
RSF	MJ, net calorific value	0.00E+0	0.00E+0	0.00E+0	ND	ND	ND	ND	ND	ND	ND	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
NRSF	MJ, net calorific value	0.00E+0	0.00E+0	0.00E+0	ND	ND	ND	ND	ND	ND	ND	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
FW	m^3	0.00E+0	0.00E+0	0.00E+0	ND	ND	ND	ND	ND	ND	ND	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Acronyms	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water.															
General disclaimer	The results of the end-of-life stage (modules C1-C4) should be considered when using the results of the product stage (modules A1-A3/A1-A5 for services).															

Waste indicators according to EN 15804

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	kg	4.06E-2	4.36E-4	1.07E-2	ND	ND	ND	ND	ND	ND	ND	8.47E-4	6.50E-6	1.04E+0	8.94E-4	-1.25E-3
NHWD	kg	3.01E+0	3.48E-3	1.33E+0	ND	ND	ND	ND	ND	ND	ND	1.53E-2	5.07E-5	1.10E-1	6.95E+0	-4.43E-3
RWD	kg	4.16E-4	1.79E-6	1.48E-4	ND	ND	ND	ND	ND	ND	ND	1.05E-4	2.76E-8	1.03E-6	5.40E-8	4.29E-7
Acronyms	HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed.															
General disclaimer	The results of the end-of-life stage (modules C1-C4) should be considered when using the results of the product stage (modules A1-A3/A1-A5 for services).															

Output flow indicators according to EN 15804

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
CRU	kg	0.00E+0	0.00E+0	0.00E+0	ND	ND	ND	ND	ND	ND	ND	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
MFR	kg	3.28E-2	0.00E+0	0.00E+0	ND	ND	ND	ND	ND	ND	ND	0.00E+0	0.00E+0	4.31E+0	0.00E+0	0.00E+0
MER	kg	0.00E+0	0.00E+0	0.00E+0	ND	ND	ND	ND	ND	ND	ND	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
EEE	MJ, net calorific value	0.00E+0	0.00E+0	1.02E+0	ND	ND	ND	ND	ND	ND	ND	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
EET	MJ, net calorific value	0.00E+0	0.00E+0	1.25E+0	ND	ND	ND	ND	ND	ND	ND	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Acronyms	CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy.															
General disclaimer	The results of the end-of-life stage (modules C1-C4) should be considered when using the results of the product stage (modules A1-A3/A1-A5 for services).															

Results for additional scenarios for modules A4-C4

Additional scenario	100% landfill
Description of the scenario/method	The results contain the mandatory impact categories from PCR2019:14 and EN15804+A2. These are followed by the impact categories required by the ISO 21930:2017, for which the impacts are calculated with TRACI for the North American market. The end of life scenario consists solely out of landfilling.

Impact category	Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Climate change - total	GWP-total	kg CO2 eq.	3.77E+1	3.21E+0	7.59E+0	ND	ND	ND	ND	ND	ND	ND	1.27E+0	4.88E-2	0.00E+0	4.20E-2	9.31E+0
Climate change - fossil	GWP-fossil	kg CO2 eq.	3.98E+1	3.21E+0	5.33E+0	ND	ND	ND	ND	ND	ND	ND	1.27E+0	4.87E-2	0.00E+0	4.20E-2	9.31E+0
Climate change - biogenic	GWP-biogenic	kg CO2 eq.	-2.18E+0	0.00E+0	2.25E+0	ND	ND	ND	ND	ND	ND	ND	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Climate change - land use and land use change	GWP-luluc	kg CO2 eq.	4.72E-2	1.72E-4	6.09E-3	ND	ND	ND	ND	ND	ND	ND	5.73E-4	1.84E-4	0.00E+0	1.17E-5	6.50E-3
Ozone depletion	ODP	kg CFC-11 eq.	3.34E-7	4.13E-8	3.42E-8	ND	ND	ND	ND	ND	ND	ND	3.17E-9	7.55E-10	0.00E+0	6.73E-10	3.07E-8
Acidification	AP	mol H+ eq.	2.27E-1	4.94E-3	2.10E-2	ND	ND	ND	ND	ND	ND	ND	3.25E-3	2.07E-4	0.00E+0	3.52E-4	4.48E-2
Eutrophication aquatic freshwater	EP-freshwater	kg P eq.	2.12E-3	2.17E-5	3.63E-4	ND	ND	ND	ND	ND	ND	ND	1.11E-4	3.11E-7	0.00E+0	2.25E-7	2.93E-4
Eutrophication aquatic marine	EP-marine	kg N eq.	4.57E-2	9.93E-4	4.19E-3	ND	ND	ND	ND	ND	ND	ND	4.67E-4	8.66E-5	0.00E+0	1.59E-4	7.78E-3
Eutrophication terristrial	EP-terrestrial	mol N eq.	5.03E-1	1.11E-2	4.46E-2	ND	ND	ND	ND	ND	ND	ND	5.23E-3	9.34E-4	0.00E+0	1.71E-3	8.68E-2
Photochemical ozone formation	POCP	kg NMVOC eq.	1.69E-1	7.28E-3	1.59E-2	ND	ND	ND	ND	ND	ND	ND	2.22E-3	2.96E-4	0.00E+0	5.24E-4	2.84E-2
Depletion of abiotic resources - minerals and metals 1,2	ADP-minerals&metals1,2	kg Sb eq.	2.36E-4	2.58E-7	3.73E-5	ND	ND	ND	ND	ND	ND	ND	6.55E-8	3.98E-9	0.00E+0	2.98E-9	8.67E-7
Depletion of abiotic resources - fossil fuels	ADP-fossil1	MJ, net calorific value	4.62E+2	4.20E+1	6.80E+1	ND	ND	ND	ND	ND	ND	ND	2.27E+1	6.36E-1	0.00E+0	6.05E-1	9.11E+1
Water use	WDP1	m3 world eq. deprived	1.10E+1	5.46E-2	1.35E+0	ND	ND	ND	ND	ND	ND	ND	1.93E-1	8.42E-4	0.00E+0	-1.08E-1	7.60E-1
Ozone depletion (ISO 21930:2017)	ODP	kg CFC-11 eq.	3.58E-7	4.35E-8	3.66E-8	ND	ND	ND	ND	ND	ND	ND	3.41E-9	7.95E-10	0.00E+0	7.09E-10	3.37E-8
Global warming potential (ISO 21930:2017)	GWP100	kg CO2 eq.	3.95E+1	3.17E+0	5.39E+0	ND	ND	ND	ND	ND	ND	ND	1.25E+0	4.82E-2	0.00E+0	4.14E-2	9.22E+0
Photochemical oxidant creation potential (ISO 21930:2017)	POCP	kg O3 eq.	2.82E+0	6.31E-2	2.45E-1	ND	ND	ND	ND	ND	ND	ND	2.92E-2	5.42E-3	0.00E+0	9.84E-3	4.92E-1
Acidifaction potential (ISO 21930:2017)	AP	kg SO2 eq.	2.77E-1	4.40E-3	1.79E-2	ND	ND	ND	ND	ND	ND	ND	2.73E-3	1.91E-4	0.00E+0	3.63E-4	3.84E-2
Eutrophication potential (ISO 21930:2017)	EP	kg N eq.	1.14E-6	1.18E-9	1.55E-7	ND	ND	ND	ND	ND	ND	ND	4.44E-9	2.23E-11	0.00E+0	3.62E-11	2.47E-8
Climate change - Greenhouse gases	GWP-GHG	kg CO2 eq.	3.70E+1	3.21E+0	5.33E+0	ND	ND	ND	ND	ND	ND	ND	1.22E+0	4.85E-2	0.00E+0	4.18E-2	1.03E+1

(PCR2019:14)	
Acronyms	
Disclaimers	
General disclaimer	The results of the end-of-life stage (modules C1-C4) should be considered when using the results of the product stage (modules A1-A3/A1-A5 for services).

Results for additional scenarios for modules A4-C4

Additional scenario	100% incineration
Description of the scenario/method	The results contain the mandatory impact categories from PCR2019:14 and EN15804+A2. These are followed by the impact categories required by the ISO 21930:2017, for which the impacts are calculated with TRACI for the North American market. The end of life scenario consists solely out of incineration.

Impact category	Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Climate change - total	GWP-total	kg CO2 eq.	3.66E+1	3.21E+0	7.40E+0	ND	ND	ND	ND	ND	ND	ND	1.27E+0	4.88E-2	2.51E-1	0.00E+0	9.31E+0
Climate change - fossil	GWP-fossil	kg CO2 eq.	3.87E+1	3.21E+0	5.15E+0	ND	ND	ND	ND	ND	ND	ND	1.27E+0	4.87E-2	2.51E-1	0.00E+0	9.31E+0
Climate change - biogenic	GWP-biogenic	kg CO2 eq.	-2.18E+0	0.00E+0	2.25E+0	ND	ND	ND	ND	ND	ND	ND	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Climate change - land use and land use change	GWP-luluc	kg CO2 eq.	4.49E-2	1.72E-4	5.75E-3	ND	ND	ND	ND	ND	ND	ND	5.73E-4	1.84E-4	3.42E-4	0.00E+0	6.50E-3
Ozone depletion	ODP	kg CFC-11 eq.	3.15E-7	4.13E-8	2.93E-8	ND	ND	ND	ND	ND	ND	ND	3.17E-9	7.55E-10	2.01E-9	0.00E+0	3.07E-8
Acidification	AP	mol H+ eq.	2.17E-1	4.94E-3	1.89E-2	ND	ND		ND	ND	ND	ND	3.25E-3	2.07E-4	8.80E-4	0.00E+0	4.48E-2
Eutrophication aquatic freshwater	EP-freshwater	kg P eq.	2.07E-3	2.17E-5	3.52E-4	ND	ND	ND	ND	ND	ND	ND	1.11E-4	3.11E-7	1.04E-6	0.00E+0	2.93E-4
Eutrophication aquatic marine	EP-marine	kg N eq.	4.39E-2	9.93E-4	3.89E-3	ND	ND	ND	ND	ND	ND	ND	4.67E-4	8.66E-5	3.89E-4	0.00E+0	7.78E-3
Eutrophication terrestrial	EP-terrestrial	mol N eq.	4.79E-1	1.11E-2	4.07E-2	ND	ND	ND	ND	ND	ND	ND	5.23E-3	9.34E-4	4.24E-3	0.00E+0	8.68E-2
Photochemical ozone formation	POCP	kg NMVOC eq.	1.61E-1	7.28E-3	1.47E-2	ND	ND	ND	ND	ND	ND	ND	2.22E-3	2.96E-4	1.28E-3	0.00E+0	2.84E-2
Depletion of abiotic resources - minerals and metals	ADP-minerals&metals1,2	kg Sb eq.	1.93E-4	2.58E-7	2.12E-5	ND	ND	ND	ND	ND	ND	ND	6.55E-8	3.98E-9	1.50E-8	0.00E+0	8.67E-7
Depletion of abiotic resources - fossil fuels	ADP-fossil1	MJ, net calorific vlaue	4.47E+2	4.20E+1	6.56E+1	ND	ND	ND	ND	ND	ND	ND	2.27E+1	6.36E-1	1.75E+0	0.00E+0	9.11E+1
Water use	WDP1	m3 world eq. deprived	1.07E+1	5.46E-2	1.28E+0	ND	ND	ND	ND	ND	ND	ND	1.93E-1	8.42E-4	-6.62E-3	0.00E+0	7.60E-1
Ozone depletion potential (ISO 29310:2017)	ODP	kg CFC-11 eq.	3.58E-7	4.35E-8	3.66E-8	ND	ND	ND	ND	ND	ND	ND	3.41E-9	7.95E-10	2.11E-9	0.00E+0	3.37E-8
Global warming potential (ISO 29310:2017)	GWP100	kg CO2 eq.	3.95E+1	3.17E+0	5.39E+0	ND	ND	ND	ND	ND	ND	ND	1.25E+0	4.82E-2	2.49E-1	0.00E+0	9.22E+0

Photochemical oxidant creation potential (ISO 29310:2017)	POCP	kg O3 eq.	2.82E+0	6.31E-2	2.45E-1	ND	ND	ND	ND	ND	ND	ND	2.92E-2	5.42E-3	2.45E-2	0.00E+0	4.92E-1
Acidification potential (ISO 29310:2017)	AP	kg SO2 eq.	2.77E-1	4.40E-3	1.79E-2	ND	ND	ND	ND	ND	ND	ND	2.73E-3	1.91E-4	8.13E-4	0.00E+0	3.84E-2
Eutrophication potential (ISO 29310:2017)	EP	kg N eq.	1.14E-6	1.18E-9	1.55E-7	ND	ND	ND	ND	ND	ND	ND	4.44E-9	2.23E-11	2.49E-8	0.00E+0	2.47E-8
Climate change - Greenhouse gases (PCR2019:14)	GWP-GHG	kg CO2 eq.	3.70E+1	3.21E+0	5.16E+0	ND	ND	ND	ND	ND	ND	ND	1.22E+0	4.85E-2	2.50E-1	0.00E+0	1.03E+1
Acronyms																	
Disclaimers																	
General disclaimer	The results of the end-of-life stage (modules C1-C4) should be considered when using the results of the product stage (modules A1-A3/A1-A5 for services).																

Results for additional scenarios for modules A4-C4

Additional scenario	100% recycling
Description of the scenario/method	The results contain the mandatory impact categories from PCR2019:14 and EN15804+A2. These are followed by the impact categories required by the ISO 21930:2017, for which the impacts are calculated with TRACI for the North American market. The end of life scenario consists solely out of recycling.

Impact category	Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Climate change - total	GWP-total	kg CO2 eq.	3.66E+1	3.21E+0	7.40E+0	ND	ND	ND	ND	ND	ND	ND	1.27E+0	4.88E-2	7.48E-1	0.00E+0	-2.44E+1
Climate change - fossil	GWP-fossil	kg CO2 eq.	3.87E+1	3.21E+0	5.15E+0	ND	ND	ND	ND	ND	ND	ND	1.27E+0	4.87E-2	7.46E-1	0.00E+0	-2.44E+1
Climate change - biogenic	GWP-biogenic	kg CO2 eq.	-2.18E+0	0.00E+0	2.25E+0	ND	ND	ND	ND	ND	ND	ND	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Climate change - land use and land use change	GWP-luluc	kg CO2 eq.	4.49E-2	1.72E-4	5.75E-3	ND	ND	ND	ND	ND	ND	ND	5.73E-4	1.84E-4	1.56E-3	0.00E+0	-1.62E-2
Ozone depletion	ODP	kg CFC-11 eq.	3.15E-7	4.13E-8	2.93E-8	ND	ND	ND	ND	ND	ND	ND	3.17E-9	7.55E-10	7.00E-9	0.00E+0	-7.91E-8
Acidification	AP	mol H+ eq.	2.17E-1	4.94E-3	1.89E-2	ND	ND	ND	ND	ND	ND	ND	3.25E-3	2.07E-4	4.17E-3	0.00E+0	-1.16E-1
Eutrophication aquatic freshwater	EP-freshwater	kg P eq.	2.07E-3	2.17E-5	3.52E-4	ND	ND	ND	ND	ND	ND	ND	1.11E-4	3.11E-7	1.81E-5	0.00E+0	-7.71E-4
Eutrophication aquatic marine	EP-marine	kg N eq.	4.39E-2	9.93E-4	3.89E-3	ND	ND	ND	ND	ND	ND	ND	4.67E-4	8.66E-5	1.59E-3	0.00E+0	-2.09E-2
Eutrophication terrestrial	EP-terrestrial	mol N eq.	4.79E-1	1.11E-2	4.07E-2	ND	ND	ND	ND	ND	ND	ND	5.23E-3	9.34E-4	1.54E-2	0.00E+0	-2.38E-1
Photochemical ozone formation	POCP	kg NMVOC eq.	1.61E-1	7.28E-3	1.47E-2	ND	ND	ND	ND	ND	ND	ND	2.22E-3	2.96E-4	4.84E-3	0.00E+0	-7.62E-2
Depletion of abiotic resources - minerals and metals	ADP-minerals&metals1,2	kg Sb eq.	1.93E-4	2.58E-7	2.12E-5	ND	ND	ND	ND	ND	ND	ND	6.55E-8	3.98E-9	2.20E-6	0.00E+0	-2.38E-6
Depletion of abiotic resources - fossil fuels	ADP-fossil1	MJ, net calorific value	4.47E+2	4.20E+1	6.56E+1	ND	ND	ND	ND	ND	ND	ND	2.27E+1	6.36E-1	7.38E+0	0.00E+0	-2.40E+2

Water use	WDP1	m3 world eq. deprived	1.07E+1	5.46E-2	1.28E+0	ND	ND	ND	ND	ND	ND	ND	1.93E-1	8.42E-4	3.25E-2	0.00E+0	-2.03E+0
Ozone depletion (ISO 21930:2017)	ODP	kg CFC-11 eq.	3.58E-7	4.35E-8	3.66E-8	ND	ND	ND	ND	ND	ND	ND	3.41E-9	7.95E-10	7.38E-9	0.00E+0	-8.69E-8
Global warming potential (ISO 21930:2017)	GWP100	kg CO2-eq.	3.95E+1	3.17E+0	5.39E+0	ND	ND	ND	ND	ND	ND	ND	1.25E+0	4.82E-2	1.04E+0	0.00E+0	-2.42E+1
Photochemical oxidant creation potential (ISO 21930:2017)	POCP	kg O3 eq.	2.82E+0	6.31E-2	2.45E-1	ND	ND	ND	ND	ND	ND	ND	2.92E-2	5.42E-3	8.97E-2	0.00E+0	-1.32E+0
Acidification potential (ISO 21930:2017)	AP	kg SO2 eq.	2.77E-1	4.40E-3	1.79E-2	ND	ND	ND	ND	ND	ND	ND	2.73E-3	1.91E-4	4.00E-3	0.00E+0	-9.91E-2
Eutrophication potential (ISO 21930:2017)	EP	kg N eq.	1.14E-6	1.18E-9	1.55E-7	ND	ND	ND	ND	ND	ND	ND	4.44E-9	2.23E-11	4.47E-9	0.00E+0	-6.00E-8
Climate change - Greenhouse gases	GWP-GHG	kg CO2 eq.	3.70E+1	3.21E+0	5.16E+0	ND	ND	ND	ND	ND	ND	ND	1.22E+0	4.85E-2	1.14E+0	0.00E+0	-2.34E+1
Acronyms																	
Disclaimers																	
General disclaimer	The results of the end-of-life stage (modules C1-C4) should be considered when using the results of the product stage (modules A1-A3/A1-A5 for services).																

ADDITIONAL ENVIRONMENTAL INFORMATION

The products powder coating contains two hazardous substances, that do NOT cross the 0.1% threshold.

- Metallic nickel: Up to 0.0000192% by coating weight (0.192 PPM)
- 2-mercaptobenzothiazole: Up to 0.0925% by coating weight

ABBREVIATIONS

CAS: Chemical Abstracts Service

CEN: European Committee for Standardization

CDP: Carbon Disclosure Project

CHP: Combined Heat and Power

CLP: Classification, Labelling and Packaging

EC-JRC: European Commission Joint Reserve Directorate

EDIP: Environmental Design of Industrial Products

eGRID: Emissions & Generation Resource Integrated Database

EN: European Norm

EPA: Environmental Protection Agency

EPD: Environmental Product Declaration

GBC: Green Building Council

GLO: Global

HMIRA: Hazardous Materials Information Review Act

HPD: Health Product Declaration

ISO: International Organization for Standardization

LCA: Life Cycle Assessment

LHV: Lower Heating Value

MJ: Mega Joule

ND: Not Declared

N/A: Not Applicable

PCR: Product Category Rules

RE100: Renewable Energy 100%

REC: Renewable Energy Certificate

RoW: Rest of World

R&D: Research & Development

SVHC: Substances of Very High Concern

TRACI: Tool for Reduction and Assessment of Chemicals and Other Environmental Impacts

TSCA: Toxic Substances Control Act

UN CPC: United Nations Central Product Classification

USA: United Stated of America

VOC: Volatile Organic Compound

WARM: Waste Reduction Model

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VERSION HISTORY

Original version of the EPD