Environmental Product Declaration

In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021 for:

DRAINAGE CHANNEL (max-i NW 520)

from

BIRCO GmbH

Programme:	The International EPD System, www.environdec.com
Programme operator:	EPD International AB
Type of EPD:	EPD of a single product from a manufacturer
EPD registration number:	EPD-IES-0018606:003
Version date:	2025-11-17
Validity date:	2030-11-16
	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

GENERAL INFORMATION

Programme Information	
Programme:	The 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 (PCR)
CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product Category Rules (PCR): *PCR 2019:14 Product Category Rules Construction Products, Version 2.0.1 (2025-06-05); UN CPC 375*
PCR review was conducted by: *The Technical Committee of the International EPD System. A full list of members is available on www.environdec.com. The review panel may be contacted via support@environdec.com. Members of the Technical Committee were requested to state any potential conflict of interest with the PCR Committee, and if there were conflicts of interest they were excused from the review; Chairs of the PCR review: Rob Rouwette (chair), Noa Meron (co-chair)*
c-PCR, if applicable: *c-PCR-003 (TO PCR 2019:14) Concrete and concrete elements (EN 16757:2022), Version 1.0.0 (2025-04-08)*

Third-party Verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: ☒ **Individual EPD verification without a pre-verified LCA/EPD tool** Third-party verifier: *Angela Schindler, Tüfinger Str. 12, 88682 Salem, Germany* Approved by: International EPD System
Procedure for follow-up of data during EPD validity involves third party verifier: ☐ Yes ☒ No

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

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.
For further information about comparability, see EN 15804 and ISO 14025.

INFORMATION ABOUT EPD OWNER

Owner of the EPD: BIRCO GmbH

Address: Herrenpfädel 142, D-76532 Baden-Baden, Germany

Contact: Dr. Ingo Markgraf, i.markgraf@birco.de, www.birco.de

Address and contact information of the LCA practitioner commissioned by the EPD owner:

Dr. Christine Wenk, Neosys AG, Privatstrasse 10, 4563 Gerlafingen, Switzerland

Description of the organisation: BIRCO was founded in 1927 as a coal and building materials supplier. As early as the 1950s, the first concrete drainage channels were produced for agricultural use. This triggered the idea of producing drainage channels for traffic areas. In 1965 BIRCO was the first German producer of a concrete channel covered with a mesh grating. The beginning of BIRCO's specializing in solid channel systems for surface drainage was thus marked. Today BIRCO is amongst the leading suppliers of channel systems in Europe. The products are marketed through the company's sales agencies in Germany, France, Belgium, the Netherlands, and Luxembourg. In numerous other countries they are sold through partners and licensees.

The BIRCO channel systems for surface drainage and discharge of aggressive liquids are made of concrete, steel, and PE, and cover a wide range of uses – from areas frequented by heavy-duty vehicles to roof terraces. In addition, BIRCO offers an infiltration system which allows the infiltration of stormwater with the use of only little space. Various cover versions are available for all systems. They include slotted cast gratings, cast mesh gratings, mesh gratings with various mesh widths, slotted and perforated gratings, as well as design-gratings such as the „Wave" and „Ellipse" cast gratings.

Product-related or management system-related certifications: DIN EN ISO 9001, DIN EN ISO 14001, interzero recycling certificate, Member of German Sustianable Building Council.

PRODUCT INFORMATION

Product name: BIRCO max-i NW 520 with ductile iron slotted gratings

Product identification: BIRCO max-i NW 520 drainage channel (article no. 0685200829) with six ductile iron triple-slot gratings, class F 900 (article no. 0685200093)

UN CPC code: 375 Articles of concrete, cement, and plaster.

Product description: Drainage channel with anchoring system type I – until class F 900 according to EN 1433; triple-slot gratings class F 900 according to EN 1433.

Areas of application: urban development, industrial construction, airports, ports, heavy traffic areas, parking lots also used by lorries, properties with special architectural requirements, and areas requiring rapid intake of large volumes of surface water, based on the broad range of gratings.

The concrete mix is produced at the Baden-Baden site of BIRCO GmbH and cast into drainage channels. Reinforcing steel, as well as the cast frames, the cast gratings and the stainless-steel screws, which are part of the final product, are purchased as finished components from suppliers.

Name and location of production site: BIRCO GmbH, Production site in 76532 Baden-Baden, Germany

CONTENT DECLARATION

Product content	Mass, kg	Post-consumer recycled material, mass-% of product	Biogenic material, mass-% of product	Biogenic material, kg C/product or declared unit
Sand / Gravel	1’195	0	0	0
Cement	270	0	0	0
Additives / Plasticiser	109	0	0	0
Water	40	0	0	0
Steel	25	0 *	0	0
Iron cast	373	0 *	0	0
TOTAL	2’012	0.0	0	0

** The assumption of 35% scrap iron input has been used for LCA modelling. This scrap iron input, however, is assumed to be 100% post-industrial material.*

Packaging materials	Mass, kg	Mass-% (versus the product)	Biogenic material, kg C/product or declared unit
no packaging material			

Hazardous substances from the candidate list of SVHC	EC No.	CAS No.	Mass-% per product or declared unit
none			

LCA INFORMATION

Declared unit: The declared unit (DU) is 1 piece of a concrete drainage channel (max-i NW 520) including reinforcing steel, cast frames and cast gratings with stainless-steel screws.

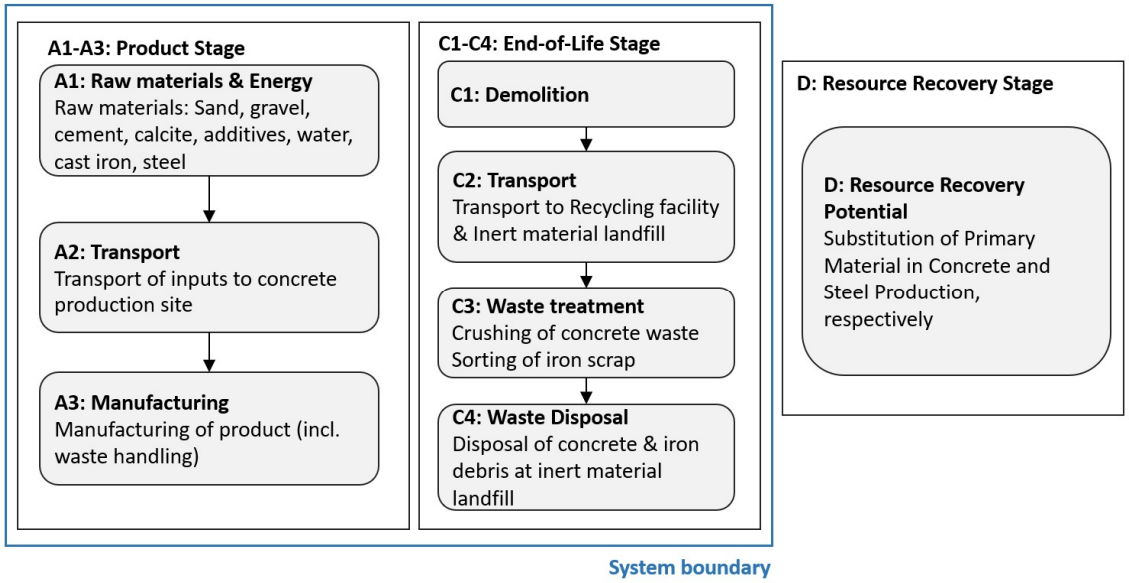
Time representativeness: Full year of 2024 for data collected from the factory (primary data) and electricity uses, respectively.

Geographical scope: The manufacturing stage represents Germany, modules C1-C4 and D represent Europe.

Database(s) and LCA software used: Modelled in Activity-Browser and MS Excel based on Ecoinvent v.3.9.1, system-model ‘allocation, cut-off, EN 15804’. Characterisation factors are based on LCIA methods EF v3.1 and EN15804 implemented in Ecoinvent v.3.9.1 with minor modifications to ensure full compliance with EN15804+A2.

Description of system boundaries: Cradle-to-gate with modules C1-C4 and module D.

Process flow diagram:



Modelling of production stage:

Modules A1-A3 take into account all processes of raw material extraction and preparation, the production of auxiliary materials and additives, all transport associated with the delivery of the raw and auxiliary materials used, the provision of all energy sources and electricity generation, the actual concrete production at the Baden-Baden site, and the treatment of all waste. Module A3 ends at the factory gate at the Baden-Baden site.

Energy sources of the electricity used in manufacturing processes:

The electricity used by the manufacturing plant in Baden-Baden is 100% renewable electricity from on-site photovoltaic production (1.2%) amd from hydropower (98.8%). The climate impact of this electricity source was modelled as 0.032 kg CO_2 eq / kWh (GWP-total). This conservatively includes electricity losses during voltage transformation and transmission, and contributions from electricity transmission and transformation infrastructure.

Scenario adopted for modelling the End-of-Life and Resource Recovery Stage

The End-of-Life stage and the Resource Recovery Stage were modelled assuming 100% product deployment in Europe, and based on the following assumptions:

- Deconstruction / demolition of the drainage channels is carried out with excavators. Diesel is assumed to be the energy source for the working machines. A fuel consumption of 1 L diesel per ton of demolition material is assumed (inclusive of crushing into recycled concrete granulate).
- During the utilization phase and the deconstruction no loss of mass takes place, i.e. the complete mass of the used product is disposed of.
- The total transport distance covered by the demolition material on average is 50 km in Germany and abroad. This includes the transport from the demolition site to a processing plant or a landfill, as well as the transport between the processing plant and the landfill of the material that is separated as a residual fraction after processing for landfilling.
- Concrete debris are transported by diesel-powered EURO 5 trucks.
- No component of the demolition material can be reused.

- The fraction of demolished concrete processed into recycled concrete granulate is 70%, the recycling fraction of steel is assumed to be 90%
- The remaining 30% of the concrete demolition material and the remaining 10% of the steel will be landfilled.
- In addititon to this mix-scenario of recycling and landfill, a scenario with 100% recycling and a scenario with 100% landfill have been included (see Additional LCA results).

Modules declared, geographical scope, share of primary data (in GWP-GHG results) and data variation (in GWP-GHG results):

	Product stage			Distribution/ installation stage		Use stage							End-of-life stage				Beyond product life cycle
	Raw material supply	Transport	Manufacturing	Transport	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	ND	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	Germany			-	-	-	-	-	-	-	-	-	Europe				Europe
Share of primary data	2%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	Not relevant			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	Not relevant			-		-	-	-	-	-	-	-	-	-	-	-	-

Process	Source type	Source	Reference year	Data category	Share of primary data, of GWP-GHG results for A1-A3
Manufacturing of product	Collected data	EPD owner	2024	Primary data	0.8%
Generation of electricity used in manufacturing of product	Database	Ecoinvent v3.9.1	1945 - 2008	Primary data	0.1%
Cement production *	EPD	Opterra (2025)	unknown	Secondary data	0%
Production of reinforcing steel, cast steel frames, gratings, and screws	Database	Ecoinvent v3.9.1	2011 - 2013	Secondary data	0%
Production of other inputs and auxiliaries	Database	Ecoinvent v3.9.1	1997 - 2018	Secondary data	0%
Transport of inputs to production site	Database	Ecoinvent v3.9.1	2009	Primary data	0.9%
Treatment of production waste	Database	Ecoinvent v3.9.1	1994 - 2011	Secondary data	0%
Total share of primary data, of GWP-GHG results for A1-A3					1.8%

** The reported share of primary data is associated with uncertainty, as the EPD used as data source for cement production lacks information on the share of primary data. According to section 4.6.5.1, PCR 2019:14, the share of primary data of the cement EPD was thus conservatively considered as 0%.*

ENVIRONMENTAL PERFORMANCE

LCA results of the product - main environmental performance results

Mandatory impact category indicators according to EN 15804

Results per declared unit							
Indicator	**Unit**	**A1 - A3**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total *	kg CO_2 eq.	1.02E+03	6.90E+00	1.90E+01	1.30E+01	3.19E+00	-3.58E+02
GWP-fossil *	kg CO_2 eq.	1.02E+03	6.90E+00	1.89E+01	1.30E+01	3.18E+00	-3.58E+02
GWP-biogenic	kg CO_2 eq.	8.67E-01	9.51E-04	6.00E-03	2.80E-02	1.38E-03	-7.69E-02
GWP-luluc	kg CO_2 eq.	5.97E-01	7.75E-04	9.20E-03	1.03E-02	1.92E-03	-9.54E-02
ODP	kg CFC 11 eq.	1.63E-05	1.10E-07	4.12E-07	2.05E-07	9.22E-08	-8.56E-06
AP	mol H^+ eq.	4.30E+00	6.39E-02	6.17E-02	1.43E-01	2.40E-02	-1.36E+00
EP-freshwater	kg P eq.	2.99E-01	2.11E-04	1.32E-03	5.49E-03	2.65E-04	-1.45E-01
EP-marine	kg N eq.	8.82E-01	2.96E-02	2.12E-02	4.27E-02	9.21E-03	-3.29E-01
EP-terrestrial	mol N eq.	1.09E+01	3.22E-01	2.24E-01	4.72E-01	9.87E-02	-3.49E+00
POCP	kg NMVOC eq.	4.54E+00	9.54E-02	9.22E-02	1.40E-01	3.44E-02	-1.92E+00
ADP-minerals & metals **	kg Sb eq.	2.18E-03	2.41E-06	6.21E-05	5.71E-04	4.49E-06	-2.17E-04
ADP-fossil **	MJ	1.02E+04	9.10E+01	2.71E+02	1.74E+02	7.99E+01	-3.76E+03
WDP **	m^3	2.20E+02	2.25E-01	1.33E+00	2.11E+00	2.48E-01	-2.60E+01
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						

Disclaimers:
** The table contains net GWP values without emissions from secondary fuels. According to the cement manufacturer, secondary fuels are used in clinker production. The additional emissions from the incineration of this waste during clinker production amount to 25 kg CO_2 eq per declared unit.*
*** 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 experienced with the indicator.*

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. 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). Characterisation factors are based on LCIA methods EF v3.1 and EN15804 implemented in Ecoinvent v.3.9.1 with minor modifications to ensure full compliance with EN15804+A2.

Additional mandatory and voluntary impact category indicators

Results per declared unit							
Indicator	**Unit**	**A1 - A3**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-GHG[1]	kg CO_2 eq.	1.02E+03	6.90E+00	1.90E+01	1.30E+01	3.19E+00	-3.58E+02
PM	Disease incidence	8.76E-05	1.78E-06	1.51E-06	1.10E-05	5.25E-07	-2.53E-05
IRP **	kBq U235 eq.	3.11E+01	4.28E-02	3.59E-01	1.01E+00	5.02E-02	-4.93E+00
ETP-fw *	CTUe	3.83E+03	4.32E+01	1.33E+02	1.17E+02	3.72E+01	-1.03E+03
HTP-c *	CTUh	1.03E-05	2.12E-09	8.63E-09	1.50E-08	1.36E-09	-1.96E-06
HTP-nc *	CTUh	1.33E-04	1.48E-08	1.90E-07	6.38E-07	1.71E-08	-1.66E-06
SQP *	dimensionless	2.72E+03	6.06E+00	1.60E+02	2.14E+02	1.58E+02	-7.78E+02
Acronyms	PM = Particulate matter emissions; IRP = Ionizing radiation, human health; ETP-fw = Eco-toxicity – freshwater; HTP-c = Human toxicity, cancer effect; HTP-nc = Human toxicity, non-cancer effects; SQP = Land use related impacts/Soil quality						

Disclaimers:

** 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. The results of this indicator 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.*

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

The additional voluntary environmental impact indicators are not fully supported by all data inventories used, since the EDP used for modelling the plasticiser (EPD-EFC-20210198-IBG1-EN) does not contain these optional environmental indicator values.

[1] This 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.

Resource use indicators

Results per declared unit							
Indicator	**Unit**	**A1 - A3**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	6.14E+02	5.12E-01	4.16E+00	1.96E+01	6.71E-01	-8.01E+01
PERM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	6.14E+02	5.12E-01	4.16E+00	1.96E+01	6.71E-01	-8.01E+01
PENRE	MJ	1.01E+04	9.10E+01	2.71E+02	1.74E+02	8.93E+01	-3.76E+03
PENRM	MJ	3.13E+01	0.00E+00	0.00E+00	-2.19E+01	-9.38E+00	0.00E+00
PENRT	MJ	1.01E+04	9.10E+01	2.71E+02	1.53E+02	7.99E+01	-3.76E+03
SM	kg	1.76E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.47E+03
RSF *	MJ	1.66E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF *	MJ	2.89E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	5.56E+00	4.87E-03	3.23E-02	5.92E-02	8.26E-02	-2.34E+00
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						

Disclaimer:
** The value in A1-A3 originates 100% from cement production (see Opterra (2025)).*

Waste indicators

Results per declared unit							
Indicator	**Unit**	**A1 - A3**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed *	kg	7.65E+01	4.19E-02	1.81E-01	3.25E-01	3.84E-02	-3.17E+01
Non-hazardous waste disposed *	kg	1.31E+03	8.34E-01	5.51E+00	2.15E+01	1.15E+00	-6.95E+02
Radioactive waste disposed *	kg	1.03E-02	9.88E-06	8.72E-05	2.57E-04	1.17E-05	-1.22E-03

Disclaimer:
** Since the EPD self-declaration for cement was created with the GCCA tool v5.2, which does not declare waste flows fully compliant with EN 15804+A2, these indicator values are not fully supported by all data inventories used.*

Output flow indicators

Results per declared unit							
Indicator	**Unit**	**A1 - A3**	**C1**	**C2**	**C3**	**C4**	**D**
Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Material for recycling	kg	3.35E+02	0.00E+00	0.00E+00	1.55E+03	0.00E+00	0.00E+00
Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, electricity	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, thermal	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Additional LCA results

The results of the equivalent 100% scenarios (100% recycling; 100% landfill) in line with section 4.8.4 of PCR 2019:14 V.2.0.1 are presented in the tables below.

Indicator name and abbreviation (EN)	Unit (EN)				
Core environmental impact indicators (MANDATORY)		C1 - 100% recycling	C2 - 100% recycling	C3 - 100% recycling	C4 - 100% recycling
Global warming potential - fossil fuels (GWP-fossil)	kg CO_2 eq.	6.90E+00	1.89E+01	1.59E+01	0.00E+00
Global warming potential - biogenic (GWP-biogenic)	kg CO_2 eq.	9.51E-04	6.00E-03	3.14E-02	0.00E+00
Global warming potential - land use and land use change (GWP-luluc)	kg CO_2 eq.	7.75E-04	9.20E-03	1.16E-02	0.00E+00
Global warming potential - total (GWP-total)	kg CO_2 eq.	6.90E+00	1.90E+01	1.60E+01	0.00E+00
Depletion potential of the stratospheric ozone layer (ODP)	kg CFC-11 eq.	1.10E-07	4.12E-07	2.52E-07	0.00E+00
Acidification potential, accumulated exceedance (AP)	mol H^+ eq.	6.39E-02	6.17E-02	1.73E-01	0.00E+00
Eutrophication potential - freshwater (EP-freshwater)	kg P eq.	2.11E-04	1.32E-03	6.15E-03	0.00E+00
Eutrophication potential - marine (EP-marine)	kg N eq.	2.96E-02	2.12E-02	5.41E-02	0.00E+00
Eutrophication potential - terrestrial (EP-terrestrial)	mol N eq.	3.22E-01	2.24E-01	5.97E-01	0.00E+00
Photochemical ozone creation potential (POCP)	kg NMVOC eq.	9.54E-02	9.22E-02	1.77E-01	0.00E+00
Abiotic depletion potential - non-fossil resources (ADPE) [2]	kg Sb eq.	2.41E-06	6.21E-05	6.35E-04	0.00E+00
Abiotic depletion potential - fossil resources (ADPF) [2]	MJ, net calorific value	9.10E+01	2.71E+02	2.14E+02	0.00E+00
Water (user) deprivation potential (WDP) [2]	m^3 world eq. deprived	2.25E-01	1.33E+00	2.40E+00	0.00E+00
Additional mandatory environmental impact indicators (MANDATORY)					
Global warming potential (GWP-GHG)	kg CO_2 eq.	6.90E+00	1.90E+01	1.60E+01	0.00E+00
Additional voluntary environmental impact indicators (OPTIONAL)					
Particulate matter emissions (PM) [3]	Disease incidence	1.78E-06	1.51E-06	1.53E-05	0.00E+00
Ionizing radiation, human health (IRP) [1, 3]	kBq U235 eq.	4.28E-02	3.59E-01	1.13E+00	0.00E+00
Eco-toxicity - freshwater (ETP-fw) [2, 3]	CTUe	4.32E+01	1.33E+02	1.40E+02	0.00E+00
Human toxicity, cancer effect (HTP-c) [2, 3]	CTUh	2.12E-09	8.63E-09	1.72E-08	0.00E+00
Human toxicity, non-cancer effects (HTP-nc) [2, 3]	CTUh	1.48E-08	1.90E-07	7.12E-07	0.00E+00
Land use related impacts/Soil quality (SQP) [2, 3]	dimensionless	6.06E+00	1.60E+02	2.40E+02	0.00E+00
Indicators describing resource use (MANDATORY)					
Use of renewable primary energy as energy carrier (PERE)	MJ, net calorific value	5.12E-01	4.16E+00	2.18E+01	0.00E+00
Use of renewable primary energy resources used as raw materials (PERM)	MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of renewable primary energy (PERT)	MJ, net calorific value	5.12E-01	4.16E+00	2.18E+01	0.00E+00
Use of non renewable primary energy as energy carrier (PENRE)	MJ, net calorific value	9.10E+01	2.71E+02	2.14E+02	0.00E+00
Use of non renewable primary energy resources used as raw materials (PENRM)	MJ, net calorific value	0.00E+00	0.00E+00	-3.13E+01	0.00E+00
Total use of non renewable primary energy resource (PENRT)	MJ, net calorific value	9.10E+01	2.71E+02	1.83E+02	0.00E+00
Use of secondary material (SM)	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels (RSF)	MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non-renewable secondary fuels (NRSF)	MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net use of fresh water (FW)	m^3	4.87E-03	3.23E-02	6.68E-02	0.00E+00
Environmental information describing waste categories (MANDATORY)					
Hazardous waste disposed (HWD)	kg	4.19E-02	1.81E-01	3.70E-01	0.00E+00
Non-harzardous waste disposed (NHWD)	kg	8.34E-01	5.51E+00	2.41E+01	0.00E+00
Radioactive waste disposed (RWD)	kg	9.88E-06	8.72E-05	2.87E-04	0.00E+00
Environmental information describing output flows (MANDATORY)					
Components for re-use (CRU)	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling (MFR)	kg	0.00E+00	0.00E+00	2.01E+03	0.00E+00
Materials for energy recovery (MER)	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported electrical energy (EEE)	MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported thermal energy (EET)	MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Indicator name and abbreviation (EN)	Unit (EN)				
Core environmental impact indicators (MANDATORY)		C1 - 100% landfill	C2 - 100% landfill	C3 - 100% landfill	C4 - 100% landfill
Global warming potential - fossil fuels (GWP-fossil)	kg CO_2 eq.	6.90E+00	1.89E+01	0.00E+00	1.22E+01
Global warming potential - biogenic (GWP-biogenic)	kg CO_2 eq.	9.51E-04	6.00E-03	0.00E+00	5.32E-03
Global warming potential - land use and land use change (GWP-luluc)	kg CO_2 eq.	7.75E-04	9.20E-03	0.00E+00	7.38E-03
Global warming potential - total (GWP-total)	kg CO_2 eq.	6.90E+00	1.90E+01	0.00E+00	1.22E+01
Depletion potential of the stratospheric ozone layer (ODP)	kg CFC-11 eq.	1.10E-07	4.12E-07	0.00E+00	3.54E-07
Acidification potential, accumulated exceedance (AP)	mol H^+ eq.	6.39E-02	6.17E-02	0.00E+00	9.21E-02
Eutrophication potential - freshwater (EP-freshwater)	kg P eq.	2.11E-04	1.32E-03	0.00E+00	1.02E-03
Eutrophication potential - marine (EP-marine)	kg N eq.	2.96E-02	2.12E-02	0.00E+00	3.54E-02
Eutrophication potential - terrestrial (EP-terrestrial)	mol N eq.	3.22E-01	2.24E-01	0.00E+00	3.79E-01
Photochemical ozone creation potential (POCP)	kg NMVOC eq.	9.54E-02	9.22E-02	0.00E+00	1.32E-01
Abiotic depletion potential - non-fossil resources (ADPE) [2]	kg Sb eq.	2.41E-06	6.21E-05	0.00E+00	1.72E-05
Abiotic depletion potential - fossil resources (ADPF) [2]	MJ, net calorific value	9.10E+01	2.71E+02	0.00E+00	3.07E+02
Water (user) deprivation potential (WDP) [2]	m^3 world eq. deprived	2.25E-01	1.33E+00	0.00E+00	9.54E-01
Additional mandatory environmental impact indicators (MANDATORY)					
Global warming potential (GWP-GHG)	kg CO_2 eq.	6.90E+00	1.90E+01	0.00E+00	1.22E+01
Additional voluntary environmental impact indicators (OPTIONAL)					
Particulate matter emissions (PM) [3]	Disease incidence	1.78E-06	1.51E-06	0.00E+00	2.02E-06
Ionizing radiation, human health (IRP) [1, 3]	kBq U235 eq.	4.28E-02	3.59E-01	0.00E+00	1.93E-01
Eco-toxicity - freshwater (ETP-fw) [2, 3]	CTUe	4.32E+01	1.33E+02	0.00E+00	1.43E+02
Human toxicity, cancer effect (HTP-c) [2, 3]	CTUh	2.12E-09	8.63E-09	0.00E+00	5.22E-09
Human toxicity, non-cancer effects (HTP-nc) [2, 3]	CTUh	1.48E-08	1.90E-07	0.00E+00	6.57E-08
Land use related impacts/Soil quality (SQP) [2, 3]	dimensionless	6.06E+00	1.60E+02	0.00E+00	6.05E+02
Indicators describing resource use (MANDATORY)					
Use of renewable primary energy as energy carrier (PERE)	MJ, net calorific value	5.12E-01	4.16E+00	0.00E+00	2.58E+00
Use of renewable primary energy resources used as raw materials (PERM)	MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of renewable primary energy (PERT)	MJ, net calorific value	5.12E-01	4.16E+00	0.00E+00	2.58E+00
Use of non renewable primary energy as energy carrier (PENRE)	MJ, net calorific value	9.10E+01	2.71E+02	0.00E+00	3.38E+02
Use of non renewable primary energy resources used as raw materials (PENRM)	MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00	-3.13E+01
Total use of non renewable primary energy resource (PENRT)	MJ, net calorific value	9.10E+01	2.71E+02	0.00E+00	3.07E+02
Use of secondary material (SM)	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels (RSF)	MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non-renewable secondary fuels (NRSF)	MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net use of fresh water (FW)	m^3	4.87E-03	3.23E-02	0.00E+00	3.17E-01
Environmental information describing waste categories (MANDATORY)					
Hazardous waste disposed (HWD)	kg	4.19E-02	1.81E-01	0.00E+00	1.47E-01
Non-harzardous waste disposed (NHWD)	kg	8.34E-01	5.51E+00	0.00E+00	4.41E+00
Radioactive waste disposed (RWD)	kg	9.88E-06	8.72E-05	0.00E+00	4.50E-05
Environmental information describing output flows (MANDATORY)					
Components for re-use (CRU)	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling (MFR)	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery (MER)	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported electrical energy (EEE)	MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported thermal energy (EET)	MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ABBREVIATIONS

Abbreviation	Definition
General Abbreviations	
EN	European Norm (Standard)
EF	Environmental Footprint
GPI	General Programme Instructions
ISO	International Organization for Standardization
CPC	Central product classification
SVHC	Substances of Very High Concern
ND	Not Declared

REFERENCES

- General Programme Instructions of International EPD System. Version 5.0.1 (2025-02-27)
- PCR 2019:14 Product Category Rules Construction Products, Version 2.0.1 (2025-06-05)
- c-PCR-003 (TO PCR 2019:14) Concrete and concrete elements (EN 16757:2022), Version 1.0.0 (2025-04-08)
- Opterra (2025). EPD self-declaration OPTA FAST. Based on GCCA's Industry EPD Tool for Cement and Concrete (V5.2), International version. OPTERRA Wössingen GmbH
- EFCA (2021). ENVIRONMENTAL PRODUCT DECLARATION; Concrete admixtures – Plasticizers and Superplasticizers; EFCA (European Federation of Concrete Admixtures Associations); Institut Bauen und Umwelt e.V. (IBU); EPD-EFC-20210198-IBG1-EN

VERSION HISTORY

Original Version of the EPD (EPD-IES-0018606), 2025-01-14

Revision 1, 2025-11-17, Differences versus the previously published version:

- Energy and material consumption data for 2024 (previously 2023)
- New concrete mix
- New cement supplier
- Adjusted number of iron casts and screws
- Update to new PCR 2019:14, Version 2.0.1 (2025-06-05)

EPD
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