Environmental Product Declaration

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

Holcim ECOPlanet Ekspert cement CEM II/B-M (S-LL) 42,5N

from

Holcim (Hrvatska) d.o.o.

Programme:	"National Environmental Labelling Program" - Czech Republic (NPEZ)
Programme operator:	Ministry of the Environment of the Czech Republic, CENIA, Czech Environmental Information Agency, executive function of the NPEZ Agency
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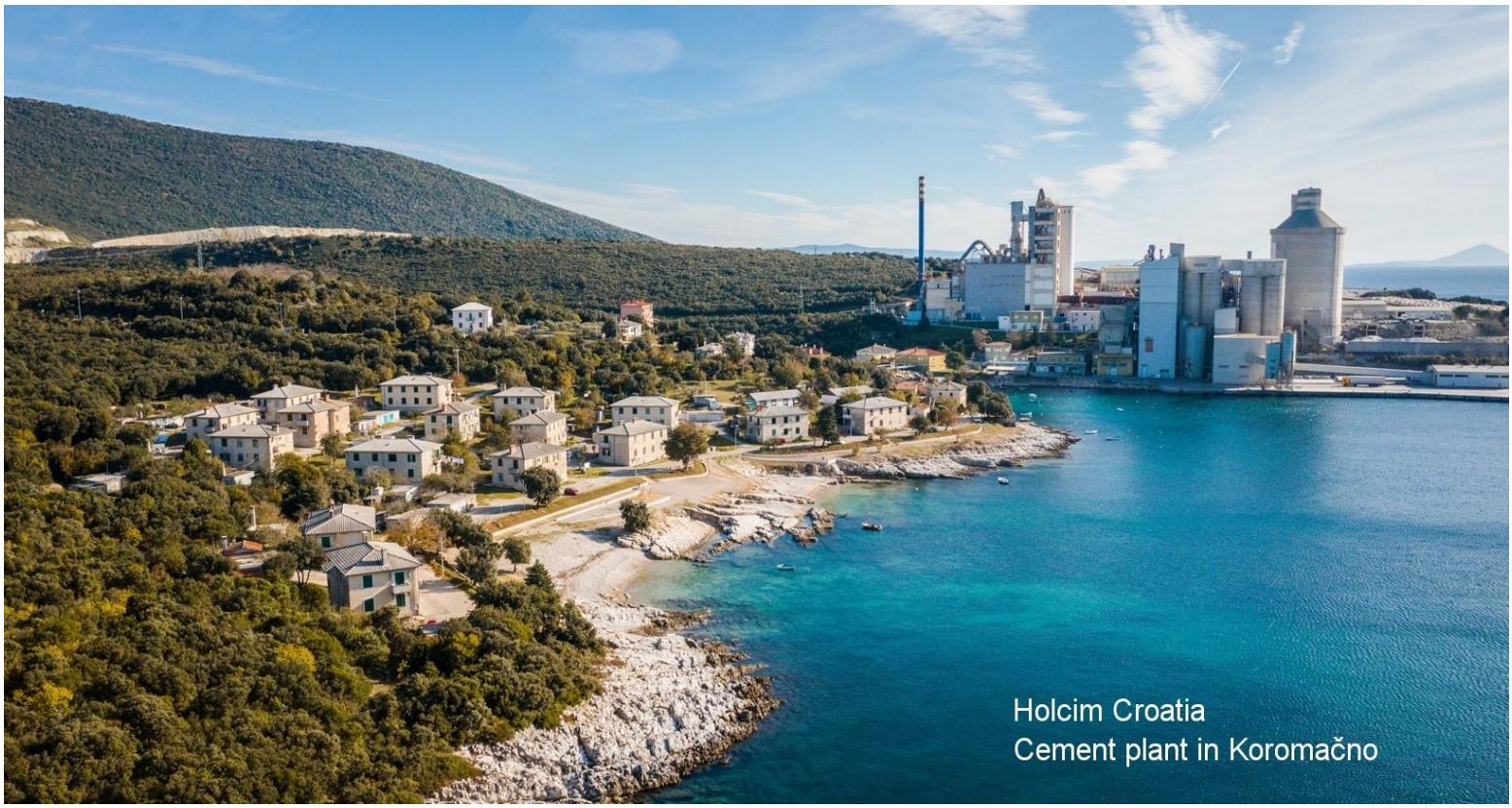
An EPD should provide current information and may be updated if conditions change.



General information

Programme information

Programme:	"National Environmental Labelling Program" - Czech Republic (NPEZ)
Address:	Ministry of the Environment of the Czech Republic Department of Voluntary Instruments 100 10 Praha 10, Vršovická 1442/65
Website:	www.mzp.cz, www.cenia.cz
E-mail:	info@mzp.cz

Accountabilities for PCR, LCA and independent, third-party verification
Product Category Rules (PCR)
CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product Category Rules (PCR): EN 16908:2017+A1:2022 *Cement and building lime - Environmental product declarations - Product category rules complementary to EN 15804* *ECO PLATFORM LCA Calculation Rules and Specifications for EPDs, Version 01 (December 2023)*
Life Cycle Assessment (LCA)
LCA accountability: *Technický a zkušební ústav stavební Praha, s.p.,*
Third-party verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: ☒ EPD verification by accredited certification body Third-party verification: ***Technický a zkušební ústav stavební Praha, s.p.*** is an approved certification body accountable for the third-party verification. 190 00 Praha 9, Prosecká 811/76a, CZ The certification body is accredited by: ***Českým institutem pro akreditaci, o.p.s., Osvědčení č. 456/2024*** Verifier: Ing. Lenka Vrbová    
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 registered in different EPD programmes, or not compliant with EN 15804, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same 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 equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

Company information

Owner of the EPD:

Holcim (Hrvatska) d.o.o.

Koromačno 7b, HR - 52 222 Koromačno, Croatia

Contact:

holcim-hrvatska@holcim.com, www.holcim.hr

Description of the organisation:

As member of the Holcim Group, Holcim (Hrvatska) d.o.o. is a leader in innovative and sustainable building solutions. Our employees are driven by our purpose to build progress for people and the planet across our regions to improve living standards for all. We partner with our customers to offer the broadest range of advanced solutions, from sustainable building materials ECOPact and ECOPlanet, to our circular technology ECOCycle®, all the way to Elevate's advanced roofing and insulation systems.

Our cement plant in Koromačno was founded in 1926. In the last 30 years we significantly developed the process, capacity and technology. Since 1997 a big part of investments were focused on carbon footprint decrease, for example:

1. **decreased consumption of fossil fuels:** this EPD is based on 2023 production data when 45% of thermal energy was produced with fossil fuels. We have an investment ongoing that will enable alternative fuels with only 5% fossil fuels in 2026.
2. **co-operation with customers to accept new cement types:** since 1997 we have researched and introduced new mineral components that enable a lower carbon footprint. In order to introduce them to the market a close co-operation with our customers was needed. Because of our long term trust relationship, we were the first producer in Croatia to cancel production of CEM I cement type with highest carbon footprint.
3. **carbon capture:** as a final step in our decarbonisation roadmap, carbon capture and storage project KOdeCO net zero is co-financed by the EU Innovation Fund. Project is worth 237 Mio EUR and will result in capturing of all remaining CO2 as of December 2028.

Product-related or management system-related certifications:

Holcim Croatia has an Integrated Management System that combines the Quality Management System ISO 9001, Environment Management System ISO 14001, Health and Safety Management System ISO 45001 and Energy Management System ISO 50001 - scanned certificates are publicly available on our website *link*

Name and location of production site(s):

Holcim (Hrvatska) d.o.o.
Koromačno 7b, HR - 52 222 Koromačno, Croatia

Product information

Product name:

Holcim ECOPlanet Ekspert cement

Product identification:

CEM II/B-M (S-LL) 42,5N

Product description:

Holcim's cement plant in Koromačno produces several cement types, based on the HRN EN 197-1:

- Holcim ECOPlanet Ekspert cement (website link)
- Holcim ECOPlanet Protektor cement (website link)
- Holcim Lumen cement (website link)
- Holcim Adria cement (website link)

Holcim ECOPlanet Ekspert® cement is a Portland cement consisting of 65-79% Portland cement clinker, 21-35% sum of granulated blast furnace slag (S) and limestone (LL), up to 5% minor additional constituents. Industrial gypsum is used as a binding regulator.
All products are assessed in accordance with Regulation (EU) No. 305/2011 of the European Parliament and of the Council of 9 March 2011, as amended, laying down harmonised conditions for the marketing of construction products (system 1+).

Conformity criteria	**Requirements**	**Technical specification**
Common cement: composition and specifications	CEM II/B-M (S-LL) 42,5N	**EN 197 – 1:2012**
Compressive strength (early and standard)	≥ 10,0 MPa ≥ 42,5 MPa	
Setting time	≥ 60 min	
Soundness (expansion)	≤ 10 mm	
Sulfate content (as SO_3)	≤ 3,5 %	
Chloride content	≤ 0,1 %	

UN CPC code:

37440 Portland cement, aluminous cement, slag cement and similar hydraulic cements, except in the form of clinkers

Geographical scope:

General data from the Ecoinvent database valid for HR (e.g. energy inputs) are used and in case of unavailability of data for HR, data valid for the EU or according to the supplier's location are used. Based on the assessment according to EN 15804+A2, Annex E, Tab. E.1, the generic data used meet the quality level - medium.

Product packaging, environment and health during use:

The products are delivered in accordance with the standards indicated in the product description. This cement type is distributed in bulk by road with silo trucks or by sea with ships. Bulk cement is distributed in closed silo trucks with automatic pressure unloading into cement silos at industrial production sites, therefore under normal conditions of use resulting with no product release into the air. Safety Data Sheets according to (EC) 1907/2006 are available on request at holcim-hrvatska@holcim.com.

LCA information

Functional unit / declared unit:

The declared unit is 1 t of the produced product – Holcim ECOPlanet Ekspert cement CEM II/B-M (S-LL) 42,5N.

Designation	Unit	Value
Declared unit	t	1
Conversion factor to 1 kg	kg	0,001

Reference service life:

In accordance with Article 6.3.4.1 of EN 16908+A1, cement is defined as an intermediate product from the point of view of construction products and no reference lifetime can be defined for it. A reference lifetime can be declared for downstream products – for example concrete.

Time representativeness:

For specific data, the manufacturer's data for the **year 2023** is used. For generic data, data from the Ecoinvent database version 3.8 is used. Based on the evaluation according to EN 15804+A2, Annex E, tab. E.1 the generic data used meet the quality level - very good.

Database(s) and LCA software used:

SimaPro calculation software, version 9.5 SimaPro Analyst, Ecoinvent database version 3.8.
GWP-GHG from electricity production: 0,690 kg CO2 eq/kWh (HR residual mix).

Description of system boundaries:

d) Cradle to gate (A1–A3).

The use of only modules A1-A3 is possible due to the requirements of Article 5.2 in EN 15804+A2.

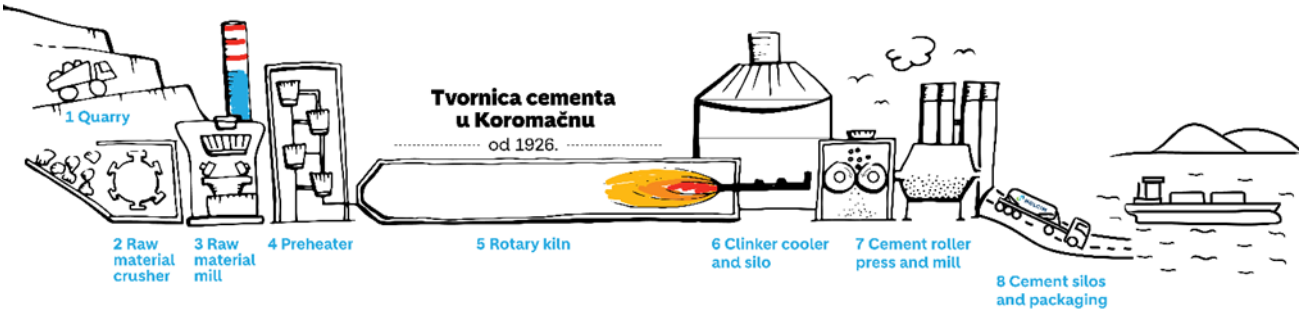
The production phase includes the following modules:

- **A1** - extraction and processing of raw materials and production of packaging from input raw materials
- **A2** - transport of input raw materials from the supplier to the manufacturer, waste removal
- **A3 -** production of products, production of auxiliary materials and semi-finished products, energy consumption, including waste processing until reaching a state where it ceases to be waste or after removal of the last material residues during the production phase.

Production

Cement is produced according to the HRN EN 197-1. Quality is assured with a quality control program in own laboratory. Declaration of performance and Certificate of constancy of performance for all products are available at: https://www.holcim.hr/proizvodi-i-usluge/cement/certifikati-i-tehnicke-upute

System diagram:



1. Quarry: limestone and marl as the main raw materials are quarried from natural rocks.
2. Raw material crusher: from the quarry material is transferred to a raw material crusher where other corrective and alternative raw materials are added to get the desired chemical composition. The material is crushed to approx. <10 cm in size and transported to raw material storage.
3. Raw material mill: the raw materials are ground in the raw mill where the particle size is reduced to a powder like material and then transferred to a homogenization silo to ensure the production of uniform and good quality clinker.
4. Preheater: raw meal is preheated using kiln hot gases to approx. 850 °C. At this point most of the calcination takes place.
5. Rotary kiln: approx. 45% fossil fuels and 55% alternative fuels like waste oils and emulsions, solid recovered fuel, waste tires and dried sewage sludge is burnt to produce enough heat to further calcine the raw meal (the temperature inside the kiln needed for the reactions to take place is around 1450 °C) and turn it to clinker.
6. Clinker cooler and silo: clinker is cooled using air from 1450 °C to approx. 140 °C and then transported to a clinker silo.
7. Cement roller press and mill: in the milling phase different mineral components are used to decrease carbon footprint like fly ash, slag, limestone from own quarry - together with the clinker they are ground to a very fine powder – cement. According to the EN 197, by adding different mineral components different cement types are produced.
8. Cement silos and packaging: distribution of cement is in bulk, using ships and silo trucks as well as packaged in 25 kg bags.

More information:

For the study, all operational data related to the consumption of main and auxiliary materials for the production of the product, energy data, diesel consumption and the distribution of annual waste production and emissions according to plant records were taken. In terms of produced waste, only those wastes that are clearly related to production activities were included in the analysis.

The processes required for the installation of production equipment and the construction of infrastructure were not included in the analysis. Also, administrative processes are not included – inputs and outputs are balanced per production phase.

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

	Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage
	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	ND	ND	ND	ND	ND
Geography	GLO EU	GLO, EU	EU, HR														
Specific data used	> 95 %					-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	ND					-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	ND					-	-	-	-	-	-	-	-	-	-	-	-

The data used to calculate the EPD conforms to the following principles:

Technological point of view: Data corresponding to the current production of individual types of partial products of the plant and corresponding to the current state of the technologies used are used. Based on the evaluation according to EN 15804+A2, Annex E, tab. E.1 the generic data used meet the quality level - very good.

The aspect of completeness: Most of the input data is based on consumption balances, which are precisely recorded in the manufacturer's information system. The reliability of the source of specific data is determined by the uniformity of the collection methodology of the information system.

Consistency point of view: Uniform points of view are used throughout the report (allocation rules, age of data, technological scope of validity, temporal scope of validity, geographical scope of validity).

Credibility aspect: All important data were checked for adherence to cross-comparison of mass balances.

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.

Content information

Product components	Weight %	Post-consumer material, weight-%	Biogenic carbon content in kg C/DU
Clinker	65-79	summarized in a separate table	0
Sum of granulated blast furnace slag (S) and limestone (LL)	21-35	summarized in a separate table	0
Other components	0-5	summarized in a separate table	0
TOTAL	100	summarized in a separate table	0
Packaging materials	**Weight %**	**Weight-% (versus the product)**	**Biogenic carbon content in kg C/DU**
The product is not packaged.	0	0	0
TOTAL	0	0	0

Recycled content (according to EN ISO14021) in the product [%]					
Recycled content (RECYCLED TOTAL)	Pre-consumer material (PRECONSUMER)	Post-consumer material (POSTCONSUMER)	Recycled material (REUSED TOTAL)	Recovered material (BY PRODUCT TOTAL)	**TOTAL ALTERNATIVE MATERIALS**
0,64	0,63	0,01	0,45	0,00	**1,1**

Dangerous substances from the candidate list of SVHC for Authorisation	EC No.	CAS No.	Weight-% per functional or declared unit (DU)
Does not contain	-	-	-

Substances listed on the list of substances of very high concern subject to authorization by the European Chemicals Agency are not contained in the product in declarable quantities.

Results of the environmental performance indicators

Mandatory impact category indicators - according to EN 15804:2012+A2:2019/AC:2021

Results per functional or declared unit					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
GWP-fosil*	kg CO_2 ekv.	7,09E+01	7,34E+00	4,85E+02	**5,64E+02**
GWP-biogenic*	kg CO_2 ekv.	2,55E-01	3,58E-02	1,56E+00	**1,85E+00**
GWP-luluc	kg CO_2 ekv.	1,41E-02	4,94E-03	1,27E-02	**3,17E-02**
GWP–total*	kg CO_2 ekv.	7,12E+01	7,38E+00	4,87E+02	**5,65E+02**
ODP	kg CFC 11 ekv.	1,37E-06	1,44E-07	3,61E-06	**5,12E-06**
AP	mol H^+ ekv.	2,10E-01	8,89E-02	4,20E-01	**7,19E-01**
EP-freshwater	kg P ekv.	6,90E-03	4,39E-04	1,87E-02	**2,60E-02**
EP-marine	kg N ekv.	1,84E-02	2,08E-02	2,72E-01	**3,12E-01**
EP-terrestrial	mol N ekv.	8,72E-01	2,28E-01	1,61E+00	**2,71E+00**
POCP	kg NMVOC ekv.	2,47E-01	7,24E-02	8,77E-01	**1,20E+00**
ADP-minerals& metals**	kg Sb ekv.	4,27E-05	1,60E-05	4,40E-05	**1,03E-04**
ADP-fosil**	MJ	4,51E+02	1,02E+02	2,25E+03	**2,81E+03**
WDP**	m^3	1,17E+01	1,60E+00	9,29E+00	**2,26E+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				

Characterisation factors based on EF 3.1 package.

** Remark to Global warming potential: For all GWP indicators in A1 – A3 net values are reported (according to the ETS CO_2 production report). The waste status of all (waste-based) fuels has been proven. Gross CO_2 emissions including combustion of proven waste are 648 kg CO_2Eq. / t (GWP total).*

*** Disclaimer: The results of this environmental impact indicator should be used with caution because the uncertainty of these results is high or because there is limited experience with the indicator.*

Additional mandatory and voluntary impact category indicators

Results per functional or declared unit					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
GWP-GHG*	kg CO_2 ekv.	7,09E+01	7,33E+00	4,85E+02	**5,64E+02**
PM	Disease incidence	2,40E-06	5,06E-07	4,99E-06	**7,90E-06**
IRP	kBq U235 ekv.	4,08E+02	1,05E-01	4,21E+00	**4,13E+02**
ETP-fw	CTUe	4,14E+01	4,32E+01	6,26E+02	**7,11E+02**
HTP-c	CTUh	1,72E-07	1,57E-09	7,94E-09	**1,82E-07**
HTP-nc	CTUh	3,92E-06	2,54E-08	1,68E-07	**4,11E-06**
SQP	dimensionless	1,04E+02	6,64E+01	1,60E+02	**3,30E+02**
Acronyms	**GWP-GHG** = this indicator includes all greenhouse gases except biogenic uptake and emissions of carbon dioxide 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, **PM** = Potential incidence of disease due to PM 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				

Resource use indicators

Results per functional or declared unit					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
PERE	MJ	1,88E+01	1,28E+00	4,36E+01	**6,37E+01**
PERM	MJ	0,00E+00	0,00E+00	0,00E+00	**0,00E+00**
PERT	MJ	1,88E+01	1,28E+00	4,36E+01	**6,37E+01**
PENRE	MJ	4,65E+02	1,09E+02	2,40E+03	**2,98E+03**
PENRM	MJ	0,00E+00	0,00E+00	0,00E+00	**0,00E+00**
PENRT	MJ	4,65E+02	1,09E+02	2,40E+03	**2,98E+03**
SM	kg	1,92E+01	0,00E+00	0,00E+00	**1,92E+01**
RSF	MJ	1,67E+01	0,00E+00	4,98E+02	**5,14E+02**
NRSF	MJ	2,48E+01	0,00E+00	1,58E+03	**1,60E+03**
FW	m^3	3,52E-01	0,00E+00	0,00E+00	**3,52E-01**
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				

Additional environmental information - Waste indicators

Results per functional or declared unit					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Hazardous waste disposed	kg	0,00E+00	0,00E+00	3,91E-01	**3,91E-01**
Non-hazardous waste disposed	kg	0,00E+00	0,00E+00	1,13E+00	**1,13E+00**
Radioactive waste disposed	kg	0,00E+00	0,00E+00	0,00E+00	**0,00E+00**

Additional environmental information - Output flow indicators

Results per functional or declared unit					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Components for re-use	kg	0,00E+00	0,00E+00	0,00E+00	**0,00E+00**
Material for recycling	kg	1,57E-01	0,00E+00	2,23E-01	**3,80E-01**
Materials for energy recovery	kg	0,00E+00	0,00E+00	4,12E-01	**4,12E-01**
Exported energy, electricity	MJ	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**

The result tables may only contain values or the letters "ND" (not declared). It is not possible to specify ND for mandatory indicators. ND is only used for voluntary parameters that are not quantified because no data are available.

Other environmental performance indicators

Additional environmental information

References

EN ISO 14025:2010 Environmental labels and declarations - Type III environmental declarations - Principles and procedures
EN ISO 14021:2016 Environmental labels and declarations - Self-declared environmental claims (Type II environmental labelling)
EN 15804:2012+A2:2019/AC:2021 Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products
EN ISO 14040:2006 Environmental management - Life Cycle Assessment - Principles and Framework
EN ISO 14044:2006 Environmental management - Life Cycle Assessment – Requirements and guidelines
EN ISO 14063:2020 Environmental management - Environmental communication - Guidelines and examples
EN 15643:2021 Sustainability of construction works - Framework for assessment of buildings and civil engineering works
EN 15942:2021 Sustainability of construction works - Environmental product declarations - Communication format business-to-business
EN 17672:2022 Sustainability of construction works - Environmental product declarations - Horizontal rules for business-to-consumer communication
TNI CEN/TR 15941:2012 Sustainability of construction works - Environmental product declarations - Methodology for selection and use of generic data
EN 16908:2017+A1:2022 Cement and building lime - Environmental product declarations - Product category rules complementary to EN 15804
EN 16449:2014 Wood and wood-based products - Calculation of the biogenic carbon content of wood and conversion to carbon dioxide
ILCD General guide for Life Cycle Assessment (2010) - JRC EU
Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives; CZ - Act No. 541/2020 Coll., as amended (Waste Act)
Decree No. 8/2021 Coll. Waste catalogue – Waste catalogue
Regulation (EC) No 1907/2006 of the European Parliament concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) and establishing a European Chemicals Agency - REACH (Registration, Evaluation and Authorisation of Chemicals
Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006
SimaPro LCA Package, Pré Consultants, the Netherlands, www.pre-sustainability.com
ECO PLATFORM LCA Calculation Rules and Specifications for EPDs, Version 01 (December 2023)
Ecoinvent Centre, www.Ecoinvent.org
Explanatory documents are available from the EPD owner at holcim-hrvatska@holcim.com.