Product Specific

Environmental Product Declaration for Cement

Heidelberg Materials

Bellingham, WA

Production Facility
Bellingham Cement Terminal
741 Marine Drive, Bellingham, WA

Program Operator
ASTM International
100 Barr Harbor Drive, West
Conshohocken, PA 19428
www.astm.org

ASTM INTERNATIONAL

In accordance with ISO 21930, ISO 14025, ISO 14040, and ISO 14044

EPD Scope: A1-A3 (Cradle to Gate)

Issuance Date: 12/17/2025

Expiration Date: 12/17/2030

Declaration Number: EPD 1103

PATHWAYS

Environmental Impacts

Bellingham Plant: Product-Specific Type III EPD

Declared Cement Products: EcoCemPLC, HE/Type 30, Masonry S

Declared Unit: One metric tonne of cement

	Cement Products		
	EcoCemPLC	HE/Type 30	Masonry S
Total Global Warming Potential (kg CO_2 eq)	**692**	**743**	**477**
Global Warming Potential, Fossil (kg CO_2 eq)	688	738	474
Global Warming Potential, Biogenic (kg CO_2 eq)	4.46	4.80	3.03
Global Warming Potential, Luluc (kg CO_2 eq)	0.03	0.04	0.02
Stratospheric Ozone Depl. Potential (kg CFC-11 eq)	2.69e-6	2.86e-6	1.89e-6
Eutrophication Potential, Marine (kg N eq)	0.2	0.21	0.14
Eutrophication Potential, Freshwater (kg P eq)	0	0	0
Soil and Water Acidification Potential (kg SO2 eq)	1.61	1.72	1.13
Tropospheric Ozone Formation Potential (kg O_3 eq)	56.0	59.9	39.1
Product Components			
Clinker	84.0%	90.5%	56.8%
Limestone, Gypsum, and Others	16.0%	9.5%	43.2%

Reference Standards	ISO 21930:2017 Sustainability in Building Construction-Environmental Declaration of Building Products: serves as the core PCR. Smart EPD Part A Product Category Rules for Building and Construction Products and Services: serves as the Part A PCR. Smart EPD (2025) Part B Product Category Rules for Cements for Construction Version 4.0. Standard 1000-010. Published July 2, 2025: serves as the Part B PCR.
Sub-Category PCR Reviewer	Dr Thomas Gloria (t.gloria@industrial-ecology.com) • Industry Ecology Consulting Garav Das (gd30gcc@gmail.com) • Independent Consultant Emily B Lorenz (emilyblorenz@gmail.com) • Independent Consultant
Internal/External	Independent verification of the declaration, according to ISO 21930:2017 and ISO 14025:2006: ☐ internal ☑ external
LCA Project Third Party Verifier	Dr Thomas Gloria • t.gloria@industrial-ecology.com • Industry Ecology Consulting
EPD Third Party Verifier	Dr Thomas Gloria • t.gloria@industrial-ecology.com • Industry Ecology Consulting
For Additional Material	Manufacture Representative: Ignacio Cariaga (ignacio.cariaga@heidelbergmaterials.com) This LCA EPD was prepared by: Capucine Richard • Pathways (www.pathwaysai.co)

Limitations, Liability, and Ownership

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

Environmental declarations from different programs (ISO 14025) may not be comparable. Comparison of the environmental performance of products using EPD information shall be based on the product's use and impacts at the building or construction works level, and therefore EPDs may not be used for comparability purposes when not considering the whole building life cycle. EPD comparability is only possible when all stages of a life cycle have been considered. However, variations and deviations are possible. Example of variations: Different LCA software and background LCI datasets may lead to differences in results upstream or downstream of the life cycle stages declared.

The environmental impact results of products in this document are based on a declared unit and therefore do not provide sufficient information to establish comparisons. The results shall not be used for comparisons without knowledge of how the physical properties of the product impact the precise function at the construction level. The environmental impact results shall be converted to a functional unit basis before any comparison is attempted.

A manufacturer shall not make claims based on an industry-average EPD which leads the market to believe the industry-average is representative of manufacturer-specific or product-specific results.

Product Names	EcoCemPLC, Type III, Masonry S Cements	**Declaration Number**	EPD 1103
Declared Unit	1 metric ton	**Date of Issue**	12/17/2025
EPD Scope	A1-A3	**Expiration**	12/17/2030
Markets of Applicability	US and Canada	**Last Updated**	12/17/2025

Company Description

Heidelberg Materials is a leading supplier of cementitious materials in North America. Their Bellingham plant started operations in May 1913, under the name Olympic Portland Cement. The cement plant was one of Bellingham's largest employers until the 1950s. The plant stopped producing clinker in 1987 and is now a cement grinding facility and fly ash distribution location. The Bellingham plant receives all its clinker from the Heidelberg plant in Delta, British Columbia. Raw materials for cement production are received by rail, truck, and barge into the Port of Bellingham. Water and rail access help mitigate the environmental impact through efficient and more sustainable transportation of raw materials and delivery of cement. Heidelberg Materials' commitment to sustainable manufacturing processes includes actively working to create low-carbon cements through supplementary cementitious materials (SCMs), and alternative raw materials and fuels. Consistent with their vision of reducing greenhouse gas (GHG) emissions to produce net-zero cement by 2050, Heidelberg Materials has developed product and plant specific EPDs as baselines for its embodied carbon.

Heidelberg Materials believes that the health and well-being of their employees, communities and the natural environment are vital to their success. In Bellingham, the company gives back by supporting Alderwood Elementary School with an annual donation to help the school provide much needed meals and access to the music, art and sports programs. Alderwood Elementary is less than one mile from the plant, so the annual donation has a positive impact on the community in which we operate.

Product Information

EcoCemPLC

Product Type	Portland Limestone Cement	**Standard Designation**	Type IL (GUL)
Applicable Standards	ASTM C595, C1157, AASHTO M240, CSA A3001	**Supply-Chain Specificity of Product**	95.3%
UNSPSC Code	30111504	**UNCPC Code**	3744

Type III

Product Type	Portland Cement	**Standard Designation**	Type III (HE)
Applicable Standards	ASTM C150, C1157, AASHTO M85, CSA A3001	**Supply-Chain Specificity of Product**	95.4%
UNSPSC Code	30111504	**UNCPC Code**	3744

Masonry S

Product Type	Masonry Cement	**Standard Designation**	Type S
Applicable Standards	ASTM C91, CSA A3002	**Supply-Chain Specificity of Product**	94.9%
UNSPSC Code	30111504	**UNCPC Code**	3744

Product Description

This EPD reports environmental transparency information for three cement products, produced by Heidelberg Materials at their Bellingham, WA grinding facility; EcoCem®PLC, Type III (HE/Type 30), and Masonry S cements. These cements are hydraulic binders and are manufactured by grinding cement clinker and other main or minor constituents into a finely ground, usually grey colored mineral powder. Cement is just one ingredient in the mixture that creates concrete, but it is the most chemically active ingredient and crucial to the quality of the final product. When mixed with water, cement acts as a glue to bind together the sand, gravel or crushed stone to form concrete, one of the most durable, resilient and widely used construction materials in the world. EcoCem®PLC, Heidelberg Material's branded Type IL/GUL cement, is manufactured to provide strength and durability while reducing carbon footprint of the cement. This product is a portland limestone cement product for concrete and mortar as well as all various applications for cement, including engineered soils and solidification/stabilization of materials and wastes.

Materials and Composition

Product	Product components
EcoCemPLC	Clinker, Limestone, Synthetic Gypsum, Grinding Aids
Type III (HE)	Clinker, Synthetic Gypsum, Grinding Aids
Masonry S	Clinker, Limestone, Synthetic Gypsum, Masonry Additives

Hazardous Materials
No hazardous substances are contained in the products according to the normative requirements of the US and Canadian EPD markets per the Smart EPD Part A PCR. Wastes classifications have been assessed per the US waste classification: Resource Conservation and Recovery Act (RCRA), Subtitle C.

EPD Representativeness

Primary Data Year	2024	
Manufacturing Specificity	X	Industry average
	X	Manufacturer average
	✓	Facility-specific
	✓	Product-specific
	X	Product-average

System Boundary

Production	A1	Raw material supply	✓
	A2	Transport	✓
	A3	Manufacturing	✓
Construction	A4	Transport to site	
	A5	Assembly / install	
Use	B1	Use	
	B2	Maintenance	
	B3	Repair	
	B4	Replacement	
	B5	Refurbishment	
	B6	Operational energy use	
	B7	Operational water use	
End of Life	C1	Deconstruction	
	C2	Transport	
	C3	Waste processing	
	C4	Disposal	
Benefits & Loads Beyond System Boundary	D	Recycling, reuse, recovery potential	

General Cement System Boundary Diagram

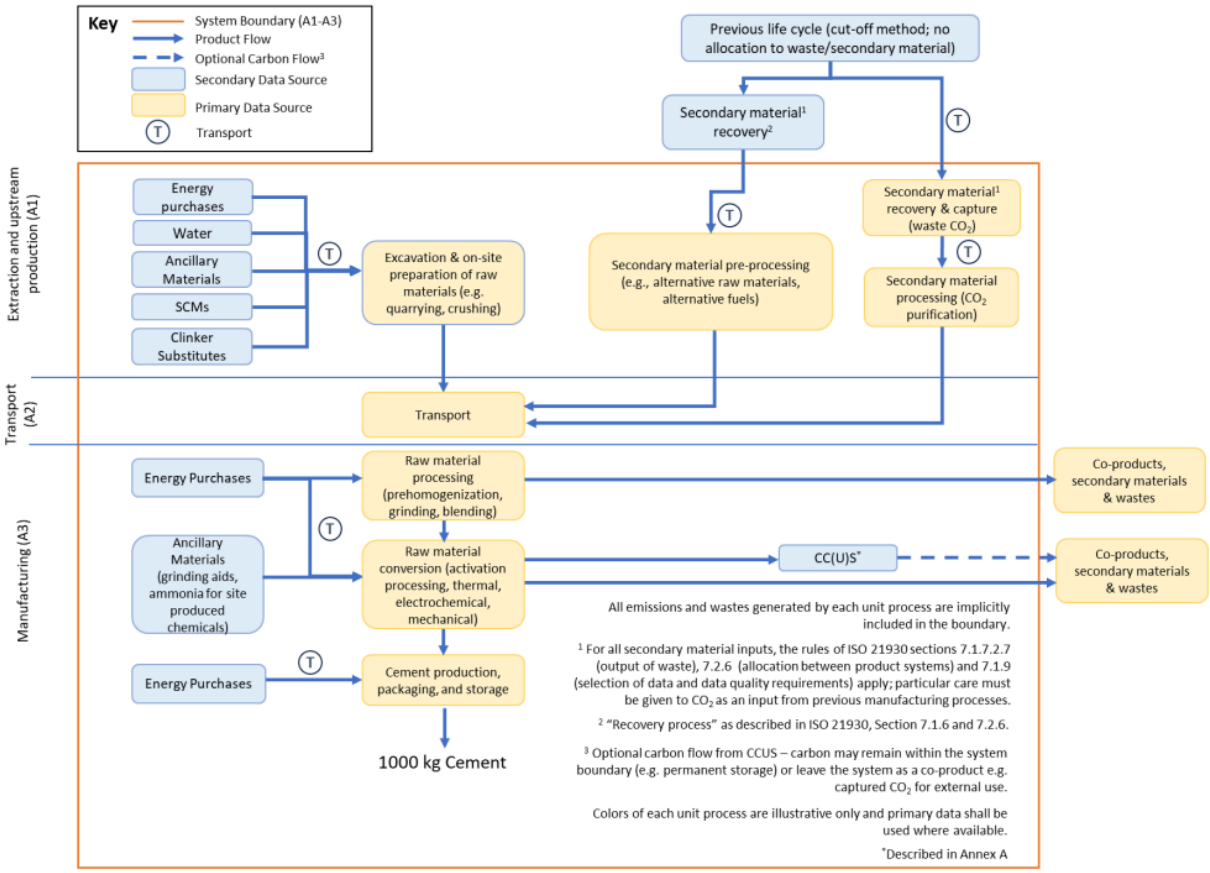

Diagram from Smart EPD (2025) Part B Product Category Rules for Cements for Construction Version 4.0. Standard 1000-010

Manufacturing Process Description

EcoCemPLC

EcoCemPLC cement manufacturing uses clinker as a main cementitious input; additional raw materials include synthetic gypsum, limestone, and grinding aids. These materials are ground together using electricity to produce EcoCemPLC Cement.

Type III

Type III cement manufacturing uses clinker as a cementitious input; additional raw materials include synthetic gypsum, limestone, and grinding aids. These materials are ground together using electricity to produce Type III Cement.

Masonry S

Masonry S cement manufacturing uses clinker as a main cementitious input; additional raw materials include synthetic gypsum, limestone, and masonry additives. These materials are ground together using electricity to produce Masonry S cement.

Software and Data

Software

LCA Software	Pathways v1.0

Data Quality

Indicator	**Definition**		**Data Quality Score Meaning**	**Data Quality Score** (1=lowest; 5=highest)
Temporal representativeness	Indicates the temporal difference between the date of data generation and the date the data are supposed to represent based on the PCR		Previous calendar or financial year (1 year)	1
Geographical representativeness	Indicates how well the geographical area from which data for a unit process are collected satisfies the goal of the study		Site-specific data	1
Technological Representativeness	Indicates technical representativeness based on four categories: process design, operating conditions, material quantity/type and process scale		Site-specific data	1
Reliability (Precision, Accuracy, Verification)	Indicates quality of data generation method and verification of data collection methods	Combustion emissions		1
		Calcination emissions		1
		Thermal energy quantity by source type	Site-specific data	1
		Electricity quantities	Site-specific data	1
		Raw material quantities	Site-specific data	1
		Waste quantities	Site-specific data	1
		Inbound transport distance	Site-specific data	1
		Outbound transport distances from A3	Default values	2
		Raw material quantities	Site-specific data	1
		Waste quantities	Site-specific data	1

Data Sources

Material/ Process Category	**Module**	**Material/ Process Name**	**Inventory Dataset Name**	**Dataset Geographic Region**	**Reporting Period/Year Dataset Represents**	**Reference**
Material/ Product	A1	Aggregate	Gravel production, crushed	Rest of World	1997-2023	ecoinvent Association. (2023). *ecoinvent database, version 3.10*. Zurich, Switzerland: ecoinvent Association.
	A1	Clinker production	EPD from Delta Plant	British Columbia	2024	n/a
	A1	Limestone	Market for limestone, crushed for mill - RoW (Ecoinvent 3.10)	Rest of World	2011-2023	ecoinvent Association. (2023). *ecoinvent database, version 3.10*. Zurich, Switzerland: ecoinvent Association.

	A1	Grinding aids	Alkylbenzene sulfonate production, linear, petrochemical - RoW (Ecoinvent 3.10)	Rest of World	1992-2023	ecoinvent Association. (2023). *ecoinvent database, version 3.10*. Zurich, Switzerland: ecoinvent Association.
	A1	Synthetic gypsum	Market for gypsum, mineral - RoW (Ecoinvent 3.10)	Rest of World	2017-2023	ecoinvent Association. (2023). *ecoinvent database, version 3.10*. Zurich, Switzerland: ecoinvent Association.
	A1	Fly Ash	burden-free production (default)	Global	2011-2023	ecoinvent Association. (2023). *ecoinvent database, version 3.10*. Zurich, Switzerland: ecoinvent Association.
	A1	Masonry additives	EFCA 2021 Concrete Admixtures - Plasticizers and Superplasticizers	Global	2021	European Federation of Concrete Admixtures Associations (EFCA). (2021). *Model Environmental Product Declaration – Concrete admixtures: Plasticisers and Superplasticisers*, 2021
	A3	Process water	Market for tap water - RoW (Ecoinvent 3.10)	Rest of World	2012-2023	ecoinvent Association. (2023). *ecoinvent database, version 3.10*. Zurich, Switzerland: ecoinvent Association.
Transportation	A2	Truck Transport	Transport, combination truck, long-haul, diesel powered, Northeast (adjusted petroleum for diesel coproduction) (USLCI)	United States	2024	U.S. Life Cycle Inventory Database. (2012). National Renewable Energy Laboratory. Accessed Sept. 9, 2025: https://www.lcacommons.gov/nrel/search
	A2	Ocean freighter	Transport, ocean freighter average fuel mix (adjusted petroleum for diesel coproduction)	United States	2023	U.S. Life Cycle Inventory Database. (2012). National Renewable Energy Laboratory. Accessed Sept. 9, 2025: https://www.lcacommons.gov/nrel/search
	A2	Rail	Transport, train, diesel powered (USLCI), adjusted for supplier-specific emissions.	United States	2012	U.S. Life Cycle Inventory Database. (2012). National Renewable Energy Laboratory. Accessed Sept. 9, 2025: https://www.lcacommons.gov/nrel/search
Electricity	A3	Electricity - medium voltage	NWPP EPD Power Profile 2023 (eGrid)	Northwest US	2023	U.S. Environmental Protection Agency. (2025). eGRID Power Profiler. https://www.epa.gov/egrid/power-profiler#
Energy	A3	Diesel - mobile equipment	Diesel, combusted in industrial equipment (USLCI)	United States	2003	U.S. Life Cycle Inventory Database. (2012). National Renewable Energy Laboratory. Accessed Sept. 9, 2025: https://www.lcacommons.gov/nrel/search

Waste/Other	A3	Wastewater	Treatment of wastewater, average, wastewater treatment (Ecoinvent 3.10)	Rest of World	2010-2023	ecoinvent Association. (2023). *ecoinvent database, version 3.10*. Zurich, Switzerland: ecoinvent Association.

LCA Discussion

Allocation Procedure

Allocation follows the requirements and guidance of ISO 14044:2006, Clause 4.3.4; ISO 21930:2017 section 7.2 and Smart EPD (2025) Part B Product Category Rules for Cements for Construction Version 4.0. Recycling and recycled content is modeled using the cut-off rule.

This sub-category PCR recognizes coal combustion products, other combustion ashes, granulated blast-furnace slag, silica fume, off-spec lime, mine tailings, recycled concrete fines, ponded/washed fines from grinding or crushing of aggregates, metallurgical slag, flue gas desulfurization gypsum, lime kiln dust, and cement kiln dust as recovered materials and thus the environmental impacts allocated to these materials are limited to the treatment and transportation required to use as a cement material input.

Cut-Off Procedure

All known energy and material flow data were included in accordance with the system boundary. Proxy data were used as needed in the model to capture all considered life cycle impacts, aligning with ISO requirements for data completeness.

Items excluded from system boundary include:

- Production, manufacture and construction of manufacturing capital goods and infrastructure;
- Production and manufacture of production equipment, delivery vehicles, and laboratory equipment;
- Personnel-related activities (travel, furniture, and office supplies); and
- Energy and water use related to company management and sales activities that may be located either within the factory site or at another location.

Results

LCIA Results - EcoCemPLC

Impact Assessment	Unit	A1	A2	A3	A1-A3
Global warming potential – total (GWP-total)	kg CO_2 eq	10.2	26.7	655.5	692
Global warming potential – fossil (GWP-fossil)	kg CO_2 eq	10.2	26.7	651	688
Global warming potential – biogenic (GWP-biogenic)	kg CO_2 eq	0.03	0.01	4.41	4.46
Global warming potential – luluc (GWP-luluc)	kg CO_2 eq	7.01e-3	0	0.03	0.03
Global warming potential – CC (GWP-CC)	kg CO_2 eq	0	0	0	0
Global warming potential – S (GWP-CC)	kg CO_2 eq	0	0	0	0
Global warming potential – U (GWP-U)	kg CO_2 eq	0	0	0	0
Depletion potential of the stratospheric ozone layer (ODP)	kg CFC-11 eq	1.25e-7	3.87e-7	2.18e-6	2.69e-6
Eutrophication potential – marine (EP-marine)	kg N eq	8.47e-3	0.02	0.17	0.20
Eutrophication potential – freshwater (EP-freshwater)	kg P eq	6.69e-4	4.00e-5	-5.91e-3	-5.20e-3
Acidification potential (AP)	kg SO_2 eq	0.09	0.17	1.35	1.61
Formation potential of tropospheric ozone (POCP)	kg O_3 eq	2.13	5.43	48.4	56.0
Resource Uses					
Use of renewable primary energy resources (RPR_E)	MJ	4.37	0	57.3	61.7
Use of renewable primary energy resources used as raw materials (RPR_M)	MJ	0	0	185	185
Total use of renewable primary energy resources (RPR_T)	MJ	4.37	0	242	246
Use of non-renewable primary energy resources ($NRPR_E$)	MJ	101	0	0	101
Use of non-renewable primary energy resources used as raw materials ($NRPR_M$)	MJ	21.5	0	256	277
Total use of non-renewable primary energy resources ($NRPR_T$)	MJ	122.5	0	256	378
Use of secondary material (SM)	kg	0.05	0	0.06	0.12

Use of renewable secondary fuels (RSF)	MJ	1.18e-3	0	5.72e-4	1.76e-3
Use of non-renewable secondary fuels (NRSF)	MJ	0	0	0	0
Use of net fresh water (FW)	m^3	1.59	0	90.6	92.2
Use of recovered energy (RE)	MJ	0.08	0	0.32	0.40
Recovered energy (RE)	MJ	0.08	0	0.32	0.40
Waste & Output Flows					
Hazardous waste disposed (HWD)	kg	2.52	0	0.92	3.44
Non-hazardous waste disposed (NHWD)	kg	7.42	0	517	525
High-level radioactive waste	kg	1.12e-5	0	1.25e-5	2.37e-5
Intermediate and low-level radioactive waste	kg	2.84e-5	0	2.73e-5	5.57e-5
Materials for energy recovery	kg	3.20e-5	0	3.71e-6	3.57e-5
Materials for recycling (MFR)	kg	1.65e-3	0	3.88	3.88
Components for reuse (CFR)	kg	0	0	0	0
Exported energy – electricity (EEE)	MJ	0.02	0	0.26	0.28

Additional Carbon Emissions and Removals – EcoCemPLC

Parameter	Value, kg CO_2 eq
Biogenic Carbon Removal from Product	0
Biogenic Carbon Emission from Product	0
Biogenic Carbon Removal from Packaging	0
Biogenic Carbon Emission from Packaging	0
Biogenic Carbon Emission from Combustion of Waste from Renewable Sources Used in Production Processes	38.4
Calcination Carbon Emissions	363.7
Carbonation Carbon Removals	0
Carbon Emissions from Combustion of Waste from Non-Renewable Sources used in Production Processes	49.3
Global Warming Potential - Carbon Capture	0
Global Warming Potential - Sequestration	0
Global Warming Potential - Utilization	0
Global Warming Potential - Carbon Capture, Utilization, and Sequestration	0

GWP Impact Reporting for Different Processes – EcoCemPLC

Impact Category		Unit	Primary Fuels Combustion	Alternative Fuels Combustion	Calcination	Other	GWP-CC	GWP-S	GWP-U	GWP-CCUS
GWP	Fossil	kg CO2 eq	208.6	10.9	363.7	0	0	0	0	0
	Biogenic	kg CO2 eq	0	38.4	0	0	0	0	0	0
	Total	kg CO2 eq	208.6	49.3	363.7	0	0	0	0	0

LCIA Results – Type III

Impact Assessment	Unit	A1	A2	A3	A1-A3
Global warming potential – total (GWP-total)	kg CO_2 eq	10.07	28.1	704	743
Global warming potential – fossil (GWP-fossil)	kg CO_2 eq	10.0	28.1	700	738
Global warming potential – biogenic (GWP-biogenic)	kg CO_2 eq	0.03	0.01	4.75	4.80
Global warming potential – luluc (GWP-luluc)	kg CO_2 eq	7.00e-3	0	0.03	0.04
Global warming potential – CC (GWP-CC)	kg CO_2 eq	0	0	0	0
Global warming potential – S (GWP-CC)	kg CO_2 eq	0	0	0	0
Global warming potential – U (GWP-U)	kg CO_2 eq	0	0	0	0
Depletion potential of the stratospheric ozone layer (ODP)	kg CFC-11 eq	1.13e-7	4.11e-7	2.34e-6	2.86e-6
Eutrophication potential – marine (EP-marine)	kg N eq	8.54e-3	0.02	0.18	0.21
Eutrophication potential – freshwater (EP-freshwater)	kg P eq	5.64e-4	4.26e-5	0	0
Acidification potential (AP)	kg SO_2 eq	0.09	0.17	1.46	1.72
Formation potential of tropospheric ozone (POCP)	kg O_3 eq	2.15	5.66	52.1	59.9
Resource Uses					
Use of renewable primary energy resources (RPR_E)	MJ	4.04	0	61.6	65.7
Use of renewable primary energy resources used as raw materials (RPR_M)	MJ	0	0	199	199
Total use of renewable primary energy resources (RPR_T)	MJ	4.04	0	261	265

Use of non-renewable primary energy resources ($NRPR_E$)	MJ	95.3	0	0	95.3
Use of non-renewable primary energy resources used as raw materials ($NRPR_M$)	MJ	12.2	0	275	288
Total use of non-renewable primary energy resources ($NRPR_T$)	MJ	95.3	0	275	383
Use of secondary material (SM)	kg	0.05	0	0.07	0.12
Use of renewable secondary fuels (RSF)	MJ	1.13e-3	0	6.13e-4	1.75e-3
Use of non-renewable secondary fuels (NRSF)	MJ	0	0	0	0
Use of net fresh water (FW)	m^3	1.70	0	97.6	99.3
Recovered energy (RE)	MJ	0.06	0	0.35	0.41
Waste & Output Flows					
Hazardous waste disposed (HWD)	kg	2.65	0	0.98	3.63
Non-hazardous waste disposed (NHWD)	kg	6.84	0	522	529
High-level radioactive waste	kg	1.02e-5	0	1.30e-5	2.33e-5
Intermediate and low-level radioactive waste	kg	2.58e-5	0	2.84e-5	5.43e-5
Materials for energy recovery	kg	2.80e-5	0	3.92e-6	3.19e-5
Materials for recycling (MFR)	kg	1.50e-3	0	4.18	4.18
Components for reuse (CFR)	kg	0	0	0	0
Exported energy – electricity (EEE)	MJ	0.01	0	0.28	0.30
Exported energy – electricity (EEE)	MJ	0.02	0	0.26	0.28

Additional Carbon Emissions and Removals – Type III

Parameter	Value, kg CO_2 eq
Biogenic Carbon Removal from Product	0
Biogenic Carbon Emission from Product	0
Biogenic Carbon Removal from Packaging	0
Biogenic Carbon Emission from Packaging	0
Biogenic Carbon Emission from Combustion of Waste from Renewable Sources Used in Production Processes	41.3
Calcination Carbon Emissions	391.9
Carbonation Carbon Removals	0
Carbon Emissions from Combustion of Waste from Non-Renewable Sources used in Production Processes	53.2

Global Warming Potential - Carbon Capture	0
Global Warming Potential - Sequestration	0
Global Warming Potential - Utilization	0
Global Warming Potential - Carbon Capture, Utilization, and Sequestration	0

GWP Impact Reporting for Different Processes – Type III

Impact Category		Unit	Primary Fuels Combustion	Alternative Fuels Combustion	Calcination	Other	GWP-CC	GWP-S	GWP-U	GWP-CCUS
GWP	Fossil	kg CO2 eq	224.8	11.8	391.9	0	0	0	0	0
	Biogenic	kg CO2 eq	0	41.4	0	0	0	0	0	0
	Total	kg CO2 eq	224.8	53.2	391.9	0	0	0	0	0

LCIA Results – Masonry S

Impact Assessment	Unit	A1	A2	A3	A1-A3
Global warming potential – total (GWP-total)	kg CO_2 eq	7.36	20.2	449.9	477
Global warming potential – fossil (GWP-fossil)	kg CO_2 eq	7.34	20.2	447	474
Global warming potential – biogenic (GWP-biogenic)	kg CO_2 eq	0.02	8.34e-3	2.99	3.03
Global warming potential – luluc (GWP-luluc)	kg CO_2 eq	4.6e-3	0	0.02	0.02
Global warming potential – CC (GWP-CC)	kg CO_2 eq	0	0	0	0
Global warming potential – S (GWP-CC)	kg CO_2 eq	0	0	0	0
Global warming potential – U (GWP-U)	kg CO_2 eq	0	0	0	0
Depletion potential of the stratospheric ozone layer (ODP)	kg CFC-11 eq	8.55e-8	2.76e-7	1.53e-6	1.89e-6
Eutrophication potential – marine (EP-marine)	kg N eq	7.21e-3	0.02	0.11	0.14
Eutrophication potential – freshwater (EP-freshwater)	kg P eq	4.34e-4	2.86e-5	-5.63e-3	-5.17e-3
Acidification potential (AP)	kg SO_2 eq	0.07	0.13	0.93	1.13
Formation potential of tropospheric ozone (POCP)	kg O_3 eq	1.81	4.26	33.1	39.1
Resource Uses					
Use of renewable primary energy resources (RPR_E)	MJ	5.61	0	39.0	44.7

Use of renewable primary energy resources used as raw materials (RPR_M)	MJ	0.14	0	125	125
Total use of renewable primary energy resources (RPR_T)	MJ	5.7	0	164	170
Use of non-renewable primary energy resources ($NRPR_E$)	MJ	99.0	0	0	99
Use of non-renewable primary energy resources used as raw materials ($NRPR_M$)	MJ	15.0	0	173	188
Total use of non-renewable primary energy resources ($NRPR_T$)	MJ	114	0	173	287
Use of secondary material (SM)	kg	0.04	0	0.05	0.09
Use of renewable secondary fuels (RSF)	MJ	9.00e-4	0	4.03e-4	1.30e-3
Use of non-renewable secondary fuels (NRSF)	MJ	0	0	0	0
Use of net fresh water (FW)	m^3	1.10	0	61.3	62.4
Recovered energy (RE)	MJ	0.04	0	0.22	0.26
Waste & Output Flows					
Hazardous waste disposed (HWD)	kg	1.71	0	0.66	2.36
Non-hazardous waste disposed (NHWD)	kg	4.97	0	497	502
High-level radioactive waste (HLRW)	kg	7.20e-6	0	1.02e-5	1.74e-5
Intermediate and low-level radioactive waste (ILLRW)	kg	8.34e-4	0	2.24e-5	8.56e-4
Materials for energy recovery (MER)	kg	1.85e-5	0	2.82e-6	2.13e-5
Materials for recycling (MFR)	kg	1.10e-3	0	2.62	2.62
Components for reuse (CFR)	kg	0	0	0	0
Exported energy – electricity (EEE)	MJ	9.76e-3	0	0.18	0.19

Additional Carbon Emissions and Removals – Masonry S

Parameter	Value, kg CO_2 eq
Biogenic Carbon Removal from Product	0
Biogenic Carbon Emission from Product	0
Biogenic Carbon Removal from Packaging	0
Biogenic Carbon Emission from Packaging	0
Biogenic Carbon Emission from Combustion of Waste from Renewable Sources Used in Production Processes	25.9
Calcination Carbon Emissions	245.9
Carbonation Carbon Removals	0
Carbon Emissions from Combustion of Waste from Non-Renewable Sources used in Production Processes	33.4
Global Warming Potential - Carbon Capture	0
Global Warming Potential - Sequestration	0
Global Warming Potential - Utilization	0
Global Warming Potential - Carbon Capture, Utilization, and Sequestration	0

GWP Impact Reporting for Different Processes – Masonry S

Impact Category		Unit	Primary Fuels Combustion	Alternative Fuels Combustion	Calcination	Other	GWP-CC	GWP-S	GWP-U	GWP-CCUS
GWP	Fossil	kg CO2 eq	168.9	8.8	245.9	0	0	0	0	0
	Biogenic	kg CO2 eq	0	31.2	0	0	0	0	0	0
	Total	kg CO2 eq	168.9	40.0	245.9	0	0	0	0	0

Note: comparisons cannot be made between product-specific or industry average EPDs at the design stage of a project, before a building or construction works has been specified. Comparisons may be made between product-specific or industry average EPDs at the time of product purchase only when product or construction works performance and specifications have been established and serve as a functional unit for comparison. Environmental impact results shall be converted to a functional unit basis before any comparison is attempted. Any comparison of EPDs shall be subject to the requirements of ISO 21930 or EN 15804. EPDs are not comparative assertions and are either not comparable or have limited comparability when they have different system boundaries, are based on different product category rules or are missing relevant environmental impacts. Such comparisons can be inaccurate and could lead to erroneous selection of materials or products that are higher-impact, at least in some impact categories.

Additional Environmental Information

Additional information for reporting transport from cement plant gate

Plant/Gate Location	Percent of Supply	Transport Mode (Leg 1)	Distance and Unit	End User or Terminal Location
Bellingham	100%	Rail	446 km	Portland, OR - 4035 SE - 22nd Ave

Environmental Management System (EMS)

The Bellingham Grinding Plant has processes in place which identifies environmental impacts and related best management practices and controls. These policies and procedures are continually reviewed and updated to reflect current environmental knowledge and regulations. The various plans provide plant personnel with information on environmental procedures and requirements.

- Site Specific Emergency Management Plan
- Spill Prevention, Control, and Countermeasures Plan
- Stormwater Pollution Prevention Plan
- Operations and Maintenance Plan for Air Emission Sources
- Solid Waste Control Plan

For environmental reporting the plant complies with Washington State and United States federal requirements and reporting. The Plant maintains a Title V Air Operating Permit (AOP 022R1) issued by the Northwest Clean Air Agency (NWCAA) in accordance with the provisions of the Regulation of the NWCAA and Chapter 173-401 of the Washington Administrative Code. The permit also requires compliance with the federal New Source Performance Standards (NSPS) and the National Emission Standards for Hazardous Air Pollutants (NESHAP). Emissions reporting is completed annually through the Washington Emissions Inventory Reporting System.

The plant maintains coverage under the Washington State Industrial Stormwater General Permit. The program includes stormwater outfall monitoring, online data submittal, routine inspections, and annual compliance reporting.

The Plant maintains a Tier II inventory and submits annual reports to the Washington Department of Ecology, Whatcom County, and the local fire department under the Community-Right-to-Know reporting program.

The Plant maintains a Solid Waste Control Plan which outlines the proper handling, management, and disposal requirements for general office waste, universal waste (e.g. batteries, light bulbs, scrap metal), electronics, and hazardous materials (e.g. waste oil, waste chemicals, oily rags, etc.)

Heidelberg Materials Sustainability Commitments 2030

The world needs smart, sustainable and resilient infrastructure, buildings, and public spaces. At Heidelberg Materials, we have transformed our business to address these challenges, and placed sustainability at the core of what we do.

The United Nations Sustainable Development Goals (SDGs) shape our strategy and sustainability commitments. Our Sustainability Commitments 2030 support our vision to build a more sustainable future that is net zero, safe and inclusive, nature positive, and circular and resilient. Learn more at Sustainability Commitments 2030 (heidelbergmaterials.com/en/sustainability).

References

ACLCA. (2018). *ACLCA Guidance to Calculating Non-LCIA Inventory Metrics in Accordance with ISO 21930: 2017.*

ACLCA. (2025). *EPD classifications addendum 2025: Guidance for determining EPD types and calculating and communicating data specificity through the supply chain*. ACLCA.

Bare, J. (2011). TRACI - The Tool for the Reduction and Assessment of Chemical and other Environmental Impacts. *CLEAN TECHNOLOGIES AND ENVIRONMENTAL POLICY*.

European Standards. (2012). *EN 15804 - 2012 Sustainability of construction works, Environmental product declarations, Core rules for the product category of construction products.*

Guinée, J.B. et al. (2002). *Handbook on life cycle assessment. Operational guide to the ISO standards. I: LCA in perspective. IIa: Guide. IIb: Operational annex. III: Scientific background.* Dordrecht: Kluwer Academic Publishers.

IPCC. (2021). *Climate Change 2021: The Physical Science Basis.* IPCC.

ISO. (2006a). *14040:2006/Amd.1:2020 – Environmental management — Life cycle assessment — Principles and framework.* Geneva: International Organization of Standardization.

ISO. (2006b). *14044:2006/Amd.1:2017/Amd.2:2020 – Environmental management — Life cycle assessment — Requirements and guidelines.* Geneva: International Organization for Standardization.

National Renewable Energy Laboratory. (2012). *U.S. Life Cycle Inventory Database*. U.S. Department of Energy. https://www.lcacommons.gov/nrel/search

Smart EPD (2025) *Part A Product Category Rules for Building and Construction Products and Services* 1000-012 . Published March 14, 2025. www.smartepd.com.

Smart EPD (2025) *Part B Product Category Rules for Cements for Construction Version 4.0. Standard* 1000-010. Published July 2, 2025. www.smartepd.com. .

Statistics Canada. (2024). *Electric power generation, fuel consumed and cost of fuel by electricity generating thermal plants (Table 25-10-0084-01)*. https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=2510008401

UL Environment. (2022). *Part A: Life Cycle Assessment Calculation Rules and Report Requirements.* UL Environment.

Wernet, G., Bauer, C., Steubing, B., Reinhard, J., Moreno-Ruiz, E., & Weidema, B. (2016). The ecoinvent database version 3 (part I): overview and methodology. *The International Journal of Life Cycle Assessment*, 1218-1230.