

Environmental Product Declaration (EPD) for CarbonSense Cement Produced at Ozinga's Blending Facility

GENERAL INFORMATION

This cradle to gate Environmental Product Declaration covers a blended cement product produced at Ozinga's blending facility. The Life Cycle Assessment (LCA) was prepared in conformity with ISO 21930, ISO 14025, ISO 14040, and ISO 14044. This EPD is intended for business-to-business (B-to-B) audiences.

OZINGA CEMENT

Ozinga Blending Facility
3221 E 95th St
Chicago, IL

PROGRAM OPERATOR

ASTM International
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DATE OF ISSUE

EPD 592 Ozinga CarbonSense Cement
October 5, 2023 (valid for 5 years until
October 5, 2028)

ENVIRONMENTAL IMPACTS

Ozinga Blending Facility: Product- Specific EPD
Declared Cement Product: CarbonSense Blend
Declared Unit: One metric tonne of cement

	CarbonSense Cement
Global Warming Potential (kg CO ₂ e)	1.37E+02
Ozone Depletion (kg CFC11e)	1.11E-05
Acidification (kg SO ₂ e)	5.84E-01
Eutrophication (Ne)	2.62E-01
Formation potential of tropospheric ozone (kg O ₃ e)	8.76E+00
Abiotic depletion potential for non-fossil mineral resources (kg Sbe)	1.05E-04
Abiotic depletion potential for fossil resources (MJ, NCV)	2.37E+02
Product Components: Portland Limestone Cement, GGBFS, Other Additives	

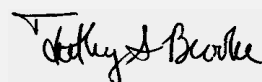
Additional detail and impacts are reported on page 5

ISO 21930:2017 Sustainability in Building Construction-Environmental Declaration of Building Products: serves as the core PCR
NSF PCR for Portland, Blended, Masonry, Mortar, and Plastic (Stucco) Cements V3.2, September 2021: serves as the sub-category PCR

Sub-category PCR review was conducted by

Thomas P. Gloria, PhD. (t.gloria@industrial-ecology.com)

• Industrial Ecology Consultants



Independent verification of the declaration, according to ISO 21930:2017 and ISO 14025:2006.: ☐ internal ☒ external

Third party verifier •

For additional explanatory material

This LCA EPD was prepared by: Alana Brittin (alana@wapsustainability.com) • WAP Sustainability Consulting

EPDs are comparable only if they comply with ISO 21930 (2017), use the same, sub-category PCR where applicable, include all relevant information modules and are based on equivalent scenarios with respect to the context of construction works.

LIFE CYCLE ASSESSMENT

PRODUCER



Ozinga provides quality bulk materials and diverse concrete solutions delivered where you need it, when you need it with our extensive network of transportation services including truck, rail, barge and ship terminals across the Midwest and South Florida regions. Perhaps best recognized for our red and white striped concrete mixer trucks, Ozinga is proud to be an American-owned, fourth-generation family business serving individuals and the communities where we live and work since 1928.

PRODUCT

The cement product covered in this EPD meet UN CPC 3744 classification and the following standards:

Product Type	Applicable Standard	Standard Designation - Ozinga Brand Name
Blended Cement	CSA A3000-98	CarbonSense Cement
	ASTM C1157	Type I

PRODUCT DESCRIPTION

This EPD reports environmental transparency information for one product, produced by Ozinga at their Chicago, IL facility. The product is an Innovative ASTM C1157 Low Carbon Cement.

DECLARED UNIT

The declared unit is one metric tonne of CarbonSense Cement produced at Ozinga's facility.



SYSTEM BOUNDARY

This EPD is a cradle-to-gate EPD covering A1-A3 stages of the life cycle. See Appendix A for data sources.

BUILDING LIFE CYCLE INFORMATION MODULES (X: Included in LCA; MND: Module Not Declared)															
Production Stage			Construction Stage		Use Stage							End-Of-Life Stage			
Extraction and Upstream Production	Transport to Facility	Manufacturing	Transport to Site	Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational Energy Use	Operational Water Use	De-Construction /Demolition	Transport to Waste Process. or Disposal	Waste Processing	Disposal of Waste
			A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
			X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

CUT-OFF

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.

ALLOCATION PROCEDURE

Allocation follows the requirements and guidance of ISO 14044:2006, Clause 4.3.4; NSF PCR:2021; and ISO 21930:2017 section 7.2. Recycling and recycled content is modeled using the cut-off rule.

This sub-category PCR recognizes fly ash, silica fume, granulated blast furnace slag, cement kiln dust, flue gas desulfurization (FGD) gypsum, and post-consumer gypsum 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.

LIFE CYCLE IMPACT ASSESSMENT RESULTS – Ozinga Cement Product: CarbonSense Cement (per 1 metric tonne)

Impact Assessment	Unit	Total	A1	A2	A3
Global warming potential (GWP) ¹	kg CO ₂ eq	1.37E+02	1.29E+02	7.28E+00	1.01E+00
Depletion potential of the stratospheric ozone layer (ODP)	kg CFC-11 eq	1.11E-05	1.09E-05	1.19E-07	6.06E-08
Eutrophication potential (EP)	kg N eq	2.62E-01	2.55E-01	2.91E-03	3.93E-03
Acidification potential of soil and water sources (AP)	kg SO ₂ eq	5.84E-01	5.38E-01	4.31E-02	3.37E-03
Formation potential of tropospheric ozone (POCP)	kg O ₃ eq	8.76E+00	7.55E+00	1.18E+00	2.88E-02
Resource Use					
Abiotic depletion potential for non-fossil mineral resources (ADPelements)*	kg Sb eq	1.05E-04	9.90E-05	4.94E-08	5.88E-06
Abiotic depletion potential for fossil resources (ADPfossil)	MJ, NCV	2.37E+02	1.33E+02	9.32E+01	1.08E+01
Renewable primary energy resources as energy (fuel), (RPRE)*	MJ, NCV	6.74E+01	6.67E+01	1.15E-01	5.28E-01
Renewable primary resources as material, (RPRM)*	MJ, NCV	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Non-renewable primary resources as energy (fuel), (NRPRE)*	MJ, NCV	1.67E+03	1.55E+03	9.90E+01	1.95E+01
Non-renewable primary resources as material (NRPRM)*	MJ, NCV	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Consumption of fresh water	m3	7.93E-02	7.44E-02	1.44E-04	4.78E-03
Secondary Material, Fuel and Recovered Energy					
Secondary Materials, (SM)*	kg	1.05E+03	1.05E+03	0.00E+00	0.00E+00
Renewable secondary fuels, (RSF)*	MJ, NCV	1.35E+01	1.35E+01	0.00E+00	0.00E+00
Non-renewable secondary fuels (NRSF)*	MJ, NCV	1.20E+01	1.20E+01	0.00E+00	0.00E+00
Recovered energy, (RE)*	MJ, NCV	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Waste & Output Flows					
Hazardous waste disposed*	kg	6.44E-03	6.44E-03	0.00E+00	0.00E+00
Non-hazardous waste disposed*	kg	1.43E-01	1.43E-01	0.00E+00	0.00E+00
High-level radioactive waste*	kg	2.07E-07	2.02E-07	3.92E-11	4.10E-09
Intermediate and low-level radioactive waste*	kg	3.07E-06	3.04E-06	1.89E-10	3.74E-08
Components for reuse*	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling*	kg	1.66E-01	1.66E-01	0.00E+00	0.00E+00
Materials for energy recovery*	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Recovered energy exported from the product system*	MJ, NCV	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Additional Inventory Parameters for Transparency					
Emissions from calcination and uptake from carbonation	kg CO ₂ eq	2.08E+01	2.08E+01	0.00E+00	0.00E+00
Biogenic CO ₂ , reporting the emissions from combustion of waste from renewable sources used in production processes	kg CO ₂ eq	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Emissions from combustion of waste from non-renewable sources used in production processes	kg CO ₂ eq	0.00E+00	0.00E+00	0.00E+00	0.00E+00

¹ GWP 100, includes biogenic CO₂ emissions from the combustion of wastes from renewable sources; excludes biogenic CO₂ removals and emissions associated with the production of any biobased products; 100-year time horizon GWP factors are provided by the IPCC 2013 Fifth Assessment Report (AR5).

* Emerging LCA impact categories and inventory items are still under development and can have high levels of uncertainty that preclude international acceptance pending further development. Use caution when interpreting data in these categories.

- Not all LCA datasets for upstream materials include these impact categories and thus results may be incomplete. Use caution when interpreting data in these categories.

Only EPDs prepared from cradle-to-grave life-cycle results and based on the same function, quantified by the same functional unit, and taking account of replacement based on the product reference service life (RSL) relative to an assumed building service life, can be used to assist purchasers and users in making informed comparisons between products.

REFERENCES

ISO 21930:2017 Sustainability in buildings and civil engineering works — Core rules for environmental product declarations of construction products and services
ISO 14044:2006 Environmental Management - Life Cycle Assessment - Requirements and Guidelines
ISO 14040:2006 Environmental Management - Life Cycle Assessment - Principles and Framework
NSF 2021: PCR for Portland, Blended, Masonry, Mortar and Plastic (Stucco) Cements v3.2, September 2021
USLCI: 2015 The U.S. Life Cycle Inventory Database
WBCSD CSI 2013: CO2 and Energy Protocol Version 3.1 of 9 December 2013; <https://www.cement-co2-protocol.org/en/>
WCI: 2010 WCI, Final Essential Requirements of Mandatory Reporting

Appendix A: Data Sources

Item	Dataset	Geographical Coverage	Last Updated	Representativeness
Portland Limestone Cement	Environmental Product Declaration: Lafarge St. Constant Cement Plant	North America	2022	Excellent – exact primary data
GGBFS	Environmental Product Declaration: South Chicago Slag Cement Plant	US	2022	Excellent – exact primary data
Construction Grade Gypsum	Ecoinvent 3.8: Gypsum, mineral {RoW} gypsum quarry operation Cut-off, U	Global	2018	Good
Bag House Fines (Waste Product from Asphalt)	No Burden, Recycled Product	US	N/A	Excellent – exact primary data
Trucking	USLCI: Transport, single unit truck, short-haul, diesel powered	US	2014	Good
Electricity	Ecoinvent 3.8: Electricity, low voltage {RFC} market for Cut-off, U	US – region specific	2018	Good