NATIONAL CEMENT
The National Cement Company, Inc.

Environmental Product Declaration (EPD) for Cement Produced at Lebec, California Operation

GENERAL INFORMATION

This cradle to gate Environmental Product Declaration covers cement products produced at the Lebec Production Plant. 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.

ENVIRONMENTAL IMPACTS Lebec Plant:
Product-Specific Type III EPD Declared Cement
Product:
Type IL, Type IL Block and Type II/V
Declared Unit: One metric Ton of cement

IMPACT CATEGORIES	Type IL	Type IL Block	Type II/V
Global Warming Potential, kg CO_2 eq	**698**	**650**	**746**
Ozone Depletion Potential kg CFC-11 eq	4.32E-05	4.10E-05	4.64E-05
Eutrophication Potential kg N eq	2.72E-01	2.50E-01	2.87E-01
Acidification Potential kg SO2 eq	1.24	1.07	1.32
Photochemical Ozone Formation Potential, kg O_3eq	25.2	21.2	26.8
Abiotic Depletion, non-fossil kg Sb eq	1.21E-05	1.06E-05	1.29E-05
Abiotic Depletion, fossil MJ, NCV	4,739	4,353	5,047

PRODUCT COMPONENTS			
Clinker Percent	84%	79%	90%
Limestone, Gypsum and others percent	16%	21%	10%

NATIONAL CEMENT COMPANY OF CALIFORNIA

Lebec Operation

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PROGRAM OPERATOR

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EPD 603
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Valid for 5 years

LIFE CYCLE ASSESSMENT

PRODUCER

National Cement Company of California Inc., (NCC of CA), a subsidiary of National Cement Company Inc., (NCC) is an innovative and dynamic manufacturer of artificial cement and ready-mix concrete serving markets in California and the southeastern United States. NCC is a proud, wholly-owned subsidiary of the Vicat Group based in France. Vicat is an international group of companies and a French, family-run business founded in 1817 by Louis Vicat who mastered the production of artificial cement during construction of the Souillac Bridge in southwestern France.

The portland cement manufacturing plant in Lebec was built in 1966 to serve the rapidly growing demand for Portland cement in Southern California. NCC of CA was formed in 1987 as part of the acquisition of the Lebec Plant. Since that time, NCC of CA has modernized the Lebec plant with state-of-the-art technology to eliminate landfilling of CKD waste, improve energy efficiency and minimize emissions. In addition to manufacturing cement, NCC of CA's ready-mix subsidiaries (National Ready-Mix, Builders Concrete, Viking Ready-Mix and Golden Empire Concrete) serve the region's needs for high-quality residential and commercial concrete products from their numerous batch plants which attend to the diverse markets of Southern California and the Central Valley.

PRODUCT

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

Product Type	Applicable Standard	Standard Designation
Portland Limestone Cement	ASTM C595, C1157, AASHTO M240	Type IL, Type IL Block
Portland Cement	ASTM C150, C1157, AASHTO M85	Type II/V

PRODUCT DESCRIPTION

This EPD reports environmental information for three cement products produced by NCC of CA at their Lebec, CA facility. These cements are used as the key ingredient in many products, such as ready-mix concrete, mortar, grout, masonry units, and in a wide array of applications such as concrete pipes, pre-stressed concrete, roads, foundations, bridges, soil stabilization, and more. Type IL cement is a general-use cement engineered to reduce the carbon footprint by integrating a higher ground limestone content than permitted in Type II/V cement.

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 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 Thomas P. Gloria, PhD. (t.gloria@industrial-ecology.com) • Industrial Ecology Consultants
For additional explanatory material **Manufacture Representative: Thomas Snowden (thomas.snowden@natcem.com)** **This LCA EPD was prepared by: Melissa Diaz Segura, LCA and EPD Project Manager • Climate Earth (www.climateearth.com)**
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.

DECLARED UNIT

The declared unit is one metric tonne of Type IL, Type IL Block and Type II/V cement.

SYSTEM BOUNDARY

This EPD is a cradle-to-gate EPD covering A1-A3 stages of the life cycle.

PRODUCTION STAGE			CONSTRUCTION STAGE		USE STAGE							END-OF-LIFE STAGE			
Extraction and upstream production	Tansport to factory	Manufacturing	Transport to site	Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational eater use	Deconstruction / Demolition	Transport	Waste Procesing	Disposal of Waste
A1	A2	A3	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	MND	MND	MND

Note: MND = module not declared; X = module included.

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. Recycled and recovered materials with fuel content and used as fuels, such as scrap tires and agricultural waste, are considered nonrenewable or renewable secondary fuels. Impacts allocated to these fuels are limited to the treatment and transport required for their use from point of generation along with all emissions from combustion.

LIFE CYCLE INVENTORY (LCI)

Primary Sources of LCI Data:

Diesel: US-EI (2021) “Diesel, combusted in industrial equipment/US”
Electricity: US-EI (2021) “Electricity, high voltage, at grid, eGrid (2021), WECC/US US-EI U”
Limestone: Manufacture specific primary data (2019)
Natural Gas: ecoinvent 3.8 (2021) “market for natural gas, high pressure US”
Petroleum Coke: US-EI (2021) “Petroleum coke, at refinery US”
Truck transport: USLCI (2015) “Transport, combination truck, long-haul, diesel powered, West/tkm/RNA”
Truck transport: USLCI (2015) “Transport, combination truck, short-haul, diesel powered, West/tkm/RNA”

Electricity grid mix includes: 34.16% Natural Gas, 17.16% Coal, 9.97% Wind, 7.72% Nuclear, 7.78% Solar, 2.15% Geothermal, 19.31% Hydro, 1.22% Biomass, 0.11% oil, with a global warming potential of 0.465 kg CO_2eq/kWh.

LIFE CYCLE IMPACT ASSESSMENT RESULTS
Lebec Cement Products[1]: Type IL and Type II/V; per 1 metric tonne

Impact Assessment	Unit	Type IL	Type IL Block	Type II/V
Global warming potential (GWP)[2]	kg CO_2 eq	698	650	746
Depletion potential of the stratospheric ozone layer (ODP)	kg CFC-11 eq	4.32E-05	4.10E-05	4.64E-05
Eutrophication potential (EP)	kg N eq	2.72E-01	2.50E-01	2.87E-01
Acidification potential of soil and water sources (AP)	kg SO_2 eq	1.24	1.07	1.32
Formation potential of tropospheric ozone (POCP)	kg O_3 eq	25.2	21.2	26.8
Resource Use				
Abiotic depletion potential for non-fossil mineral resources (ADPelements)*	kg Sb eq	1.21E-05	1.06E-05	1.29E-05
Abiotic depletion potential for fossil resources (ADPfossil)	MJ, NCV	4,739	4,353	5,047
Renewable primary energy resources as energy (fuel), (RPRE[3]) *	MJ, NCV	221	207	228
Renewable primary resources as material, (RPRM[2]) *	MJ, NCV	0.00E+00	0.00E+00	0.00E+00
Non-renewable primary resources as energy (fuel), (NRPRE[2]) *	MJ, NCV	4,936	4,538	5,252
Non-renewable primary resources as material, (NRPRM[2]) *	MJ, NCV	0.00E+00	0.00E+00	0.00E+00
Consumption of fresh water, (FW[2])	m3	2.74	2.69	2.90
Secondary Material, Fuel and Recovered Energy				
Secondary Materials, (SM[2]) *	kg	0.00E+00	0.00E+00	0.00E+00
Renewable secondary fuels, (RSF[2]) *	MJ, NCV	821	776	882
Non-renewable secondary fuels (NRSF[2]) *	MJ, NCV	224	212	241
Recovered energy, (RE[2]) *	MJ, NCV	0.00E+00	0.00E+00	0.00E+00
Waste & Output Flows				
Hazardous waste disposed, (HW[2]) *	kg	0.00E+00	0.00E+00	0.00E+00
Non-hazardous waste disposed, (NHWD[2]) *	kg	2.97E-02	2.89E-02	3.07E-02
High-level radioactive waste, (HLRW[2]) *	kg	1.06E-07	1.00E-07	1.11E-07
Intermediate and low-level radioactive waste, (ILLRW[2]) *	kg	5.28E-07	4.95E-07	5.48E-07
Components for reuse, (CRU[2]) *	kg	0.00E+00	0.00E+00	0.00E+00
Materials for recycling, (MR[2]) *	kg	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery, (MER[2]) *	kg	1.41E-03	1.37E-03	1.45E-03
Recovered energy exported from the product system, (EE[2]) *	MJ, NCV	0.00E+00	0.00E+00	0.00E+00
Additional Inventory Parameters for Transparency				
CO_2 emissions from calcination and uptake from carbonation[4]	kg CO_2 eq	448	423	481

* 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. The following optional indicators are not reported and also have high levels of uncertainty: Land use related impacts, toxicological aspects, and emissions from land use change.

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.

[1] These products contain no materials that are considered hazardous as defined by the PCR.
[2] GWP 100; 100-year time horizon GWP factors are provided by the IPCC 2013 Fifth Assessment Report (AR5).
CO2 from biogenic secondary fuels used in kiln are climate-neutral (CO2 sink = CO2 emissions), ISO 21930, 7.2.7.
[3] Calculated per ACLCA ISO 21930 Guidance.
[4] Calcination emissions were calculated based on the Cement CO2 and Energy Protocol detailed output method (B2) published by the World Business Council for Sustainable Development (WBCSD) Cement Sustainability Initiative (CSI).

ADDITIONAL ENVIRONMENTAL INFORMATION

NCC of CA's Lebec Plant complies with local, state and federal environmental regulations and monitors and reports emissions to air and water from the manufacturing process. The plant maintains a Title V Operating Permit (1128-V-2000) issued by Eastern Kern Air Pollution Control District (EKAPCD). This permit also requires compliance with the Federal New Source Performance Standards (NSPS), the National Emission Standards for Hazardous Air Pollutants (NESHAP) and Prevention of Significant Deterioration (PSD) permit number NSR 4-4-11, SE 95-01. NCC of CA's commitment to sustainability includes the use of alternative raw materials and alternative fuels such as tire-derived fuel (TDF) and wood-derived fuel to lower the carbon footprint of the products.

NCC is part of the Vicat Group, a global innovator of construction materials across 12 countries worldwide. The Vicat Group's sustainability initiatives include implementation of new, less energy-intensive organizational methods, integration of new technologies derived from our research and development projects and a focus on the use of new materials for the construction of housing and transportation infrastructures. To learn more about the Vicat Group's sustainability initiatives, visit https://www.vicat.com/commitments/respecting-environment.

REFERENCES

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Climate Earth 2023: National Cement – LCA Project Report, Lebec Plant
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ISO 14020:2000 Environmental labels and declarations – General principles
ISO 14025:2006 Environmental labeling and declarations – Type III environmental declarations – Principles and procedures
ISO 14040:2006 Environmental Management - Life Cycle Assessment - Principles and Framework
ISO 14044:2006/Amd 1:2017/Amd2:2020 Environmental Management - Life Cycle Assessment - Requirements and Guidelines
ISO 21930:2017 Sustainability in buildings and civil engineering works — Core rules for environmental product declarations of construction products and services
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