
Concrete Innovations
Concrete PCR Version 3
What Ready-Mix Producers Need to Know
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NRMCA
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PAVE AHEAD
DURABLE. SUSTAINABLE. CONCRETE.

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NRMCA Sustainability Initiatives

2009 | 2012 | 2014 | 2016 | 2021

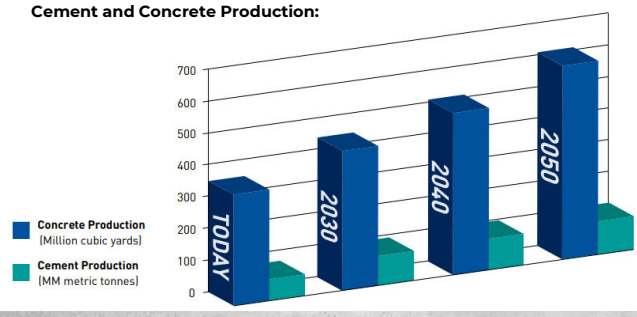
ADOPTER architecture 2030 CHALLENGE

NRMCA CERTIFIED EPD

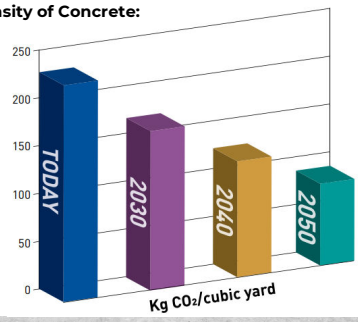
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Roadmap to Carbon Neutrality
A more sustainable world is Shaped by Concrete

Cement and Concrete Production:



CO2 Intensity of Concrete:



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Concrete PCR V3: NSF 1112-26; 2026



PCR = Rules for creating concrete EPDs.

PCR → LCA → EPD → Project/Market Requirements

WHY UPDATE:

Modernization, Harmonization, Clarification; better alignment with upstream PCRs; more specific rules for current materials, supply chains and production practices.

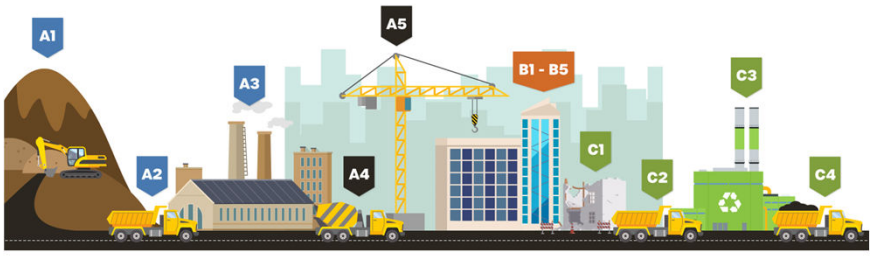


NRMCA CERTIFIED EPD

Contact: Tiffany Reed-Villarreal - treedvillarreal@nrmca.org

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Sources of embodied carbon across the construction lifecycle



A1 - A3 Product Stage
A1 Raw material extraction
A2 Transport to manufacturing site
A3 Manufacturing

A4 - A5 Construction Stage
A4 Transport to construction site
A5 Installation/Assembly

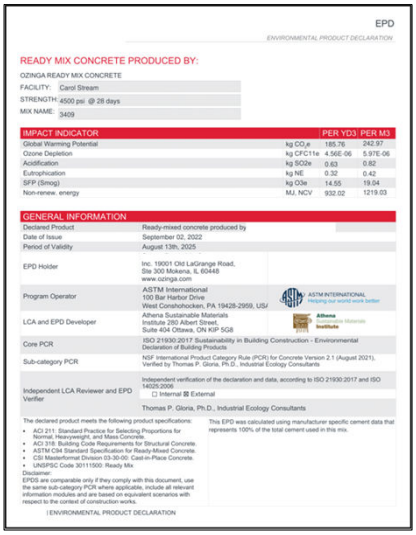
B1 - B5 Use Stage
B1 Use
B2 Maintenance
B3 Repair
B4 Replacement
B5 Refurbishment

C1 - C4 End of Life Stage
C1 Deconstruction & demolition
C2 Transport
C3 Waste processing
C4 Disposal

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Environmental Product Declarations (EPD)



EPD

ENVIRONMENTAL PRODUCT DECLARATION

READY MIX CONCRETE PRODUCED BY:

OZINGA READY MIX CONCRETE

FACILITY: Carol Stream

STRENGTH: 4500 psi @ 28 days

MIX NAME: 3409

IMPACT INDICATOR		PER YD3	PER M3
Global Warming Potential	kg CO_2e	185.76	242.97
Ozone Depletion	kg CFC11e	4.56E-06	5.97E-06
Acidification	kg SO2e	0.63	0.82
Eutrophication	kg NE	0.32	0.42
SFP (Smog)	kg O3e	14.55	19.04
Non-renew. energy	MJ, NCV	932.02	1219.03

GENERAL INFORMATION

Declared Product	Ready-mixed concrete produced by
Date of Issue	September 02, 2022
Period of Validity	August 13th, 2025
EPD Holder	Inc. 19001 Old LaGrange Road, Ste 300 Mokena, IL 60448 www.ozinga.com
Program Operator	ASTM International 100 Bar Harbor Drive West Conshohocken, PA 19428-2959, US/
LCA and EPD Developer	Athena Sustainable Materials Institute 280 Albert Street, Suite 404 Ottawa, ON K1P 5G8
Core PCR	ISO 21930:2017 Sustainability in Building Construction - Environmental Declaration of Building Products
Sub-category PCR	NSF International Product Category Rule (PCR) for Concrete Version 2.1 (August 2021), Verified by Thomas P. Gloria, Ph.D., Industrial Ecology Consultants
Independent LCA Reviewer and EPD Verifier	Independent verification of the declaration and data, according to ISO 21930:2017 and ISO 14025:2006 ☐ Internal ☒ External Thomas P. Gloria, Ph.D., Industrial Ecology Consultants

The declared product meets the following product specifications:

- ACI 211: Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete.
- ACI 318: Building Code Requirements for Structural Concrete.
- ASTM C94 Standard Specification for Ready-Mixed Concrete.
- CSI Masterformat Division 03-30-00: Cast-in-Place Concrete.
- UNSPSC Code 30111500: Ready Mix

This EPD was calculated using manufacturer specific cement data that represents 100% of the total cement used in this mix.

Disclaimer:
EPDS are comparable only if they comply with this document, 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.

| ENVIRONMENTAL PRODUCT DECLARATION

Third-party verified & registered documents that communicate environmental impacts…

IMPACT INDICATOR		PER YD3	PER M3
Global Warming Potential	kg CO_2e	185.76	242.97

…most importantly GWP (global warming potential), measured in kg CO2 equivalent per cubic yard…

…while protecting proprietary information such as

- Quantities in mix design
- Specific products and suppliers

NRMCA CERTIFIED EPD

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Important V2.3 → V3 Concrete PCR changes

Topic	V2.3	V3 (2026)	Why producers should care
Material loss – A3	**Default 5%** unless product-specific data available	**Default 2%** unless primary data are available and transparently reported	**Potentially meaningful effect on calculated A3 impacts; actual plant data can replace default**
A2 trucking	Different assumptions for short- vs. long-haul trucking	All short- and long-haul truck transport assumes empty return under specified calculation	**Changes transportation modeling**
Imported materials	Less prescriptive	Detailed hierarchy for ocean shipping, terminals and land transportation	**Important for imported cementitious materials/SCMs**
EPD types	Primarily product-specific and industry-average definitions	Multiple clearly defined EPD types	**Greater clarity regarding exactly what an EPD represents**
Portable/volumetric production	Addressed, but less clearly distinguished	Explicit definitions and modeling requirements	**Important for DOT/infrastructure/project-site production**
Renewable electricity	Limited specific direction	Detailed REC/PPA rules	**Producers making renewable electricity claims need documentation**
Foreground data	Existing data requirements	12 consecutive months; facility specificity and proxy-data provisions clarified	**Stronger data-management expectations**
Upstream data	Default data hierarchy	Greater emphasis on product- and facility-specific upstream EPDs and Annex A hierarchy	**Supplier EPD quality matters more**
A5	Optional under V2.3	**Not included; shall not be reported**	**Clearer boundary for ready-mix EPDs**

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Scope & Materials

The PCR better reflects today's ready-mixed concrete industry.





The PCR is technology-neutral. It is designed to accommodate innovation rather than assume that every concrete mixture looks like a traditional portland-cement mixture.

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More Precise EPD Types

EPD Type	What It Represents
Facility-specific	One manufacturer + one facility
Product-specific	A specific product or group of products sharing equivalent material and performance characteristics
Product- and facility-specific	A specific product + a specific facility
Manufacturer-average	A manufacturer's product averaged across multiple facilities
Product-average	Similar products averaged across one or more sites
Industry-average	Data representing multiple manufacturers within a defined sector and/or geographic area

More flexibility for producers + clearer environmental performance information for customers.

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Upstream Data: Greater Specificity

V3 establishes a hierarchy that prioritizes **valid product- and facility-specific EPDs for upstream materials**. If those aren't available, the PCR moves through **industry-average EPDs**/prescribed **Annex A datasets** and other acceptable sources.



Example
A producer purchases cement from Supplier A. Instead of simply relying on a generic cement dataset, if an appropriate **product- and facility-specific EPD** exists for that material, V3 prioritizes that information.



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Transportation & Imported Materials

For imported materials, V3 establishes an order of preference:

1. Use transportation information contained in the upstream material EPD when available.

2. Otherwise use primary shipping-distance data for the actual route.

3. If specific ocean transportation data aren't available, use the **default distances in Annex B**.

Land transportation to the concrete facility must be based on primary trucking/train distance data.



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Plant Operations & Material Loss: 5% → 2%

V2.3:
5% default material loss

V3:
2% default material loss

OR
Actual primary plant data



V3 defines material loss based on volume returned or disposed divided by total plant production during the 12-month EPD evaluation period.

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Portable Plants & Volumetric Mixers

V3 now separately defines:

Portable equipment: mobile, compact equipment designed to produce wet- or dry-batch concrete at construction sites or remote locations.



Mobile volumetric mixing equipment: vehicles that store the individual ingredients separately and mix them on demand at the site.



Important for highway, airport and large infrastructure projects where production may occur at or near the project rather than at a conventional permanent ready-mix plant.

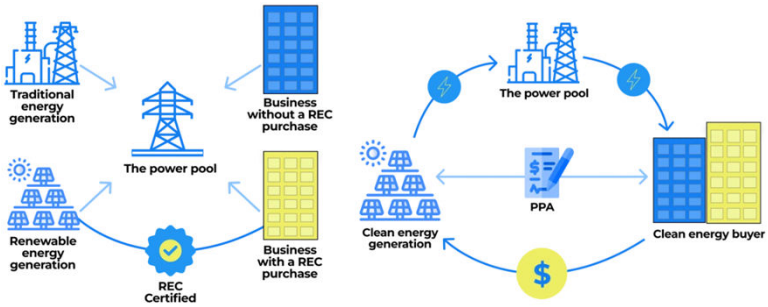
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REC (Renewable Energy Certificates): **& PPA** (Power Purchase Agreements)

V3 provides a framework for producers that want renewable electricity reflected in their EPD.

Producers need documentation supporting:

- **REC/PPA allocation**
- **Electricity balance**
- **Certificate information**
- **REC retirement**
- **Temporal alignment**
- **Verification/audit information**
- **Commitment documentation**



RECs must belong to the concrete manufacturer, are limited to A3, and the EPD reports results both with and without RECs.

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What Producers Need to Collect

CATEGORY	✓	Dat-
PLANT OPERATIONS	☐	
	☐	
	☐	
	☐	.olume
		ıal loss
		Waste / ancillary materials
MATERIALS		Material quantities
		Supplier information
		Supplier EPDs
	☐	Production source / location
TRANSPORTATION	☐	Truck distances
	☐	Rail distances
	☐	Import terminals
	☐	Ocean routes, where applicable
DOC.	☐	Utility / energy bills
	☐	Sales records
	☐	Product designs
	☐	Supporting records

Proprietary Data Is Protected

Primary data supports calculation and verification—it does not mean confidential plant, production, or business records are publicly disclosed in the EPD.

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What This Means for Your EPD Program

Better plant data = better EPD data
Don't automatically rely on defaults when you have credible primary information.

Know where your materials come from
Transportation—particularly imported materials—is modeled more explicitly.

Ask suppliers for EPDs
Upstream product- and facility-specific information is increasingly valuable

Renewable electricity claims require evidence
RECs and PPAs can be reflected, but V3 establishes documentation and reporting requirements.



V3 creates the foundation for the next generation of concrete EPDs

The changes are intended to improve consistency, transparency and comparability while better representing today's ready-mixed concrete industry.

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Industry-Wide EPD & Regional Benchmark v4



Version 1 - 2013

Version 2 - 2016

Version 3 - 2019
3.1 - 2021
3.2 - 2022

Version 4 - 2026

Features
- Use latest concrete PCR v3

Timeline
- March-August 2024: Data gathering surveys
- April 2026: Concrete PCR v3 completion
- August 2026: IW-EPD v4 completion target

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NRMCA Concrete Carbon Calculator

Producer

NRMCA

Designer

Access at **https://nrmca.climateearth.com/**



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Top Ten Ways

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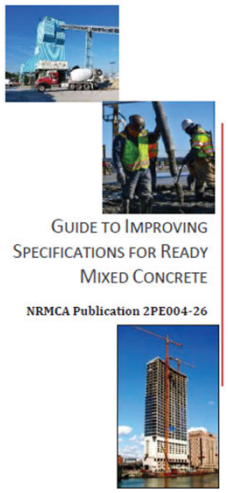
- Actionable steps with recommendations to reduce concrete's carbon footprint

THE TOP 10 WAYS TO REDUCE CONCRETE'S CARBON FOOTPRINT

The following is a list of strategies for reducing concrete's carbon footprint through collaboration, design optimization, and performance-based specification:

- Communicate carbon reduction goals
- Specify supplementary cementitious materials
- Don't limit ingredients
- Ensure good quality control and assurance
- Specify admixtures
- Sequester carbon dioxide in concrete
- Optimize concrete design
- Set targets for carbon footprint
- Encourage innovation
- Specify innovative cements

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GUIDE TO IMPROVING SPECIFICATIONS FOR READY MIXED CONCRETE

NRMCA Publication 2PE004-26

NRMCA

WITH NOTES ON REDUCING EMBODIED CARBON FOOTPRINT, RESPONSIBLE SOURCING, LEED v5 AND ENVISION

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How Can NRMCA Help You?

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Training for Staff

Educational Presentations

Specification and Design Assistance Center

https://www.nrmca.org/association-resources/design-center

Policy Review and Implementation

https://www.nrmca.org/advocacy/state-and-local-advocacy

Concrete Innovations Monthly Webinars

https://www.concreteinnovations.com

General Consulting on Low-Carbon Solutions

https://www.nrmca.org/association-resources/sustainability

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