


American Concrete Institute
Always advancing

Hydration of Low Portland Cement Binders: Recent Advances in Experiments and Modeling, Part 1 of 2

ACI Spring 2014 Convention
March 23 - 25, Reno, NV



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WEB SESSIONS

Ryan Henkensiefken, Central Concrete's Business Development Engineer, partners with architects, engineers and LEED consultants and key customers to put his deep knowledge of concrete to work for them. Ryan conducts customer and partner visits, supports our partners with research and information in response to their customer's requirements, identifies the offerings that match their requirements, and provides the necessary data to develop meaningful specifications very early in the design process. Prior to taking this position, Henkensiefken was the Technical Services Manager of U.S. Concrete's National Research Laboratory, where he was responsible for advancing the performance of concrete and driving the creation of many innovative, cost-effective solutions. Henkensiefken was instrumental in the technical development of U.S. Concrete's Environmentally Friendly Technology® Process, which uses alternative cement replacement materials to reduce the production of greenhouse gasses. Henkensiefken is also one of the co-inventors of U.S. Concrete's Aridus® Rapid-drying Concrete. The Aridus concrete is the first ready-mix concrete solution for preventing floor-covering failures. Aridus-based concrete dries faster than conventional concrete mixes, allowing flooring materials to be installed faster and more effectively. Henkensiefken holds a B.S. degree in civil engineering from Minnesota State University, Mankato, and an M.S. degree in civil engineering from Purdue University. He is currently pursuing his MBA from Santa Clara University. Henkensiefken is a licensed professional engineer in the state of California.



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Stronger, Cleaner, Greener Concrete.

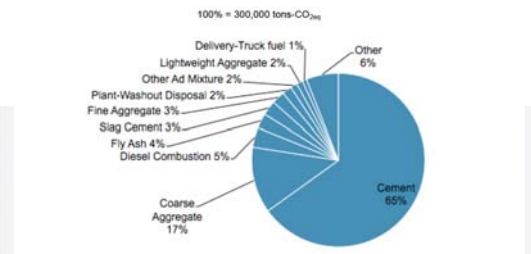


The Development and Commercialization of Low Portland Cement Concrete in the San Francisco Bay Area

Ryan Henkensiefken
Business Development Engineer

A U.S. CONCRETE COMPANY


Central Concrete Carbon Footprint




100% = 300,000 tons-CO₂e

Category	Percentage
Cement	65%
Coarse Aggregate	17%
Other	6%
Delivery-Truck fuel	1%
Lightweight Aggregate	2%
Other Ad Mixture	2%
Plant-Washout Disposal	2%
Fine Aggregate	3%
Slag Cement	3%
Fly Ash	4%
Diesel Combustion	5%

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Central Concrete: At-a-Glance




Leader in **Low-CO₂** concrete

Thousands of mixes – standard mixes are **≥ 50%** cement replacement

We have delivered structural mixes with up to **70%** cement replacement

PLEDGED Architecture 2030 for Products




FIRST U.S. Concrete Company to adopt **EPDs** for its mixes




Central Concrete At-a-Glance

Quick Facts

60+	472
Year Bay Area Legacy	Employees
12	229
Bay Area Locations	Trucks
3	U.S.
Companies	Concrete Company Business Unit

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Trusted Performance, Proven Results

- Primary mix: 70% cement replacement
- Largest net-zero energy building in California
- Concrete mixes will reduce overall carbon footprint by 23 million pounds of CO₂
- 50-75% cement replacement
- 7 day max. strength: 700 psi
- 90 day min. strength: 2000 psi
- 50% cement replacement

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Trusted Performance, Proven Results

- 50% cement replacement materials
- Ultra-low shrinkage
- Low CO₂ concrete
- Locally procured materials
- 70% cement replacement materials
- Reduced CO₂ by 54%, or 7.4 million lbs. of CO₂ emissions
- With the exception of evening, entirely lit by sunlight

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Central Concrete EPD

The following impacts were calculated based on a product specific Type III (internally verified) Environmental Product Declaration, which can be found at: http://centralconcrete.com/centralconcrete/EPD/Central_Concrete_EPDPdf

Declaration Owner: Central Concrete Supply, Inc. a U.S. Concrete Company
785 Stockton Avenue, San Jose, CA 95128
<http://www.centralconcrete.com>

LCA and EPD Developer: Rio Solis Concrete Earth, Inc.
<http://www.riosoliscem.com>

Product Category Rule: The North American Product Category Rule (PCR) for ISO 14025 Type III Environmental Product Declaration (EPDs) and ISO 19001 Compliant Product Carbon Footprint of Concrete, Version 1.0 dated 10/20/2012. The Carbon Leadership Forum. <http://www.carbonleadersforum.org>

Environmental Impacts: 0 per cyd, 0 per m3

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EPD System: ISO 14025 Type III EPD

Date of Issue: 12/2013 (used for 3 years until 4/12/2016)

Independent Verifier: Lindt Sturt, where Sustainable Ventures Institute
<http://www.sustainable.org>

Program Operator: National Ready Mix Concrete Association
<http://www.nrmca.org/sustainability>

EPD Number: NC448EPD 10001

Impact	Value
Global warming potential	278 kg CO ₂ eq
Acid equivalent potential	1,458 kg SO ₂ eq
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EPD Number: NC448EPD 10001

Impact	Value
28-day compressive strength	5,500 psi
Shrink	0.12 in/in
Total primary energy	2,024 MJ
Concrete water use (batch)	5,108.2 gal
Concrete water use (plant)	6,855.3 gal
Global warming potential	278 kg CO ₂ eq
Acid equivalent potential	1,458 kg SO ₂ eq
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Thank You!

For more information contact:
Ryan Henkensiefken, P.E.
Business Development Engineer
Central Concrete
www.centralconcrete.com
Tel: (408) 836-9122

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