BURNCO COLORADO

ENVIRONMENTAL PRODUCT DECLARATION

Mix 40VL30C6G • Denver Plant

This Environmental Product Declaration (EPD) reports the impacts for 1 m^3 of ready mixed concrete mix, meeting the following specifications:

- ASTM C94: Ready-Mixed Concrete
- UNSPSC Code 30111505: Ready Mix Concrete
- CSA A23.1/A23.2: Concrete Materials and Methods of Concrete Construction
- CSI Division 03-30-00: Cast-in-Place Concrete

COMPANY

Material Supplier Name & EPD Owner/Company

BURNCO Colorado
301 Centennial Dr.
Milliken, CO 80543

PLANT

Material Supplier Address

Denver Plant
5901 York Street
Denver, CO 80216

EPD PROGRAM OPERATOR

National Ready Mixed Concrete Association
900 Spring St
Silver Spring, MD 20910

EPD Declaration Number

NRMCAEPD:20029

DATE OF ISSUE

10/02/2021 **(valid for 5 years until 10/02/2026)**

EPD Publication Date

EPD Expiration Date

ENVIRONMENTAL IMPACTS

EPD Type

Declared Product:
Mix 40VL30C6G • Denver Plant
Description: 4K 20% INT GENERAL
Compressive strength: 4500 PSI at 28 days

EPD Declared Unit

Declared Unit: 1 m^3 of concrete

Global Warming Potential (kg CO_2-eq)	**300**
Ozone Depletion Potential (kg CFC-11-eq)	**6.91E-6**
Acidification Potential (kg SO_2-eq)	**0.93**
Eutrophication Potential (kg N-eq)	**0.33**
Photochemical Ozone Creation Potential (kg O_3-eq)	**21.1**
Abiotic Depletion, non-fossil (kg Sb-eq)	**5.96E-5**
Abiotic Depletion, fossil (MJ)	**668**
Total Waste Disposed (kg)	**87.3**
Consumption of Freshwater (m^3)	**3.37**

Product Components: natural aggregate (ASTM C33), Portland cement (ASTM C150), batch water (ASTM C1602), fly ash (ASTM C618), admixture (ASTM C494)

Additional detail and impacts are reported on page three of this EPD

PCR/Standard(s) Used for EPD Development

ISO 21930:2017 Sustainability in Building Construction — Environmental Declaration of Building Products: serves as the core PCR
PCR for Concrete, NSF International, August 2021 v2.1 serves as the sub-category PCR

Third Party Reviewed? Yes/No

Sub-category PCR review was conducted by Thomas P. Gloria • Industrial Ecology Consultants

Independent verification of the declaration, according to ISO 14025:2006: ☐ internal ☑ external

Third party verifier Cara Vought (cara@sustainablesolutionscorporation.com) • Sustainable Solutions Corporation

For additional explanatory material
Manufacture Representative: Dana Rotkovich (dana.rotkovich@burnco.com)
Software Tool: CarbonCLARITY Suite, EPD Generator • Verification
LCA & EPD Developer: Climate Earth (support@climateearth.com)

LIFE CYCLE ASSESSMENT

SYSTEM BOUNDARY

This EPD is a cradle-to-gate EPD covering the product stages (A1-A3) only

PRODUCTION Stage (*Mandatory*)			CONSTRUCTION Stage		USE Stage					END-OF-LIFE Stage			
Extraction and upstream production	Transport to factory	Manufacturing	Transport to site	Installation	Use	Maintenance	Repair	Replacement	Refurbishment	De-construction/ Demolition	Transport to waste processing or disposal	Waste processing	Disposal of waste
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	C1	C2	C3	C4

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.
The product category rules for this EPD recognize fly ash, silica fume and slag as waste products recovered materials and thus the environmental impacts allocated to these materials are limited to the treatment and transportation required to use as a concrete material input.
Denver Plant is a truck (transit) mixing plant. 30% of all mixing truck(fleet) energy has been allocated to module A3.

LIFE CYCLE INVENTORY (LCI)

This EPD was calculated using industry average cement data. Cement LCA impacts can vary depending upon manufacturing process, efficiency and fuel source by as much as 50% for some environmental impact categories. Cement accounts for as much as 87% of the impacts of the concrete mixes included in this EPD and thus manufacturer specific cement impacts could result in variation of as much as 43%.

PRIMARY SOURCES OF LCI DATA

- **Admixture (plasticizing)**: EFCA EPD, 2015
- **Aggregate (natural)**: US-EI (2016): “Gravel, round, at mine/US”, 2001
- **Cleaning Chemicals**: Ecoinvent 3.4: 50% Citric acid and 50% Phosphoric acid, industrial grade, without water, in 70% solution state, market for/GLO, 2017
- **Diesel**: USLCI: “Diesel, combusted in industrial equipment/NREL/US”, 2007
- **Electricity (WECC)**: Ecoinvent 3.4: “ Electricity, medium voltage, market for, cut-off”, 2015
- **Fly ash**: byproduct of coal combustion; no upstream manufacturing impacts
- **Municipal Water**: US-EI (2016): “Tap water, at user/US”, 2000
- **Natural gas**: USLCI: “Natural gas, combusted in industrial boiler/NREL/US”, 2007
- **Non-Hazardous Solid Waste**: US-EI (2016): Disposal, municipal solid waste, 2008
- **Oils, Lubricants and Greases**: Ecoinvent 3.4: Lubricating oil, GLO, market for, cut-off, 2011
- **Portland cement**: Portland Concrete Association, Industry Average EPD, 2021
- **Rail transport**: USLCI: “Transport, train, diesel powered NREL/US”, 2007
- **Truck transport**: USLCI:"Transport, combination truck, long-haul, diesel powered/tkm/RNA", 2010
- **Truck transport**: USLCI:"Transport, combination truck, short-haul, diesel powered/tkm/RNA", 2010

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DECLARATION OF ENVIRONMENTAL INDICATORS DERIVED FROM LCA

Impact Assessment	Unit	A1 (A1 GWP)	A2 (A2 GWP)	A3 (A3 GWP)	Total (A1-A3 GWP)
Global warming potential	kg CO_2-eq	270	16.8	13.8	300
Depletion potential of the stratospheric ozone layer (ODP)	kg CFC-11-eq	6.60E-6	6.98E-10	3.03E-7	6.91E-6
Eutrophication potential	kg N-eq	0.30	0.01	0.02	0.33
Acidification potential of soil and water sources (AP)	kg SO_2-eq	0.54	0.22	0.17	0.93
Formation potential of tropospheric ozone (POCP)	kg O_3-eq	10.2	6.00	4.86	21.1
Resource Use					
Abiotic depletion potential for non-fossil mineral resources (ADPelements)*	kg Sb-eq	5.81E-5	-	1.56E-6	5.96E-5
Abiotic depletion potential for fossil resources (ADPfossil)	MJ	228	237	203	668
Renewable primary energy resources as energy (fuel), (RPRE)*	MJ	43.9	0.00E+0	3.35	47.2
Renewable primary resources as material, (RPRM)*	MJ	0.00E+0	-	0.00E+0	0.00E+0
Non-renewable primary resources as energy (fuel), (NRPRE)*	MJ	1,292	237	206	1,735
Non-renewable primary resources as material (NRPRM)*	MJ	6.82	-	0.00E+0	6.82
Consumption of fresh water	m^3	3.34	-	0.03	3.37
Secondary Material, Fuel and Recovered Energy					
Secondary Materials, (SM)*	kg	97.6	-	0.00E+0	97.6
Renewable secondary fuels, (RSF)*	MJ	15.3	-	0.00E+0	15.3
Non-renewable secondary fuels (NRSF)*	MJ	148	-	0.00E+0	148
Recovered energy, (RE)*	MJ	0.00E+0	-	0.00E+0	0.00E+0
Waste & Output Flows					
Hazardous waste disposed*	kg	3.68E-3	-	0.00E+0	3.68E-3
Non-hazardous waste disposed*	kg	87.3	-	9.66E-3	87.3
High-level radioactive waste*	m^3	1.27E-3	-	1.52E-9	1.27E-3
Intermediate and low-level radioactive waste*	m^3	4.71E-8	-	4.88E-8	9.60E-8
Components for reuse*	kg	0.00E+0	-	0.00E+0	0.00E+0
Materials for recycling*	kg	1.47	-	3.76E-3	1.47
Materials for energy recovery*	kg	0.00E+0	-	0.05	0.05
Recovered energy exported from the product system*	MJ	0.00E+0	-	0.00E+0	0.00E+0
Additional Inventory Parameters for Transparency					
Emissions from calcination and uptake from carbonation*	kg CO_2-eq	135	-	-	135

* 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

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.

REFERENCES

ISO 21930:2017 Sustainability in Building Construction — Environmental Declaration of Building Products

ISO 14044:2006/Amd 1:2017/Amd 2:2020 Environmental Management — Life Cycle Assessment — Requirements and Guidelines

NSF International, August 2021 v2.1 — PCR for Concrete

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