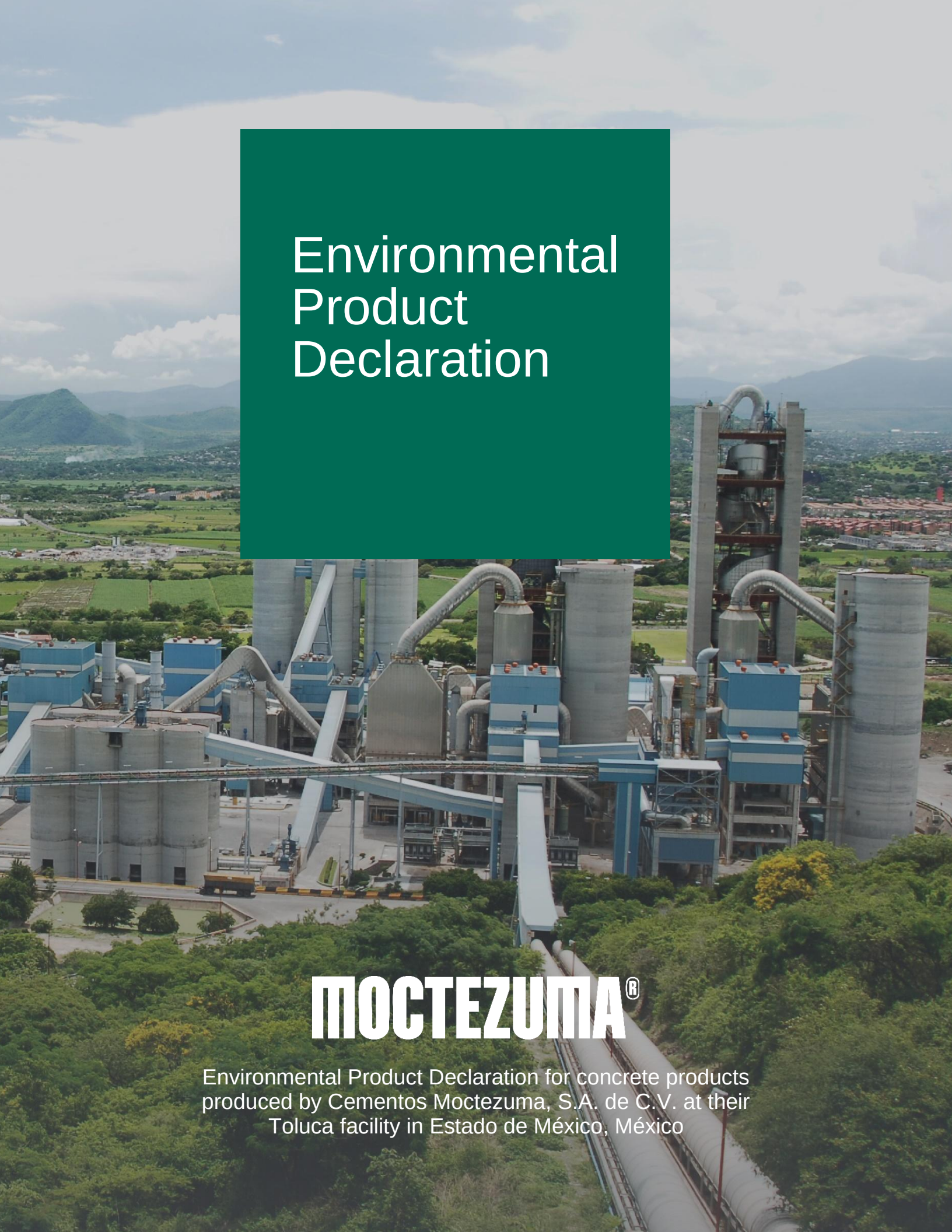

Environmental Product Declaration

MOCTEZUMA®

Environmental Product Declaration for concrete products produced by Cementos Moctezuma, S.A. de C.V. at their Toluca facility in Estado de México, México

ADMINISTRATIVE INFORMATION

International Certified Environmental Product Declaration

Declared Product:	This Environmental Product Declaration (EPD) covers ready mix concrete products produced by Cementos Moctezuma S.A. de C.V. Declared unit: 1 m3 of concrete
Declaration Owner:	Cementos Moctezuma S.A. de C.V. 134 PH Monte Elbruz, Col. Lomas de Chapultepec Ciudad de México, México www.cmoctezuma.com.mx Jair Juan Manuel Martínez Miguel, martinez.jair@cmoctezuma.com.mx
Program Operator:	Labeling Sustainability Address, 11670 W Sunset Blvd. Los Angeles, CA www.labelingsustainability.com
Product Category Rule:	ISO 21930:2017 Sustainability in Building Construction – Environmental Declaration of Building Products: serves as the core PCR Product Category Rule of Environmental Product Declarations PCR for Concrete serves as the sub-category PCR. PCR Program Operator: NSF International Sub-category PCR review was conducted by: Thomas P. Gloria, Ph. D. of Industrial Ecology Consultants: 35 Bracebridge, Rd., Newton, MA 02459-1728, t.gloria@industrial-ecology.com. Dr. Michael Overcash of Environmental Clarity: 2908 Chipmunk Lane, Raleigh, NC 27607-3117, mrovercash@earthlink.net. Mr. Bill Stough of Sustainable Research Group: PO Box 1684, Grand Rapids, MI 49501-1684, bstough@sustainableresearchgroup.com.
Independent LCA Reviewer and EPD Verifier:	This EPD was independently verified in accordance with ISO 14025 and ISO 21930. The life cycle assessment was independently reviewed in accordance ISO 14044 and the referenced PCR. Independent verification of the declaration, according to ISO 14025:2006 External Third Party Verifier Geoffrey Guest, Certified 3rd Party Verifier under the International EPD Program (www.environdec.com), CSA Group (www.csaregistries.ca)
Date of Issue:	23 January 2025
Period of Validity:	5 years; valid until 23 January 2030
EPD Number:	ac9408a6-c98c-443a-9c72-1a5daebe972e

TABLE OF CONTENTS

Administrative Information **1**
Company Description **3**
Study Goal **3**
Description Of Product And Scope **4**
Ready Mix Concrete Design Summary **4**
Ready Mix Concrete Design Composition **14**
System Boundaries **15**
Cut-Off Criteria **16**
Data Sources And Data Quality Assessment **16**
Raw Material Transport 16
Electricity 17
Process/Space Heating 17
Fuel Required For Machinery 17
Waste Generation 17
Recovered Energy 17
Recycled/Reused Material/Components. 17
Module A1 Material Losses 17
Direct A3 Emissions Accounting 17
Waste Transport Requirements 17
Product Transport Requirements 17
Data Quality Assessment **18**
Environmental Indicators And Inventory Metrics **19**
Limitations **21**
Total Impact Summary **21**
Other Environmental Info **38**
References **39**
ASTM Standards 39
ISO Standards 40

COMPANY DESCRIPTION

Cementos Moctezuma is a prominent Mexican company established in 1943, specializing in the production, distribution, and marketing of cement, concrete, and aggregates under the well-known brands Cementos Moctezuma and Concretos Moctezuma. Listed on the Mexican Stock Exchange since 1988, the company maintains a strong financial position characterized by discipline and zero debt.

With three cement plants boasting an annual capacity of eight million tons and 30 concrete plants producing over 590 types of concrete, Cementos Moctezuma has an extensive distribution network of more than 530 centers, covering 95% of Mexico. The company also offers value-added services, including specialized technical advice, mobile laboratories, construction supervision, and training.

Cementos Moctezuma is committed to sustainable development, aligning its operations with the United Nations' Sustainable Development Goals through a strategy focused on five pillars: Safety and health, Energy and climate change, Corporate social responsibility, Environment and biodiversity, and Circular economy. The company emphasizes technological innovation and operational efficiency to produce high-quality products while minimizing environmental impact, including reducing CO_2 emissions and optimizing water use.

A qualified team of 1,303 passionate collaborators drives Cementos Moctezuma's mission to promote the construction of a better country for families and future generations while being committed to environmental stewardship. The company also champions equity and inclusion in the construction industry through initiatives like Casco Rosa, which recognizes the contributions of women in the sector. Additionally, Cementos Moctezuma actively engages in social responsibility programs to enhance the quality of life in the communities it serves, reinforcing its status as a consolidated company with deep Mexican roots.

STUDY GOAL

The intended application of this life cycle assessment (LCA) is to comply with the procedures for creating a Type III environmental product declaration (EPD) and publish the EPD for public review on the website, http://labelingsustainability.com/ . This level of study is in accordance with EPD Product Category Rule (PCR) for Ready Mix Concrete published by NSF International (2019) and is a sub-PCR of International Standards Organization (ISO) 21930:2017 Sustainability in buildings and civil works - Core rules for EPDs of construction products and services; International Standards Organization (ISO) 14025:2006 Environmental labels and declarations, Type III environmental declarations-Principles and procedures; ISO 14044:2006 Environmental management, Life cycle assessment- Requirements and guidelines; and ISO 14040:2006 Environmental management, Life cycle assessment-Principles and framework. The performance of this study and its subsequent publishing is in alignment with the business-to-business (B2B) communication requirements for the environmental assessment of building products. The study does not intend to support comparative assertions and is intended to be disclosed to the public.

This project report was commissioned to differentiate Cementos Moctezuma from their competition for the following reasons: generate an advantage for the organization; offer customers information to help them make informed product decisions; improve the environmental performance of Cementos Moctezuma by continuously measuring, controlling and reducing the environmental impacts of their products; help project facilitators working on Leadership in Energy and Environmental Design (LEED)

projects achieve their credit goal; and to strengthen Cementos Moctezuma's license to operate in the community. The intended audience for this LCA report is Cementos Moctezuma's employees, their suppliers, project specifiers of their products, architects, and engineers. The EPD report is also available for policy makers, government officials interested in sustainability, academic professors, and LCA professionals. This LCA report does not include product comparisons from other facilities.

DESCRIPTION OF PRODUCT AND SCOPE

This EPD reports on 142 concrete mixes manufactured at the Moctezuma concrete facility in Toluca, Estado de México, México..

This LCA assumes the impacts from products manufactured in accordance with the standards outlined in this report. This LCA is a cradle-to-gate study, and therefore, stages extending beyond the plant gate are not included in this LCA. Excluded stages include transportation of the manufactured material to the construction site; on-site construction processes and components; building (infrastructure) use and maintenance; and "end-of-life" effects.

READY MIX CONCRETE DESIGN SUMMARY

The following tables provide a list of the ready-mix concrete products considered in this EPD along with key performance parameters.

Mix Designs: 0 to 15 MPa

Table 1: **Declared products with Mix designs: 0 to 15MPa considered in this environmental product declaration**

Mix#	Unique name/ID	Short description	Product type	Resistance strength, MPa	H2O to cement ratio
1	Convencional - f´c 100 - 7 dias	9.80 MPa 7d strength Ready Mix Concrete	Ready Mix Concrete	9.80	Proprietary
2	Convencional - f´c 100 - 3 dias	9.80 MPa 3d strength Ready Mix Concrete	Ready Mix Concrete	9.80	Proprietary
3	Convencional - f´c 100 - 28 dias	9.80 MPa 28d strength Ready Mix Concrete	Ready Mix Concrete	9.80	Proprietary
4	Convencional - f´c 100 - 14 dias	9.80 MPa 14d strength Ready Mix Concrete	Ready Mix Concrete	9.80	Proprietary
5	Convencional - f´c 150 - 7 dias	14.70 MPa 7d strength Ready Mix Concrete	Ready Mix Concrete	14.70	Proprietary
6	Convencional - f´c 150 - 3 dias	14.70 MPa 3d strength Ready Mix Concrete	Ready Mix Concrete	14.70	Proprietary
7	Convencional - f´c 150 - 28 dias	14.70 MPa 28d strength Ready Mix Concrete	Ready Mix Concrete	14.70	Proprietary

8	Convencional - f´c 150 - 14 dias	14.70 MPa 14d strength Ready Mix Concrete	Ready Mix Concrete	14.70	Proprietary
57	Relleno Fluido - f´c 30 - 7 dias	2.94 MPa 7d strength Ready Mix Concrete	Ready Mix Concrete	2.94	Proprietary
58	Relleno Fluido - f´c 30 - 3 dias	2.94 MPa 3d strength Ready Mix Concrete	Ready Mix Concrete	2.94	Proprietary
59	Relleno Fluido - f´c 30 - 28 dias	2.94 MPa 28d strength Ready Mix Concrete	Ready Mix Concrete	2.94	Proprietary
60	Relleno Fluido - f´c 30 - 14 dias	2.94 MPa 14d strength Ready Mix Concrete	Ready Mix Concrete	2.94	Proprietary
61	Relleno Fluido - f´c 15 - 7 dias	1.47 MPa 7d strength Ready Mix Concrete	Ready Mix Concrete	1.47	Proprietary
62	Relleno Fluido - f´c 15 - 3 dias	1.47 MPa 3d strength Ready Mix Concrete	Ready Mix Concrete	1.47	Proprietary
63	Relleno Fluido - f´c 15 - 28 dias	1.47 MPa 28d strength Ready Mix Concrete	Ready Mix Concrete	1.47	Proprietary
64	Relleno Fluido - f´c 15 - 14 dias	1.47 MPa 14d strength Ready Mix Concrete	Ready Mix Concrete	1.47	Proprietary
65	Relleno Fluido - f´c 20 - 7 dias	1.96 MPa 7d strength Ready Mix Concrete	Ready Mix Concrete	1.96	Proprietary
66	Relleno Fluido - f´c 20 - 3 dias	1.96 MPa 3d strength Ready Mix Concrete	Ready Mix Concrete	1.96	Proprietary
67	Relleno Fluido - f´c 20 - 28 dias	1.96 MPa 28d strength Ready Mix Concrete	Ready Mix Concrete	1.96	Proprietary
68	Relleno Fluido - f´c 20 - 14 dias	1.96 MPa 14d strength Ready Mix Concrete	Ready Mix Concrete	1.96	Proprietary
69	Relleno Fluido - f´c 25 - 7 dias	2.45 MPa 7d strength Ready Mix Concrete	Ready Mix Concrete	2.45	Proprietary
70	Relleno Fluido - f´c 25 - 3 dias	2.45 MPa 3d strength Ready Mix Concrete	Ready Mix Concrete	2.45	Proprietary
71	Relleno Fluido - f´c 25 - 28 dias	2.45 MPa 28d strength Ready Mix Concrete	Ready Mix Concrete	2.45	Proprietary
72	Relleno Fluido - f´c 25 - 14 dias	2.45 MPa 14d strength Ready Mix Concrete	Ready Mix Concrete	2.45	Proprietary

73	Relleno Fluido - f´c 40 - 7 dias	3.92 MPa 7d strength Ready Mix Concrete	Ready Mix Concrete	3.92	Proprietary
74	Relleno Fluido - f´c 40 - 3 dias	3.92 MPa 3d strength Ready Mix Concrete	Ready Mix Concrete	3.92	Proprietary
75	Relleno Fluido - f´c 40 - 28 dias	3.92 MPa 28d strength Ready Mix Concrete	Ready Mix Concrete	3.92	Proprietary
76	Relleno Fluido - f´c 40 - 14 dias	3.92 MPa 14d strength Ready Mix Concrete	Ready Mix Concrete	3.92	Proprietary
77	Relleno Fluido - f´c 50 - 7 dias	4.90 MPa 7d strength Ready Mix Concrete	Ready Mix Concrete	4.90	Proprietary
78	Relleno Fluido - f´c 50 - 3 dias	4.90 MPa 3d strength Ready Mix Concrete	Ready Mix Concrete	4.90	Proprietary
79	Relleno Fluido - f´c 50 - 28 dias	4.90 MPa 28d strength Ready Mix Concrete	Ready Mix Concrete	4.90	Proprietary
80	Relleno Fluido - f´c 50 - 14 dias	4.90 MPa 14d strength Ready Mix Concrete	Ready Mix Concrete	4.90	Proprietary
81	Relleno Fluido - f´c 60 - 7 dias	5.88 MPa 7d strength Ready Mix Concrete	Ready Mix Concrete	5.88	Proprietary
82	Relleno Fluido - f´c 60 - 3 dias	5.88 MPa 3d strength Ready Mix Concrete	Ready Mix Concrete	5.88	Proprietary
83	Relleno Fluido - f´c 60 - 28 dias	5.88 MPa 28d strength Ready Mix Concrete	Ready Mix Concrete	5.88	Proprietary
84	Relleno Fluido - f´c 60 - 14 dias	5.88 MPa 14d strength Ready Mix Concrete	Ready Mix Concrete	5.88	Proprietary
85	Relleno Fluido - f´c 70 - 7 dias	6.86 MPa 7d strength Ready Mix Concrete	Ready Mix Concrete	6.86	Proprietary
86	Relleno Fluido - f´c 70 - 3 dias	6.86 MPa 3d strength Ready Mix Concrete	Ready Mix Concrete	6.86	Proprietary
87	Relleno Fluido - f´c 70 - 28 dias	6.86 MPa 28d strength Ready Mix Concrete	Ready Mix Concrete	6.86	Proprietary
88	Relleno Fluido - f´c 70 - 14 dias	6.86 MPa 14d strength Ready Mix Concrete	Ready Mix Concrete	6.86	Proprietary

Mix Designs: 15 to 20 MPa

Table 2 **Declared products with Mix designs: 15 to 20MPa considered in this environmental product declaration**

Mix#	Unique name/ID	Short description	Product type	Resistance strength, MPa	H2O to cement ratio
9	Convencional - f´c 200 - 7 dias	19.60 MPa 7d strength Ready Mix Concrete	Ready Mix Concrete	19.6	Proprietary
10	Convencional - f´c 200 - 3 dias	19.60 MPa 3d strength Ready Mix Concrete	Ready Mix Concrete	19.6	Proprietary
11	Convencional - f´c 200 - 28 dias	19.60 MPa 28d strength Ready Mix Concrete	Ready Mix Concrete	19.6	Proprietary
12	Convencional - f´c 200 - 14 dias	19.60 MPa 14d strength Ready Mix Concrete	Ready Mix Concrete	19.6	Proprietary
127	Lanzado - f´c 200 - 7 dias	19.60 MPa 7d strength Ready Mix Concrete	Ready Mix Concrete	19.6	Proprietary
128	Lanzado - f´c 200 - 3 dias	19.60 MPa 3d strength Ready Mix Concrete	Ready Mix Concrete	19.6	Proprietary
129	Lanzado - f´c 200 - 28 dias	19.60 MPa 28d strength Ready Mix Concrete	Ready Mix Concrete	19.6	Proprietary
130	Lanzado - f´c 200 - 14 dias	19.60 MPa 14d strength Ready Mix Concrete	Ready Mix Concrete	19.6	Proprietary

Mix Designs: 21 to 25 MPa

Table 3: **Declared products with Mix designs: 21 to 25MPa considered in this environmental product declaration**

Mix#	Unique name/ID	Short description	Product type	Resistance strength, MPa	H2O to cement ratio
13	Convencional - f´c 250 - 7 dias	24.50 MPa 7d strength Ready Mix Concrete	Ready Mix Concrete	24.5	Proprietary

14	Convencional - f´c 250 - 3 dias	24.50 MPa 3d strength Ready Mix Concrete	Ready Mix Concrete	24.5	Proprietary
15	Convencional - f´c 250 - 28 dias	24.50 MPa 28d strength Ready Mix Concrete	Ready Mix Concrete	24.5	Proprietary
16	Convencional - f´c 250 - 14 dias	24.50 MPa 14d strength Ready Mix Concrete	Ready Mix Concrete	24.5	Proprietary
25	Estructural - f´c 250 - 7 dias	24.50 MPa 7d strength Ready Mix Concrete	Ready Mix Concrete	24.5	Proprietary
26	Estructural - f´c 250 - 3 dias	24.50 MPa 3d strength Ready Mix Concrete	Ready Mix Concrete	24.5	Proprietary
27	Estructural - f´c 250 - 28 dias	24.50 MPa 28d strength Ready Mix Concrete	Ready Mix Concrete	24.5	Proprietary
28	Estructural - f´c 250 - 14 dias	24.50 MPa 14d strength Ready Mix Concrete	Ready Mix Concrete	24.5	Proprietary
89	Modulo de ruptura - MR 35 - 7 dias	24.50 MPa 7d strength Ready Mix Concrete	Ready Mix Concrete	24.5	Proprietary
90	Modulo de ruptura - MR 35 - 3 dias	24.50 MPa 3d strength Ready Mix Concrete	Ready Mix Concrete	24.5	Proprietary
91	Modulo de ruptura - MR 35 - 28 dias	24.50 MPa 28d strength Ready Mix Concrete	Ready Mix Concrete	24.5	Proprietary
92	Modulo de ruptura - MR 35 - 14 dias	24.50 MPa 14d strength Ready Mix Concrete	Ready Mix Concrete	24.5	Proprietary
131	Lanzado - f´c 250 - 7 dias	24.50 MPa 7d strength Ready Mix Concrete	Ready Mix Concrete	24.5	Proprietary
132	Lanzado - f´c 250 - 3 dias	24.50 MPa 3d strength Ready Mix Concrete	Ready Mix Concrete	24.5	Proprietary
133	Lanzado - f´c 250 - 28 dias	24.50 MPa 28d strength Ready Mix Concrete	Ready Mix Concrete	24.5	Proprietary
134	Lanzado - f´c 250 - 14 dias	24.50 MPa 14d strength Ready Mix Concrete	Ready Mix Concrete	24.5	Proprietary

Mix Designs: 26 to 30 MPa

Table 4: **Declared products with Mix designs: 26 to 30MPa considered in this environmental product declaration**

Mix#	Unique name/ID	Short description	Product type	Resistance strength, MPa	H2O to cement ratio
17	Convencional - f´c 300 - 7 dias	29.40 MPa 7d strength Ready Mix Concrete	Ready Mix Concrete	29.4	Proprietary
18	Convencional - f´c 300 - 3 dias	29.40 MPa 3d strength Ready Mix Concrete	Ready Mix Concrete	29.4	Proprietary
19	Convencional - f´c 300 - 28 dias	29.40 MPa 28d strength Ready Mix Concrete	Ready Mix Concrete	29.4	Proprietary
20	Convencional - f´c 300 - 14 dias	29.40 MPa 14d strength Ready Mix Concrete	Ready Mix Concrete	29.4	Proprietary
29	Estructural - f´c 300 - 7 dias	29.40 MPa 7d strength Ready Mix Concrete	Ready Mix Concrete	29.4	Proprietary
30	Estructural - f´c 300 - 3 dias	29.40 MPa 3d strength Ready Mix Concrete	Ready Mix Concrete	29.4	Proprietary
31	Estructural - f´c 300 - 28 dias	29.40 MPa 28d strength Ready Mix Concrete	Ready Mix Concrete	29.4	Proprietary
32	Estructural - f´c 300 - 14 dias	29.40 MPa 14d strength Ready Mix Concrete	Ready Mix Concrete	29.4	Proprietary
93	Modulo de ruptura - MR 38 - 7 dias	26.60 MPa 7d strength Ready Mix Concrete	Ready Mix Concrete	26.6	Proprietary
94	Modulo de ruptura - MR 38 - 3 dias	26.60 MPa 3d strength Ready Mix Concrete	Ready Mix Concrete	26.6	Proprietary
95	Modulo de ruptura - MR 38 - 28 dias	26.60 MPa 28d strength Ready Mix Concrete	Ready Mix Concrete	26.6	Proprietary
96	Modulo de ruptura - MR 38 - 14 dias	26.60 MPa 14d strength Ready Mix Concrete	Ready Mix Concrete	26.6	Proprietary
97	Modulo de ruptura - MR 40 - 7 dias	28.00 MPa 7d strength Ready Mix Concrete	Ready Mix Concrete	28.0	Proprietary
98	Modulo de ruptura - MR 40 - 3 dias	28.00 MPa 3d strength Ready Mix Concrete	Ready Mix Concrete	28.0	Proprietary
99	Modulo de ruptura - MR 40 - 28 dias	28.00 MPa 28d strength Ready Mix Concrete	Ready Mix Concrete	28.0	Proprietary

100	Modulo de ruptura - MR 40 - 14 dias	28.00 MPa 14d strength Ready Mix Concrete	Ready Mix Concrete	28.0	Proprietary
101	Modulo de ruptura - MR 42 - 7 dias	29.40 MPa 7d strength Ready Mix Concrete	Ready Mix Concrete	29.4	Proprietary
102	Modulo de ruptura - MR 42 - 3 dias	29.40 MPa 3d strength Ready Mix Concrete	Ready Mix Concrete	29.4	Proprietary
103	Modulo de ruptura - MR 42 - 28 dias	29.40 MPa 28d strength Ready Mix Concrete	Ready Mix Concrete	29.4	Proprietary
104	Modulo de ruptura - MR 42 - 14 dias	29.40 MPa 14d strength Ready Mix Concrete	Ready Mix Concrete	29.4	Proprietary
113	Modulo de ruptura - MR 36 - 7 dias	25.20 MPa 7d strength Ready Mix Concrete	Ready Mix Concrete	25.2	Proprietary
114	Modulo de ruptura - MR 36 - 3 dias	25.20 MPa 3d strength Ready Mix Concrete	Ready Mix Concrete	25.2	Proprietary
115	Modulo de ruptura - MR 36 - 28 dias	25.20 MPa 28d strength Ready Mix Concrete	Ready Mix Concrete	25.2	Proprietary
116	Modulo de ruptura - MR 36 - 14 dias	25.20 MPa 14d strength Ready Mix Concrete	Ready Mix Concrete	25.2	Proprietary
117	Baja contracción - MR 38 - 28 dias	26.60 MPa 28d strength Ready Mix Concrete	Ready Mix Concrete	26.6	Proprietary
118	Baja contracción - MR 38 - 14 dias	26.60 MPa 14d strength Ready Mix Concrete	Ready Mix Concrete	26.6	Proprietary
119	Baja contracción - MR 40 - 28 dias	28.00 MPa 28d strength Ready Mix Concrete	Ready Mix Concrete	28.0	Proprietary
120	Baja contracción - MR 40 - 14 dias	28.00 MPa 14d strength Ready Mix Concrete	Ready Mix Concrete	28.0	Proprietary
121	Baja contracción - MR 42 - 28 dias	29.40 MPa 28d strength Ready Mix Concrete	Ready Mix Concrete	29.4	Proprietary
122	Baja contracción - MR 42 - 14 dias	29.40 MPa 14d strength Ready Mix Concrete	Ready Mix Concrete	29.4	Proprietary
135	Lanzado - f´c 300 - 7 dias	29.40 MPa 7d strength Ready Mix Concrete	Ready Mix Concrete	29.4	Proprietary
136	Lanzado - f´c 300 - 3 dias	29.40 MPa 3d strength Ready Mix Concrete	Ready Mix Concrete	29.4	Proprietary

137	Lanzado - f´c 300 - 28 dias	29.40 MPa 28d strength Ready Mix Concrete	Ready Mix Concrete	29.4	Proprietary
138	Lanzado - f´c 300 - 14 dias	29.40 MPa 14d strength Ready Mix Concrete	Ready Mix Concrete	29.4	Proprietary

Mix Designs: 31 to 35 MPa

Table 5: **Declared products with Mix designs: 31 to 35MPa considered in this environmental product declaration**

Mix#	Unique name/ID	Short description	Product type	Resistance strength, MPa	H2O to cement ratio
21	Convencional - f´c 350 - 7 dias	34.30 MPa 7d strength Ready Mix Concrete	Ready Mix Concrete	34.3	Proprietary
22	Convencional - f´c 350 - 3 dias	34.30 MPa 3d strength Ready Mix Concrete	Ready Mix Concrete	34.3	Proprietary
23	Convencional - f´c 350 - 28 dias	34.30 MPa 28d strength Ready Mix Concrete	Ready Mix Concrete	34.3	Proprietary
24	Convencional - f´c 350 - 14 dias	34.30 MPa 14d strength Ready Mix Concrete	Ready Mix Concrete	34.3	Proprietary
33	Estructural - f´c 350 - 7 dias	34.30 MPa 7d strength Ready Mix Concrete	Ready Mix Concrete	34.3	Proprietary
34	Estructural - f´c 350 - 3 dias	34.30 MPa 3d strength Ready Mix Concrete	Ready Mix Concrete	34.3	Proprietary
35	Estructural - f´c 350 - 28 dias	34.30 MPa 28d strength Ready Mix Concrete	Ready Mix Concrete	34.3	Proprietary
36	Estructural - f´c 350 - 14 dias	34.30 MPa 14d strength Ready Mix Concrete	Ready Mix Concrete	34.3	Proprietary
105	Modulo de ruptura - MR 45 - 7 dias	31.50 MPa 7d strength Ready Mix Concrete	Ready Mix Concrete	31.5	Proprietary
106	Modulo de ruptura - MR 45 - 3 dias	31.50 MPa 3d strength Ready Mix Concrete	Ready Mix Concrete	31.5	Proprietary
107	Modulo de ruptura - MR 45 - 28 dias	31.50 MPa 28d strength Ready Mix Concrete	Ready Mix Concrete	31.5	Proprietary
108	Modulo de ruptura - MR 45 - 14 dias	31.50 MPa 14d strength Ready Mix Concrete	Ready Mix Concrete	31.5	Proprietary

109	Modulo de ruptura - MR 48 - 7 dias	33.60 MPa 7d strength Ready Mix Concrete	Ready Mix Concrete	33.6	Proprietary
110	Modulo de ruptura - MR 48 - 3 dias	33.60 MPa 3d strength Ready Mix Concrete	Ready Mix Concrete	33.6	Proprietary
111	Modulo de ruptura - MR 48 - 28 dias	33.60 MPa 28d strength Ready Mix Concrete	Ready Mix Concrete	33.6	Proprietary
112	Modulo de ruptura - MR 48 - 14 dias	33.60 MPa 14d strength Ready Mix Concrete	Ready Mix Concrete	33.6	Proprietary
123	Baja contracción - MR 45 - 28 dias	31.50 MPa 28d strength Ready Mix Concrete	Ready Mix Concrete	31.5	Proprietary
124	Baja contracción - MR 45 - 14 dias	31.50 MPa 14d strength Ready Mix Concrete	Ready Mix Concrete	31.5	Proprietary
125	Baja contracción - MR 48 - 28 dias	33.60 MPa 28d strength Ready Mix Concrete	Ready Mix Concrete	33.6	Proprietary
126	Baja contracción - MR 48 - 14 dias	33.60 MPa 14d strength Ready Mix Concrete	Ready Mix Concrete	33.6	Proprietary
139	Lanzado - f´c 350 - 7 dias	34.30 MPa 7d strength Ready Mix Concrete	Ready Mix Concrete	34.3	Proprietary
140	Lanzado - f´c 350 - 3 dias	34.30 MPa 3d strength Ready Mix Concrete	Ready Mix Concrete	34.3	Proprietary
141	Lanzado - f´c 350 - 28 dias	34.30 MPa 28d strength Ready Mix Concrete	Ready Mix Concrete	34.3	Proprietary
142	Lanzado - f´c 350 - 14 dias	34.30 MPa 14d strength Ready Mix Concrete	Ready Mix Concrete	34.3	Proprietary

Mix Designs: 36 to 40 MPa

Table 6: **Declared products with Mix designs: 36 to 40MPa considered in this environmental product declaration**

Mix#	Unique name/ID	Short description	Product type	Resistance strength, MPa	H2O to cement ratio
37	Alta resistencia - f´c 400 - 7 dias	39.20 MPa 7d strength Ready Mix Concrete	Ready Mix Concrete	39.2	Proprietary
38	Alta resistencia - f´c 400 - 3 dias	39.20 MPa 3d strength Ready Mix Concrete	Ready Mix Concrete	39.2	Proprietary
39	Alta resistencia - f´c 400 - 28 dias	39.20 MPa 28d strength Ready Mix Concrete	Ready Mix Concrete	39.2	Proprietary

40	Alta resistencia - f´c 400 - 14 dias	39.20 MPa 14d strength Ready Mix Concrete	Ready Mix Concrete	39.2	Proprietary

Mix Designs: 41 to 45 MPa

Table 7: **Declared products with Mix designs: 41 to 45MPa considered in this environmental product declaration**

Mix#	Unique name/ID	Short description	Product type	Resistance strength, MPa	H2O to cement ratio
41	Alta resistencia - f´c 450 - 7 dias	44.10 MPa 7d strength Ready Mix Concrete	Ready Mix Concrete	44.1	Proprietary
42	Alta resistencia - f´c 450 - 3 dias	44.10 MPa 3d strength Ready Mix Concrete	Ready Mix Concrete	44.1	Proprietary
43	Alta resistencia - f´c 450 - 28 dias	44.10 MPa 28d strength Ready Mix Concrete	Ready Mix Concrete	44.1	Proprietary
44	Alta resistencia - f´c 450 - 14 dias	44.10 MPa 14d strength Ready Mix Concrete	Ready Mix Concrete	44.1	Proprietary

Mix Designs: 46 to 50 MPa

Table 7: **Declared products with Mix designs: 46 to 50MPa considered in this environmental product declaration**

Mix#	Unique name/ID	Short description	Product type	Resistance strength, MPa	H2O to cement ratio
45	Alta resistencia - f´c 500 - 7 dias	49.00 MPa 7d strength Ready Mix Concrete	Ready Mix Concrete	49	Proprietary
46	Alta resistencia - f´c 500 - 3 dias	49.00 MPa 3d strength Ready Mix Concrete	Ready Mix Concrete	49	Proprietary
47	Alta resistencia - f´c 500 - 28 dias	49.00 MPa 28d strength Ready Mix Concrete	Ready Mix Concrete	49	Proprietary
48	Alta resistencia - f´c 500 - 14 dias	49.00 MPa 14d strength Ready Mix Concrete	Ready Mix Concrete	49	Proprietary

Mix Designs: 51 to 55 MPa

Table 7: **Declared products with Mix designs: 51 to 55MPa considered in this environmental product declaration**

Mix#	Unique name/ID	Short description	Product type	Resistance strength, MPa	H2O to cement ratio
49	Alta resistencia - f´c 550 - 7 dias	53.90 MPa 7d strength Ready Mix Concrete	Ready Mix Concrete	53.9	Proprietary
50	Alta resistencia - f´c 550 - 3 dias	53.90 MPa 3d strength Ready Mix Concrete	Ready Mix Concrete	53.9	Proprietary
51	Alta resistencia - f´c 550 - 28 dias	53.90 MPa 28d strength Ready Mix Concrete	Ready Mix Concrete	53.9	Proprietary
52	Alta resistencia - f´c 550 - 14 dias	53.90 MPa 14d strength Ready Mix Concrete	Ready Mix Concrete	53.9	Proprietary

Mix Designs: 56 to 60 MPa

Table 7: **Declared products with Mix designs: 56 to 60MPa considered in this environmental product declaration**

Mix#	Unique name/ID	Short description	Product type	Resistance strength, MPa	H2O to cement ratio
53	Alta resistencia - f´c 600 - 7 dias	58.80 MPa 7d strength Ready Mix Concrete	Ready Mix Concrete	58.8	Proprietary
54	Alta resistencia - f´c 600 - 3 dias	58.80 MPa 3d strength Ready Mix Concrete	Ready Mix Concrete	58.8	Proprietary
55	Alta resistencia - f´c 600 - 28 dias	58.80 MPa 28d strength Ready Mix Concrete	Ready Mix Concrete	58.8	Proprietary
56	Alta resistencia - f´c 600 - 14 dias	58.80 MPa 14d strength Ready Mix Concrete	Ready Mix Concrete	58.8	Proprietary

READY MIX CONCRETE DESIGN COMPOSITION

The following figures provide mass breakdown (kg per functional unit) of the material composition of each ready mix concrete design considered. Please note that the presented breakdown has been randomly altered by +/-10%, and is therefore only an approximation; this manipulation is to ensure confidentiality.

Table 8: **Ready mix concrete composition.**

Product Components	Product Components
Cement	Proprietary
Aggregates	30–60.00
Others	0.01-5.00
Total	100.00

SYSTEM BOUNDARIES

The following figure depicts the cradle-to-gate system boundary considered in this study.

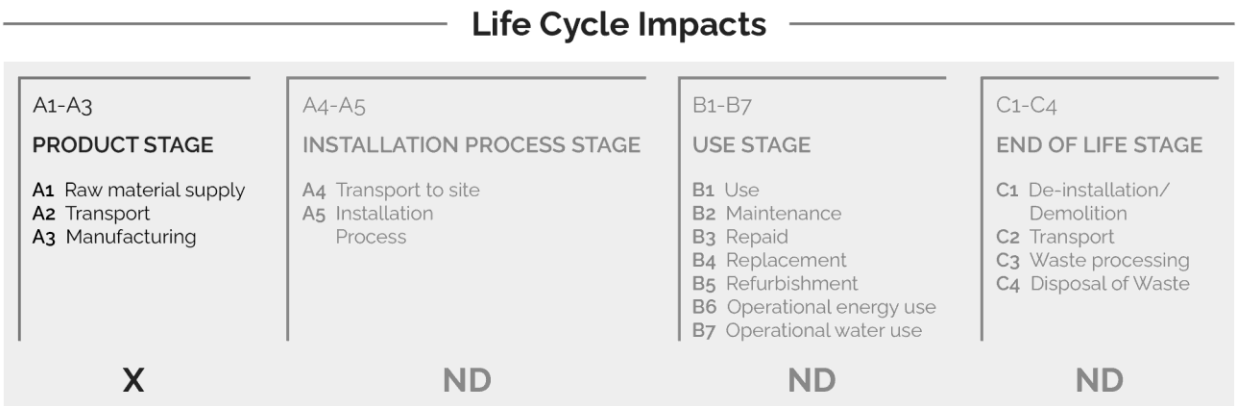

Figure 1: **General life cycle phases for consideration in a construction works system**

This is a Cradle-to-gate life cycle assessment and the following life cycle stages are included in the study:

- A1: Raw material supply (upstream processes) - Extraction, handling, and processing of the materials used in manufacturing the declared products in this LCA.
- A2: Transportation - Transportation of A1 materials from the supplier to the "gate" of the manufacturing facility (i.e., A3).
- A3: Manufacturing (core processes)- The energy and other utility inputs used to store, move, and manufacture the declared products and to operate the facility.

According to the PCR, the following figure illustrates the general activities and input requirements for producing ready mix concrete products and is not necessarily exhaustive.

System Boundary

Raw Material Supply (A1)	Transport (A2)	Manufacturing (A3)
Cements & SCMs Aggregates Admixtures Batch Water Fibers & Pigments	Truck, Rail, Ship Energy Carriers (fuels)	Energy Carriers (electricity and fuels) Ancillary Materials (lubricants, motor oil, cleaning chemicals, other consumables) Water (manufacturing water, including wash water for cement trucks, but excluding batch water) Waste (end of life treatment of ancillary materials and any packaging) 30% total fleet energy transit mix plants only

Figure 2: **General system inputs considered in the product system and categorized by modules in scope**

In addition, according to the relevant PCR, the following requirements are excluded from this study:

- Production, manufacture and construction of A3 building/capital goods and infrastructure.
- Production and manufacture of steel production equipment, steel delivery vehicles, earth-moving equipment, and laboratory equipment.
- Personnel-related activities (travel, furniture, office supplies);
- Energy use is related to company management and sales activities.

For this LCA the manufacturing plant, owned and operated by Cementos Moctezuma, is located at their Toluca facility in Estado de México, México. All operating data is formulated using the actual data from Cementos Moctezuma's plant at the above location, including water, energy consumption and waste generation. All inputs for this system boundary are calculated for the plant.

This life cycle inventory was organized in a spreadsheet and was then input into an RStudio environment where pre-calculated LCIA results for relevant products/activities stemming from the ecoinvent v3.10 database and a local EPD database in combination with primary data from Cementos Moctezuma were utilized. Explanations of the contribution of each data source to this study are outlined in the section 'Data Sources and Quality'. Further LCI details for each declared product are provided in the sections 'Detailed LCI tables' and 'Transport tables' of the detailed LCA report. A parameter uncertainty analysis was also performed where key statistical results (e.g. min/mean/max etc.) are provided in the detailed LCA report.

CUT-OFF CRITERIA

ISO 14044:2006 and the focus PCR requires the LCA model to contain a minimum of 95% of the total inflows (mass and energy) to the upstream and core modules be included in this study. The cut-off criteria were applied to all other processes unless otherwise noted above as follows. A 1% cut-off is considered for all renewable and non-renewable primary energy consumption and the total mass of inputs within a unit process where the total of the neglected inputs does not exceed 5%.

DATA SOURCES AND DATA QUALITY ASSESSMENT

Raw material transport: A combination of actual mode/distance combinations were assumed for key bulk materials whereas ecoinvent default multi-modal market mix distances were assumed for other inputs where no original data could be provided.

Electricity: Electricity consumption values are for Moctezuma in calendar year 2023. These values were direct reported from Moctezuma records. The unit process "market for electricity, medium voltage/electricity, medium voltage/MX/kWh" was used to represent the Mexico grid electricity used by the cement plant.**Process/space heating**: No fuel is used for space heating at this plant.

Fuel required for machinery: Machinery-related fuel requirements were determined from direct Moctezuma information for the reference year 2023.

Waste generation: No High-level radioactive waste is generated on-site at this facility.

Recovered energy: There was no recovered energy on-site.

Recycled/reused material/components: The amount of returned concrete is based on Moctezuma primary data for the reference year, 2023.

Module A1 material losses: Due to lack of data, default loss factors were assumed.

Direct A3 emissions accounting: Direct emissions are modeled using fuel and technology appropriate ecoinvent activities. See LCI input tables for details.

Waste transport requirements: Transportation distances are using estimated values. The waste hauler cannot guarantee the exact distances traveled due to the variation of route and actual location of disposal. Most waste disposal sites are near the plant therefore the 25 km distance is a representative estimate

Product transport requirements: Truck-related fuel requirements were determined from direct Moctezuma information for the reference year 2023.

The following tables depict a list of assumed life cycle inventory utilized in the LCA modeling to generate the impact results across the life cycle modules in scope. An assessment of the quality of each LCI activities utilized from various sources is also provided.

Table 9: **LCI inputs assumed for module A1 (i.e., raw material supply)** ***Data Quality Assessment Key Fair=1, Good=2, Very Good =3.***

Input	LCI.activity	Data.source	Geo	Year	Technology	Time	Geography	Reliability	Completeness
Andesite Sand	basalt quarry operation/basalt/RoW/ kg; Note: modifications made (see ecoinvent activity changes table)	ecoinvent v3.10 in 2024	Edo. Mex	2024	2	3	1	3	3
Water	tap water production, conventional treatment/tap water/RoW/kg	ecoinvent v3.10 in 2024	Edo. Mex	2024	2	3	2	3	3

Limestone Gravel	limestone quarry operation/limestone, unprocessed/RoW/kg; Note: modifications made (see ecoinvent activity changes table)	ecoinvent v3.10 in 2024	Edo. Mex	2024	2	3	1	3	3
Additives	chemical production, organic/chemical, organic/GLO/kg	ecoinvent v3.10 in 2024	Queretaro	2024	2	3	1	3	3
Cement	Gris CPC 40RS/cement/MX/tonne	Program Operator: Labeling Sustainability - EPD ID: bb72e77d-c6d2-4caa-ba9e-18cce10c7824	Morelos	23 November 2024	3	3	3	3	3
River Sand	sand quarry operation, extraction from river bed/sand/BR/kg; Note: modifications made (see ecoinvent activity changes table)	ecoinvent v3.10 in 2024	Morelos	2024	2	3	2	3	3

DATA QUALITY ASSESSMENT

Data quality/variability requirements, as specified in the PCR, are applied. This section describes the data quality achieved relative to the ISO 14044:2006 requirements. Data quality is judged based on its precision (measured, calculated or estimated), completeness (e.g., unreported emissions), consistency (degree of uniformity of the methodology applied within a study serving as a data source) and representativeness (geographical, temporal, and technological).

Precision: Through measurement and calculation, the manufacturers collected and provided primary data on their annual production. For accuracy, the LCA practitioner and 3rd Party Verifier validated the plant gate-to-gate data.

Completeness: All relevant specific processes, including inputs (raw materials, energy and ancillary materials) and outputs (emissions and production volume) were considered and modeled to represent the specified and declared products. Most relevant background materials and processes were taken from ecoinvent v3.10 LCI datasets where relatively recent region-specific electricity inputs were utilized. The most relevant EPDs requiring key A1 input were also utilized where readily available.

Consistency: To ensure consistency, the same modeling structure across the respective product systems was utilized for all inputs, which consisted of raw material inputs and ancillary material, energy flows, water resource inputs, product and co-products outputs, returned and recovered Ready Mix Concrete materials, emissions to air, water and soil, and waste recycling and treatment. The same background LCI datasets from the ecoinvent v3.10 database were used across all product systems. Crosschecks concerning the plausibility of mass and energy flows were continuously conducted. The

LCA team conducted mass and energy balances at the plant and selected process level to maintain a high level of consistency.

Reproducibility: Internal reproducibility is possible since the data and the models are stored and available in a machine-readable project file for all foreground and background processes, and in Labeling Sustainability's proprietary Ready Mix Concrete LCA calculator* for all production facility and product-specific calculations. A considerable level of transparency is provided throughout the detailed LCA report as the specifications and material quantity make-up for the declared products are presented and key primary and secondary LCI data sources are summarized. The provision of more detailed publicly accessible data to allow full external reproducibility was not possible due to reasons of confidentiality.

Labeling Sustainability has developed a proprietary tool that allows the calculation of PCR-compliant LCA results for Ready Mix Concrete product designs. The tool auto-calculates results by scaling base-unit technosphere inputs (i.e. 1 kg sand, 1 kWh electricity, etc.) to replicate the reference flow conversions that take place in any typical LCA software like openLCA or SimaPro. The tool was tested against several LCAs performed in openLCA and the tool generated identical results to those realized in openLCA across every impact category and inventory metric (where comparisons could be readily made).

Representativeness: The representativeness of the data is summarized as follows.

- Time related coverage of the manufacturing processes' primary collected data from 2023-01-01 to 2023-12-31.
- Upstream (background) LCI data was either the PCR specified default (if applicable) or more appropriate LCI datasets as found in the country-adjusted ecoinvent v3.10 database.
- Geographical coverage for inputs required by the A3 facility(ies) is representative of its region of focus; other upstream and background processes are based on US, North American, or global average data and adjusted to regional electricity mixes when relevant.
- Technological coverage is typical or average and specific to the participating facilities for all primary data.

ENVIRONMENTAL INDICATORS AND INVENTORY METRICS

Per the PCR, this EPD supports the life cycle impact assessment indicators and inventory metrics as listed in the tables below. As specified in the PCR, the most recent US EPA Tool for the Reduction and Assessment of Chemical and Other Environmental Impacts (TRACI), impact categories were utilized as they provide a North American context for the mandatory category indicators to be included in the EPD. Additionally, the PCR requires a set of inventory metrics to be reported with the LCIA indicators.

Table 10: **Life cycle impact categories and life cycle inventory metrics**

ID	LCIA.indicators	Abbreviations	Units
1	Climate change: global warming potential (GWP100)	GWP100	kg CO2-eq
2	Ozone depletion: ozone depletion potential (ODP)	ODP	kg CFC-11-eq
3	Acidification: acidification potential (AP)	AP	kg SO2-eq
4	Eutrophication: eutrophication potential	EP	kg N-eq
5	Smog formation potential	SFP	kg O3-eq

6	Energy resources: non-renewable: abiotic depletion potential (ADP): fossil fuels	ADPfossil	MJ
Inventory metrics			
7	Inventory indicators ISO21930: Cumulative Energy Demand - renewable energy resources	RPRE	MJ
8	Inventory indicators ISO21930: Renewable primary resources with energy content used as material (i.e., PERM)	PRM	MJ
9	Inventory indicators ISO21930: Cumulative Energy Demand - non-renewable energy resources	NRPRE	MJ
10	Inventory indicators ISO21930: Non-renewable primary resources with energy content used as material (i.e., PENRM)	NRPRM	kg
11	Inventory indicators ISO21930: use of secondary material	SM	MJ
12	Inventory indicators ISO21930: use of renewable secondary fuels	RSF	MJ
13	Inventory indicators ISO21930: recovered energy	RE	MJ
14	Inventory indicators ISO21930: use of net fresh water	FW	m3
15	Inventory indicators ISO21930: hazardous waste disposed	HWD	kg
16	Inventory indicators ISO21930: non-hazardous waste disposed	NHWD	kg
17	Inventory indicators ISO21930: high-level radioactive waste disposed	HLRW	kg
18	Inventory indicators ISO21930: intermediate and low-level radioactive waste disposed	ILLRW	kg
19	Inventory indicators ISO21930: materials for recycling	MR	kg
20	Inventory indicators ISO21930: materials for energy recovery	MER	kg

It should be noted that 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 any of the following categories.

- Renewable primary energy resources as energy (fuel);
- Renewable primary resources as material;
- Non-renewable primary resources as energy (fuel);
- Non-renewable primary resources as material;
- Secondary Materials;
- Renewable secondary fuels;
- Non-renewable secondary fuels;
- Recovered energy;
- Abiotic depletion potential for non-fossil mineral resources.
- Land use related impacts, for example on biodiversity and/or soil fertility;
- Toxicological aspects;
- Emissions from land use change [GWP 100 (land-use change)];
- Hazardous waste disposed;
- Non-hazardous waste disposed;
- High-level radioactive waste;
- Intermediate and low-level radioactive waste;

- Components for reuse;
- Materials for recycling;
- Materials for energy recovery;
- Recovered energy exported from the product system.

LIMITATIONS

This EPD is a declaration of potential environmental impact and does not support or provide definitive comparisons of the environmental performance of specific products. Only EPDs prepared from cradle-to-grave life cycle results and based on the same function and reference service life and quantified by the same functional unit can be used to assist purchasers and users in making informed comparisons between products.

LCIA results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins or risks. Further, LCA offers a wide array of environmental impact indicators, and this EPD reports a collection of those, as specified by the PCR.

In addition to the impact results, this EPD provides several metrics related to resource consumption and waste generation. While this data may be informational in other ways, they do not provide a measure of impact on the environment.

TOTAL IMPACT SUMMARY

The following table reports the total LCA results for each product produced at the given ready mix concrete facility on a per 1m3 of concrete basis.

Table 11: **Total life cycle (across modules in scope) impact results for all mix designs, assuming the geometric mean point values on a per 1 m3 of concrete basis.**

a) Midpoint Impact Categories:

Indicator/LCI Metric	GWP100	ODP	AP	EP	SFP	ADPfossil
Unit	**kg CO2-eq**	**kg CFC-11-eq**	**kg SO2-eq**	**kg N-eq**	**kg O3-eq**	**MJ**
Alta resistencia - f´c 400 - 14 dias	453	3.51E-06	0.469	0.274	8.75	2780
Alta resistencia - f´c 400 - 28 dias	431	3.35E-06	0.455	0.263	8.53	2660
Alta resistencia - f´c 400 - 3 dias	530	4.07E-06	0.519	0.31	9.5	3200
Alta resistencia - f´c 400 - 7 dias	485	3.74E-06	0.49	0.289	9.06	2960
Alta resistencia - f´c 450 - 14 dias	494	3.81E-06	0.496	0.293	9.15	3010
Alta resistencia - f´c 450 - 28 dias	472	3.65E-06	0.481	0.282	8.92	2890
Alta resistencia - f´c 450 - 3 dias	571	4.37E-06	0.547	0.329	9.9	3430

Alta resistencia - f´c 450 - 7 dias	526	4.04E-06	0.517	0.308	9.46	3180
Alta resistencia - f´c 500 - 14 dias	531	4.08E-06	0.521	0.311	9.52	3210
Alta resistencia - f´c 500 - 28 dias	509	3.92E-06	0.506	0.3	9.3	3090
Alta resistencia - f´c 500 - 3 dias	608	4.63E-06	0.571	0.347	10.3	3640
Alta resistencia - f´c 500 - 7 dias	563	4.31E-06	0.541	0.325	9.83	3390
Alta resistencia - f´c 550 - 14 dias	581	4.49E-06	0.558	0.356	10.1	3520
Alta resistencia - f´c 550 - 28 dias	559	4.32E-06	0.543	0.344	9.84	3390
Alta resistencia - f´c 550 - 3 dias	658	5.04E-06	0.609	0.395	10.8	3940
Alta resistencia - f´c 550 - 7 dias	613	4.72E-06	0.579	0.372	10.4	3690
Alta resistencia - f´c 600 - 14 dias	631	4.83E-06	0.59	0.374	10.6	3790
Alta resistencia - f´c 600 - 28 dias	609	4.67E-06	0.575	0.362	10.3	3660
Alta resistencia - f´c 600 - 3 dias	708	5.39E-06	0.641	0.412	11.3	4210
Alta resistencia - f´c 600 - 7 dias	663	5.06E-06	0.611	0.39	10.9	3960
Baja contracción - MR 38 - 14 dias	349	2.89E-06	0.394	0.205	7.74	2320
Baja contracción - MR 38 - 28 dias	327	2.74E-06	0.379	0.195	7.52	2200
Baja contracción - MR 40 - 14 dias	359	2.96E-06	0.4	0.209	7.83	2370
Baja contracción - MR 40 - 28 dias	336	2.81E-06	0.386	0.199	7.61	2250
Baja contracción - MR 42 - 14 dias	370	3.04E-06	0.408	0.214	7.94	2430
Baja contracción - MR 42 - 28 dias	348	2.89E-06	0.393	0.204	7.72	2310
Baja contracción - MR 45 - 14 dias	389	3.17E-06	0.421	0.222	8.13	2530
Baja contracción - MR 45 - 28 dias	366	3.02E-06	0.406	0.212	7.9	2410
Baja contracción - MR 48 - 14 dias	409	3.31E-06	0.434	0.231	8.32	2640
Baja contracción - MR 48 - 28 dias	387	3.16E-06	0.419	0.221	8.1	2520
Convencional - f´c 100 - 14 dias	185	1.48E-06	0.296	0.14	6.24	1240
Convencional - f´c 100 - 28 dias	162	1.33E-06	0.281	0.131	6.01	1110
Convencional - f´c 100 - 3 dias	261	2.01E-06	0.345	0.168	6.99	1650

Convencional - f´c 100 - 7 dias	216	1.70E-06	0.316	0.151	6.55	1410
Convencional - f´c 150 - 14 dias	208	1.65E-06	0.311	0.148	6.47	1360
Convencional - f´c 150 - 28 dias	186	1.49E-06	0.296	0.14	6.25	1240
Convencional - f´c 150 - 3 dias	284	2.18E-06	0.36	0.176	7.22	1770
Convencional - f´c 150 - 7 dias	239	1.86E-06	0.331	0.16	6.78	1530
Convencional - f´c 200 - 14 dias	242	1.88E-06	0.333	0.161	6.81	1550
Convencional - f´c 200 - 28 dias	220	1.73E-06	0.318	0.153	6.59	1420
Convencional - f´c 200 - 3 dias	318	2.41E-06	0.382	0.189	7.55	1960
Convencional - f´c 200 - 7 dias	273	2.10E-06	0.354	0.172	7.12	1720
Convencional - f´c 250 - 14 dias	275	2.11E-06	0.355	0.173	7.14	1730
Convencional - f´c 250 - 28 dias	253	1.96E-06	0.34	0.165	6.92	1600
Convencional - f´c 250 - 3 dias	351	2.64E-06	0.404	0.201	7.88	2140
Convencional - f´c 250 - 7 dias	306	2.33E-06	0.375	0.185	7.45	1900
Convencional - f´c 300 - 14 dias	330	2.50E-06	0.39	0.193	7.67	2030
Convencional - f´c 300 - 28 dias	308	2.34E-06	0.376	0.185	7.45	1900
Convencional - f´c 300 - 3 dias	406	3.03E-06	0.439	0.221	8.41	2440
Convencional - f´c 300 - 7 dias	362	2.72E-06	0.41	0.205	7.97	2200
Convencional - f´c 350 - 14 dias	377	2.82E-06	0.42	0.21	8.12	2280
Convencional - f´c 350 - 28 dias	354	2.67E-06	0.406	0.202	7.9	2160
Convencional - f´c 350 - 3 dias	453	3.35E-06	0.469	0.238	8.86	2690
Convencional - f´c 350 - 7 dias	408	3.04E-06	0.44	0.222	8.43	2450
Estructural - f´c 250 - 14 dias	278	2.19E-06	0.342	0.163	6.79	1780
Estructural - f´c 250 - 28 dias	255	2.04E-06	0.328	0.155	6.58	1660
Estructural - f´c 250 - 3 dias	354	2.73E-06	0.39	0.19	7.51	2190
Estructural - f´c 250 - 7 dias	309	2.41E-06	0.362	0.174	7.09	1950
Estructural - f´c 300 - 14 dias	331	2.56E-06	0.375	0.182	7.28	2060

Estructural - f´c 300 - 28 dias	308	2.41E-06	0.361	0.174	7.07	1940
Estructural - f´c 300 - 3 dias	407	3.09E-06	0.424	0.209	8	2480
Estructural - f´c 300 - 7 dias	362	2.78E-06	0.395	0.193	7.58	2230
Estructural - f´c 350 - 14 dias	379	2.90E-06	0.406	0.199	7.75	2320
Estructural - f´c 350 - 28 dias	356	2.74E-06	0.392	0.191	7.54	2200
Estructural - f´c 350 - 3 dias	455	3.43E-06	0.455	0.227	8.48	2740
Estructural - f´c 350 - 7 dias	410	3.12E-06	0.426	0.211	8.05	2490
Lanzado - f´c 200 - 14 dias	370	2.77E-06	0.409	0.205	7.88	2230
Lanzado - f´c 200 - 28 dias	343	2.58E-06	0.391	0.196	7.61	2090
Lanzado - f´c 200 - 3 dias	414	3.08E-06	0.438	0.222	8.32	2470
Lanzado - f´c 200 - 7 dias	396	2.96E-06	0.426	0.215	8.14	2380
Lanzado - f´c 250 - 14 dias	396	2.96E-06	0.426	0.215	8.14	2380
Lanzado - f´c 250 - 28 dias	370	2.77E-06	0.409	0.205	7.88	2230
Lanzado - f´c 250 - 3 dias	441	3.27E-06	0.455	0.232	8.58	2620
Lanzado - f´c 250 - 7 dias	423	3.14E-06	0.443	0.225	8.4	2520
Lanzado - f´c 300 - 14 dias	432	3.21E-06	0.449	0.228	8.49	2570
Lanzado - f´c 300 - 28 dias	405	3.02E-06	0.432	0.219	8.23	2430
Lanzado - f´c 300 - 3 dias	477	3.52E-06	0.478	0.245	8.93	2810
Lanzado - f´c 300 - 7 dias	459	3.39E-06	0.467	0.238	8.75	2720
Lanzado - f´c 350 - 14 dias	472	3.49E-06	0.475	0.243	8.89	2790
Lanzado - f´c 350 - 28 dias	446	3.30E-06	0.458	0.233	8.63	2640
Lanzado - f´c 350 - 3 dias	517	3.80E-06	0.504	0.26	9.32	3030
Lanzado - f´c 350 - 7 dias	499	3.67E-06	0.493	0.253	9.15	2940
Modulo de ruptura - MR 35 - 14 dias	316	2.46E-06	0.367	0.168	7.18	1990
Modulo de ruptura - MR 35 - 28 dias	294	2.31E-06	0.353	0.16	6.96	1870
Modulo de ruptura - MR 35 - 3 dias	401	3.05E-06	0.421	0.197	8.01	2450

Modulo de ruptura - MR 35 - 7 dias	356	2.74E-06	0.393	0.182	7.58	2210
Modulo de ruptura - MR 36 - 14 dias	319	2.49E-06	0.369	0.169	7.22	2010
Modulo de ruptura - MR 36 - 28 dias	297	2.33E-06	0.355	0.161	7	1890
Modulo de ruptura - MR 36 - 3 dias	404	3.08E-06	0.424	0.198	8.04	2470
Modulo de ruptura - MR 36 - 7 dias	360	2.77E-06	0.395	0.183	7.61	2230
Modulo de ruptura - MR 38 - 14 dias	328	2.55E-06	0.375	0.172	7.3	2060
Modulo de ruptura - MR 38 - 28 dias	306	2.40E-06	0.36	0.164	7.08	1940
Modulo de ruptura - MR 38 - 3 dias	413	3.14E-06	0.429	0.201	8.13	2520
Modulo de ruptura - MR 38 - 7 dias	368	2.83E-06	0.401	0.186	7.7	2280
Modulo de ruptura - MR 40 - 14 dias	338	2.62E-06	0.381	0.175	7.39	2110
Modulo de ruptura - MR 40 - 28 dias	316	2.46E-06	0.367	0.168	7.17	1990
Modulo de ruptura - MR 40 - 3 dias	423	3.21E-06	0.436	0.204	8.22	2570
Modulo de ruptura - MR 40 - 7 dias	378	2.90E-06	0.407	0.189	7.79	2330
Modulo de ruptura - MR 42 - 14 dias	351	2.71E-06	0.389	0.179	7.51	2180
Modulo de ruptura - MR 42 - 28 dias	328	2.55E-06	0.375	0.172	7.29	2060
Modulo de ruptura - MR 42 - 3 dias	435	3.29E-06	0.443	0.208	8.34	2640
Modulo de ruptura - MR 42 - 7 dias	391	2.98E-06	0.415	0.193	7.91	2400
Modulo de ruptura - MR 45 - 14 dias	370	2.84E-06	0.402	0.186	7.71	2290
Modulo de ruptura - MR 45 - 28 dias	348	2.69E-06	0.387	0.179	7.48	2160
Modulo de ruptura - MR 45 - 3 dias	455	3.43E-06	0.456	0.215	8.53	2740
Modulo de ruptura - MR 45 - 7 dias	410	3.12E-06	0.428	0.2	8.1	2500
Modulo de ruptura - MR 48 - 14 dias	392	2.99E-06	0.415	0.193	7.91	2400
Modulo de ruptura - MR 48 - 28 dias	369	2.83E-06	0.401	0.186	7.69	2280
Modulo de ruptura - MR 48 - 3 dias	476	3.57E-06	0.47	0.222	8.74	2860
Modulo de ruptura - MR 48 - 7 dias	432	3.27E-06	0.441	0.207	8.31	2620
Relleno Fluido - f´c 15 - 14 dias	172	1.36E-06	0.261	0.119	5.46	1130

Relleno Fluido - f´c 15 - 28 dias	150	1.20E-06	0.247	0.112	5.24	1010
Relleno Fluido - f´c 15 - 3 dias	257	1.94E-06	0.315	0.146	6.28	1580
Relleno Fluido - f´c 15 - 7 dias	212	1.63E-06	0.287	0.132	5.85	1350
Relleno Fluido - f´c 20 - 14 dias	177	1.39E-06	0.264	0.12	5.51	1150
Relleno Fluido - f´c 20 - 28 dias	154	1.23E-06	0.25	0.113	5.28	1030
Relleno Fluido - f´c 20 - 3 dias	261	1.97E-06	0.318	0.147	6.33	1610
Relleno Fluido - f´c 20 - 7 dias	217	1.66E-06	0.29	0.133	5.9	1370
Relleno Fluido - f´c 25 - 14 dias	182	1.42E-06	0.267	0.122	5.55	1180
Relleno Fluido - f´c 25 - 28 dias	160	1.27E-06	0.253	0.115	5.33	1060
Relleno Fluido - f´c 25 - 3 dias	266	2.01E-06	0.322	0.149	6.38	1640
Relleno Fluido - f´c 25 - 7 dias	222	1.70E-06	0.293	0.135	5.95	1400
Relleno Fluido - f´c 30 - 14 dias	188	1.47E-06	0.271	0.124	5.62	1220
Relleno Fluido - f´c 30 - 28 dias	166	1.31E-06	0.257	0.117	5.39	1100
Relleno Fluido - f´c 30 - 3 dias	273	2.05E-06	0.326	0.151	6.44	1670
Relleno Fluido - f´c 30 - 7 dias	228	1.74E-06	0.297	0.137	6.01	1430
Relleno Fluido - f´c 40 - 14 dias	201	1.55E-06	0.279	0.128	5.74	1280
Relleno Fluido - f´c 40 - 28 dias	178	1.40E-06	0.265	0.121	5.52	1160
Relleno Fluido - f´c 40 - 3 dias	285	2.13E-06	0.333	0.154	6.56	1740
Relleno Fluido - f´c 40 - 7 dias	241	1.83E-06	0.305	0.141	6.13	1500
Relleno Fluido - f´c 50 - 14 dias	217	1.66E-06	0.29	0.133	5.89	1370
Relleno Fluido - f´c 50 - 28 dias	194	1.51E-06	0.275	0.126	5.67	1250
Relleno Fluido - f´c 50 - 3 dias	301	2.24E-06	0.344	0.159	6.71	1820
Relleno Fluido - f´c 50 - 7 dias	257	1.94E-06	0.315	0.145	6.28	1580
Relleno Fluido - f´c 60 - 14 dias	234	1.79E-06	0.301	0.138	6.06	1460
Relleno Fluido - f´c 60 - 28 dias	212	1.63E-06	0.286	0.131	5.84	1340
Relleno Fluido - f´c 60 - 3 dias	319	2.37E-06	0.355	0.165	6.88	1920

Relleno Fluido - f´c 60 - 7 dias	274	2.06E-06	0.327	0.151	6.45	1680
Relleno Fluido - f´c 70 - 14 dias	257	1.94E-06	0.315	0.145	6.27	1580
Relleno Fluido - f´c 70 - 28 dias	234	1.79E-06	0.301	0.138	6.05	1460
Relleno Fluido - f´c 70 - 3 dias	341	2.52E-06	0.369	0.172	7.09	2040
Relleno Fluido - f´c 70 - 7 dias	297	2.21E-06	0.341	0.158	6.66	1800

b) Resource Inventory Metrics:

Indicator/LCI Metric	**RPRE**	**PRM**	**NRPRE**	**NRPRM**	**SM**	**RSF**	**RE**	**FW**
Unit	**MJ**	**MJ**	**MJ**	**kg**	**MJ**	**MJ**	**MJ**	**m3**
Alta resistencia - f´c 400 - 14 dias	97.4	5.84	96.2	1330	0.565	0.00538	0.269	0.51
Alta resistencia - f´c 400 - 28 dias	93.1	5.78	92	1260	0.544	0.00525	0.262	0.497
Alta resistencia - f´c 400 - 3 dias	112	6.07	111	1580	0.635	0.00581	0.295	0.553
Alta resistencia - f´c 400 - 7 dias	103	5.94	102	1430	0.594	0.00555	0.28	0.527
Alta resistencia - f´c 450 - 14 dias	105	5.96	104	1470	0.603	0.00562	0.283	0.536
Alta resistencia - f´c 450 - 28 dias	101	5.9	99.8	1390	0.583	0.00549	0.275	0.525
Alta resistencia - f´c 450 - 3 dias	120	6.19	119	1710	0.673	0.00604	0.309	0.579
Alta resistencia - f´c 450 - 7 dias	111	6.06	110	1570	0.632	0.00579	0.294	0.554
Alta resistencia - f´c 500 - 14 dias	113	6.07	111	1580	0.637	0.00582	0.296	0.556
Alta resistencia - f´c 500 - 28 dias	108	6.01	107	1510	0.616	0.00569	0.288	0.542
Alta resistencia - f´c 500 - 3 dias	127	6.29	126	1830	0.706	0.00623	0.321	0.598
Alta resistencia - f´c 500 - 7 dias	119	6.16	117	1680	0.665	0.00598	0.306	0.573
Alta resistencia - f´c 550 - 14 dias	123	6.21	121	1750	0.687	0.00614	0.323	0.596
Alta resistencia - f´c 550 - 28 dias	118	6.15	117	1670	0.666	0.006	0.315	0.583
Alta resistencia - f´c 550 - 3 dias	138	6.43	136	1990	0.757	0.00656	0.351	0.641
Alta resistencia - f´c 550 - 7 dias	129	6.3	127	1850	0.716	0.00631	0.334	0.615
Alta resistencia - f´c 600 - 14 dias	132	6.36	131	1910	0.731	0.0064	0.338	0.619

Alta resistencia - f´c 600 - 28 dias	128	6.29	126	1830	0.71	0.00626	0.329	0.606
Alta resistencia - f´c 600 - 3 dias	147	6.58	146	2150	0.801	0.00682	0.364	0.663
Alta resistencia - f´c 600 - 7 dias	139	6.45	137	2010	0.76	0.00657	0.349	0.636
Baja contracción - MR 38 - 14 dias	72.3	5.5	71.4	952	0.57	0.00626	0.247	0.578
Baja contracción - MR 38 - 28 dias	67.9	5.43	67.1	881	0.552	0.00618	0.24	0.57
Baja contracción - MR 40 - 14 dias	74.2	5.53	73.3	983	0.577	0.00629	0.249	0.582
Baja contracción - MR 40 - 28 dias	69.8	5.46	69	912	0.56	0.00621	0.243	0.572
Baja contracción - MR 42 - 14 dias	76.5	5.56	75.5	1020	0.586	0.00633	0.253	0.583
Baja contracción - MR 42 - 28 dias	72.1	5.5	71.2	949	0.568	0.00625	0.246	0.577
Baja contracción - MR 45 - 14 dias	80.2	5.62	79.2	1080	0.601	0.00641	0.258	0.59
Baja contracción - MR 45 - 28 dias	75.8	5.55	74.8	1010	0.583	0.00632	0.251	0.583
Baja contracción - MR 48 - 14 dias	84.2	5.68	83.1	1150	0.617	0.00648	0.264	0.597
Baja contracción - MR 48 - 28 dias	79.8	5.61	78.8	1070	0.599	0.0064	0.257	0.589
Convencional - f´c 100 - 14 dias	48.7	5.07	48.2	485	0.277	0.00327	0.173	0.324
Convencional - f´c 100 - 28 dias	44.3	5	43.9	415	0.257	0.00316	0.167	0.312
Convencional - f´c 100 - 3 dias	63.3	5.3	62.6	726	0.345	0.00368	0.195	0.361
Convencional - f´c 100 - 7 dias	54.7	5.16	54.1	584	0.305	0.00344	0.183	0.339
Convencional - f´c 150 - 14 dias	53.2	5.14	52.6	559	0.298	0.0034	0.18	0.335
Convencional - f´c 150 - 28 dias	48.8	5.07	48.4	488	0.278	0.00328	0.174	0.324
Convencional - f´c 150 - 3 dias	67.8	5.37	67.1	799	0.366	0.00381	0.202	0.372
Convencional - f´c 150 - 7 dias	59.2	5.23	58.6	658	0.326	0.00357	0.189	0.349
Convencional - f´c 200 - 14 dias	59.7	5.24	59.1	666	0.328	0.00358	0.19	0.35
Convencional - f´c 200 - 28 dias	55.4	5.17	54.8	596	0.308	0.00346	0.184	0.34
Convencional - f´c 200 - 3 dias	74.3	5.47	73.5	907	0.396	0.00399	0.212	0.389
Convencional - f´c 200 - 7 dias	65.7	5.33	65	765	0.356	0.00375	0.199	0.366
Convencional - f´c 250 - 14 dias	66.1	5.34	65.4	771	0.358	0.00376	0.2	0.366

Convencional - f´c 250 - 28 dias	61.8	5.27	61.1	700	0.338	0.00364	0.193	0.355
Convencional - f´c 250 - 3 dias	80.7	5.56	79.8	1010	0.425	0.00417	0.222	0.404
Convencional - f´c 250 - 7 dias	72.1	5.43	71.3	870	0.386	0.00393	0.209	0.382
Convencional - f´c 300 - 14 dias	76.7	5.5	75.8	946	0.407	0.00405	0.215	0.401
Convencional - f´c 300 - 28 dias	72.4	5.44	71.6	876	0.387	0.00393	0.209	0.391
Convencional - f´c 300 - 3 dias	91.3	5.73	90.2	1190	0.475	0.00446	0.237	0.439
Convencional - f´c 300 - 7 dias	82.7	5.59	81.8	1050	0.435	0.00422	0.224	0.417
Convencional - f´c 350 - 14 dias	85.6	5.64	84.7	1090	0.448	0.0043	0.229	0.422
Convencional - f´c 350 - 28 dias	81.3	5.57	80.4	1020	0.428	0.00418	0.222	0.412
Convencional - f´c 350 - 3 dias	100	5.86	99	1330	0.516	0.0047	0.25	0.46
Convencional - f´c 350 - 7 dias	91.6	5.73	90.6	1190	0.476	0.00447	0.238	0.438
Estructural - f´c 250 - 14 dias	62.2	5.34	61.5	771	0.398	0.00431	0.193	0.409
Estructural - f´c 250 - 28 dias	58	5.27	57.3	700	0.377	0.00418	0.187	0.398
Estructural - f´c 250 - 3 dias	76.7	5.56	75.8	1010	0.467	0.00472	0.215	0.447
Estructural - f´c 250 - 7 dias	68.2	5.43	67.4	870	0.426	0.00448	0.202	0.425
Estructural - f´c 300 - 14 dias	72.2	5.49	71.4	938	0.445	0.00459	0.208	0.443
Estructural - f´c 300 - 28 dias	68	5.43	67.2	867	0.425	0.00446	0.202	0.434
Estructural - f´c 300 - 3 dias	86.7	5.72	85.7	1180	0.514	0.005	0.229	0.483
Estructural - f´c 300 - 7 dias	78.2	5.59	77.3	1040	0.473	0.00476	0.217	0.459
Estructural - f´c 350 - 14 dias	81.5	5.64	80.5	1090	0.488	0.00484	0.222	0.468
Estructural - f´c 350 - 28 dias	77.3	5.57	76.3	1020	0.468	0.00472	0.216	0.457
Estructural - f´c 350 - 3 dias	96	5.86	94.8	1330	0.556	0.00525	0.243	0.505
Estructural - f´c 350 - 7 dias	87.5	5.73	86.4	1190	0.516	0.00501	0.231	0.483
Lanzado - f´c 200 - 14 dias	83.8	5.62	82.8	1070	0.439	0.00419	0.223	0.46
Lanzado - f´c 200 - 28 dias	78.6	5.54	77.7	989	0.415	0.00405	0.215	0.448
Lanzado - f´c 200 - 3 dias	92.4	5.75	91.3	1210	0.479	0.00443	0.236	0.482

Lanzado - f´c 200 - 7 dias	88.9	5.7	87.9	1160	0.463	0.00433	0.23	0.474
Lanzado - f´c 250 - 14 dias	88.9	5.7	87.9	1160	0.463	0.00434	0.231	0.474
Lanzado - f´c 250 - 28 dias	83.8	5.62	82.8	1070	0.439	0.00419	0.223	0.461
Lanzado - f´c 250 - 3 dias	97.5	5.83	96.4	1300	0.503	0.00457	0.243	0.497
Lanzado - f´c 250 - 7 dias	94.1	5.78	93	1240	0.487	0.00448	0.238	0.487
Lanzado - f´c 300 - 14 dias	95.8	5.8	94.7	1270	0.495	0.00453	0.241	0.491
Lanzado - f´c 300 - 28 dias	90.7	5.73	89.6	1190	0.471	0.00438	0.233	0.478
Lanzado - f´c 300 - 3 dias	104	5.94	103	1410	0.535	0.00477	0.254	0.514
Lanzado - f´c 300 - 7 dias	101	5.88	99.8	1360	0.519	0.00467	0.248	0.505
Lanzado - f´c 350 - 14 dias	104	5.92	102	1400	0.531	0.00474	0.252	0.511
Lanzado - f´c 350 - 28 dias	98.4	5.84	97.2	1310	0.507	0.0046	0.245	0.498
Lanzado - f´c 350 - 3 dias	112	6.05	111	1540	0.571	0.00498	0.265	0.534
Lanzado - f´c 350 - 7 dias	109	6	107	1480	0.555	0.00489	0.26	0.524
Modulo de ruptura - MR 35 - 14 dias	68.5	5.45	67.7	884	0.444	0.00472	0.202	0.425
Modulo de ruptura - MR 35 - 28 dias	64.2	5.38	63.4	813	0.424	0.00459	0.196	0.415
Modulo de ruptura - MR 35 - 3 dias	84.7	5.7	83.7	1150	0.519	0.00515	0.225	0.467
Modulo de ruptura - MR 35 - 7 dias	76.2	5.57	75.3	1010	0.479	0.00492	0.213	0.445
Modulo de ruptura - MR 36 - 14 dias	69.2	5.46	68.3	895	0.447	0.00473	0.203	0.428
Modulo de ruptura - MR 36 - 28 dias	64.9	5.39	64.1	824	0.427	0.00461	0.197	0.416
Modulo de ruptura - MR 36 - 3 dias	85.4	5.71	84.4	1160	0.522	0.00517	0.226	0.468
Modulo de ruptura - MR 36 - 7 dias	76.9	5.58	76	1020	0.482	0.00494	0.214	0.447

Modulo de ruptura - MR 38 - 14 dias	70.9	5.48	70	923	0.455	0.00478	0.205	0.434
Modulo de ruptura - MR 38 - 28 dias	66.6	5.42	65.8	853	0.435	0.00466	0.199	0.422
Modulo de ruptura - MR 38 - 3 dias	87.1	5.73	86.1	1190	0.53	0.00522	0.229	0.473
Modulo de ruptura - MR 38 - 7 dias	78.6	5.6	77.6	1050	0.49	0.00499	0.217	0.451
Modulo de ruptura - MR 40 - 14 dias	72.7	5.51	71.8	954	0.464	0.00483	0.208	0.437
Modulo de ruptura - MR 40 - 28 dias	68.4	5.45	67.6	884	0.444	0.00471	0.202	0.426
Modulo de ruptura - MR 40 - 3 dias	89	5.76	87.9	1220	0.539	0.00527	0.231	0.476
Modulo de ruptura - MR 40 - 7 dias	80.5	5.63	79.5	1080	0.499	0.00504	0.219	0.457
Modulo de ruptura - MR 42 - 14 dias	75.1	5.55	74.2	993	0.475	0.0049	0.212	0.442
Modulo de ruptura - MR 42 - 28 dias	70.8	5.48	70	923	0.455	0.00478	0.205	0.432
Modulo de ruptura - MR 42 - 3 dias	91.4	5.8	90.3	1260	0.549	0.00533	0.235	0.484
Modulo de ruptura - MR 42 - 7 dias	82.9	5.67	81.8	1120	0.51	0.0051	0.223	0.463
Modulo de ruptura - MR 45 - 14 dias	78.9	5.61	77.9	1060	0.492	0.005	0.217	0.45
Modulo de ruptura - MR 45 - 28 dias	74.6	5.54	73.7	985	0.472	0.00488	0.211	0.442
Modulo de ruptura - MR 45 - 3 dias	95.2	5.86	94	1320	0.567	0.00543	0.24	0.493
Modulo de ruptura - MR 45 - 7 dias	86.6	5.73	85.6	1180	0.527	0.00521	0.228	0.469
Modulo de ruptura - MR 48 - 14 dias	83	5.67	82	1120	0.511	0.00511	0.223	0.461

Modulo de ruptura - MR 48 - 28 dias	78.7	5.61	77.7	1050	0.491	0.00499	0.217	0.451
Modulo de ruptura - MR 48 - 3 dias	99.3	5.92	98.1	1390	0.585	0.00554	0.246	0.501
Modulo de ruptura - MR 48 - 7 dias	90.7	5.79	89.6	1250	0.546	0.00531	0.234	0.479
Relleno Fluido - f´c 15 - 14 dias	44.4	5.05	44	457	0.251	0.00289	0.15	0.364
Relleno Fluido - f´c 15 - 28 dias	40.1	4.98	39.7	386	0.231	0.00278	0.144	0.354
Relleno Fluido - f´c 15 - 3 dias	60.6	5.3	59.9	723	0.325	0.00334	0.172	0.404
Relleno Fluido - f´c 15 - 7 dias	52.1	5.17	51.5	583	0.286	0.00311	0.161	0.382
Relleno Fluido - f´c 20 - 14 dias	45.3	5.06	44.8	471	0.255	0.00292	0.151	0.367
Relleno Fluido - f´c 20 - 28 dias	41	4.99	40.6	401	0.235	0.0028	0.145	0.357
Relleno Fluido - f´c 20 - 3 dias	61.4	5.31	60.8	737	0.329	0.00336	0.173	0.407
Relleno Fluido - f´c 20 - 7 dias	53	5.18	52.4	597	0.29	0.00313	0.162	0.385
Relleno Fluido - f´c 25 - 14 dias	46.3	5.08	45.8	487	0.259	0.00295	0.153	0.37
Relleno Fluido - f´c 25 - 28 dias	42	5.01	41.6	417	0.239	0.00283	0.147	0.358
Relleno Fluido - f´c 25 - 3 dias	62.5	5.33	61.8	754	0.334	0.00339	0.175	0.409
Relleno Fluido - f´c 25 - 7 dias	54	5.2	53.4	614	0.295	0.00316	0.163	0.389
Relleno Fluido - f´c 30 - 14 dias	47.5	5.09	47	507	0.265	0.00298	0.154	0.374
Relleno Fluido - f´c 30 - 28 dias	43.2	5.03	42.8	437	0.245	0.00286	0.148	0.364
Relleno Fluido - f´c 30 - 3 dias	63.7	5.35	62.9	774	0.339	0.00342	0.176	0.414
Relleno Fluido - f´c 30 - 7 dias	55.2	5.21	54.6	633	0.3	0.00319	0.165	0.392
Relleno Fluido - f´c 40 - 14 dias	49.9	5.13	49.3	546	0.276	0.00305	0.158	0.382
Relleno Fluido - f´c 40 - 28 dias	45.6	5.07	45.1	476	0.256	0.00293	0.152	0.371
Relleno Fluido - f´c 40 - 3 dias	66	5.38	65.3	813	0.35	0.00349	0.18	0.421
Relleno Fluido - f´c 40 - 7 dias	57.5	5.25	56.9	673	0.311	0.00326	0.168	0.401
Relleno Fluido - f´c 50 - 14 dias	52.9	5.18	52.4	597	0.29	0.00313	0.162	0.39

Relleno Fluido - f´c 50 - 28 dias	48.7	5.11	48.1	527	0.27	0.00301	0.156	0.379
Relleno Fluido - f´c 50 - 3 dias	69.1	5.43	68.3	863	0.365	0.00357	0.184	0.429
Relleno Fluido - f´c 50 - 7 dias	60.6	5.3	59.9	723	0.325	0.00334	0.172	0.408
Relleno Fluido - f´c 60 - 14 dias	56.3	5.23	55.7	653	0.306	0.00322	0.166	0.397
Relleno Fluido - f´c 60 - 28 dias	52.1	5.17	51.5	583	0.286	0.0031	0.16	0.388
Relleno Fluido - f´c 60 - 3 dias	72.5	5.48	71.6	920	0.38	0.00366	0.188	0.437
Relleno Fluido - f´c 60 - 7 dias	64	5.35	63.3	779	0.341	0.00343	0.177	0.416
Relleno Fluido - f´c 70 - 14 dias	60.6	5.3	59.9	723	0.325	0.00334	0.172	0.408
Relleno Fluido - f´c 70 - 28 dias	56.3	5.23	55.7	653	0.305	0.00322	0.166	0.397
Relleno Fluido - f´c 70 - 3 dias	76.7	5.55	75.8	990	0.4	0.00378	0.194	0.448
Relleno Fluido - f´c 70 - 7 dias	68.2	5.42	67.4	849	0.36	0.00355	0.182	0.426

c) Waste/output Inventory Metrics:

Indicator/LCI Metric	**HWD**	**NHWD**	**HLRW**	**ILLRW**	**MR**	**MER**
Unit	**kg**	**kg**	**kg**	**kg**	**kg**	**kg**
Alta resistencia - f´c 400 - 14 dias	3.6	89	0.000208	0.000706	0.0418	7.12E-05
Alta resistencia - f´c 400 - 28 dias	3.49	85.9	0.000201	0.000678	0.04	6.89E-05
Alta resistencia - f´c 400 - 3 dias	4.01	99.3	0.000232	0.000803	0.0481	7.90E-05
Alta resistencia - f´c 400 - 7 dias	3.77	93.2	0.000218	0.000746	0.0444	7.44E-05
Alta resistencia - f´c 450 - 14 dias	3.82	94.6	0.000221	0.000758	0.0452	7.55E-05
Alta resistencia - f´c 450 - 28 dias	3.7	91.5	0.000214	0.00073	0.0434	7.31E-05
Alta resistencia - f´c 450 - 3 dias	4.23	105	0.000245	0.000855	0.0515	8.32E-05
Alta resistencia - f´c 450 - 7 dias	3.99	98.9	0.000231	0.000798	0.0478	7.86E-05
Alta resistencia - f´c 500 - 14 dias	4.02	99.6	0.000233	0.000805	0.0483	7.92E-05
Alta resistencia - f´c 500 - 28 dias	3.9	96.6	0.000226	0.000777	0.0464	7.69E-05
Alta resistencia - f´c 500 - 3 dias	4.43	110	0.000258	0.000903	0.0546	8.69E-05
Alta resistencia - f´c 500 - 7 dias	4.19	104	0.000243	0.000846	0.0509	8.23E-05

Alta resistencia - f´c 550 - 14 dias	4.37	109	0.000252	0.000877	0.0526	8.62E-05
Alta resistencia - f´c 550 - 28 dias	4.24	105	0.000245	0.000847	0.0507	8.38E-05
Alta resistencia - f´c 550 - 3 dias	4.79	119	0.000278	0.000976	0.0589	9.42E-05
Alta resistencia - f´c 550 - 7 dias	4.54	113	0.000263	0.000917	0.0552	8.95E-05
Alta resistencia - f´c 600 - 14 dias	4.62	115	0.000268	0.000939	0.0567	9.08E-05
Alta resistencia - f´c 600 - 28 dias	4.49	112	0.000261	0.00091	0.0548	8.83E-05
Alta resistencia - f´c 600 - 3 dias	5.04	126	0.000293	0.00104	0.063	9.87E-05
Alta resistencia - f´c 600 - 7 dias	4.79	119	0.000278	0.00098	0.0593	9.40E-05
Baja contracción - MR 38 - 14 dias	3	71.5	0.000153	0.000521	0.0318	7.00E-05
Baja contracción - MR 38 - 28 dias	2.89	68.5	0.000146	0.000492	0.0299	6.81E-05
Baja contracción - MR 40 - 14 dias	3.05	72.8	0.000156	0.000534	0.0326	7.08E-05
Baja contracción - MR 40 - 28 dias	2.94	69.8	0.000149	0.000505	0.0307	6.89E-05
Baja contracción - MR 42 - 14 dias	3.11	74.3	0.00016	0.000549	0.0336	7.17E-05
Baja contracción - MR 42 - 28 dias	3	71.3	0.000153	0.000519	0.0317	6.98E-05
Baja contracción - MR 45 - 14 dias	3.21	76.8	0.000167	0.000573	0.0351	7.34E-05
Baja contracción - MR 45 - 28 dias	3.09	73.8	0.000159	0.000544	0.0333	7.14E-05
Baja contracción - MR 48 - 14 dias	3.32	79.6	0.000173	6.00E-04	0.0368	7.51E-05
Baja contracción - MR 48 - 28 dias	3.2	76.6	0.000166	0.000571	0.035	7.32E-05
Convencional - f´c 100 - 14 dias	2.23	53.9	0.00014	0.000402	0.0207	3.89E-05
Convencional - f´c 100 - 28 dias	2.11	51.1	0.000133	0.000374	0.0188	3.68E-05
Convencional - f´c 100 - 3 dias	2.61	63.7	0.000163	0.000497	0.0269	4.59E-05
Convencional - f´c 100 - 7 dias	2.39	58	0.000149	0.000441	0.0233	4.18E-05
Convencional - f´c 150 - 14 dias	2.35	56.9	0.000147	0.000431	0.0226	4.11E-05
Convencional - f´c 150 - 28 dias	2.23	54.1	0.00014	0.000403	0.0208	3.90E-05
Convencional - f´c 150 - 3 dias	2.73	66.7	0.000171	0.000527	0.0288	4.81E-05
Convencional - f´c 150 - 7 dias	2.5	60.9	0.000157	0.000471	0.0252	4.40E-05

Convencional - f´c 200 - 14 dias	2.52	61.3	0.000158	0.000474	0.0254	4.42E-05
Convencional - f´c 200 - 28 dias	2.4	58.4	0.000151	0.000446	0.0236	4.21E-05
Convencional - f´c 200 - 3 dias	2.9	71	0.000181	0.000569	0.0316	5.12E-05
Convencional - f´c 200 - 7 dias	2.68	65.3	0.000167	0.000513	0.028	4.71E-05
Convencional - f´c 250 - 14 dias	2.69	65.5	0.000168	0.000516	0.0281	4.73E-05
Convencional - f´c 250 - 28 dias	2.57	62.7	0.000161	0.000488	0.0263	4.52E-05
Convencional - f´c 250 - 3 dias	3.07	75.2	0.000191	0.00061	0.0344	5.43E-05
Convencional - f´c 250 - 7 dias	2.84	69.5	0.000178	0.000555	0.0307	5.02E-05
Convencional - f´c 300 - 14 dias	2.96	72.6	0.000185	0.000584	0.0327	5.24E-05
Convencional - f´c 300 - 28 dias	2.85	69.8	0.000178	0.000556	0.0308	5.03E-05
Convencional - f´c 300 - 3 dias	3.34	82.3	0.000208	0.000679	0.0389	5.94E-05
Convencional - f´c 300 - 7 dias	3.12	76.6	0.000194	0.000623	0.0352	5.52E-05
Convencional - f´c 350 - 14 dias	3.19	78.5	0.000199	0.000642	0.0365	5.66E-05
Convencional - f´c 350 - 28 dias	3.08	75.7	0.000192	0.000614	0.0346	5.46E-05
Convencional - f´c 350 - 3 dias	3.57	88.2	0.000222	0.000737	0.0427	6.36E-05
Convencional - f´c 350 - 7 dias	3.35	82.5	0.000209	0.000681	0.039	5.95E-05
Estructural - f´c 250 - 14 dias	2.53	61.7	0.000145	0.000467	0.027	5.06E-05
Estructural - f´c 250 - 28 dias	2.42	59	0.000138	0.00044	0.0252	4.85E-05
Estructural - f´c 250 - 3 dias	2.9	71.2	0.000167	0.00056	0.0332	5.77E-05
Estructural - f´c 250 - 7 dias	2.68	65.7	0.000154	0.000505	0.0296	5.35E-05
Estructural - f´c 300 - 14 dias	2.78	68.4	0.00016	0.000531	0.0313	5.55E-05
Estructural - f´c 300 - 28 dias	2.67	65.6	0.000154	0.000504	0.0295	5.33E-05
Estructural - f´c 300 - 3 dias	3.16	78	0.000183	0.000624	0.0375	6.25E-05
Estructural - f´c 300 - 7 dias	2.94	72.3	0.00017	0.00057	0.0339	5.83E-05
Estructural - f´c 350 - 14 dias	3.03	74.6	0.000175	0.000591	0.0353	5.99E-05
Estructural - f´c 350 - 28 dias	2.92	71.8	0.000169	0.000564	0.0334	5.78E-05

Estructural - f´c 350 - 3 dias	3.4	84.1	0.000198	0.000685	0.0415	6.69E-05
Estructural - f´c 350 - 7 dias	3.18	78.5	0.000185	0.00063	0.0378	6.28E-05
Lanzado - f´c 200 - 14 dias	3.11	77.3	0.000194	0.000627	0.0357	5.53E-05
Lanzado - f´c 200 - 28 dias	2.98	73.9	0.000186	0.000594	0.0335	5.28E-05
Lanzado - f´c 200 - 3 dias	3.34	83	0.000208	0.000683	0.0394	5.95E-05
Lanzado - f´c 200 - 7 dias	3.25	80.7	0.000202	0.00066	0.0379	5.78E-05
Lanzado - f´c 250 - 14 dias	3.25	80.8	0.000202	0.000661	0.0379	5.78E-05
Lanzado - f´c 250 - 28 dias	3.11	77.4	0.000194	0.000627	0.0357	5.53E-05
Lanzado - f´c 250 - 3 dias	3.47	86.5	0.000216	0.000716	0.0416	6.20E-05
Lanzado - f´c 250 - 7 dias	3.38	84.2	0.00021	0.000694	0.0401	6.03E-05
Lanzado - f´c 300 - 14 dias	3.43	85.3	0.000213	0.000705	0.0409	6.11E-05
Lanzado - f´c 300 - 28 dias	3.29	81.9	0.000205	0.000672	0.0387	5.87E-05
Lanzado - f´c 300 - 3 dias	3.65	91	0.000227	0.000761	0.0445	6.53E-05
Lanzado - f´c 300 - 7 dias	3.56	88.7	0.000221	0.000739	0.043	6.36E-05
Lanzado - f´c 350 - 14 dias	3.63	90.5	0.000226	0.000755	0.0442	6.48E-05
Lanzado - f´c 350 - 28 dias	3.5	87.1	0.000217	0.000722	0.042	6.24E-05
Lanzado - f´c 350 - 3 dias	3.85	96.2	0.000239	0.000811	0.0478	6.90E-05
Lanzado - f´c 350 - 7 dias	3.76	93.9	0.000234	0.000789	0.0464	6.73E-05
Modulo de ruptura - MR 35 - 14 dias	2.68	65.3	0.000151	0.000502	0.0298	5.49E-05
Modulo de ruptura - MR 35 - 28 dias	2.57	62.5	0.000145	0.000475	0.028	5.29E-05
Modulo de ruptura - MR 35 - 3 dias	3.1	75.9	0.000177	0.000608	0.0368	6.25E-05
Modulo de ruptura - MR 35 - 7 dias	2.88	70.4	0.000164	0.000553	0.0332	5.85E-05
Modulo de ruptura - MR 36 - 14 dias	2.7	65.8	0.000153	0.000507	0.0301	5.53E-05
Modulo de ruptura - MR 36 - 28 dias	2.59	62.9	0.000146	0.000479	0.0283	5.32E-05
Modulo de ruptura - MR 36 - 3 dias	3.12	76.4	0.000179	0.000612	0.0371	6.28E-05
Modulo de ruptura - MR 36 - 7 dias	2.9	70.8	0.000165	0.000557	0.0334	5.88E-05

Modulo de ruptura - MR 38 - 14 dias	2.74	66.9	0.000155	0.000517	0.0309	5.61E-05
Modulo de ruptura - MR 38 - 28 dias	2.63	64.1	0.000148	0.00049	0.029	5.40E-05
Modulo de ruptura - MR 38 - 3 dias	3.16	77.5	0.000181	0.000623	0.0378	6.36E-05
Modulo de ruptura - MR 38 - 7 dias	2.94	71.9	0.000168	0.000568	0.0342	5.97E-05
Modulo de ruptura - MR 40 - 14 dias	2.79	68.1	0.000158	0.000529	0.0317	5.70E-05
Modulo de ruptura - MR 40 - 28 dias	2.68	65.2	0.000151	0.000502	0.0298	5.49E-05
Modulo de ruptura - MR 40 - 3 dias	3.21	78.7	0.000184	0.000635	0.0386	6.45E-05
Modulo de ruptura - MR 40 - 7 dias	2.99	73.2	0.000171	0.00058	0.035	6.05E-05
Modulo de ruptura - MR 42 - 14 dias	2.85	69.6	0.000162	0.000545	0.0327	5.81E-05
Modulo de ruptura - MR 42 - 28 dias	2.74	66.8	0.000155	0.000517	0.0309	5.60E-05
Modulo de ruptura - MR 42 - 3 dias	3.27	80.3	0.000188	0.000651	0.0396	6.56E-05
Modulo de ruptura - MR 42 - 7 dias	3.05	74.7	0.000174	0.000595	0.036	6.17E-05
Modulo de ruptura - MR 45 - 14 dias	2.95	72.1	0.000168	0.000569	0.0343	5.98E-05
Modulo de ruptura - MR 45 - 28 dias	2.84	69.3	0.000161	0.000542	0.0325	5.78E-05
Modulo de ruptura - MR 45 - 3 dias	3.37	82.8	0.000194	0.000675	0.0413	6.74E-05
Modulo de ruptura - MR 45 - 7 dias	3.15	77.2	0.00018	0.00062	0.0376	6.34E-05
Modulo de ruptura - MR 48 - 14 dias	3.05	74.7	0.000174	0.000596	0.0361	6.17E-05
Modulo de ruptura - MR 48 - 28 dias	2.94	71.9	0.000168	0.000568	0.0342	5.97E-05
Modulo de ruptura - MR 48 - 3 dias	3.47	85.4	0.000201	0.000702	0.043	6.93E-05
Modulo de ruptura - MR 48 - 7 dias	3.25	79.8	0.000187	0.000647	0.0394	6.53E-05
Relleno Fluido - f´c 15 - 14 dias	1.97	49	0.000123	0.000361	0.0189	3.43E-05
Relleno Fluido - f´c 15 - 28 dias	1.86	46.3	0.000116	0.000333	0.0171	3.23E-05
Relleno Fluido - f´c 15 - 3 dias	2.38	59.4	0.000149	0.000465	0.0259	4.17E-05
Relleno Fluido - f´c 15 - 7 dias	2.16	54	0.000135	0.000411	0.0222	3.78E-05
Relleno Fluido - f´c 20 - 14 dias	1.99	49.6	0.000125	0.000367	0.0193	3.47E-05
Relleno Fluido - f´c 20 - 28 dias	1.88	46.8	0.000118	0.000339	0.0175	3.27E-05

Relleno Fluido - f´c 20 - 3 dias	2.4	60	0.00015	0.000471	0.0262	4.21E-05
Relleno Fluido - f´c 20 - 7 dias	2.19	54.5	0.000137	0.000416	0.0226	3.82E-05
Relleno Fluido - f´c 25 - 14 dias	2.02	50.3	0.000126	0.000373	0.0198	3.52E-05
Relleno Fluido - f´c 25 - 28 dias	1.91	47.5	0.000119	0.000345	0.0179	3.32E-05
Relleno Fluido - f´c 25 - 3 dias	2.43	60.6	0.000152	0.000478	0.0267	4.26E-05
Relleno Fluido - f´c 25 - 7 dias	2.21	55.2	0.000138	0.000423	0.023	3.87E-05
Relleno Fluido - f´c 30 - 14 dias	2.05	51.1	0.000128	0.000381	0.0203	3.57E-05
Relleno Fluido - f´c 30 - 28 dias	1.94	48.3	0.000121	0.000353	0.0184	3.37E-05
Relleno Fluido - f´c 30 - 3 dias	2.46	61.4	0.000154	0.000485	0.0272	4.31E-05
Relleno Fluido - f´c 30 - 7 dias	2.24	56	0.00014	0.00043	0.0236	3.92E-05
Relleno Fluido - f´c 40 - 14 dias	2.11	52.6	0.000132	0.000396	0.0213	3.68E-05
Relleno Fluido - f´c 40 - 28 dias	2	49.8	0.000125	0.000368	0.0195	3.48E-05
Relleno Fluido - f´c 40 - 3 dias	2.52	63	0.000157	0.000501	0.0282	4.42E-05
Relleno Fluido - f´c 40 - 7 dias	2.3	57.5	0.000144	0.000446	0.0246	4.03E-05
Relleno Fluido - f´c 50 - 14 dias	2.18	54.6	0.000137	0.000416	0.0226	3.82E-05
Relleno Fluido - f´c 50 - 28 dias	2.07	51.8	0.00013	0.000388	0.0208	3.62E-05
Relleno Fluido - f´c 50 - 3 dias	2.59	64.9	0.000162	0.00052	0.0295	4.56E-05
Relleno Fluido - f´c 50 - 7 dias	2.38	59.5	0.000149	0.000465	0.0259	4.17E-05
Relleno Fluido - f´c 60 - 14 dias	2.27	56.7	0.000142	0.000438	0.0241	3.97E-05
Relleno Fluido - f´c 60 - 28 dias	2.16	54	0.000135	0.00041	0.0222	3.78E-05
Relleno Fluido - f´c 60 - 3 dias	2.68	67.1	0.000167	0.000542	0.031	4.72E-05
Relleno Fluido - f´c 60 - 7 dias	2.46	61.7	0.000154	0.000487	0.0273	4.33E-05
Relleno Fluido - f´c 70 - 14 dias	2.38	59.4	0.000149	0.000465	0.0259	4.17E-05
Relleno Fluido - f´c 70 - 28 dias	2.27	56.7	0.000142	0.000437	0.024	3.97E-05
Relleno Fluido - f´c 70 - 3 dias	2.78	69.8	0.000174	0.000569	0.0328	4.91E-05
Relleno Fluido - f´c 70 - 7 dias	2.57	64.3	0.000161	0.000514	0.0291	4.52E-05

OTHER ENVIRONMENTAL INFO

- Certificado SIG Calidad
- Certificado SIG Medio Ambiente
- Certificado SIG Seguridad y Salud en el Trabajo
- ONNNCE
- EMA
- Industria Limpia
- Empresa Segura

REFERENCES

ASTM Standards:

- ASTM A36/A36M Standard Specification for Carbon Structural Steel
- ASTM A108 Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished
- ASTM A123/A123M Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
- ASTM A153/A153M Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
- ASTM A184 Standard Specification for Welded Deformed Steel Bar Mats for Concrete Reinforcement
- ASTM A307 Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60,000 PSI Tensile Strength
- ASTM A416/A416M Standard Specification for Steel Strand, Uncoated Seven-Wire for Prestressed Concrete
- ASTM A555/A555M Standard Specification for General Requirements for Stainless Steel Wire and Wire Rods
- ASTM A615/A615M Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
- ASTM A666 Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar
- ASTM A706/A706M Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement
- ASTM A767/A767M Standard Specification for Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement
- ASTM A775/A775M Standard Specification for Epoxy-Coated Steel Reinforcing Bars
- ASTM A820/A820M Standard Specification for Steel Fibers for Fiber-Reinforced Concrete
- ASTM A884/A884M Standard Specification for Epoxy-Coated Steel Wire and Welded Wire Reinforcement
- ASTM A934/A934M Standard Specification for Epoxy-Coated Prefabricated Steel Reinforcing Bars
- ASTM A1064/A1064M Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete
- ASTM C33/C33M Standard Specification for Concrete Aggregates
- ASTM C94 Standard Specification for Ready-Mixed Concrete

- ASTM C150/C150M Standard Specification for Portland Cement
- ASTM C260/C260M Standard Specification for Air-Entraining Admixtures for Concrete
- ASTM C595 Standard Specification for Blended Hydraulic Cements
- ASTM C618 Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete
- ASTM C979/C979M Standard Specification for Pigments for Integrally Colored Concrete
- ASTM C989/C989M Standard Specification for Slag Cement for Use in Concrete and Mortars
- ASTM C1017/C1017M Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete
- ASTM C1116/C1116M Standard Specification for Fiber-Reinforced Concrete
- ASTM C1157/C1157M Standard Performance Specification for Hydraulic Cement
- ASTM C1240 Standard Specification for Silica Fume Used in Cementitious Mixtures
- ASTM C1602/C1602M Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete
- ASTM G109 Standard Test Method for Determining Effects of Chemical Admixtures on Corrosion of Embedded Steel Reinforcement in Concrete Exposed to Chloride Environments
- ASTM C330/C330M Standard Specification for Lightweight Aggregates for Structural Concrete
- ASTM C494/C494M Standard Specification for Chemical Admixtures for Concrete

ISO Standards:

- ISO 6707-1: 2014 Buildings and Civil Engineering Works - Vocabulary - Part 1: General Terms
- ISO 14021:1999 Environmental Labels and Declarations - Self-declared Environmental Claims (Type II Environmental Labeling)
- ISO 14025:2006 Environmental Labels and Declarations - Type III Environmental Declarations - Principles and Procedures
- ISO 14040:2006 Environmental Management - Life Cycle Assessment - Principles and Framework
- ISO 14044:2006 Environmental Management - Life Cycle Assessment - Requirements and Guidelines
- ISO 14067:2018 Greenhouse Gases - Carbon Footprint of Products - Requirements and Guidelines for Quantification
- ISO 14050:2009 Environmental Management - Vocabulary
- ISO 21930:2017 Sustainability in Building Construction - Environmental Declaration of Building Products