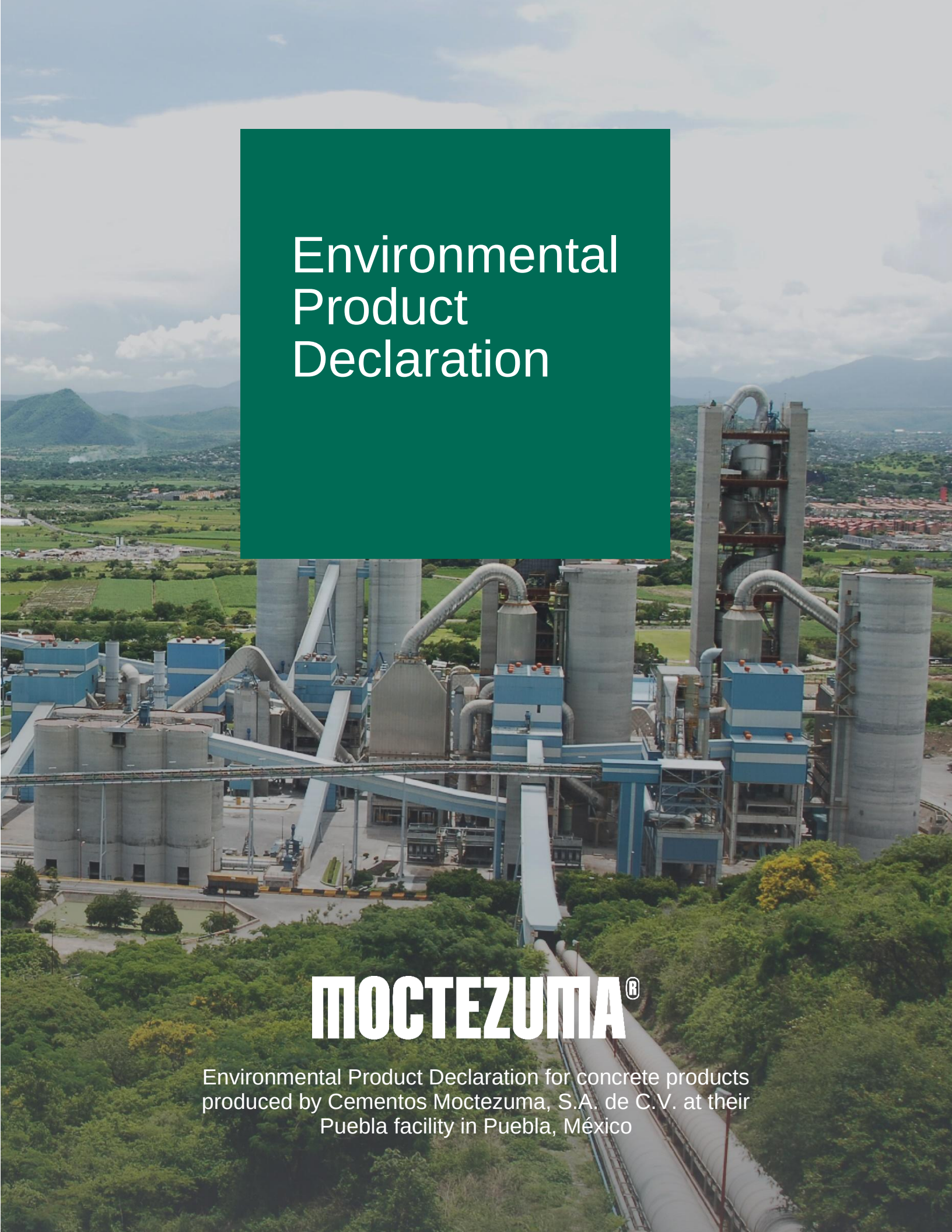

Environmental Product Declaration

MOCTEZUMA®

Environmental Product Declaration for concrete products produced by Cementos Moctezuma, S.A. de C.V. at their Puebla facility in Puebla, 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:	d89dbedc-f751-4c8b-a739-6042ca877fd9

TABLE OF CONTENTS

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 Puebla, Mexico.

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.

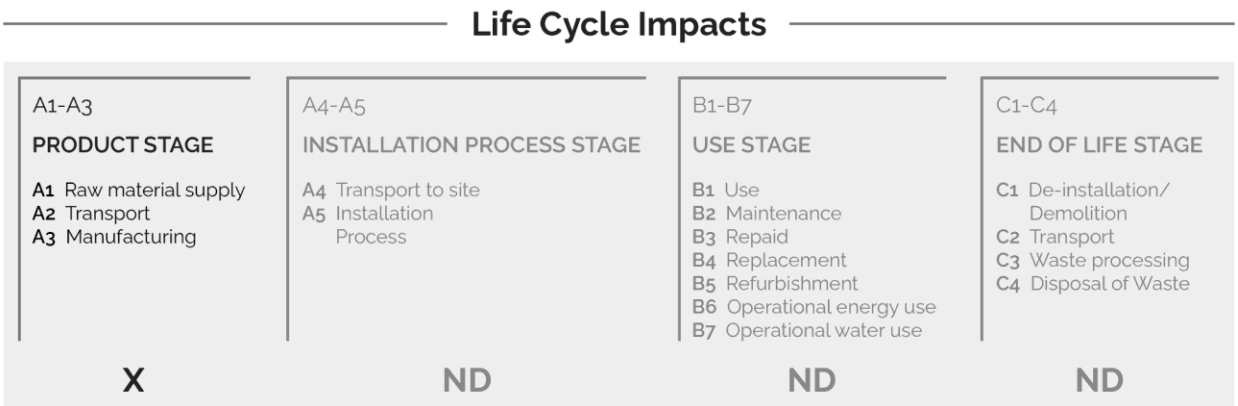

Figure 1: **General life cycle phases for consideration in a construction works system**

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 Puebla facility in Puebla, 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	445	3.41E-06	0.429	0.225	7.92	2650
Alta resistencia - f´c 400 - 28 dias	413	3.17E-06	0.406	0.21	7.56	2470
Alta resistencia - f´c 400 - 3 dias	518	3.93E-06	0.48	0.259	8.72	3060
Alta resistencia - f´c 400 - 7 dias	472	3.60E-06	0.448	0.238	8.22	2800
Alta resistencia - f´c 450 - 14 dias	487	3.71E-06	0.459	0.245	8.38	2890
Alta resistencia - f´c 450 - 28 dias	455	3.48E-06	0.436	0.23	8.03	2710
Alta resistencia - f´c 450 - 3 dias	560	4.23E-06	0.51	0.278	9.18	3290

Alta resistencia - f´c 450 - 7 dias	514	3.90E-06	0.478	0.257	8.68	3040
Alta resistencia - f´c 500 - 14 dias	528	4.01E-06	0.488	0.264	8.84	3120
Alta resistencia - f´c 500 - 28 dias	496	3.77E-06	0.465	0.249	8.48	2940
Alta resistencia - f´c 500 - 3 dias	601	4.53E-06	0.539	0.297	9.64	3530
Alta resistencia - f´c 500 - 7 dias	555	4.20E-06	0.507	0.276	9.14	3270
Alta resistencia - f´c 550 - 14 dias	583	4.45E-06	0.531	0.311	9.5	3450
Alta resistencia - f´c 550 - 28 dias	551	4.22E-06	0.508	0.295	9.14	3270
Alta resistencia - f´c 550 - 3 dias	656	4.98E-06	0.583	0.348	10.3	3860
Alta resistencia - f´c 550 - 7 dias	611	4.65E-06	0.55	0.325	9.8	3600
Alta resistencia - f´c 600 - 14 dias	630	4.79E-06	0.564	0.334	10	3710
Alta resistencia - f´c 600 - 28 dias	598	4.56E-06	0.541	0.318	9.66	3530
Alta resistencia - f´c 600 - 3 dias	703	5.33E-06	0.616	0.371	10.8	4130
Alta resistencia - f´c 600 - 7 dias	657	4.99E-06	0.584	0.348	10.3	3870
Baja contracción - MR 38 - 3 dias	322	2.61E-06	0.352	0.212	6.69	2000
Baja contracción - MR 38 - 7 dias	299	2.43E-06	0.335	0.198	6.43	1870
Baja contracción - MR 40 - 14 dias	329	2.66E-06	0.356	0.216	6.77	2040
Baja contracción - MR 40 - 28 dias	306	2.48E-06	0.339	0.202	6.5	1910
Baja contracción - MR 42 - 3 dias	337	2.72E-06	0.363	0.221	6.86	2090
Baja contracción - MR 42 - 7 dias	314	2.54E-06	0.346	0.207	6.6	1960
Baja contracción - MR 45 - 14 dias	349	2.81E-06	0.371	0.228	7	2160
Baja contracción - MR 45 - 28 dias	326	2.64E-06	0.354	0.214	6.73	2030
Baja contracción - MR 48 - 3 dias	367	2.94E-06	0.384	0.239	7.2	2260
Baja contracción - MR 48 - 7 dias	344	2.77E-06	0.367	0.225	6.93	2130
Convencional - f´c 100 - 14 dias	216	1.75E-06	0.264	0.122	5.27	1360
Convencional - f´c 100 - 28 dias	193	1.58E-06	0.248	0.111	5.02	1230
Convencional - f´c 100 - 3 dias	275	2.18E-06	0.306	0.15	5.94	1690

Convencional - f´c 100 - 7 dias	239	1.91E-06	0.28	0.133	5.53	1490
Convencional - f´c 150 - 14 dias	240	1.92E-06	0.281	0.133	5.54	1490
Convencional - f´c 150 - 28 dias	217	1.75E-06	0.264	0.122	5.28	1360
Convencional - f´c 150 - 3 dias	299	2.35E-06	0.323	0.161	6.21	1830
Convencional - f´c 150 - 7 dias	263	2.08E-06	0.297	0.144	5.8	1620
Convencional - f´c 200 - 14 dias	268	2.13E-06	0.301	0.147	5.86	1650
Convencional - f´c 200 - 28 dias	245	1.96E-06	0.285	0.136	5.61	1520
Convencional - f´c 200 - 3 dias	328	2.56E-06	0.343	0.175	6.53	1990
Convencional - f´c 200 - 7 dias	291	2.29E-06	0.318	0.157	6.12	1780
Convencional - f´c 250 - 14 dias	300	2.36E-06	0.324	0.162	6.24	1830
Convencional - f´c 250 - 28 dias	277	2.19E-06	0.308	0.151	5.99	1700
Convencional - f´c 250 - 3 dias	359	2.78E-06	0.366	0.189	6.87	2160
Convencional - f´c 250 - 7 dias	322	2.52E-06	0.34	0.172	6.47	1960
Convencional - f´c 300 - 14 dias	348	2.70E-06	0.357	0.184	6.74	2100
Convencional - f´c 300 - 28 dias	325	2.54E-06	0.341	0.173	6.48	1970
Convencional - f´c 300 - 3 dias	407	3.13E-06	0.4	0.212	7.4	2430
Convencional - f´c 300 - 7 dias	370	2.87E-06	0.374	0.195	7	2230
Convencional - f´c 350 - 14 dias	388	2.99E-06	0.386	0.203	7.19	2330
Convencional - f´c 350 - 28 dias	365	2.83E-06	0.37	0.192	6.93	2200
Convencional - f´c 350 - 3 dias	447	3.42E-06	0.428	0.231	7.85	2660
Convencional - f´c 350 - 7 dias	411	3.16E-06	0.402	0.214	7.45	2460
Estructural - f´c 250 - 14 dias	300	2.36E-06	0.324	0.162	6.23	1830
Estructural - f´c 250 - 28 dias	277	2.19E-06	0.307	0.151	5.98	1700
Estructural - f´c 250 - 3 dias	359	2.79E-06	0.366	0.19	6.89	2170
Estructural - f´c 250 - 7 dias	322	2.52E-06	0.34	0.172	6.49	1960
Estructural - f´c 300 - 14 dias	348	2.71E-06	0.358	0.184	6.76	2110

Estructural - f´c 300 - 28 dias	325	2.54E-06	0.341	0.174	6.51	1980
Estructural - f´c 300 - 3 dias	407	3.14E-06	0.4	0.213	7.42	2440
Estructural - f´c 300 - 7 dias	371	2.87E-06	0.374	0.195	7.02	2230
Estructural - f´c 350 - 14 dias	388	3.00E-06	0.386	0.204	7.21	2330
Estructural - f´c 350 - 28 dias	365	2.83E-06	0.37	0.193	6.95	2200
Estructural - f´c 350 - 3 dias	447	3.43E-06	0.429	0.232	7.87	2670
Estructural - f´c 350 - 7 dias	411	3.17E-06	0.403	0.214	7.46	2460
Lanzado - f´c 200 - 14 dias	385	2.94E-06	0.38	0.183	7.11	2300
Lanzado - f´c 200 - 28 dias	358	2.75E-06	0.361	0.171	6.82	2150
Lanzado - f´c 200 - 3 dias	431	3.27E-06	0.411	0.202	7.61	2550
Lanzado - f´c 200 - 7 dias	413	3.14E-06	0.399	0.194	7.41	2450
Lanzado - f´c 250 - 14 dias	413	3.14E-06	0.399	0.194	7.41	2450
Lanzado - f´c 250 - 28 dias	385	2.94E-06	0.38	0.183	7.12	2300
Lanzado - f´c 250 - 3 dias	458	3.46E-06	0.431	0.213	7.91	2700
Lanzado - f´c 250 - 7 dias	440	3.33E-06	0.418	0.206	7.72	2600
Lanzado - f´c 300 - 14 dias	449	3.40E-06	0.424	0.21	7.82	2650
Lanzado - f´c 300 - 28 dias	422	3.20E-06	0.405	0.198	7.52	2500
Lanzado - f´c 300 - 3 dias	495	3.72E-06	0.456	0.229	8.31	2910
Lanzado - f´c 300 - 7 dias	476	3.59E-06	0.443	0.221	8.11	2800
Lanzado - f´c 350 - 14 dias	490	3.69E-06	0.453	0.227	8.27	2880
Lanzado - f´c 350 - 28 dias	463	3.49E-06	0.434	0.215	7.97	2730
Lanzado - f´c 350 - 3 dias	536	4.01E-06	0.485	0.246	8.76	3140
Lanzado - f´c 350 - 7 dias	517	3.88E-06	0.472	0.238	8.56	3030
Modulo de ruptura - MR 35 - 14 dias	334	2.57E-06	0.346	0.161	6.58	2010
Modulo de ruptura - MR 35 - 28 dias	311	2.41E-06	0.33	0.152	6.33	1880
Modulo de ruptura - MR 35 - 3 dias	402	3.06E-06	0.394	0.19	7.33	2390

Modulo de ruptura - MR 35 - 7 dias	361	2.76E-06	0.365	0.173	6.89	2160
Modulo de ruptura - MR 36 - 14 dias	338	2.59E-06	0.348	0.163	6.62	2030
Modulo de ruptura - MR 36 - 28 dias	315	2.43E-06	0.332	0.153	6.37	1900
Modulo de ruptura - MR 36 - 3 dias	406	3.08E-06	0.396	0.192	7.37	2410
Modulo de ruptura - MR 36 - 7 dias	365	2.79E-06	0.368	0.174	6.93	2180
Modulo de ruptura - MR 38 - 14 dias	345	2.65E-06	0.353	0.166	6.7	2070
Modulo de ruptura - MR 38 - 28 dias	322	2.48E-06	0.337	0.156	6.45	1940
Modulo de ruptura - MR 38 - 3 dias	413	3.14E-06	0.401	0.195	7.46	2450
Modulo de ruptura - MR 38 - 7 dias	372	2.84E-06	0.373	0.177	7	2220
Modulo de ruptura - MR 40 - 14 dias	353	2.71E-06	0.359	0.169	6.79	2110
Modulo de ruptura - MR 40 - 28 dias	330	2.54E-06	0.343	0.16	6.54	1990
Modulo de ruptura - MR 40 - 3 dias	421	3.19E-06	0.407	0.198	7.54	2490
Modulo de ruptura - MR 40 - 7 dias	380	2.90E-06	0.378	0.181	7.1	2270
Modulo de ruptura - MR 42 - 14 dias	365	2.79E-06	0.367	0.174	6.92	2180
Modulo de ruptura - MR 42 - 28 dias	342	2.63E-06	0.351	0.165	6.67	2050
Modulo de ruptura - MR 42 - 3 dias	433	3.28E-06	0.415	0.203	7.67	2560
Modulo de ruptura - MR 42 - 7 dias	392	2.99E-06	0.387	0.186	7.22	2330
Modulo de ruptura - MR 45 - 14 dias	382	2.91E-06	0.379	0.182	7.11	2280
Modulo de ruptura - MR 45 - 28 dias	359	2.75E-06	0.363	0.172	6.86	2150
Modulo de ruptura - MR 45 - 3 dias	450	3.40E-06	0.427	0.21	7.86	2660
Modulo de ruptura - MR 45 - 7 dias	410	3.11E-06	0.399	0.193	7.42	2430
Modulo de ruptura - MR 48 - 14 dias	400	3.04E-06	0.392	0.189	7.31	2380
Modulo de ruptura - MR 48 - 28 dias	378	2.88E-06	0.376	0.18	7.06	2250
Modulo de ruptura - MR 48 - 3 dias	469	3.53E-06	0.44	0.218	8.07	2760
Modulo de ruptura - MR 48 - 7 dias	428	3.24E-06	0.411	0.201	7.61	2530
Relleno Fluido - f´c 15 - 14 dias	171	1.36E-06	0.212	0.0705	4.35	1070

Relleno Fluido - f´c 15 - 28 dias	149	1.20E-06	0.196	0.0641	4.1	950
Relleno Fluido - f´c 15 - 3 dias	244	1.85E-06	0.261	0.0912	5.12	1470
Relleno Fluido - f´c 15 - 7 dias	199	1.54E-06	0.23	0.0783	4.64	1220
Relleno Fluido - f´c 20 - 14 dias	174	1.38E-06	0.214	0.0713	4.38	1090
Relleno Fluido - f´c 20 - 28 dias	152	1.22E-06	0.198	0.0649	4.13	965
Relleno Fluido - f´c 20 - 3 dias	246	1.87E-06	0.262	0.092	5.15	1480
Relleno Fluido - f´c 20 - 7 dias	201	1.56E-06	0.232	0.0791	4.67	1240
Relleno Fluido - f´c 25 - 14 dias	178	1.40E-06	0.216	0.0724	4.41	1110
Relleno Fluido - f´c 25 - 28 dias	155	1.25E-06	0.201	0.0659	4.17	984
Relleno Fluido - f´c 25 - 3 dias	250	1.90E-06	0.265	0.093	5.19	1500
Relleno Fluido - f´c 25 - 7 dias	205	1.59E-06	0.234	0.0801	4.71	1250
Relleno Fluido - f´c 30 - 14 dias	183	1.44E-06	0.22	0.0739	4.47	1140
Relleno Fluido - f´c 30 - 28 dias	161	1.28E-06	0.204	0.0674	4.23	1010
Relleno Fluido - f´c 30 - 3 dias	255	1.93E-06	0.269	0.0946	5.25	1530
Relleno Fluido - f´c 30 - 7 dias	210	1.63E-06	0.238	0.0817	4.77	1280
Relleno Fluido - f´c 40 - 14 dias	199	1.54E-06	0.23	0.0783	4.64	1220
Relleno Fluido - f´c 40 - 28 dias	176	1.39E-06	0.215	0.0718	4.39	1100
Relleno Fluido - f´c 40 - 3 dias	271	2.04E-06	0.279	0.0989	5.41	1610
Relleno Fluido - f´c 40 - 7 dias	226	1.73E-06	0.249	0.0861	4.93	1370
Relleno Fluido - f´c 50 - 14 dias	216	1.66E-06	0.242	0.0832	4.82	1310
Relleno Fluido - f´c 50 - 28 dias	193	1.51E-06	0.226	0.0767	4.58	1190
Relleno Fluido - f´c 50 - 3 dias	288	2.16E-06	0.29	0.104	5.59	1710
Relleno Fluido - f´c 50 - 7 dias	243	1.85E-06	0.26	0.091	5.11	1460
Relleno Fluido - f´c 60 - 14 dias	233	1.78E-06	0.253	0.0881	5	1410
Relleno Fluido - f´c 60 - 28 dias	210	1.62E-06	0.238	0.0816	4.76	1280
Relleno Fluido - f´c 60 - 3 dias	305	2.28E-06	0.302	0.109	5.77	1800

Relleno Fluido - f´c 60 - 7 dias	260	1.97E-06	0.272	0.0958	5.29	1550
Relleno Fluido - f´c 70 - 14 dias	251	1.90E-06	0.265	0.0932	5.19	1500
Relleno Fluido - f´c 70 - 28 dias	228	1.75E-06	0.25	0.0868	4.95	1380
Relleno Fluido - f´c 70 - 3 dias	323	2.40E-06	0.314	0.114	5.97	1900
Relleno Fluido - f´c 70 - 7 dias	278	2.09E-06	0.284	0.101	5.48	1650

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	92.3	1.15	91.4	1340	0.522	0.00485	0.215	0.541
Alta resistencia - f´c 400 - 28 dias	85.9	1.06	85.1	1240	0.491	0.00464	0.202	0.526
Alta resistencia - f´c 400 - 3 dias	107	1.35	106	1570	0.591	0.00529	0.243	0.576
Alta resistencia - f´c 400 - 7 dias	97.7	1.22	96.7	1420	0.548	0.00501	0.225	0.556
Alta resistencia - f´c 450 - 14 dias	101	1.26	99.6	1470	0.562	0.00511	0.231	0.565
Alta resistencia - f´c 450 - 28 dias	94.3	1.18	93.3	1370	0.531	0.0049	0.219	0.549
Alta resistencia - f´c 450 - 3 dias	115	1.46	114	1700	0.632	0.00555	0.259	0.601
Alta resistencia - f´c 450 - 7 dias	106	1.34	105	1550	0.588	0.00527	0.242	0.579
Alta resistencia - f´c 500 - 14 dias	109	1.37	108	1600	0.602	0.00537	0.248	0.584
Alta resistencia - f´c 500 - 28 dias	102	1.29	101	1500	0.571	0.00516	0.235	0.569
Alta resistencia - f´c 500 - 3 dias	123	1.57	122	1820	0.672	0.00581	0.276	0.62
Alta resistencia - f´c 500 - 7 dias	114	1.45	113	1680	0.628	0.00553	0.258	0.599
Alta resistencia - f´c 550 - 14 dias	120	1.52	119	1770	0.659	0.00575	0.28	0.625
Alta resistencia - f´c 550 - 28 dias	114	1.43	113	1670	0.628	0.00554	0.267	0.609
Alta resistencia - f´c 550 - 3 dias	135	1.72	134	2000	0.73	0.0062	0.31	0.663
Alta resistencia - f´c 550 - 7 dias	126	1.59	124	1860	0.685	0.00591	0.291	0.641
Alta resistencia - f´c 600 - 14 dias	130	1.65	128	1920	0.705	0.00604	0.299	0.649

Alta resistencia - f´c 600 - 28 dias	123	1.56	122	1820	0.673	0.00583	0.286	0.632
Alta resistencia - f´c 600 - 3 dias	144	1.84	143	2150	0.776	0.0065	0.329	0.687
Alta resistencia - f´c 600 - 7 dias	135	1.72	134	2010	0.732	0.00622	0.311	0.663
Baja contracción - MR 38 - 3 dias	68.9	0.809	68.3	965	0.41	0.00415	0.188	0.473
Baja contracción - MR 38 - 7 dias	64.2	0.747	63.6	892	0.387	0.00399	0.178	0.459
Baja contracción - MR 40 - 14 dias	70.2	0.826	69.6	985	0.416	0.00419	0.191	0.476
Baja contracción - MR 40 - 28 dias	65.5	0.765	64.9	913	0.393	0.00404	0.181	0.462
Baja contracción - MR 42 - 3 dias	71.9	0.849	71.2	1010	0.424	0.00424	0.195	0.482
Baja contracción - MR 42 - 7 dias	67.2	0.787	66.6	939	0.401	0.00409	0.184	0.466
Baja contracción - MR 45 - 14 dias	74.3	0.881	73.6	1050	0.436	0.00432	0.201	0.486
Baja contracción - MR 45 - 28 dias	69.6	0.819	69	977	0.413	0.00417	0.19	0.473
Baja contracción - MR 48 - 3 dias	77.8	0.928	77.1	1100	0.453	0.00443	0.209	0.497
Baja contracción - MR 48 - 7 dias	73.2	0.866	72.5	1030	0.431	0.00428	0.198	0.483
Convencional - f´c 100 - 14 dias	46.8	0.53	46.3	625	0.295	0.00331	0.125	0.417
Convencional - f´c 100 - 28 dias	42.2	0.468	41.8	554	0.273	0.00317	0.116	0.406
Convencional - f´c 100 - 3 dias	58.6	0.69	58	811	0.353	0.00368	0.148	0.447
Convencional - f´c 100 - 7 dias	51.3	0.591	50.8	697	0.317	0.00345	0.134	0.428
Convencional - f´c 150 - 14 dias	51.5	0.594	51	700	0.318	0.00346	0.134	0.429
Convencional - f´c 150 - 28 dias	46.9	0.532	46.5	628	0.296	0.00331	0.125	0.417
Convencional - f´c 150 - 3 dias	63.3	0.755	62.7	885	0.376	0.00383	0.158	0.46
Convencional - f´c 150 - 7 dias	56.1	0.656	55.5	771	0.34	0.0036	0.143	0.442
Convencional - f´c 200 - 14 dias	57.2	0.671	56.6	788	0.346	0.00365	0.146	0.448
Convencional - f´c 200 - 28 dias	52.6	0.609	52.1	717	0.324	0.00351	0.137	0.438
Convencional - f´c 200 - 3 dias	69	0.831	68.3	974	0.404	0.00402	0.169	0.479
Convencional - f´c 200 - 7 dias	61.7	0.732	61.1	860	0.368	0.00379	0.155	0.46
Convencional - f´c 250 - 14 dias	63.4	0.755	62.8	885	0.379	0.00388	0.159	0.473

Convencional - f´c 250 - 28 dias	58.9	0.693	58.3	814	0.356	0.00373	0.15	0.455
Convencional - f´c 250 - 3 dias	75.2	0.916	74.5	1070	0.434	0.00422	0.182	0.495
Convencional - f´c 250 - 7 dias	67.9	0.817	67.3	957	0.399	0.00399	0.167	0.477
Convencional - f´c 300 - 14 dias	73	0.886	72.3	1040	0.423	0.00415	0.177	0.497
Convencional - f´c 300 - 28 dias	68.5	0.824	67.8	965	0.401	0.004	0.168	0.486
Convencional - f´c 300 - 3 dias	84.9	1.05	84	1220	0.481	0.00452	0.201	0.528
Convencional - f´c 300 - 7 dias	77.6	0.948	76.8	1110	0.445	0.00429	0.187	0.51
Convencional - f´c 350 - 14 dias	81	0.995	80.2	1160	0.462	0.0044	0.193	0.519
Convencional - f´c 350 - 28 dias	76.5	0.933	75.7	1090	0.44	0.00425	0.184	0.507
Convencional - f´c 350 - 3 dias	92.9	1.16	91.9	1350	0.52	0.00477	0.217	0.549
Convencional - f´c 350 - 7 dias	85.6	1.06	84.7	1230	0.485	0.00454	0.203	0.531
Estructural - f´c 250 - 14 dias	63.4	0.755	62.8	885	0.379	0.00388	0.159	0.474
Estructural - f´c 250 - 28 dias	58.9	0.693	58.3	814	0.357	0.00374	0.15	0.463
Estructural - f´c 250 - 3 dias	75.3	0.916	74.5	1070	0.436	0.00425	0.183	0.503
Estructural - f´c 250 - 7 dias	68	0.817	67.3	957	0.401	0.00402	0.168	0.486
Estructural - f´c 300 - 14 dias	73.1	0.886	72.4	1040	0.426	0.00418	0.178	0.506
Estructural - f´c 300 - 28 dias	68.5	0.824	67.9	965	0.404	0.00404	0.169	0.494
Estructural - f´c 300 - 3 dias	84.9	1.05	84.1	1220	0.483	0.00455	0.202	0.535
Estructural - f´c 300 - 7 dias	77.6	0.948	76.9	1110	0.448	0.00432	0.187	0.517
Estructural - f´c 350 - 14 dias	81.1	0.995	80.3	1160	0.465	0.00443	0.194	0.527
Estructural - f´c 350 - 28 dias	76.5	0.933	75.8	1090	0.443	0.00429	0.185	0.515
Estructural - f´c 350 - 3 dias	92.9	1.16	92	1350	0.522	0.0048	0.218	0.556
Estructural - f´c 350 - 7 dias	85.6	1.06	84.8	1230	0.487	0.00458	0.203	0.539
Lanzado - f´c 200 - 14 dias	80.1	0.99	79.3	1150	0.46	0.0044	0.184	0.537
Lanzado - f´c 200 - 28 dias	74.7	0.916	74	1060	0.435	0.00424	0.174	0.527
Lanzado - f´c 200 - 3 dias	89.1	1.11	88.2	1290	0.504	0.00467	0.201	0.557

Lanzado - f´c 200 - 7 dias	85.5	1.06	84.6	1230	0.486	0.00457	0.194	0.547
Lanzado - f´c 250 - 14 dias	85.5	1.06	84.6	1230	0.486	0.00457	0.194	0.549
Lanzado - f´c 250 - 28 dias	80.1	0.99	79.3	1150	0.461	0.0044	0.184	0.538
Lanzado - f´c 250 - 3 dias	94.5	1.19	93.5	1380	0.53	0.00484	0.211	0.568
Lanzado - f´c 250 - 7 dias	90.9	1.14	90	1320	0.513	0.00474	0.204	0.561
Lanzado - f´c 300 - 14 dias	92.7	1.16	91.8	1350	0.521	0.00479	0.208	0.565
Lanzado - f´c 300 - 28 dias	87.3	1.09	86.4	1260	0.495	0.00463	0.198	0.555
Lanzado - f´c 300 - 3 dias	102	1.29	101	1490	0.565	0.00507	0.224	0.584
Lanzado - f´c 300 - 7 dias	98.1	1.24	97.1	1430	0.547	0.00495	0.217	0.578
Lanzado - f´c 350 - 14 dias	101	1.27	99.8	1470	0.561	0.00504	0.223	0.582
Lanzado - f´c 350 - 28 dias	95.4	1.2	94.4	1390	0.534	0.00487	0.212	0.574
Lanzado - f´c 350 - 3 dias	110	1.4	109	1620	0.604	0.00532	0.239	0.604
Lanzado - f´c 350 - 7 dias	106	1.35	105	1560	0.586	0.0052	0.232	0.595
Modulo de ruptura - MR 35 - 14 dias	69.9	0.851	69.2	990	0.408	0.00405	0.164	0.471
Modulo de ruptura - MR 35 - 28 dias	65.4	0.789	64.7	919	0.386	0.00391	0.155	0.459
Modulo de ruptura - MR 35 - 3 dias	83.4	1.04	82.6	1200	0.473	0.00447	0.189	0.505
Modulo de ruptura - MR 35 - 7 dias	75.3	0.925	74.6	1070	0.434	0.00422	0.174	0.483
Modulo de ruptura - MR 36 - 14 dias	70.6	0.861	69.9	1000	0.411	0.00407	0.165	0.472
Modulo de ruptura - MR 36 - 28 dias	66.1	0.799	65.4	930	0.389	0.00393	0.157	0.462
Modulo de ruptura - MR 36 - 3 dias	84.1	1.05	83.3	1210	0.477	0.0045	0.191	0.506
Modulo de ruptura - MR 36 - 7 dias	76	0.935	75.3	1090	0.437	0.00424	0.175	0.485

Modulo de ruptura - MR 38 - 14 dias	72.1	0.881	71.3	1020	0.418	0.00412	0.168	0.476
Modulo de ruptura - MR 38 - 28 dias	67.6	0.819	66.9	953	0.396	0.00397	0.159	0.467
Modulo de ruptura - MR 38 - 3 dias	85.6	1.07	84.7	1240	0.484	0.00454	0.193	0.51
Modulo de ruptura - MR 38 - 7 dias	77.5	0.955	76.7	1110	0.444	0.00429	0.178	0.489
Modulo de ruptura - MR 40 - 14 dias	73.7	0.903	72.9	1050	0.426	0.00417	0.171	0.478
Modulo de ruptura - MR 40 - 28 dias	69.2	0.841	68.5	978	0.404	0.00402	0.162	0.468
Modulo de ruptura - MR 40 - 3 dias	87.2	1.09	86.3	1260	0.492	0.00459	0.196	0.514
Modulo de ruptura - MR 40 - 7 dias	79.1	0.977	78.3	1130	0.452	0.00434	0.181	0.492
Modulo de ruptura - MR 42 - 14 dias	76	0.935	75.3	1090	0.437	0.00424	0.175	0.485
Modulo de ruptura - MR 42 - 28 dias	71.5	0.873	70.8	1020	0.415	0.00409	0.167	0.476
Modulo de ruptura - MR 42 - 3 dias	89.5	1.12	88.6	1300	0.503	0.00466	0.201	0.521
Modulo de ruptura - MR 42 - 7 dias	81.4	1.01	80.6	1170	0.464	0.00441	0.186	0.499
Modulo de ruptura - MR 45 - 14 dias	79.4	0.982	78.6	1140	0.454	0.00434	0.182	0.493
Modulo de ruptura - MR 45 - 28 dias	74.9	0.92	74.2	1070	0.432	0.0042	0.173	0.482
Modulo de ruptura - MR 45 - 3 dias	93	1.17	92	1350	0.519	0.00477	0.207	0.529
Modulo de ruptura - MR 45 - 7 dias	84.9	1.06	84	1230	0.48	0.00452	0.192	0.508
Modulo de ruptura - MR 48 - 14 dias	83.1	1.03	82.2	1200	0.471	0.00446	0.189	0.503

Modulo de ruptura - MR 48 - 28 dias	78.5	0.97	77.7	1130	0.449	0.00432	0.18	0.491
Modulo de ruptura - MR 48 - 3 dias	96.6	1.22	95.6	1410	0.537	0.00489	0.214	0.537
Modulo de ruptura - MR 48 - 7 dias	88.5	1.11	87.6	1280	0.498	0.00463	0.199	0.517
Relleno Fluido - f´c 15 - 14 dias	37.2	0.416	36.9	482	0.245	0.00285	0.091	0.428
Relleno Fluido - f´c 15 - 28 dias	32.8	0.354	32.5	412	0.223	0.00271	0.0841	0.418
Relleno Fluido - f´c 15 - 3 dias	51.3	0.614	50.8	705	0.312	0.00327	0.113	0.456
Relleno Fluido - f´c 15 - 7 dias	42.5	0.49	42.1	565	0.27	0.00301	0.0992	0.438
Relleno Fluido - f´c 20 - 14 dias	37.8	0.423	37.4	490	0.247	0.00286	0.0919	0.43
Relleno Fluido - f´c 20 - 28 dias	33.3	0.361	33	421	0.226	0.00273	0.085	0.42
Relleno Fluido - f´c 20 - 3 dias	51.8	0.621	51.3	713	0.315	0.00329	0.114	0.459
Relleno Fluido - f´c 20 - 7 dias	43	0.497	42.6	574	0.273	0.00302	0.1	0.44
Relleno Fluido - f´c 25 - 14 dias	38.5	0.433	38.1	501	0.251	0.00288	0.093	0.431
Relleno Fluido - f´c 25 - 28 dias	34.1	0.371	33.7	432	0.229	0.00275	0.0861	0.423
Relleno Fluido - f´c 25 - 3 dias	52.5	0.631	52	724	0.318	0.00331	0.115	0.461
Relleno Fluido - f´c 25 - 7 dias	43.7	0.507	43.3	585	0.276	0.00305	0.101	0.443
Relleno Fluido - f´c 30 - 14 dias	39.5	0.448	39.1	518	0.256	0.00292	0.0947	0.434
Relleno Fluido - f´c 30 - 28 dias	35.1	0.386	34.8	448	0.235	0.00278	0.0878	0.426
Relleno Fluido - f´c 30 - 3 dias	53.6	0.646	53	741	0.323	0.00334	0.116	0.464
Relleno Fluido - f´c 30 - 7 dias	44.8	0.522	44.3	602	0.281	0.00308	0.103	0.446
Relleno Fluido - f´c 40 - 14 dias	42.5	0.49	42.1	565	0.27	0.00301	0.0993	0.44
Relleno Fluido - f´c 40 - 28 dias	38.1	0.428	37.7	496	0.249	0.00287	0.0924	0.431
Relleno Fluido - f´c 40 - 3 dias	56.6	0.688	56	788	0.337	0.00343	0.121	0.471
Relleno Fluido - f´c 40 - 7 dias	47.8	0.564	47.3	649	0.296	0.00317	0.108	0.452
Relleno Fluido - f´c 50 - 14 dias	45.9	0.537	45.4	618	0.286	0.00311	0.104	0.448

Relleno Fluido - f´c 50 - 28 dias	41.4	0.475	41	549	0.265	0.00297	0.0976	0.439
Relleno Fluido - f´c 50 - 3 dias	59.9	0.735	59.3	841	0.353	0.00353	0.126	0.478
Relleno Fluido - f´c 50 - 7 dias	51.1	0.611	50.6	702	0.311	0.00327	0.113	0.459
Relleno Fluido - f´c 60 - 14 dias	49.2	0.584	48.7	671	0.302	0.00321	0.11	0.453
Relleno Fluido - f´c 60 - 28 dias	44.8	0.522	44.3	602	0.281	0.00307	0.103	0.444
Relleno Fluido - f´c 60 - 3 dias	63.3	0.782	62.6	894	0.369	0.00363	0.131	0.484
Relleno Fluido - f´c 60 - 7 dias	54.5	0.658	53.9	755	0.327	0.00337	0.118	0.465
Relleno Fluido - f´c 70 - 14 dias	52.7	0.633	52.2	727	0.319	0.00331	0.115	0.461
Relleno Fluido - f´c 70 - 28 dias	48.3	0.572	47.8	657	0.298	0.00318	0.108	0.452
Relleno Fluido - f´c 70 - 3 dias	66.8	0.831	66.1	950	0.386	0.00374	0.137	0.49
Relleno Fluido - f´c 70 - 7 dias	58	0.708	57.4	810	0.344	0.00347	0.123	0.473

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	3.2	75.8	0.000173	0.000636	0.04	6.13E-05
Alta resistencia - f´c 400 - 28 dias	3	71.1	0.000162	0.000593	0.0373	5.77E-05
Alta resistencia - f´c 400 - 3 dias	3.62	86.4	0.000199	0.000734	0.0462	6.93E-05
Alta resistencia - f´c 400 - 7 dias	3.35	79.8	0.000183	0.000673	0.0423	6.43E-05
Alta resistencia - f´c 450 - 14 dias	3.44	82	0.000188	0.000693	0.0436	6.60E-05
Alta resistencia - f´c 450 - 28 dias	3.25	77.3	0.000177	0.000649	0.0408	6.24E-05
Alta resistencia - f´c 450 - 3 dias	3.87	92.6	0.000214	0.000791	0.0498	7.40E-05
Alta resistencia - f´c 450 - 7 dias	3.6	86	0.000198	0.000729	0.0459	6.89E-05
Alta resistencia - f´c 500 - 14 dias	3.69	88	0.000203	0.000748	0.0471	7.06E-05
Alta resistencia - f´c 500 - 28 dias	3.5	83.3	0.000191	0.000705	0.0443	6.70E-05
Alta resistencia - f´c 500 - 3 dias	4.11	98.7	0.000229	0.000847	0.0532	7.86E-05
Alta resistencia - f´c 500 - 7 dias	3.84	92	0.000213	0.000785	0.0494	7.35E-05

Alta resistencia - f´c 550 - 14 dias	4.09	98.2	0.000226	0.00083	0.0519	7.87E-05
Alta resistencia - f´c 550 - 28 dias	3.9	93.4	0.000214	0.000787	0.0492	7.50E-05
Alta resistencia - f´c 550 - 3 dias	4.53	109	0.000253	0.00093	0.0581	8.70E-05
Alta resistencia - f´c 550 - 7 dias	4.25	102	0.000236	0.000868	0.0542	8.17E-05
Alta resistencia - f´c 600 - 14 dias	4.37	105	0.000243	0.000894	0.0559	8.40E-05
Alta resistencia - f´c 600 - 28 dias	4.18	100	0.000231	0.00085	0.0531	8.03E-05
Alta resistencia - f´c 600 - 3 dias	4.82	116	0.00027	0.000994	0.0621	9.25E-05
Alta resistencia - f´c 600 - 7 dias	4.54	109	0.000253	0.000932	0.0582	8.72E-05
Baja contracción - MR 38 - 3 dias	2.62	61.5	0.000135	0.000485	0.0299	5.13E-05
Baja contracción - MR 38 - 7 dias	2.48	57.7	0.000126	0.000452	0.0279	4.84E-05
Baja contracción - MR 40 - 14 dias	2.67	62.5	0.000138	0.000494	0.0304	5.21E-05
Baja contracción - MR 40 - 28 dias	2.52	58.8	0.000129	0.000461	0.0285	4.92E-05
Baja contracción - MR 42 - 3 dias	2.72	63.8	0.000141	0.000505	0.0312	5.31E-05
Baja contracción - MR 42 - 7 dias	2.57	60.1	0.000132	0.000473	0.0292	5.03E-05
Baja contracción - MR 45 - 14 dias	2.8	65.7	0.000145	0.000522	0.0322	5.46E-05
Baja contracción - MR 45 - 28 dias	2.65	62	0.000137	0.00049	0.0302	5.18E-05
Baja contracción - MR 48 - 3 dias	2.91	68.5	0.000152	0.000546	0.0337	5.68E-05
Baja contracción - MR 48 - 7 dias	2.76	64.8	0.000143	0.000514	0.0317	5.39E-05
Convencional - f´c 100 - 7 dias	1.97	45.6	9.91E-05	0.000357	0.0225	3.80E-05
Convencional - f´c 100 - 14 dias	1.83	42.2	9.08E-05	0.000326	0.0206	3.54E-05
Convencional - f´c 100 - 28 dias	1.7	38.8	8.26E-05	0.000295	0.0186	3.28E-05
Convencional - f´c 100 - 3 dias	2.19	51	0.000112	0.000407	0.0256	4.21E-05
Convencional - f´c 150 - 14 dias	1.98	45.7	9.94E-05	0.000359	0.0226	3.81E-05
Convencional - f´c 150 - 28 dias	1.84	42.3	9.11E-05	0.000328	0.0206	3.55E-05
Convencional - f´c 150 - 3 dias	2.33	54.5	0.000121	0.000439	0.0276	4.48E-05
Convencional - f´c 150 - 7 dias	2.11	49.1	0.000108	0.00039	0.0245	4.07E-05

Convencional - f´c 200 - 14 dias	2.15	50	0.00011	0.000397	0.025	4.14E-05
Convencional - f´c 200 - 28 dias	2.01	46.6	0.000101	0.000366	0.0231	3.88E-05
Convencional - f´c 200 - 3 dias	2.5	58.8	0.000131	0.000478	0.03	4.81E-05
Convencional - f´c 200 - 7 dias	2.28	53.4	0.000118	0.000428	0.0269	4.39E-05
Convencional - f´c 250 - 14 dias	2.34	54.7	0.000121	0.00044	0.0277	4.51E-05
Convencional - f´c 250 - 28 dias	2.2	51.3	0.000113	0.000409	0.0257	4.24E-05
Convencional - f´c 250 - 3 dias	2.69	63.4	0.000142	0.00052	0.0327	5.16E-05
Convencional - f´c 250 - 7 dias	2.47	58	0.000129	0.000471	0.0296	4.74E-05
Convencional - f´c 300 - 14 dias	2.62	61.9	0.000138	0.000505	0.0318	5.03E-05
Convencional - f´c 300 - 28 dias	2.48	58.5	0.00013	0.000474	0.0298	4.77E-05
Convencional - f´c 300 - 3 dias	2.97	70.7	0.00016	0.000586	0.0368	5.70E-05
Convencional - f´c 300 - 7 dias	2.76	65.3	0.000147	0.000536	0.0337	5.29E-05
Convencional - f´c 350 - 14 dias	2.86	67.9	0.000153	0.00056	0.0352	5.49E-05
Convencional - f´c 350 - 28 dias	2.72	64.5	0.000145	0.000529	0.0332	5.23E-05
Convencional - f´c 350 - 3 dias	3.21	76.7	0.000174	0.00064	0.0402	6.15E-05
Convencional - f´c 350 - 7 dias	3	71.3	0.000161	0.000591	0.0371	5.75E-05
Estructural - f´c 250 - 14 dias	2.34	54.7	0.000121	0.00044	0.0277	4.51E-05
Estructural - f´c 250 - 28 dias	2.2	51.3	0.000113	0.000409	0.0257	4.25E-05
Estructural - f´c 250 - 3 dias	2.69	63.5	0.000143	0.000521	0.0327	5.18E-05
Estructural - f´c 250 - 7 dias	2.48	58.1	0.000129	0.000471	0.0296	4.76E-05
Estructural - f´c 300 - 14 dias	2.63	62	0.000139	0.000506	0.0318	5.05E-05
Estructural - f´c 300 - 28 dias	2.49	58.6	0.00013	0.000475	0.0298	4.80E-05
Estructural - f´c 300 - 3 dias	2.98	70.8	0.00016	0.000586	0.0368	5.72E-05
Estructural - f´c 300 - 7 dias	2.76	65.4	0.000147	0.000537	0.0337	5.31E-05
Estructural - f´c 350 - 14 dias	2.87	68	0.000153	0.00056	0.0352	5.51E-05
Estructural - f´c 350 - 28 dias	2.73	64.6	0.000145	0.000529	0.0333	5.25E-05

Estructural - f´c 350 - 3 dias	3.22	76.7	0.000175	0.000641	0.0402	6.17E-05
Estructural - f´c 350 - 7 dias	3	71.4	0.000161	0.000591	0.0371	5.76E-05
Lanzado - f´c 200 - 14 dias	2.78	65.9	0.00015	0.00055	0.0348	5.32E-05
Lanzado - f´c 200 - 28 dias	2.63	62.1	0.00014	0.000514	0.0325	5.03E-05
Lanzado - f´c 200 - 3 dias	3.04	72.4	0.000166	0.000611	0.0387	5.80E-05
Lanzado - f´c 200 - 7 dias	2.94	69.8	0.000159	0.000587	0.0371	5.61E-05
Lanzado - f´c 250 - 14 dias	2.94	69.9	0.000159	0.000587	0.0371	5.61E-05
Lanzado - f´c 250 - 28 dias	2.78	66	0.00015	0.00055	0.0348	5.32E-05
Lanzado - f´c 250 - 3 dias	3.2	76.3	0.000175	0.000648	0.041	6.10E-05
Lanzado - f´c 250 - 7 dias	3.1	73.8	0.000169	0.000623	0.0395	5.91E-05
Lanzado - f´c 300 - 14 dias	3.15	75.1	0.000172	0.000636	0.0402	6.01E-05
Lanzado - f´c 300 - 28 dias	2.99	71.2	0.000162	0.000599	0.0379	5.71E-05
Lanzado - f´c 300 - 3 dias	3.41	81.5	0.000188	0.000696	0.0441	6.49E-05
Lanzado - f´c 300 - 7 dias	3.3	78.9	0.000182	0.000672	0.0425	6.29E-05
Lanzado - f´c 350 - 14 dias	3.39	80.9	0.000187	0.00069	0.0437	6.45E-05
Lanzado - f´c 350 - 28 dias	3.23	77	0.000177	0.000654	0.0414	6.15E-05
Lanzado - f´c 350 - 3 dias	3.65	87.4	0.000203	0.000751	0.0475	6.94E-05
Lanzado - f´c 350 - 7 dias	3.54	84.8	0.000196	0.000727	0.046	6.73E-05
Modulo de ruptura - MR 35 - 14 dias	2.48	58.2	0.000131	0.000481	0.0305	4.74E-05
Modulo de ruptura - MR 35 - 28 dias	2.35	54.9	0.000123	0.00045	0.0285	4.49E-05
Modulo de ruptura - MR 35 - 3 dias	2.88	68	0.000155	0.000572	0.0363	5.48E-05
Modulo de ruptura - MR 35 - 7 dias	2.64	62.1	0.000141	0.000518	0.0328	5.04E-05
Modulo de ruptura - MR 36 - 14 dias	2.5	58.7	0.000132	0.000486	0.0308	4.78E-05
Modulo de ruptura - MR 36 - 28 dias	2.37	55.4	0.000124	0.000455	0.0289	4.53E-05
Modulo de ruptura - MR 36 - 3 dias	2.9	68.5	0.000157	0.000577	0.0366	5.52E-05
Modulo de ruptura - MR 36 - 7 dias	2.66	62.6	0.000142	0.000522	0.0331	5.07E-05

Modulo de ruptura - MR 38 - 14 dias	2.54	59.7	0.000135	0.000496	0.0314	4.86E-05
Modulo de ruptura - MR 38 - 28 dias	2.41	56.5	0.000127	0.000465	0.0295	4.61E-05
Modulo de ruptura - MR 38 - 3 dias	2.94	69.5	0.000159	0.000587	0.0372	5.60E-05
Modulo de ruptura - MR 38 - 7 dias	2.7	63.6	0.000145	0.000532	0.0337	5.15E-05
Modulo de ruptura - MR 40 - 14 dias	2.59	60.9	0.000138	0.000507	0.0321	4.95E-05
Modulo de ruptura - MR 40 - 28 dias	2.46	57.6	0.00013	0.000476	0.0302	4.70E-05
Modulo de ruptura - MR 40 - 3 dias	2.99	70.7	0.000162	0.000598	0.0379	5.69E-05
Modulo de ruptura - MR 40 - 7 dias	2.75	64.8	0.000148	0.000543	0.0344	5.24E-05
Modulo de ruptura - MR 42 - 14 dias	2.66	62.6	0.000142	0.000522	0.0331	5.07E-05
Modulo de ruptura - MR 42 - 28 dias	2.53	59.3	0.000134	0.000492	0.0312	4.83E-05
Modulo de ruptura - MR 42 - 3 dias	3.05	72.4	0.000166	0.000614	0.0389	5.81E-05
Modulo de ruptura - MR 42 - 7 dias	2.82	66.5	0.000152	0.000559	0.0354	5.37E-05
Modulo de ruptura - MR 45 - 14 dias	2.76	65.1	0.000148	0.000546	0.0346	5.26E-05
Modulo de ruptura - MR 45 - 28 dias	2.63	61.8	0.00014	0.000515	0.0326	5.01E-05
Modulo de ruptura - MR 45 - 3 dias	3.15	74.9	0.000172	0.000637	0.0403	6.00E-05
Modulo de ruptura - MR 45 - 7 dias	2.92	69	0.000158	0.000582	0.0369	5.56E-05
Modulo de ruptura - MR 48 - 14 dias	2.86	67.7	0.000155	0.00057	0.0361	5.46E-05
Modulo de ruptura - MR 48 - 28 dias	2.73	64.4	0.000147	0.000539	0.0342	5.21E-05
Modulo de ruptura - MR 48 - 3 dias	3.26	77.5	0.000179	0.000662	0.0419	6.20E-05
Modulo de ruptura - MR 48 - 7 dias	3.02	71.6	0.000164	0.000607	0.0384	5.75E-05
Relleno Fluido - f´c 15 - 14 dias	1.44	32.9	7.03E-05	0.000256	0.0165	2.72E-05
Relleno Fluido - f´c 15 - 28 dias	1.32	29.9	6.27E-05	0.000227	0.0146	2.50E-05
Relleno Fluido - f´c 15 - 3 dias	1.82	42.3	9.44E-05	0.000349	0.0225	3.42E-05
Relleno Fluido - f´c 15 - 7 dias	1.59	36.4	7.93E-05	0.000291	0.0187	2.98E-05
Relleno Fluido - f´c 20 - 14 dias	1.46	33.2	7.12E-05	0.000259	0.0167	2.75E-05
Relleno Fluido - f´c 20 - 28 dias	1.34	30.3	6.37E-05	0.00023	0.0148	2.53E-05

Relleno Fluido - f´c 20 - 3 dias	1.84	42.7	9.53E-05	0.000353	0.0227	3.44E-05
Relleno Fluido - f´c 20 - 7 dias	1.6	36.8	8.03E-05	0.000294	0.019	3.01E-05
Relleno Fluido - f´c 25 - 14 dias	1.48	33.7	7.24E-05	0.000264	0.017	2.78E-05
Relleno Fluido - f´c 25 - 28 dias	1.36	30.8	6.49E-05	0.000235	0.0151	2.56E-05
Relleno Fluido - f´c 25 - 3 dias	1.86	43.1	9.65E-05	0.000358	0.023	3.48E-05
Relleno Fluido - f´c 25 - 7 dias	1.62	37.3	8.15E-05	0.000299	0.0193	3.04E-05
Relleno Fluido - f´c 30 - 14 dias	1.5	34.4	7.42E-05	0.000271	0.0174	2.84E-05
Relleno Fluido - f´c 30 - 28 dias	1.38	31.5	6.67E-05	0.000242	0.0155	2.62E-05
Relleno Fluido - f´c 30 - 3 dias	1.89	43.9	9.84E-05	0.000365	0.0235	3.53E-05
Relleno Fluido - f´c 30 - 7 dias	1.65	38	8.33E-05	0.000306	0.0197	3.09E-05
Relleno Fluido - f´c 40 - 14 dias	1.59	36.4	7.94E-05	0.000291	0.0187	2.98E-05
Relleno Fluido - f´c 40 - 28 dias	1.47	33.5	7.18E-05	0.000262	0.0168	2.76E-05
Relleno Fluido - f´c 40 - 3 dias	1.97	45.9	0.000103	0.000384	0.0248	3.68E-05
Relleno Fluido - f´c 40 - 7 dias	1.73	40	8.84E-05	0.000326	0.021	3.25E-05
Relleno Fluido - f´c 50 - 14 dias	1.68	38.7	8.51E-05	0.000313	0.0202	3.15E-05
Relleno Fluido - f´c 50 - 28 dias	1.56	35.7	7.75E-05	0.000284	0.0183	2.93E-05
Relleno Fluido - f´c 50 - 3 dias	2.06	48.1	0.000109	0.000407	0.0262	3.84E-05
Relleno Fluido - f´c 50 - 7 dias	1.82	42.2	9.41E-05	0.000348	0.0224	3.41E-05
Relleno Fluido - f´c 60 - 14 dias	1.77	40.9	9.08E-05	0.000335	0.0216	3.31E-05
Relleno Fluido - f´c 60 - 28 dias	1.65	37.9	8.33E-05	0.000306	0.0197	3.09E-05
Relleno Fluido - f´c 60 - 3 dias	2.15	50.4	0.000115	0.000429	0.0277	4.01E-05
Relleno Fluido - f´c 60 - 7 dias	1.91	44.5	9.99E-05	0.00037	0.0239	3.57E-05
Relleno Fluido - f´c 70 - 14 dias	1.86	43.3	9.68E-05	0.000359	0.0231	3.48E-05
Relleno Fluido - f´c 70 - 28 dias	1.74	40.3	8.93E-05	0.000329	0.0212	3.27E-05
Relleno Fluido - f´c 70 - 3 dias	2.24	52.7	0.000121	0.000452	0.0292	4.18E-05
Relleno Fluido - f´c 70 - 7 dias	2	46.8	0.000106	0.000394	0.0254	3.75E-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