

ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804+A1

Owner of the Declaration	Cementa AB, HeidelbergCement Group
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-HCG-20200136-CAA1-EN
Issue date	2020-08-25
Valid to	2025-08-24

Portland Cement Injektering 30 Cementa AB, HeidelbergCement Group



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General Information

<p>Cementa AB, HeidelbergCement Group</p> <hr/> <p>Programme holder IBU – Institut Bauen und Umwelt e.V. Panoramastr. 1 10178 Berlin Germany</p> <hr/> <p>Declaration number EPD-HCG-20200136-CAA1-EN</p> <hr/> <p>This declaration is based on the product category rules: Cement, 07.2014 (PCR checked and approved by the SVR)</p> <hr/> <p>Issue date 2020-08-25</p> <hr/> <p>Valid to 2025-08-24</p>	<p>Injektering 30</p> <hr/> <p>Owner of the declaration Cementa AB Marieviksgatan 25, Box 47210 SE-100 74 Stockholm</p> <hr/> <p>Declared product / declared unit 1 metric t of CEM I 42.5 N-SR3/MH/LA</p> <hr/> <p>Scope: This Environmental Product Declaration (EPD) covers the product life cycle stages A1-A3. It is valid for Injektering 30, a micro cement produced by Cementa AB, Sweden, in 2019 and 2020. It is based on EN 197-1-compliant CEM I 42.5 N-SR3/MH/LA (Anläggningscement Std P Slite) produced at the plant Slite and further ground at the plant Degerhamn in mills specially developed for micro cements. This analysis relies on transparent, plausible and documented basis data. All the model assumptions, which influence the results, are declared. The life cycle assessment is representative of the products introduced in the declaration for the given system boundaries.</p> <p>The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.</p> <p>The EPD was created according to the specifications of EN 15804+A1. In the following, the standard will be simplified as EN 15804.</p> <hr/> <p>Verification</p> <table border="1"> <tr> <td colspan="2">The standard EN 15804 serves as the core PCR</td> </tr> <tr> <td colspan="2">Independent verification of the declaration and data according to ISO 14025:2010</td> </tr> <tr> <td><input type="checkbox"/> internally</td> <td><input checked="" type="checkbox"/> externally</td> </tr> </table>	The standard EN 15804 serves as the core PCR		Independent verification of the declaration and data according to ISO 14025:2010		<input type="checkbox"/> internally	<input checked="" type="checkbox"/> externally
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<p></p> <hr/> <p>Dipl. Ing. Hans Peters (chairman of Institut Bauen und Umwelt e.V.)</p>	<p></p> <hr/> <p>Dr. Eva Schmincke (Independent verifier appointed by SVR)</p>
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Product

Product description/Product definition

Cement is a hydraulic binder. It consists of finely ground, non-metallic inorganic compounds. Cement is produced by grinding cement clinker and other main or minor constituents. When water is added to cement, a cement paste is formed, which sets and hardens by hydration reactions. After hardening, it retains its strength and stability even under water.

The declared product Injektering 30 is a micro cement. It is produced by grinding EN 197-1-compliant CEM I 42,5 N-SR3/LA^{*)}(Anläggningscement Std P Slite) in mills specially developed for micro cements.

^{*)} LA means Low alkali content according to Swedish standard, SS 134203.

The calculation is based on plant-specific data of Slite and Degerhamn in 2019/2020.

For the use and application of the product the respective national provisions at the place of use apply.

Application

Injektering 30 has suitable penetration characteristics for grouting in geotechnical work (cement injection of cracks in rocks).

Injektering 30 is chromate reduced.

Technical Data

Injektering 30 is mainly based on a common cement type that complies with EN 197-1.

Performance data of the product with respect to its characteristics in accordance with the relevant technical provision (no CE-marking).

Base materials/Ancillary materials

Clinker: 95 - 100 %
Cement clinker is made of a raw material mixture that is added to the cement kiln and sintered at a temperature of 1400 °C. The basic materials for the production of cement clinker consist of calcium oxide (CaO), silicon dioxide (SiO₂) and small amounts of aluminium oxide (Al₂O₃) and iron oxide (Fe₂O₃). Raw materials that provide these constituents are limestone, chalk and clay or limestone marl as its natural occurring mixture.

Gypsum/Anhydrite/Residual gypsum: 0 – 5 %
Gypsum and anhydrite are added as setting regulators to cement. Many cement plants use residual gypsum from flue gas desulfurization as well.

This product contains substances listed in the *candidate list* (date: 2.6.2020) exceeding 0.1 percentage by mass: no

Reference service life

This study covers the production stage information (from A1 to A3) of the product. As no use stage is declared, the reference service life for cement is irrelevant.

LCA: Calculation rules

Declared Unit

The declared unit is 1 metric t of Injektering 30.

Declared unit

Name	Value	Unit
Declared unit	1	t
Conversion factor to 1 kg	0.001	-

System boundary

Type of the EPD: cradle to gate.

The applied system boundaries cover the production of the cement including extraction of raw materials up to the finished and packed product at the factory gate. The product stage includes:

- Module A1:
Extraction and processing of raw materials.
- Module A2:
Transport of raw materials to the factory gate and internal transports.
- Module A3:
Cement production including packaging.

The construction, use and disposal are not considered in the LCA for cement. The development of scenarios

for these stages have to be conducted on the final product (e.g. concrete).

For the modelling of cement, both specific production data from HeidelbergCement and background data (especially for upstream processes) have been used. For life cycle modelling of the considered product, the verified Global Cement and Concrete Association GCCA online tool for EPDs of concrete and cement is used. The tool was developed by *Quantis* and is owned by the Global Cement and Concrete Association. The life cycle assessment in the tool has been implemented in compliance with *EN 15804*, the General Programme Instructions (GPI 3.0) for the International EPD® System, the product category rules *PCR 2012:01*, *Sub-PCR-G* (concrete) and *Sub-PCR-H* (cement). For the present study, version 2.0 of the GCCA tool was used, largely being based on the database *ecoinvent v3.3*.

Comparability

Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to *EN 15804* and the building context, respectively the product-specific characteristics of performance, are taken into account.

The largely used database is *ecoinvent v3.3*.

LCA: Scenarios and additional technical information

The development of scenarios shall be made on the finished product (e.g. concrete) and not on the upstream product cement.

LCA: Results

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE NOT DECLARED; MNR = MODULE NOT RELEVANT)

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	MND	MND	MND	MND	MNR	MNR	MNR	MND	MND	MND	MND	MND	MND	MND

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A1: 1 metric t Injektering 30

Parameter	Unit	A1-A3
Global warming potential	[kg CO ₂ -Eq.]	9.18E+2
Depletion potential of the stratospheric ozone layer	[kg CFC11-Eq.]	2.23E-5
Acidification potential of land and water	[kg SO ₂ -Eq.]	1.05E+0
Eutrophication potential	[kg (PO ₄) ³ -Eq.]	5.35E-1
Formation potential of tropospheric ozone photochemical oxidants	[kg ethene-Eq.]	1.09E-1
Abiotic depletion potential for non-fossil resources	[kg Sb-Eq.]	2.60E-4
Abiotic depletion potential for fossil resources	[MJ]	3.45E+3

RESULTS OF THE LCA - RESOURCE USE according to EN 15804+A1: 1 metric t Injektering 30

Parameter	Unit	A1-A3
Renewable primary energy as energy carrier	[MJ]	1.03E+3
Renewable primary energy resources as material utilization	[MJ]	0.00E+0
Total use of renewable primary energy resources	[MJ]	1.03E+3
Non-renewable primary energy as energy carrier	[MJ]	5.31E+3
Non-renewable primary energy as material utilization	[MJ]	0.00E+0
Total use of non-renewable primary energy resources	[MJ]	5.31E+3
Use of secondary material	[kg]	1.13E+2
Use of renewable secondary fuels	[MJ]	3.31E+1
Use of non-renewable secondary fuels	[MJ]	2.01E+2
Use of net fresh water	[m ³]	1.27E+1

RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES according to EN 15804+A1: 1 metric t Injektering 30

Parameter	Unit	A1-A3
Hazardous waste disposed	[kg]	0.00E+0
Non-hazardous waste disposed	[kg]	5.12E+2
Radioactive waste disposed	[kg]	0.00E+0
Components for re-use	[kg]	0.00E+0
Materials for recycling	[kg]	3.89E-1
Materials for energy recovery	[kg]	0.00E+0
Exported electrical energy	[MJ]	0.00E+0
Exported thermal energy	[MJ]	0.00E+0

Remark to Global warming potential:

This includes 27.7 kg CO₂-eq. from the incineration of wastes in clinker production. According to the "polluter-pays-principle" /EN 15804/ that would be assigned to the production system, which has caused the waste. In this EPD the CO₂ contribution is not subtracted. This is to ensure comparability across countries of calculated global warming potentials for cements even if the used secondary fuels in other countries do not have waste status.

Remark to Waste categories:

The waste indicators account for wastes from clinker and cement manufacturing only.

References

Candidate List of Substances of Very High

Concern for Authorisation/European Chemical Agency, 2020
www.echa.europa.eu/web/guest/candidate-list-table

EN 197-1

EN 197-1:2011, Cement - part 1: Composition specification and conformity criteria for common cements

ecoinvent v3.3

ecoinvent database, version 3.3, 2016
<https://www.ecoinvent.org/>

EN 206

EN 206:2013, Concrete: Specification, performance,

production and conformity

EN 15804

EN 15804:2012-04+A1 2013/, Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products

(EU) No. 305/2011 (CPR)

Regulation (EU) No 305/2011 of the European Parliament and of the council of 9 March 2011 laying down harmonised conditions for the marketing of construction products and repealing Council Directive 89/106/EEC

GCCA

Global Cement and Concrete Association
<https://gccassociation.org/>

General principles

for the EPD range of Institut Bauen und Umwelt e.V. (IBU), 2013-04
www.ibu-epd.com

IBU 2016

IBU (2016): General Programme Instructions for the Preparation of EPDs at the Institut Bauen und Umwelt e.V., Version 1.1 Institut Bauen und Umwelt e.V., Berlin.
www.ibu-epd.de

ISO 14025

DIN EN /ISO 14025:2011-10/, Environmental labels and declarations — Type III environmental declarations — Principles and procedures

PCR 2012:01

Product Category Rules according to ISO 14025: Construction products and construction services, version 2.01, 2012:01
<http://environdec.com/en/PCR/Detail/?Pcr=8098>

Quantis

<https://quantis-intl.com/>

SS 134203

SS 134203:2014, Cement - Composition, specifications and conformity criteria for low alkali common cements (LA)

Sub-PCR-H

Sub-PCR to PCR 2012:01, Cement and building lime (EN 16908:2017), 2018-03-19
<http://environdec.com>

Sub-PCR-G

Sub-PCR to PCR 2012:01, Concrete and concrete elements (EN 16757:2017), 2018-11-22
<http://environdec.com>

**Publisher**

Institut Bauen und Umwelt e.V.
Panoramastr. 1
10178 Berlin
Germany

Tel +49 (0)30 3087748- 0
Fax +49 (0)30 3087748- 29
Mail info@ibu-epd.com
Web www.ibu-epd.com

**Programme holder**

Institut Bauen und Umwelt e.V.
Panoramastr. 1
10178 Berlin
Germany

Tel +49 (0)30 - 3087748- 0
Fax +49 (0)30 - 3087748 - 29
Mail info@ibu-epd.com
Web www.ibu-epd.com

HEIDELBERGCEMENT**Author of the Life Cycle
Assessment**

HeidelbergCement AG
Oberklamweg 6
69181 Leimen
Germany

Tel +49 6221 481 13719
Fax +49 6221 481 13757
Mail martina.dietermann@heidelbergcement.com
Web www.heidelbergcement.com

CEMENTA
HEIDELBERGCEMENT Group**Owner of the Declaration**

Cementa AB, HeidelbergCement
Group
Marieviksgatan 25
11743 Stockholm
Sweden

Tel +46 8 625 68 00
Fax +46 8 753 36 20
Mail bodil.wilhelmsson@cementa.se
Web www.cementa.se