



Cendec[®]

ENVIRONMENTAL PRODUCT DECLARATION

In agreement with ISO 14025:2006

PRODUCT CATEGORY RULES AND PCR BASIC MODULE

CPC Division (not available): CONSTRUCTION PRODUCTS

AND

CPC Division 54: CONSTRUCTION SERVICES

2013-02-21 version 1.1.



ENVIRONMENTAL PRODUCT DECLARATION OF SOIL STABILIZATION PRODUCTS

REV. 0 Date 20th August 2013

Number: 3013EPD-13-0361

S-P-00462 Soil stabilization products



Organization:	Holcim (Česko) a.s., člen koncernu	Registration No. / VAT 274650/CZ15052320
Address	Tovární 296 Prachovice Czech Republic	
Statutory body	Michael Suter	
EPD representative	Ing. Milena Slepíčková Specialist AFR&Environment	
Contact	Phone: +420 602707682 E-mail: milena.slepickova@holcim.com	www.holcim.cz

Product:	Soil stabilization product
Use:	Soil improvement and stabilization
Product lifetime /days/:	The products are under warranty for 90 days.
Hazardous substance contents:	Yes/No
UN CPC:	CPC Division (not available): Construction Products and CPC Division 54: Construction Services



1 PROGRAMME RELATED INFORMATION

1.1 NAME OF THE PROGRAMME AND PROGRAMME OPERATOR

Programme operator for this EPD is Cendec® with affiliation to International EPD®system. Cendec® is Czech Type III environmental declaration operator which is affiliated to the International EPD®system by Memorandum of Understanding signed January 10th 2013.

International EPD®system	Cendec®
International EPD Consortium (IEC)	Center for Environmental Declarations
Postal address: Vasagatan 15-17, SE-111 20 Stockholm, Sweden	Postal address: Šárecká 5, 160 00 Prague 6, Czech Republic
E-mail: info@environdec.com	E-mail: info@cendec.cz
WWW: www.environdec.com	WWW: www.cendec.cz

1.2 THE REFERENCE PCR DOCUMENT

The reference documents for this EPD are General Programme Instructions (IEC 2008) and Product Category Rules for CPC Division (not available): Construction Products and CPC Division 54: Construction Services (IEC 2012). Product Category Rules (PCR) are specified for specified information modules "cradle-to-gate", so called core modules. The structure and aggregation level of the core modules is defined by the United Nation Statistics Division - Classification Registry CPC codes (<http://unstats.un.org>).

1.3 REGISTRATION NUMBER

The registration number of this EPD is: 3013EPD-13-0361

1.4 DATE OF PUBLICATION AND VALIDITY

The publication date of this EPD is: 20.8.2013

This EPD is valid until: 20.8.2016

1.5 GEOGRAPHICAL SCOPE OF APPLICATION OF EPD

The geographical scope of this EPD is international.

1.6 INFORMATION ABOUT THE YEAR OR REFERENCE PERIOD OF THE UNDERLYING DATA TO THE EPD

The reference period to this EPD is year 2011. Data shown below refers to 2011 and have been collected directly from the Holcim, a.s. Other general data used for LCA calculations from the ILCD and Ecoinvent database were taken.

1.7 REFERENCE TO THE WEBSITE

More information related to The International EPD® System programme is available at www.environdec.com. More information related to Czech type III environmental declaration programme is available at www.cendec.cz.

2 PRODUCT RELATED INFORMATION

Trade name of product: Soil stabilization product Dorosol C30; Dorosol C50 and Dorosol C70.



Unequivocal identification of the product according to the CPC classification system: **CPC Division (not available): Construction Products and CPC Division 54: Construction Services.**

2.1 SPECIFICATION OF THE COMPANY

The soil stabilization products are produced in Holcim (Česko) a.s., člen koncernu, Tovární ul. 296, CZ - 538 04 Prachovice.

Registration No. / VAT No.: 274650 / CZ15052320

The company is recorded in the Company Register kept by the Regional Court in Hradec Králové, Section B, 134.

Main activity of the Company is production of Common cements and Soil stabilization products.

Holcim, a.s. is a company having ISO 9001 Quality management system, ISO 14001 Environmental management system and OHSAS 18001 Occupational health and safety management system certificated.

2.2 TECHNICAL DESCRIPTION OF THE PRODUCT

The soil stabilization product produced in Holcim (Česko), a.s. are for use in geotechnical engineering, road and building construction for the improvement and strengthening of cohesive soils, to stabilize embankments and subgrade.

This EPD covers all Holcim, a.s. soil stabilization products produced by the same technological procedure. This EPD is valid for in table 1 summarized soil stabilization product:

Table 1: Product description

Trade name	Significant characteristic	Recommended use
Dorosol C30	A higher proportion of hydraulic components compared to quicklime	Silty and sandy soils
Dorosol C50	The same proportion of hydraulic components and calcareous components	For a broad spectrum of soils according to tests carried out
Dorosol C70	A higher proportion of lime	Clayey soil

2.3 DECLARED UNIT

According to the EN 15804 and PCR (IEC 2012) the declared unit is 1 000 kg of soil stabilization product.

2.4 DESCRIPTION OF UNDERLYING LCA-BASED INFORMATION

2.4.1 SYSTEM BOUNDARIES

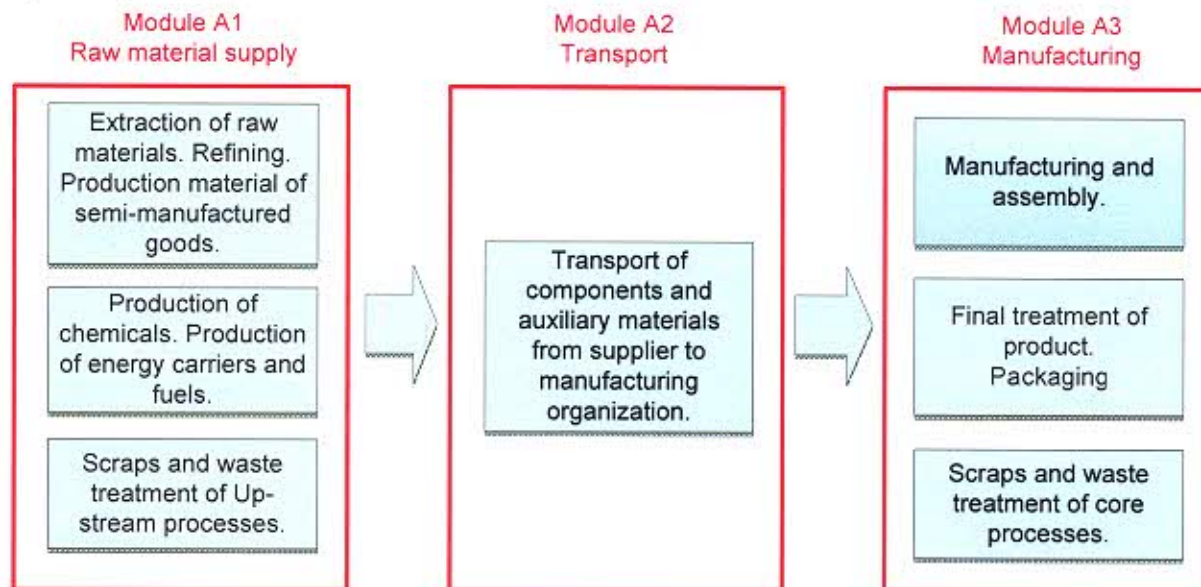
System boundaries of this EPD are cradle to gate. Based on EN 15804 The International EPD® system has adopted an LCA calculations procedure which is separated into different life cycle stages, so called modules A1, A2 and A3:

- Module A1: Upstream processes including fuels and electricity production
- Module A2: Transport of inputs to producer
- Module A3: Core processes and waste processing



Schematic description of system boundaries consisting of up-stream module processes, core processes and down-stream processes is shown on following figure.

Figure 1 System boundaries



Based on PCR (IEC 2012) the downstream module was not included into system boundaries. Transport of final product to a customer is also excluded.

2.4.2 DATA QUALITY

All relevant data are specific data. Data used for calculation were relevant for year 2011. Data set needed for calculation is complete.

2.4.3 LCA STUDY

The LCA calculations rules used for this declaration outlines the overall requirements to follow for The International EPD® System. These rules follow the international standards ISO 14040 and ISO 14044 with respect to EN 15806. The product system for this LCA has been described by using specific data when available; generic data have been used in accordance with PCR (IEC 2012) and GPI (IEC 2008) requirements. Underlying LCA study used for this EPD was complete covering all relevant inputs. For LCA study site specific data from producer were used. The LCA was conducted in year 2013. Underlying LCA study was elaborated by LCA studio, www.lcastudio.cz (Kočí 2013).

2.5 CONTENT OF MATERIALS AND CHEMICAL SUBSTANCES

The hazardous chemical substances are not present in the product. The soil stabilization products consist of clinker, slag, fly ash, waste gypsum, dust and limestone. Detailed composition of products is HOLCIM (Česko), a.s. know-how and cannot be published.

3 ENVIRONMENTAL PERFORMANCE-RELATED INFORMATION

All environmental performance is reported per declared unit 1 000 kg of soil stabilization product.

3.1 USE OF NATURAL RESOURCES

Following tables report the main consumption of resources for production of soil stabilization products. Dominant material resources used are limestone, hard coal and lignit. Use of resources in



kg/D.U and in MJ/D.U. is documented in following tables. All energy data are expressed as MJ of net caloric value.

Table 2 Resource consumption (kg) associated with Dorosol C30 production. Data are referred to D.U.

Kg/DU	Total	Module A1	Module A2	Module A3
Crude oil (resource)	5,64	4,17	1,47	0,00
Hard coal (resource)	38,53	38,52	0,01	0,00
Lignite (resource)	40,07	40,06	0,01	0,00
Natural gas (resource)	19,97	19,85	0,12	0,00
Limestone (calcium carbonate)	1099	581	0,02	508
Water	58223	57722	265	236

Table 3 Resource (MJ) and electricity consumption associated with Dorosol C30 production. Data are referred to D.U.

MJ/DU	Total	Module A1	Module A2	Module A3
Non renewable energy resources	2744	2676	68	0
Renewable energy resources	48	45	3	0
Electricity, MJ				187,6

Table 4 Resource consumption (kg) associated with Dorosol C50 production. Data are referred to D.U.

Kg/DU	Total	Module A1	Module A2	Module A3
Crude oil (resource)	7,41	5,73	1,68	0,00
Hard coal (resource)	40,04	40,04	0,01	0,00
Lignite (resource)	38,60	38,59	0,01	0,00
Natural gas (resource)	27,66	27,52	0,13	0,00
Limestone (calcium carbonate)	1215	823	0,02	392
Water	54282	53797	303	182

Table 5 Resource (MJ) and electricity consumption associated with Dorosol C50 production. Data are referred to D.U.

MJ/DU	Total	Module A1	Module A2	Module A3
Non renewable energy resources	3164	3086	78	0
Renewable energy resources	49	46	3	0
Electricity, MJ				145,4

Table 6 Resource consumption (kg) associated with Dorosol C70 production. Data are referred to D.U.

Kg/DU	Total	Module A1	Module A2	Module A3
Crude oil (resource)	9,89	7,93	1,96	0,00
Hard coal (resource)	42,01	42,00	0,01	0,00
Lignite (resource)	36,32	36,30	0,01	0,00



Natural gas (resource)	38,47	38,32	0,16	0,00
Limestone (calcium carbonate)	1390	1160	0,02	230
Water	48384	47926	353	105

Table 7 Resource (MJ) and electricity consumption associated with Dorosol C70 production. Data are referred to D.U.

MJ/DU	Total	Module A1	Module A2	Module A3
Non renewable energy resources	3745	3655	90	0
Renewable energy resources	51	48	4	0
Electricity, MJ				84,8

3.2 POTENTIAL ENVIRONMENTAL IMPACTS

Characterization factors are those prescribed in the CML 2001 methodology for calculating environmental impact as required by EPD® programme in GPI (IEC 2008). This methodology is fully developed and used at an European level due to the reliability of its data and its scientific bases which are supported in the methodology and procedures established by Guinée et al. (Guinee 2001).

In the table environmental impact per declared unit are presented:

Table 8 Impact category results of environmental results of Dorosol C30 production life cycle. Data are referred to D.U.

CML2001 - Nov. 2010 -	Celkem	A1	A2	A3
Abiotic Depletion (ADP elements) [kg Sb-Equiv.]	0,0002	0,0002	0,0000	0,0000
Abiotic Depletion (ADP fossil) [MJ]	2744	2676	68	0
Acidification Potential (AP) [kg SO2-Equiv.]	1,01	0,41	0,02	0,58
Eutrophication Potential (EP) [kg Phosphate-Equiv.]	0,11	0,03	0,01	0,07
Global Warming Potential (GWP 100 years) [kg CO2-Equiv.]	710	409	4	297
Ozone Layer Depletion Potential (ODP, steady state) [kg R11-Equiv.]	3,73E-08	3,82E-08	8,57E-11	-1,01E-09
Photochem. Ozone Creation Potential (POCP) [kg Ethene-Equiv.]	0,07	0,03	0,00	0,04

Table 9 Impact category results of environmental results of Dorosol C50 production life cycle. Data are referred to D.U.

CML2001 - Nov. 2010 -	Celkem	A1	A2	A3
Abiotic Depletion (ADP elements) [kg Sb-Equiv.]	0,0001	0,0001	0,0000	0,0000
Abiotic Depletion (ADP fossil) [MJ]	3164	3086	78	0
Acidification Potential (AP) [kg SO2-Equiv.]	0,86	0,38	0,03	0,45
Eutrophication Potential (EP) [kg Phosphate-Equiv.]	0,10	0,03	0,01	0,06
Global Warming Potential (GWP 100 years)	785	550	5	229



CML2001 - Nov. 2010 -	Celkem	A1	A2	A3
[kg CO2-Equiv.]				
Ozone Layer Depletion Potential (ODP, steady state)				
[kg R11-Equiv.]	3,14E-08	3,21E-08	9,80E-11	-7,82E-10
Photochem. Ozone Creation Potential (POCP)				
[kg Ethene-Equiv.]	0,06	0,03	0,00	0,03

Table 10 Impact category results of environmental results of Dorosol C70 production life cycle. Data are referred to D.U.

CML2001 - Nov. 2010 -	Celkem	A1	A2	A3
Abiotic Depletion (ADP elements) [kg Sb-Equiv.]	0,0001	0,0001	0,0000	0,0000
Abiotic Depletion (ADP fossil) [MJ]	3745	3655	90	0
Acidification Potential (AP)				
[kg SO2-Equiv.]	0,64	0,35	0,03	0,26
Eutrophication Potential (EP)				
[kg Phosphate-Equiv.]	0,08	0,04	0,01	0,03
Global Warming Potential (GWP 100 years)				
[kg CO2-Equiv.]	886	747	6	132
Ozone Layer Depletion Potential (ODP, steady state)				
[kg R11-Equiv.]	2,29E-08	2,32E-08	1,14E-10	-4,51E-10
Photochem. Ozone Creation Potential (POCP)				
[kg Ethene-Equiv.]	0,04	0,03	-0,01	0,02

3.3 OTHER ENVIRONMENTAL INDICATORS

During production phase of Holcim (Česko), a.s. portland cements no hazardous wastes, radioactive wastes and no substantial amount of solid wastes and/or toxic substances is released. During use phase of soil stabilization products no toxic substances are released. The following indicators are also reported in the EPD per declared unit:



Table 11 Other environmental indicators – input flows of soil stabilization products production life cycle. Data are referred to D.U.

Consumption to referred D.U.	Use of renewable primary energy excluding renewable primary energy resources used as raw materials	Use of renewable primary energy resources used as raw materials	Total use of renewable primary energy resources	Use of non renewable primary energy excluding non renewable primary energy resources used as raw materials	Use of non renewable primary energy resources used as raw materials	Total use of non renewable primary energy resources	Use of secondary material	Use of renewable secondary fuels	Use of non renewable secondary fuels	Net use of fresh water
Dorosol C30	48	2,98E-06	48	2744	-2,40E-04	2744	270	0	689	7,65
Dorosol C50	49	2,31E-06	49	3164	-1,86E-04	3164	223	0	532	5,91
Dorosol C70	51	1,33E-06	51	3745	-1,07E-04	3745	124	0	307	3,41



