

ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804

Owner of the Declaration	Hilti AG
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-HIL-20140038-CAA1-EN
Issue date	25.03.2014
Valid to	24.03.2019

Hilti HIT-CT 1
Hilti AG

www.bau-umwelt.com / <https://epd-online.com>



SAFEset



General Information

Hilti AG

Programme holder

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

Declaration number

EPD-HIL-20140038-CAA1-EN

This Declaration is based on the Product Category Rules:

Reaction resin products, 10-2012
(PCR tested and approved by the independent expert committee)

Issue date

25.03.2014

Valid to

24.03.2019



Prof. Dr.-Ing. Horst J. Bossenmayer
(President of Institut Bauen und Umwelt e.V.)



Dr. Burkhard Lehmann
(Managing Director IBU)

Hilti HIT-CT 1

Owner of the Declaration

Hilti AG
Feldkircher Str. 100
FL-9494 Schaan
Liechtenstein

Declared product / Declared unit

The declared product is Hilti HIT-CT 1 injectable mortar. The declared unit refers to 1 kg reactive resin product in the mixing ratio required for processing both components. The packaging is also included in the calculation.

Scope:

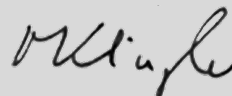
This document refers to Hilti HIT-CT 1 injectable mortar and its respective packaging. Specific data from the HILTI manufacturing plant in Kaufering was used to generate this LCA which is based on data from 2013. The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

Verification

The CEN Norm EN 15804 serves as the core PCR

Independent verification of the declaration
according to ISO 14025

☐ internally ☒ externally



Matthias Klingler
(Independent tester appointed by SVA)

Product

Product description

Hilti HIT-CT 1 involves a dual-component injection system based on vinyl ester resin. Combining the resin and curing agent components in a static mixer causes curing. The resin component comprises a vinyl ester resin mixture as well as mineral and cement-like fillers. The curing agent component comprises an aqueous benzoyl peroxide dispersion and mineral fillers. The hybrid system formed during cement and resin curing results in a product of particular long-term stability.

Hilti HIT-CT 1 is a component of the Hilti CleanTec product family which guarantees a high degree of industrial safety. Thanks to its special composition, the product does not require any hazard markings and permits safe working conditions in most cases. Hilti HIT-CT 1 is available in the form of a film-wrapped pack with the result that very little waste remains on the construction site after use.

Application

Hilti HIT-CT 1 serves for safely securing threaded rods and post-installed rebar connections in dry and damp concrete.

Rebar connections of up to 25 mm can be carried out.

Hilti HIT-CT 1 is a component of the Hilti SAFEset concept. Hilti SAFEset is a combination of wall plug system components which significantly improve the robustness of fastenings and dramatically reduce the possibilities of error during installation.

Hilti HIT-CT 1 complies with the requirements of DIBT/AgBB for applications in interior areas.

Hilti HIT-CT 1 complies with the requirements of emission class A+ outlined in the French VOC Directive.



Technical Data

Hilti HIT-CT 1 displays the following characteristics:

- Density: 1.9 g/cm³ /DIN 51757/ for mixing both components
- Compressive strength: 70 N/mm² /ISO 604/
- Elastic modulus (pressure): 1825 N/mm² /ISO 604/
- Performance and technical data as per the /ETA-11/0354/ and /ETA-11/0390/ European Technical Approvals

Shelf life of 9 months:

Container temperature during use:

+5 °C to +40 °C

Substrate temperature during installation:

-5 °C to +40 °C (internal method)

Open time:

-5 to 0 °C	60 min
+1 to +5 °C	40 min
+6 to +10 °C	25 min
+11 to +20 °C	10 min
+21 to +30 °C	4 min
+31 to +40 °C	2 min
(internal method)	

Cure time:

-5 to 0 °C	6 h
+1 to +5 °C	3 h
+6 to +10 °C	2 h
+11 to +20 °C	90 min
+21 to +30 °C	75 min
+31 to +40 °C	60 min
(internal method)	

Hilti HIT-CT 1 is stable in terms of a variety of chemical environmental factors (internal method).

Base materials / Ancillary materials

Hilti HIT-CT 1 is supplied in the form of a dual-component film-wrapped pack comprising a resin component and a curing agent component at a volume ratio of 3:1. The mixing ratio of resin and curing agent components is automatically set during the squeezing process. Product curing commences directly after the components are mixed.

The product reviewed in this EPD contains the following component volumes:

Resin component:

Vinyl ester resin mixture:	30 to 40% by weight
Mineral fillers:	40 to 50% by weight
Cement:	10 to 20% by weight
Other:	< 5% by weight

Curing agent component:

Dibenzoyl peroxide:	< 1% by weight
Water:	15 to 20% by weight
Mineral fillers:	40 to 50% by weight
Other:	< 5% by weight

Thanks to its particular composition, Hilti HIT-CT 1 does not represent a hazardous mixture in accordance with the current legislation on chemicals.

Reference service life

Hilti HIT-CT 1 is exposed to a wide variety of environmental factors during the use phase. The anticipated Reference Service Life depends on the specific installation situation and the exposure associated with the product. The main factors influencing the period of use involve weathering as well as mechanical and chemical loads.

LCA: Calculation rules

Declared Unit

The declared product is Hilti HIT-CT 1 injectable mortar. The declared unit refers to 1 kg reactive resin product in the mixing ratio required for processing both components. The packaging is also included in the calculation. Consumption of the reactive resin mixture depends on the size of the bore holes. The following table depicts the data on the declared unit.

Declared unit

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

System boundary

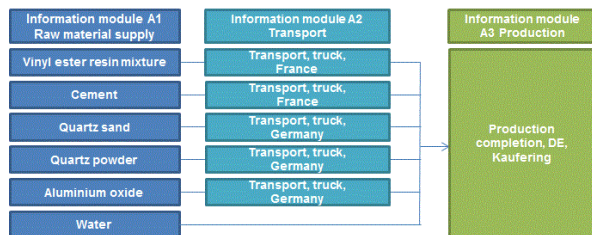
The EPD type is cradle to plant gate. The following information modules are defined in this study as system boundaries:

A1- A3 Product stage:

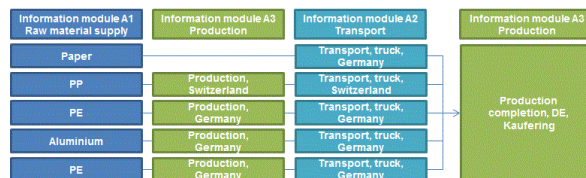
- A1 Raw material supply
- A2 Transport to manufacturer
- A3 Production

A total of three information modules are reviewed in order to obtain an accurate record of the indicators and environmental impact of the declared unit. Information modules A1 to A3 outline the supply of raw materials, transport to the production facility and the actual product production processes. All preliminary products are procured in Europe. Transport is exclusively by truck. Prior to completion of the injectable mortar in Kaufering, certain materials run through the requisite production stages at the supplier's before they are available as preliminary products.

The following process diagrams depict the production process on which this is based.



Process diagram: Reactive resin mixture



Process diagram: Packaging

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.

LCA: Scenarios and additional technical information

LCA: Results

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

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 ¹⁾	Refurbishment ¹⁾	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	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: Hilti HIT-CT1 / 1kg

Parameter	Unit	A1 - A3
Global warming potential	[kg CO ₂ -Eq.]	2.57
Depletion potential of the stratospheric ozone layer	[kg CFC11-Eq.]	2.08E-8
Acidification potential of land and water	[kg SO ₂ -Eq.]	9.26E-3
Eutrophication potential	[kg (PO ₄) ³⁻ -Eq.]	1.39E-3
Formation potential of tropospheric ozone photochemical oxidants	[kg Ethen Eq.]	1.09E-3
Abiotic depletion potential for non fossil resources	[kg Sb Eq.]	4.26E-6
Abiotic depletion potential for fossil resources	[MJ]	47

RESULTS OF THE LCA - RESOURCE USE: Hilti HIT-CT1 / 1kg

Parameter	Unit	A1 - A3
Renewable primary energy as energy carrier	[MJ]	3.518
Renewable primary energy resources as material utilization	[MJ]	0.46
Total use of renewable primary energy resources	[MJ]	3.978
Non renewable primary energy as energy carrier	[MJ]	20.76
Non renewable primary energy as material utilization	[MJ]	26.258
Total use of non renewable primary energy resources	[MJ]	47.018
Use of secondary material	[kg]	0
Use of renewable secondary fuels	[MJ]	0.021
Use of non renewable secondary fuels	[MJ]	0.087
Use of net fresh water	[m³]	-

RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES:

Hilti HIT-CT1 / 1kg

Parameter	Unit	A1 - A3
Hazardous waste disposed	[kg]	-
Non hazardous waste disposed	[kg]	3.13
Radioactive waste disposed	[kg]	9.16E-4
Components for re-use	[kg]	0
Materials for recycling	[kg]	0
Materials for energy recovery	[kg]	0
Exported electrical energy	[MJ]	0
Exported thermal energy	[MJ]	0

All indicators are recorded in accordance with /EN 15804/. The estimated impact of environmental loads is in accordance with /CML 2001, Nov. 2010/.

The Hazardous waste for disposal (HWD) and Net use of fresh water (FW) indicators are not recorded in the background data on account of this information not being available. The decision by the Expert Committee on 07.01.2013 allows for this

References

Institut Bauen und Umwelt

Institut Bauen und Umwelt e.V., Berlin (pub.):
Generation of Environmental Product Declarations (EPDs);

General principles

for the EPD range of Institut Bauen und Umwelt e.V. (IBU), 2013-04
www.bau-umwelt.de

PCR Part A

Institut Bauen und Umwelt e.V., Königswinter (pub.):
Product Category Rules for Construction Products from the range of Environmental Product Declarations of Institut Bauen und Umwelt (IBU), Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Background Report. April 2013
www.bau-umwelt.de

**ISO 14025**

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

EN 15804

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

Product Category Rules, Part B:

Reactive resin products (10.2012)

ISO 14044

DIN EN ISO 14044:2006-10: Environmental management – Life cycle assessment – Requirements and guidelines

GaBi 6.0 software for comprehensive analysis

<http://database-documentation.gabi-software.com>
(08.01.2014)

ecoinvent v. 2.2

<http://www.ecoinvent.org> (08.01.2014)

ELCD II – European Life Cycle Database

<http://eplca.jrc.ec.europa.eu/> (08.01.2014)

CML 2001 Nov. 2010

Environmental impact indicators
<http://cml.leiden.edu/software/data-cmlia.html#downloads>
(08.01.2014)

CEN/TR 15941

CEN/TR 15941:2010-03: Sustainability of construction works – Environmental product declarations – Methodology for selection and use of generic data; German version CEN/TR 15941:2010

French VOC Directive

Décret no 2011-321 du 23 mars 2011 relatif à l'étiquetage des produits de construction ou de revêtement de mur ou de sol et des peintures et vernis sur leurs émissions de polluants volatils

Arrêté du 19 avril 2011 relatif à l'étiquetage des produits de construction ou de revêtement de mur ou de sol et des peintures et vernis sur leurs émissions de polluants volatils

DIN 51757

DIN 51757:2011-01: Testing of mineral oils and related materials – Determination of density

ISO 604

DIN EN ISO 604:2003-12: Determination of compressive properties

ETA-11/0354

European Technical Approval Hilti HIT-CT 1

ETA-11/0390

European Technical Approval Hilti HIT-CT 1

**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@bau-umwelt.com
Web www.bau-umwelt.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@bau-umwelt.com
Web www.bau-umwelt.com

**Author of the Life Cycle Assessment**

FIT Umwelttechnik GmbH
Hofekamp 1
38442 Wolfsburg
Germany

Tel 05362 / 72 69 474
Fax 05362 / 72 69 478
Mail bertram@fit-umwelttechnik.de
Web www.fit-umwelttechnik.de

**Owner of the Declaration**

HILTI Aktiengesellschaft
Feldkircher Strasse 100
9494 Schaan
Liechtenstein

Tel +423 234 2111
Fax +423 234 2965
Mail HAGHSE@hilti.com
Web www.hilti.com