ENVIRONMENTAL PRODUCT DECLARATION

as per *ISO 14025* and *EN 15804+A2*

Owner of the Declaration	Hilti Aktiengesellschaft
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-HIL-20230521-CBB1-EN
Issue date	12.01.2024
Valid to	11.01.2029

Anchor Channel System HAC-(V)(-T)

Hilti Aktiengesellschaft

Institut Bauen und Umwelt e.V.

ECO PLATFORM EPD VERIFIED

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General Information

Hilti Aktiengesellschaft

Programme holder

IBU – Institut Bauen und Umwelt e.V.
Hegelplatz 1
10117 Berlin
Germany

Declaration number

EPD-HIL-20230521-CBB1-EN

This declaration is based on the product category rules:

Thin walled profiles and profiled panels of metal, 01.08.2021
(PCR checked and approved by the SVR)

Issue date

12.01.2024

Valid to

11.01.2029

Dipl.-Ing. Hans Peters
(Chairman of Institut Bauen und Umwelt e.V.)

Florian Pronold
(Managing Director Institut Bauen und Umwelt e.V.)

Anchor Channel System HAC-(V)(-T)

Owner of the declaration

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Feldkircher Strasse 100
9494 Schaan
Liechtenstein

Declared product / declared unit

The declared unit is one running metre of the HILTI HAC-(V)(-T) 30-70 anchor channel system with an appropriate special bolt, shown in the example of the HAC-V 50 anchor channel with a special HBC bolt. Two HBC-C-N bolts in size M16x60 mm are calculated per 350 mm channel section. Other product types are calculated proportional to their weight.

Scope:

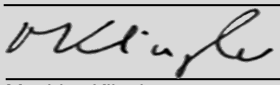
This document relates to the HILTI HAC-(V)(-T) anchor channel system with the associated special HBC bolts. Specific data was collected from HILTI's production facility in Kaufering, Germany for the establishment of the life cycle assessment.

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.

The EPD was created according to the specifications of EN 15804+A2. In the following, the standard will be simplified as *EN 15804*.

Verification

The standard EN 15804 serves as the core PCR
Independent verification of the declaration and data according to ISO 14025:2011
☐ internally ☒ externally



Matthias Klingler,
(Independent verifier)

Product

Product description/Product definition

The HILTI anchor channel system comprises HAC-(V)(-T) anchor channels and the appropriate HBC hook head bolts. The anchor channel is a V-shaped galvanised steel profile with anchors attached to the back of the channel by means of a threaded connection.

The channel profile also has end caps and is filled with LDPE (low density polyethylene) foam with a tear-out strip. These elements protect the channel against the entry of concrete slurry during the casting. The tear-out strip allows for quick, easy and safe removal of the foam body.

The HAC-(V)(-T) 30-70 anchor channels differ in mass in relation to the running metre.

The following anchor channels are covered by this document:
Product name:

- HAC-(V)(-T)30
- HAC-V 35
- HAC-(V) 40
- HAC-(V)(-T)50
- HAC-(V) 60
- HAC-(V)(-T)70

Conversion is done proportionally using the product weight. Hilti anchor channels are products in accordance with the *CPR* with *ETA* harmonised specifications.

Regulation (EU) No. 305/2011(CPR) applies for placing the product on the market in the European Union/European Free Trade Association (EU/EFTA) (with the exception of Switzerland). The product requires a declaration of performance taking into consideration *ETA 11/0006*, 24/10/2022, Hilti anchor channel (HAC) with channel bolts (HBC) and the CE label.

The geometric dimensions, product-specific parameters and load capacities are specified in the European Technical Assessment *ETA 11/0006* dated 24/10/2022.

Some systems are also approved for the transmission of cyclical fatigue loads, seismic impacts and exposure to fire.

The design and use of the systems are governed by the applicable national provisions.

Application

Anchor channels are used to connect aluminium or steel components to concrete structures or to connect two concrete components.
Typical fields of application are element façades (curtain walls), the attachment of installations in lift shafts, connections between prefabricated concrete parts, mountings for installation technology and building services, the attachment of cable trays and lines in tunnels, and others.

For use, anchor channels are positioned in the component before the concreting process and then cast flush with the surface of the concrete.

Once the concrete has cured, (attachment) parts are typically connected to the channel by employing special HBC bolts and then fixed using hexagonal nuts.

The Hilti HAC-(V)(-T) anchor channel systems and special HBC bolts may be loaded with static and quasi-static loads in the pull direction as well as with lateral loads vertical and parallel to the longitudinal direction of the channel. Cyclical fatigue loading, seismic loading and loads under exposure to fire are also approved.

Technical Data

The technical specifications for the system are set out in the European Technical Assessment *ETA 11/0006* dated 24/10/2022.
The geometric dimensions, product-specific parameters, material properties and load capacities can be found in the document.
Hilti HAC(V)(-T) anchor channel systems and special HBC bolts are approved for loading with static and quasi-static loads in the pull direction as well as with lateral loads vertical and parallel to the longitudinal direction of the channel. Cyclical fatigue loading, seismic loading and loads under exposure to fire are also approved.

The sizing and use of the systems are governed by the applicable national provisions.

Bautechnische Daten

HAC-V 50 technical specifications

Name	Value	Unit
Width of the profile	41,9	mm
Height of the profile	31	mm
Thickness of the profile	2.75	mm
Minimum anchoring depth h(ef), min	106	mm
Minimum edge distance c(min) for the anchor channel	50	mm

Hilti HAC-(-V)(-T) anchor channel systems are products in accordance with the European Construction Products Regulations (CPR) (EU) No. 305/2011 with European Technical Assessment (ETA).

The performance data for the system is set out in the *ETA 11/0006*, 24/10/2022, Hilti anchor channel (HAC) with channel bolts (HBC). Based on the ETA, the performance data for the system in relation to its essential characteristics is also set out in the declaration of performance (DoP).

Base materials/Ancillary materials

The Hilti HAC(-V)(-T) anchor channel system is a product which is predominantly made from steel. The percentage by mass of steel is 98.5%.
The proportion of the remaining systems components made from plastic is < 1% of the mass in each case.
The RoHS Directive for electronic products does not apply for this mechanical system.

Reference service life

The expected service life for the Hilti HAV-(V)(-T) anchor channel system is at least 50 years.

The individual components of the Hilti HAC-(V)(-T) anchor channel system are procured promptly up to max. 3 months before production of the system from various suppliers qualified and commissioned by Hilti for production.
The production of the channels is done within one day at the Hilti manufacturing plant 6 in Germany.

After production, the channels and associated special bolts are stored at a central warehouse in Germany for an average of approx. 2 months.

The parts are then transported and delivered to the appropriate construction site, where they are generally installed promptly within a few days. The Hilti HAC-(V)(-T) anchor channel is already prepared for use with the special HBC bolts on the construction site. To this end, the filling foam is removed from the channel with the help of the tear-out strip and disposed of.

In the course of the ETA, the technical performance data for the system was evaluated for an expected service life of at least 50 years (ref. *ETA-11/0006* dated 24/10/2022, Part 2). However, this expected service life cannot be interpreted as a promise or a guarantee. The actual practical service life is based on the usage conditions as well as the associated assumptions concerning environmental factors and loads on the system, must be assessed on a case by case basis by authorised engineers, and may therefore differ significantly from the expected service life.

At the end of the service life of the actual structure in which the system is used, the building is generally demolished and the individual materials are professionally separated and sent for recycling in accordance with the state of the art.

LCA: Calculation rules

Declared Unit

The declared unit in this EPD is one metre of anchor channel with an appropriate number of special HBC bolts.
An HAC-V 50 with a length of 350 mm with two special M16 HBC bolts, which number among the most commonly used types in typical use, serves as a reference. The weight of the reference system was projected for one running meter.

Deklarierte Einheit und Massebezug

Name	Value	Unit
Declared unit	1	rm
linear density	3.77	kg/m

Other products and product types declared in this EPD are calculated and scaled per running metre in accordance with their weight ratio.

System boundary

Type of EPD: cradle to factory gate with options. The following information modules are defined as system boundaries in this study:

Production stage (A1–A3):
A1, raw material extraction,
A2, transport to the manufacturer,
A3, production.

End of life (C1–C4):
C1, dismantling/demolition, C2, transport,
C3, waste treatment, C4, disposal.

Potential for re-use, recovery and recycling (D)

All 8 information modules are considered in order to precisely gauge the parameters and environmental impacts of the declared unit. Information modules A1 to A3 describe the provision of materials, transport to the production facility, and the production process for the product itself.

The primary products are obtained from the European Union and Asia. Transport is done by lorry and ship. The following flow diagrams illustrate the underlying production process here.

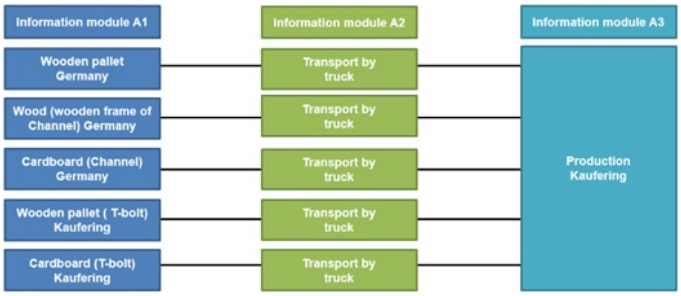


Illustration:Information modules A1 to A3 for the product

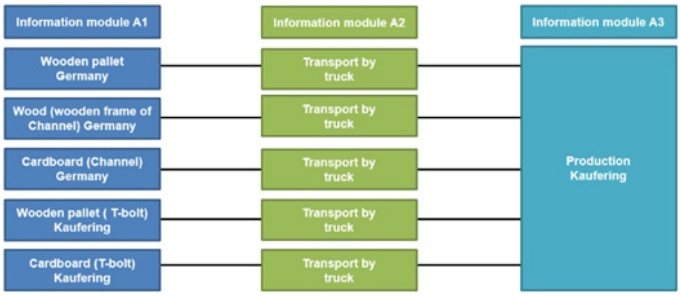


Illustration:Information modules A1 to A3 for the packaging
Dismantling or demolition from the building, transport for waste disposal, waste treatment and disposal of the product are covered in information modules C1 to C4. In addition, potential for re-use, recovery and recycling are set out in information module D.

Geographic Representativeness

Land or region, in which the declared product system is manufactured, used or handled at the end of the product´s lifespan: Germany

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.
In principle, comparison or assessment of EPD data is only possible if all data sets to be compared have been established in accordance with EN 15804 and the building context and the product-specific performance characteristics are taken into consideration. The Hilti HAC-V anchor channel system is available in a variety of combinations of dimensions, special bolts and their quantities.

The declared unit on which this EPD is based is one running metre of a representative product combination which is considered to be rather above average when it comes to its use of materials (and resource consumption).
Conversion for other combinations can therefore be done using the conversion factors for various channel types in conjunction with the running metre factor and will represent their environmental impacts as being somewhat higher (conservative) here than in reality.

LCA: Scenarios and additional technical information

Characteristic product properties of biogenic carbon

No renewable raw materials are used for the product. The biogenic carbon is therefore stated to be zero.

Information describing the biogenic carbon content at the factory gate

Name	Value	Unit
Biogenic carbon content in product	-	kg C
Biogenic carbon content in accompanying packaging	0.1725	kg C

End of life (C1–C4)

The product is disassembled with an electric screwdriver. The electrical energy consumption of the tool is expected to be 0.6 MJ for the specified unit. The power consumption is calculated with a European electricity mix.
The construction waste is transported 50 km by lorry to the waste treatment plant. The plastic content in the product is thermally processed, the steel content is recycled.

Name	Value	Unit
Collected as mixed construction waste	3.733	kg
Recycling	3.604	kg
Energy recovery	0.016	kg

A collection rate of 85% is assumed.

Potential for re-use, recovery and recycling (D), relevant scenario information

Name	Value	Unit
Steel recycling	3,604	kg

LCA: Results

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; ND = MODULE OR INDICATOR 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	X	X	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 lfm HAC-V 50

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
Global Warming Potential total (GWP-total)	kg CO_2 eq	1.17E+01	7.03E-02	2.26E-02	6.13E-02	0	-7.72E+00
Global Warming Potential fossil fuels (GWP-fossil)	kg CO_2 eq	1.17E+01	7.03E-02	2.24E-02	6.12E-02	0	-7.75E+00
Global Warming Potential biogenic (GWP-biogenic)	kg CO_2 eq	2.16E-03	3.5E-05	0	0	0	3.45E-02
Global Warming Potential luluc (GWP-luluc)	kg CO_2 eq	4.24E-03	6.43E-06	2.05E-04	7.19E-05	0	-1.94E-03
Depletion potential of the stratospheric ozone layer (ODP)	kg CFC11 eq	1.05E-11	6.91E-13	1.93E-15	1.84E-14	0	-5.15E-12
Acidification potential of land and water (AP)	mol H^+ eq	4.79E-02	1.07E-04	2.66E-05	5.49E-05	0	-1.82E-02
Eutrophication potential aquatic freshwater (EP-freshwater)	kg P eq	6.9E-06	6.95E-08	8.06E-08	3.31E-08	0	-4.21E-06
Eutrophication potential aquatic marine (EP-marine)	kg N eq	9.94E-03	3.02E-05	9.02E-06	2.39E-05	0	-4.03E-03
Eutrophication potential terrestrial (EP-terrestrial)	mol N eq	1.07E-01	3.19E-04	1.09E-04	2.77E-04	0	-4.24E-02
Formation potential of tropospheric ozone photochemical oxidants (POCP)	kg NMVOC eq	3.2E-02	8.34E-05	2.28E-05	6.52E-05	0	-1.41E-02
Abiotic depletion potential for non fossil resources (ADPE)	kg Sb eq	3.2E-05	3.4E-09	1.43E-09	1.02E-08	0	-2.51E-05
Abiotic depletion potential for fossil resources (ADPF)	MJ	1.29E+02	1.54E+00	3E-01	1.94E-01	0	-7.96E+01
Water use (WDP)	m^3 world eq deprived	1.46E+00	5.91E-03	2.55E-04	6.62E-03	0	-1.07E+00

RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1 lfm HAC-V 50

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
Renewable primary energy as energy carrier (PERE)	MJ	1.09E+01	2.12E-01	2.13E-02	1.9E-02	0	-5.85E+00
Renewable primary energy resources as material utilization (PERM)	MJ	5.96E+00	0	0	0	0	0
Total use of renewable primary energy resources (PERT)	MJ	1.68E+01	2.12E-01	2.13E-02	1.9E-02	0	-5.85E+00
Non renewable primary energy as energy carrier (PENRE)	MJ	1.27E+02	1.54E+00	3.01E-01	9.05E-01	0	-7.98E+01
Non renewable primary energy as material utilization (PENRM)	MJ	2.52E+00	0	0	-7.1E-01	0	0
Total use of non renewable primary energy resources (PENRT)	MJ	1.29E+02	1.54E+00	3.01E-01	1.95E-01	0	-7.98E+01
Use of secondary material (SM)	kg	3.4E-03	0	0	0	0	3.06E+00
Use of renewable secondary fuels (RSF)	MJ	0	0	0	0	0	0
Use of non renewable secondary fuels (NRSF)	MJ	0	0	0	0	0	0
Use of net fresh water (FW)	m^3	5.42E-02	3.54E-04	2.34E-05	1.65E-04	0	-3.97E-02

RESULTS OF THE LCA – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2: 1 lfm HAC-V 50

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
Hazardous waste disposed (HWD)	kg	3.89E-07	8.95E-11	1.11E-12	-3.5E-13	0	-3E-07
Non hazardous waste disposed (NHWD)	kg	1.59E-01	3.4E-04	4.34E-05	2.54E-04	0	-1.02E-01
Radioactive waste disposed (RWD)	kg	1.19E-03	2.41E-04	3.89E-07	2.9E-06	0	-1.56E-04
Components for re-use (CRU)	kg	0	0	0	0	0	0
Materials for recycling (MFR)	kg	0	0	0	0	0	0
Materials for energy recovery (MER)	kg	0	0	0	0	0	0
Exported electrical energy (EEE)	MJ	0	0	0	1.1E-01	0	0
Exported thermal energy (EET)	MJ	0	0	0	1.96E-01	0	0

RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional: 1 lfm HAC-V 50

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
Incidence of disease due to PM emissions (PM)	Disease incidence	ND	ND	ND	ND	ND	ND
Human exposure efficiency relative to U235 (IR)	kBq U235 eq	ND	ND	ND	ND	ND	ND
Comparative toxic unit for ecosystems (ETP-fw)	CTUe	ND	ND	ND	ND	ND	ND
Comparative toxic unit for humans (carcinogenic) (HTP-c)	CTUh	ND	ND	ND	ND	ND	ND
Comparative toxic unit for humans (noncarcinogenic) (HTP-nc)	CTUh	ND	ND	ND	ND	ND	ND

Soil quality index (SQP)	SQP	ND	ND	ND	ND	ND	ND

Disclaimer 1 – for the indicator “Potential Human exposure efficiency relative to U235”. This impact category deals mainly with the eventual impact of low-dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure or radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, radon and from some construction materials is also not measured by this indicator.

Disclaimer 2 – for the indicators “abiotic depletion potential for non-fossil resources”, “abiotic depletion potential for fossil resources”, “water (user) deprivation potential, deprivation-weighted water consumption”, “potential comparative toxic unit for ecosystems”, “potential comparative toxic unit for humans – cancerogenic”, “Potential comparative toxic unit for humans - not cancerogenic”, “potential soil quality index”. The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high as there is limited experience with the indicator.

References

EU Regulation No. 305/2011 (CPR)
Official Journal of the European Union, 04/04/2011: Regulation (EU) No. 305/2011 of the European Parliament and of the Council of 9 March 2011 laying down standardised conditions for the marketing of construction products and repealing Council Directive 89/106/EEC, https://eur-lex.europa.eu/legal- content/DE/TXT/PDF/?uri=CELEX:32011R0305&from=DE, accessed 22/06/2023

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

EN 15804
EN 15804:2019-04+A2+AC:2021, Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products.

EN 1993-1-3
DIN EN 1993-1-3:2010-12, Design of steel structures – Part 1–3: General rules – Supplementary rules for cold-formed members and sheeting

ETA 11/0006
European Technical Assessment *ETA-11/0006* dated 24/10/2022 'Hilti anchor channel (HAC) with special bolt (HBC)'

IBU 2021
General guidance for the Institut Bauen und Umwelt e.V. EPD programme, version 2.0, Berlin: Institut Bauen und Umwelt e.V., 2021
www.ibu-epd.com

ISO 14001
DIN EN ISO 14001:2009-11, Environmental management systems – Requirements with guidance for use (ISO 14001:2004
+ Cor. 1:2009)

ISO 50001
DIN EN ISO 50001:2011-12, Environmental management systems – Requirements with guidance for use (ISO 50001:2011)

PCR part A
Product category rules for building-related products and services – part A: Calculation rules for the life cycle assessment and requirements for the background report V1.3, Institut Bauen und Umwelt e.V., 08/2022.

PCR: Thin-walled profiles and profiled panels made from metal
Product category rules for building-related products and services – part B: Requirements for the EDP for thin-walled profiles and profiled panels made from metal, version 1.6. 2017-11, Institut für Bauen und Umwelt e.V., 01/08/2021

ROHS Directive
Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (recast)
www.eur-lex.europa.eu

Sphera
LCA for Experts: Software und Datenbank zur Ganzheitlichen Bilanzierung (Software and Database for Integrated Life Cycle Assessment)
Leinfelden-Echterdingen; Sphera Solution GmbH (Hrsg.)
http://www.gabi-software.com/deutsch/index/

(18/07/2023)
The literature referred to in the Environmental Product Declaration must be listed in full.Standards already fully quoted in the EPD do not need to be listed here again.
The current version of PCR Part A and PCR Part B of the PCR document on which they are based must be referenced.

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