

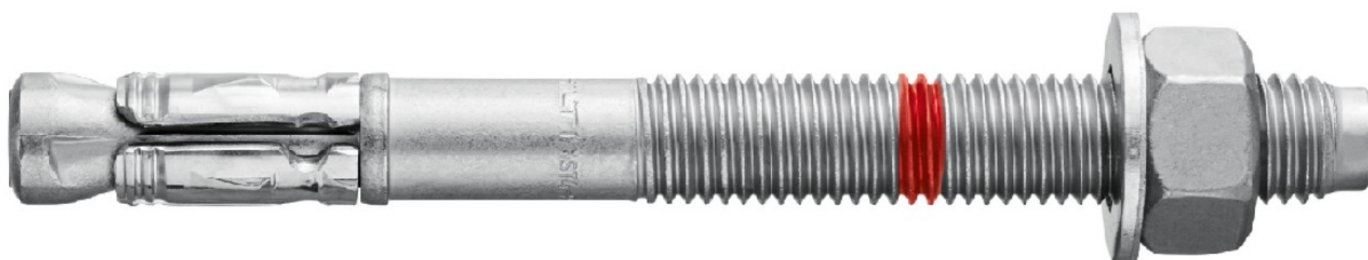
ENVIRONMENTAL PRODUCT DECLARATION

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-20240046-CBA1-EN
Issue date	04.06.2024
Valid to	03.06.2029

HST4 Wedge anchor
HILTI AG

www.ibu-epd.com | <https://epd-online.com>



General Information

HILTI AG

Programme holder

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

Declaration number

EPD-HIL-20240046-CBA1-EN

This declaration is based on the product category rules:

Screws, 01.06.2023
(PCR checked and approved by the SVR)

Issue date

04.06.2024

Valid to

03.06.2029

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

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

HST4 Wedge anchor

Owner of the declaration

Hilti Aktiengesellschaft
Feldkircher Strasse 100
9494 Schaan
Liechtenstein

Declared product / declared unit

HST4 / 1kg

Scope:

The document relates to the carbon steel HST4 portfolio as a leading Hilti wedge anchor product group. The HST4 wedge anchors portfolio consists of a diameter range from M8 - M20 and a standard length portfolio of 50mm-260mm. The declared product for this specific EPD is the HST4 M10x90, which represents one of the most commonly used and produced items in the carbon steel portfolio.

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
<input type="checkbox"/> internally <input checked="" type="checkbox"/> externally

Matthias Klingler,
(Independent verifier)



Product

Product description/Product definition

HST4 is a performance concrete wedge expansion anchor used to resist static and seismic structural loads in the construction industry (residential, industrial, infrastructure, etc.). The HST4 carbon steel variant of the HST4 family is described further in this report.

For the placing of the product on the market in the European Union European Free Trade Association EU/EFTA (with the exception of Switzerland) Regulation (EU) No. 305/2011 (CPR) applies. The product needs a declaration of performance taking into consideration the following European Technical Approval ETA-21/0878 assessed based on EAD 330232-01-0601-v03 'Mechanical fasteners with variable embedment depth for use in concrete'. For the application and use the respective national provisions apply

The Hilti HST4 anchor is a torque-controlled expansion anchor made of carbon steel which is installed into a drilled hole and anchored by torque-controlled expansion

Markit item number	Product name (Specification, including size)	Number of items per sales pack	Packaging Materials			Total weight [kg]	specific weight without packaging [kg/pc]	specific weight with packaging [kg/pc]
			Component A					
			Name	Weight [kg]	Material			
2328937	HST4 M8x5 5	100	Sales box	0.081	Cardboard	2.2814	0.0220	0.0228
2328938	HST4 M8x5 5-20	100	Sales box	0.081	Cardboard	2.7314	0.0295	0.0273
2328939	HST4 M8x75 5-30	100	Sales box	0.081	Cardboard	3.0314	0.0295	0.0303
2329050	HST4 M8x5 5-50	100	Sales box	0.081	Cardboard	3.6314	0.0355	0.0363
2329051	HST4 M8x115 5-70	100	Sales box	0.081	Cardboard	4.2414	0.0416	0.0424
2329053	HST4 M8x70 5-30 BW	100	Sales box	0.081	Cardboard	3.4774	0.0340	0.0348
2329052	HST4 M10x50 5-10	72	Sales box	0.081	Cardboard	3.2645	0.0442	0.0453
2329053	HST4 M10x70 5-20	72	Sales box	0.081	Cardboard	3.6029	0.0489	0.0500
2329054	HST4 M10x80 5-30	72	Sales box	0.081	Cardboard	3.9420	0.0536	0.0548
2329055	HST4 M10x90 5-40	72	Sales box	0.081	Cardboard	4.2804	0.0583	0.0595
2329056	HST4 M10x100 5-50	60	Sales box	0.081	Cardboard	3.8632	0.0630	0.0644
2329057	HST4 M10x110 5-60	60	Sales box	0.081	Cardboard	4.1452	0.0677	0.0691
2329058	HST4 M10x130 5-80	40	Sales box	0.081	Cardboard	3.1670	0.0771	0.0792
2329059	HST4 M10x160 5-110	40	Sales box	0.081	Cardboard	3.7314	0.0913	0.0933
2329060	HST4 M10x180 5-130	40	Sales box	0.081	Cardboard	4.1078	0.1007	0.1027
2329064	HST4 M10x100 5-50 BW	40	Sales box	0.081	Cardboard	2.9642	0.0721	0.0741
2329088	HST4 M10x90 5-40 DN	50	Sales box	0.086	Cardboard	3.9060	0.0764	0.0781
2329089	HST4 M10x100 5-50 DN	50	Sales box	0.086	Cardboard	4.1415	0.0811	0.0828
2329128	HST4-R M10x100 5-50 BW	40	Sales box	0.081	Cardboard	3.0086	0.0732	0.0752
2329061	HST4 M12x75 5-10	40	Sales box	0.081	Cardboard	3.0350	0.0738	0.0759
2329062	HST4 M12x85 5-20	40	Sales box	0.081	Cardboard	3.3310	0.0812	0.0833
2402937	HST4 M12x95 5-30	40	Sales box	0.081	Cardboard	3.6110	0.0892	0.0903
2329063	HST4 M12x105 5-40	40	Sales box	0.081	Cardboard	3.8910	0.0952	0.0973
2329064	HST4 M12x115 5-50	40	Sales box	0.081	Cardboard	4.1670	0.1021	0.1042
2329065	HST4 M12x125 5-60	32	Sales box	0.081	Cardboard	3.5707	0.1090	0.1116
2329066	HST4 M12x135 5-70	32	Sales box	0.081	Cardboard	3.7915	0.1159	0.1185
2329067	HST4 M12x145 5-80	20	Sales box	0.081	Cardboard	4.0123	0.1228	0.1254
2329068	HST4 M12x165 5-100	20	Sales box	0.081	Cardboard	2.8142	0.1366	0.1407
2329069	HST4 M12x180 5-115	20	Sales box	0.081	Cardboard	3.0302	0.1474	0.1515
2329070	HST4 M12x200 5-135	20	Sales box	0.081	Cardboard	3.2842	0.1601	0.1642
2329071	HST4 M12x260 35-195	20	Sales box	0.106	Cardboard	4.1504	0.2022	0.2075
2329085	HST4 M12x115 5-50 BW	20	Sales box	0.081	Cardboard	2.4194	0.1169	0.1210
2329090	HST4 M12x105 5-40 DN	25	Sales box	0.086	Cardboard	2.9788	0.1157	0.1192
2329091	HST4 M12x115 5-50 DN	25	Sales box	0.086	Cardboard	3.1513	0.1226	0.1261
2329072	HST4 M16x115 5-15	20	Sales box	0.081	Cardboard	3.8454	0.1892	0.1923
2329073	HST4 M16x125 5-25	20	Sales box	0.081	Cardboard	4.1074	0.2013	0.2054
2329074	HST4 M16x135 5-35	20	Sales box	0.081	Cardboard	4.3654	0.2142	0.2183
2329075	HST4 M16x145 5-45	20	Sales box	0.081	Cardboard	4.6314	0.2275	0.2316
2329076	HST4 M16x170 5-70	12	Sales box	0.081	Cardboard	3.1954	0.2595	0.2663
2329077	HST4 M16x190 5-90	12	Sales box	0.081	Cardboard	3.4978	0.2847	0.2915
2329078	HST4 M16x220 5-120	12	Sales box	0.106	Cardboard	3.9876	0.3235	0.3323
2329079	HST4 M16x260 5-160	12	Sales box	0.106	Cardboard	4.6080	0.3752	0.3840
2329086	HST4 M16x145 5-45 BW	12	Sales box	0.081	Cardboard	3.1280	0.2539	0.2607
2329080	HST4 M20x170 5-30	5	Sales box	0.061	Cardboard	2.1163	0.4111	0.4233
2329081	HST4 M20x200 5-60	5	Sales box	0.061	Cardboard	2.3713	0.4621	0.4743
2329082	HST4 M20x260 60-120	5	Sales box	0.094	Cardboard	2.9143	0.5641	0.5829

LCA: Calculation rules

Declared Unit

The declared product is the HST4 M10x90 5-40 from HILTI AG. The declared unit refers to 1 kg of bolt anchor. Packaging is also included in the calculation, as Hilti sells the product with packaging. The declared unit is stated in [kg].

Declared unit and mass reference

Name	Value	Unit
Declared unit	1	kg
Gross density	7850	kg/m ³

System boundary

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

Application

The core use of the product is in various construction sites including but not limited to commercial, residential, industrial and infrastructure. The main applications for the HST4 wedge anchor is in the structural connection of baseplates to concrete base materials, in instances like Structural Steel members, Handrails and Balustrades, Façade connections and MEP/services connections.

Technical Data

Performance data of the product in accordance with the declaration of performance with respect to its essential characteristics according to *ETA-21/0878* and the relevant product technical data sheets.

Base materials/Ancillary materials

Designation	Material
HST4	
Expansion sleeve	M8-M20: carbon steel, galvanized, ≥5µm or stainless steel according to EN 10088-1:2014
Bolt	Carbon steel, galvanized, ≥5µm, cone coated (transparent), Rupture elongation (l ₀ = 5d) > 8 %
Washer	Carbon steel, galvanized, ≥5µm
Hexagon nut	Carbon steel, galvanized, ≥5µm, coated (transparent)
Dome nut	

Reference service life

The lifetime of the HST4 mechanical fastener is defined by the *EAD 330232-01-0601-v03* and described in the *ETA-21/0878* as referenced further.

The provisions made in this European technical assessment are based on an assumed working life of the anchor of 50 years. The indications given on the working life cannot be interpreted as a guarantee given by the producer but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

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.

Reuse, recovery and recycling potential (D)

In order to accurately record the indicators and environmental impacts of the declared unit, a total of 8 information modules are considered. The information modules A1 to A3 describe the provision of materials, transport to the production site and the production processes of the product itself.

The primary products are sourced from the European Union. Transport is by lorry. The following flow charts illustrate the underlying production process.

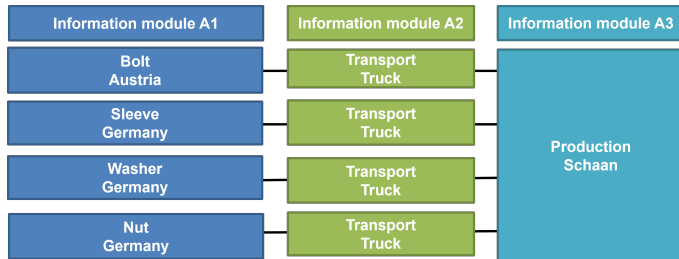


Figure Information modules A 1 to A3 of the product

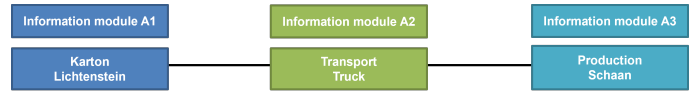


Figure Information modules A 1 to A3 of the packaging

Information modules C1 to C4 record the dismantling or demolition of the building, transport for waste disposal, waste treatment and disposal of the product. Furthermore, reuse, recovery and recycling potentials are shown 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: EU-27 Member States

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 database referred to in this study is *LCA for Experts* by Sphera.

LCA: Scenarios and additional technical information

Characteristic product properties of biogenic carbon

The declared product does not contain any biogenic Carbon.

Information on describing the biogenic carbon content at factory gate

Name	Value	Unit
Biogenic carbon content in accompanying packaging	0.0028	kg C

Note: 1 kg of biogenic carbon is equivalent to 44/12 kg of CO₂

End of life (C1-C4)

The demolition of the bolt anchor from the building is calculated in information module C1. The demolition is carried out using an electric chisel. The electrical energy consumption for the tool is assumed to be 0.5 MJ for the declared unit. The electricity consumption is calculated using a European electricity mix.

Name	Value	Unit
Collected separately waste type waste type	1	kg
Recycling	0.85	kg
Landfilling	0.15	kg

Reuse, recovery and/or recycling potentials (D), relevant scenario information

In Module D, a recycling rate of 85% is assumed (world steel association).

Name	Value	Unit
Recycling	0,85	kg

LCA: Results

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = 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 kg

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
Global Warming Potential total (GWP-total)	kg CO ₂ eq	2.77E+00	5.86E-02	3.73E-03	2.58E-03	2.2E-03	-1.7E+00
Global Warming Potential fossil fuels (GWP-fossil)	kg CO ₂ eq	2.77E+00	5.86E-02	3.7E-03	2.56E-03	2.19E-03	-1.7E+00
Global Warming Potential biogenic (GWP-biogenic)	kg CO ₂ eq	0	0	0	0	0	0
Global Warming Potential luluc (GWP-luluc)	kg CO ₂ eq	1.33E-03	5.36E-06	3.39E-05	1.92E-05	6.79E-06	-6.31E-04
Depletion potential of the stratospheric ozone layer (ODP)	kg CFC11 eq	3.42E-12	5.76E-13	3.2E-16	4.28E-15	5.56E-15	-1.08E-12
Acidification potential of land and water (AP)	mol H ⁺ eq	5.63E-03	8.92E-05	4.03E-06	1.34E-05	1.55E-05	-3.9E-03
Eutrophication potential aquatic freshwater (EP-freshwater)	kg P eq	1.99E-06	5.79E-08	1.33E-08	8.71E-09	4.4E-09	-1.28E-06
Eutrophication potential aquatic marine (EP-marine)	kg N eq	1.45E-03	2.52E-05	1.36E-06	6.13E-06	4.01E-06	-9.58E-04
Eutrophication potential terrestrial (EP-terrestrial)	mol N eq	1.58E-02	2.66E-04	1.61E-05	6.77E-05	4.41E-05	-1.03E-02
Formation potential of tropospheric ozone photochemical oxidants (POCP)	kg NMVOC eq	4.78E-03	6.95E-05	3.5E-06	1.66E-05	1.21E-05	-3.26E-03
Abiotic depletion potential for non fossil resources (ADPE)	kg Sb eq	9.72E-08	2.84E-09	2.36E-10	2.74E-09	1.01E-10	-6.59E-08
Abiotic depletion potential for fossil resources (ADPF)	MJ	2.93E+01	1.29E+00	4.97E-02	5.04E-02	2.91E-02	-1.43E+01
Water use (WDP)	m ³ world eq deprived	3.6E-02	4.92E-03	4.21E-05	4.98E-04	2.4E-04	-2.19E-02

RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1 kg

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
Renewable primary energy as energy carrier (PERE)	MJ	1.51E+00	1.76E-01	3.52E-03	4.68E-03	4.74E-03	-8.12E-01
Renewable primary energy resources as material utilization (PERM)	MJ	2.9E-01	0	0	0	0	0
Total use of renewable primary energy resources (PERT)	MJ	1.8E+00	1.76E-01	3.52E-03	4.68E-03	4.74E-03	-8.12E-01
Non renewable primary energy as energy carrier (PENRE)	MJ	2.94E+01	1.29E+00	4.99E-02	5.05E-02	2.91E-02	-1.44E+01
Non renewable primary energy as material utilization (PENRM)	MJ	0	0	0	0	0	0
Total use of non renewable primary energy resources (PENRT)	MJ	2.94E+01	1.29E+00	4.99E-02	5.05E-02	2.91E-02	-1.44E+01
Use of secondary material (SM)	kg	0	0	0	0	0	0
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	4.62E-03	2.95E-04	3.88E-06	1.44E-05	7.35E-06	-1.96E-03

RESULTS OF THE LCA - WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2:

1 kg

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
Hazardous waste disposed (HWD)	kg	9.8E-10	7.46E-11	1.84E-13	1.31E-13	6.34E-13	3.58E-10
Non hazardous waste disposed (NHWD)	kg	2.91E-02	2.84E-04	7.18E-06	1.33E-05	1.46E-01	-2.12E-02
Radioactive waste disposed (RWD)	kg	1.45E-03	2.01E-04	6.45E-08	6.77E-07	3.31E-07	-8.09E-05
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	0	0	0
Exported thermal energy (EET)	MJ	0	0	0	0	0	0

RESULTS OF THE LCA - additional impact categories according to EN 15804+A2-optional:

1 kg

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
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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

EN 15804

EN 15804:2012+A2:2019+AC:2021, Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products.

ISO 14025

EN ISO 14025:2011, Environmental labels and declarations — Type III environmental declarations — Principles and procedures.

IBU 2021

General Instructions for the EPD programme of Institut Bauen und Umwelt e.V. Version 2.0, Berlin: Institut Bauen und Umwelt e.V., 2021 www.ibu-epd.de

Produktkategorienregeln Bauprodukte Teil A

Produktkategorienregeln für Bauprodukte und Dienstleistungen - Rechenregeln für die Ökobilanz und Anforderungen an den Hintergrundbericht V1.3, Institut Bauen und Umwelt e.V., 08.2022.

Produktkategorienregeln Teil B

Screws, 01.06.2023

Sphera

LCA for Experts: Ganzheitliche Bilanzierung Leinfelden-Echterdingen; Sphera Solution GmbH (Hrsg.) www.gabi-software.com/deutsch/index/ (07.11.2023)

EAD330232-01-0601-v03

European Assessment Document - Mechanical fasteners for use in concrete

EN 10088-1:2014

stainless steels - part 1: list of stainless steels

ETA-21/0878

European Technical Assessment - Hilti HST4



Publisher

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