epddanmark

ECO PLATFORM EPD VERIFIED

Owner: Kvadrat A/S
No.: MD-24124-EN
Issued: 18-12-2024
Valid to: 18-12-2029

3rd PARTY **VERIFIED**

EPD

VERIFIED ENVIRONMENTAL PRODUCT DECLARATION | **ISO 14025 & EN 15804**

Owner of declaration
Kvadrat A/S
Lundbergsvej 10
8400 Ebeltoft, Denmark
CVR: 45 99 85 17

Programme
EPD Danmark
www.epddanmark.dk

☐ Industry EPD
☒ Product EPD

Declared product(s)
Haku

Number of declared datasets/product variations: 1

Production site

Anhui, CHINA

Use of Guarantees of Origin
☐ No certificates used
☒ Electricity covered by GoO
☐ Biogas covered by GoO

Declared/ functional unit
1 kg non-woven textile

Year of production site data (A3)
2023

EPD version
First version

Issued: 18-12-2024
Valid to: 18-12-2029

Basis of calculation
This EPD is developed and verified in accordance with the European standard EN 15804+A2.

Comparability
EPDs of construction products may not be comparable if they do not comply with the requirements in EN 15804. EPD data may not be comparable if the datasets used are not developed in accordance with EN 15804 and if the background systems are not based on the same database.

Validity
This EPD has been verified in accordance with ISO 14025 and is valid for 5 years from the date of issue.

Use
The intended use of an EPD is to communicate scientifically based environmental information for construction products, for the purpose of assessing the environmental performance of buildings.

EPD type
☒Cradle-to-gate with modules C1-C4 and D
☐Cradle-to-gate with options, modules C1-C4 and D
☐Cradle-to-grave and module D
☐Cradle-to-gate
☐Cradle-to-gate with options

CEN standard EN 15804 serves as the core PCR

Independent verification of the declaration and data, according to EN ISO 14025

☐ internal ☒ external

Third party verifier:

Stefan Emil Danielsson

Martha Katrine Sørensen
EPD Danmark

Life cycle stages and modules (MND = module not declared)																
Product			Construction process		Use							End of life				Beyond the system boundary
Raw material supply	Transport	Manufacturing	Transport	Installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Re-use, recovery and 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	X	X	X	X	X

Product information

Product description

The main product components of the declared textile are shown in the table below.

Material	Weight-% of declared product
Silicone	4,5%
Polyester	55,0%
Polyurethane	38,5-39,8%
Pigments	0,7%-1,96%
Total	**100%**

Haku is a coated non-woven textile consisting of 4 layers: one layer of polyester textile at the bottom, several layers of polyurethane, and a silicone layer on top.

The term non-woven refers to the production method of Haku. Unlike other textiles, Haku is not woven from fibers but is made by layering and coating materials on top of each other. Thus, Haku consists of four coated layers rather than woven fibers.

As visible in the product pictures, Haku is available in various colors. To achieve these colors, approx. 28 different pigments in varying concentrations are used. These pigments are added to the polyurethane during its production process. As the pigments are added in low concentrations, their influence on the result was so small that no separate datasets needed to be declared, but the results for all the pigments were grouped in accordance with EPD Danmark's program instructions.

Product packaging:

The composition of the sales- and transport packaging of the product is shown in the table below.

Material	Weight of packaging material (g)	Weight-% of packaging
Cardboard	80,5	69,4%
Plastic	8,2	7,1%
Wooden pallet	27,3	23,6%
Total	**116,1**	**100%**

Representativity

This declaration, including data collection and the modeled foreground system including results, represents the production of 1 kg Haku at the production site located in Hefei, Anhui, China. Product specific data are based on average values collected in the period of 2023. Background data are based on the LCA for experts 2024.2 database and Ecoinvent v.3.9.1 and are less than 10 years old. Generally, the used background datasets are of high quality, and the majority of the datasets are only a couple of years old.

Hazardous substances

Haku does not contain substances listed on the "Candidate List of Substances of Very High Concern for authorisation"

(http://echa.europa.eu/candidate-list-table)

Product(s) use

Haku is used in buildings as an upholstery in furniture for high traffic areas.

Essential characteristics

Haku is covered by harmonised technical specifications EN1021-1, EN1021-2, EN ISO 12945, EN ISO 12947 and EN ISO 810. Declaration of performance according to EU regulation 305/2011 is available for all declared product variations. Further technical information can be obtained by contacting the manufacturer or on the manufacturers website: https://www.kvadrat.dk

Reference Service Life (RSL)

Kvadrat offers 10 years guarantee for the majority of its textile products. The actual service life of Kvadrat textile depends on a wide range of various impact factors such as the allocation of the application area to the use class, maintenance, intensity of use and functional purpose. Most often Kvadrat textiles are applied for building and transportation related purposes. Therefore, technical service life cannot be defined for Kvadrat textiles. Kvadrat product specific textile warranty are disclosed in the Technical Specifications of each product.

Picture of product(s)

LCA background

Declared unit

The LCI and LCIA results in this EPD relates to the declared unit of Haku listed in the table below, with an indication of average density and a conversion factor from m to kg and m^2 to kg.

Name	Value	Unit
Declared unit	1	kg
Area Density	0,56	kg/m^2
Conversion factor from 1 m^2 to 1 kg.	1,8	-
Density per running meter	0,85	kg/m
Conversion factor from 1 m to 1 kg.	1,18	-

Functional unit

Not defined

PCR

This EPD is developed according to the core rules for the product category of construction products in EN15804:2012+A2:2019. No PCR was applied.

Energy modelling principles

Foreground system:

The product is produced using electricity covered by Guarantees of Origin in production. Remaining electricity processes are modelled using the Chinese residual grid mix.

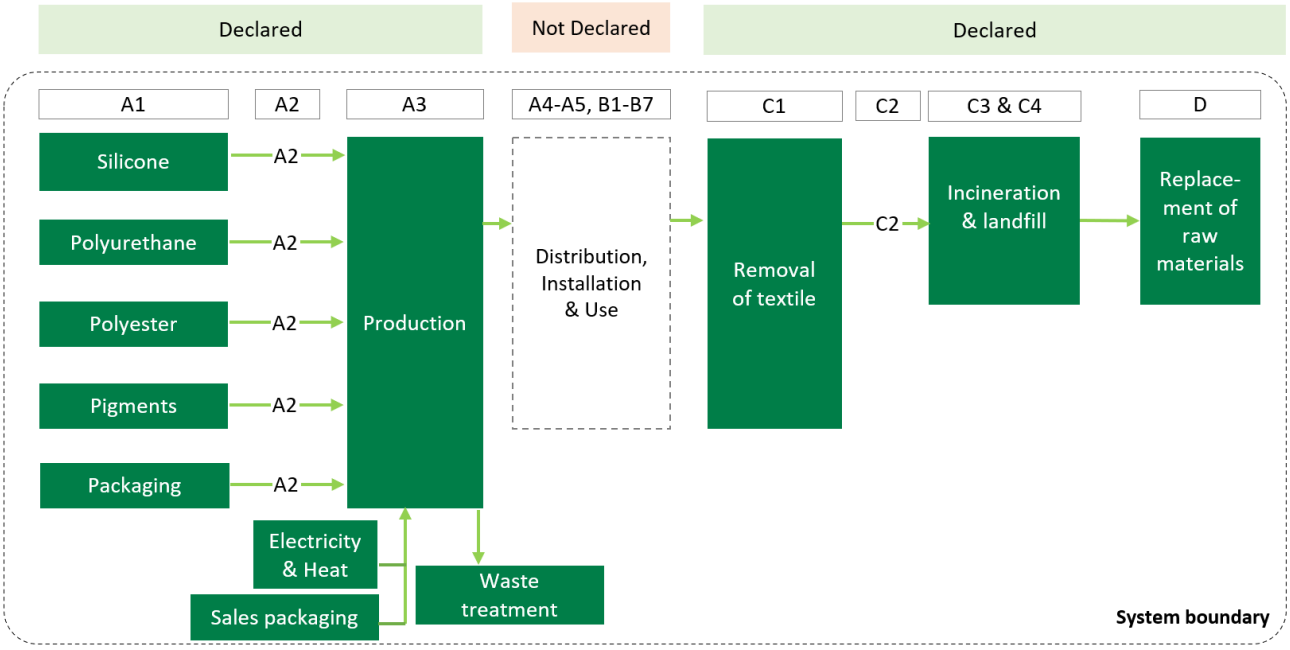
Information about the energy mix in the foreground system:

Dataset
Electricity from wind power, CN, 2020
Electricity from photovoltaic, CN, 2020
Electricity grid mix 1kV-60kV, CN, 2020
Thermal energy from natural gas, CN, 2020

Background system:

Upstream and downstream processes are modelled using the Chinese grid mix.

Flowdiagram



System boundary

This EPD is based on a cradle-to-gate with modules C and D LCA, in which 100 weight-% has been accounted for.

The general rules for the exclusion of inputs and outputs follows the requirements in EN 15804, 6.3.5, where the total of neglected input flows per module shall be a maximum of 5 % of energy usage and mass and 1 % of energy usage and mass for unit processes.

Product stage (A1-A3) includes:

A1 – Extraction and processing of raw materials

A2 – Transport to the production site

A3 – Manufacturing processes

The product stage comprises the acquisition of all raw materials, products and energy, transport to the production site, packaging and waste processing up to the ”end-of-waste” state or final disposal. The LCA results are declared in aggregated form for the product stage, which means, that the sub-modules A1, A2 and A3 are declared as one module A1-A3.

To manufacture Haku, a carrier unit - also called release paper – is coated with a layer of polyurethane before being dried in a chamber. Subsequently, it is coated with a polyurethane foam layer, which is dried in a second chamber. During the drying process, the two polyurethane layers are bonded together. Afterwards, the two polyurethane layers are laminated with a base layer of polyester, which is dried in a third chamber. The manufactured complex is referred to as EPU. EPU is then released from the release paper and coated with silicone in a second production line. After drying of the complex, the production of the textile Haku is complete.

Both polyurethane layers are produced in-house at the production site in Anhui, China from polyhydric alcohol and methylene di-isocyanate additive. During the production process of polyurethane, pigments are added to give Haku its variety of colors. Hence, no additional dyeing process is necessary since the polyurethane used in the production of Haku is already colored.

After production, the product is packaged and prepared for shipment to Kvadrat’s storage facility in Ebeltoft, Denmark.

End of Life (C1-C4) includes:

There are no impacts associated with C1 as the textiles – once they are incorporated into a product – are deconstructed manually and without the need for any additional materials and/or machinery. Therefore, the impact of this lifecycle stage is therefore set to zero.

After its removal from the building, Haku is partially sent to a waste incineration plant, partially to landfill. In this LCA report, 50 km has been used as the transportation distance from the deconstruction site to both incineration and waste treatment facilities. It is assumed that Haku is incinerated in a municipal incineration plant. Recovered energy is credited in module D.

Re-use, recovery and recycling potential (D) includes:

There is an export of electricity and heat from the municipal waste incineration of the textiles as described in the waste processing occurring in C3. The benefits of this incineration are declared in module D and correspond to the exported electricity and heat in the incineration process. They replace an average European mix for electricity and district heating.

LCA results

ENVIRONMENTAL IMPACTS PER KG HAKU							
Parameter	**Enhed**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	[kg CO_2 eq.]	6,96E+00	0,00E+00	4,47E-03	1,01E+00	5,56E-01	-4,10E-01
GWP-fossil	[kg CO_2 eq.]	7,10E+00	0,00E+00	4,39E-03	1,01E+00	5,54E-01	-4,08E-01
GWP-bio	[kg CO_2 eq.]	-1,40E-01	0,00E+00	1,05E-05	-1,72E-03	2,03E-03	-2,27E-03
GWP-luluc	[kg CO_2 eq.]	3,03E-03	0,00E+00	7,38E-05	5,02E-05	7,79E-05	-8,71E-05
ODP	[kg CFC 11 eq.]	2,55E-07	0,00E+00	6,47E-16	1,27E-13	5,75E-14	-2,98E-12
AP	[mol H^+ eq.]	1,95E-02	0,00E+00	6,83E-06	8,31E-04	1,54E-04	-8,49E-04
EP-fw	[kg P eq.]	5,66E-04	0,00E+00	1,88E-08	4,24E-08	5,77E-06	-1,58E-06
EP-mar	[kg N eq.]	6,37E-03	0,00E+00	2,60E-06	3,78E-04	3,02E-04	-2,23E-04
EP-ter	[mol N eq.]	5,03E-02	0,00E+00	3,06E-05	4,29E-03	5,67E-04	-2,31E-03
POCP	[kg NMVOC eq.]	1,79E-02	0,00E+00	6,77E-06	9,75E-04	3,32E-04	-5,91E-04
ADP-mm[1]	[kg Sb eq.]	2,16E-05	0,00E+00	3,83E-10	1,61E-09	1,37E-09	-6,68E-08
ADP-fos[1]	[MJ]	1,38E+02	0,00E+00	5,79E-02	4,18E-01	4,60E-01	-5,94E+00
WDP[1]	[m^3]	2,77E+00	0,00E+00	6,80E-05	1,16E-01	2,31E-03	-6,76E-02
Caption	GWP-total = Global Warming Potential - total; GWP-fossil = Global Warming Potential - fossil fuels; GWP-biogenic = Global Warming Potential - biogenic; GWP-luluc = Global Warming Potential - land use and land use change; ODP = Ozone Depletion; AP = Acidifcation; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water use						
Disclaimer	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.						
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: $1,95*10^2$ or 195, while 1,12E-11 is the same as $1,12*10^{-11}$ or 0,0000000000112.						

ADDITIONAL ENVIRONMENTAL IMPACTS PER KG HAKU							
Parameter	**Enhed**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
PM	[Disease incidence]	2,89E-07	0,00E+00	7,42E-11	2,62E-09	1,49E-09	-6,85E-09
IRP[2]	[kBq U235 eq.]	3,08E-01	0,00E+00	1,53E-05	2,08E-03	8,03E-04	-1,00E-01
ETP-fw[1]	[CTUe]	1,69E+02	0,00E+00	4,30E-02	1,47E-01	1,04E+00	-1,68E+00
HTP-c[1]	[CTUh]	2,60E-08	0,00E+00	8,67E-13	2,98E-11	1,00E-11	-7,31E-11
HTP-nc[1]	[CTUh]	3,36E-07	0,00E+00	3,89E-11	2,71E-09	8,76E-10	-2,60E-09
SQP[1]	-	3,56E+01	0,00E+00	2,85E-02	9,59E-02	5,43E-02	-5,68E+00
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality						
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: $1,95*10^2$ or 195, while 1,12E-11 is the same as $1,12*10^{-11}$ or 0,0000000000112.						
Disclaimers	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.						
	[2] 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 nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.						

RESSOURCE CONSUMPTION PER KG HAKU							
Parameter	**Enhed**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	[MJ]	2,52E+01	0,00E+00	4,98E-03	7,87E-02	4,66E-02	-3,59E+00
PERM	[MJ]	2,06E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	[MJ]	2,73E+01	0,00E+00	4,98E-03	7,87E-02	4,66E-02	-3,59E+00
PENRE	[MJ]	1,12E+02	0,00E+00	5,79E-02	4,18E-01	4,60E-01	-5,94E+00
PENRM	[MJ]	2,62E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	[MJ]	1,38E+02	0,00E+00	5,79E-02	4,18E-01	4,60E-01	-5,94E+00
SM	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	[m^3]	7,35E-02	0,00E+00	5,55E-06	2,73E-03	7,00E-05	-2,54E-03
Caption	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non renewable primary energy excluding non renewable primary energy resources used as raw materials; PENRM = Use of non renewable primary energy resources used as raw materials; PENRT = Total use of non renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non renewable secondary fuels; FW = Net use of fresh water						
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: $1,95*10^2$ or 195, while 1,12E-11 is the same as $1,12*10^{-11}$ or 0,0000000000112.						

WASTE CATEGORIES AND OUTPUT FLOWS PER KG HAKU							
Parameter	**Enhed**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
HWD	[kg]	5,69E-08	0,00E+00	2,22E-12	1,63E-10	7,73E-11	-8,09E-10
NHWD	[kg]	1,05E-01	0,00E+00	9,45E-06	1,32E-02	3,08E-01	-1,11E-02
RWD	[kg]	1,71E-03	0,00E+00	1,05E-07	1,34E-05	5,39E-06	-5,92E-04
CRU	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	[kg]	2,36E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MER	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EEE	[MJ]	3,61E-01	0,00E+00	0,00E+00	1,98E+00	0,00E+00	0,00E+00
EET	[MJ]	1,08E-01	0,00E+00	0,00E+00	3,24E+00	0,00E+00	0,00E+00
Caption	HWD = Hazardous waste disposed; NHWD = Non hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy						
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: $1,95*10^{2}$ or 195, while 1,12E-11 is the same as $1,12*10^{-11}$ or 0,0000000000112.						

BIOGENIC CARBON CONTENT PER KG HAKU		
Parameter	**Unit**	**At the factory gate**
Biogenic carbon content in product	[kg C]	0
Biogenic carbon content in accompanying packagaing	[g C]	9
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO_2	

Additional information

LCA interpretation

The raw materials have the highest contribution to almost all the impact categories. Especially, polyester and polyurethane are responsible for the highest impact in most impact categories. This can among others be explained by the high amount in which they are present in Haku (both together account for more than 90% of the overall mass). The second largest contributor to the environmental impacts of the product system is the consumption of electricity and natural gas during the production of Haku.

Technical information on scenarios

Reference service life

RSL information		Unit
Reference service Life	10	Years
Declared product properties	-	As appropriate
Design application parameters	-	As appropriate
Assumed quality of work	-	As appropriate
Outdoor environment	-	As appropriate
Indoor environment	-	As appropriate
Usage conditions	-	As appropriate
Maintenance	-	As appropriate

End of life (C1-C4)

Scenario information	Value	Unit
Collected separately	-	kg
Collected with mixed waste	1	kg
For reuse	-	kg
For recycling	-	kg
For energy recovery	0,58	kg
For final disposal	0,42	kg
Assumptions for scenario development	-	As appropriate

Re-use, recovery and recycling potential (D)

Scenario information/Materiel	Value	Unit
Textiles sent to municipal waste incineration	1	kg
Exported electricity from municipal waste incineration	1,8	MJ
Exported thermal energy from municipal waste incineration	4,4	MJ

Indoor air

The EPD does not give information on release of dangerous substances to indoor air because the horizontal standards on the relevant measurements are not available. Read more in EN15804+A1 chapter 7.4.1.

However, the product covered in the EPD is GREENGUARD® certified and comply with respective Indoor climate minimum requirements.

The GREENGUARD® certification ensures products do not exceed limits for dangerous substance emissions (VOCs) and thereby contribute to a healthier indoor climate.

The certificates and standards as well as the EU Ecolabel are available at the following link, by choosing a textile and selecting the Downloads section, after which the certificates are presented:

https://www.kvadrat.dk/en/products

Soil and water

The EPD does not give information on release of dangerous substances to soil and water because the horizontal standards on the relevant measurements are not available. Read more in EN15804+A1 chapter 7.4.2.

However, selected Kvadrat products are EU Ecolabel certified, which guarantees limited use of substances harmful to the environment and health and reduced water and air pollution.

References

Publisher	epddanmark www.epddanmark.dk Template version 2024.1
Programme operator	Danish Technological Institute Gregersensvej DK-2630 Taastrup www.teknologisk.dk
LCA-practitioner	Daniel Matthaeus Krisa Danish Technological Institute Buildings & Environment Gregersensvej DK-2630 Taastrup www.teknologisk.dk
LCA software /background data	Sphera LCA for experts version 10.7.1.28, 2023 including databases v.2024.2 https://sphera.com/ Ecoinvent v3.9.1 Life-Cycle Assessment database *https://ecoinvent.org/database-login/* *EN 15804 reference package 3.1*
3rd party verifier	Stefan Emil Danielsson Circonomy Consulting stefan.e.danielsson@hotmail.com

General programme instructions
General Programme Instructions, version 2.0, spring 2020
www.epddanmark.dk

EN 15804
DS/EN 15804 + A2:2019 - "Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products"

EN 15942
DS/EN 15942:2011 – " Sustainability of construction works – Environmental product declarations – Communication format business-to-business"

ISO 14025
DS/EN ISO 14025:2010 – " Environmental labels and declarations – Type III environmental declarations – Principles and procedures"

ISO 14040
DS/EN ISO 14040:2008 – " Environmental management – Life cycle assessment – Principles and framework"

ISO 14044
DS/EN ISO 14044:2008 – ”Environmental management – Life cycle assessment – Requirements and guidelines”

GREENGUARD® certification

Harmonized technical specifications:
EN1021-1, EN1021-2, EN ISO 12945, EN ISO 12947 and EN ISO 810

EU regulation 305/2011