

ENVIRONMENTAL PRODUCT DECLARATION

In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021 for:

Quartz Surface from BELENCO



Programme: The International EPD® System, www.environdec.com

Programme operator: EPD International AB

EPD registration number: S-P-08773

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Valid until: 2028-09-25

An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com



General Information

Programme information

Programme:	The International EPD® System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Website:	www.environdec.com
E-mail:	info@environdec.com

Accountabilities for PCR, LCA and independent, third-party verification

Product Category Rules (PCR)

CEN standard EN 15804 serves as the Core Product Category Rules (PCR)

Product Category Rules (PCR): PCR 2019:14 Construction products, v1.2,5 2022-11-01

PCR review was conducted by: The Technical Committee of the International EPD® System.

Life Cycle Assessment (LCA)

LCA accountability: Metsims Sustainability Consulting

Third-party verification

Independent third-party verification of the declaration and data, according to ISO 14025:2006, via:

Third party verifier: Prof. Ing. Vladimír Kočí,

Approved by: The International EPD® System Technical Committee

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but registered in different EPD programmes, or not compliant with EN 15804, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

Company information



Ever since our establishment in 2011, our production lines are equipped by the most advanced technologies of the Italian Breton S.p.A, the leading natural and composite stone technology company in the world. With our second production facility commissioned in 2020; we have reached an annual production capacity of 2.000.000 sqm, and we continue our production operations on 3 fully-automatic casting and 4 polishing lines. With its 152 x 310 cm ekstra and 165 x 330 cm Jumbo slab dimensions, Belenco reduces need for seams on the countertop, thus eliminating the risk of shade texture difrence between parts.

Through its bussiness model which integrates R&D and innovation into all the processes, Belenco is the first in Turkey to produce long vein natural stone-looking quartz slabs using robotic arm technology.

Product information

The product UN CPC code is 37310 (Bricks, blocks, tiles and other ceramic goods of siliceous earths) according to Central Product Classification (CPC) Version 2.1

Production of Belenco Quartz Surfaces are realized in Belenco production facilities which are located in Manisa in Türkiye.

Belenco Quartz Surfaces, which contain over 90% quartz mineral, are very resistant, state-of-the-art surfaces that are made of high quality polymers (binders), with high resistance to scratching and abrasion as well as chemicals and staining, and quite hygienic with their non- porous structure.

Belenco Quartz Surfaces used for kitchen countertops and bathroom vanity tops, floors, wall and facade claddings, service and reception desks and various special application areas; they are surface materials that require minimum maintenance and offer excellent performance thanks to their technical and physical characteristics.

Production Facility I: Manisa Organize Sanayi Bölgesi 4. Kısım Keçiliköy OSB Mahallesi Ahmet Nazif Zorlu Bulvarı No: 22 Yunusemre - MANİSA / TÜRKİYE

Production Facility II: Manisa Organize Sanayi Bölgesi 4. Kısım Keçiliköy OSB Mah. 418. Cad No: 2 Yunusemre - MANİSA / TÜRKİYE



LCA information

Functional unit / declared unit: 1 square meter (1m²) of quartz surface with 15 mm thickness.

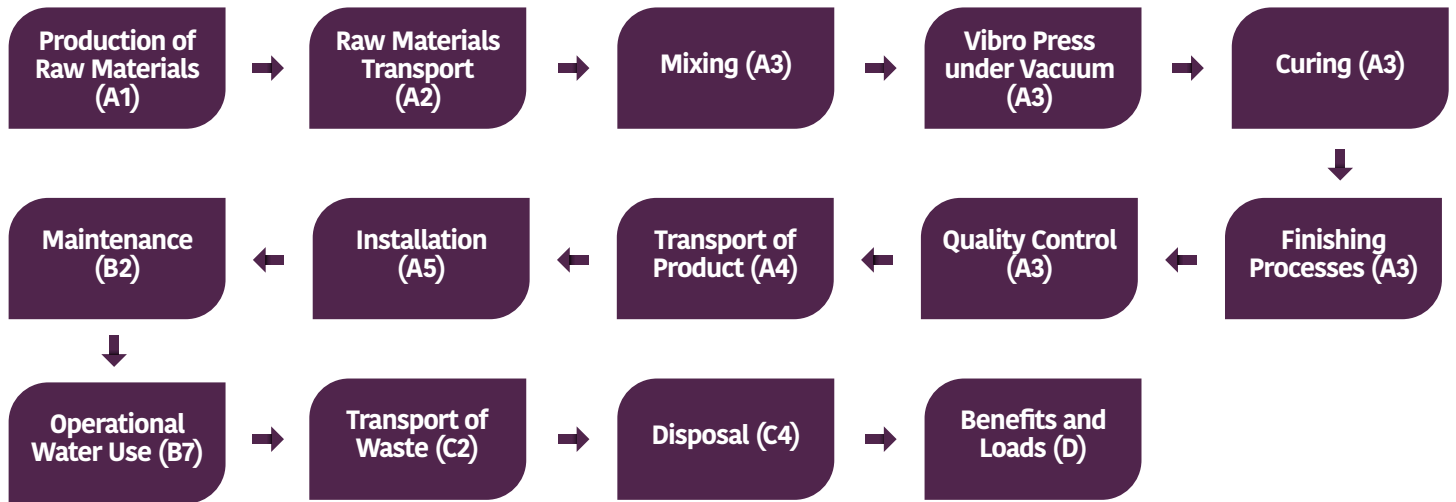
Reference service life: 10 years

Time representativeness: 2022

Database(s) and LCA software used: Ecoinvent 3.9.1 and SimaPro 9.5

Description of system boundaries: Cradle to grave and module D (A + B + C + D).

System diagram:



System Description

Raw Materials (A1)

Quartz, resin and other raw materials are supplied.

Transport of Raw Materials (A2)

Transport distance of raw materials were calculated specifically for each raw material.

Mixing (A3)

Raw materials are fixed by its particular recipe at this step.

Vibro Press Vacuum (A3)

Mixture is moulded under vibration, vacuum condition with high pressure.

Curing (A3)

The product is hardened by curing.

Finishing Processes (A3)

Product is cut, polished and calibrated after cooling.

Quality Control (A3)

To provide highest quality, produced products are checked in aspect of their physical, chemical and aesthetic attribute.

Transport of Product (A4)

Average transport distance was calculated according to weighted delivery average of 2022.

Installation (A5)

This step includes installation inputs like adhesive mortar, silicone sealant and drilling electricity.

Maintenance (B2)

Every 5 years, silicone sealants need to be replaced.

Operational Water Use (B7)

This step includes cleaning water.

Transport of Waste (C2)

60 km waste transport distance was assumed.

Disposal (C4)

Product and production waste is landfilled as inert waste. In addition to inert waste, wood waste occurs during production. Wood waste is incinerated and landfilled.

Benefits and Loads (D)

During the incineration of wood waste, electricity and heat are produced.

Modules declared, geographical scope, share of specific data (in GWP-GHG results) and data variation (in GWP-GHG results):

	Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage	
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential	
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D	
Modules declared	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Geography	TR, BE, CN	TR, BE, CN	TR	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO
Specific data used	>90%			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	<10%			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	0%			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Content information

Product components	Weight, kg	Post-consumer material, weight-%	Biogenic material, weight-% and kg C/kg
Quartz	31	0	0
Cristobalite	12	0	0
Resin	6	0	0
Other Aditives	2	0	0
TOTAL	51	0	0

Packaging materials	Weight, kg	Weight-% (versus the product)	Weight biogenic carbon, kg C/kg
Metal Components	0.11	0.21%	0, 0
Plastic Components	0.02	0.04%	0, 0
Wood	0.24	0.47%	0.12, 0.5
TOTAL	0.37		

The product doesn't contain any substance from the candidate list to authorization of the REACH legislation with a concentration above 0.1% (w/w).

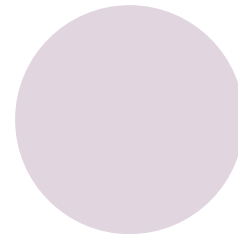
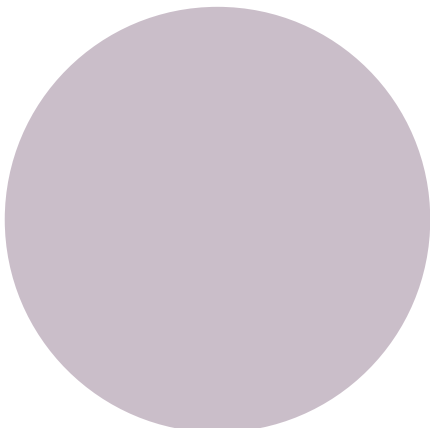
Results of the environmental performance indicators

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-fossil	kg CO ₂ eq.	6.32E+01	4.66E+00	1.67E+00	0	5.69E+00	0	0	0	0	9.17E-02	0	8.66E-01	0	1.17E+00	-7.83E-02
GWP-biogenic	kg CO ₂ eq.	6.43E-02	1.75E-03	1.24E-01	0	7.25E-01	0	0	0	0	2.59E-04	0	3.25E-04	0	2.75E-01	-2.39E-04
GWP-luluc	kg CO ₂ eq.	2.79E+00	2.43E-03	2.58E-03	0	8.37E+00	0	0	0	0	1.43E-04	0	4.49E-04	0	3.16E-04	-6.44E-04
GWP-total	kg CO ₂ eq.	6.61E+01	4.67E+00	1.80E+00	0	1.48E+01	0	0	0	0	9.21E-02	0	8.67E-01	0	1.45E+00	-7.92E-02
ODP	kg CFC 11 eq.	2.66E-06	7.18E-08	7.30E-08	0	2.95E-07	0	0	0	0	1.39E-08	0	1.33E-08	0	2.02E+00	-7.52E-10
AP	mol H ⁺ eq.	2.73E-01	1.24E-02	7.81E-03	0	5.95E-02	0	0	0	0	4.78E-04	0	2.10E-03	0	1.37E-08	-3.79E-04
EP-freshwater	kg P eq.	1.98E-02	3.71E-04	6.16E-04	0	9.01E-02	0	0	0	0	3.91E-05	0	6.93E-05	0	4.04E-03	-6.12E-05
EP-marine	kg N eq.	6.10E-02	3.04E-03	1.50E-03	0	6.31E-02	0	0	0	0	9.64E-05	0	5.11E-04	0	5.88E-05	-5.69E-05
EP-terrestrial	mol N eq.	5.48E-01	3.15E-02	1.54E-02	0	2.14E-01	0	0	0	0	9.74E-04	0	5.25E-03	0	1.49E-02	-5.18E-04
POCP	kg NMVOC eq.	4.04E-01	1.59E-02	5.23E-03	0	3.68E-02	0	0	0	0	3.17E-04	0	2.80E-03	0	1.71E-02	-1.92E-04
ADP-minerals&metals*	kg Sb eq.	2.43E-04	1.47E-05	6.02E-06	0	5.31E-05	0	0	0	0	4.16E-07	0	2.75E-06	0	6.30E-03	-6.75E-08
ADP-fossil*	MJ	1.02E+03	6.42E+01	2.62E+01	0	6.68E+01	0	0	0	0	1.14E+00	0	1.19E+01	0	7.58E-07	-9.35E-01
WDP*	m ³	7.31E+01	2.89E-01	5.31E-01	0	9.58E+00	0	0	0	0	4.17E+00	0	5.40E-02	0	1.19E+01	-3.35E-02

Acronyms

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 = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption

* Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.



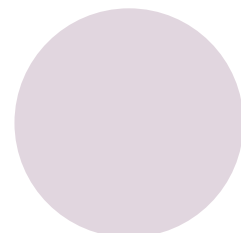
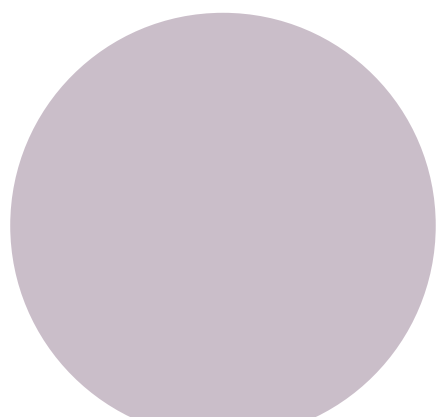
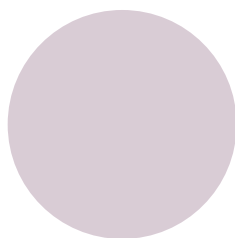
Output flow indicators

Results per functional or declared unit

Indicator	Unit	A1-3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Material for recycling	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Materials for energy recovery	kg	1.94	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exported energy, electricity	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exported energy, thermal	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Other environmental performance indicators: TRACI 2.1 V1.08 / Canada 2005

Impact category	Unit	A1-3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Ozone depletion	kg CFC-11 eq	2.84E-06	7.89E-08	8.10E-08	0	3.23E-07	0	0	0	0	1.72E-08	0	1.47E-08	0	1.48E-08	-9.56E-10
Global warming	kg CO2 eq	6.33E+01	4.51E+00	1.60E+00	0	1.42E+01	0	0	0	0	8.81E-02	0	8.36E-01	0	1.13E+00	-7.68E-02
Smog	kg O3 eq	3.47E+00	1.79E-01	8.74E-02	0	5.23E-01	0	0	0	0	5.49E-03	0	2.98E-02	0	1.00E-01	-2.94E-03
Acidification	kg SO2 eq	2.29E-01	1.06E-02	6.65E-03	0	4.45E-02	0	0	0	0	4.07E-04	0	1.80E-03	0	3.71E-03	-3.12E-04
Eutrophication	kg N eq	1.94E-01	3.75E-03	5.21E-03	0	1.13E+00	0	0	0	0	3.21E-04	0	6.93E-04	0	1.19E-01	-4.12E-04
Carcinogenics	CTUh	4.68E-06	3.37E-07	1.08E-07	0	7.70E-07	0	0	0	0	6.11E-08	0	6.26E-08	0	6.36E-08	-5.35E-09
Non carcinogenics	CTUh	1.02E-05	1.05E-06	3.23E-07	0	4.03E-06	0	0	0	0	3.98E-08	0	1.97E-07	0	4.64E-06	-1.19E-08
Respiratory effects	kg PM2.5 eq	1.01E-01	2.36E-03	1.79E-03	0	1.10E-02	0	0	0	0	1.17E-04	0	4.30E-04	0	2.86E-03	-4.20E-04
Ecotoxicity	CTUe	6.24E+02	4.14E+01	1.61E+01	0	1.83E+02	0	0	0	0	1.61E+00	0	7.73E+00	0	2.76E+02	-5.57E-01
Fossil fuel depletion	MJ surplus	1.29E+02	8.99E+00	2.35E+00	0	6.98E+00	0	0	0	0	6.89E-02	0	1.67E+00	0	1.72E+00	-9.15E-02



References

- 2019:14 Construction products (EN 15804:A2) (1.2.5) prepared by IVL Swedish Environmental Research Institute, EPD International Secretariat, date 2022-11-01.
- Cristobalite Production Energy Popescu, Adina. (2016). Design of Rotary Kiln for Cristobalite Production. 10.13140/RG.2.2.33111.88489.
- Ecoinvent / Ecoinvent Centre, www.ecoinvent.org
- EN 15804:2012+A2:2019/AC:2021 Sustainability of construction works - Environmental Product Declarations – Core rules for the product category of construction products
- EN ISO 50001/ Energy Management Systems - Requirements ISO 14020:2000/ Environmental Labels and Declarations – General principles
- GPI/ General Programme Instructions of the International EPD® System. Version 4.0. EN ISO 9001/ Quality Management Systems - Requirements EN ISO 14001/ Environmental Management Systems - Requirements
- Grbeš, A. (2016). A life cycle assessment of silica sand: comparing the beneficiation processes. Sustainability, 8(1), 11.
- ISO 14025/ DIN EN ISO 14025:2009-11: Environmental labels and declarations - Type III environmental declarations – Principles and procedures
ISO 14040/44/ DIN EN ISO 14040:2006-10, Environmental management - Life cycle assessment - Principles and framework (ISO14040:2006) and Requirements and guidelines (ISO 14044:2006) PCR
- Metsims/ www.metsims.com
- SimaPro/ SimaPro LCA Software, Pré Consultants, the Netherlands, www.pre-sustainability.com
- The International EPD® System/ The International EPD® System is a programme for type III environmental declarations, maintaining a system to verify and register EPD®s as well as keeping a library of EPD®s and PCRs in accordance with ISO 14025. www.environdec.com

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