



THE INTERNATIONAL EPD® SYSTEM



ENVIRONMENTAL PRODUCT DECLARATIONS

Environmental Product Declaration

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

Filli Boya Aqusto Silan

from

BETEK BOYA VE KİMYA SANAYİİ A.Ş.

Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
EPD registration number:	EPD-IES-0015487
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Valid until:	2029-08-30



General information

Programme information

Programme:	The International EPD® System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
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Accountabilities for PCR, LCA and independent, third-party verification
Product Category Rules (PCR)
This EPD is in accordance with EN 15804+A2 and ISO 14025:2010 standards. The EN 15804 +A2:2019 serves as the core Product Category Rules (PCR). In addition, the Int'l EPD System PCR 2019:14 Construction products, version 1.3.3, valid until 2024.12.20
PCR review was conducted by: The Technical Committee of the International EPD System. See www.environdec.com for a list of members. Review chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat www.environdec.com/contact .
Life Cycle Assessment (LCA)
LCA accountability: Eren YAMAN, ERKE Sürdürülebilir Bina Tasarım Danışmanlık Ltd. Şti.
Third-party verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006: <input type="checkbox"/> EPD process certification <input checked="" type="checkbox"/> EPD verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: <input checked="" type="checkbox"/> EPD verification by individual verifier
Third-party verifier: <i>Ipek Goktas</i>
Approved by: The International EPD® System
Procedure for follow-up of data during EPD validity involves third party verifier: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

Betek 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

Owner of the EPD: Betek Boya Kimya ve Sanayi A.Ş.

Location of Production Site: GOSB, Tembelova Alanı 3200 sk. No: 3206 Gebze/Kocaeli

About Betek

Founded in 1988, in its early years in the sector Betek Boya Kimya ve Sanayi A.Ş. developed the high-quality concrete admixtures, ready-mixed mortars, and waterproofing materials that were in high demand within the construction market.

Using cutting-edge manufacturing technologies, Betek gained a reputation as a “leading and Innovative brand known for top quality manufacturing” with its products appealing to consumers and changing the game in the paint industry.

With almost 1300 employees and over 5000 sales points, Betek has made its mark in the sector and secured an important position for not only in the paint sector but also among Turkey’s leading industrial enterprises.

2003 was the year of the beginning of the company’s heat insulation activities and in which it took over the role of leader in this sector resulting from its operations, considered also as part of its social responsibility to the future development of its native country Turkey. Operating in accordance with international environmental protection and environmental health standards, Betek Boya Kimya ve Sanayi A.Ş. actually took the first step towards its environmental work in 1993 by adhering to EU paint standards, and has been managing its manufacturing and R&D processes accordingly ever since. Betek owns following management systems: ISO 9001, ISO 10002, ISO 14001, ISO 45001, ISO/IEC 27001, ISO 50001. In line with its mission to extend its domestic success beyond Turkey’s borders, Betek has a 11000 m² production facility for paints in Egypt with a capacity of 26000 metric tons. Betek has also opened manufacturing facilities in Kayseri and Balıkesir where it manufactures all major heat insulation system products using the latest technologies and to the highest standards in order to meet Turkey’s insulation demands as awareness gradually increases.

Product Information

About the Product

Product name: Filli Boya Aqusto Silan

Geographical scope: The geographical scope of this EPD is global.

Product description: Filli Boya Aqusto Silan is manufactured by Betek A.Ş. with certificate of conformity to the standards TS EN ISO 9001, TS EN ISO 14001, TS ISO 45001, TS EN ISO 50001, TS ISO 10002. Filli Boya Aqusto Silan can be applied on plaster, rough plaster, comb mosaic, concrete, exposed concrete, concrete board, MDF, OSB, and even priorly painted ready-plaster type surfaces that have faded in color but still self-supporting. Filli Boya Aqusto Silan is water-based, matte, decorative, top-coat exterior paint with Duomax® Protection Factor that balances "maximum water repellency" and "maximum breathability" perfectly as a product of the innovative Active Silicone Technology of Filli Boya. Its consumption ranges between 6-10,7 m² per 1 liter for single coat, depending on surface evenness and absorbency.

Content of the product and packaging materials as shown in below.

Product components	% by weight		Biogenic material, weight-% and kg C/kg
Additive (%)	1-10		0%, 0kg C/kg
Pigments (%)	1-10		0%, 0kg C/kg
Fillers (%)	20-40		<1%, 0,001kg C/kg
Solvents / Water (%)	10-30		<3%, 0,005kg C/kg
Binders (%)	20-40		0%, 0kg C/kg
Packaging materials	Weight, kg		Biogenic material, weight-% and kg C/kg
Plastic Bucket	0,775	kg	0%, 0kg C/kg
Others	0,1452	kg	0%, 0kg C/kg

The products do not contain SVHC substances (Substances of Very High Concern), nor post-consumer or renewable materials.

During the entire manufacturing process, no other health protection measures are required extending beyond the legally specified industrial protection measures for commercial enterprises.

Technical Data of the Product		
Name	Value	Unit
Density	1,50-1,60	kg/L
Coverage	7,4-12	m ² /L

UN CPC Code: 35110, Paints and varnishes and related products

Application

Filli Boya Aqusto Silan can be applied on plaster, rough plaster, comb mosaic, concrete, exposed concrete, concrete board, MDF, OSB, and even priorly painted ready-plaster type surfaces that have faded in color but still self-supporting. Recommended to be applied on thermal insulation systems due to high breathability feature.

LCA information

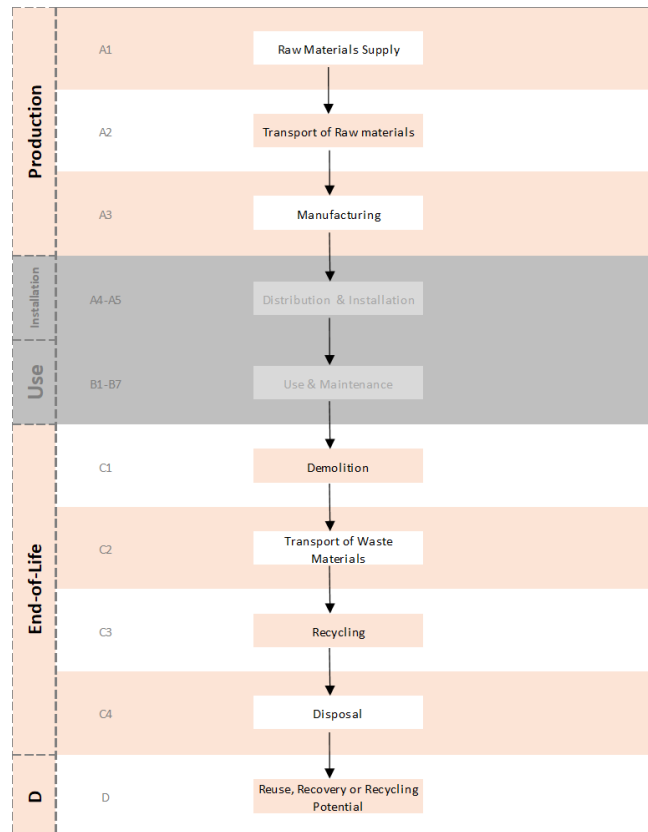
Declared unit: 1 kg

Reference service life: Not applicable for this product category.

Time representativeness: Goal of the study is to determine the actual environmental loads for 12 consecutive months, so data for the time period is the year 2023.

Database(s) and LCA software used: Ecoinvent v3.8 and OpenLCA v1.11 based on EF 3.0

System Diagram:



Description of system boundaries: Cradle to gate with options, modules C1-C4 and D

Excluded lifecycle stages: Modules A4-A5, Modules B1-B7

SYSTEM BOUNDARY	PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARYS
	Raw material supply	Transport	Manufacturing	Transport from gate to site	Assembly/Install	Use	Maintenance	Repair	Replacement 1)	Refurbishment 1)	Operational Energy Use	Operational Water Use	Deconstruction	Transport	Waste processing	Disposal	
	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Cradle to gate with options	x	x	x	MND	MND	MND	MND	MND	MND	MND	MND	MND	x	x	x	x	x
Specific data used	> 99%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation products	Not relevant			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation sites	Not relevant			-	-	-	-	-	-	-	-	-	-	-	-	-	-

(MND: Module not declared)

Period under consideration: The period under consideration is defined as one year. The monthly data is collected by the producer and is averaged to obtain the yearly data. The specific data for the year 2023 is utilized within this study.

Estimates and Assumptions: Since there is no follow up procedure, transportation distance to the closest recycling facilities, disposal area is estimated as 50 km and common transportation type and fuel are used in the calculation. C1 is assumed to be 0 because no future dismantling activities are expected for the paint. No additional energy consumption is anticipated as the paint will be disposed of along with the building demolition. In C2, due to the lack of tracking procedures, the distance to the nearest recycling facility and disposal site is estimated to be 50 km. Common transportation modes and fuels are used in the calculation. All other estimations and assumptions related to cut-off criteria and allocation are declared in these sections. No additional estimations or assumptions are made within the scope of this study. The applied paint cannot be removed and recycled. Therefore, the C3 has not been considered and 100% landfilling is assumed. 100% landfill in C4.

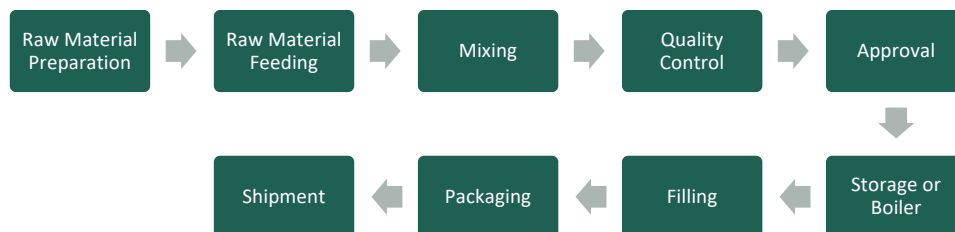
All the other estimations and assumptions regarding the cut off criteria and the allocation are declared in that parts. There are no other additional estimations and/or assumptions in the scope of this study.

Cut of Rules: All inputs and outputs to a (unit) process are included in the calculation, for which data were available. The cut-off rule for insufficient data or data gaps that are less than 1% of the total input mass or mass per module was applied. In case of insufficient input data or data gaps for a unit process, the cut-off criteria shall be 1% of renewable and nonrenewable primary energy usage and 1% of the total mass input of that unit process. Infrastructure/capital goods for upstream, core and downstream processes are cut off. There is wastage during production; however, it is less than 1% and has therefore not been considered.

The infrastructure/capital goods are excluded for upstream, core and downstream processes.

Allocation: The allocation was performed in which the product output fixed to 1 kg and the corresponding amount of product was used in calculations. Average breakdown was done by considering product total weight per year production. According to this, the total energy, water, and raw materials used to produce the product were divided by the total annual production. Since the production processes of products are the same, the annual production percentages are taken into consideration to allocate water and energy consumption. Since electricity and natural gas are used in the production of other products in the factory, the share of energy is calculated by proportioning the production amount. The raw material and energy/water inputs and waste outputs were allocated depending on the total mass annual production and calculated for 1 kg product. Co-product allocation is not applicable, since there is no co-product generation in the production line.

Production Process



The energy source datasets from openLCA

Process	Data	Data Source	Publication Date
Electricity	market for electricity, medium voltage electricity, medium voltage Cutoff, S – TR GWP-GHG = 0.63 KgCO ₂ /KWh	Ecoinvent 3.8	2021

Results of the environmental performance indicators

Mandatory impact category indicators according to EN 15804

Results per functional or declared unit										
Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
GWP-fossil	kg CO ₂ eq.	2,178E+00	3,340E-03	3,402E+00	5,583E+00	0,000E+00	2,690E-02	0,000E+00	8,530E-01	0,000E+00
GWP-biogenic	kg CO ₂ eq.	1,220E-01	2,610E-05	6,251E-02	1,845E-01	0,000E+00	2,600E-04	0,000E+00	2,292E-02	0,000E+00
GWP-luluc	kg CO ₂ eq.	1,468E-02	1,504E-06	2,750E-03	1,743E-02	0,000E+00	1,711E-05	0,000E+00	4,081E-05	0,000E+00
GWP-total	kg CO ₂ eq.	2,315E+00	3,368E-03	3,467E+00	5,785E+00	0,000E+00	2,718E-02	0,000E+00	8,760E-01	0,000E+00
ODP	kg CFC 11 eq.	1,854E-05	6,074E-10	7,858E-08	1,862E-05	0,000E+00	4,389E-09	0,000E+00	2,043E-08	0,000E+00
AP	mol H ⁺ eq.	1,751E-02	1,342E-05	1,481E-02	3,233E-02	0,000E+00	1,100E-04	0,000E+00	4,100E-04	0,000E+00
EP-freshwater ^{r1}	kg P eq.	7,600E-04	2,358E-07	7,500E-04	1,510E-03	0,000E+00	2,752E-06	0,000E+00	5,078E-06	0,000E+00
EP-marine	kg N eq.	2,600E-03	2,890E-06	2,950E-03	5,553E-03	0,000E+00	2,915E-05	0,000E+00	8,990E-05	0,000E+00
EP-terrestrial	mol N eq.	2,499E-02	3,164E-05	3,063E-02	5,565E-02	0,000E+00	3,200E-04	0,000E+00	9,900E-04	0,000E+00
POCP	kg NMVO C eq.	7,900E-03	1,051E-05	1,298E-02	2,089E-02	0,000E+00	9,583E-05	0,000E+00	3,000E-04	0,000E+00
ADP-minerals&metals ²	kg Sb eq.	8,494E-05	1,304E-08	1,976E-05	1,047E-04	0,000E+00	1,612E-07	0,000E+00	2,161E-07	0,000E+00
ADP-fossil ²	MJ	3,229E+01	4,945E-02	9,733E+01	1,297E+02	0,000E+00	3,820E-01	0,000E+00	1,640E+00	0,000E+00
WDP ²	m ³	1,491E+00	2,600E-04	2,036E+00	3,527E+00	0,000E+00	2,310E-03	0,000E+00	1,500E-02	0,000E+00
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									

¹ Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO4e.

² The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.

Additional mandatory and voluntary impact category indicators

Results per functional or declared unit										
Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
GWP-GHG ¹	kg CO ₂ eq.	2,34E+00	3,37E-03	3,47E+00	5,81E+00	0,00E+00	2,72E-02	0,00E+00	8,76E-01	0,00E+00
PM	Disease inc.	1,464E-07	1,998E-10	1,249E-07	2,715E-07	0,000E+00	1,455E-09	0,000E+00	4,253E-09	0,000E+00
IRP ²	kBq U-235 eq	1,008E-01	2,600E-04	1,832E-01	2,843E-01	0,000E+00	1,770E-03	0,000E+00	7,510E-03	0,000E+00
SQP ³	Pt	-1,838E-01	3,238E-02	7,314E+00	7,162E+00	0,000E+00	1,770E-01	0,000E+00	4,023E-01	0,000E+00
HTTP-C ³	CTUh	1,513E-07	1,999E-10	1,979E-07	3,494E-07	0,000E+00	2,211E-09	0,000E+00	5,129E-07	0,000E+00
HTTP-NC ³	CTUh	8,206E-07	4,344E-10	3,695E-07	1,191E-06	0,000E+00	3,942E-09	0,000E+00	1,045E-06	0,000E+00
Acronyms	GWP-GHG = Global Warming Potential greenhouse gases, PM = Particulate Matter emissions, IR = Ionizing radiation, human health, SQP = Land use related impacts/Soil quality, HTTP-C = Human toxicity, cancer effects, HTTP-NC = Human toxicity, non-cancer effects									

¹ This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO₂ is set to zero.

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.

³ The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

Resource use indicators

Results per functional or declared unit										
Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
PERE	MJ	3,624E+01	5,700E-04	2,635E+00	3,888E+01	0,000E+00	2,030E-03	0,000E+00	3,065E-02	0,000E+00
PERM	MJ	2,730E-02	0,000E+00	0,000E+00	2,730E-02	0,000E+00	0,000E+00	0,000E+00	-2,730E-02	0,000E+00
PERT	MJ	3,627E+01	5,700E-04	2,635E+00	3,890E+01	0,000E+00	2,030E-03	0,000E+00	3,350E-03	0,000E+00
PENRE	MJ	3,471E+01	5,369E-02	1,095E+02	1,443E+02	0,000E+00	4,064E-01	0,000E+00	1,743E+00	0,000E+00
PENRM	MJ	0,000E+00	0,000E+00	0,000E+00	0,000E+00	0,000E+00	0,000E+00	0,000E+00	0,000E+00	0,000E+00
PENRT	MJ	3,471E+01	5,369E-02	1,095E+02	1,443E+02	0,000E+00	4,064E-01	0,000E+00	1,743E+00	0,000E+00
SM	kg	0,000E+00	0,000E+00	0,000E+00	0,000E+00	0,000E+00	0,000E+00	0,000E+00	0,000E+00	0,000E+00
RSF	MJ	0,000E+00	0,000E+00	0,000E+00	0,000E+00	0,000E+00	0,000E+00	0,000E+00	0,000E+00	0,000E+00

NRSF	MJ	0,000E+00	0,000E+00	0,000E+00	0,000E+00	0,000E+00	0,000E+00	0,000E+00	0,000E+00	0,000E+00
FW	m ³	3,471E-02	5,991E-06	4,740E-02	8,212E-02	0,000E+00	5,382E-05	0,000E+00	3,500E-04	0,000E+00
Acronyms	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 re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water									

Waste indicators

Results per functional or declared unit										
Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
Hazardous waste disposed	kg	3,184E-05	1,304E-07	7,700E-04	8,020E-04	0,000E+00	1,062E-06	0,000E+00	1,322E-05	0,000E+00
Non-hazardous waste disposed	kg	7,941E-01	2,360E-03	2,956E-01	1,092E+00	0,000E+00	1,254E-02	0,000E+00	6,972E-01	0,000E+00
Radioactive waste disposed	kg	6,136E-05	3,402E-07	6,855E-05	1,303E-04	0,000E+00	2,403E-06	0,000E+00	1,117E-05	0,000E+00

Output flow indicators

Results per functional or declared unit										
Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
Components for re-use	kg	0,000E+00	0,000E+00	0,000E+00	0,000E+00	0,000E+00	0,000E+00	0,000E+00	0,000E+00	0,000E+00
Material for recycling	kg	0,000E+00	0,000E+00	0,000E+00	0,000E+00	0,000E+00	0,000E+00	0,000E+00	0,000E+00	0,000E+00
Materials for energy recovery	kg	0,000E+00	0,000E+00	0,000E+00	0,000E+00	0,000E+00	0,000E+00	0,000E+00	0,000E+00	0,000E+00
Exported energy, electricity	MJ	0,000E+00	0,000E+00	0,000E+00	0,000E+00	0,000E+00	0,000E+00	0,000E+00	0,000E+00	0,000E+00
Exported energy, thermal	MJ	0,000E+00	0,000E+00	0,000E+00	0,000E+00	0,000E+00	0,000E+00	0,000E+00	0,000E+00	0,000E+00

Mass balance approaches (MBAs), to claim, for example, biobased, renewable, and/or recycled product content, are not applied.

The use of the results of modules A1-A3 (A1-A5 for services) without considering the results of module C is not encouraged.

The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.

References

- PCR 2019:14 Construction products v1.3.3
- EN 15804:2012+A2:2019: Sustainability of construction works — Environmental product declarations — Core rules for the product category of construction product
- ISO 14040: 2006 Environmental management - Life cycle assessment - Principles and framework
- ISO 14044: 2006 Environmental management - Life cycle assessment - Requirements and Guidelines
- ISO 14020: 2002 Environmental labels and declarations- General principles
- ISO 14025: 2006 Environmental labels and declarations - Type III environmental declarations - Principles and procedures
- The International EPD® System; www.environdec.com
- The International EPD® System / The General Programme Instructions; <http://www.environdec.com/tr/The-International-EPD-System/General-Programme-Instructions>
- openLCA Software, ecoinvent 3.8 database; <https://www.openlca.org/openlca>

Contact Information

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Programme



Programme Operator

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LCA practitioner



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