ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025 / ISO 21930

BAGA Effektiv 1hh

Kingspan Water and Energy

EPD HUB, HUB-0482

Publishing date 02 June 2023, last updated on 02 June 2023, valid until 02 December 2024

Created with One Click LCA

GENERAL INFORMATION

MANUFACTURER

Manufacturer	Kingspan Water and Energy
Address	Gåserødveien 11, 3158, Andebu, Norway
Contact details	baga.info@kingspan.com
Website	https://www.kingspan.com/se/sv/affarsenheter/Kingspan-water-energy/

EPD STANDARDS, SCOPE AND VERIFICATION

Program operator	EPD Hub, hub@epdhub.com
Reference standard	EN 15804+A2:2019 and ISO 14025
PCR	EPD Hub Core PCR version 1.0, 1 Feb 2022
Sector	Construction product
Category of EPD	Design phase EPD
Scope of the EPD	Cradle to gate with options, A4-A5, and modules C1-C4, D
EPD author	Michela Ferrando, Kingspan Water & Energy
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal certification ☑ External verification
EPD verifier	HaiHa Nguyen, as an authorized verifier acting for EPD Hub Limited

The manufacturer has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but from different programs may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804 and if they are not compared in a building context.

PRODUCT

Product name	BAGA Effektiv 1hh
Additional labels	-
Product reference	561 6257
Place of production	Andebu, Norway
Period for data	January 2023
Averaging in EPD	No averaging
Variation in GWP-fossil for A1-A3	0 %

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 tank, inlet and outlet pipes, spreader plates and bioModules
Declared unit mass	276.45 kg
GWP-fossil, A1-A3 (kgCO2e)	1,07E3
GWP-total, A1-A3 (kgCO2e)	1,03E3
Secondary material, inputs (%)	1.54
Secondary material, outputs (%)	100.0
Total energy use, A1-A3 (kWh)	4630.0
Total water use, A1-A3 (m3e)	1,47E3

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

Kingspan Water & Energy is an industry leader in the design and manufacture of efficient ways of storing and protecting water and energy. KWE product offering ranges from sewage treatment plants, attenuation tanks, rainwater harvesting and separators to fuel storage tanks and monitoring systems. Kingspan Water & Energy is part of Kingspan Group PLC, global market leader in high-performance building solutions.

PRODUCT DESCRIPTION

BAGA Effektiv consists of one of the markets most efficient sludge separators combined with a bed made up of bioModules and spreader plates. The open construction of the bioModules means that the important oxygen effectively comes into contact with the biological mass that lives on its surface. It provides a very beneficial environment for the biological processes and prevents the risk of clogging. The spreader plates in turn increase the biodegradation capacity even more by distributing the water over the bed or infiltration surface.
The system is designed for domestic and commercial applications.
BAGA Effektiv is available in a variety of sizes and volumes.
Further technical information is available on the Kingspan website: https://www.kingspan.com/se/sv/kunskapsartiklar/baga-effektiv/

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass- %	Material origin
Metals	-	-
Minerals	29	EU, Asia
Fossil materials	71	EU
Bio-based materials	-	-

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	-
Biogenic carbon content in packaging, kg C	8.757

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 tank, inlet and outlet pipes, spreader plates and bioModules
Mass per declared unit	276.45 kg
Functional unit	-
Reference service life	-

SUBSTANCES, REACH - VERY HIGH CONCERN

The product does not contain any REACH SVHC substances in amounts greater than 0,1 % (1000 ppm).

PRODUCT LIFE-CYCLE

SYSTEM BOUNDARY

This EPD covers the life-cycle modules listed in the following table.

Product stage			Assembly stage		Use stage							End of life stage				Beyond the system boundaries		
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D		
x	x	x	x	x	MND	MND	MND	MND	MND	MND	MND	x	x	x	x	x		
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstr./demol.	Transport	Waste processing	Disposal	Reuse	Recovery	Recycling

Modules not declared = MND. Modules not relevant = MNR.

MANUFACTURING AND PACKAGING (A1-A3)

The environmental impacts considered for the product stage cover the manufacturing of raw materials used in the production as well as packaging materials and other ancillary materials. Also, fuels used by machines, and handling of waste formed in the production processes at the manufacturing facilities are included in this stage. The study also considers the material losses occurring during the manufacturing processes as well as losses during electricity transmission.

The BAGA Effektiv sludge separator tank is manufactured in GRP (Glass Reinforced Plastic) via direct spray lay-up. Fibre glass strands, polyester resin combined with calcium carbonate and catalyst are added together and the mix is sprayed over a mould with an air compressed spray gun. The fibre glass strands are chopped through the process. Once that full coverage is assured, the mixture is compacted with a roller and left to cure. The part is then removed from the mould. The process is completed by trimming excess fibreglass where needed, putting 3 parts together to form the shape of the tank, spraying the joints with the same mix of materials used for the tank manufacturing and curing.

The BAGA Effektiv sludge separator is provided with a package(s) of bioModules bed and spreader plates, both manufactured externally by a third-party supplier. The final product is then placed on wooden pallets.

TRANSPORT AND INSTALLATION (A4-A5)

Transportation impacts occurred from final products delivery to construction site (A4) cover fuel direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions.

Transportation of the products accounts for delivery to a distribution centre (600km) and following site delivery for installation, estimated to be within a 100km distance. The sales area for BAGA products comprises Sweden and the Nordics.

Planning and installation work for the sludge separator tank and bioModules are carried out by professionals and BAGA-trained contractors. Installation guidelines are provided by BAGA. The installation scenario assumes excavation works with a diesel-powered digger (140 kWh), a crane (2kWh), 10m3 of crushed gravel for the tank backfilling and a 4.8m3 of sand for reinforced infiltration. Installation losses do not generally occur, and packaging wooden pallets are widely reused.

PRODUCT USE AND MAINTENANCE (B1-B7)

This EPD does not cover the use phase.

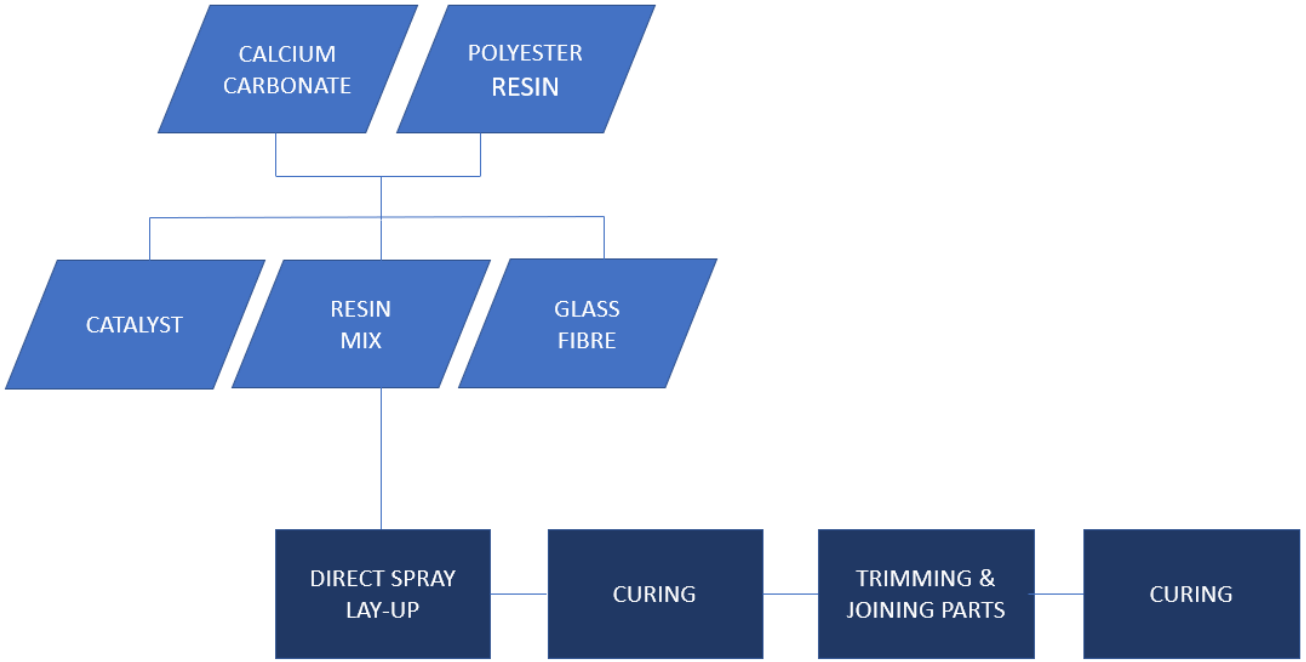
Air, soil, and water impacts during the use phase have not been studied.

PRODUCT END OF LIFE (C1-C4, D)

Estimated lifespan for the BAGA Effektiv sludge separator tank is 25 years. For the removal of the tank, excavation works with a diesel digger (140 kWh) and the assistance of a crane (2 kWh) are estimated. Due to continuous exposure to waste liquids and materials throughout the tank's lifecycle and consequent contamination, at the end of service life the

product should be send for incineration with energy recovery. In Module D, the net benefit of incinerating the tank and plastic components is accounted for, as electricity and heat production.

MANUFACTURING PROCESS



LIFE-CYCLE ASSESSMENT

CUT-OFF CRITERIA

The study does not exclude any modules or processes which are stated mandatory in the reference standard and the applied PCR. The study does not exclude any hazardous materials or substances. The study includes all major raw material and energy consumption. All inputs and outputs of the unit processes, for which data is available for, are included in the calculation. There is no neglected unit process more than 1% of total mass or energy flows. The module specific total neglected input and output flows also do not exceed 5% of energy usage or mass.

ALLOCATION, ESTIMATES AND ASSUMPTIONS

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation. All allocations are done as per the reference standards and the applied PCR. In this study, allocation has been done in the following ways:

Data type	Allocation
Raw materials	No allocation
Packaging materials	No allocation
Ancillary materials	Allocated by mass or volume
Manufacturing energy and waste	Allocated by mass or volume

AVERAGES AND VARIABILITY

Type of average	No averaging
Averaging method	Not applicable
Variation in GWP-fossil for A1-A3	0 %

This EPD is product and factory specific and does not contain average calculations.

LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator. The LCA and EPD have been prepared according to the reference standards and ISO 14040/14044. Ecoinvent and One Click LCA databases were used as sources of environmental data.

ENVIRONMENTAL IMPACT DATA

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total[1)]	kg CO_2e	9,25E2	9,3E1	1,54E1	1,03E3	1,93E1	2,01E2	MND	MND	MND	MND	MND	MND	MND	4,63E1	5,19E-1	7,04E2	0E0	-2,17E2
GWP – fossil	kg CO_2e	9,23E2	9,3E1	5,13E1	1,07E3	1,94E1	1,66E2	MND	MND	MND	MND	MND	MND	MND	4,63E1	5,19E-1	7,05E2	0E0	-2,55E2
GWP – biogenic	kg CO_2e	1,2E0	0E0	-3,6E1	-3,48E1	0E0	3,59E1	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	-1,12E0	0E0	3,76E1
GWP – LULUC	kg CO_2e	6,18E-1	5,94E-2	6,86E-2	7,46E-1	6,99E-3	6,32E-2	MND	MND	MND	MND	MND	MND	MND	4,61E-3	1,91E-4	7,68E-3	0E0	-1,93E-1
Ozone depletion pot.	kg $CFC_{-11}e$	9,93E-5	1,81E-5	4,03E-6	1,21E-4	4,64E-6	3,43E-5	MND	MND	MND	MND	MND	MND	MND	9,9E-6	1,19E-7	2,62E-6	0E0	-1,39E-5
Acidification potential	mol H^+e	4,1E0	5,56E-1	1,71E-1	4,83E0	8,11E-2	1,35E0	MND	MND	MND	MND	MND	MND	MND	4,81E-1	2,2E-3	1,31E-1	0E0	-2,08E0
EP-freshwater[2)]	kg Pe	2,64E-2	1,09E-3	7,17E-4	2,82E-2	1,33E-4	1,55E-3	MND	MND	MND	MND	MND	MND	MND	1,53E-4	4,25E-6	2,49E-4	0E0	-1,02E-2
EP-marine	kg Ne	7,09E-1	1,89E-1	5,77E-2	9,55E-1	2,46E-2	5,27E-1	MND	MND	MND	MND	MND	MND	MND	2,13E-1	6,53E-4	5,69E-2	0E0	-2,39E-1
EP-terrestrial	mol Ne	7,81E0	2,08E0	6,37E-1	1,05E1	2,71E-1	5,9E0	MND	MND	MND	MND	MND	MND	MND	2,34E0	7,2E-3	6,26E-1	0E0	-2,8E0
POCP ("smog")[3)]	kg NMVOCe	2,98E0	5,93E-1	3,59E0	7,17E0	8,71E-2	1,62E0	MND	MND	MND	MND	MND	MND	MND	6,43E-1	2,3E-3	1,62E-1	0E0	-7,82E-1
ADP-minerals & metals[4)]	kg Sbe	2,44E-2	3,52E-4	2,12E-4	2,49E-2	4,56E-5	1,08E-3	MND	MND	MND	MND	MND	MND	MND	2,35E-5	1,22E-6	1,05E-4	0E0	-4,86E-4
ADP-fossil resources	MJ	1,66E4	1,31E3	6,28E2	1,85E4	2,97E2	2,49E3	MND	MND	MND	MND	MND	MND	MND	6,23E2	7,79E0	8,39E1	0E0	-2,51E3
Water use[5)]	m^3e depr.	5,24E2	8,67E0	2,9E1	5,61E2	1,37E0	4,87E1	MND	MND	MND	MND	MND	MND	MND	1,68E0	3,49E-2	9,88E0	0E0	-7,67E2

1) GWP = Global Warming Potential; 2) EP = Eutrophication potential. Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO4e; 3) POCP = Photochemical ozone formation; 4) ADP = Abiotic depletion potential; 5) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

USE OF NATURAL RESOURCES

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Renew. PER as energy[8)]	MJ	9,11E2	3,09E1	4,79E2	1,42E3	3,85E0	3,01E2	MND	MND	MND	MND	MND	MND	MND	3,56E0	8,78E-2	7,22E0	0E0	-2,92E3
Renew. PER as material	MJ	0E0	0E0	3,14E2	3,14E2	0E0	-3,14E2	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	-3,56E2
Total use of renew. PER	MJ	9,11E2	3,09E1	7,93E2	1,73E3	3,85E0	-1,32E1	MND	MND	MND	MND	MND	MND	MND	3,56E0	8,78E-2	7,22E0	0E0	-3,28E3
Non-re. PER as energy	MJ	1,33E4	1,31E3	6,05E2	1,52E4	2,97E2	2,49E3	MND	MND	MND	MND	MND	MND	MND	6,23E2	7,79E0	8,39E1	0E0	-2,51E3
Non-re. PER as material	MJ	6,98E3	0E0	2,25E1	7,01E3	0E0	-2,25E1	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	-6,98E3	0E0	-2,2E1
Total use of non-re. PER	MJ	2,03E4	1,31E3	6,28E2	2,23E4	2,97E2	2,47E3	MND	MND	MND	MND	MND	MND	MND	6,23E2	7,79E0	-6,9E3	0E0	-2,53E3
Secondary materials	kg	2,01E0	8,34E-1	1,41E0	4,25E0	8,39E-2	1,94E0	MND	MND	MND	MND	MND	MND	MND	2,44E-1	2,16E-3	1,09E-1	0E0	-2,56E-2
Renew. secondary fuels	MJ	1,99E0	5,34E-3	1,06E1	1,26E1	7,4E-4	1,15E-2	MND	MND	MND	MND	MND	MND	MND	7,97E-4	2,18E-5	1,03E-3	0E0	-1,92E-3

Non-ren. secondary fuels	MJ	0E0	0E0	0E0	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Use of net fresh water	m^3	1,47E3	2,22E-1	6,55E-1	1,47E3	3,95E-2	3,52E1	MND	MND	MND	MND	MND	MND	MND	3,79E-2	1,01E-3	2,4E-1	0E0	-1,93E1

8) PER = Primary energy resources.

END OF LIFE – WASTE

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste	kg	3,71E1	3,04E0	2,3E0	4,24E1	3,19E-1	6,31E0	MND	MND	MND	MND	MND	MND	MND	8,34E-1	1,03E-2	9,74E-4	0E0	-2,12E1
Non-hazardous waste	kg	1,06E3	4,57E1	2,95E1	1,13E3	5,55E0	6,52E1	MND	MND	MND	MND	MND	MND	MND	5,86E0	1,7E-1	2,76E2	0E0	-8,56E2
Radioactive waste	kg	2,88E-2	8,58E-3	4,48E-3	4,19E-2	2,05E-3	1,83E-2	MND	MND	MND	MND	MND	MND	MND	4,39E-3	5,21E-5	3,07E-7	0E0	-8,62E-3

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	0E0	0E0	0E0	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	2,45E4	0E0	0E0	0E0	0E0
Materials for recycling	kg	0E0	0E0	0E0	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	3,9E-1	0E0	0E0
Materials for energy rec	kg	0E0	0E0	0E0	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	2,76E2	0E0	0E0
Exported energy	MJ	0E0	0E0	1,6E0	1,6E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	4,13E3	0E0	0E0

ENVIRONMENTAL IMPACTS – EN 15804+A1, CML / ISO 21930

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Global Warming Pot.	kg CO_2e	8,84E2	9,19E1	5,07E1	1,03E3	1,93E1	1,64E2	MND	MND	MND	MND	MND	MND	MND	4,58E1	5,14E-1	7,05E2	0E0	-2,5E2
Ozone depletion Pot.	kg $CFC_{-11}e$	6,76E-5	1,44E-5	3,35E-6	8,53E-5	3,68E-6	2,72E-5	MND	MND	MND	MND	MND	MND	MND	7,84E-6	9,45E-8	2,57E-6	0E0	-1,12E-5
Acidification	kg SO_2e	3,42E0	4,22E-1	1,29E-1	3,97E0	6,29E-2	9,82E-1	MND	MND	MND	MND	MND	MND	MND	3,43E-1	1,71E-3	9,21E-2	0E0	-1,78E0
Eutrophication	kg PO_4^3e	1,38E0	1,04E-1	6,26E-2	1,55E0	1,41E-2	2,54E-1	MND	MND	MND	MND	MND	MND	MND	7,96E-2	3,89E-4	1,38E-1	0E0	-3,68E-1
POCP (“smog”)	kg C_2H_4e	2,52E-1	1,54E-2	1,07E-2	2,78E-1	2,47E-3	2,94E-2	MND	MND	MND	MND	MND	MND	MND	7,51E-3	6,66E-5	3,29E-3	0E0	-7,84E-2
ADP-elements	kg Sbe	7,17E-3	3,45E-4	2,08E-4	7,72E-3	4,44E-5	1,07E-3	MND	MND	MND	MND	MND	MND	MND	2,31E-5	1,18E-6	6,44E-5	0E0	-4,8E-4
ADP-fossil	MJ	2,03E4	1,31E3	6,27E2	2,23E4	2,97E2	2,49E3	MND	MND	MND	MND	MND	MND	MND	6,23E2	7,79E0	8,38E1	0E0	-2,51E3

VERIFICATION STATEMENT

VERIFICATION PROCESS FOR THIS EPD

This EPD has been verified in accordance with ISO 14025 by an independent, third-party verifier by reviewing results, documents and compliancy with reference standard, ISO 14025 and ISO 14040/14044, following the process and checklists of the program operator for:

- This Environmental Product Declaration
- The Life-Cycle Assessment used in this EPD
- The digital background data for this EPD

Why does verification transparency matter? Read more online
This EPD has been generated by One Click LCA EPD generator, which has been verified and approved by the EPD Hub.

THIRD-PARTY VERIFICATION STATEMENT

I hereby confirm that, following detailed examination, I have not established any relevant deviations by the studied Environmental Product Declaration (EPD), its LCA and project report, in terms of the data collected and used in the LCA calculations, the way the LCA-based calculations have been carried out, the presentation of environmental data in the EPD, and other additional environmental information, as present with respect to the procedural and methodological requirements in ISO 14025:2010 and reference standard.

I confirm that the company-specific data has been examined as regards plausibility and consistency; the declaration owner is responsible for its factual integrity and legal compliance.

I confirm that I have sufficient knowledge and experience of construction products, this specific product category, the construction industry, relevant standards, and the geographical area of the EPD to carry out this verification.

I confirm my independence in my role as verifier; I have not been involved in the execution of the LCA or in the development of the declaration and have no conflicts of interest regarding this verification.

HaiHa Nguyen, as an authorized verifier acting for EPD Hub Limited
02.06.2023

VERIFIED ISO 14025