ENVIRONMENTAL PRODUCT DECLARATION

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

Silencers - Metal coated steel

BEVENT RASCH

EPD HUB, HUB-2347
Publishing date 11 December 2024, last updated on 11 December 2024, valid until 11 December 2029.

Created with One Click LCA

BEVENT RASCH

GENERAL INFORMATION

MANUFACTURER

Manufacturer	Bevent Rasch AB
Address	Skaraborgsvägen 6 | 506 30 Borås | Sweden
Contact details	info@bevent-rasch.se
Website	www.bevent-rasch.se

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 1.1, 5 Dec 2023
Sector	Construction product
Category of EPD	Third party verified EPD
Parent EPD number	-
Scope of the EPD	Cradle to gate with options, A4-A5, and modules C1-C4, D
EPD author	Tobias Jakobsson
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal verification ☑ External verification
EPD verifier	Magaly González Vázquez, 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	Silencers - Metal coated steel
Additional labels	-
Product reference	-
Place of production	Norrsten, 591 92 Motala, Sweden
Period for data	Calender year 2023
Averaging in EPD	Multiple products
Variation in GWP-fossil for A1-A3	17 %

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 kg of product
Declared unit mass	1 kg
GWP-fossil, A1-A3 ($kgCO_2e$)	2,89E+00
GWP-total, A1-A3 ($kgCO_2e$)	2,77E+00
Secondary material, inputs (%)	2.41
Secondary material, outputs (%)	57.7
Total energy use, A1-A3 (kWh)	14.9
Net freshwater use, A1-A3 (m^3)	0.01

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

Bevent Rasch is an industry-leading manufacturer of ventilation products in Sweden and the Nordic countries, with collaboration partners on the export market. Our products are at the forefront of development and have long set standards followed by the rest of the industry. With innovation, technology, and a long-term perspective as watchwords, we develop smart, high-tech solutions and safe installation methods, delivered with uncompromising timeliness.

PRODUCT DESCRIPTION

Bevent Rasch offers a wide range of duct silencers in which glass wool or mineral wool are used as sound-absorbing materials. This Environmental Product Declaration (EPD) encompasses all rectangular silencers offered by Bevent Rasch. As standard the duct silencers are manufactured using hot-dipped galvanised steel plate in corrosivity category C3, but duct silencers can also be customised according to specific requirements. A representative product has been selected based on material composition and sales data. To ensure accuracy, the product with the highest and lowest steel content has been modeled, demonstrating that all products fall within the EPD's specified limits.

Further information can be found at https://www.bevent-rasch.se/.

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass %	Material origin
Metals	64,16	Europe
Minerals	35,84	Europe
Fossil materials	-	-
Bio-based materials	-	-

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	0
Biogenic carbon content in packaging, kg C	0.034

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 kg of product
Mass per declared unit	1 kg
Functional unit	-
Reference service life	50 years

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	Deconstruction/ demolition	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 raw materials and components (A1) are predominantly sourced from European suppliers, with a few minor components sourced from Asian countries. The final products manufacturing (A3) occurs in Motala, Sweden. This manufacturing process entails cutting and shaping steel sheets, cutting of mineral wool, assembling, and packaging. The primary production losses occur during the cutting of steel sheets and the cutting of mineral wool, production losses not related to the specific products are not included. Waste generated at the factory is sent for recycling. All operations at the factory site are powered by electricity, which is fossil-free. Approximately 30% of this electricity is generated from on-site solar cells.

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.

The assumed average transportation distance from the production plant to the building site is 250 km, utilizing lorries as the transportation method. It is assumed that the vehicle capacity utilization volume factor is 100%, indicating a full load. Although in reality, this factor may vary, the impact of transportation emissions on the overall results is considered minor, thus variations in load are regarded as negligible for this study. As a conservative measure, empty returns are factored into this analysis, incorporated through an average load factor within the Ecoinvent transport datapoints. Proper packaging ensures that transportation does not incur losses for the products being transported. Installation loss of the product is estimated to be zero. The waste generated during installation originates from the packaging and pallets. This waste has been modeled using EU averages, with references to Europal (2023) and Eurostat & PSR-0014 v2 (2023).

It is assumed that no energy is needed during the installation process, except for human labor. However, the impact arises from the waste treatment of the packaging materials. The transportation of this waste is modeled using the transportation distance to treatment is assumed as 50 km and the transportation method is assumed to be lorry.

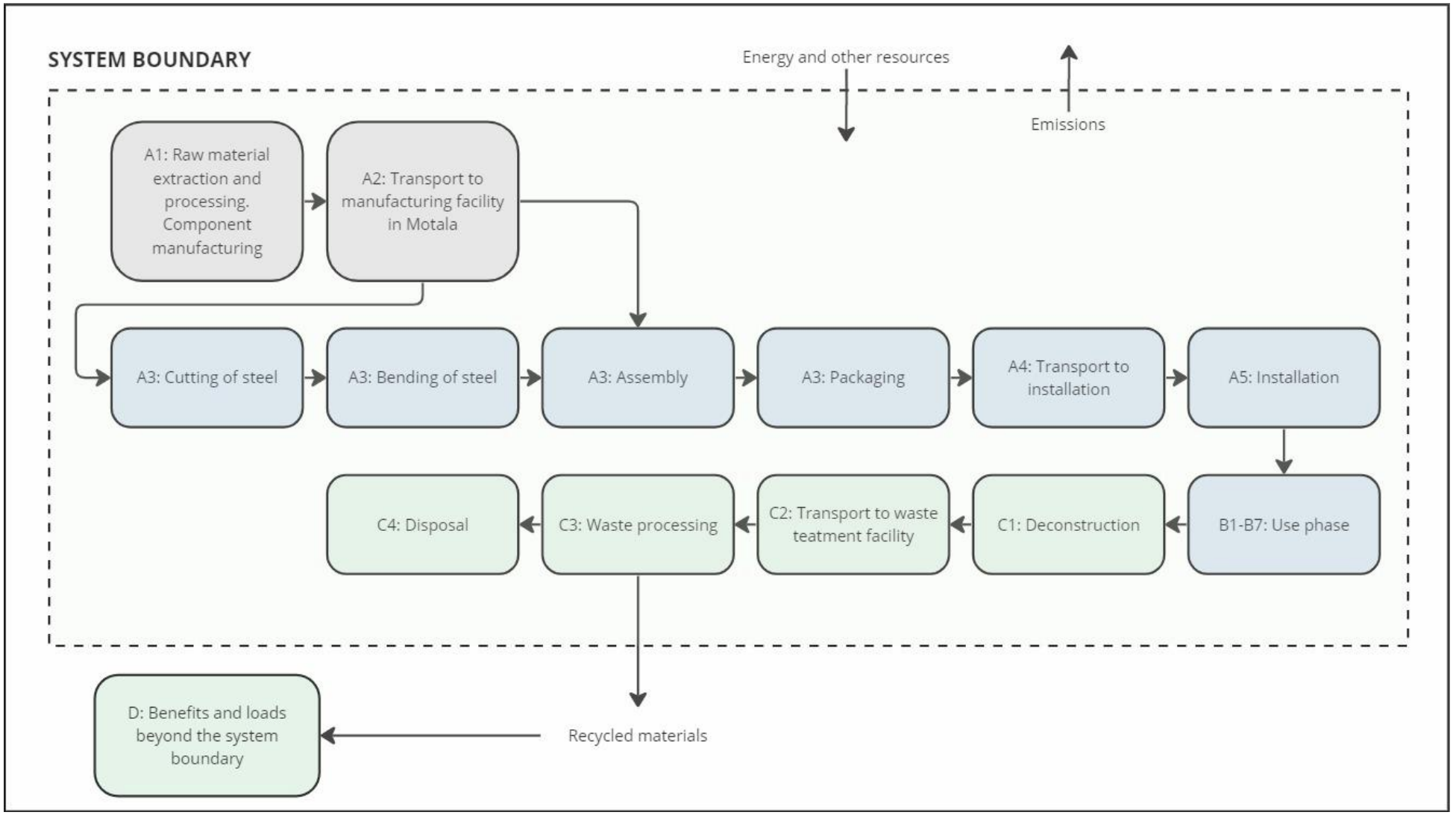
PRODUCT USE AND MAINTENANCE (B1-B7)

The reference service life is determined to be 50 years, based on its material composition and its intended use. The product is assumed to have no environmental impacts during the use phase; therefore, these modules are not included in the analysis. Air, soil, and water impacts during the use phase have not been studied.

PRODUCT END OF LIFE (C1-C4, D)

It is assumed that 100% of the waste is collected and transported to the waste treatment center. During deconstruction only manual labor is assumed. For conservative values 0,01 kWh of Diesel burned in machine is added (C1). Transportation distance to treatment is assumed as 50 km and the transportation method is assumed to be lorry (C2). Approximately 90% of steel is assumed to be recycled based on European Comission 2020 (C3). It is assumed that the remaining 10% of steel is taken to landfill for final disposal (C4). Due to the recycling process, the end-of-life product is converted into recycled steel, while the wooden pallet is partly recycled and mostly incinerated with energy recovery (D). The raw material, which contains 20% recycled steel, is deducted from the 90%. Thus, 70% of the net flow of steel is to be credited in Module D. For mineral wool it is assumed that 100% goes to landfil for final disposal (C4).

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 material	No allocation
Ancillary materials	Allocated by mass or volume
Manufacturing energy and waste	Allocated by mass or volume

AVERAGES AND VARIABILITY

Type of average	Multiple products
Averaging method	Representative product
Variation in GWP-fossil for A1-A3	17 %

All products are manufactured at the same site in Motala, Sweden and goes through the same processes.

The Silencers manufactured are made from SSAB galvanized steel sheets, insulation/mineral wool and fasteners. The range of the percentage of steel sheet in these products is 40-93%. The reference product, which is a typical product, contains 63,9 % steel sheet, with the remainder being mainly insulation/mineral wool and a small amount of fasteners.

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. The EPD Generator uses Ecoinvent v3.8, Plastics Europe, Federal LCA Commons and One Click LCA databases 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	2,68E+00	9,88E-02	-7,43E-03	2,77E+00	4,57E-02	1,42E-01	MND	MND	MND	MND	MND	MND	MND	3,31E-03	4,70E-03	1,26E-02	2,23E-03	-7,83E-01
GWP – fossil	kg CO_2e	2,68E+00	9,88E-02	1,14E-01	2,89E+00	4,56E-02	1,73E-02	MND	MND	MND	MND	MND	MND	MND	3,31E-03	4,69E-03	1,26E-02	2,23E-03	-7,83E-01
GWP – biogenic	kg CO_2e	0,00E+00	0,00E+00	-1,25E-01	-1,25E-01	0,00E+00	1,25E-01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
GWP – LULUC	kg CO_2e	9,45E-04	6,67E-05	3,42E-03	4,43E-03	1,79E-05	1,63E-06	MND	MND	MND	MND	MND	MND	MND	3,30E-07	1,73E-06	1,66E-05	2,10E-06	-1,71E-04
Ozone depletion pot.	kg $CFC\text{-}_{11}$e	3,12E-08	2,00E-08	8,45E-09	5,96E-08	1,06E-08	2,87E-10	MND	MND	MND	MND	MND	MND	MND	7,07E-10	1,08E-09	1,56E-09	9,01E-10	-3,10E-08
Acidification potential	mol H^+e	1,12E-02	1,77E-03	6,23E-04	1,36E-02	1,85E-04	1,32E-05	MND	MND	MND	MND	MND	MND	MND	3,44E-05	1,99E-05	1,61E-04	2,10E-05	-3,33E-03
EP-freshwater[2)]	kg Pe	2,41E-05	1,04E-06	5,23E-06	3,04E-05	3,20E-07	4,87E-08	MND	MND	MND	MND	MND	MND	MND	1,10E-08	3,84E-08	6,78E-07	2,34E-08	-3,27E-05
EP-marine	kg Ne	1,99E-03	4,62E-04	1,52E-04	2,60E-03	5,53E-05	5,92E-06	MND	MND	MND	MND	MND	MND	MND	1,52E-05	5,91E-06	3,39E-05	7,25E-06	-6,63E-04
EP-terrestrial	mol Ne	2,48E-02	5,12E-03	1,69E-03	3,16E-02	6,10E-04	5,26E-05	MND	MND	MND	MND	MND	MND	MND	1,67E-04	6,52E-05	3,92E-04	7,98E-05	-7,73E-03
POCP ("smog")[3)]	kg NMVOCe	7,05E-03	1,36E-03	5,40E-04	8,95E-03	1,87E-04	1,50E-05	MND	MND	MND	MND	MND	MND	MND	4,59E-05	2,08E-05	1,08E-04	2,32E-05	-3,85E-03
ADP-minerals & metals[4)]	kg Sbe	1,52E-04	2,21E-07	1,64E-06	1,54E-04	1,62E-07	8,31E-09	MND	MND	MND	MND	MND	MND	MND	1,68E-09	1,10E-08	1,70E-06	5,12E-09	-1,43E-05
ADP-fossil resources	MJ	3,12E+01	1,37E+00	1,39E+01	4,64E+01	6,77E-01	2,71E-02	MND	MND	MND	MND	MND	MND	MND	4,45E-02	7,05E-02	1,71E-01	6,11E-02	-7,11E+00
Water use[5)]	m^3e depr.	2,98E-01	8,49E-03	3,51E-01	6,58E-01	3,13E-03	2,52E-03	MND	MND	MND	MND	MND	MND	MND	1,20E-04	3,15E-04	3,32E-03	1,94E-04	-1,44E-01

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.

ADDITIONAL (OPTIONAL) 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
Particulate matter	Incidence	3,30E-08	7,13E-09	1,07E-08	5,08E-08	3,94E-09	2,03E-10	MND	MND	MND	MND	MND	MND	MND	9,22E-10	5,41E-10	2,10E-09	4,22E-10	-5,32E-08
Ionizing radiation[6)]	kBq U235e	2,20E-02	8,45E-03	9,12E-01	9,42E-01	3,55E-03	2,31E-04	MND	MND	MND	MND	MND	MND	MND	2,05E-04	3,36E-04	1,91E-03	2,76E-04	2,11E-02
Ecotoxicity (freshwater)	CTUe	1,47E+01	1,09E+00	4,45E+00	2,02E+01	5,62E-01	3,32E-02	MND	MND	MND	MND	MND	MND	MND	2,68E-02	6,34E-02	7,76E-01	3,99E-02	-2,74E+01
Human toxicity, cancer	CTUh	2,29E-09	5,46E-11	2,46E-10	2,59E-09	1,74E-11	3,13E-12	MND	MND	MND	MND	MND	MND	MND	1,03E-12	1,56E-12	2,38E-11	9,96E-13	6,30E-09
Human tox. non-cancer	CTUh	7,46E-09	9,51E-10	2,45E-09	1,09E-08	5,71E-10	1,01E-10	MND	MND	MND	MND	MND	MND	MND	1,94E-11	6,28E-11	1,06E-09	2,61E-11	-1,83E-08
SQP[7)]	-	3,03E+00	9,04E-01	1,26E+01	1,65E+01	4,74E-01	3,52E-02	MND	MND	MND	MND	MND	MND	MND	5,79E-03	8,12E-02	3,45E-01	1,31E-01	-6,66E+00

6) EN 15804+A2 disclaimer for Ionizing radiation, human health. 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; 7) SQP = Land use related impacts/soil quality.

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	1,95E+00	3,32E-02	5,96E+00	7,95E+00	9,72E-03	1,39E-03	MND	MND	MND	MND	MND	MND	MND	2,54E-04	7,94E-04	3,04E-02	5,30E-04	-1,01E+00
Renew. PER as material	MJ	0,00E+00	0,00E+00	1,09E+00	1,09E+00	0,00E+00	-1,09E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of renew. PER	MJ	1,95E+00	3,32E-02	7,05E+00	9,04E+00	9,72E-03	-1,09E+00	MND	MND	MND	MND	MND	MND	MND	2,54E-04	7,94E-04	3,04E-02	5,30E-04	-1,01E+00
Non-re. PER as energy	MJ	3,12E+01	1,37E+00	1,33E+01	4,58E+01	6,77E-01	2,71E-02	MND	MND	MND	MND	MND	MND	MND	4,45E-02	7,05E-02	1,71E-01	6,11E-02	-6,95E+00
Non-re. PER as material	MJ	0,00E+00	0,00E+00	5,63E-01	5,63E-01	0,00E+00	-5,63E-01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of non-re. PER	MJ	3,12E+01	1,37E+00	1,38E+01	4,64E+01	6,77E-01	-5,36E-01	MND	MND	MND	MND	MND	MND	MND	4,45E-02	7,05E-02	1,71E-01	6,11E-02	-6,95E+00
Secondary materials	kg	2,41E-02	6,92E-04	5,08E-03	2,98E-02	2,27E-04	3,00E-05	MND	MND	MND	MND	MND	MND	MND	1,74E-05	1,96E-05	1,91E-04	1,28E-05	4,34E-01
Renew. secondary fuels	MJ	7,83E-05	2,98E-06	3,72E-02	3,73E-02	2,50E-06	2,74E-07	MND	MND	MND	MND	MND	MND	MND	5,70E-08	1,98E-07	9,92E-06	3,35E-07	-7,24E-05
Non-ren. secondary fuels	MJ	8,31E-22	0,00E+00	0,00E+00	8,31E-22	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m^3	4,40E-03	2,28E-04	8,70E-03	1,33E-02	8,52E-05	1,19E-05	MND	MND	MND	MND	MND	MND	MND	2,70E-06	9,13E-06	1,00E-04	6,69E-05	-1,96E-03

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	9,62E-02	2,54E-03	1,13E-02	1,10E-01	7,60E-04	6,72E-05	MND	MND	MND	MND	MND	MND	MND	5,96E-05	9,35E-05	1,16E-03	0,00E+00	-2,51E-01
Non-hazardous waste	kg	9,44E-01	4,48E-02	1,90E-01	1,18E+00	1,35E-02	6,95E-02	MND	MND	MND	MND	MND	MND	MND	4,19E-04	1,54E-03	3,72E-02	4,23E-01	-1,34E+00
Radioactive waste	kg	4,69E-04	9,38E-06	1,97E-04	6,76E-04	4,67E-06	8,89E-08	MND	MND	MND	MND	MND	MND	MND	3,13E-07	4,72E-07	1,00E-06	0,00E+00	2,68E-08

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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	kg	0,00E+00	0,00E+00	2,85E-01	2,85E-01	0,00E+00	3,07E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	5,77E-01	0,00E+00	0,00E+00
Materials for energy rec	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,18E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,27E-01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

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	2,60E+00	9,78E-02	1,15E-01	2,81E+00	4,52E-02	1,93E-02	MND	MND	MND	MND	MND	MND	MND	3,27E-03	4,65E-03	1,24E-02	2,18E-03	-7,42E-01
Ozone depletion Pot.	kg CFC_{-11}e	3,08E-08	1,58E-08	7,22E-09	5,39E-08	8,37E-09	2,32E-10	MND	MND	MND	MND	MND	MND	MND	5,60E-10	8,55E-10	1,26E-09	7,13E-10	-3,40E-08
Acidification	kg SO_2e	9,08E-03	1,40E-03	4,91E-04	1,10E-02	1,44E-04	9,84E-06	MND	MND	MND	MND	MND	MND	MND	2,45E-05	1,54E-05	1,30E-04	1,58E-05	-2,70E-03
Eutrophication	kg PO_4^3e	1,68E-03	1,96E-04	2,45E-04	2,12E-03	3,27E-05	1,19E-04	MND	MND	MND	MND	MND	MND	MND	5,69E-06	3,52E-06	4,28E-05	3,41E-06	-1,33E-03
POCP (“smog”)	kg C_2H_4e	6,92E-04	3,84E-05	4,35E-05	7,73E-04	5,89E-06	8,98E-07	MND	MND	MND	MND	MND	MND	MND	5,36E-07	6,03E-07	4,90E-06	6,64E-07	-4,37E-04
ADP-elements	kg Sbe	1,52E-04	2,16E-07	1,66E-06	1,54E-04	1,58E-07	8,00E-09	MND	MND	MND	MND	MND	MND	MND	1,65E-09	1,07E-08	1,70E-06	5,05E-09	-1,42E-05
ADP-fossil	MJ	3,00E+01	1,37E+00	1,38E+01	4,52E+01	6,77E-01	2,71E-02	MND	MND	MND	MND	MND	MND	MND	4,45E-02	7,05E-02	1,71E-01	6,11E-02	-7,11E+00

ENVIRONMENTAL IMPACTS – GWP-GHG - THE INTERNATIONAL EPD SYSTEM

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-GHG[9)]	kg CO_2e	2,68E+00	9,88E-02	1,14E-01	2,89E+00	4,56E-02	1,73E-02	MND	MND	MND	MND	MND	MND	MND	3,31E-03	4,69E-03	1,26E-02	2,23E-03	-7,83E-01

9) This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product as defined by IPCC AR 5 (IPCC 2013). In addition, the characterisation factors for the flows - CH4 fossil, CH4 biogenic and Dinitrogen monoxide - were updated in line with the guidance of IES PCR 1.2.5 Annex 1. This indicator is identical to the GWP-total of EN 15804:2012+A2:2019 except that the characterization factor for biogenic CO2 is set to zero.

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

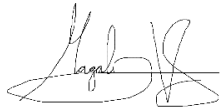
I hereby confirm that, following detailed examination, I have not established any relevant deviations by the studied Environmental Product Declaration (EPD), its LCA and project report, in terms of the data collected and used in the LCA calculations, the way the LCA-based calculations have been carried 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.

Magaly González Vázquez, as an authorized verifier acting for EPD Hub Limited
11.12.2024



VERIFIED ISO 14025

Appendix 1

Rectangular silencers model weight, circular silencers not included in EPD

**The weight is accurate as of the date of publication; any adjustments are detailed in the data sheet.*

LFAL

The weight is calculated according to: W x H x L x 52 = kg where W, H and L are stated in meters.

Width, height and length are selected for the specific product according to (for standard dimensions, see table):

Width (W) = 300 - 1200 mm
Height (H) = 150 - 300 mm
Length (L) = 600 - 1200 mm

LFAR

The weight is calculated according to: B+0,2 x H x L x F_V = kg where W, H and L are stated in meters.

Width, height and length are selected for the specific product according to (for standard dimensions, see table):

Width (W) = 300 - 1500 mm
Height (H) = 300 - 1200 mm
Length (L) = 600 - 2500 mm

LFAR	Type 1	Type 2	Type 3
Factor F_V	160	100	90

LFIK

The weight is calculated according to: (W+0,2) x H x L x F_V = kg where W, H and L are given in meters.

Width, height and length are selected for the specific product according to (for standard dimensions, see table):

Width (W) = 300 - 2000 mm
Height (H) = 300 - 2000 mm
Length (L) = 600 - 2400 mm

LFIK	Type 1	Type 2	Type 3
Factor F_V	96	62	42

LFIV

The weight is calculated according to: (X+0.2) x Y x L x F_V= kg where X, Y and L are stated in meters.

Width, height and length are selected for the specific product according to (for standard dimensions, see table):

X = 300 - 2000 mm
Y = 300 - 2000 mm
Centre Length (L) = 600 - 2400 mm

LFIV	Type 1	Type 2	Type 3
Factor F_V	96	62	42

LFAS Type 1 without middle baffle

Ød mm	L mm	W mm	H mm	Weight kg
100	500	226	160	4,2
	1000	226	160	8,3
125	500	250	186	5,3
	1000	250	186	10
160	500	286	220	6,3
	1000	286	220	12
200	500	346	260	8,1
	1000	346	260	16
250	500	396	310	9,5
	1000	396	310	19
315	500	460	376	12
	1000	460	376	24
400	500	546	460	17
	1000	546	460	31

LFAS Type 2 with middle baffle

Ød mm	L mm	W mm	H mm	Weight kg
250	500	396	310	13
	1000	396	310	27
315	500	460	376	16
	1000	460	376	34
400	500	546	460	23
	1000	546	460	44

LFAS-L

Ød mm	L mm	W mm	H mm	Weight kg
100	500	265	123	3,8
	1000	265	123	7,1
125	500	288	149	4,3
	1000	288	149	8,2
160	500	327	183	5,2
	1000	327	183	10
200	500	367	223	6,4
	1000	367	223	12,3
250	500	415	273	7,9
	1000	415	273	14,6
315	500	481	339	9,8
	1000	481	339	17,9
400	500	565	423	12,2
	1000	565	423	22,3