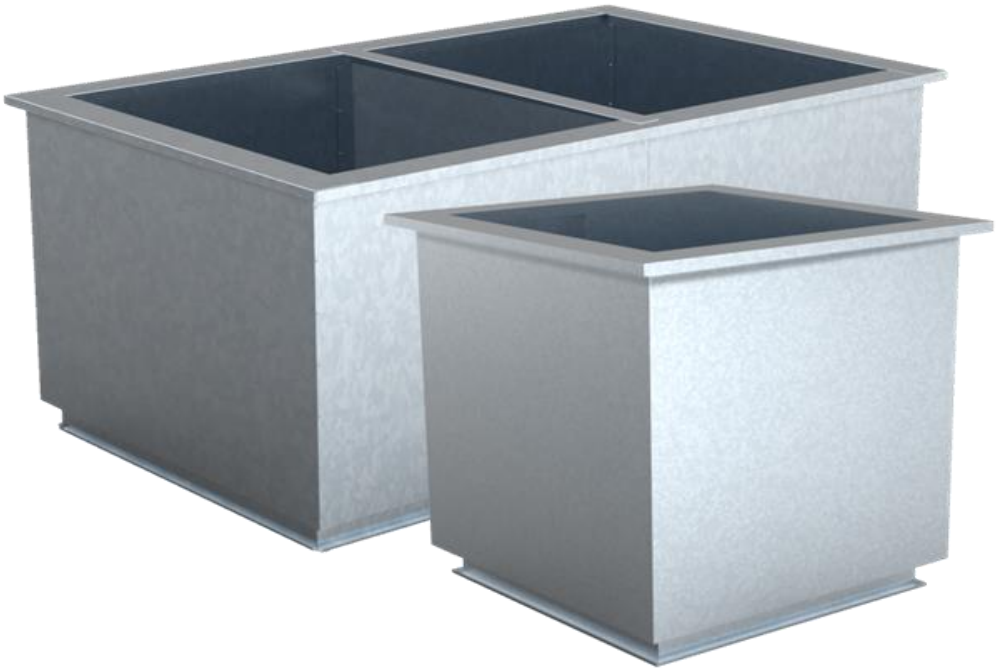
ENVIRONMENTAL PRODUCT DECLARATION

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

Roof Feedthrough – Coated and Isolated
HAGAB INDUSTRI AB



EPD HUB, HUB-1535
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GENERAL INFORMATION

Manufacturer	
Manufacturer	Hagab Industri AB
Address	Industrivägen 5 Taberg, Sweden
Contact details	info@hagab.com
Website	hagab.com/

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
Scope of the EPD	Cradle to gate with options, A4-A5, and modules C1-C4, D
EPD author	Petter Ydrestrand, HAGAB
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal certification ☑ 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	Roof Feedthrough – Coated and Isolated
Additional labels	TGHA-A, TGHA-B
Product reference	-
Place of production	Taberg, Sweden
Period for data	Calendar year 2023
Averaging in EPD	Multiple products
Variation in GWP-fossil for A1-A3	22,2%

Environmental data summary	
Declared unit	1 kg of coated and isolated roof feedthrough
Declared unit mass	1 kg
GWP-fossil, A1-A3 ($kgCO_2e$)	3,42E+00
GWP-total, A1-A3 ($kgCO_2e$)	2,37E+00
Secondary material, inputs (%)	46.8
Secondary material, outputs (%)	28.1
Total energy use, A1-A3 (kWh)	19.1
Total water use, A1-A3 (m^3e)	0,07

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

HAGAB is one of Sweden´s leading companies that develop, manufacture and sell advanced fire protection and ventilation solutions. Since 1985, HAGAB has made everyday life easier and safer for our customers.

PRODUCT DESCRIPTION

Hagab roof feedthroughs are produced locally at our manufacturing site in Taberg, south of Jönköping. We provide two different types of roof feedthroughs including single and combined. Our products meet the demands of both performance and esthetical properties.

We offer roof feedthroughs in a wide range of sizes and materials including, hot-dip galvanised, Zink-Magnesium, Aluminium-Zink and stainless steel. We also allow our customers to order a specialized size or material. With our powder coating facility, we offer the customer to receive the roof feedthrough in a wide range of different colours.
For all standard product sizes and weights see the table in Appendix A.

Further information can be found at www.hagab.com.

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass- %	Material origin
Metals	81,6%	Europe
Minerals	18,4%	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	0.291

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 kg of coated and isolated roof feedthrough
Mass per declared unit	1 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).

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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

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, packaging materials, and other ancillary materials. The raw materials consist of coated steel sheets and stone wool bought from suppliers in Sweden from different distances where a Euro 6 lorry is assumed. Also, fuels used by machines, and handling of waste formed in the preparatory production processes at the manufacturing facilities are included in this stage.

Our manufacturing process includes punching sheet metal, bending and assembling. All the electricity and heating used for these processes are accounted for based on sales volume. A scrap factor of 20% is taken for punching metal sheets and cutting stone wool. The manufacturing waste is 100% recycled due to close collaboration with waste process companies and 50 km with Euro 6 lorry is assumed for the transport. The finished product is packed on an appropriate wooden pallet for the specific size, plastered, and anchored with plastic strips.

TRANSPORT AND INSTALLATION (A4-A5)

Transportation impacts occurring from final product delivery to the construction site (A4) cover fuel direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions. The roof feedtroughs are mostly sold locally therefore a 150 km transportation by Euro 6 lorry is assumed.

The product is assumed to be installed by crane; therefore, fuel consumption is accounted for. A5 involves waste treatment of packaging where 33% of the plastering packaging is assumed to be recycled, 43% incinerated for energy recovery and 24% sent to landfill based on EuroPal (2023). The waste treatment of the pallet is modelled according to Eurostat & PSR-0014 v2 (2023) where 30% are recycled, 30% incarnated for energy recovery and 40% are sent to landfill. A transport distance of 50 km is assumed.

PRODUCT USE AND MAINTENANCE (B1-B7)

The environmental impact of the use phase for this product can be neglected therefore this phase has not been included in the analysis. Further, air, soil, and water impacts during the use phase have not been studied.

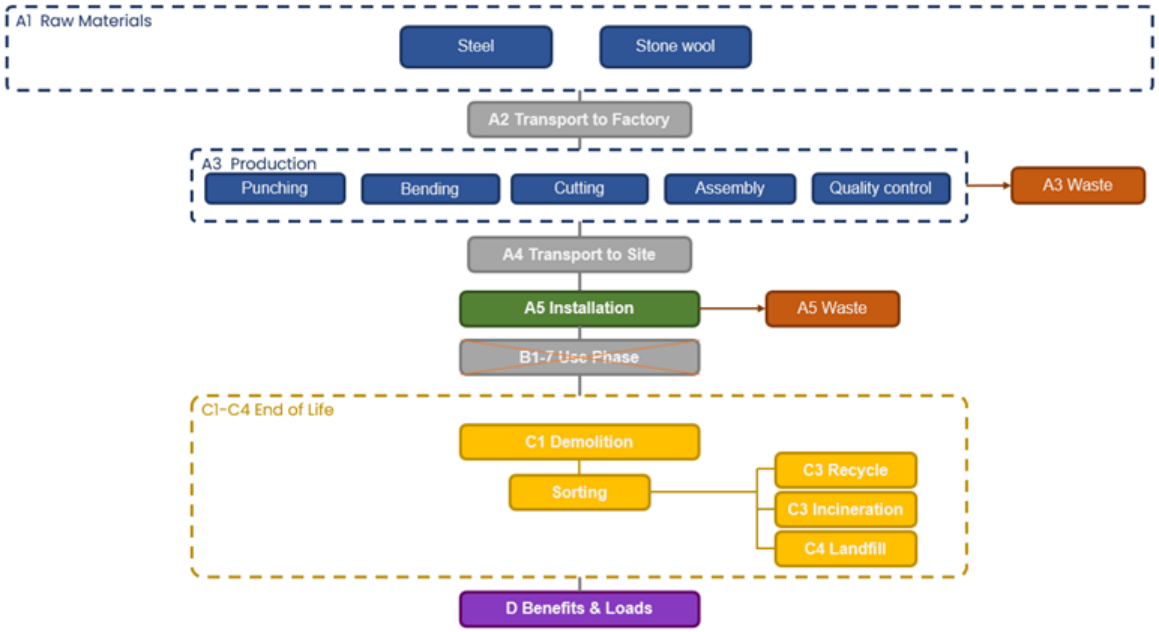
PRODUCT END OF LIFE (C1-C4, D)

The modelled scenario for EOL is based on recycling, incarnation and landfill. C1 covers the energy used for deconstructing the product where construction equipment is assumed to be involved, therefore fuel consumption is accounted for. C2 involves the transportation of waste which is assumed to be 50 km with a Euro 6 lorry. C3 covers both the sorting and pressing of iron scrap and the handling of waste stone wool. C4 includes the waste disposal processes where 95% of the steel is assumed to be recycled and 5% put in landfill, based on national and EU statistics. For the stone wool, 75% is assumed to be recycled and 25% put in landfill, based on data forecasts from Rockwool. D includes the loads from recycling the steel and stone wool further the benefit of avoiding virgin production of steel and stone wool.

ENVIRONMENTAL PRODUCT DECLARATION

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

LIFE CYCLE DIAGRAM



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 materials and energy consumption. All inputs and outputs of the unit processes, for which data is available, 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	Allocated by mass or volume
Packaging materials	Allocated by mass or volume
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	Averaged by shares of total volume
Variation in GWP-fossil for A1-A3	22,2%

The product exists in two different variants which come in many different sizes therefore the declared unit is per 1 kg product. The GWP-fossil varies for specific sizes due to different amounts of steel and stone wool. The main data used to calculate the average steel and stone wool ratio is based on the sales volume for the past year. The table in Appendix A displays the weight of every standard product which is used to translate the result of this EPD to a specific product size.

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 v3.8 and One Click LCA databases were used as sources of environmental data.

ENVIRONMENTAL PRODUCT DECLARATION

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

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	2,98E+00	5,92E-02	-6,71E-01	2,37E+00	2,54E-02	1,37E+00	MND	MND	MND	MND	MND	MND	MND	2,07E-01	7,51E-03	1,19E-02	-4,10E-05	-1,74E+00
GWP – fossil	kg CO_2e	2,97E+00	5,92E-02	3,91E-01	3,42E+00	2,54E-02	3,03E-01	MND	MND	MND	MND	MND	MND	MND	2,07E-01	7,51E-03	1,95E-02	4,57E-04	-1,74E+00
GWP – biogenic	kg CO_2e	9,74E-03	0,00E+00	-1,07E+00	-1,06E+00	0,00E+00	1,07E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	-7,62E-03	-4,98E-04	0,00E+00
GWP – LULUC	kg CO_2e	3,71E-03	2,37E-05	5,71E-03	9,45E-03	9,36E-06	3,29E-05	MND	MND	MND	MND	MND	MND	MND	2,06E-05	2,97E-06	2,34E-05	4,32E-07	-3,75E-04
Ozone depletion pot.	kg $CFC_{-11}e$	2,08E-07	1,37E-08	3,24E-08	2,55E-07	5,84E-09	4,65E-08	MND	MND	MND	MND	MND	MND	MND	4,42E-08	1,74E-09	2,75E-09	1,85E-10	-7,05E-08
Acidification potential	mol H^+e	7,10E-02	1,68E-04	2,01E-03	7,32E-02	1,07E-04	2,25E-03	MND	MND	MND	MND	MND	MND	MND	2,15E-03	2,25E-05	2,40E-04	4,30E-06	-8,26E-03
EP-freshwater[2)]	kg Pe	6,16E-05	4,23E-07	1,97E-05	8,17E-05	2,08E-07	1,06E-06	MND	MND	MND	MND	MND	MND	MND	6,85E-07	5,45E-08	9,40E-07	4,79E-09	-7,06E-05
EP-marine	kg Ne	4,92E-03	3,36E-05	4,47E-04	5,40E-03	3,19E-05	9,98E-04	MND	MND	MND	MND	MND	MND	MND	9,51E-04	4,85E-06	5,53E-05	1,49E-06	-1,48E-03
EP-terrestrial	mol Ne	2,70E-01	3,73E-04	5,01E-03	2,76E-01	3,52E-04	1,08E-02	MND	MND	MND	MND	MND	MND	MND	1,04E-02	5,38E-05	6,34E-04	1,64E-05	-1,83E-02
POCP ("smog")[3)]	kg NMVOCe	1,41E-02	1,43E-04	1,79E-03	1,61E-02	1,13E-04	2,98E-03	MND	MND	MND	MND	MND	MND	MND	2,87E-03	1,99E-05	1,75E-04	4,76E-06	-8,60E-03
ADP-minerals & metals[4)]	kg Sbe	1,02E-05	2,14E-07	3,62E-06	1,41E-05	5,95E-08	1,61E-07	MND	MND	MND	MND	MND	MND	MND	1,05E-07	2,61E-08	2,29E-06	1,05E-09	-3,12E-05
ADP-fossil resources	MJ	7,01E+00	8,81E-01	1,66E+01	2,45E+01	3,81E-01	3,00E+00	MND	MND	MND	MND	MND	MND	MND	2,78E+00	1,12E-01	2,75E-01	1,25E-02	-1,57E+01
Water use[5)]	m^3e depr.	1,39E+00	4,13E-03	5,43E-01	1,94E+00	1,71E-03	2,68E-02	MND	MND	MND	MND	MND	MND	MND	7,48E-03	5,21E-04	4,68E-03	3,98E-05	-3,36E-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.

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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	6,13E-07	4,77E-09	3,27E-08	6,50E-07	2,92E-09	5,92E-08	MND	MND	MND	MND	MND	MND	MND	5,76E-08	6,35E-10	4,43E-09	4,29E-10	-1,11E-07
Ionizing radiation[6]	kBq U235e	1,26E-01	4,63E-03	6,95E-01	8,26E-01	1,81E-03	1,46E-02	MND	MND	MND	MND	MND	MND	MND	1,28E-02	5,81E-04	2,83E-03	5,67E-05	4,61E-02
Ecotoxicity (freshwater)	CTUe	1,21E+02	7,36E-01	8,46E+00	1,30E+02	3,43E-01	1,92E+00	MND	MND	MND	MND	MND	MND	MND	1,67E+00	9,42E-02	1,07E+00	8,18E-03	-5,94E+01
Human toxicity, cancer	CTUh	1,65E-08	2,26E-11	1,40E-09	1,79E-08	8,42E-12	8,59E-11	MND	MND	MND	MND	MND	MND	MND	6,41E-11	2,82E-12	3,32E-11	2,04E-13	1,19E-08
Human tox. non-cancer	CTUh	1,68E-07	7,20E-10	6,88E-09	1,76E-07	3,39E-10	1,97E-09	MND	MND	MND	MND	MND	MND	MND	1,21E-09	9,23E-11	1,45E-09	5,35E-12	-3,90E-08
SQP[7]	-	7,93E+00	6,26E-01	8,78E+01	9,64E+01	4,39E-01	6,49E-01	MND	MND	MND	MND	MND	MND	MND	3,62E-01	8,52E-02	5,11E-01	2,68E-02	-5,88E+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.

ENVIRONMENTAL PRODUCT DECLARATION

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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	6,29E+00	1,28E-02	1,03E+01	1,66E+01	4,29E-03	2,67E-02	MND	MND	MND	MND	MND	MND	MND	1,59E-02	1,58E-03	4,17E-02	1,09E-04	-1,24E+00
Renew. PER as material	MJ	0,00E+00	0,00E+00	9,35E+00	9,35E+00	0,00E+00	-9,35E+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	6,29E+00	1,28E-02	1,97E+01	2,60E+01	4,29E-03	-9,32E+00	MND	MND	MND	MND	MND	MND	MND	1,59E-02	1,58E-03	4,17E-02	1,09E-04	-1,24E+00
Non-re. PER as energy	MJ	3,63E+01	8,81E-01	1,46E+01	5,18E+01	3,81E-01	3,00E+00	MND	MND	MND	MND	MND	MND	MND	2,78E+00	1,12E-01	2,75E-01	1,25E-02	-1,57E+01
Non-re. PER as material	MJ	1,52E-01	0,00E+00	2,85E+00	3,00E+00	0,00E+00	-2,87E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	-9,52E-02	-3,17E-02	0,00E+00
Total use of non-re. PER	MJ	3,65E+01	8,81E-01	1,74E+01	5,48E+01	3,81E-01	1,26E-01	MND	MND	MND	MND	MND	MND	MND	2,78E+00	1,12E-01	1,80E-01	-1,92E-02	-1,57E+01
Secondary materials	kg	4,68E-01	3,00E-04	3,56E-02	5,04E-01	1,06E-04	1,29E-03	MND	MND	MND	MND	MND	MND	MND	1,09E-03	3,73E-05	2,76E-04	2,63E-06	8,71E-01
Renew. secondary fuels	MJ	2,86E-05	3,30E-06	3,15E-01	3,15E-01	1,07E-06	5,53E-06	MND	MND	MND	MND	MND	MND	MND	3,56E-06	4,07E-07	1,35E-05	6,88E-08	-1,69E-04
Non-ren. secondary fuels	MJ	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
Use of net fresh water	m^3	5,78E-02	1,12E-04	1,48E-02	7,28E-02	4,94E-05	2,61E-04	MND	MND	MND	MND	MND	MND	MND	1,69E-04	1,43E-05	1,61E-04	1,37E-05	-4,69E-03

8) PER = Primary energy resources.

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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	6,03E-01	1,00E-03	2,59E-02	6,30E-01	5,05E-04	4,15E-03	MND	MND	MND	MND	MND	MND	MND	3,72E-03	1,29E-04	1,61E-03	1,38E-05	-5,10E-01
Non-hazardous waste	kg	8,73E+00	1,78E-02	6,87E-01	9,44E+00	8,30E-03	6,00E-01	MND	MND	MND	MND	MND	MND	MND	2,62E-02	2,28E-03	5,04E-02	4,02E-02	-2,64E+00
Radioactive waste	kg	1,60E-04	6,07E-06	1,59E-04	3,25E-04	2,55E-06	2,03E-05	MND	MND	MND	MND	MND	MND	MND	1,96E-05	7,65E-07	1,56E-06	8,68E-08	2,33E-06

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	2,00E-01	2,00E-01	0,00E+00	2,43E-01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	9,13E-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	2,49E-01	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	3,10E+00	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	2,94E+00	6,58E-02	3,89E-01	3,40E+00	2,51E-02	3,19E-01	MND	MND	MND	MND	MND	MND	MND	2,05E-01	7,44E-03	1,92E-02	4,48E-04	-1,65E+00
Ozone depletion Pot.	kg $CFC_{11}e$	1,71E-07	1,22E-08	2,73E-08	2,11E-07	4,62E-09	3,69E-08	MND	MND	MND	MND	MND	MND	MND	3,50E-08	1,38E-09	2,21E-09	1,46E-10	-7,73E-08
Acidification	kg SO_2e	3,96E-02	1,55E-04	1,60E-03	4,13E-02	8,35E-05	1,61E-03	MND	MND	MND	MND	MND	MND	MND	1,53E-03	1,83E-05	1,92E-04	3,25E-06	-6,68E-03
Eutrophication	kg $PO_4^{3}e$	1,01E-02	3,34E-05	8,30E-04	1,10E-02	1,90E-05	1,35E-03	MND	MND	MND	MND	MND	MND	MND	3,55E-04	3,99E-06	6,19E-05	7,00E-07	-3,01E-03
POCP ("smog")	kg C_2H_4e	1,28E-03	7,82E-06	1,61E-04	1,44E-03	3,26E-06	4,09E-05	MND	MND	MND	MND	MND	MND	MND	3,35E-05	8,93E-07	7,11E-06	1,36E-07	-9,60E-04
ADP-elements	kg Sbe	8,23E-03	2,35E-07	3,60E-06	8,24E-03	5,76E-08	1,57E-07	MND	MND	MND	MND	MND	MND	MND	1,03E-07	2,54E-08	2,29E-06	1,04E-09	-3,11E-05
ADP-fossil	MJ	3,47E+01	9,88E-01	1,74E+01	5,32E+01	3,81E-01	3,00E+00	MND	MND	MND	MND	MND	MND	MND	2,78E+00	1,12E-01	2,75E-01	1,25E-02	-1,57E+01

ENVIRONMENTAL PRODUCT DECLARATION

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

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, do- cuments 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 genera- tor, 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 Environ- mental 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.

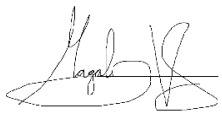
I confirm that the company-specific data has been examined as regards plausibility and consistency; the declaration owner is responsible for its factual integrity and legal compliance.

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 deve- lopment of the declaration and have no conflicts of interest regarding this verification.

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

05.07.2024



VERIFIED ISO 14025

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APPENDIX A: PRODUCT VARIATIONS

As mentioned in earlier sections, the table in this appendix can be used to convert the results of the LCA presented in this EPD to all the below roof feedthroughs that are available at HAGAB. The environmental impact for each unique article can thus be calculated by multiplying the results presented in this EPD by the weight of the specific article.

TGHA-A			
Article nr	Width [mm]	Height [mm]	Weight [kg]
TGA033-08	200	800	9
TGA033-12	200	1200	13
TGA036-08	100	800	10
TGA036-12	100	1200	15
TGA043-08	300	800	12
TGA043-12	300	1200	18
TGA046-08	200	800	14
TGA046-12	200	1200	21
TGA053-08	400	800	16
TGA053-12	400	1200	24
TGA056-08	300	800	18
TGA056-12	300	1200	27
TGA063-08	500	800	19
TGA063-12	500	1200	28
TGA066-08	400	800	22
TGA066-12	400	1200	33
TGA073-08	600	800	22
TGA073-12	600	1200	33
TGA076-08	500	800	26
TGA076-12	500	1200	39
TGA083-08	700	800	25
TGA083-12	700	1200	37
TGA086-08	600	800	30
TGA086-12	600	1200	45
TGA093-08	800	800	28
TGA093-12	800	1200	42
TGA096-08	700	800	34
TGA096-12	700	1200	51
TGA103-08	900	800	31
TGA103-12	900	1200	46

TGHB-B			
Article nr	Width [mm]	Height [mm]	Weight [kg]
TGB10203-08	1000	800	62
TGB10203-12	1000	1200	92
TGB10206-08	1000	800	76
TGB10206-12	1000	1200	110
TGB11223-08	1100	800	70
TGB11223-12	1100	1200	102
TGB11226-08	1100	800	82
TGB11226-12	1100	1200	122
TGB12243-08	1200	800	76
TGB12243-12	1200	1200	110
TGB12246-08	1200	800	90
TGB12246-12	1200	1200	134
TGB13263-08	1300	800	82
TGB13263-14	1300	1400	140
TGB13266-08	1300	800	98
TGB13266-14	1300	1400	168
TGB14283-08	1400	800	88
TGB14283-14	1400	1400	150
TGB14286-08	1400	800	106
TGB14286-14	1400	1400	182
TGB15303-08	1500	800	94
TGB15303-14	1500	1400	162
TGB15306-08	1500	800	114
TGB15306-14	1500	1400	196
TGB16323-08	1600	800	100
TGB16323-14	1600	1400	172
TGB16326-08	1600	800	122
TGB16326-14	1600	1400	208
TGB17343-08	1700	800	108
TGB17343-14	1700	1400	182

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TGA106-08	800	800	38		TGB17346-08	1700	800	130
TGA106-12	800	1200	55		TGB17346-14	1700	1400	222
TGA113-08	1000	800	35		TGB363-08	300	800	18
TGA113-12	1000	1200	51		TGB363-12	300	1200	27
TGA116-08	900	800	41		TGB366-08	300	800	20
TGA116-12	900	1200	61		TGB366-12	300	1200	30
TGA123-08	1100	800	38		TGB483-08	400	800	24
TGA123-12	1100	1200	55		TGB483-12	400	1200	36
TGA126-08	1000	800	45		TGB486-08	400	800	28
TGA126-12	1000	1200	67		TGB486-12	400	1200	42
TGA133-08	1200	800	41		TGB5103-08	500	800	32
TGA133-14	1200	1400	70		TGB5103-12	500	1200	48
TGA136-08	1100	800	49		TGB5106-08	500	800	36
TGA136-14	1100	1400	84		TGB5106-12	500	1200	54
TGA143-08	1300	800	44		TGB6123-08	600	800	38
TGA143-14	1300	1400	75		TGB6123-12	600	1200	57
TGA146-08	1200	800	53		TGB6126-08	600	800	44
TGA146-14	1200	1400	91		TGB6126-12	600	1200	66
TGA153-08	1400	800	47		TGB7143-08	700	800	44
TGA153-14	1400	1400	81		TGB7143-12	700	1200	66
TGA156-08	1300	800	57		TGB7146-08	700	800	52
TGA156-14	1300	1400	98		TGB7146-12	700	1200	78
TGA163-08	1500	800	50		TGB8163-08	800	800	50
TGA163-14	1500	1400	86		TGB8163-12	800	1200	75
TGA166-08	1400	800	61		TGB8166-08	800	800	60
TGA166-14	1400	1400	104		TGB8166-12	800	1200	90
TGA173-08	1600	800	54		TGB9183-08	900	800	56
TGA173-14	1600	1400	91		TGB9183-12	900	1200	84
TGA176-08	1500	800	65		TGB9186-08	900	800	68
TGA176-14	1500	1400	111		TGB9186-12	900	1200	102