ENVIRONMENTAL PRODUCT DECLARATION

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

HEATLOK HFO PRO, HEATLOK EZ = FOAMLOK 2001 4G

HUNTSMAN BUILDING SOLUTIONS

Programme:	Programme operator:	EPD registration number:	Publication date:	Valid until:	Geographical scope:
The International EPD® System, www.environdec.com	***EPD International AB***	***S-P-07866***	***2022.11.28***	***2027.11.28***	***Europe***

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

MANUFACTURER INFORMATION

Manufacturer	Huntsman Building Solutions
Address	30B Clos Chapelle-aux-Champs, 1200 Brussels, Belgium
Contact details	pabertier@huntsmanbuilds.com
Website	https://huntsmanbuildingsolutions.com/

PRODUCT IDENTIFICATION

Product name	HEATLOK HFO Pro / HEATLOK EZ = FOAMLOK 2001 4G
Place(s) of production	• PUR SYSTEM, Werner-von-Siemens-Str. 22, 49124 Georgsmarienhütte, Germany • HIFS, Station Road Roydon, Norfolk, PE32 1AW United Kingdom
CPC code	Code UN CPC Ver2.1 Code 54: Construction services

EPD International AB

EPDs within the same product category but from different programmes may not be comparable.

EPD INFORMATION

The EPD owner has the sole ownership, liability, and responsibility for the EPD. Construction products EPDs may not be comparable if they do not comply with EN 15804 and if they are not compared in a building context.

EPD program operator	EPD International AB
EPD standards	This EPD is in accordance with EN 15804+A2 and ISO 14025 standards.
Product category rules	PCR 2019:14 Construction products (EN 15804+A2) (1.11) and C-PCR-005 Thermal Insulation products (EN 16783:2017)
EPD author	Ipek Goktas, One Click LCA Ltd www.oneclicklca.com
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal certification ☑ External verification
Verification date	2022.11.28
EPD verifier	Elisabet Amat
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ECO Platform nr.	-
Publishing date	2022.11.28
EPD valid until	2027.11.28

PRODUCT INFORMATION

PRODUCT DESCRIPTION

The product under study is a two-component polyurethane insulation with close cells formed on site. The product is referenced under the following names:

- HEATLOK HFO Pro
- HEATLOK EZ = FOAMLOK 2001 4G

The different names refer to different products, based on similar raw materials but with slightly different ratios. The composition of the reference systems used represents a weighted average composition based on the sales in the Europe market.

It is a thermal and acoustic insulation product with a reference life of 50 years.

PRODUCT APPLICATION

The product is intended for use as a thermal insulation and air barrier in roofs, wall cavities, floors, ceilings, attics (ventilated and unventilated) and crawl spaces (ventilated and unventilated) in all types of buildings located in all types of climates. In addition, the product can be sprayed on: concrete and masonry, wood, plasterboard and particle board, steel, membrane.

TECHNICAL SPECIFICATIONS

The products are CE marked in accordance with standard NF EN 14 315-1. They have a thermal conductivity between 25 and 26 m².K/W, an average density of 33-40 kg/m3 and are classified A+ in terms of VOC emissions. All technical documents (DOP, Product Sheet and Application Guide) are available at https://huntsmanbuildingsolutions.com/.

The conductivity and density of the product used depend on the conditions of use. The variation in conductivity and density is linked to the process which can be described as artisanal, these are not different commercial references. Therefore, the amount per FU varies and the value of 3.79 kg is an average value.

PRODUCT STANDARDS

EN 14315-1:2013 thermal insulating products for buildings.

PHYSICAL PROPERTIES OF THE PRODUCT

Thermal resistance R is between 3.8 and 4 m².K/W.

ADDITIONAL TECHNICAL INFORMATION

Further information can be found at https://huntsmanbuildingsolutions.com/.

PRODUCT RAW MATERIAL COMPOSITION

Product and Packaging Material	Weight ratio %	Post-consumer %	Renewable %	Country Region of origin
Component A (Polyol mixture)	45%	0%	0%	Europe
Component B (MDI)	55%	0%	0%	Europe

SUBSTANCES, REACH - VERY HIGH CONCERN

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

MANUFACTURING AND PACKAGING (A1-A3)

The production stage (A1-A3) includes:

- The production of component B (polyol blend) at the Huntsman Building Solutions' site at PURS (Germany) and HIF (United Kingdom).
- The supply of component A (MDI) from the Huntsman Building Solutions' site at the Rotterdam plant (Netherlands)
- The provision of these two components (product kit corresponding to a "finished" product) to installers in Europe

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 transport phase describes the transport of the products from the site where the applicator companies are located to the construction site. The installation area is delimited using adhesive and staples. Component A MDI and component B polyol are mixed then sprayed by an operator wearing protective equipment (PPE) on the area to be isolated using a spraying machine. The spraying machine is powered by a diesel generator. Once the foam has been deposited, the operator applies a shield (reused on construction sites) in order to control its expansion and avoid cuts.

A5 takes into account the auxiliary inputs for the installation, the treatment of waste generated during the implementation of the product as well as the diesel consumption of the generator supplying the spraying equipment. No water consumption is to be considered. 5% product loss is considered. The reused component packaging is transported over a distance of 50 km.

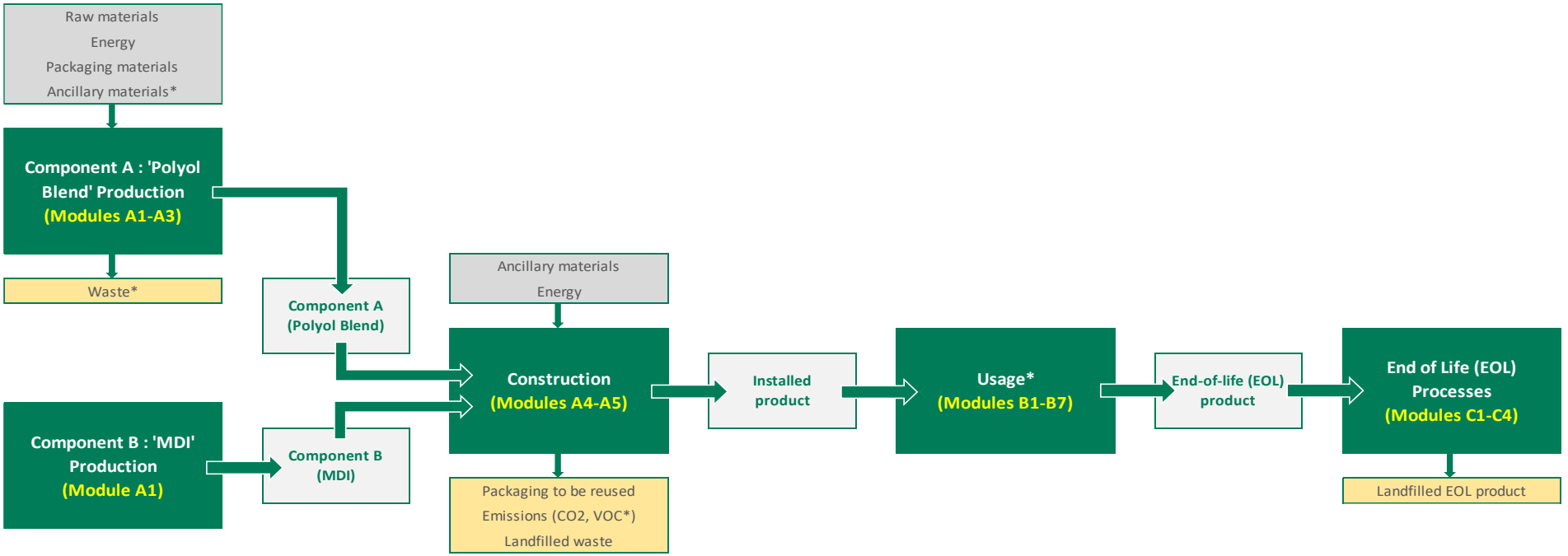
PRODUCT USE AND MAINTENANCE (B1-B7)

The product does not require any maintenance, repair or replacement during the reference life. Furthermore, no direct emission during the working life could be identified.

PRODUCT END OF LIFE (C1-C4, D)

The deconstruction of the foam is done manually and collected separately to be landfilled.

MANUFACTURING PROCESS & END-OF-LIFE STAGES



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LIFE-CYCLE ASSESSMENT

LIFE-CYCLE ASSESSMENT INFORMATION

Period for data	2020

DECLARED AND FUNCTIONAL UNIT

Declared unit	1 m2
Mass per declared unit	3.79
Functional unit	The functional unit of the study is 1 m2 of the product with 100 mm thickness and the thermal conductivity between 25 and 26 m².K/W. The mass of the product per declared unit is 3.79 kg. The reference service life of the product is 50.
Reference service life	50

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 (wood pallet is reused, therefore the allocated biogenic carbon is almost zero)

SYSTEM BOUNDARY

This EPD covers the *cradle to grave* scope with following modules; A1 (Raw material supply), A2 (Transport) and A3 (Manufacturing), A4 (Transport), A5 (Assembly) as well as usage stage, end-of-life stage and Module D.

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	D	D
x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Geography, by two-letter ISO country code or regions. The International EPD System only.																		
EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU		
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

CUT-OFF CRITERIA

The study does not exclude any modules or processes which are stated mandatory in the EN 15804:2012+A2:2019 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.

In this study, as per EN 15804, allocation is conducted in the following order;

1. Allocation should be avoided.
2. Allocation should be based on physical properties (e.g. mass, volume) when the difference in revenue is small.
3. Allocation should be based on economic values.

The values for 1m^2 (100mm thickness) of the manufactured product that are used in this study are calculated considering the total weight of the product per annual production. The output data of the product is fixed at 1m^2 (100mm thickness) and the quantity corresponding product value is used in the calculations. This allocation was made during the data collection process to calculate the energy consumed and packaging used per 1m^2 of product. Energy consumption in the production area is not measured separately for each production line. Therefore, since the production methods are similar for all products produced in the factory, the energy consumption per declared product has been allocated on the basis of annual consumption and production. Packaging materials are also allocated according to the same scenario (based on annual consumption and production). On the other hand, since there is no co-product or by-product generated, the co-product allocation is not the object. In addition, the allowance for raw materials is not applicable since the formulation is taken into consideration to specify the ingredients used.

On the other hand, average formulation of the product has been adjusted as per the sales rate in the Europe market.

Component A (polyol blend) is produced at two production plants in Germany and the UK. Within the LCA, the mixture of polyols is taken into account in modules A1-A3. The allocation for two production plants is based on the exported quantities of component A (polyol blend) to the construction sites from two production plants.

Component B (MDI) is produced by Huntsman Building Solutions in their own factory in Rotterdam and is sent to construction sites. However, instead of collecting data from the Rotterdam plant, data from Plastic Europe was used for the MDI. The so-called Plastics Europe data is collected by ISOPA – producers of di-isocyanates and polyol of which Huntsman is a member. Within LCA, MDI is considered a raw material and all production impacts are calculated under A1. So instead of calculating the impacts on the production of the MDI, the generic data can be found in module A1.

In the A4/A5 module, the transport and installation inputs/outputs are allocated according to the mixing shares of the two components (components A & B) in the final product.

This LCA study is conducted in accordance with all methodological considerations, such as performance, system limitations, data quality, allocation procedures, and decision rules to assess inputs and outputs.

All estimates and assumptions are given below:

Modules A2, A4 & C2: The vehicle capacity utilization volume factor is assumed to be 1, meaning full load. It can vary but as the role of transport emissions in the total results is small and therefore the load variety assumed to be negligible. Empty returns are not taken into account as it is assumed that the return trip is used by the transport companies to meet the needs of other customers.

Module A4: Transport does not cause losses because the products are properly packaged. In addition, the volume capacity utilization factor is assumed as 1 for packaged and nested products. In addition, transportation distances and vehicle types are assumed based on the delivery rates in the past year. Both components in liquid form are transported in steel drums on wooden pallets. According to the basic data used (Ecoinvent) for trucks, average load factors are taken into account. According to the Ecoinvent data used, the average load factor is between 16 and 30 tonnes. Considering that the range is quite flexible in the Ecoinvent data and the components are neither light nor heavy, it is reasonable to assume that the volume factor is 1.

Module A5: Weight loss due to the cutting process during installation is assumed to be 5%.

Modules B1-B7: Impacts of usage are negligible since there is no maintenance, replacement, weight loss or emission.

Module C1: The energy consumed and other sources for the product demolition process are negligible.

Module C2: The transport distance to the nearest storage area is estimated at 50km and the mode of transport is assumed to be truck which is most common. (ref. EeBGuide)

Modules C3, C4 & D: For the EOL, a conservative scenario has been applied since there is no significant analysis for future PUR system waste procedures found. 100% of EOL product is assumed to be landfilled (C4); thus, the impacts of waste recovery process (C3) and the benefits thanks to the waste recovery process (D) are assumed as zero.

Allocation used in Ecoinvent 3.6 environmental data sources follows the methodology 'allocation, cut-off by classification'. This methodology is in line with the requirements of the EN 15804 - standard.

AVERAGES AND VARIABILITY

Weight average quantities for the 2 products have been considered based on the sales rates in the market. However, since the formulation of the product are similar and the production is same, variations do not exceed 10%.

The International EPD System additional data requirements

Data specificity and GWP-GHG variability for GWP-GHG for A1-A3.

Supply-chain specific data for GWP-GHG	≈ 99%
Variation in GWP-GHG between products	< 10%
Variation in GWP-GHG between sites	< 10%

ENVIRONMENTAL IMPACT DATA

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1-A3	A4	A5	A4-A5	B1	B2	B3	B4	B5	B6	B7	B1-B7	C1	C2	C3	C4	C1-C4	A1-C4	D
GWP – total	kg CO_2e	1.24E+1	1.74E-1	1.52E+0	1.69E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.44E-2	0.00E+0	3.60E-1	3.85E-1	1.45E+1	0.00E+0
GWP – fossil	kg CO_2e	1.27E+1	1.74E-1	1.51E+0	1.68E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.44E-2	0.00E+0	2.02E-2	4.46E-2	1.44E+1	0.00E+0
GWP – biogenic	kg CO_2e	-3.10E-1	1.27E-4	1.98E-3	2.11E-3	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.50E-5	0.00E+0	3.40E-1	3.40E-1	3.21E-2	0.00E+0
GWP – LULUC	kg CO_2e	1.04E-2	5.24E-5	3.30E-3	3.35E-3	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	8.63E-6	0.00E+0	6.00E-6	1.46E-5	1.38E-2	0.00E+0
Ozone depletion pot.	kg CFC_{-11}e	1.09E-7	4.10E-8	2.16E-7	2.57E-7	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	5.60E-9	0.00E+0	8.32E-9	1.39E-8	3.80E-7	0.00E+0
Acidification potential	mol H^+e	2.47E-2	7.32E-4	1.12E-2	1.19E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.01E-4	0.00E+0	1.92E-4	2.93E-4	3.69E-2	0.00E+0
EP-freshwater	kg Pe	8.85E-5	1.42E-6	2.83E-5	2.97E-5	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.11E-7	0.00E+0	2.44E-7	4.55E-7	1.19E-4	0.00E+0
EP-marine	kg Ne	6.45E-3	2.21E-4	5.40E-3	5.62E-3	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.98E-5	0.00E+0	6.60E-5	9.58E-5	1.22E-2	0.00E+0
EP-terrestrial	mol Ne	7.05E-2	2.44E-3	4.96E-2	5.20E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	3.29E-4	0.00E+0	7.27E-4	1.06E-3	1.24E-1	0.00E+0
POCP (“smog”)	kg NMVOCe	2.18E-2	7.83E-4	1.48E-2	1.56E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.03E-4	0.00E+0	2.11E-4	3.14E-4	3.77E-2	0.00E+0
ADP-minerals & metals	kg Sbe	3.45E-5	2.97E-6	6.45E-6	9.42E-6	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	6.10E-7	0.00E+0	1.85E-7	7.95E-7	4.47E-5	0.00E+0
ADP-fossil resources	MJ	3.39E+2	2.71E+0	2.96E+1	3.23E+1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	3.73E-1	0.00E+0	5.65E-1	9.38E-1	3.72E+2	0.00E+0
Water use	m^3e depr.	-2.82E+1	1.01E-2	-6.80E-1	-6.70E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.32E-3	0.00E+0	2.61E-2	2.74E-2	-2.88E+1	0.00E+0

1) GWP = Global Warming Potential; EP = Eutrophication potential; POCP = Photochemical ozone formation; ADP = Abiotic depletion potential

2) 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 experienced with the indicator.

3) Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO_4e.

ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1-A3	A4	A5	A4-A5	B1	B2	B3	B4	B5	B6	B7	B1-B7	C1	C2	C3	C4	C1-C4	A1-C4	D
Particulate matter	Incidence	2.29E-7	1.58E-8	3.28E-8	4.86E-8	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.89E-9	0.00E+0	3.73E-9	5.62E-9	2.83E-7	0.00E+0
Ionizing radiation	kBq U235e	4.69E-1	1.18E-2	7.01E-2	8.19E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.63E-3	0.00E+0	2.32E-3	3.95E-3	5.55E-1	0.00E+0
Ecotoxicity (freshwater)	CTUe	3.60E+2	2.07E+0	2.89E+1	3.10E+1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.91E-1	0.00E+0	3.56E-1	6.47E-1	3.92E+2	0.00E+0
Human toxicity, cancer	CTUh	2.65E-9	5.30E-11	4.68E-10	5.21E-10	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	8.25E-12	0.00E+0	8.44E-12	1.67E-11	3.19E-9	0.00E+0
Human tox. non-cancer	CTUh	3.02E-7	2.45E-9	2.58E-8	2.83E-8	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	3.34E-10	0.00E+0	2.60E-10	5.94E-10	3.31E-7	0.00E+0
SQP	-	8.00E+0	4.09E+0	1.38E+0	5.47E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	4.15E-1	0.00E+0	9.60E-1	1.38E+0	1.48E+1	0.00E+0

4) SQP = Land use related impacts/soil quality
5) 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.

USE OF NATURAL RESOURCES

Impact category	Unit	A1-A3	A4	A5	A4-A5	B1	B2	B3	B4	B5	B6	B7	B1-B7	C1	C2	C3	C4	C1-C4	A1-C4	D
Renew. PER as energy	MJ	2.95E+1	3.41E-2	1.82E+0	1.85E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	5.29E-3	0.00E+0	4.57E-3	9.86E-3	3.14E+1	0.00E+0
Renew. PER as material	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Total use of renew. PER	MJ	2.95E+1	3.41E-2	1.82E+0	1.85E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	5.29E-3	0.00E+0	4.57E-3	9.86E-3	3.14E+1	0.00E+0
Non-re. PER as energy	MJ	2.33E+2	2.71E+0	2.29E+1	2.56E+1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	3.73E-1	0.00E+0	5.65E-1	9.38E-1	2.60E+2	0.00E+0
Non-re. PER as material	MJ	1.09E+2	0.00E+0	4.95E-1	4.95E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	-1.09E+2	-1.09E+2	4.95E-1	0.00E+0
Total use of non-re. PER	MJ	3.42E+2	2.71E+0	2.34E+1	2.61E+1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	3.73E-1	0.00E+0	-1.08E+2	-1.08E+2	2.60E+2	0.00E+0
Secondary materials	kg	0.00E+0	0.00E+0	2.94E-3	2.94E-3	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.94E-3	0.00E+0
Renew. secondary fuels	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Non-ren. secondary fuels	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Use of net fresh water	m^3	4.93E+0	5.64E-4	2.87E-1	2.88E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	7.07E-5	0.00E+0	6.18E-4	6.89E-4	5.22E+0	0.00E+0

6) PER = Primary energy resources

END OF LIFE – WASTE

Impact category	Unit	A1-A3	A4	A5	A4-A5	B1	B2	B3	B4	B5	B6	B7	B1-B7	C1	C2	C3	C4	C1-C4	A1-C4	D
Hazardous waste	kg	8.51E-3	2.63E-3	2.13E-2	2.39E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	3.88E-4	0.00E+0	5.27E-4	9.15E-4	3.34E-2	0.00E+0
Non-hazardous waste	kg	6.71E-1	2.91E-1	6.06E-1	8.97E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	3.22E-2	0.00E+0	3.83E+0	3.86E+0	5.43E+0	0.00E+0
Radioactive waste	kg	1.23E-3	1.86E-5	1.34E-4	1.53E-4	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.55E-6	0.00E+0	3.74E-6	6.29E-6	1.39E-3	0.00E+0

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1-A3	A4	A5	A4-A5	B1	B2	B3	B4	B5	B6	B7	B1-B7	C1	C2	C3	C4	C1-C4	A1-C4	D
Components for re-use	kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Materials for recycling	kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Materials for energy rec	kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Exported energy	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0

ENVIRONMENTAL IMPACTS – GWP-GHG

Impact category	Unit	A1-A3	A4	A5	A4-A5	B1	B2	B3	B4	B5	B6	B7	B1-B7	C1	C2	C3	C4	C1-C4	A1-C4	D
GWP-GHG	kg CO_2e	1.27E+1	1.74E-1	1.51E+0	1.68E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.44E-2	0.00E+0	2.02E-2	4.46E-2	1.44E+1	0.00E+0

7) 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). This indicator Is almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

SCENARIO DOCUMENTATION

Manufacturing energy scenario documentation

Scenario parameter	Value
Electricity data source and quality	Market for electricity, medium voltage (Reference product: electricity, medium voltage), UK, Ecoinvent 3.6
Electricity CO_2e / kWh	0.37
Electricity data source and quality	Market for electricity, medium voltage (Reference product: electricity, medium voltage), Germany, Ecoinvent 3.6
Electricity CO_2e / kWh	0.61
District heating data source and quality	Heat and power co-generation, natural gas, combined cycle power plant, 400mw electrical (Reference product: electricity, high voltage), Germany, Ecoinvent 3.6
District heating CO_2e / kWh	0.41

Transport scenario documentation (A4)

Scenario parameter	Value
Specific transport CO_2e emissions, kg CO_2e / tkm	0,0901
Average transport distance, km	468
Capacity utilization (including empty return) %	≈ 100%
Bulk density of transported products	N/A
Volume capacity utilization factor	≈ 1

End of life scenario documentation

Scenario parameter	Value
Collection process – kg collected separately	3.84*
Collection process – kg collected with mixed waste	0
Recovery process – kg for re-use	0
Recovery process – kg for recycling	0
Recovery process – kg for energy recovery	0
Disposal (total) – kg for final deposition	3.84*
Scenario assumptions e.g. transportation	50 km

*It includes the ancillary materials which have been fixed with the product during installation

BIBLIOGRAPHY

ISO 14025:2010 Environmental labels and declarations – Type III environmental declarations. Principles and procedures.

ISO 14040:2006 Environmental management. Life cycle assessment. Principles and frameworks.

ISO 14044:2006 Environmental management. Life cycle assessment. Requirements and guidelines.

EN 15804:2012+A2:2019 Sustainability in construction works – Environmental product declarations – Core rules for the product category of construction products.

PCR 2019:14. Construction Products. Version 1.1.

C-PCR-005 Thermal Insulation products (EN 16783:2017)

Data references:

Ecoinvent database v3.6 (2019)

Plastics Europe 2021 which the data owner is 'ISOPA'

GaBi 2021

EeBGuide: C-05 Transport of wastes to landfill, incineration and recycling facilities – screening and simplified LCA

HEATLOK HFO Pro / HEATLOK EZ = FOAMLOK 2001 4G LCA report

ABOUT THE MANUFACTURER

Enriching Lives Through Innovation

Huntsman Building Solutions embraces the entrepreneurial spirit of our founder, Jon Huntsman, and his core values of honesty, integrity, respect and responsibility.

For 50 years, our employees have been using science and ingenuity to create innovations that play a critical role in the everyday lives of many millions of people.

As a global chemicals company, Huntsman Building Solutions' work forms the building blocks for countless consumer and industrial products that are part of your everyday life.

Our employees are united around a common goal: enriching lives through innovation.

EPD AUTHOR AND CONTRIBUTORS

Manufacturer	Huntsman Building Solutions
EPD author	Ipek Goktas, One Click LCA Ltd
EPD verifier	Elisabet Amat
EPD program operator	EPD International AB
Background data	Ecoinvent 3.6 (cut-off) and GaBi
LCA software	The LCA and EPD have been created using One Click LCA Pre-Verified EPD Generator for construction products

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 EN 15804, 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 background report (project report) for this EPD

Why does verification transparency matter? Read more online.

VERIFICATION OVERVIEW

Following independent third party has verified this specific EPD:

EPD verification information	Answer
Independent EPD verifier	Elisabet Amat
EPD verification started on	Date when started
EPD verification completed on	Date when completed
Supply-chain specific data %	99%
Approver of the EPD verifier	EPD International AB

Author & tool verification	Answer
EPD author	Ipek Goktas, One Click LCA Ltd
Independent software verifier	Ugo Pretato, Studio Fieschi & soci
Software verification date	2021.05.11

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 EN 15804:2012+A2:2019.

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.

Signature

Elisabet Amat

VERIFICATION AND REGISTRATION

ISO standard ISO 21930 and CEN standard EN 15804 serves as the core Product Category Rules (PCR)	
PCR	PCR 2019:14 Construction products, version 1.11
PCR review was conducted by:	The Technical Committee of the International EPD® System. See www.environdec.com/TC 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.
Independent third-party verification of the declaration and data, according to ISO 14025:2006:	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal certification ☑ External verification
Third party verifier	Elisabet Amat
	Approved by: The International EPD® System Technical Committee, supported by the Secretariat
Procedure for follow-up during EPD validity involves third party verifier	☐ yes ☑ no

THE INTERNATIONAL EPD® SYSTEM

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