ENVIRONMENTAL PRODUCT DECLARATION

as per *ISO 14025* and *EN 15804+A1*

Owner of the Declaration	Kaimann GmbH
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-KAI-20200014-IBC1-EN
Issue date	08.06.2020
Valid to	07.06.2025

Kaiflex HFplus s2

Kaimann GmbH

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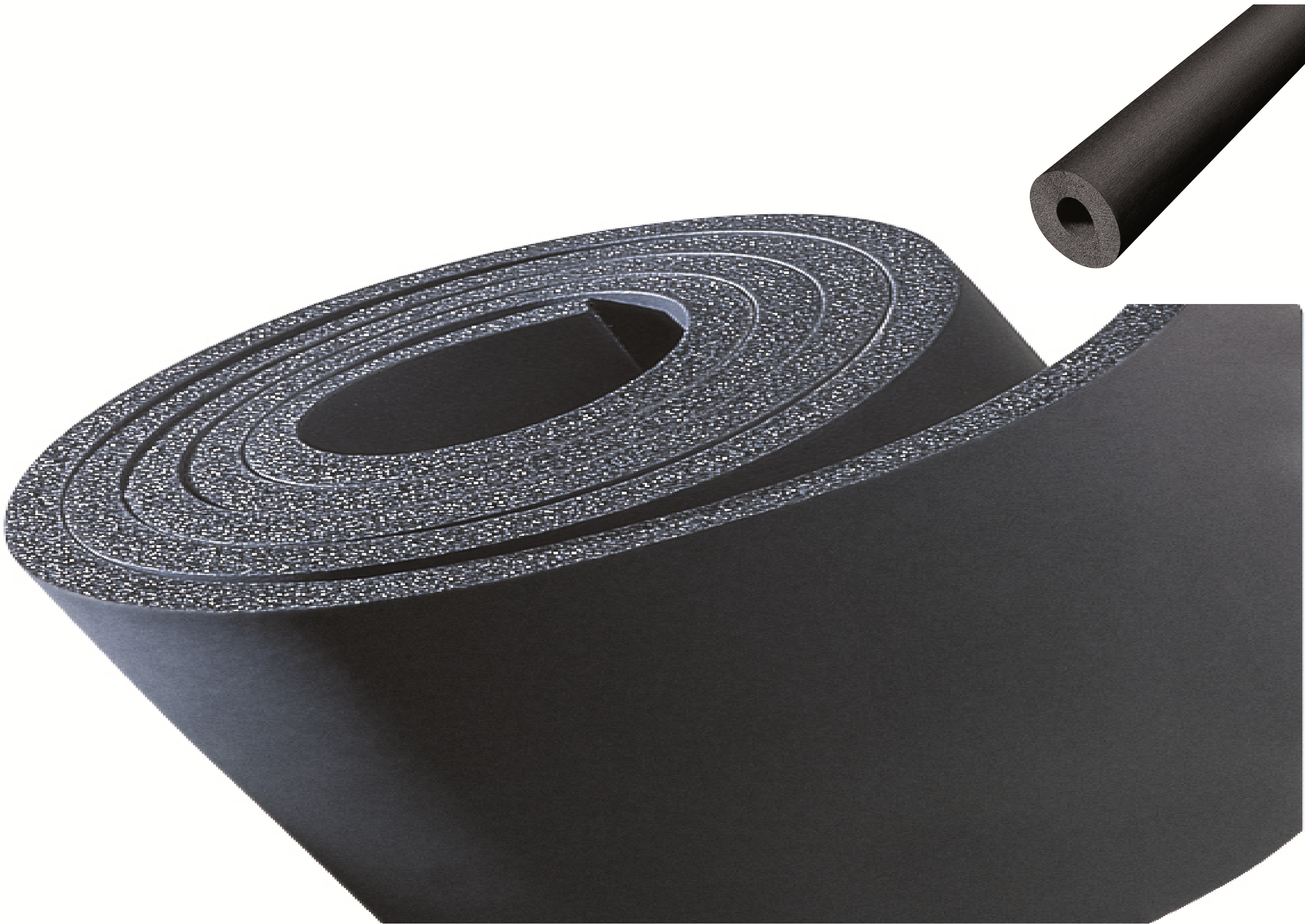


1. General Information

Kaimann GmbH	Kaiflex HFplus s2
Programme holder IBU – Institut Bauen und Umwelt e.V. Panoramastr. 1 10178 Berlin Germany	**Owner of the declaration** Kaimann GmbH Hansastraße 2-5 33161 Hövelhof
Declaration number EPD-KAI-20200014-IBC1-EN	**Declared product / declared unit** 1 m3 insulation material Kaiflex HFplus s2
This declaration is based on the product category rules: Insulating materials made of foam plastics, 06.2017 (PCR checked and approved by the SVR)	**Scope:** Product line Kaiflex HFplus s2 Thermal insulation material made of flexible elastomeric foam for technical building equipment and industrial installations. The EPD is performed in agreement with the demands of PCR Part A with reference to EN 15804+A1:2013 and PCR Part B: Requirements on the EPD for insulating materials made of foam plastics. The EPD is based on the average Kaiflex HFplus s2 production from two different variations produced in one plant in Germany. The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences. The EPD was created according to the specifications of *EN 15804+A1*. In the following, the standard will be simplified as *EN 15804*.
Issue date 08.06.2020	
Valid to 07.06.2025	**Verification** The standard *EN 15804* serves as the core PCR Independent verification of the declaration and data according to *ISO 14025:2010* ☐ internally ☒ externally
Dipl. Ing. Hans Peters (chairman of Institut Bauen und Umwelt e.V.)	
Dr. Alexander Röder (Managing Director Institut Bauen und Umwelt e.V.))	Matthias Klingler (Independent verifier appointed by SVR)

2. Product

2.1 Product description/Product definition

Kaiflex HFplus s2 is a flexible closed cell rubber insulation that prevents condensation and reduces energy loss. By incorporating a water vapour barrier into the insulation cell structure Kaiflex HFplus s2 can effectively eliminate water vapour migration and retain its performance over the entire system life. This EPD covers the Kaiflex HFplus s2 product family including Kaiflex HFplus s2 tubes and sheets.

For the placing on the market of the product in the European Union/European Free Trade Association (EU/EFTA) (with the exception of Switzerland) Regulation (EU) No. 305/2011 (CPR) applies. The product needs a declaration of performance taking into consideration *EN 14304:2009* Thermal insulation products for building equipment and industrial installations - Factory made flexible elastomeric foam (FEF) products - Specification, and the CE-marking.

For the application and use the respective national provisions apply.

2.2 Application

Kaiflex HFplus s2 is available in tube and sheets for use on air-conditioning, refrigeration, chilled water, heating and hot water pipes and air-distribution ductwork. In addition to preventing condensation and saving energy, Kaiflex HFplus s2 also performs an acoustic function, absorbing sound and dampening duct wall vibration. With inherent anti-microbial resistance as standard, and a Class D fire rated, closed cell rubber that is completely dust and fibre free, Kaiflex HFplus s2 can be used in any kind of public, commercial or industrial building without impacting on health or the quality of air. Outdoor application requires protection against UV-radiation.

2.3 Technical Data

Constructional data

Name	Value	Unit
Gross density	88	kg/m^3
Water vapour diffusion resistance factor acc. to EN 12088	μ ≥ 2000	-
Thermal conductivity	$\lambda\vartheta = 0.04 + 8.0 \cdot 10E\text{-}5\ \vartheta + 7*10E\text{-}7*\vartheta^2$	W/(mK)
Thermal conductivity at -10 °C	0.039	W/(mK)
Thermal conductivity at 0 °C	0.04	W/(mK)
Thermal conductivity at 10 °C	0.041	W/(mK)

Performance data of the product in accordance with the declaration of performance with respect to its essential characteristics according to *EN 14304:2009*, Thermal insulation products for building equipment and industrial installations - Factory made flexible elastomeric foam (FEF) products - Specification.

2.4 Delivery status

The EPD is declared as an average product of one plant of one manufacturer. It looks at the average environmental performance of six product varieties from the product line Kaiflex HFplus s2. This is in accordance with the classification rules for group 1c) from *PCR Part A* paragraph 5.2. The products are:

- Kaiflex HFplus s2 tube
- Kaiflex HFplus s2 sheet

Sheets are available from d_N = 3 mm to 32 mm. Tubes are available from d_N = 6 mm to 32 mm

2.5 Base materials/Ancillary materials

Kaiflex HFplus s2 is based on synthetic rubber and consists of several components. The following table shows the components clustered into substance groups:

- Rubber and polymers: 28%
- Fillers and pigments: 2.6%
- Blowing agent: 7%
- Vulcanisation system, additives, plasticizer: 12.1%
- Flame retardant: 50%
- Stabilizer: 0.3%

Rubber and polymer are the base material. Fillers and pigments are for firmness and colour. The blowing agent causes the volume increase and expansion process during the manufacture of the product. The vulcanisation system, additives, and plasticizer provide flexibility and workability. The flame retardants ensure the fire resistance of the end-product, and the adhesives and stabilizers are for processing and process control.

1) This product/article/at least one partial article contains substances listed in the ECHA candidate list (16.01.2020) exceeding 0.1 percentage by mass: **no**.
2) This product/article/at least one partial article contains other CMR substances in categories 1A or 1B which are not on the candidate list, exceeding 0.1 percentage by mass: **no**.
3) Biocide products were added to this construction product or it has been treated with biocide products (this then concerns a treated product as defined by the (EU) Ordinance on Biocide Products No. 528/2012): **no**.

2.6 Manufacture

Upon delivery, the raw materials are either stored in a warehouse or used in the production shortly after. The first step in the production of Kaiflex HFplus s2 is to mix the raw materials in a kneader and to roll out the resulting mixture which is then cut into sheets. The flat sheets are passed through an industrial cooler and cooled off. The cooled-off sheets are granulated and the granulates are temporarily stored at room temperature before entering the compounding plant.

In a next step, the different types of granulates enter the compounding plant for mixing. The resulting elastomer compound is pushed through one of five extruders and carried on a conveyer belt through an industrial furnace for foaming. After foaming, the endless sheets are passed through an industrial cooler upon which a continuous longitudinal cut is applied to cut sheets into the right width. If applicable, adhesive coating is applied on one side of the sheets. Finally, a traverse cut trims the continuous sheet into sheets of various sizes.

2.7 Environment and health during manufacturing

The manufacturer of the product complies with national manufacturing guidelines and regulations such as the German Energy Saving Regulation (EnEV) and the German Renewable Energy Act (EEG). In addition, KAIMANN's environmental management system is certified in accordance with *ISO 9001/14001/50001.*

2.8 Product processing/Installation

The installation of Kaiflex HFplus s2 requires basic tools such as cutters and scissors. No additional specific protection, beyond normal protective clothes, is required. Liquid oxygen can react explosively in conjunction with organic material such as Kaiflex HFplus s2 insulation material. To avoid the diffusion of oxygen, a complete seal must be affected. Butt joints and overlapping areas must also be made airtight using Kaiflex adhesive.

2.9 Packaging

Kaiflex HFplus s2 is packaged in cardboard boxes, polyethylene film, and polypropylene bags, both in varying sizes. Cardboard boxes and polypropylene bags are placed on wooden EURO pallets.

2.10 Condition of use

Changes in materials composition of the product during the use phase only occur in case of extraordinary effects.

2.11 Environment and health during use

An odour should be considered normal. The odour will dissipate during use (about 4 weeks) because the cells are exchanged with the air.

2.12 Reference service life

Since the use stage (B1-B7) is not fully declared, the declaration of the reference service life is only voluntary.

2.13 Extraordinary effects

Fire
Kaiflex HFplus s2 has been designed to meet European fire regulations and is a self- extinguishing foam that will not drip, or support flame spread. With a European Class DL-s2, d0 or Class D-s2, d0 fire classification, Kaiflex HFplus s2 can be used in public, commercial and industrial buildings.

Fire protection

Name	Value
Building material class	D (sheets) / DL (tubes)
Burning droplets	d0
Smoke gas development	s2

Water
Formed from thousands of independently water-resistant cells, Kaiflex insulation is naturally resistant to moisture ingress and requires no additional water vapour barrier.

Mechanical destruction
Kaiflex insulation materials are flexible foams and display limited mechanical rigidity. If the material should be subjected to mechanical loads, it should be protected accordingly.

2.14 Re-use phase

At the end-of-life, the product can be used for energy recovery in a waste incineration plat, as well the plastic from packaging. The cardboard and wooden pallets from packaging can be recycled.

2.15 Disposal

The product is disposed in accordance with local regulations governed by the *European Waste Catalogue* (waste code: 07 wastes from organic chemical processes - 07 02 13 waste plastic).

2.16 Further information

Additional information about the product is available on https://kaimann.com/.

3. LCA: Calculation rules

3.1 Declared Unit

The declared unit is 1 m³ of the thermal insulation material for technical building equipment and industrial installations Kaiflex HFplus s2 including packaging materials. The declared unit refers to the product as it leaves the factory gate. The gross density is the average density of al declared products, weighted by production volume.

Declared unit

Name	Value	Unit
Gross density	88	kg/m³
Conversion factor to 1 kg	0.01136	-
Declared unit	1	m³

3.2 System boundary

The type of EPD is cradle to gate. The system boundaries of the EPD follow the modular structure of *EN 15804* (according to *EN 15804*, section 6.2.1). Only the declaration of the product stage modules A1 to A3 is mandatory for compliance with *EN 15804*. The declaration of the modules of other life cycle stages is optional. Resources from the ecosphere and Technosphere enter the system on stage A1 and leave the system on stage C4. The following life cycle stages are considered:

Module A1: The system boundaries comprise raw material extraction and supply from cradle to factory gate and is represented through generic background data sets.
Module A2: The transport of the raw materials from the factory gate to the point of manufacturing is represented through generic background data sets. The transportation distances have been provided by the manufacturer.
Module A3: The manufacturing includes manufacturer-specific material and energy data which are represented through generic data sets. Machinery, as well as buildings to manufacture the declared unit, is neglected. On average, 0.49 kWh electricity and 2.65 kWh natural gas are required for the manufacturing of 1m³ Kaiflex HFplus s2. This data was provided by Kaimann GmbH. This module also includes packaging with plastics and carboard and wooden pallets. the biogenic carbon stored is declared in the result section.
Module A4: The transport of Kaiflex HFplus s2 from the factory gate to the site of assembly is represented through generic background data. The transportation distances are based on average transportation data provided by the manufacturer.
Module A5: The assembly can be done manually without the use of any electrical equipment. Only glue (Kaiflex Special glue) is required for the assembly of Kaiflex HFplus s2. Packaging material from module A3 is disposed of here: Plastic packaging is incinerated, and cardboard and the wooden pallets are re-used.
Modules B1-B7: No resource use and impacts occur during the use phase of the products.
Modules C1&C3: Dismantling of Kaiflex HFplus s2 is done manually without using any electrical equipment. No processing is required before disposal. Therefore, module C1 and C3 are disregarded.
Module C2: The products to be disposed of are transported to the waste treatment facility.
Module C4: The waste is treated according to the waste framework directive of the European Union.
Module D: Potential impacts and benefits from energy recovery and recycling are described.

3.3 Estimates and assumptions

Module A2: Raw materials are transported to the manufacturer by road transport and shipping. Information on the transportation distances was provided by the manufacturer. For the calculation, the distances were weighted by the mass of the respective raw materials.

Module A3: No production waste is assumed during the production of Kaiflex.

Module A4: Kaiflex HFplus s2 is distributed in Europe. The average transportation distance per declared unit was calculated based on the sales volume and average transportation distance per country where Kaiflex HFplus s2 is distributed. Based on the sum product of sales volume multiplied with road transportation, the total transportation distances were calculated and divided by the total sales volume to calculate the average transportation distance per declared unit. As a result, the average road transportation distance per declared unit is 743 km, and the average ship transportation distance is 97 km. No loss during transportation is assumed.

Module A5: Kaiflex HFplus s2 is assembled by manual labour under use of adhesive. It is assumed that no further energy or materials are required in this module, and that consumers of Kaiflex HFplus s2 order correct product sizes and thus avoid waste production during the assembly. The packaging materials are disposed of by re-using (cardboard and wooden pallet) and by incineration (polyethylene and polypropylene).

Module C2: The average distance of the disassembled product to the point of disposal is assumed to be 75 kilometres covered by road.

Module C4: The product is incinerated.

3.4 Cut-off criteria

All material flows in module A1 are covered and almost all material and energy flows in module A3 are covered. Neglected material or energy flows have a mass or energy contribution of less than one percent per process and contribute to less than 5% of mass and energy flows of a module. Infrastructure such as office buildings and the manufacturing hall as well as the machinery required to produce the product have not been considered.

3.5 Background data

The LCA model underlying this EPD was created in *openLCA 1.10* developed by GreenDelta GmbH. As a background database *GaBi database* professional database (version from September 2019) by thinkstep AG was used and has been complemented by data sets from *GaBi database* extension databases as well as data sets from the *EuGeos database* 15804-IA database version 2.1 by EuGeos Ltd.

3.6 Data quality

The life cycle inventory for the assessed product is based on an internal assessment of manufacturing and environmental data, assessment of LCA-relevant data for the supply chain and energy measurement within the factors. The required product flows for creation of the product system were handed over to GreenDelta GmbH.
All data was scrutinised and found to be plausible and consistent and were therefore found to be representative.
Some of the background data sets are more than 10 years old but were used when no recent dataset was available. Datasets from the *GaBi database* are assumed to have a high quality.
There are no materials or processes that are left out because they are under the cut-off threshold.

3.7 Period under review

The production data refers to the average of the year 2018.

3.8 Allocation

No allocation is carried out.

3.9 Comparability

Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to *EN 15804* and the building context, respectively the product-specific characteristics of performance, are taken into account.

As a background database *GaBi database* professional database (version from September 2019) by thinkstep AG was used and has been complemented by data sets from GaBi extension databases as well as data sets from the *EuGeos database* 15804-IA database version 2.1 by EuGeos Ltd.

4. LCA: Scenarios and additional technical information

The following technical scenario information serves as a basis for the declared modules. All values refer to the declared unit of 1 m³.

Transport to the building site (A4)

Name	Value	Unit
Transport distance (road)	743	km
transport distance (ship)	97	km

Installation into the building (A5)

Name	Value	Unit
Auxiliary	1.6	kg
Water consumption	0	m^3
Other resources	0	kg
Electricity consumption	0	kWh
Other energy carriers	0	MJ
Material loss	0	kg
Output substances following waste treatment on site	16.5	kg
Dust in the air	0	kg
VOC in the air	0	kg

The 16.5 kg are the sum of all packaging materials per declared unit.

End of life (C1-C4)

Name	Value	Unit
Collected separately	89.6	kg
Collected as mixed construction waste	0	kg
Reuse	0	kg
Recycling	0	kg
Energy recovery	89.6	kg
Landfilling	0	kg

88 kg Kaiflex and 1.6 kg special glue are incinerated for energy recovery.

Reuse, recovery and/or recycling potentials (D), relevant scenario information

Module D includes the credits of the incineration processes from modules C4 and A5 (packaging waste) at a waste incineration plant with an assumed efficiency of R1<0.6.

5. LCA: Results

The life cycle impact assessment method is based on EN15804. Energy indicators for resource use utilise the lower calorific value.

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE NOT DECLARED; MNR = MODULE NOT RELEVANT)

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse- Recovery- Recycling- potential
A1	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
X	X	X	X	X	MND	MND	MNR	MNR	MNR	MND	MND	MND	X	MND	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A1: 1 m³

Parameter	Unit	A1	A2	A3	A4	A5	C2	C4	D
GWP	[kg CO_2-Eq.]	2.84E+2	6.64E+0	2.64E+1	1.08E+1	1.27E+1	1.08E+0	2.27E+2	-2.44E+2
ODP	[kg CFC11-Eq.]	4.77E-5	7.57E-7	2.23E-7	1.99E-6	2.88E-7	2.01E-7	1.56E-13	-2.23E-7
AP	[kg SO_2-Eq.]	1.35E+0	8.98E-2	8.69E-2	4.57E-2	1.74E-2	4.26E-3	2.57E-2	-2.33E-1
EP	[kg $(PO_4)^{3-}$-Eq.]	2.18E+0	1.17E-2	2.05E-2	1.03E-2	8.10E-3	1.00E-3	5.99E-3	-5.54E-2
POCP	[kg ethene-Eq.]	6.59E-2	2.72E-3	5.07E-3	1.86E-3	2.36E-3	1.78E-4	1.51E-3	-1.19E-2
ADPE	[kg Sb-Eq.]	1.53E-3	1.23E-5	9.33E-6	3.21E-5	1.15E-5	3.24E-6	1.52E-6	-1.35E-5
ADPF	[MJ]	4.90E+3	9.41E+1	3.19E+2	1.67E+2	1.08E+2	1.67E+1	9.43E+1	-1.89E+3

Caption	GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources

RESULTS OF THE LCA - RESOURCE USE according to EN 15804+A1: 1 m³

Parameter	Unit	A1	A2	A3	A4	A5	C2	C4	D
PERE	[MJ]	3.08E+2	7.75E-1	2.79E+2	1.79E+0	7.93E+0	1.80E-1	2.64E+1	-5.58E+2
PERM	[MJ]	7.94E+0	0.00E+0	2.35E+2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	-2.35E+2
PERT	[MJ]	3.16E+2	7.75E-1	5.13E+2	1.79E+0	7.93E+0	1.80E-1	2.64E+1	-7.93E+2
PENRE	[MJ]	1.45E+3	9.51E+1	2.24E+2	1.69E+2	2.26E+2	1.69E+1	3.83E+3	-1.89E+3
PENRM	[MJ]	3.73E+3	0.00E+0	1.16E+2	0.00E+0	-1.16E+2	0.00E+0	-3.73E+3	0.00E+0
PENRT	[MJ]	5.18E+3	9.51E+1	3.40E+2	1.69E+2	1.10E+2	1.69E+1	9.43E+1	-1.89E+3
SM	[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
RSF	[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
NRSF	[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
FW	[m³]	6.11E+0	1.23E-2	7.24E-1	2.83E-2	2.27E-1	2.85E-3	7.39E-1	-4.31E+0

Caption	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water

RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES according to EN 15804+A1: 1 m³

Parameter	Unit	A1	A2	A3	A4	A5	C2	C4	D
HWD	[kg]	3.49E-2	3.37E-9	9.50E-3	1.60E-10	4.35E-8	0.00E+0	5.84E-7	-1.71E-3
NHWD	[kg]	1.58E+2	6.61E-2	9.01E+0	3.13E-3	4.54E+0	0.00E+0	6.65E+1	-3.54E+2
RWD	[kg]	3.86E-2	3.77E-5	2.79E-3	1.79E-6	8.02E-4	0.00E+0	4.52E-3	-5.17E-3
CRU	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.37E+1	0.00E+0	0.00E+0	0.00E+0
MFR	[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
MER	[kg]	5.55E-11	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
EEE	[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
EET	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	6.94E+1	0.00E+0	2.24E+3	0.00E+0

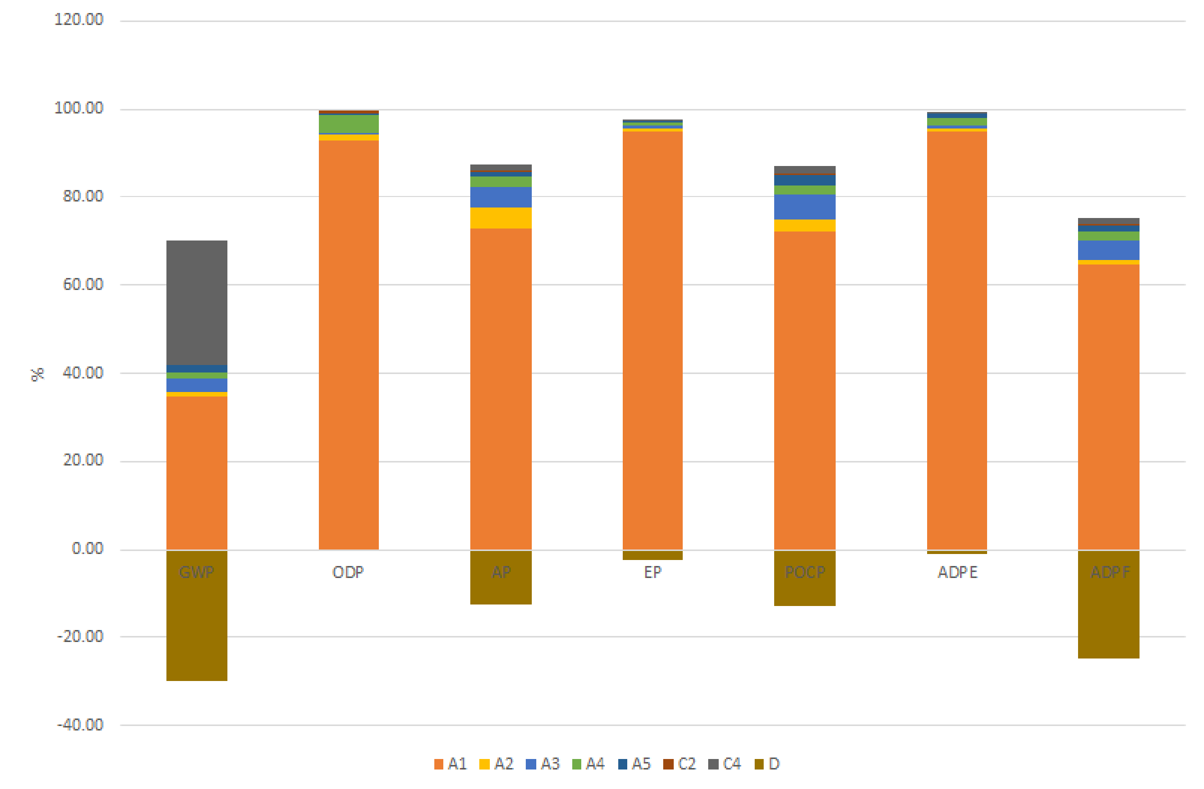
Caption	HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EEE = Exported thermal energy

Additional Technical scenario:

Biogenic carbon is not included in the results. It enters the product system with wood and cardboard in modules A3 and is 'released' by being an avoided burden in module A5 (declared in module D) and has thus no net-effect on the overall results. The wooden pallet has approximately 23 kg biogenic CO2, and the carboard has 16 kg.

6. LCA: Interpretation

Environmental Impacts



All seven environmental impact categories are dominated by module A1 raw material supply. The production of the blowing agent and the base material are the largest contributors. For the global warming potential, the incineration of the product in module C4 is another major source of greenhouse gas emissions.

Renewable primary energy as energy carrier (PERE)
Renewable energy is used in the production of the raw materials and in the production of the packaging (mainly the wooden pallet). Likewise, energy is released in the incineration process (D).

Renewable primary energy resources as material utilization (PERM)
The wood of the pallet acts as a storage for renewable energy. By re-using the pallet, the same amount of energy is credited in module D.

Use of net fresh water (FW)
This impact category is dominated by module A1 raw material supply.
The production of the blowing agent uses the most fresh water.

Hazardous waste disposed (HWD)
Most of the hazardous waste comes from the production of the blowing agent in A1 and the production of the plastic packaging in A3.

Non-hazardous waste disposed (NHWD)
This impact category is dominated by module A1 raw material supply and the incineration residues in module C4.
The main contributor is the production of the base material.

Radioactive waste disposed (RWD)
This impact category is dominated by module A1 raw material supply.
Most radioactive waste stems from the production of the base material.

Conclusion
The production of the blowing agent is the largest contributor to the environmental impacts of Kaiflex HFplus s2.

7. Requisite evidence

7.1 VOC emissions

The Volatile Organic Compound (VOC) emissions have been tested by *Eurofins* Product Testing A/S by using the Committee for health-related evaluation of building products/Deutsches Institut für Bautechnik (*AgBB/DIBt*) test method in 09.2013.

AgBB overview of results (28 days [µg/m³])

Name	Value	Unit
TVOC (C6 - C16)	<5	µg/m³
Sum SVOC (C16 - C22)	<5	µg/m³
R (dimensionless)	<1	-
VOC without NIK	<5	µg/m³
Carcinogenic Substances	<1	µg/m³

AgBB overview of results (3 days [µg/m³])

Name	Value	Unit
TVOC (C6 - C16)	<5	µg/m³
Sum SVOC (C16 - C22)	<5	µg/m³
R (dimensionless)	<1	-
VOC without NIK	<5	µg/m³
Carcinogenic Substances	<1	µg/m³

7.2 Leaching performance

The concentration of water-soluble chloride ions is 300 mg/kg according to /EN 13468:2001/.

8. References

AGBB/DIBt
Deusches Institut für Bautechnik 2018: Anforderungen an die Innenraumluftqualität in Gebäuden: Gesundheitliche Bewertung der Emissionen von flüchtigen organischen Verbindungen (VVOC, VOC und SVOC) aus Bauprodukten

EN 12088
EN 12088:2013, Thermal insulating products for building applications. Determination of long term water absorption by diffusion

EN 13468
EN 13468:2001, Thermal insulating products for building equipment and industrial installations - Determination of trace quantities of water soluble chloride, fluoride, silicate, and sodium ions and pH

EN 14304
EN 14304:2009+A1:2013, Thermal insulation products for building equipment and industrial installations - Factory made flexible elastomeric foam (FEF) products - Specification

EN 15804
EN 15804:2012+A1:2013, Nachhaltigkeit von Bauwerken – Umweltproduktdeklarationen – Grundregeln für die Produktkategorie Bauprodukte

EuGeos database
LCA database by EuGeos Limited

Eurofins
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