SENTINEL HOLDING
INSTITUT

SHI-PRODUKTPASS

Produkte finden - Gebäude zertifizieren

SHI-Produktpass-Nr.:

13373-10-1104

Distanzklotz-Sortiment

Warengruppe: Montagezubehör - Distanzklötze

WÜRTH

Adolf Würth GmbH & Co. KG
Reinhold-Würth-Straße 12-17
74653 Künzelsau-Gaisbach

Produktqualitäten:

- SHI-Produkt bewertung 2024
- QNG Qualitätssiegel Nachhaltiges Gebäude
- DGNB NEUBAU 2023
- DGNB NEUBAU 2018
- BNB-BN NEUBAU V2015
- EU-Taxonomie
- BREEAM DE NEUBAU 2018

GEPRÜFT NACHHALTIGES PRODUKT
SHI PRODUKT PASS
SENTINEL HOLDING INSTITUT
www.sentinel-holding.eu

Köttner

Helmut Köttner
Wissenschaftlicher Leiter
Freiburg, den 14.10.2025

Produkt:
Distanzklotz-Sortiment

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Inhalt

Wir sind stolz darauf, dass die SHI-Datenbank, die erste und einzige Datenbank für Bauprodukte ist, die ihre umfassenden Prozesse sowie die Aktualität regelmäßig von dem unabhängigen Prüfunternehmen SGS-TÜV Saar überprüfen lässt.

SGS TÜV SAAR

SENTINEL HOLDING
INSTITUT

Produkt:
Distanzklotz-Sortiment

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SHI-Produktbewertung 2024

Seit 2008 etabliert die Sentinel Holding Institut GmbH (SHI) einen einzigartigen Standard für schadstoffgeprüfte Produkte. Experten führen unabhängige Produktprüfungen nach klaren und transparenten Kriterien durch. Zusätzlich überprüft das unabhängige Prüfunternehmen SGS regelmäßig die Prozesse und Aktualität.

Kriterium	Produktkategorie	Schadstoffgrenzwert	Bewertung
SHI-Produktbewertung	sonstige Produkte	TVOC ≤ 300 µg/m³ Formaldehyd ≤ 24 µg/m³	Emissionsneutral
Gültig bis: 11.06.2026			

Produkt:
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QNG - Qualitätssiegel Nachhaltiges Gebäude

Das Qualitätssiegel Nachhaltiges Gebäude, entwickelt durch das Bundesministerium für Wohnen, Stadtentwicklung und Bauwesen (BMWSB), legt Anforderungen an die ökologische, soziokulturelle und ökonomische Qualität von Gebäuden fest. Das Sentinel Holding Institut prüft Bauprodukte gemäß den QNG-Anforderungen für eine Zertifizierung und vergibt das QNG-ready Siegel. Das Einhalten des QNG-Standards ist Voraussetzung für den KfW-Förderkredit. Für bestimmte Produktgruppen hat das QNG derzeit keine spezifischen Anforderungen definiert. Diese Produkte sind als nicht bewertungsrelevant eingestuft, können jedoch in QNG-Projekten genutzt werden.

Kriterium	Pos. / Bauproduktgruppe	Betrachtete Stoffe	QNG Freigabe
3.1.3 Schadstoffvermeidung in Baumaterialien	nicht zutreffend	nicht zutreffend	QNG-ready nicht bewertungsrelevant

Produkt:
Distanzklotz-Sortiment

SHI Produktpass-Nr.:
13373-10-1104

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DGNB Neubau 2023

Das DGNB-System (Deutsche Gesellschaft für Nachhaltiges Bauen) bewertet die Nachhaltigkeit von Gebäuden verschiedener Art. Das System ist sowohl anwendbar für private und gewerbliche Großprojekte als auch für kleinere Wohngebäude. Die Version 2023 setzt hohe Standards für ökologische, ökonomische, soziokulturelle und funktionale Aspekte während des gesamten Lebenszyklus eines Gebäudes.

Kriterium	Pos. / Relevante Bauteile / Bau-Materialien / Flächen	Betrachtete Stoffe / Aspekte	Qualitätsstufe
ENV 1.2 Risiken für die lokale Umwelt, 03.05.2024 (3. Auflage)	nicht zutreffend		nicht bewertungsrelevant

Kriterium	Pos. / Relevante Bauteile / Bau-Materialien / Flächen	Betrachtete Stoffe / Aspekte	Qualitätsstufe
ENV 1.2 Risiken für die lokale Umwelt, 29.05.2025 (4. Auflage)	nicht zutreffend		nicht bewertungsrelevant

Produkt:
Distanzklotz-Sortiment

SHI Produktpass-Nr.:
13373-10-1104

WÜRTH

DGNB Neubau 2018

Das DGNB-System (Deutsche Gesellschaft für Nachhaltiges Bauen) bewertet die Nachhaltigkeit von Gebäuden verschiedener Art. Das System ist sowohl anwendbar für private und gewerbliche Großprojekte als auch für kleinere Wohngebäude.

Kriterium	Pos. / Relevante Bauteile / Bau-Materialien / Flächen	Betrachtete Stoffe / Aspekte	Qualitätsstufe
ENV 1.2 Risiken für die lokale Umwelt	nicht zutreffend	nicht zutreffend	nicht bewertungsrelevant

Produkt:
Distanzklotz-Sortiment

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BNB-BN Neubau V2015

Das Bewertungssystem Nachhaltiges Bauen ist ein Instrument zur Bewertung von Büro- und Verwaltungsgebäuden, Unterrichtsgebäuden, Laborgebäuden sowie Außenanlagen in Deutschland. Das BNB wurde vom damaligen Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit (BMUB) entwickelt und unterliegt heute dem Bundesministerium für Wohnen, Stadtentwicklung und Bauwesen.

Kriterium	Pos. / Bauprodukttyp	Betrachtete Schadstoffgruppe	Qualitätsniveau
1.1.6 Risiken für die lokale Umwelt			nicht bewertungsrelevant

Produkt:
Distanzklotz-Sortiment

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EU-Taxonomie

Die EU-Taxonomie klassifiziert wirtschaftliche Aktivitäten und Produkte nach ihren Umweltauswirkungen. Auf der Produktebene gibt es gemäß der EU-Verordnung klare Anforderungen zu Formaldehyd und flüchtigen organischen Verbindungen (VOC). Die Sentinel Holding Institut GmbH kennzeichnet qualifizierte Produkte, die diesen Standard erfüllen.

Kriterium	Produkttyp	Betrachtete Stoffe	Bewertung
DNSH - Vermeidung und Verminderung der Umweltverschmutzung			nicht bewertungsrelevant

Produkt:
Distanzklotz-Sortiment

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BREEAM DE Neubau 2018

BREEAM (Building Research Establishment Environmental Assessment Methodology) ist ein britisches Gebäudebewertungssystem, welches die Nachhaltigkeit von Neubauten, Sanierungsprojekten und Umbauten einstuft. Das Bewertungssystem wurde vom Building Research Establishment (BRE) entwickelt und zielt darauf ab, ökologische, ökonomische und soziale Auswirkungen von Gebäuden zu bewerten und zu verbessern.

Kriterium	Produktkategorie	Betrachtete Stoffe	Qualitätsstufe
Hea 02 Qualität der Innenraumluft			nicht bewertungsrelevant

Produkt:
Distanzklotz-Sortiment

SHI Produktpass-Nr.:
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Produktsiegel

In der Baubranche spielt die Auswahl qualitativ hochwertiger Materialien eine zentrale Rolle für die Gesundheit in Gebäuden und deren Nachhaltigkeit. Produktlabels und Zertifikate bieten Orientierung, um diesen Anforderungen gerecht zu werden. Allerdings besitzt jedes Zertifikat und Label eigene Prüfkriterien, die genau betrachtet werden sollten, um sicherzustellen, dass sie den spezifischen Bedürfnissen eines Bauvorhabens entsprechen.

epddanmark

EPD Denmark ist das nationale Programm für Umweltproduktdeklarationen in Dänemark. Es stellt sicher, dass registrierte EPDs die Anforderungen der internationalen Normen ISO 14025 und EN 15804 erfüllen. Dies geschieht durch klare Programmanweisungen, die sowohl die Kompetenzen als auch die Unabhängigkeit von Drittprüfern definieren. Die Verifizierung jeder EPD erfolgt durch unabhängige Prüfer, wodurch Transparenz, Glaubwürdigkeit und internationale Vergleichbarkeit gewährleistet werden.

GEPRÜFT NACHHALTIGES PRODUKT
SHI PRODUKT PASS
SENTINEL HOLDING INSTITUT

Dieses Produkt verfügt über einen SHI-Produktpass. Das innovative Tool vereint erstmals alle Produktqualitäten in einem Dokument und enthält die Bewertungen und Nachweisquellen für die Anforderungen gemäß SHI, DGNB, QNG, EU-Taxonomie, BNB und BREEAM.

GEPRÜFT NACHHALTIGES PRODUKT
QNG READY
SENTINEL HOLDING INSTITUT

Produkte mit dem QNG-ready Siegel des Sentinel Holding Instituts eignen sich für Projekte, für welche das Qualitätssiegel Nachhaltiges Gebäude (QNG) angestrebt wird. QNG-ready Produkte erfüllen die Anforderungen des QNG Anhangdokument 3.1.3 "Schadstoffvermeidung in Baumaterialien". Das KfW-Kreditprogramm Klimafreundlicher Neubau mit QNG kann eine höhere Fördersumme ermöglichen.

WÜRTH

Rechtliche Hinweise

(*) Die Kriterien dieses Steckbriefs beziehen sich auf das gesamte Bauobjekt. Die Bewertung erfolgt auf der Ebene des Gebäudes. Im Rahmen einer sachgemäßen Planung und fachgerechten Installation können einzelne Produkte einen positiven Beitrag zum Gesamtergebnis der Bewertung leisten. Das Sentinel Holding Institut stützt sich einzig auf die Angaben des Herstellers.

Alle Kriterien finden Sie unter:
https://www.sentinel-holding.eu/de/Themenwelten/Pr%C3%BCfkriterien%20f%C3%BCr%20Produkte

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SGS TÜV SAAR

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epddanmark

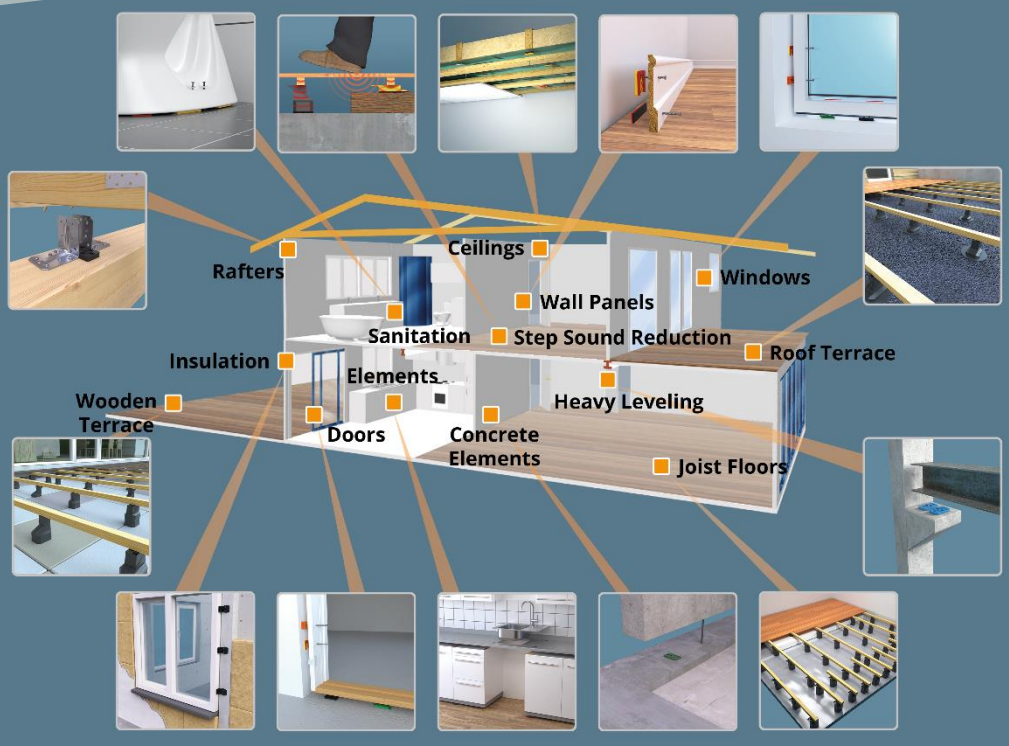
ECO PLATFORM EPD VERIFIED

Owner: Knudsen Kilen A/S
No.: MD-23135-EN
Issued: 11-08-2023
Valid to: 11-08-2028

3rd PARTY **VERIFIED**

EPD

VERIFIED ENVIRONMENTAL PRODUCT DECLARATION | **ISO 14025 & EN 15804**



Owner of declaration
Knudsen Kilen A/S
Industrivej 21
DK 3300 Frederiksværk
CVR: 87 43 28 15

Knudsen Kilen A/S

Programme
EPD Danmark
www.epddanmark.dk

epddanmark

☐ Industry EPD
☒ Product EPD

Declared product(s)
Knudsen Kilen Height Adjustment Products

Number of declared datasets/product variations: 5 Product groups

This EPD covers five product groups of Knudsen Kilen Height Adjustment products: Product group 1 (Wedges, HDPE), Product group 2 (Height Adjustment Products, LDPE), Product group 3 (Combi Sole, PS), Product group 4 (Sound Reducer, Regupol) and Product group 5 (Sound Reducer Light, Regupol Resist).

Production site
Industrivej 21, DK 3300 Frederiksværk

No green electricity or biogas is used in A3 (production)

Product(s) use
The products are applied in buildings as height adjustment and levelling solutions in rafters, ceilings, windows, wall panels, sanitations, step sound reductions, roof terraces, insulation, elements, doors, wooden terraces, concrete elements and joist flows.

Declared/ functional unit
1 kg of Knudsen Kilen Height Adjustment Products

Year of production site data (A3)
2022

EPD version
Version 1.0

Issued: 11-08-2023

Valid to: 11-08-2028

Basis of calculation
This EPD is developed in accordance with the European standard EN 15804+A2.

Comparability
EPDs of construction products may not be comparable if they do not comply with the requirements in EN 15804. EPD data may not be comparable if the datasets used are not developed in accordance with EN 15804 and if the background systems are not based on the same database.

Validity
This EPD has been verified in accordance with ISO 14025 and is valid for 5 years from the date of issue.

Use
The intended use of an EPD is to communicate scientifically based environmental information for construction products, for the purpose of assessing the environmental performance of buildings.

EPD type
☒Cradle-to-gate with modules C1-C4 and D
☐Cradle-to-gate with options, modules C1-C4 and D
☐Cradle-to-grave and module D
☐Cradle-to-gate
☐Cradle-to-gate with options

CEN standard EN 15804 serves as the core PCR

Independent verification of the declaration and data, according to EN ISO 14025

☐ internal ☒ external

Third party verifier:

Guangli Du Aalborg University, BUILD

Martha Katrine Sørensen
EPD Danmark

Life cycle stages and modules (MND = module not declared)																
Product			Construction process		Use							End of life				Beyond the system boundary
Raw material supply	Transport	Manufacturing	Transport	Installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Re-use, recovery and recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	X	X	X	X	X

Product information

Product description

This EPD covers Knudsen Kilen Height Adjustment Products. The results are shown for five different Product groups produced from different materials. The declared unit is 1 kg. In Table 1 on page 9 an overview of the weight per Height Adjustment Product for the different declared Product groups is listed.

The main material components are shown in the table below for each Product group (PG).

Material	Weight-% of declared product				
	PG1	PG2	PG3	PG4	PG5
HDPE granulate	98.5	-	-	-	-
LDPE granulate	-	98.5	-	-	-
PS granulate	-	-	97	-	-
Master batch, LDPE	1.5	1.5	-	-	-
Master batch, PS	-	-	3	-	-
Regupol	-	-	-	79	-
Regupol resist	-	-	-	-	98
Adhesive	-	-	-	21	2

Product packaging:

The composition of the sales- and transport packaging of the product is shown in the table below.

Material	Weight-% of packaging				
	PG1	PG2	PG3	PG4	PG5
Cardboard	4.2	21.6	34.4	33.8	33.7
EU pallet, wood	46.9	50.6	65.1	65.7	65.7
Plastic wrap, LDPE	0.4	0.4	0.5	0.5	0.5
Plastic box, PP	48.5	27.4	-	-	-

Representativity

This declaration, including data collection and the modelled foreground system including results, represents the production of 1 kg Knudsen Kilen Height Adjustment Product from the production site located in Frederiksværk, Denmark. Product specific data are based on average values collected in the period January 2022 to December 2022. Background data is based on Managed LCA Content (MLC) database from Sphera (version 2023.1) and Ecoinvent database version 3.8 and the data is less than 10 years old. Generally, the used background datasets are of high quality, and the majority of the datasets are only a couple of years old.

Hazardous substances

Knudsen Kilen does not contain substances listed on the ”Candidate List of Substances of Very High Concern for authorisation”

(http://echa.europa.eu/candidate-list-table)

Essential characteristics

Knudsen Kilen is the Danish construction industry's leading supplier of height adjustment and levelling solutions.

Knudsen Kilen height adjustment and levelling solutions are produced in accordance with the ISO 9001:200 standard. The products made from HDPE, LDPE, and PS are fire class B2/DIN 4102-1 and do not develop toxic smoke in case of fire. The products made from Regupol and Regupol resist (PU bonded rubber) are fire class EN13501-1 Class E and B2/DIN 4102-1 respectively, and develop toxic smoke in case of fire.

Furthermore, Knudsen Kilen height adjustment and levelling solutions do not split when pierced by nails and screws and are not affected by moisture, rot, or fungus.

Further technical information can be obtained by contacting the manufacturer Knudsen Kilen A/S or from their webpage:

https://knudsenkilen.dk/knudsen-downloads

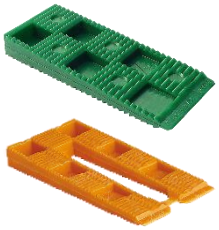
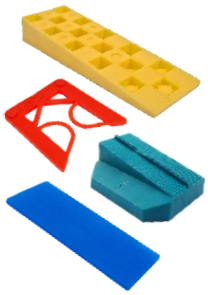
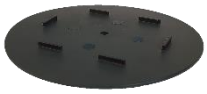
Reference Service Life (RSL)

Not applicable.
Knudsen Kilen height adjustment products has a lifespan of 75 years in an environment of 20 degrees celcius. This lifespan has been tested by the Danish Technological Institute for injection molded black wedges produced from secondary LDPE. More information can be found on the manufacturer’s webpage or by contacting them:

https://knudsenkilen.dk/om-knudsen/knudsen-og-miljoet

Picture of product(s)

Below are pictures of the Product groups of Knudsen Kilen Height Adjustment Products, covered by this EPD.

Product group 1 Wedges, HDPE	**Product group 2** Height Adjustment Products, LDPE	**Product group 3** Combi Sole, PS	**Product group 4** Sound Reducer, Regupol	**Product group 5** Sound Reducer Light, Regupol Resist
				

The declared Product groups are "*Wedges, HDPE"*, "*Height Adjustment Products, LDPE"*, "*Combi Sole, PS"*, "*Sound reducer, Regupol*" and "*Sound Reducer Light, Regupol Resist*".

Within Knudsen Kilen Height Adjustment Products, there are several different product types, which are listed in Table 1.

LCA background

Declared unit

The LCI and LCIA results in this EPD relates to the declared unit of 1 kg Knudsen Kilen Height Adjustment Products, used for different places in the building.

Name	Value	Unit
Declared unit	1	kg
Density	PG1: 960 PG2: 910-925 PG3: 1030 PG4: 687±25% PG5: 730	kg/m^3
Conversion factor to 1 kg	1	kg/kg

The weights per Height Adjustment Product are listed in Table 1 on page 9.

A mass-based allocation factor was used to allocate energy use in production and energy use for utilities at the factory among the different products produced at the factory. Linearity between the energy use of the injection molding machines and produced mass is assumed.

Functional unit

Not defined.

PCR

This EPD is developed according to the core rules for the product category of construction products in EN 15804:2012+A2:2019, which serves as the core PCR.

Guarantee of Origin – certificates

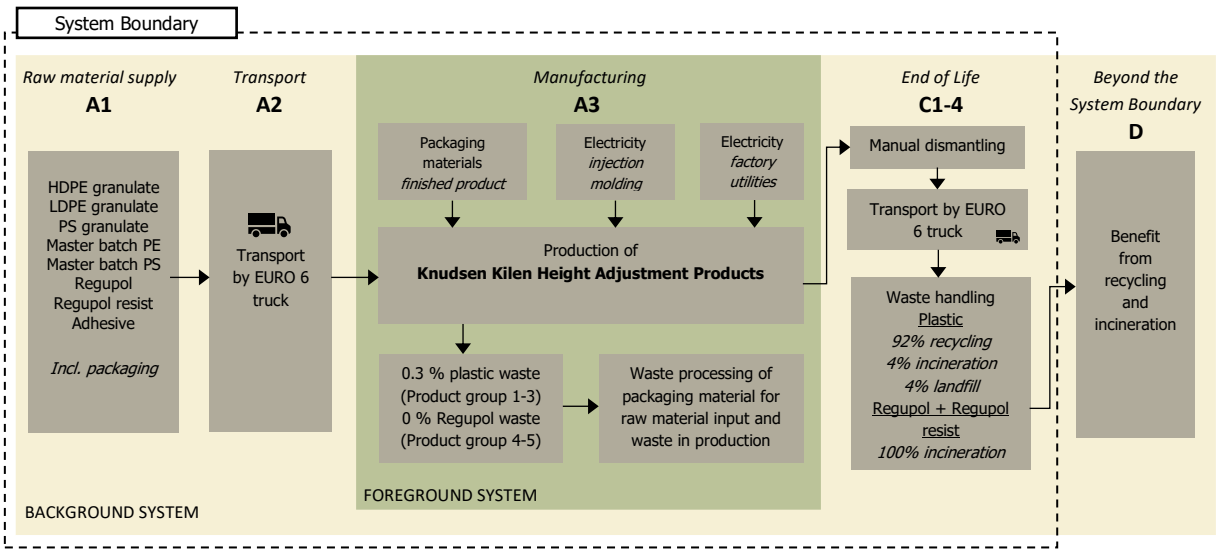
Foreground system:

No use of certified green electricity in the foreground system. The products are produced using electricity modelled as Danish residual electricity mix from 2021 in the production.

Background system:

No use of certified green electricity in the background system. Upstream processes are modelled using national energy mixes. Downstream processes are modelled using national energy mixes.

Flow diagram



System boundary

This EPD is based on a cradle-to-gate LCA with life cycle modules A1-3, C1-4 and D declared, in which 100 weight-% has been accounted for. In the production of 1 kg Knudsen Kilen Height Adjustment Products, a waste of 0.3% occurs in Product group 1-3 an 0% occurs in Product group 4-5 in production in module A3.

The general rules for the exclusion of inputs and outputs follows the requirements in EN 15804, 6.3.5, where the total of neglected input flows per module shall be a maximum of 5 % of energy usage and mass and 1 % of energy usage and mass for unit processes. Packaging material for some of the raw materials in module A1 has been excluded as no data was available. This exclusion of data is in alignment with the requirements in EN 15804.

Product stage (A1-A3) includes:

A1 – Extraction and processing of raw materials
A2 – Transport to the production site
A3 – Manufacturing processes

The product stage comprises the acquisition of all raw materials, products and energy, transport to the production site, packaging and waste processing up to the "end-of-waste" state or final disposal. The LCA results are declared in aggregated form for the product stage, which means, that the sub-modules A1, A2 and A3 are declared as one module A1-A3.

The product stage includes raw materials as input material, transport to the manufacturer's production site in Frederiksværk, electricity for plastic injection molding machines and utilities at the factory site, packaging materials for the finished declared product as well as waste processing of the material waste in production and the raw materials' packaging materials up to the "end-of-waste" state or final disposal, according to EN15804+A2 §6.3.5.2.

The production of the declared Knudsen Kilen Height Adjustment Products is located at the manufacturer's factory in Frederiksværk, Denmark. The raw materials in module A1 are high density polyethylene (HDPE) granulates and LDPE master batch (MB, coloring) for Product group 1, low density polyethylene (LDPE) granulates (secondary material) and LDPE master batch for Product group 2, polystyrene (PS) granulates and PS master batch for Product group 3, Regupol (rubber bond with polyurethane) and adhesive (scrim tape) for Product group 4 as well as Regupol resist (secondary material: rubber bond with polyurethane) and adhesive (scrim tape) for Product group 5.

The packaging materials for the above-mentioned raw materials are octabins (cardboard box) on wood pallets and plastic bags. Packaging materials for regupol, regupol resist and adhesive have been excluded from the LCA according to the cut-off rules.

The transport of the raw materials in module A2 is also included in the product stage and consists of transport by truck from Egypt, Sweden, Belgium, and Denmark.

The production at the factory in Frederiksværk consists of plastic injection molding processes for Product group 1-3 and manual assembling of regupol, regupol resist and adhesive for Product group 4-5. Besides electricity consumption for the plastic injection molding machines, electricity consumption for utilities at the factory is also included in the product stage.

Once the height adjustment products 1-3 have been injection molded, and Product group 4-5 have been manually assembled, the products are packaged with packaging materials consisting of EU pallets (wood), plastic wrap, cardboard and plastic boxes. All these packaging materials are also included in the product stage in module A3. The EU pallets (wood) are assumed reused 25 times before disposal (EPD Danmark, 2023) (Environment, 2021). Thus, the modelling has been done accordingly with 1/25 virgin material input and 24/25 secondary input material. For the packaging materials in A3 the biogenic carbon content from renewable materials (cardboard and wood), is calculated based on the standard EN16485 as 0.5 kg C/kg dry matter. The cardboard has a moisture content of 7.5% (Mahakalkar, Sambare, & Sunheriya, 2019) and the wood has a moisture content of 15%. The biogenic carbon content is calculated from 100% of the material weight input. There is no biogenic carbon content in the declared product leaving the system boundary.

The packaging materials for the raw material input appearing in module A1 and the waste in production are treated up to "end-of-waste-state" in module A3. This includes waste treatment of plastic, wood, and cardboard. The plastic is modelled with a waste treatment of 92% recycling, 4% incineration and 4% landfill and the cardboard is modelled with a waste treatment of 99.4% recycling and 0.6% incineration, based on national Danish waste statistics from 2020 for the building and construction waste (Miljøministeriet Miljøstyrelsen, 2020). The wood is modelled with a waste treatment of 100% incineration as it is informed by the manufacturer that the wood pallets are single-service pallets. The recycling treatment is modelled as part of module A3, and impacts relating to the treatment is reported as part of module A3.

As stated in EN15804+A2 §6.3.5.2 the flows leaving the system at the end-of-waste state of the boundary of A1-3 (waste from production and packaging material from raw material inputs) shall be allocated as co-products and loads and benefits from these flows shall not be declared in module D. This rule is applied to handle all waste treatment from A1-3 in module A3 and no potential load and benefits from these waste processes are declared in module D.

End of Life (C1-C4) includes:

Module C1 is assumed to be zero using manual dismantling.

In C2, the transport distances scenario is set to 50 km by truck based on a Danish national scenario.

In module C3-C4, 92% of the plastic from Product group 1-3 is recycled, 4% is incinerated and 4% is landfilled. This waste scenario is based on national Danish waste statistics from 2020 (Miljøministeriet Miljøstyrelsen, 2020). In module C3-C4, 100% of the regupol, regupol resist and adhesive in Product group 4-5 is modelled incinerated.

The generated waste in module C3-4 is included up to the "end-of-waste" state, including a process for sorting of waste at the waste facility before the plastic materials are recycled.

The potential from the recycling and incineration of the materials beyond the system boundary is calculated in module D.

Re-use, recovery and recycling potential (D) includes:

Module D includes reuse, recovery and/or recycling potential, expressed as net impact and benefits, due to reuse, recycling and incineration of materials with energy recovery in module C3.

To calculate the amount of net-scrap for credit in module D, the secondary input material in A1 has been deducted from the amount of material for recycling and incineration credit in module D. This calculation rules takes effect in Product group 2 where the LDPE granulated input is 100% secondary material input and in Product group 5, where the regupol resist is 100% secondary material input.

In Product group 1-3 the plastic has a recycling rate of 92%. The credit is calculated as the difference between production of new plastic granulates and the production of plastic granulates from secondary material. The process for production of plastic granulates from secondary material, calculates that an input of 1.19 kg plastic is needed to produce 1 kg of plastic granulates from secondary material.

By crediting the difference between these two production types, the impacts from producing plastic granulates from secondary plastic material are subtracted from the potentially avoided impacts of producing primary plastic granulates. This ensures that overestimating of the credit in module D is avoided.

In Product group 1-3, 4% of the plastic is incinerated with energy recovery. For Product group 4-5 regupol, 100% of the plastic is incinerated with energy recovery. The energy recovery is credited in module D and the energy recovered is based on the calorific values of the different raw materials. Datasets for energy recovery efficiency at the plant have been adjusted to be representative of the efficiency for heat and electricity recovery at Danish combined heating and power plants (CPH plant). The total efficiency for CHP plants in Denmark is around 85-90% (Hjørring Varmeforsyning, 2023),

(Støvring Kraftvarmeværk, 2023), (Hofor, 2023), (Rambøll, 2023), (Lundgren, 2009). The efficiency for electricity is set to 43.5% and the efficiency for heat (steam) is set to 45.5%, which is based on average values from actual CHP plants in Denmark (Hjørring Varmeforsyning, 2023), (Støvring Kraftvarmeværk, 2023).

Table 1 - Weight of different Knudsen Kilen Height Adjustment Products and specification of declared product group

Product and product no.	Weight per piece [g]	Conversion factor to 1 kg	Material*	Declared Product group
Product type: Wedges				
Green (80x30x10mm) product no. 910200080	6.94	0.00694	HDPE	Product group 1
Orange (80x40x8mm) product no. 928700110	6.88	0.00688	HDPE	Product group 1
Brown (90x45x15mm) product no. 971116080	12.44	0.01244	LDPE	Product group 2
Yellow (150x45x25mm) product no. 911300068	34.69	0.03469	LDPE	Product group 2
Terrace, black (150x45x25mm) product no. 911300030	34.50	0.0345	LDPE	Product group 2
Grey (150x45x50mm) product no. 9061904122D	83.16	0.08316	LDPE	Product group 2
Black (150x45x70mm) product no. 9062004032D	123.09	0.12309	LDPE	Product group 2
Product type: Combi wedges				
Combi top small (80x43x19mm) product no. 975308120	12.50	0.01250	LDPE	Product group 2
Combi top medium (130x43x28mm) product no. 975408120	26.29	0.02629	LDPE	Product group 2
Combi base (100x80x40mm) product no. 975108120	56.00	0.05600	LDPE	Product group 2
Combi sole (Ø160mm) product no. 989502120	59.17	0.05917	PS	Product group 3
Product type: Combi max				
Combi max top product no. 986408220	32.74	0.03274	LDPE	Product group 2
Combi max high product no. 985104221	110.25	0.11025	LDPE	Product group 2
Product type: Shims				
Blue (50x22x1mm) product no. 987316051	1.11	0.00111	LDPE	Product group 2
Black (50x22x2mm) product no. 987316031	2.01	0.00201	LDPE	Product group 2
Red (50x22x3mm) product no. 987316041	2.93	0.00293	LDPE	Product group 2
White (50x22x4mm) product no. 987316021	4.03	0.00403	LDPE	Product group 2
Yellow (50x22x5mm) product no. 987316061	4.92	0.00492	LDPE	Product group 2
Blue (100x22x1mm) product no. 987316050	2.18	0.00218	LDPE	Product group 2
Black (100x22x2mm) product no. 987316030	3.83	0.00383	LDPE	Product group 2
Red (100x22x3mm) product no. 987316040	5.71	0.00571	LDPE	Product group 2
White (100x22x4mm) product no. 987316020	7.69	0.00769	LDPE	Product group 2
Yellow (100x22x5mm) product no. 987316060	9.49	0.00949	LDPE	Product group 2
Product type: Hanger shims				
Blue (54x46x1mm) product no. 973204050	1.15	0.00115	LDPE	Product group 2
Black (54x46x2mm) product no. 973204030	1.87	0.00187	LDPE	Product group 2
Red (54x46x3mm) product no. 973204040	2.45	0.00245	LDPE	Product group 2
White (54x46x4mm) product no. 973204010	3.05	0.00305	LDPE	Product group 2
Yellow (54x46x5mm) product no. 973204060	3.66	0.00366	LDPE	Product group 2

Brown (54x46x10mm) product no. 973204220	6.46	0.00646	LDPE	Product group 2
Product type: Sound wedges				
Yellow wedge w/sound reducer product no. 8701212K	64.00	0.064	Combi	Combi
	34.00	*0.034*	LDPE	Product group 2
	30.00	*0.030*	Regupol	Product group 4
Combi Top Medium wedge w/sound reducer product no. 8701214K	50.00	0.050	Combi	Combi
	26.00	*0.026*	LDPE	Product group 2
	24.00	*0.024*	Regupol	Product group 4
Combi top large w/sound reducer product no. 8701217K	70.00	0.070	Combi	Combi
	46.00	*0.046*	LDPE	Product group 2
	24.00	*0.024*	Regupol	Product group 4
Combi sound reducer product no. 8701210K	48.00	0.048	Combi	Combi
	14.00	*0.014*	HDPE	Product group 1
	34.00	*0.034*	Regupol	Product group 4
Combi sound reducer light product no. 8701209K	74.00	0.074	Combi	Combi
	14.00	*0.014*	HDPE	Product group 1
	60.00	*0.060*	Regupol resist	Product group 5

** LDPE = low density polyethylene*
HDPE = high density polyethylene
PS = polystyrene
Regupol = polyurethane bonded rubber fibers
Regupol resist = polyurethane bonded rubber fibers made from secondary material
Combi = combination of two declared Product groups to calculate the impacts related to these specific products

LCA results

Product group 1 Wedges, HDPE

ENVIRONMENTAL IMPACTS PER 1 kg Knudsen Kilen Wedges, HDPE										
Parameter	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	[kg CO_2 eq.]	1.42E+00	5.58E-01	1.24E+00	3.22E+00	0.00E+00	4.34E-03	1.36E-01	2.80E-03	-9.21E-01
GWP-fossil	[kg CO_2 eq.]	1.51E+00	5.51E-01	1.23E+00	3.29E+00	0.00E+00	4.29E-03	1.35E-01	2.84E-03	-9.12E-01
GWP-biogenic	[kg CO_2 eq.]	-9.06E-02	1.63E-03	1.31E-02	-7.60E-02	0.00E+00	1.27E-05	1.68E-04	-3.24E-05	-8.97E-03
GWP-luluc	[kg CO_2 eq.]	3.55E-04	5.11E-03	3.02E-04	5.77E-03	0.00E+00	3.98E-05	2.13E-06	2.26E-06	-1.07E-04
ODP	[kg CFC 11 eq.]	2.05E-09	7.18E-14	4.23E-10	2.48E-09	0.00E+00	5.59E-16	2.53E-09	4.62E-15	-2.01E-12
AP	[mol H^+ eq.]	2.68E-03	8.22E-04	1.29E-03	4.79E-03	0.00E+00	6.40E-06	7.42E-05	8.25E-06	-1.37E-03
EP-freshwater	[kg P-eq.]	8.98E-06	2.02E-06	1.66E-06	1.27E-05	0.00E+00	1.57E-08	6.65E-07	5.30E-07	-3.36E-07
EP-marine	[kg N eq.]	6.83E-04	3.00E-04	4.11E-04	1.39E-03	0.00E+00	2.34E-06	2.59E-05	1.89E-06	-4.18E-04
EP-terrestrial	[mol N eq.]	7.04E-03	3.54E-03	4.37E-03	1.49E-02	0.00E+00	2.76E-05	3.14E-04	2.08E-05	-4.22E-03
POCP	[kg NMVOC eq.]	2.97E-03	7.22E-04	1.27E-03	4.95E-03	0.00E+00	5.62E-06	8.15E-05	6.00E-06	-1.96E-03
ADPm[1]	[kg Sb eq.]	2.44E-07	3.63E-08	5.84E-08	3.38E-07	0.00E+00	2.83E-10	3.42E-08	7.27E-11	-5.50E-08
ADPf[1]	[MJ]	6.68E+01	7.51E+00	2.55E+01	9.98E+01	0.00E+00	5.85E-02	2.07E-01	4.11E-02	-4.80E+01
WDP[1]	[m^3]	5.72E-02	6.67E-03	4.33E-02	1.07E-01	0.00E+00	5.19E-05	2.26E-02	-3.88E-05	1.74E-02
Caption	GWP-total = Global Warming Potential - total; GWP-fossil = Global Warming Potential - fossil fuels; GWP-biogenic = Global Warming Potential - biogenic; GWP-luluc = Global Warming Potential - land use and land use change; ODP = Ozone Depletion; AP = Acidification; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water use									
Disclaimer	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.									

ADDITIONAL ENVIRONMENTAL IMPACTS PER 1 kg Knudsen Kilen Wedges, HDPE										
Parameter	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
PM	[Disease incidence]	3.37E-08	6.81E-09	1.34E-08	5.39E-08	0.00E+00	5.30E-11	5.06E-09	8.00E-11	-1.66E-08
IRP[2]	[kBq U235 eq.]	3.36E-02	2.10E-03	1.48E-01	1.84E-01	0.00E+00	1.64E-05	1.89E-03	7.19E-05	5.88E-02
ETP-fw[1]	[CTUe]	3.03E+01	5.34E+00	8.42E+00	4.40E+01	0.00E+00	4.16E-02	1.82E-01	3.91E-02	-2.14E+01
HTP-c[1]	[CTUh]	8.57E-10	1.09E-10	2.09E-10	1.18E-09	0.00E+00	8.51E-13	6.78E-12	1.80E-12	-5.36E-10
HTP-nc[1]	[CTUh]	3.35E-08	5.82E-09	8.50E-09	4.78E-08	0.00E+00	4.54E-11	1.08E-10	1.50E-10	-2.40E-08
SQP[1]	-	1.25E+01	3.14E+00	4.90E+00	2.06E+01	0.00E+00	2.45E-02	4.76E-01	3.56E-03	-3.72E+00
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality (dimensionless)									
Disclaimers	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator. [2] 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.									

RESOURCE USE PER 1 kg Knudsen Kilen Wedges, HDPE										
Parameter	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	[MJ]	-3.97E+01	5.47E-01	-3.33E+00	-4.24E+01	0.00E+00	4.26E-03	4.18E+01	1.74E+00	-2.20E+00
PERM	[MJ]	4.36E+01	0.00E+00	6.50E+00	5.01E+01	0.00E+00	0.00E+00	-4.18E+01	-1.74E+00	0.00E+00
PERT	[MJ]	3.98E+00	5.47E-01	3.17E+00	7.69E+00	0.00E+00	4.26E-03	2.18E-02	3.71E-03	-2.20E+00
PENRE	[MJ]	6.57E+01	7.54E+00	2.37E+01	9.70E+01	0.00E+00	5.87E-02	2.08E-01	4.11E-02	-4.80E+01
PENRM	[MJ]	1.07E+00	0.00E+00	1.80E+00	2.86E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	[MJ]	6.68E+01	7.54E+00	2.55E+01	9.98E+01	0.00E+00	5.87E-02	2.08E-01	4.11E-02	-4.80E+01
SM	[kg]	0.00E+00	0.00E+00	1.42E-01	1.42E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	[m^3]	7.90E-03	5.99E-04	3.42E-03	1.19E-02	0.00E+00	4.66E-06	5.28E-04	4.05E-07	-3.90E-03
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 = Net use of fresh water									

WASTE CATEGORIES AND OUTPUT FLOWS PER 1 kg Knudsen Kilen Wedges, HDPE										
Parameter	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
HWD	[kg]	1.84E-08	2.34E-11	5.22E-09	2.37E-08	0.00E+00	1.82E-13	3.35E-13	3.46E-12	-4.09E-09
NHWD	[kg]	2.00E-02	1.15E-03	9.40E-03	3.05E-02	0.00E+00	8.96E-06	4.97E-04	3.98E-02	7.90E-02
RWD	[kg]	2.89E-04	1.41E-05	1.30E-03	1.61E-03	0.00E+00	1.10E-07	8.96E-07	4.86E-07	2.60E-04
CRU	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	[kg]	0.00E+00	0.00E+00	4.41E-02	4.41E-02	0.00E+00	0.00E+00	9.20E-01	0.00E+00	0.00E+00
MER	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE	[MJ]	0.00E+00	0.00E+00	7.92E-01	7.92E-01	0.00E+00	0.00E+00	1.55E+00	0.00E+00	0.00E+00
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; EE = Exported energy									

BIOGENIC CARBON CONTENT PER 1 kg Knudsen Kilen Wedges, HDPE		
Parameter	**Unit**	**At the factory gate**
Biogenic carbon content in product	kg C	0.00E+0
Biogenic carbon content in accompanying packaging	kg C	6.82E-02
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO_2	

Product group 2 Height Adjustment products, LDPE

ENVIRONMENTAL IMPACTS PER 1 kg Knudsen Kilen Height Adjustment products, LDPE										
Parameter	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	[kg CO_2 eq.]	3.76E-01	1.06E-02	7.36E-01	1.12E+00	0.00E+00	4.34E-03	1.36E-01	2.80E-03	-1.70E-02
GWP-fossil	[kg CO_2 eq.]	3.73E-01	1.04E-02	8.13E-01	1.20E+00	0.00E+00	4.29E-03	1.35E-01	2.84E-03	-1.68E-02
GWP-biogenic	[kg CO_2 eq.]	3.01E-03	3.08E-05	-7.76E-02	-7.46E-02	0.00E+00	1.27E-05	1.68E-04	-3.24E-05	-1.63E-04
GWP-luluc	[kg CO_2 eq.]	4.51E-05	9.67E-05	3.40E-04	4.81E-04	0.00E+00	3.98E-05	2.13E-06	2.26E-06	-2.07E-06
ODP	[kg CFC 11 eq.]	2.05E-09	1.36E-15	1.30E-11	2.06E-09	0.00E+00	5.59E-16	2.53E-09	4.62E-15	-1.11E-13
AP	[mol H^+ eq.]	1.02E-03	1.56E-05	8.20E-04	1.85E-03	0.00E+00	6.40E-06	7.42E-05	8.25E-06	-2.51E-05
EP-freshwater	[kg P-eq.]	8.51E-06	3.82E-08	1.64E-06	1.02E-05	0.00E+00	1.57E-08	6.65E-07	5.30E-07	-2.32E-08
EP-marine	[kg N eq.]	1.56E-04	5.68E-06	2.91E-04	4.53E-04	0.00E+00	2.34E-06	2.59E-05	1.89E-06	-7.79E-06
EP-terrestrial	[mol N eq.]	1.60E-03	6.71E-05	3.06E-03	4.72E-03	0.00E+00	2.76E-05	3.14E-04	2.08E-05	-7.90E-05
POCP	[kg NMVOC eq.]	4.42E-04	1.37E-05	8.35E-04	1.29E-03	0.00E+00	5.62E-06	8.15E-05	6.00E-06	-2.52E-05
ADPm[1]	[kg Sb eq.]	1.87E-07	6.88E-10	3.26E-08	2.20E-07	0.00E+00	2.83E-10	3.42E-08	7.27E-11	-1.36E-09
ADPf[1]	[MJ]	5.79E+00	1.42E-01	1.49E+01	2.08E+01	0.00E+00	5.85E-02	2.07E-01	4.11E-02	-7.63E-01
WDP[1]	[m^3]	8.74E-02	1.26E-04	2.15E-02	1.09E-01	0.00E+00	5.19E-05	2.26E-02	-3.88E-05	1.73E-04
Caption	GWP-total = Global Warming Potential - total; GWP-fossil = Global Warming Potential - fossil fuels; GWP-biogenic = Global Warming Potential - biogenic; GWP-luluc = Global Warming Potential - land use and land use change; ODP = Ozone Depletion; AP = Acidification; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water use									
Disclaimer	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.									

ADDITIONAL ENVIRONMENTAL IMPACTS PER 1 kg Knudsen Kilen Height Adjustment products, LDPE										
Parameter	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
PM	[Disease incidence]	6.00E-09	1.29E-10	9.79E-09	1.59E-08	0.00E+00	5.30E-11	5.06E-09	8.00E-11	-1.82E-10
IRP[2]	[kBq U235 eq.]	1.14E-01	3.99E-05	1.01E-01	2.15E-01	0.00E+00	1.64E-05	1.89E-03	7.19E-05	4.55E-04
ETP-fw[1]	[CTUe]	3.04E+00	1.01E-01	4.25E+00	7.39E+00	0.00E+00	4.16E-02	1.82E-01	3.91E-02	-3.38E-01
HTP-c[1]	[CTUh]	2.06E-10	2.07E-12	1.06E-10	3.14E-10	0.00E+00	8.51E-13	6.78E-12	1.80E-12	-8.87E-12
HTP-nc[1]	[CTUh]	3.11E-09	1.10E-10	4.49E-09	7.72E-09	0.00E+00	4.54E-11	1.08E-10	1.50E-10	-3.77E-10
SQP[1]	-	1.83E+00	5.95E-02	5.17E+00	7.06E+00	0.00E+00	2.45E-02	4.76E-01	3.56E-03	-8.30E-02
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality (dimensionless)									
Disclaimers	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator. [2] 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.									

RESOURCE USE PER 1 kg Knudsen Kilen Height Adjustment products, LDPE										
Parameter	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	[MJ]	-4.10E+01	1.04E-02	2.99E-01	-4.07E+01	0.00E+00	4.26E-03	4.18E+01	1.74E+00	-7.20E-02
PERM	[MJ]	4.36E+01	0.00E+00	2.39E+00	4.60E+01	0.00E+00	0.00E+00	-4.18E+01	-1.74E+00	0.00E+00
PERT	[MJ]	2.61E+00	1.04E-02	2.69E+00	5.31E+00	0.00E+00	4.26E-03	2.18E-02	3.71E-03	-7.20E-02
PENRE	[MJ]	5.79E+00	1.43E-01	1.23E+01	1.82E+01	0.00E+00	5.87E-02	2.08E-01	4.11E-02	-7.63E-01
PENRM	[MJ]	0.00E+00	0.00E+00	2.61E+00	2.61E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	[MJ]	5.79E+00	1.43E-01	1.49E+01	2.08E+01	0.00E+00	5.87E-02	2.08E-01	4.11E-02	-7.63E-01
SM	[kg]	9.88E-01	0.00E+00	1.03E-01	1.09E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	[m^3]	3.11E-03	1.13E-05	2.30E-03	5.42E-03	0.00E+00	4.66E-06	5.28E-04	4.05E-07	-7.52E-05
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 = Net use of fresh water									

WASTE CATEGORIES AND OUTPUT FLOWS PER 1 kg Knudsen Kilen Height Adjustment products, LDPE										
Parameter	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
HWD	[kg]	-1.93E-10	4.42E-13	1.46E-08	1.44E-08	0.00E+00	1.82E-13	3.35E-13	3.46E-12	-5.36E-11
NHWD	[kg]	1.23E-01	2.18E-05	6.35E-03	1.29E-01	0.00E+00	8.96E-06	4.97E-04	3.98E-02	1.19E-03
RWD	[kg]	6.76E-04	2.67E-07	8.77E-04	1.55E-03	0.00E+00	1.10E-07	8.96E-07	4.86E-07	-1.54E-07
CRU	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	[kg]	0.00E+00	0.00E+00	2.84E-03	2.84E-03	0.00E+00	0.00E+00	1.38E-02	0.00E+00	0.00E+00
MER	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE	[MJ]	0.00E+00	0.00E+00	1.19E-02	1.19E-02	0.00E+00	0.00E+00	2.32E-02	0.00E+00	0.00E+00
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; EE = Exported energy									

BIOGENIC CARBON CONTENT PER 1 kg Knudsen Kilen Height Adjustment products, LDPE		
Parameter	**Unit**	**At the factory gate**
Biogenic carbon content in product	kg C	0.00E+0
Biogenic carbon content in accompanying packaging	kg C	6.59E-02
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO_2	

ENVIRONMENTAL IMPACTS PER 1 kg Knudsen Kilen Combi Sole, PS										
Parameter	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	[kg CO_2 eq.]	2.12E+00	7.92E-02	5.92E-01	2.79E+00	0.00E+00	4.34E-03	1.45E-01	2.80E-03	-1.40E+00
GWP-fossil	[kg CO_2 eq.]	2.11E+00	7.82E-02	6.79E-01	2.87E+00	0.00E+00	4.29E-03	1.45E-01	2.84E-03	-1.39E+00
GWP-biogenic	[kg CO_2 eq.]	1.29E-02	2.31E-04	-8.74E-02	-7.43E-02	0.00E+00	1.27E-05	1.68E-04	-3.24E-05	-8.28E-03
GWP-luluc	[kg CO_2 eq.]	1.52E-04	7.25E-04	3.23E-04	1.20E-03	0.00E+00	3.98E-05	2.13E-06	2.26E-06	-9.06E-05
ODP	[kg CFC 11 eq.]	4.09E-09	1.02E-14	2.61E-11	4.11E-09	0.00E+00	5.59E-16	2.53E-09	4.62E-15	-9.89E-13
AP	[mol H^+ eq.]	3.92E-03	1.17E-04	6.05E-04	4.64E-03	0.00E+00	6.40E-06	7.36E-05	8.25E-06	-2.05E-03
EP-freshwater	[kg P-eq.]	1.43E-05	2.86E-07	1.55E-06	1.61E-05	0.00E+00	1.57E-08	6.65E-07	5.29E-07	-8.32E-07
EP-marine	[kg N eq.]	8.75E-04	4.26E-05	2.39E-04	1.16E-03	0.00E+00	2.34E-06	2.59E-05	1.89E-06	-6.00E-04
EP-terrestrial	[mol N eq.]	9.33E-03	5.03E-04	2.50E-03	1.23E-02	0.00E+00	2.76E-05	3.11E-04	2.08E-05	-6.37E-03
POCP	[kg NMVOC eq.]	3.28E-03	1.02E-04	6.37E-04	4.02E-03	0.00E+00	5.62E-06	8.13E-05	6.00E-06	-2.28E-03
ADPm[1]	[kg Sb eq.]	3.81E-07	5.16E-09	2.48E-08	4.11E-07	0.00E+00	2.83E-10	3.42E-08	7.27E-11	-5.15E-08
ADPf[1]	[MJ]	7.25E+01	1.07E+00	1.02E+01	8.37E+01	0.00E+00	5.85E-02	2.07E-01	4.11E-02	-5.26E+01
WDP[1]	[m^3]	2.05E-01	9.46E-04	1.16E-02	2.17E-01	0.00E+00	5.19E-05	2.20E-02	-3.88E-05	-7.55E-02
Caption	GWP-total = Global Warming Potential - total; GWP-fossil = Global Warming Potential - fossil fuels; GWP-biogenic = Global Warming Potential - biogenic; GWP-luluc = Global Warming Potential - land use and land use change; ODP = Ozone Depletion; AP = Acidification; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water use									
Disclaimer	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.									

ADDITIONAL ENVIRONMENTAL IMPACTS PER 1 kg Knudsen Kilen Combi Sole, PS										
Parameter	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
PM	[Disease incidence]	2.20E-08	9.66E-10	8.26E-09	3.12E-08	0.00E+00	5.30E-11	5.06E-09	8.00E-11	-1.25E-08
IRP[2]	[kBq U235 eq.]	3.45E-02	2.99E-04	8.96E-02	1.24E-01	0.00E+00	1.64E-05	1.89E-03	7.19E-05	5.71E-02
ETP-fw[1]	[CTUe]	4.15E+01	7.58E-01	2.07E+00	4.44E+01	0.00E+00	4.16E-02	1.82E-01	3.91E-02	-2.98E+01
HTP-c[1]	[CTUh]	1.09E-09	1.55E-11	5.07E-11	1.15E-09	0.00E+00	8.51E-13	6.72E-12	1.80E-12	-6.25E-10
HTP-nc[1]	[CTUh]	3.58E-08	8.27E-10	2.30E-09	3.89E-08	0.00E+00	4.54E-11	1.07E-10	1.50E-10	-2.60E-08
SQP[1]	-	1.63E+00	4.46E-01	4.99E+00	7.07E+00	0.00E+00	2.45E-02	4.76E-01	3.56E-03	-3.11E+00
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality (dimensionless)									
Disclaimers	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator. [2] 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.									

RESOURCE USE PER 1 kg Knudsen Kilen Combi Sole, PS										
Parameter	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	[MJ]	-3.79E+01	7.76E-02	2.63E+00	-3.52E+01	0.00E+00	4.26E-03	3.80E+01	1.59E+00	-1.60E+00
PERM	[MJ]	4.00E+01	0.00E+00	-3.29E-01	3.96E+01	0.00E+00	0.00E+00	-3.80E+01	-1.58E+00	0.00E+00
PERT	[MJ]	2.04E+00	7.76E-02	2.30E+00	4.41E+00	0.00E+00	4.26E-03	2.18E-02	3.71E-03	-1.60E+00
PENRE	[MJ]	7.26E+01	1.07E+00	7.66E+00	8.13E+01	0.00E+00	5.87E-02	2.07E-01	4.11E-02	-5.26E+01
PENRM	[MJ]	0.00E+00	0.00E+00	2.53E+00	2.53E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	[MJ]	7.26E+01	1.07E+00	1.02E+01	8.38E+01	0.00E+00	5.87E-02	2.07E-01	4.11E-02	-5.26E+01
SM	[kg]	0.00E+00	0.00E+00	9.36E-02	9.36E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	[m^3]	1.20E-02	8.50E-05	1.77E-03	1.39E-02	0.00E+00	4.66E-06	5.13E-04	4.05E-07	-6.89E-03
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 = Net use of fresh water									

WASTE CATEGORIES AND OUTPUT FLOWS PER 1 kg Knudsen Kilen Combi Sole, PS										
Parameter	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
HWD	[kg]	4.87E-09	3.32E-12	1.61E-08	2.10E-08	0.00E+00	1.82E-13	3.36E-13	3.46E-12	-3.47E-09
NHWD	[kg]	1.77E-02	1.63E-04	5.37E-03	2.32E-02	0.00E+00	8.95E-06	4.87E-04	3.98E-02	7.98E-02
RWD	[kg]	2.57E-04	2.00E-06	7.66E-04	1.03E-03	0.00E+00	1.10E-07	8.96E-07	4.86E-07	2.72E-04
CRU	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	[kg]	0.00E+00	0.00E+00	7.93E-03	7.93E-03	0.00E+00	0.00E+00	9.20E-01	0.00E+00	0.00E+00
MER	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE	[MJ]	0.00E+00	0.00E+00	7.21E-01	7.21E-01	0.00E+00	0.00E+00	1.41E+00	0.00E+00	0.00E+00
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; EE = Exported energy									

BIOGENIC CARBON CONTENT PER 1 kg Knudsen Kilen Combi Sole, PS		
Parameter	**Unit**	**At the factory gate**
Biogenic carbon content in product	kg C	0.00E+0
Biogenic carbon content in accompanying packaging	kg C	6.47E-02
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO_2	

Product group 4 Sound Reducer, Regupol

ENVIRONMENTAL IMPACTS PER 1 kg Knudsen Kilen Sound Reducer, Regupol										
Parameter	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	[kg CO_2 eq.]	2.69E+00	2.68E-02	1.07E-01	2.82E+00	0.00E+00	4.34E-03	2.21E+00	0.00E+00	-8.03E-01
GWP-fossil	[kg CO_2 eq.]	2.69E+00	2.65E-02	1.78E-01	2.90E+00	0.00E+00	4.29E-03	2.21E+00	0.00E+00	-7.91E-01
GWP-biogenic	[kg CO_2 eq.]	-1.04E-02	7.84E-05	-7.12E-02	-8.16E-02	0.00E+00	1.27E-05	1.58E-04	0.00E+00	-1.13E-02
GWP-luluc	[kg CO_2 eq.]	2.35E-03	2.46E-04	2.23E-04	2.82E-03	0.00E+00	3.98E-05	3.53E-06	0.00E+00	-2.57E-04
ODP	[kg CFC 11 eq.]	5.92E-07	3.45E-15	1.02E-12	5.92E-07	0.00E+00	5.59E-16	1.78E-13	0.00E+00	-1.61E-11
AP	[mol H^+ eq.]	1.51E-02	3.96E-05	2.26E-04	1.53E-02	0.00E+00	6.40E-06	1.30E-03	0.00E+00	-2.76E-03
EP-freshwater	[kg P-eq.]	8.45E-04	9.71E-08	1.14E-06	8.47E-04	0.00E+00	1.57E-08	4.83E-08	0.00E+00	-1.21E-05
EP-marine	[kg N eq.]	2.48E-03	1.44E-05	9.61E-05	2.59E-03	0.00E+00	2.34E-06	6.30E-04	0.00E+00	-9.03E-04
EP-terrestrial	[mol N eq.]	2.59E-02	1.71E-04	9.80E-04	2.70E-02	0.00E+00	2.76E-05	7.25E-03	0.00E+00	-7.69E-03
POCP	[kg NMVOC eq.]	1.65E-02	3.47E-05	2.48E-04	1.68E-02	0.00E+00	5.62E-06	1.62E-03	0.00E+00	-2.03E-03
ADPm[1]	[kg Sb eq.]	4.76E-05	1.75E-09	1.54E-08	4.76E-05	0.00E+00	2.83E-10	1.70E-09	0.00E+00	-3.12E-07
ADPf[1]	[MJ]	7.67E+01	3.62E-01	2.69E+00	7.97E+01	0.00E+00	5.85E-02	5.83E-01	0.00E+00	-1.08E+01
WDP[1]	[m^3]	2.05E+00	3.21E-04	5.22E-03	2.06E+00	0.00E+00	5.19E-05	2.17E-01	0.00E+00	-1.42E-01
Caption	GWP-total = Global Warming Potential - total; GWP-fossil = Global Warming Potential - fossil fuels; GWP-biogenic = Global Warming Potential - biogenic; GWP-luluc = Global Warming Potential - land use and land use change; ODP = Ozone Depletion; AP = Acidification; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water use									
Disclaimer	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.									

ADDITIONAL ENVIRONMENTAL IMPACTS PER 1 kg Knudsen Kilen Sound Reducer, Regupol										
Parameter	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
PM	[Disease incidence]	1.67E-07	3.28E-10	3.95E-09	1.71E-07	0.00E+00	5.30E-11	3.60E-09	0.00E+00	-2.04E-08
IRP[2]	[kBq U235 eq.]	4.49E-01	1.01E-04	2.16E-02	4.71E-01	0.00E+00	1.64E-05	3.78E-03	0.00E+00	-1.04E-01
ETP-fw[1]	[CTUe]	6.21E+01	2.57E-01	6.07E-01	6.30E+01	0.00E+00	4.16E-02	1.97E-01	0.00E+00	-3.54E+00
HTP-c[1]	[CTUh]	1.85E-09	5.26E-12	1.80E-11	1.87E-09	0.00E+00	8.51E-13	1.51E-11	0.00E+00	-5.17E-10
HTP-nc[1]	[CTUh]	5.56E-08	2.80E-10	8.79E-10	5.67E-08	0.00E+00	4.54E-11	5.14E-10	0.00E+00	-1.01E-08
SQP[1]	-	1.25E+01	1.51E-01	3.59E+00	1.63E+01	0.00E+00	2.45E-02	1.27E-01	0.00E+00	-5.40E+01
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality (dimensionless)									
Disclaimers	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator. [2] 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.									

RESOURCE USE PER 1 kg Knudsen Kilen Sound Reducer, Regupol										
Parameter	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	[MJ]	-2.22E+01	2.63E-02	1.25E+00	-2.09E+01	0.00E+00	4.26E-03	2.56E+01	0.00E+00	-3.31E+01
PERM	[MJ]	2.55E+01	0.00E+00	2.84E-02	2.55E+01	0.00E+00	0.00E+00	-2.55E+01	0.00E+00	0.00E+00
PERT	[MJ]	3.30E+00	2.63E-02	1.28E+00	4.61E+00	0.00E+00	4.26E-03	1.10E-01	0.00E+00	-3.31E+01
PENRE	[MJ]	7.67E+01	3.63E-01	5.88E-01	7.76E+01	0.00E+00	5.87E-02	5.84E-01	0.00E+00	-1.08E+01
PENRM	[MJ]	0.00E+00	0.00E+00	2.10E+00	2.10E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	[MJ]	7.67E+01	3.63E-01	2.69E+00	7.97E+01	0.00E+00	5.87E-02	5.84E-01	0.00E+00	-1.08E+01
SM	[kg]	0.00E+00	0.00E+00	7.84E-02	7.84E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	[m^3]	4.78E-02	2.88E-05	7.58E-04	4.86E-02	0.00E+00	4.66E-06	5.11E-03	0.00E+00	-8.23E-03
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 = Net use of fresh water									

WASTE CATEGORIES AND OUTPUT FLOWS PER 1 kg Knudsen Kilen Sound Reducer, Regupol										
Parameter	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
HWD	[kg]	0.00E+00	1.12E-12	1.29E-08	1.29E-08	0.00E+00	1.82E-13	5.15E-11	0.00E+00	7.97E-09
NHWD	[kg]	0.00E+00	5.53E-05	2.20E-03	2.26E-03	0.00E+00	8.95E-06	1.11E-02	0.00E+00	-4.38E-02
RWD	[kg]	0.00E+00	6.79E-07	1.80E-04	1.80E-04	0.00E+00	1.10E-07	2.39E-05	0.00E+00	-9.11E-04
CRU	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MER	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE	[MJ]	0.00E+00	0.00E+00	1.16E+01	1.16E+01	0.00E+00	0.00E+00	2.27E+01	0.00E+00	0.00E+00
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; EE = Exported energy									

BIOGENIC CARBON CONTENT PER 1 kg Knudsen Kilen Sound Reducer, Regupol		
Parameter	**Unit**	**At the factory gate**
Biogenic carbon content in product	kg C	0.00E+0
Biogenic carbon content in accompanying packaging	kg C	5.37E-02
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO_2	

ENVIRONMENTAL IMPACTS PER 1 kg Knudsen Kilen Sound Reducer Light, Regupol Resist										
Parameter	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	[kg CO_2 eq.]	4.14E-01	2.68E-02	1.17E-01	5.58E-01	0.00E+00	4.34E-03	2.21E+00	0.00E+00	-1.61E-02
GWP-fossil	[kg CO_2 eq.]	4.11E-01	2.65E-02	1.64E-01	6.02E-01	0.00E+00	4.29E-03	2.21E+00	0.00E+00	-1.58E-02
GWP-biogenic	[kg CO_2 eq.]	2.94E-03	7.84E-05	-4.72E-02	-4.41E-02	0.00E+00	1.27E-05	1.58E-04	0.00E+00	-2.26E-04
GWP-luluc	[kg CO_2 eq.]	9.43E-05	2.46E-04	1.53E-04	4.93E-04	0.00E+00	3.98E-05	3.53E-06	0.00E+00	-5.14E-06
ODP	[kg CFC 11 eq.]	7.69E-09	3.45E-15	9.87E-13	7.69E-09	0.00E+00	5.59E-16	1.78E-13	0.00E+00	-3.22E-13
AP	[mol H^+ eq.]	9.04E-04	3.96E-05	1.83E-04	1.13E-03	0.00E+00	6.40E-06	1.30E-03	0.00E+00	-5.52E-05
EP-freshwater	[kg P-eq.]	2.06E-05	9.71E-08	7.70E-07	2.15E-05	0.00E+00	1.57E-08	4.83E-08	0.00E+00	-2.42E-07
EP-marine	[kg N eq.]	2.04E-04	1.44E-05	7.57E-05	2.94E-04	0.00E+00	2.34E-06	6.30E-04	0.00E+00	-1.81E-05
EP-terrestrial	[mol N eq.]	2.14E-03	1.71E-04	7.79E-04	3.09E-03	0.00E+00	2.76E-05	7.25E-03	0.00E+00	-1.54E-04
POCP	[kg NMVOC eq.]	1.08E-03	3.47E-05	1.97E-04	1.31E-03	0.00E+00	5.62E-06	1.62E-03	0.00E+00	-4.06E-05
ADPm[1]	[kg Sb eq.]	8.95E-07	1.75E-09	1.07E-08	9.07E-07	0.00E+00	2.83E-10	1.70E-09	0.00E+00	-6.24E-09
ADPf[1]	[MJ]	6.12E+00	3.62E-01	2.47E+00	8.95E+00	0.00E+00	5.85E-02	5.83E-01	0.00E+00	-2.16E-01
WDP[1]	[m^3]	9.61E-02	3.21E-04	3.96E-03	1.00E-01	0.00E+00	5.19E-05	2.17E-01	0.00E+00	-2.83E-03
Caption	GWP-total = Global Warming Potential - total; GWP-fossil = Global Warming Potential - fossil fuels; GWP-biogenic = Global Warming Potential - biogenic; GWP-luluc = Global Warming Potential - land use and land use change; ODP = Ozone Depletion; AP = Acidification; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water use									
Disclaimer	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.									

ADDITIONAL ENVIRONMENTAL IMPACTS PER 1 kg Knudsen Kilen Sound Reducer Light, Regupol Resist										
Parameter	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
PM	[Disease incidence]	7.75E-09	3.28E-10	2.96E-09	1.10E-08	0.00E+00	5.30E-11	3.60E-09	0.00E+00	-4.08E-10
IRP[2]	[kBq U235 eq.]	1.16E-01	1.01E-04	2.06E-02	1.37E-01	0.00E+00	1.64E-05	3.78E-03	0.00E+00	-2.08E-03
ETP-fw[1]	[CTUe]	3.99E+00	2.57E-01	5.34E-01	4.78E+00	0.00E+00	4.16E-02	1.97E-01	0.00E+00	-7.09E-02
HTP-c[1]	[CTUh]	1.37E-10	5.26E-12	1.48E-11	1.57E-10	0.00E+00	8.51E-13	1.51E-11	0.00E+00	-1.03E-11
HTP-nc[1]	[CTUh]	5.39E-09	2.80E-10	7.04E-10	6.38E-09	0.00E+00	4.54E-11	5.14E-10	0.00E+00	-2.01E-10
SQP[1]	-	1.85E+00	1.51E-01	2.44E+00	4.45E+00	0.00E+00	2.45E-02	1.27E-01	0.00E+00	-1.08E+00
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality (dimensionless)									
Disclaimers	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator. [2] 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.									

RESOURCE USE PER 1 kg Knudsen Kilen Sound Reducer Light, Regupol Resist										
Parameter	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	[MJ]	-2.29E+01	2.63E-02	9.03E-01	-2.20E+01	0.00E+00	4.26E-03	2.56E+01	0.00E+00	-6.63E-01
PERM	[MJ]	2.55E+01	0.00E+00	1.89E-02	2.55E+01	0.00E+00	0.00E+00	-2.55E+01	0.00E+00	0.00E+00
PERT	[MJ]	2.57E+00	2.63E-02	9.22E-01	3.52E+00	0.00E+00	4.26E-03	1.10E-01	0.00E+00	-6.63E-01
PENRE	[MJ]	6.12E+00	3.63E-01	1.08E+00	7.56E+00	0.00E+00	5.87E-02	5.84E-01	0.00E+00	-2.16E-01
PENRM	[MJ]	0.00E+00	0.00E+00	1.39E+00	1.39E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	[MJ]	6.12E+00	3.63E-01	2.47E+00	8.96E+00	0.00E+00	5.87E-02	5.84E-01	0.00E+00	-2.16E-01
SM	[kg]	9.80E-01	0.00E+00	5.20E-02	1.03E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	[m^3]	3.23E-03	2.88E-05	5.85E-04	3.84E-03	0.00E+00	4.66E-06	5.11E-03	0.00E+00	-1.65E-04
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 = Net use of fresh water									

WASTE CATEGORIES AND OUTPUT FLOWS PER 1 kg Knudsen Kilen Sound Reducer Light, Regupol Resist										
Parameter	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
HWD	[kg]	-2.40E-10	1.12E-12	8.59E-09	8.35E-09	0.00E+00	1.82E-13	5.15E-11	0.00E+00	1.59E-10
NHWD	[kg]	1.22E-01	5.53E-05	1.69E-03	1.24E-01	0.00E+00	8.95E-06	1.11E-02	0.00E+00	-8.76E-04
RWD	[kg]	6.64E-04	6.79E-07	1.74E-04	8.39E-04	0.00E+00	1.10E-07	2.39E-05	0.00E+00	-1.82E-05
CRU	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MER	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE	[MJ]	0.00E+00	0.00E+00	2.32E-01	2.32E-01	0.00E+00	0.00E+00	4.54E-01	0.00E+00	0.00E+00
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; EE = Exported energy									

BIOGENIC CARBON CONTENT PER 1 kg Knudsen Kilen Sound Reducer Light, Regupol Resist		
Parameter	**Unit**	**At the factory gate**
Biogenic carbon content in product	kg C	0.00E+0
Biogenic carbon content in accompanying packaging	kg C	3.56E-02
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO_2	

Additional information

LCA interpretation

The results in accordance with DS/EN 15804+A2 of the five Knudsen Kilen Products show that the life cycle modules A1-A3 have the largest contribution to most of the 13 core environmental impact categories. For *Product group 1, Wedges, HDPE*, and *Product group 2, Height Adjustment Products, LDPE*, the life cycle modules A1-A3 have the largest contribution to 12 out of the 13 core environmental impact categories, whereas the life cycle modules C1-C4 have the largest contribution to only 1, which is ODP. For *Product group 3, Combi Sole*, and *Product group 4, Sound Reducer Regupol*, life cycle modules A1-A3 have the largest contribution to all the environmental impact categories. For *Product group 5, Sound Reducer Light of Regupol Resist*, the life cycle modules A1-A3 have the largest contribution to only 6 of the 13 core environmental impact categories and the life cycle modules C1-C4 have the largest contribution to the remaining 7 of the 13 core environmental impact categories.

For Product group 1, the results shows that HDPE granulate and also MB LDPE (Master Batch) are the most dominant processes for the total environmental impact in the different core environmental impact indicators for modules A1-A3. The process HDPE granulate has the largest contribution in 7 of the 13 core environmental impact categories. For Product group 2, the process Electricity from injection molding has the largest contribution in 6 of the 13 core environmental impact categories. For Product group 3, PS granulate has the largest contribution in 8 of the 13 core environmental impact categories. For Product group 4, Regupol has the largest contribution in 12 of the 13 core environmental impact categories, and for the remaining category, which is Climate change biogenic, it is the packaging of cardboard which is the largest contributor. For all of the five products, it is the the process of packaging, which is contributing the most to the impact category of Climate Change biogenic. For Product group 5, the production of Regupol resist, has the largest contribution in 7 of the 13 core environmental impact categories. The production of the Adhesive is dominant for the results.

Relative to Product group 1, Product group 3 and Product group 4, Product group 2 has a smaller impact in A1-A3, as the main input material is LDPE granulate produced from secondary plastic input. The same is apply for Product group 5, where the main material input, regupol resist, is produced from secondary material input.

The low impact for Product group 1, 2 and 3 compared to Product group 4 and 5 for module C1-C4 is due to high share of recycling at EoL compared to Product group 4 and 5 where 100% of the product is incinerated.

Technical information on scenarios

Reference service life

RSL information		Unit
Reference service Life – not applicable	-	Years

End of life (C1-C4)

Scenario information	Value	Unit
Collected separately	1	kg
Collected with mixed waste	-	kg
For reuse	-	kg
For recycling	0 - 0.92	kg
For energy recovery	0.04 - 1	kg
For final disposal	0 – 0.04	kg
Assumptions for scenario development	-	As appropriate

Re-use, recovery and recycling potential (D)

Scenario information/Materiel	Value	Unit
Displaced material	0 – 0.774	kg
Energy recovery from waste incineration	0.04 - 1	MJ

Indoor air

The EPD does not give information on release of dangerous substances to indoor air because the horizontal standards on the relevant measurements are not available. Read more in EN15804+A1 chapter 7.4.1.

Soil and water

The EPD does not give information on release of dangerous substances to soil and water because the horizontal standards on the relevant measurements are not available. Read more in EN15804+A1 chapter 7.4.2.

References

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LCA software /background data	*LCA for Experts (LCA FE)* version 10.7. Generic data are primarily based on life cycle inventory data from Spheras database Managed LCA Content (MLC) version 2023.1 and Ecoinvent database 3.8.
3rd party verifier	Guangli Du BUILD – Institut for Byggeri, By og Miljø, Aalborg Universitet København

General programme instructions
General Programme Instructions, version 2.0, spring 2020
www.epddanmark.dk

EN 15804
DS/EN 15804 + A2:2019 - "Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products"

EN 15942
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