Environmental Product Declaration

In accordance with ISO 14025:2006, EN 15804+A2:2019/AC:2021 and ISO 21930:2017 for:

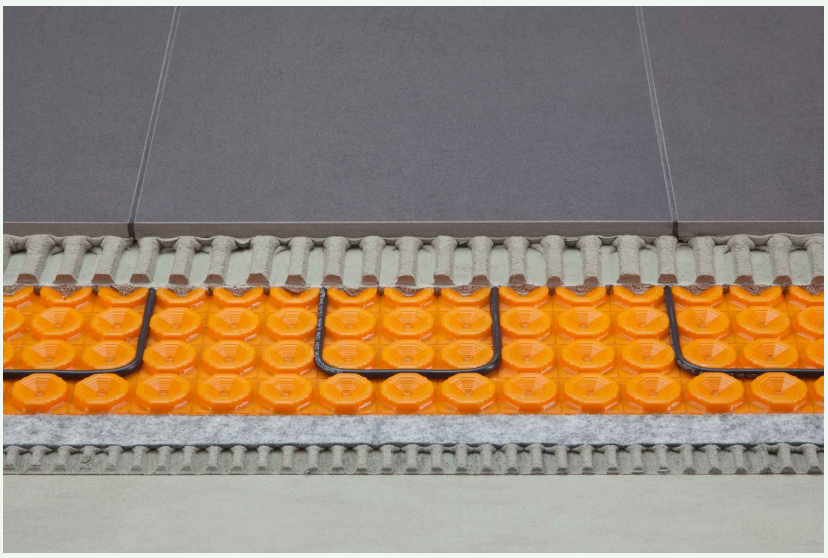
Schlüter®- DITRA-HEAT-DUO Waterproofing and Uncoupling Membrane

from

Schlüter-Systems KG

Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
EPD registration number:	EPD-IES-0023944
Publication date:	2025-06-20
Valid until:	2030-06-20

An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com



General information

Programme information

Programme:	The International EPD® System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Website:	www.environdec.com
E-mail:	info@environdec.com

Accountabilities for PCR, LCA and independent, third-party verification	
General Program Instructions and Product Category Rules (PCR)[1]	
General Programme Instructions for the International EPD® System. Version 4.0. 2021-03-29	
CEN standard EN 15804 and ISO 21930 serve as the core Product Category Rules (PCR)	
Construction Products PCR 2019: 14, Version 1.3.4	
PCR review was conducted by: The Technical Committee of the International EPD® System. A full list of members available on www.environdec.com. The review panel may be contacted via info@environdec.com. Members of the Technical Committee were requested to state any potential conflict of interest with the PCR moderator or PCR committee and were excused from the review. Chair of the PCR Review: Claudia A. Peña Review Dates: 2019-11-28 until 2019-12-18	
Life Cycle Assessment (LCA)	
LCA accountability: Isabel Oskwarek and Manasa Rao, WAP Sustainability	
Third-party verification	
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: ☒ EPD verification by individual verifier ☐ INTERNAL ☒ EXTERNAL	Third-party verifier: James Mellentine, Thrive ESG Approved by: The International EPD System
Procedure for follow-up of data during EPD validity involves third party verifier: ☐ Yes ☒ No	

[1] This EPD is based on a PCR that satisfies procurement rules at the federal, state, and municipal levels which call for EPDs based on the Construction Products PCR 2019: 14, Version 1.3.4. The Construction Products PCR 2019: 14, Version 1.3.4 was used to meet regulatory (example: Buy Clean California Act, etc.) and market expectations (example: Building Transparency EC3 comparisons, LEED and existing vendor procurement requirements, product scoring programs, etc.). The EPD should not be used outside of this context.

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but registered in different EPD programme, or not compliant with EN 15804 or ISO 21930, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical Declared units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterization factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804, ISO 21930, and ISO 14025.

Company information

Owner of the EPD: Schlüter-Systems

Address: Schlüter-Systems KG
Schmölestraße 7
D-58640 Iserlohn

Contact: Björn Spiegel [itn@schlueter.de]

Description of the organization: Schlüter-Systems has its headquarters in Iserlohn, Germany. In Europe, there are also subsidiaries in France, Italy, Spain, Turkey, and England. Many other countries are served by sales representatives. In North America, Schluter Systems has four locations: Plattsburgh, New York; Reno, Nevada; Dallas-Fort Worth, Texas; and Montréal, Québec. Schlüter-Systems KG is dedicated to creating innovative solutions for the tile industry, and working closely with its network of distributors, dealers, tile contractors, architects, specifiers and other members of the building and construction industry.

Location of production site(s): Germany

Product information

Product name: DITRA-HEAT-DUO

Product description: DITRA-HEAT-DUO is a polypropylene membrane featuring a 2mm special anchoring fleece on the underside, which bonds with the adhesive, while also reducing impact sound and enabling a faster heat-up response for installed heating cables, which function separately from the product. DITRA-HEAT-DUO is a universal substrate for tile and stone coverings, which serves as an uncoupling, crack bridging, waterproofing, vapor pressure equalization layer and is designed for the attachment of DITRA-HEAT-E-HK heating cables.

Product identification: CSI division 09 30 00, UN CPC: 54699

Geographical scope: Asia and Europe (A1); Germany (A3); Europe and North America (A4-A5, B1-B7, C1-C4, D)

Table 1: Technical Details

Parameter	DITRA-HEAT-DUO Waterproofing and Uncoupling Membrane
Width [m]	0.98
Length [m]	0.8 – 10.2
Thickness [mm]	7.5
Water vapor retardant (sd)	9.6
Reaction to fire (EN 13501-1)	Euroclass E
Water tightness	Watertight
ANSI A118.10	Comply
ASTM E96 Vapor Management [perms]	0.48

LCA information

Declared unit: One (1) m^2 of uncoupling membrane for the reference service life of 75 years.

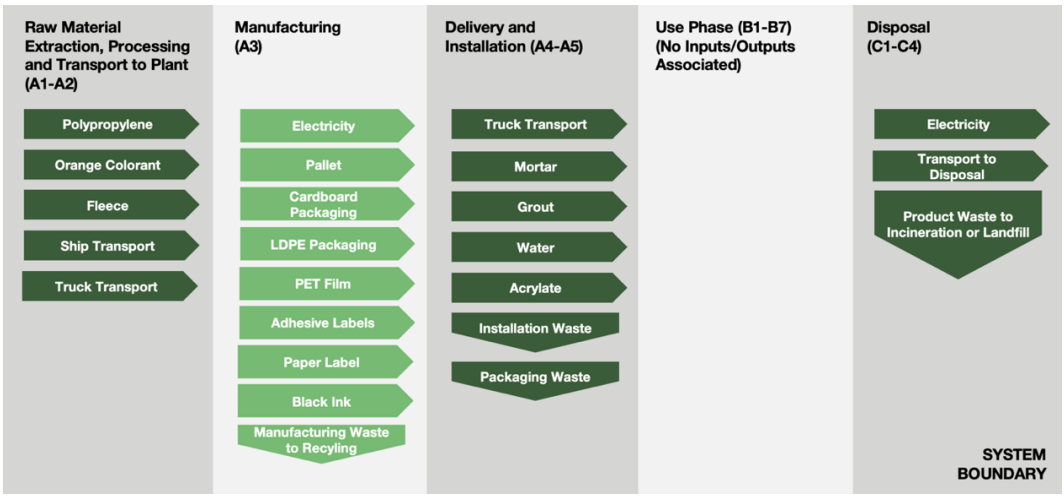
Reference service life: 75 years

Time representativeness: 2024

Database(s) and LCA software used: Sphera Managed LCA Content (fka GaBi) 2024.2; Sphera LCA for Experts (fka GaBi) 10.9.1.10

Description of system boundaries: Cradle to gate with options, modules A4-A5, modules B, modules C1-C4, and module D.

System diagram:



Manufacturing:
The polypropylene granulate is homogenized with the orange colorant in an extruder and heated to the required processing temperature. The resulting melt is then extruded through a slot die directly onto a three-dimensional forming line. The mat is then formed in a vacuum molding process and bonded to the 450-gram fleece in a thermally heated state.

Electricity:
Energy resources used in the manufacturing process are accounted for in the model. The electricity is sourced from the power grid, and no onsite electricity generation is used. Regional residual grid mix datasets from MLC are used to assess the generation, distribution, and transmission of electricity. No other energy resources are used. Details on the electricity mix used for manufacturing are as follows:

Source	Quantity [%]	GWP-GHG [kg CO2-eq/kWh]
Natural gas	21%	0.731
Hard coal	21%	
Nuclear	18%	
Lignite	35%	

Heavy fuel oil	1%	
Renewables	2%	

Cut-Off Criteria:
Cumulative excluded material inputs, energy inputs, and environmental impacts must not exceed 5% based on total weight, energy use, or environmental impact of the declared unit. Inputs or outputs greater than 1% (based on total mass of the final product) were included within the scope of analysis. Material inputs less than 1% were included if sufficient data was available to warrant inclusion and/or the material input was thought to have significant environmental impact. Cumulative excluded material inputs and environmental impacts are less than 5% based on total weight and impact of the declared unit. The list of excluded inputs include:

- As the tools used during the installation of the product are multi-use tools and can be reused after each installation, the per-declared unit impacts are considered negligible and therefore are not included.
- Some material and energy inputs may have been excluded within the MLC datasets used for this project. All MLC datasets have been critically reviewed and conform to the exclusion requirements of the PCR.

Allocation:
General principles of allocation were based on ISO 14040/44. There are other products produced at the manufacturing facility. To derive a per-unit value for manufacturing inputs such as electricity, allocation based on total production by mass was adopted.

As a default, secondary MLC datasets use a physical basis for allocation. Additionally, impacts and benefits associated with secondary functions of materials at end of life are included (i.e., production into a third life or energy generation from the incineration plant).

Data Sources:
Primary data were used where available, including supplier data for raw materials used in the production process. When primary data does not exist, secondary data for raw material production are obtained from the MLC database.

Data Quality:
Data quality follows the schema defined by the UN Environment Global Guidance on LCA database development, per Annex E of EN15804+A2.

Geographic Coverage:
The geographical scope of the manufacturing portion of the life cycle is Germany. The geographical scope of the raw material acquisition is Europe and Asia. Customer distribution, site installation, and use portions of the life cycle is within Europe and North America. Results are presented separately for European and North American scenarios.

Time Coverage:
This temporal scope is production during fiscal year 2024 (September 2023 – September 2024).

Technological Coverage:
The technological scope is the specific technology the company uses in manufacturing their product.

Modules declared, geographical scope, share of specific data (in GWP-GHG results) and data variation (in GWP-GHG results):

	Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
Module	**A1**	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Modules declared	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Geography	EU/CN	EU/CN	DE	EU/NA	EU/NA	EU/NA	EU/NA	EU/NA	EU/NA	EU/NA	EU/NA	EU/NA	EU/NA	EU/NA	EU/NA	EU/NA	EU/NA
Specific data used	12%			-	-	-	-	-	-	-	-	-	-	-	-	-	-

Content information

Product components	Weight, kg	Post-consumer material, weight-%	Biogenic material, weight-% and kg C/kg
Polypropylene	7.30E-01	0%	0%/0
Colorant	1.00E-02	0%	0.64%/0.0077
PET	4.60E-01	0%	0%
TOTAL	1.20E+00	0%	0.64%/0.0077
Ancillary Materials	**Weight, kg**	**Weight-% (versus the product)**	**Weight biogenic carbon, kg C/kg**
Black ink	2.50E-05	0%	0%/0
TOTAL	2.50E-05	0%	0%/0
Packaging materials	**Weight, kg**	**Weight-% (versus the product)**	**Weight biogenic carbon, kg C/kg**
Wood pallet	3.69E-01	30.74%	1.62E-01
Cardboard	1.72E-01	14.35%	7.40E-02
LDPE Bags	2.47E-04	0.02%	0.00E+00
Paper Labels	6.73E-05	0.01%	2.89E-05
Adhesive	3.55E-05	0.003%	0.00E+00
PET Film	5.00E-07	0.00004%	0.00E+00
TOTAL	5.41E-01	45.21%	2.36E-01

No substances included in the Candidate List of Substances of Very High Concern for authorization under REACH Regulations are present in Schluter Systems membranes, either above the threshold for registration with the European Chemicals Agency or above 0.1% (wt./wt).

Post-Factory Gate Scenario Development

A4 (Delivery to Installation Site) Scenario Per Declared Unit

The product is delivered to the customer via truck within the E.U. and via truck and ocean freight to North America. Transportation averages are calculated based on sales records.

Distribution Details	European Truck	European Ship to N.A.	North American Truck
Vehicle Type	Truck-trailer, Euro 1, 34 - 40t gross weight / 27t payload capacity	Bulk commodity carrier, 1.000 to 250.000 dwt payload capacity, deep sea	Heavy-duty Diesel Truck / 53,333 lb payload – 8b
Fuel Efficiency [L/100km]	56.2	15,134	42

Distribution Details	European Truck	European Ship to N.A.	North American Truck
Fuel Type	Diesel	Diesel	Diesel
Distance [km]	944	8120	944
Capacity Utilization [%]	61%	53%	67%
Weight of Products Transported [kg]	1.74E+00	1.74E+00	1.74E+00
Capacity utilization volume factor	1	1	1

A5 (Construction) Scenario Per Declared Unit

Ancillary installation materials are required, as indicated in the table below. However, the manufacturing of the installation equipment is not included in the study as these are multi-use tools and the impacts per declared unit are considered negligible. Packaging and installation waste disposal have been modeled as per guidelines in the PCR.

DITRA-HEAT-DUO is embedded with a trowel into thin-set mortar. If being used as a waterproof membrane, seams and protrusions must be treated with other Schlüter products. Tile or stone is installed on top of the DITRA-HEAT-DUO with the thin-bed method taking care to fill in the cavities in the membrane with mortar.

Construction Phase End of Life Fates	DITRA-HEAT-DUO E.U. Scenario	DITRA-HEAT-DUO N.A. Scenario
Mortar	2.10E+00	2.10E+00
Net Freshwater Consumption	2.10E-01	2.10E-01
Product wastage	5%	5%
Waste materials at the construction site before waste processing, generated by product installation	1.23E+00	1.23E+00
Product Waste to Incineration	8.70E-02	0.00E+00
Product Waste to Landfill	0.00E+00	8.70E-02
Packaging Waste to Landfill	3.69E-01	3.69E-01
Packaging Waste to Incineration	0.00E+00	0.00E+00
Packaging Waste to Recycling	1.72E-01	1.72E-01
Biogenic carbon content of packaging	2.36E-01	2.36E-01

The product should be installed according to the manufacturer's instructions found at Schlüter-Systems product pages for DITRA-HEAT-DUO North America and E.U.

B1-B7 (Use) Scenario Per Declared Unit

This stage contains all of the energy, water, and materials related to the use of the product, including cleaning, maintenance, and replacements. The DITRA-HEAT-DUO membrane does not require any inputs or energy for maintenance or use. Once installed, it lies below tile flooring protecting the substrate from any damage due to moisture or leakage. Heat is provided by a separate product (cabling), thus no energy is required to use DITRA-HEAT-DUO.

This membrane typically lasts as long as the building (75 years) and generally don't need to be replaced unless they are damaged or not installed as per manufacturer guidelines.

C1-C4 (Product End of Life) Scenario Per Declared Unit
In this stage, the product is transported to the end-of-life facility and disposed.

In Europe, during deconstruction (module C1), the membrane is removed from the mortar. Based on research of standard methods for mortar removal, this study assumes the usage of a commercial scraper and grinder to separate the DITRA-HEAT-DUO membrane from the mortar. Energy in the form of electricity is necessary in this stage to power the scraper and grinder. The separated membrane is sent to incineration, and the mortar to landfill.

In North America, it is assumed that the membrane is sent to landfill as mixed construction waste and is not separated from the mortar.

The table below shows the parameters for the end-of-life scenario utilized in the model. All waste has been classified according to the PCR and regional standards.

Distribution Details	DITRA-HEAT-DUO (E.U.)	DITRA-HEAT-DUO (N.A.)
Collected as mixed construction waste	0.00E+00	3.30E+00
Energy input	8.76E-02	0.00E+00
Waste to Landfill	2.10E+00	3.30E+00
Distance to Landfill	161	161
Waste to Incineration	1.20E+00	0.00E+00
Distance to Incineration	161	0.00E+00
Waste to Recycling	0.00E+00	0.00E+00
Distance to Recycling	0.00E+00	0.00E+00

Module D (Benefits and Loads Beyond the System Boundary) Scenario Per Declared Unit
Module D calculates the environmental benefits or loads from reusing products, recycling materials, and producing energy from end-of-life options. Only those flows leaving the product system that have not been allocated as co-products and that have passed the end-of-waste state are included within module D.

Within this study, the flows within Module D fall into the category of waste-to-energy for the EU scenario. However, the energy conversion efficiency rate is less than 60% for incineration of plastics, details of which are provided in the table below, which based on EN15804+A2, the impacts of the incineration process are assigned to C4. Module D represents benefits associated with electricity and steam generated as part of the incineration process.

Parameter	DITRA-HEAT-DUO (E.U.)
Incineration with energy recovery [kg]	0.98
Heating value [MJ/kg]	30
Electrical energy conversion efficiency rate [%]	12.9
Thermal energy conversion efficiency rate [%]	29.8

Results of the environmental performance indicators – EU Installation, Use, and Disposal Scenario – Most Representative Scenario

Mandatory impact category indicators according to EN 15804+A2 (EF 3.1)

LCIA results for DITRA-HEAT-DUO 1 m^2 – EU Installation, Use, and Disposal Scenario – Most Representative Scenario

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-GHG	kg CO_2 eq.	3.19E+00	1.08E-01	1.75E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.25E-01	3.64E-02	0.00E+00	3.06E+00	-1.39E+00
GWP-total	kg CO_2 eq.	2.37E+00	1.10E-01	2.56E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.27E-01	3.68E-02	0.00E+00	3.69E+00	-1.40E+00
GWP-fossil	kg CO_2 eq.	3.19E+00	1.08E-01	2.38E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.25E-01	3.64E-02	0.00E+00	3.06E+00	-1.39E+00
GWP-biogenic	kg CO_2 eq.	-8.22E-01	6.21E-04	1.80E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.76E-03	1.22E-04	0.00E+00	6.39E-01	-9.13E-03
GWP-luluc	kg CO_2 eq.	3.47E-03	2.09E-03	5.97E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.46E-05	2.46E-04	0.00E+00	2.17E-04	-1.61E-04
ODP	kg CFC 11 eq.	2.93E-11	3.43E-14	7.75E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.93E-12	4.66E-15	0.00E+00	1.21E-12	-1.64E-11
AP	mol H^+ eq.	7.01E-03	1.16E-03	3.37E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.96E-04	1.81E-04	0.00E+00	8.07E-04	-1.29E-03
EP-freshwater	kg P eq.	9.33E-06	2.96E-07	8.49E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.83E-07	3.74E-08	0.00E+00	6.06E-05	-3.32E-06
EP-marine	kg N eq.	2.17E-03	5.86E-04	1.10E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.12E-05	8.41E-05	0.00E+00	1.86E-04	-4.73E-04
EP-terrestrial	mol N eq.	2.31E-02	6.47E-03	1.19E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.30E-04	9.28E-04	0.00E+00	3.17E-03	-5.04E-03
POCP	kg NMVOC eq.	7.69E-03	1.10E-03	3.22E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.47E-04	1.69E-04	0.00E+00	5.41E-04	-1.25E-03
ADP-minerals&metals *	kg Sb eq.	3.52E-07	1.85E-08	1.50E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.64E-08	2.73E-09	0.00E+00	1.50E-08	-1.30E-07
ADP-fossil*	MJ	9.64E+01	1.43E+00	2.21E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.75E+00	5.47E-01	0.00E+00	2.26E+00	-2.12E+01
WDP*	m^3	8.42E-02	7.79E-04	2.99E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.06E-03	1.19E-04	0.00E+00	2.85E-01	-1.75E-02
PM	Disease incidence	1.96E-07	1.10E-08	2.44E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.54E-09	1.84E-09	0.00E+00	9.26E-09	-9.02E-09
IRP**	kBq U235 eq	1.14E-01	2.39E-04	5.17E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.79E-02	3.58E-05	0.00E+00	5.78E-03	-7.47E-02
ETP-fw*	CTUe	4.59E+01	1.11E+00	7.66E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.51E-01	1.43E-01	0.00E+00	3.94E+00	-2.89E+00
HTP-c*	CTUh	1.18E-09	2.22E-11	5.51E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.73E-11	4.33E-12	0.00E+00	5.66E-11	-2.15E-10
HTP-nc*	CTUh	4.50E-08	9.32E-10	9.48E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.14E-10	2.77E-10	0.00E+00	4.15E-09	-8.30E-09
Land Use*	Pt	2.18E+02	9.49E-01	1.50E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.23E+00	1.12E-01	0.00E+00	5.60E-01	-5.14E+00
Acronyms	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 = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals & metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption															

** Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.*

***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.*

Impact category indicators according to TRACI 2.1

LCIA results for DITRA-HEAT-DUO 1 m² – EU Installation, Use, and Disposal Scenario - Most Representative Scenario

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
AP	kg SO_2 eq	6.43E-03	1.08E-03	3.10E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.08E-04	1.67E-04	0.00E+00	1.16E-03	-1.31E-03
EP	kg N eq	6.03E-04	7.43E-05	3.04E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.71E-05	1.06E-05	0.00E+00	4.45E-04	-1.82E-04
GWP	kg CO_2 eq	2.27E+00	1.07E-01	1.88E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.26E-01	3.60E-02	0.00E+00	3.68E+00	-1.39E+00
ODP	kg CFC 11 eq	1.27E-11	6.90E-16	7.59E-13	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.82E-14	9.40E-17	0.00E+00	2.42E-14	-3.26E-13
SFP	kg O_3 eq	1.30E-01	2.50E-02	6.50E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.24E-03	3.76E-03	0.00E+00	1.10E-02	-2.74E-02
Acronyms	AP = Acidification potential of soil and water; EP = Eutrophication potential; GWP = Global Warming Air, incl. biogenic carbon; ODP – depletion of stratospheric ozone layer; SFP = smog formation potential															

Carbon Emissions and Removals

Carbon emissions and removals for DITRA-HEAT-DUO 1 m² – EU Installation, Use, and Disposal Scenario - Most Representative Scenario

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
BCRP	kg CO_2	5.07E-04	0.00E+00	2.54E-05	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	0.00E+00	0.00E+00	0.00E+00
BCEP	kg CO_2	0.00E+00	0.00E+00	8.86E-05	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	0.00E+00	1.77E-03	0.00E+00
BCRK	kg CO_2	9.31E-01	0.00E+00	4.65E-02	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	0.00E+00	0.00E+00	0.00E+00
BCEK	kg CO_2	0.00E+00	0.00E+00	9.77E-01	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	0.00E+00	0.00E+00	0.00E+00
BCEW	kg CO_2	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CCE	kg CO_2	0.00E+00	0.00E+00	6.35E-01	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	0.00E+00	0.00E+00	0.00E+00
CCR	kg CO_2	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CWNR	kg CO_2	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acronyms	BCRP = Biogenic Carbon Removal from Product; BCEP = Biogenic Carbon Emissions from Product; BCRK = Biogenic Carbon Removal from Packaging; BCEK = Biogenic Carbon Emissions from Packaging; BCEW = Biogenic Carbon Emission from Combustion of Waste from Renewable Sources Used in Production Processes; CCE = Calcination Carbon Emissions; CCR = Carbonation Carbon Removals; CWNR = Carbon Emissions from Combustion of Waste from Non- Renewable Sources used in Production Processes															

Resource use indicators

Resource use results for DITRA-HEAT-DUO 1 m² – EU Installation, Use, and Disposal Scenario - Most Representative Scenario

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	1.36E+01	1.58E-01	4.35E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.88E+00	1.93E-02	0.00E+00	6.32E-01	-7.86E+00
PERM	MJ	9.34E+00	0.00E+00	4.67E-01	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	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	2.29E+01	1.58E-01	4.82E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.88E+00	1.93E-02	0.00E+00	6.32E-01	-7.86E+00
PENRE	MJ	4.43E+01	1.43E+00	1.95E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.75E+00	5.47E-01	0.00E+00	2.26E+00	-2.12E+01
PENRM	MJ	5.21E+01	0.00E+00	2.61E+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	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ	9.64E+01	1.43E+00	2.21E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.75E+00	5.47E-01	0.00E+00	2.26E+00	-2.12E+01
SM	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	0.00E+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	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RE	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	1.20E-02	1.47E-04	9.71E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.94E-04	1.86E-05	0.00E+00	6.86E-03	-2.51E-03
Acronyms	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 re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water															

Waste indicators

Waste results for DITRA-HEAT-DUO 1 m^2 – EU Installation, Use, and Disposal Scenario - Most Representative Scenario

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste disposed	kg	3.39E-07	6.94E-11	2.58E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.34E-09	1.53E-11	0.00E+00	1.41E-09	-1.83E-08
Non-hazardous waste disposed	kg	5.34E-02	2.41E-04	3.48E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.78E-03	9.56E-05	0.00E+00	2.61E+00	-1.13E-02
Radioactive waste disposed	kg	1.06E-03	2.27E-06	5.33E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.68E-04	3.24E-07	0.00E+00	5.51E-05	-7.02E-04
High-level radioactive waste, conditioned, to final repository	kg	1.12E-06	2.41E-09	5.95E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.79E-07	3.40E-10	0.00E+00	5.91E-08	-7.45E-07
Intermediate- and low-level radioactive waste, conditioned, to final repository	kg	1.05E-03	2.27E-06	5.32E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.68E-04	3.24E-07	0.00E+00	5.51E-05	-7.01E-04

Output flow indicators

Output flow results for DITRA-HEAT-DUO 1 m^2 – EU Installation, Use, and Disposal Scenario - Most Representative Scenario

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	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
Material for recycling	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery	kg	0.00E+00	0.00E+00	5.97E-02	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	0.00E+00	0.00E+00	0.00E+00

Exported energy, electricity	MJ	0.00E+00	0.00E+00	3.39E-01	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	0.00E+00	4.60E+00	0.00E+00
Exported energy, thermal	MJ	0.00E+00	0.00E+00	6.48E-01	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	0.00E+00	1.07E+01	0.00E+00

Results of the environmental performance indicators – North America Installation, Use, and Disposal Scenario – Additional Scenario

Mandatory impact category indicators according to EN 15804+A2 (EF 3.1)

LCIA results for DITRA-HEAT-DUO 1 m^2 – North America Installation, Use, and Disposal Scenario – Additional Scenario																
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-GHG	kg CO_2 eq.	3.19E+00	1.81E-01	1.59E+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	3.47E-02	0.00E+00	1.03E-01	0.00E+00
GWP-total	kg CO_2 eq.	2.37E+00	1.82E-01	2.38E+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	3.48E-02	0.00E+00	1.04E-01	0.00E+00
GWP-fossil	kg CO_2 eq.	3.19E+00	1.81E-01	2.23E+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	3.47E-02	0.00E+00	1.03E-01	0.00E+00
GWP-biogenic	kg CO_2 eq.	-8.22E-01	2.66E-04	1.49E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.37E-05	0.00E+00	6.73E-01	0.00E+00
GWP-luluc	kg CO_2 eq.	3.47E-03	4.50E-04	5.09E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.35E-06	0.00E+00	3.80E-04	0.00E+00
ODP	kg CFC 11 eq.	2.93E-11	2.80E-14	7.51E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.64E-16	0.00E+00	3.40E-13	0.00E+00
AP	mol H^+ eq.	7.01E-03	1.84E-03	3.38E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.83E-05	0.00E+00	6.18E-04	0.00E+00
EP-freshwater	kg P eq.	9.33E-06	7.36E-07	8.40E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.71E-09	0.00E+00	5.92E-05	0.00E+00
EP-marine	kg N eq.	2.17E-03	6.62E-04	1.09E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.40E-05	0.00E+00	1.33E-04	0.00E+00
EP-terrestrial	mol N eq.	2.31E-02	7.29E-03	1.18E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.53E-04	0.00E+00	1.46E-03	0.00E+00
POCP	kg NMVOC eq.	7.69E-03	1.52E-03	3.22E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.21E-05	0.00E+00	4.26E-04	0.00E+00
ADP-minerals&metals*	kg Sb eq.	3.52E-07	2.15E-08	1.48E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.04E-10	0.00E+00	6.86E-09	0.00E+00
ADP-fossil*	MJ	9.64E+01	2.35E+00	2.20E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.59E-01	0.00E+00	1.74E+00	0.00E+00
WDP*	m^3	8.42E-02	8.14E-03	2.86E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.59E-05	0.00E+00	1.33E-02	0.00E+00
PM	Disease incidence	1.96E-07	2.56E-08	2.44E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.42E-10	0.00E+00	6.39E-09	0.00E+00
IRP**	kBq U235 eq	1.14E-01	5.45E-04	5.07E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.80E-06	0.00E+00	3.37E-03	0.00E+00
ETP-fw*	CTUe	4.59E+01	1.82E+00	7.65E+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	7.09E-03	0.00E+00	3.78E+00	0.00E+00
HTP-c*	CTUh	1.18E-09	4.25E-11	5.51E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.38E-12	0.00E+00	5.60E-11	0.00E+00
HTP-nc*	CTUh	4.50E-08	8.56E-10	9.48E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.48E-10	0.00E+00	1.17E-09	0.00E+00
Land Use*	Pt	2.18E+02	5.12E-01	1.48E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.30E-03	0.00E+00	2.96E-01	0.00E+00

Acronyms	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 = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption

** Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.*

***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.*

Impact category indicators according to TRACI 2.1

LCIA results for DITRA-HEAT-DUO 1 m² – North America Installation, Use, and Disposal Scenario – Additional Scenario

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
AP	kg SO_2 eq	6.43E-03	1.63E-03	3.07E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.65E-05	0.00E+00	5.33E-04	0.00E+00
EP	kg N eq	6.03E-04	9.43E-05	3.00E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.70E-06	0.00E+00	3.93E-04	0.00E+00
GWP	kg CO_2 eq	2.27E+00	1.79E-01	1.70E+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	3.42E-02	0.00E+00	1.02E-01	0.00E+00
ODP	kg CFC 11 eq	1.27E-11	5.60E-16	7.54E-13	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.76E-17	0.00E+00	6.77E-15	0.00E+00
SFP	kg O_3 eq	1.30E-01	3.32E-02	6.49E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.59E-04	0.00E+00	8.37E-03	0.00E+00
Acronyms	AP = Acidification potential of soil and water; EP = Eutrophication potential; GWP = Global Warming Air, incl. biogenic carbon; ODP – depletion of stratospheric ozone layer; SFP = smog formation potential															

Carbon Emissions and Removals

Carbon emissions and removals for DITRA-HEAT-DUO 1 m² – North America Installation, Use, and Disposal Scenario – Additional Scenario

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
BCRP	kg CO_2	5.07E-04	0.00E+00	2.54E-05	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	0.00E+00	0.00E+00	0.00E+00
BCEP	kg CO_2	0.00E+00	0.00E+00	8.86E-05	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	0.00E+00	1.77E-03	0.00E+00
BCRK	kg CO_2	9.31E-01	0.00E+00	4.65E-02	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	0.00E+00	0.00E+00	0.00E+00
BCEK	kg CO_2	0.00E+00	0.00E+00	9.77E-01	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	0.00E+00	0.00E+00	0.00E+00
BCEW	kg CO_2	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CCE	kg CO_2	0.00E+00	0.00E+00	6.35E-01	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	0.00E+00	0.00E+00	0.00E+00
CCR	kg CO_2	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CWNR	kg CO_2	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acronyms	BCRP = Biogenic Carbon Removal from Product; BCEP = Biogenic Carbon Emissions from Product; BCRK = Biogenic Carbon Removal from Packaging; BCEK = Biogenic Carbon Emissions from Packaging; BCEW = Biogenic Carbon Emission from Combustion of Waste from Renewable Sources Used in Production Processes; CCE = Calcination Carbon Emissions; CCR = Carbonation Carbon Removals; CWNR = Carbon Emissions from Combustion of Waste from Non- Renewable Sources used in Production Processes															

Resource use indicators

Resource use results for DITRA-HEAT-DUO 1 m² – North America Installation, Use, and Disposal Scenario – Additional Scenario																
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	1.36E+01	1.08E-01	4.23E+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	1.08E-03	0.00E+00	2.64E-01	0.00E+00
PERM	MJ	9.34E+00	0.00E+00	4.67E-01	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	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	2.29E+01	1.08E-01	4.70E+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	1.08E-03	0.00E+00	2.64E-01	0.00E+00
PENRE	MJ	4.43E+01	2.35E+00	1.94E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.59E-01	0.00E+00	1.74E+00	0.00E+00
PENRM	MJ	5.21E+01	0.00E+00	2.61E+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	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ	9.64E+01	2.35E+00	2.20E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.59E-01	0.00E+00	1.74E+00	0.00E+00
SM	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	0.00E+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	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RE	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	1.20E-02	2.87E-04	9.36E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.52E-06	0.00E+00	3.99E-04	0.00E+00
Acronyms	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 re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water															

Waste indicators

Waste results for DITRA-HEAT-DUO 1 m² – North America Installation, Use, and Disposal Scenario – Additional Scenario																
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed	kg	3.39E-07	2.60E-10	2.55E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E-11	0.00E+00	4.31E-10	0.00E+00
Non-hazardous waste disposed	kg	5.34E-02	2.51E-04	3.92E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E-04	0.00E+00	3.50E+00	0.00E+00
Radioactive waste disposed	kg	1.06E-03	6.10E-06	5.23E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.31E-08	0.00E+00	2.46E-05	0.00E+00
High-level radioactive waste, conditioned, to final repository	kg	1.12E-06	7.07E-09	5.84E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.14E-11	0.00E+00	2.25E-08	0.00E+00
Intermediate- and low-level radioactive waste, conditioned, to final repository	kg	1.05E-03	6.09E-06	5.23E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.30E-08	0.00E+00	2.46E-05	0.00E+00

Output flow indicators

Output flow results for DITRA-HEAT-DUO 1 m^2 – North America Installation, Use, and Disposal Scenario – Additional Scenario																
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	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
Material for recycling	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, electricity	MJ	0.00E+00	0.00E+00	1.09E-01	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	0.00E+00	0.00E+00	0.00E+00
Exported energy, thermal	MJ	0.00E+00	0.00E+00	1.14E-01	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	0.00E+00	0.00E+00	0.00E+00

Additional environmental information

DITRA-HEAT-DUO was tested in summer 2024 by the testing institute Eurofins Danmark for emissions of volatile organic compounds (VOC) according to the Indoor Air Comfort GOLD test protocol and is found to be suitable for indoor use.

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