epd-global
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Environmental product declaration

in accordance with ISO 14025 and EN 15804+A2

Fine Fire Clay produced by RAK Ceramics



RAK CERAMICS

EPD-Global

Owner of the declaration:
RAK Ceramics P.J.S.C

Product:
Fine Fire Clay produced by RAK Ceramics

Declared unit:
1 tonne

This declaration is based on Product Category Rules:
CEN Standard EN 15804:2012+A2:2019 serves as core PCR
IBU PCR Part B: Requirements on the EPD for Sanitary ceramics

Program operator:
EPD-Global

Declaration number:
NEPD-19243-24036

Issue date:
18.11.2026

Valid to:
18.11.2031

EPD software:
LCAno EPD generator ID: 1850778

General information

Product

Fine Fire Clay produced by RAK Ceramics

Owner of the declaration:

RAK Ceramics P.J.S.C
Contact person: Randel Joseph Despi & Elias Hallegado Jr.
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Program operator:

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Manufacturer:

RAK Ceramics P.J.S.C

Declaration number:

NEPD-19243-24036

Place of production:

RAK Ceramics P.J.S.C
PO Box
4714 Ras Al Khaimah, United Arab Emirates

This declaration is based on Product Category Rules:

CEN Standard EN 15804:2012+A2:2019 serves as core PCR
IBU PCR Part B: Requirements on the EPD for Sanitary ceramics

Management system:

Statement of liability:

The owner of the declaration shall be liable for the underlying information and evidence. EPD-Global shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

Organisation no:

Declared unit:

1 tonne Fine Fire Clay produced by RAK Ceramics

Issue date:

18.11.2026

Declared unit with option:

A1-A3, A4, A5, C1, C2, C3, C4, D

Valid to:

18.11.2031

Year of study:

2025

Functional unit:

Not relevant.

Comparability:

EPDs of construction products may not be comparable if they do not comply with EN 15804 and are not viewed in a building context.

General information on verification of EPD from EPD tools:

Independent verification of data, other environmental information and the declaration according to ISO 14025:2010, § 8.1.3 and § 8.1.4. Verification of each EPD is made according to EPD-Global's guidelines for verification and approval requiring that tools are i) integrated into the company's environmental management system, ii) the procedures for use of the EPD tool are approved by EPD-Global, and iii) the process is reviewed annually by an independent third party verifier. See Appendix G of EPD-Global's General Programme Instructions for further information on EPD tools

Development and verification of EPD:

The declaration is created using EPD generator v2025.09, developed by LCA.no. The EPD tool is integrated in the company's management system, and has been approved by EPD-Global.

Developer of EPD: Eren Yaman - ERKE Sustainability Consultancy

Reviewer of company-specific input data and EPD: Børge Heggen Johansen, Energiråd AS

Verification of EPD tool:

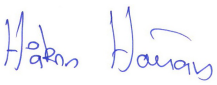
Independent third party verification of the EPD tool, background data and test-EPD in accordance with EPD-Global's procedures and guidelines for verification and approval of EPD tools.

Third party verifier:

Alexander Borg, Asplan Viak AS

(no signature required)

Approved:



Håkon Hauan, CEO EPD-Global

Product

Product description:

The declared product group consists of fine fire clay ceramic sanitaryware. These products are manufactured from ceramic raw materials and fired at high temperatures to achieve the required mechanical strength, durability, and water resistance. They are intended for installation in residential, commercial, and public buildings for personal hygiene.

Product specification:

Fine fireclay ceramic is manufactured using a combination of ceramic raw materials, including fireclay. The material composition contributes to refractoriness and green strength during forming, helping to maintain dimensional stability throughout the drying and firing processes. These properties make fine fireclay suitable for manufacturing large ceramic sanitaryware products.

Materials	kg	%
Additives	2.10	0.2103
Aggregate	167.66	16.77
Cement	0.6363	0.06363
Chemical	10.82	1.08
Clay	429.92	42.99
Filler	341.00	34.10
Mineral	37.41	3.74
Mineral additives	0.5257	0.05257
Pigments	9.93	0.9932
Total	1000.00	100.00

Packaging	kg	%
Packaging - Cardboard	42.10	53.50
Packaging - Plastic	6.25	7.94
Packaging - Wood	30.34	38.56
Total incl. packaging	1078.69	100.00

Technical data:

Fine fireclay ceramic sanitaryware products manufactured by RAK Ceramics have glazed surfaces and are subject to quality inspections based on international standards and manufacturer specifications.
Technical performance is assessed in terms of resistance to dry heat, chemical and staining agents, scratching, abrasion, crazing, water absorption and mechanical strength. Selected sink models and ceramic samples have been tested in accordance with BS EN 13310, meeting the specified acceptance criteria. Further technical characteristics and test results are presented in the table below.

Standard	Test Parameter	Product / Sample	Colour / Finish	Acceptance Criteria	Test Result
(BS EN 13310)	Resistance to Dry Heat	RESORT SINK	AL-WHITE	According to Clause no 5.3, the kitchen sink shall not show surface changes.	PASSED
(BS EN 13310)	Resistance Against to Chemical and Staining Agents	JACLYN SINK	AL-WHITE	According to Clause no 5.4, the kitchen sink shall not show surface changes.	PASSED
(BS EN 13310)	Resistance Against to Chemical and Staining Agents	RESORT SINK	AL-WHITE	According to Clause no 5.4, the kitchen sink shall not show surface changes.	PASSED
(BS EN 13310)	Resistance to Scratching	SLAB	AL-WHITE	According to Clause no. 5.6, any scratch shall not exceed 0.1 mm and/or the top layer whichever is the least.	PASSED
(BS EN 13310)	Resistance to Scratching	SLAB	AL-WHITE	According to Clause no. 5.6, any scratch shall not exceed 0.1 mm and/or the top layer whichever is the least.	PASSED
(BS EN 13310)	Resistance to Scratching	SLAB	AL-WHITE	According to Clause no. 5.6, any scratch shall not exceed 0.1 mm and/or the top layer whichever is the least.	PASSED
(BS EN 13310)	Resistance to Abrasion	SLAB	AL-WHITE	According to Clause no. 5.7, the top layer of the test specimen shall not be abraded through.	PASSED
(BS EN 13310)	Resistance to Abrasion	SLAB	AL-WHITE	According to Clause no. 5.7, the top layer of the test specimen shall not be abraded through.	PASSED
(BS EN 13310)	Resistance to Abrasion	SLAB	AL-WHITE	According to Clause no. 5.7, the top layer of the test specimen shall not be abraded through.	PASSED
(BS EN 13310)	Resistance to Dry Heat	JACKLYN SINK	AL-WHITE	According to Clause no 5.3, the kitchen sink shall not show surface changes.	PASSED
ASME A112.19.2 / CSA B45.1	Water absorption	Fine fireclay ceramic sanitaryware	Glazed; colour not specified	14% maximum	11 % maximum
BS 3402:1969	Crazing resistance	Fine fireclay ceramic sanitaryware	Glazed; colour not specified	No crazing	No crazing

Market:

Global.

Reference service life, product

Not applicable. Reference service life is not declared.

Reference service life, building or construction works

Not relevant.

LCA: Calculation rules

Declared unit:

1 tonne Fine Fire Clay produced by RAK Ceramics

Cut-off criteria:

All major raw materials and all the essential energy are included. The production processes for raw materials and energy flows with very small amounts (less than 1%) may not be included. These cut-off criteria do not apply for hazardous materials and substances.

Allocation:

The allocation is made in accordance with the provisions of EN 15804. Incoming energy and water and waste production in-house is allocated equally among all products through mass allocation. Effects of primary production of recycled materials is allocated to the main product in which the material was used. The recycling process and transportation of the material is allocated to this analysis.

Data quality:

Specific data for the product composition are provided by the manufacturer. The data represent the production of the declared product and were collected for EPD development in the year of study. Background data is based on EPDs according to EN 15804 and different LCA databases. The data quality of the raw materials in A1 is presented in the table below.

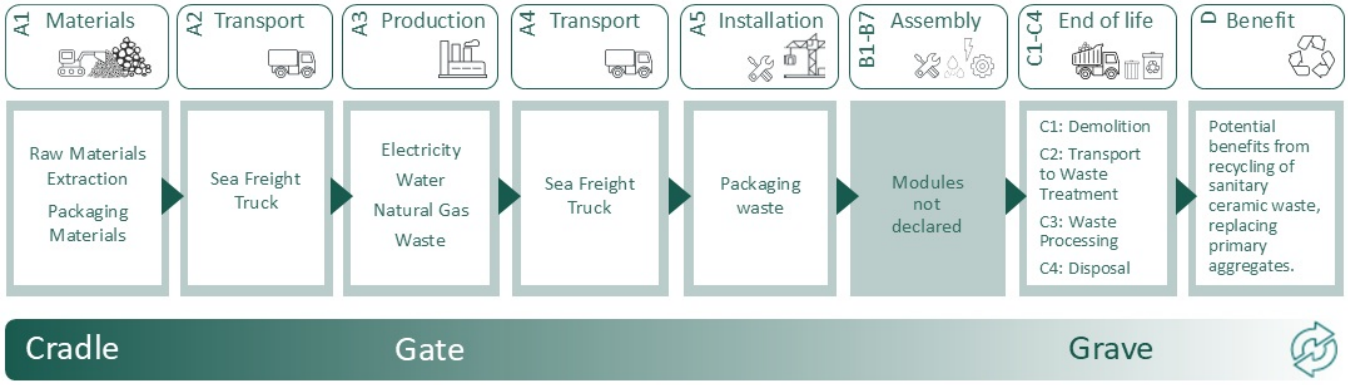
Materials	Source	Data quality	Year
Additives	ecoinvent 3.10.1	Database	2023
Aggregate	ecoinvent 3.10.1	Database	2023
Cement	Ecoinvent 3.10.1	Database	2023
Chemical	ecoinvent 3.10.1	Database	2023
Clay	ecoinvent 3.10.1	Database	2023
Filler	ecoinvent 3.10.1	Database	2023
Mineral	ecoinvent 3.10.1	Database	2023
Mineral additives	ecoinvent 3.10.1	Database	2023
Packaging - Cardboard	ecoinvent 3.10.1	Database	2023
Packaging - Plastic	ecoinvent 3.10.1	Database	2023
Packaging - Wood	ecoinvent 3.10.1	Database	2023
Pigments	ecoinvent 3.10.1	Database	2023

System boundaries (X=included, MND=module not declared, MNR=module not relevant)

Product stage			Construction installation stage		Use stage							End of life stage				Beyond the system boundaries
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	MND	MND	MND	MND	MND	MND	MND	X	X	X	X	X

System boundary:

Cradle to gate with options A4 and A5, end-of-life modules C1–C4 and module D.



Additional technical information:

LCA: Scenarios and additional technical information

The following information describe the scenarios in the different modules of the EPD.

For the transport stage (A4), a representative distribution scenario is considered, reflecting RAK Ceramics' global market presence. A maritime transport distance of 6,520 km and a road transport distance of 300 km using Euro 5 diesel trucks are assumed.
During installation (A5), packaging waste generated at the installation site is considered.
At the end-of-life stage (C1–C4), ceramic sanitaryware products are assumed to be removed manually, with no energy consumption considered during dismantling. Waste is transported to a disposal facility over an assumed distance of 50 km. A conservative end-of-life scenario is adopted, in which 100% of the ceramic waste is assumed to be disposed of in sanitary landfill.
Module D accounts for the potential environmental benefits and loads associated with material and energy recovery from packaging waste generated during installation (A5).

Transport from production place to user (A4)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Ship, Freight, container ship (km) GLO -- ecoinvent 3.10.1	65.0 %	6520.00	0.003	l/tkm	19.56
Truck, 16-32 tonnes, EURO 5 (km) - RER	38.8 %	300.00	0.045	l/tkm	13.50

Assembly (A5)	Unit	Value			
Waste, packaging, wood (kg) (A5 included)	kg	30.34			
Waste, cardboard and paper, to average treatment (kg) - incl. 85 km transp.	kg	42.10			
Waste, packaging, plastic, mixture, to average treatment (kg)	kg	6.25			

Transport to waste processing (C2)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Truck, 16-32 tonnes, EURO 6 (km)	38.8 %	50.00	0.044	l/tkm	2.20

Disposal (C4)	Unit	Value			
Waste, inert waste, to landfill (kg)	kg	1000.00			

Benefits and loads beyond the system boundaries (D)	Unit	Value			
Substitution, Corrugated board box (kg)	kg	-2.36			
Substitution of electricity (MJ)	MJ	0.0006027			
Substitution, Packaging, Pallet, EUR wooden pallet, single use (kg)	kg	19.60			
Substitution of thermal energy, district heating (MJ)	MJ	0.00121			

LCA: Results

The LCA results are presented below for the declared unit defined on page 2 of the EPD document.

Environmental impact										
	Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
	GWP-total	kg CO_2 -eq	9.38E+02	1.35E+02	1.24E+02	0	1.02E+01	0.00E+00	1.14E+01	2.25E+01
	GWP-fossil	kg CO_2 -eq	1.04E+03	1.35E+02	1.02E+01	0	1.02E+01	0.00E+00	1.14E+01	-2.74E+00
	GWP-biogenic	kg CO_2 -eq	-1.02E+02	5.99E-02	1.14E+02	0	7.90E-03	0.00E+00	3.15E-02	2.52E+01
	GWP-luluc	kg CO_2 -eq	1.99E+00	6.10E-02	5.35E-04	0	3.67E-03	0.00E+00	7.30E-03	7.41E-02
	ODP	kg CFC11 -eq	2.00E-05	1.29E-06	3.28E-08	0	2.16E-07	0.00E+00	2.84E-07	-5.69E-07
	AP	mol H+ -eq	3.04E+00	2.31E+00	8.32E-03	0	2.13E-02	0.00E+00	1.21E-01	-1.68E-02
	EP-FreshWater	kg P -eq	7.73E-02	6.41E-03	1.67E-04	0	6.89E-04	0.00E+00	1.75E-02	-4.21E-04
	EP-Marine	kg N -eq	8.28E-01	5.93E-01	5.19E-03	0	5.12E-03	0.00E+00	3.02E-02	-2.76E-03
	EP-Terrestial	mol N -eq	8.26E+00	6.57E+00	3.63E-02	0	5.52E-02	0.00E+00	3.25E-01	-5.67E-02
	POCP	kg NMVOC -eq	3.55E+00	1.89E+00	1.18E-02	0	3.54E-02	0.00E+00	1.14E-01	-3.11E-02
	ADP-minerals&metals[1]	kg Sb-eq	2.85E-03	2.75E-04	5.30E-06	0	3.41E-05	0.00E+00	2.58E-05	-1.89E-05
	ADP-fossil[1]	MJ	1.57E+04	1.76E+03	2.13E+01	0	1.44E+02	0.00E+00	2.48E+02	-5.37E+01
	WDP[1]	m^3	1.11E+02	6.77E+00	1.23E+00	0	7.16E-01	0.00E+00	1.29E+00	-1.84E+00

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 = 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

"Reading example: 9.0 E-03 = 9.0*10-3 = 0.009"

1. The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator

Remarks to environmental impacts

The LCA results in the EPD are calculated using a specific methodological approach for accounting energy resources, see the additional requirements section for more information. In this EPD the following approach was used: Location-based approach.

The manufacturing stage (A3) is the main contributor to the cradle-to-gate environmental impacts of fine fireclay ceramic, particularly in terms of global warming potential (GWP-total) and ozone depletion potential (ODP).

For the declared unit of 1 tonne of fine fireclay ceramic, the cradle-to-gate GWP-total (A1–A3) is approximately 938 kg CO_2-eq, with the manufacturing stage accounting for approximately 82% of this impact.

The total GWP for modules A1–C4 is approximately 1,218 kg CO_2-eq.

Additional environmental impact indicators										
Indicator		**Unit**	A1-A3	A4	A5	C1	C2	C3	C4	D
	PM	Disease incidence	1.59E-05	4.85E-06	1.33E-07	0	7.55E-07	0.00E+00	1.84E-06	-3.96E-07
	IRP[2]	kgBq U235 -eq	1.52E+01	1.52E+00	3.23E-02	0	1.86E-01	0.00E+00	2.17E-01	-2.70E-01
	ETP-fw[1]	CTUe	1.91E+03	1.80E+02	2.75E+01	0	1.92E+01	0.00E+00	2.43E+02	-2.08E+00
	HTP-c[1]	CTUh	1.81E-07	0.00E+00	8.92E-10	0	0.00E+00	0.00E+00	6.00E-09	-2.98E-08
	HTP-nc[1]	CTUh	4.50E-06	6.47E-07	5.73E-08	0	1.08E-07	0.00E+00	3.23E-07	-4.01E-08
	SQP[1]	dimensionless	7.64E+03	5.91E+02	1.20E+01	0	8.70E+01	0.00E+00	5.80E+02	-2.47E+03

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 = Potential Soil Quality Index (dimensionless)

"Reading example: 9.0 E-03 = 9.0*10-3 = 0.009"

1. The results of this environmental impact 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										
Indicator		Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
	PERE	MJ	8.70E+02	2.19E+01	4.74E-01	0	2.52E+00	0.00E+00	3.65E+00	-1.74E+02
	PERM	MJ	9.73E+02	0.00E+00	-9.73E+02	0	0.00E+00	0.00E+00	0.00E+00	-2.50E+02
	PERT	MJ	1.84E+03	2.19E+01	-9.73E+02	0	2.52E+00	0.00E+00	3.65E+00	-4.23E+02
	PENRE	MJ	1.54E+04	1.76E+03	2.13E+01	0	1.44E+02	0.00E+00	2.48E+02	-3.46E+01
	PENRM	MJ	2.67E+02	0.00E+00	-2.65E+02	0	0.00E+00	-2.51E+00	0.00E+00	9.90E-02
	PENRT	MJ	1.57E+04	1.76E+03	-2.44E+02	0	1.44E+02	-2.51E+00	2.48E+02	-3.45E+01
	SM	kg	4.33E+01	0.00E+00	0.00E+00	0	0.00E+00	0.00E+00	0.00E+00	2.33E+00
	RSF	MJ	1.87E+01	5.99E-03	1.78E-04	0	8.46E-04	0.00E+00	1.70E-03	-9.23E+00
	NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0	0.00E+00	0.00E+00	0.00E+00	-3.66E-05
	FW	m^3	7.21E+00	1.78E-01	1.79E-02	0	1.96E-02	0.00E+00	0.00E+00	-4.17E-02

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 materials; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Net use of fresh water

"Reading example: 9.0 E-03 = 9.0*10-3 = 0.009"

End of life - Waste

Indicator		Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
	HWD	kg	1.68E+01	2.43E+00	1.34E-01	0	2.09E-01	0.00E+00	0.00E+00	-2.38E-01
	NHWD	kg	1.92E+03	4.23E+01	2.25E+01	0	4.42E+00	0.00E+00	1.00E+03	-6.00E+00
	RWD	kg	1.37E-02	3.77E-04	5.76E-06	0	4.62E-05	0.00E+00	0.00E+00	-7.12E-05

HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed

"Reading example: 9.0 E-03 = 9.0*10-3 = 0.009"

End of life - Output flow

Indicator		Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
	CRU	kg	0.00E+00	0.00E+00	0.00E+00	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	MFR	kg	2.31E-04	0.00E+00	6.07E+01	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	MER	kg	4.44E-07	0.00E+00	7.83E-08	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	EEE	MJ	7.43E-03	0.00E+00	2.11E-03	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	EET	MJ	1.67E-02	0.00E+00	3.85E-03	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00

CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported energy electrical; EET = Exported energy thermal

"Reading example: 9.0 E-03 = 9.0*10-3 = 0.009"

Biogenic Carbon Content

Indicator	Unit	At the factory gate
Biogenic carbon content in product	kg C	0.00E+00
Biogenic carbon content in accompanying packaging	kg C	3.10E+01

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO2

Additional requirements

Transparent energy reporting

The EPD presents environmental impact categories in the main results tables using a specific methodological approach for accounting energy resources. To ensure transparency and support informed interpretation, the table below explains the implications of the chosen methodology. It illustrates the GWP-total for energy resources used in the manufacturing stage, comparing the location-based and market-based approaches. In this EPD the following approach was used in main result tables: Location-based approach.

Electricity mix	Source	Amount	Unit	GWPtotal [kg CO2/Unit]	SUM [kg CO2]
Location-based approach.					
Electricity, United Arab Emirates, low voltage	ecoinvent 3.10.1	3.77E+02	kWh	6.28E-01	2.37E+02
Market-based approach.					

"Reading example: 9.0 E-03 = 9.0*10-3 = 0.009"

Dangerous substances

The product contains no substances given by the REACH Candidate list.

Indoor environment

Not relevant.

Additional Environmental Information

Additional environmental impact indicators required in NPCR Part A for construction products									
Indicator	**Unit**	A1-A3	A4	A5	C1	C2	C3	C4	D
GWPIOBC	kg CO_2 -eq	1.05E+03	1.35E+02	1.02E+01	0	1.02E+01	0.00E+00	1.14E+01	-2.61E+00

GWP-IOBC: Global warming potential calculated according to the principle of instantaneous oxidation. In order to increase the transparency of biogenic carbon contribution to climate impact, the indicator GWP-IOBC is required as it declares climate impacts calculated according to the principle of instantaneous oxidation. GWP-IOBC is also referred to as GWP-GHG in context to Swedish public procurement legislation.

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