



Natural aggregates

Registration number: EPD-Kiwa-EE-175818-EN

 Issue date:
 27-01-2025

 Valid until:
 27-01-2030

Declaration owner: Näppi T & N Oy

Publisher: Kiwa-Ecobility Experts
Programme operator: Kiwa-Ecobility Experts

Status: verified





1 General information

1.1 PRODUCT

Natural aggregates

1.2 REGISTRATION NUMBER

EPD-Kiwa-EE-175818-EN

1.3 VALIDITY

Issue date: 27-01-2025 Valid until: 27-01-2030

1.4 PROGRAMME OPERATOR

Kiwa-Ecobility Experts Wattstraße 11-13 13355 Berlin DE

Raoul Mancke

(Head of programme operations, Kiwa-Ecobility Experts) Dr. Ronny Stadie

C. Stadie

(Verification body, Kiwa-Ecobility Experts)

1.5 OWNER OF THE DECLARATION

Manufacturer: Näppi T & N Oy

Address: Hirveläntie 11, 27100 Eurajoki, Finland

E-mail: niklas@murskeet.fi

Website: https://www.murskeet.fi/

Production location: Näppi T & N Oy, Rikantila quarry

Address production location: Lapintie 606, 27100 Eurajoki, Finland

1.6 VERIFICATION OF THE DECLARATION

The independent verification is in accordance with the ISO 14025:2011. The LCA is in compliance with ISO 14040:2006 and ISO 14044:2006. The EN 15804:2012+A2:2019 serves as the core PCR.

☐ Internal ☐ External

Lucas Pedro Berman, Senda

1.7 STATEMENTS

The owner of this EPD shall be liable for the underlying information and evidence. The programme operator Kiwa-Ecobility Experts shall not be liable with respect to manufacturer data, life cycle assessment data and evidence.

1.8 PRODUCT CATEGORY RULES

Kiwa-Ecobility Experts (Kiwa-EE) - General Product Category Rules (2022-02-14)

Institute Construction and Environment e.V. (IBU) - Part B: Requirements on the EPD for Natural aggregates (2023-12-19)

1.9 COMPARABILITY

In principle, a comparison or assessment of the environmental impacts of different products is only possible if they have been prepared in accordance with EN 15804+A2. For the evaluation of the comparability, the following aspects have to be considered in particular: PCR used, functional or declared unit, geographical reference, the definition of



1 General information

the system boundary, declared modules, data selection (primary or secondary data, background database, data quality), scenarios used for use and disposal phases, and the life cycle inventory (data collection, calculation methods, allocations, validity period). PCRs and general program instructions of different EPD program operators may differ. Comparability needs to be evaluated. For further guidance, see EN 15804+A2 (5.3 Comparability of EPD for construction products) and ISO 14025 (6.7.2 Requirements for comparability).

1.10 CALCULATION BASIS

LCA method R<THINK: Ecobility Experts | EN15804+A2

LCA software*: Simapro 9.1

Characterization method: EN 15804 +A2 Method v1.0

LCA database profiles: Ecolnvent version 3.6

Version database: v3.17 (2024-05-22)

* Simapro is used for calculating the characterized results of the Environmental profiles within R<THINK.

1.11 LCA BACKGROUND REPORT

This EPD is generated on the basis of the LCA background report 'Natural aggregates' with the calculation identifier ReTHiNK-75818.



2 Product

2.1 PRODUCT DESCRIPTION

Näppi T&N aggregate products are manufactured in the Rikantila quarry in Eurajoki. Aggregates are produced from Finnish granite by mining and crushing to different grain sizes. The final product is natural aggregates without any added materials. The crushing phase is done with electricity, utilizing the company's own solar power plant and purchased electricity with a guarantee of origin.

This declaration has been prepared for one ton (1000 kg) of natural aggregates. This declaration is an average EPD covering all aggregate products produced at the declared production site. Aggregate products are listed in the table below, divided into coarse and all-in aggregates. All products are produced at the same crushing plant, but the duration of the manufacturing process varies depending on the grading of the product. The manufacturing process of all-in aggregates is shorter, while coarse aggregates have more production stages and take longer. The inputs used in the calculations is average data of the entire production.

3/6 mm 0/4 mm 4/8 mm 0/8 mm 8/12 mm 0/11 mm 8/16 mm 0/16 mm 16/32 mm 0/22 mm 32/63 mm 0/32 mm	
8/12 mm 0/11 mm 8/16 mm 0/16 mm 16/32 mm 0/22 mm	
8/16 mm	
16/32 mm 0/22 mm	
32/63 mm 0/32 mm	
90/150 mm 0/45 mm	
11/22 mm 0/56 mm	
120/200 mm 0/63 mm	
4/16 mm 0/90 mm	
0/150 mm	



2.2 APPLICATION (INTENDED USE OF THE PRODUCT)

The declared products are intended to use for wide array of construction processes and materials. Aggregates can be used for civil engineering work and road construction for unbound and hydraulically bound structures also in the different structural layers of railways. They can also be used as raw material for concrete and asphalt. The intended use of the aggregate defines the technical properties required for the aggregate.

The aggregates are CE marked according to applicable standards EN 13242 Aggregates for unbound and hydraulically bond mixtures, EN 13043 Aggregates for bituminous mixtures and surface treatments for roads, airfields and other trafficked areas, EN 12620 Aggregates for concrete and EN 13450 Aggregates for railway ballast.

The area of applicability is presented in the declaration of performance (DoP) of the aggregates.



2 Product

2.3 REFERENCE SERVICE LIFE

RSL PRODUCT

As aggregates are semi-finished products, no service life is declared. As in input it is required, 50 years was used, as that represents the reference service life most of the products natural aggregates are being used for. This has no impact on the presented calculation.

USED RSL (YR) IN THIS LCA CALCULATION:

50

2.4 TECHNICAL DATA

Some of the material uses a bit more electricity for the production phase than others, but most of the environmental impacts are from the use of diesel and mining with explosives, that comply for all the listed aggregates equally.

The amount of 0,8 % process waste is an estimate, since there really isn't any real waste and all the material can be sold. If there are some process waste, it is used on site for landscaping of old mining areas and building roads to new mining areas.

Full information of products and their performances are published in Declaration of performances (DoP). The assessment and verification of constancy of performance system used is 2+. Certificate of conformity of the factory production control 0416-CPR- 6868-04 is issued by notified body Inspecta Sertificinti Oy 20.8.2012.

Constructional data:

Name / standard	Value / Unit	Products
Particle density EN 1097-6	2,63 Mg/m3	all
Water absorption EN 1097-6	0,3 %	all
Nordic Abrasion value EN 1097-9	An19	EN 13043
Los Angeles coefficient EN 1097-2	LA25	EN 13242 coarse aggregates

2.5 SUBSTANCES OF VERY HIGH CONCERN

No dangerous substances from the candidate list of SVHC for Authorization are used in the product. The radioactivity of the aggregate source is determined according to the Finnish national law 859/2018 and the related regulation STUK S/6/2022. The activity concentrations of the products have been declared in DoP accordance with the applicable product standards.

2.6 DESCRIPTION PRODUCTION PROCESS

In the first stage of production, the vegetation and top soil are removed from the top of the rock which will be mined. Holes are drilled into the rock and filled with emulsion explosives and then blasted into appropriate grain size for the aggregate production. If needed, oversize stones are broken by hydraulic hammer before loading. The boulders are loaded onto the dumper with an excavator and transported to the feeder of the crushing plant.

The crushing and screening plant is fixed. The production line consists of a feeder, precrusher, intermediate crusher, post-crusher, screening devices and conveyors. All devices are powered by electricity.

In the manufacturing process the raw material moves along conveyor belts to a crusher and undergoes screening. The process is controlled according to the natural aggregate being manufactured, the number of crushing steps and the need for screening varies.

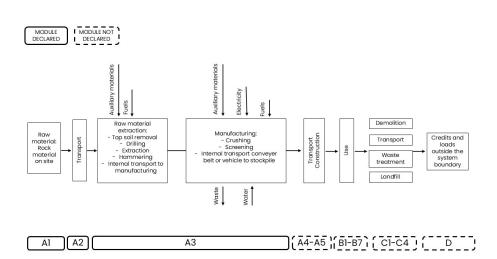
The finished natural aggregate is moved to a storage pile along a conveyor belt or loaded directly into a truck to be delivered to the customer. No packaging material is needed in this process.

If necessary, the crushing plant uses surface water for dust binding, the water is pumped from a pond in the production area.

The scope for this EPD is cradle-to-gate, representing the modules A1, A2 and A3. The end-of-life is excluded because the natural aggregates can be used in many different ways with great effects on the end-of-life scenarios.



2 Product





3 Calculation rules

3.1 DECLARED UNIT

Declared unit

1000 kg (1 ton)

Gross Density 2630 kg/m3.

Reference unit: ton (ton)

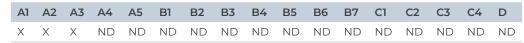
3.2 CONVERSION FACTORS

Description	Value	Unit
Reference unit	1	ton
Weight per reference unit	1000.000	kg
Conversion factor to 1 kg	0.001000	ton

3.3 SCOPE OF DECLARATION AND SYSTEM BOUNDARIES

This is a Cradle to gate EPD. The life cycle stages included are as shown below:

(X = module included, ND = module not declared)



The modules of the EN15804 contain the following:

Module A1 = Raw material supply	Module B5 = Refurbishment
Module A2 = Transport	Module B6 = Operational energy use
Module A3 = Manufacturing	Module B7 = Operational water use
Module A4 = Transport	Module C1 = De-construction / Demolition
Module A5 = Construction -	Modulo C2 = Transport
Installation process	Module C2 = Transport
Module B1 = Use	Module C3 = Waste Processing
Module B2 = Maintenance	Module C4 = Disposal
Madula DZ - Danain	Module D = Benefits and loads beyond the
Module B3 = Repair	product system boundaries
Module B4 = Replacement	

3.4 REPRESENTATIVENESS

This EPD is representative for Natural aggregates of Näppi T & N Oy at their own production location Rikantila quarry.

3.5 CUT-OFF CRITERIA

Product stage (A1-A3)

All input flows (e.g. raw materials, transportation, energy use, packaging, etc.) and output flows (e.g. production waste) are considered in this LCA. The total neglected input flows do therefore not exceed the limit of 5% of energy use and mass.



3 Calculation rules

The manufacturing process of the equipment and machines, buildings and other capital goods used in the natural aggregate production have not been included, as well as maintenance of the the machines and buildings. The transportation of personnel to the plant or within the plant, research and development, long-term emissions, exipients and fluctuants have also been excluded.

3.6 ALLOCATION

This EPD is the average EPD for Näppi T & N Oy natural aggregates produced at the Rikantila quarry. This declaration represents coarse and all-in aggregates in various grain sizes. There is no other production or co-products at the site, so no allocation is needed.

3.7 DATA COLLECTION & REFERENCE PERIOD

Primary data was collected and provided by Näppi T & N Oy internally. The data refers the annual aggregate production of the Rikantila quarry in Eurajoki, Finland, during the collection and reference period 1.7.2023-30.6.2024.

3.8 ESTIMATES AND ASSUMPTIONS

The EPD covers all natural aggregates manufactured by Näppi T & N Oy at Rikantila quarry. There are two different product types: coarse aggregates and all-in aggregates. Both types are produced using same crushing and sieving equipment but the required process steps vary by product type. The production of all-in aggregates, the manufacturing process is shorter, while in the manufacturing process of coarse aggregates, more steps are used.

Because the inputs of manufacturing process cannot be allocated per product types, average amounts is used to present total production. Also most of the environmental effects come form mining and the use of diesel, that is equal to all products.

Rikantila quarry is the production area and the source of raw material. Because of that, there is no transportation for raw material declared for module A2. The diesel used for production on module A3 covers all the machines working in the area.

Natural aggregate production is not producing any actual waste. Still, some of the material is used on site for landscaping, roads and storage areas and is declared as waste in this EPD. Production waste is an assumption. The location has always been the same place, so the need for new roads is minimum and basically all produced aggregates are sold.

Purchased energy is with Guarantee of Origin from the year 2023. EPD is made with the assumption, that the energy mix will be the same for year 2024.

3.9 DATA QUALITY

The data consists of annual data of production amounts, annual energy usage of electricity and diesel, annual solar power production used in the process and annual explosive usage. Data is collected directly from the company and can be described as good.

The data is based on the annual average. In order to ensure comparability of the results, only consistent background data of the Ecoinvent database was used in the LCA. The database is regularly reviewed and thus complies with the requirements of EN 15804 (background data not older than 10 years). All consistent datasets contained in the Ecoinvent database are documented and can be viewed in the online Ecoinvent documentation. Te life cycle was modelled with the R<THiNK EPD App.

The scenarios included are currently in use and are representative for one of the most likely scenario alternatives.

According to the criteria of the "UN Environmental Global Guidance on LCA database development" mentioned in EN 15804+A2, the data quality for all three representativeness categories (geographical, technical and time) can be described as good.

3.10 POWER MIX

The electricity environmental profile was created using a local-based approach, aligned with the geographical reference area (Finland) and Guarantee of Origin certificate from the supplier. The electricity it uses has a Global Warming Potential (GWP-total) of 0.1044783 kg CO2e per kilowatt-hour (kWh).





For the impact assessment, the characterization factors of the LCIA method EN 15804 +A2 Method v1.0 are used. Long-term emissions (>100 years) are not considered in the impact assessment. The results of the impact assessment are only relative statements that do not make any statements about end-points of the impact categories, exceedance of threshold values, safety margins or risks. The following tables show the results of the indicators of the impact assessment, of the use of resources as well as of waste and other output flows.

4.1 ENVIRONMENTAL IMPACT INDICATORS PER TON

CORE ENVIRONMENTAL IMPACT INDICATORS EN15804+A2

Abbr.	Unit	A1	A2	A3	A1-
					A3
AP	mol H+ eqv.	0.00E+0	0.00E+0	2.08E-2	2.08E-2
GWP-total	kg CO2 eqv.	0.00E+0	0.00E+0	2.55E+0	2.55E+0
GWP-b	kg CO2 eqv.	0.00E+0	0.00E+0	1.08E-2	1.08E-2
GWP-f	kg CO2 eqv.	0.00E+0	0.00E+0	2.54E+0	2.54E+0
GWP-luluc	kg CO2 eqv.	0.00E+0	0.00E+0	2.83E-3	2.83E-3
EP-m	kg N eqv.	0.00E+0	0.00E+0	7.04E-3	7.04E-3
EP-fw	kg P eq	0.00E+0	0.00E+0	3.31E-5	3.31E-5
EP-T	mol N eqv.	0.00E+0	0.00E+0	8.47E-2	8.47E-2
ODP	kg CFC 11 eqv.	0.00E+0	0.00E+0	3.69E-7	3.69E-7
POCP	kg NMVOC eqv.	0.00E+0	0.00E+0	2.10E-2	2.10E-2
ADP-f	МЈ	0.00E+0	0.00E+0	3.29E+1	3.29E+1
ADP-mm	kg Sb-eqv.	0.00E+0	0.00E+0	4.11E-5	4.11E-5
WDP	m3 world eqv.	0.00E+0	0.00E+0	4.75E-1	4.75E-1

AP=Acidification (AP) | GWP-total=Global warming potential (GWP-total) | GWP-b=Global warming potential - Biogenic (GWP-b) | GWP-f=Global warming potential - Fossil (GWP-f) | GWP-luluc=Global warming potential - Land use and land use change (GWP-luluc) | EP-m=Eutrophication marine (EP-m) | EP-fw=Eutrophication, freshwater (EP-fw) | EP-T=Eutrophication, terrestrial (EP-T) | ODP=Ozone depletion (ODP) | POCP=Photochemical ozone formation - human health (POCP) | ADP-f=Resource use, fossils (ADP-f) | ADP-mm=Resource use, minerals and metals (ADP-mm) | WDP=Water use (WDP)



ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS EN15804+A2

Abbr.	Unit	A1	A2	A3	A1-
					A3
ETP-fw	CTUe	0.00E+0	0.00E+0	4.30E+1	4.30E+1
PM	disease incidence	0.00E+0	0.00E+0	4.10E-7	4.10E-7
HTP-c	CTUh	0.00E+0	0.00E+0	1.06E-9	1.06E-9
HTP-nc	CTUh	0.00E+0	0.00E+0	2.55E-8	2.55E-8
IR	kBq U235 eqv.	0.00E+0	0.00E+0	3.48E-1	3.48E-1
SQP	Pt	0.00E+0	0.00E+0	8.52E+0	8.52E+0

ETP-fw=Ecotoxicity, freshwater (ETP-fw) | PM=Particulate Matter (PM) | HTP-c=Human toxicity, cancer (HTP-c) | HTP-nc=Human toxicity, non-cancer (HTP-nc) | IR=Ionising radiation, human health (IR) | SQP=Land use (SQP)

CLASSIFICATION OF DISCLAIMERS TO THE DECLARATION OF CORE AND ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS

ILCD classification	Indicator	Disclaimer	
	Global warming potential (GWP)	None	
ILCD type / level 1	Depletion potential of the stratospheric ozone layer (ODP)	None	
	Potential incidence of disease due to PM emissions (PM)	None	
	Acidification potential, Accumulated Exceedance (AP)	None	
	Eutrophication potential, Fraction of nutrients reaching freshwater end compartment	None	
	(EP-freshwater)	None	
II CD type / level 2	Eutrophication potential, Fraction of nutrients reaching marine end compartment	None	
ILCD type / level 2	(EP-marine)	none	
	Eutrophication potential, Accumulated Exceedance (EP-terrestrial)	None	
	Formation potential of tropospheric ozone (POCP)	None	
	Potential Human exposure efficiency relative to U235 (IRP)	1	
ILCD type / level 3	Abiotic depletion potential for non-fossil resources (ADP-minerals&metals)	2	
	Abiotic depletion potential for fossil resources (ADP-fossil)	2	
	Water (user) deprivation potential, deprivation-weighted water consumption (WDP)	2	
	Potential Comparative Toxic Unit for ecosystems (ETP-fw)	2	



ILCD classification	Indicator	Disclaimer
	Potential Comparative Toxic Unit for humans (HTP-c)	2
Potential Comparative Toxic Unit for humans (HTP-nc)		2
	Potential Soil quality index (SQP)	2

Disclaimer 1 – 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.

Disclaimer 2 – 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.

4.2 INDICATORS DESCRIBING RESOURCE USE AND ENVIRONMENTAL INFORMATION BASED ON LIFE CYCLE INVENTORY (LCI)

PARAMETERS DESCRIBING RESOURCE USE

Abbr.	Unit	A1	A2	A3	A1-
					A3
PERE	МЈ	0.00E+0	0.00E+0	3.46E+0	3.46E+0
PERM	МЈ	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PERT	МЈ	0.00E+0	0.00E+0	3.46E+0	3.46E+0
PENRE	МЈ	0.00E+0	0.00E+0	3.46E+1	3.46E+1
PENRM	МЈ	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PENRT	МЈ	0.00E+0	0.00E+0	3.46E+1	3.46E+1
SM	Kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0
RSF	МЈ	0.00E+0	0.00E+0	0.00E+0	0.00E+0
NRSF	МЈ	0.00E+0	0.00E+0	0.00E+0	0.00E+0
FW	M3	0.00E+0	0.00E+0	1.67E-2	1.67E-2

PERE=renewable primary energy ex. raw materials | PERM=renewable primary energy used as raw materials | PERT=renewable primary energy total | PERRE=non-renewable primary energy ex. raw materials | PENRM=non-renewable primary energy used as raw materials | PENRT=non-renewable primary energy total | SM=use of secondary material | RSF=use of renewable secondary fuels | NRSF=use of non-renewable secondary fuels | FW=use of net fresh water



OTHER ENVIRONMENTAL INFORMATION DESCRIBING WASTE CATEGORIES

Abbr.	Unit	Al	A2	A3	A1-
					A3
HWD	Kg	0.00E+0	0.00E+0	9.89E-5	9.89E-5
NHWD	Kg	0.00E+0	0.00E+0	2.13E-1	2.13E-1
RWD	Kg	0.00E+0	0.00E+0	2.51E-4	2.51E-4

HWD=hazardous waste disposed | NHWD=non hazardous waste disposed | RWD=radioactive waste disposed

ENVIRONMENTAL INFORMATION DESCRIBING OUTPUT FLOWS

Abbr.	Unit	A1	A2	A3	A1-
					A3
CRU	Kg	0.00E+0	0.00E+0	7.92E+0	7.92E+0
MFR	Kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0
MER	Kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0
EET	МЈ	0.00E+0	0.00E+0	0.00E+0	0.00E+0
EEE	МЈ	0.00E+0	0.00E+0	0.00E+0	0.00E+0

CRU=Components for re-use | MFR=Materials for recycling | MER=Materials for energy recovery | EET=Exported Energy Thermic | EEE=Exported Energy Electric



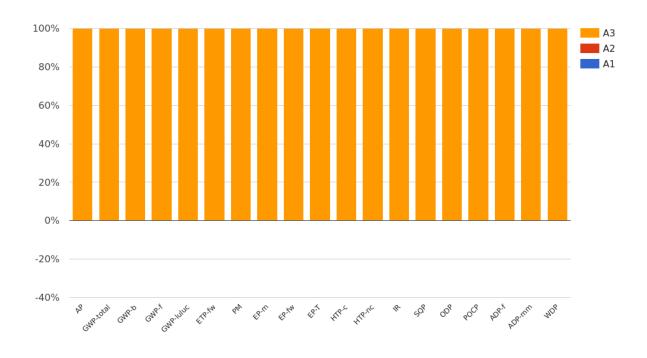
4.3 INFORMATION ON BIOGENIC CARBON CONTENT PER TON

BIOGENIC CARBON CONTENT

The following Information describes the biogenic carbon content in (the main parts of) the product at the factory gate per ton:

Biogenic carbon content	Amount	Unit
Biogenic carbon content in the product	0	kg C
Biogenic carbon content in accompanying packaging	0	kg C

5 Interpretation of results



As shown in the figure, the energy consumption and ancillary materials (A3) show all the environmental effects and core indicators. Raw material (A1) and transport (A2) don't show any effects. Rikantila quarry is the production area and the source of raw material. Because of that, there is no transportation for raw material declared for module A2. The diesel used for production on module A3 covers all the machines working in the area. The scope for this declaration is cradle-to-gate (A1-A3) excluding transport to customer (A4), construction (A5), End of life (C1-C4) and Disposal (D).



6 References

ISO 14040

ISO 14040:2006/Amd 1:2020, Environmental management - Life cycle assessment - Principles and framework; EN ISO 14040:2006+A1:2020

ISO 14044

ISO 14044:2006/Amd 1:2017/Amd 2:2020, Environmental management - Life cycle assessment - Requirements and guidelines; EN ISO 14044:2006+A1:2018+A2:2020

ISO 14025

ISO 14025:2006 Environmental labels and declarations — Type III environmental declarations — Principles and procedures EN ISO 14025:2010

EN 15804+A2

EN 15804:2012+A2: 2019: Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products

General PCR Ecobility Experts

Kiwa-Ecobility Experts (Kiwa-EE) – General Product Category Rules (2022-02-14)

Specific PCR Natural aggregates

Institute Construction and Environment e.V. (IBU) - Part B: Requirements on the EPD for Natural aggregates (2023-07-04)

EN 13242

Aggregates for unbound and hydraulically bond mixtures,

EN 13043

Aggregates for bituminous mixtures and surface treatments for roads, airfields and other trafficked areas

EN 12620

Aggregates for concrete

EN 13450

Aggregates for railway ballast

EN 1097-2

EN 1097-2:2020 Tests for mechanical and physical properties of aggregates — Part 2: Methods for the

EN 1097-6

EN 1097-6:2014 Tests for mechanical and physical properties of aggregates — Part 6: Determination of particle density and water absorption.

EN 1097-9

EN 1097-9:2014 Tests for mechanical and physical properties of aggregates. Part 9: Determination of the resistance to wear by abrasion from studded tyres. Nordic test"





6 References

LCA database profiles: Ecolnvent version 3.6

Version database: v3.17 (2024-05-22)

NMD process database: v3.9 (2024-08-16)



7 Contact information

Publisher Operator Owner of declaration





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