Result summary

Enkelvoudige oppervlakte behandeling met rode steenslag inclusief transport naar project locatie

Bouwend Nederland, commissie Wegdek Onderhouds Technieken (WOT)

Calculation number:	ReTHiNK-97522
Generation on:	09-04-2025
Issue date:	09-04-2025
Valid until:	09-04-2030
Status:	verified

R<THiNK

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1 General information

1.1 PRODUCT

Enkelvoudige oppervlakte behandeling met rode steenslag inclusief transport naar project locatie

1.2 VALIDITY

Issue date: 09-04-2025

Valid until: 09-04-2030

1.3 OWNER OF THE DECLARATION

Manufacturer: Bouwend Nederland, commissie Wegdek Onderhouds Technieken (WOT)
Address: Zilverstraat 69, 2718 RP Zoetermeer
E-mail: info@bouwendnederland.nl
Website: https://wegdekonderhoudstechnieken.nl/
Production location: Bouwend Nederland Vakgroep Specialistische Wegenbouw commissie Wegdek Onderhouds Technieken (WOT)
Address production location: Zilverstraat 69, 2718 RP Zoetermeer

1.4 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

Anne Kees Jeeninga, Advieslab

1.5 PRODUCT CATEGORY RULES

NMD Determination method Environmental performance Construction works v1.1 March 2022

1.6 DECLARED UNIT

m2 enkelvoudige rode slijtlaag

De slijtlaag bestaat per m2 uit 1,5 kg emulsie afgestrooid met 12 kg tilrode steenslag

Reference unit: square meter (m2)

1.7 CONVERSION FACTORS

Description	Value	Unit
Reference unit	1	m2
Weight per reference unit	13.500	kg
Conversion factor to 1 kg	0.074074	m2

1.8 SCOPE OF DECLARATION AND SYSTEM BOUNDARIES

This is a Cradle to gate with options EPD. The life cycle stages included are as shown below:
(X = module included, ND = module not declared)

1 General information

A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

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 - Installation process	Module C2 = Transport
Module B1 = Use	Module C3 = Waste Processing
Module B2 = Maintenance	Module C4 = Disposal
Module B3 = Repair	Module D = Benefits and loads beyond the product system boundaries
Module B4 = Replacement	

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 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).

2 Product

2.1 PRODUCT DESCRIPTION

De enkelvoudige oppervlakte behandeling met tilrode steenslag bestaat uit 1,5 kg Eshalite Labiel C en 12 kg tilrode steenslag per m2.

Deze LCA geeft de milieueffecten weer van de productie van de bitumen en de steenslag inclusief het transport van deze grondstoffen naar de project locatie.

Het aanbrengen van deze slijtlaag valt buiten de scope van deze LCA.

2.2 APPLICATION (INTENDED USE OF THE PRODUCT)

Een enkelvoudige oppervlakbehandeling (slijtlaag) wordt gebruikt als conserverende laag op asfaltverhardingen die nog in relatief goede staat zijn.

De Vakgroep Specialistische Wegenbouw, commissie Wegdek Onderhouds Technieken (WOT) van Bouwend Nederland heeft deze LCA op laten stellen voor een gemiddelde referentie slijtlaag.

Voor het transport van de steenslag vanaf de leverancier van de slijtlaag naar de project locatie én het transport van de bitumen rechtstreeks vanaf de producent naar de project locatie is een referentieafstand van 150 km aangehouden..

2.3 DESCRIPTION PRODUCTION PROCESS

De enkelvoudige tilrode oppervlakte behandeling bestaat uit één laag bindmiddel, Eshalite Labiel C en één laag tilrode steenslag. De grondstoffen worden ingekocht bij de leverancier/producent.

Eshalite Labiel C is een bitumenemulsie die bestaat uit een staight-run penetratiebitumen (160/220) en water en wordt geproduceerd volgens recept in Groningen.

De tilrode steenslag wordt te Tarmac Harden Quarry (GB) geproduceerd en vervoerd naar De Hoop te Terneuzen.

3 Results

3.1 ENVIRONMENTAL IMPACT INDICATORS PER SQUARE METER

CORE ENVIRONMENTAL IMPACT INDICATORS EN15804+A2

Abbr.	Unit	A1	A2	A3	A1-A3	A4	Total
GWP-total	kg CO_2 eq.	1.17E+0	8.65E-2	0.00E+0	1.26E+0	2.73E-1	1.53E+0
GWP-f	kg CO_2 eq.	1.17E+0	8.63E-2	0.00E+0	1.25E+0	2.73E-1	1.53E+0
GWP-b	kg CO_2 eq.	1.69E-3	6.60E-5	0.00E+0	1.76E-3	1.10E-4	1.87E-3
GWP-luluc	kg CO_2 eq.	5.44E-4	1.61E-4	0.00E+0	7.05E-4	1.00E-4	8.05E-4
ODP	kg CFC 11 eq.	1.42E-7	1.52E-8	0.00E+0	1.57E-7	6.03E-8	2.17E-7
AP	mol H+ eq.	9.23E-3	8.54E-4	0.00E+0	1.01E-2	1.59E-3	1.17E-2
EP-fw	kg P eq.	1.11E-5	1.04E-6	0.00E+0	1.22E-5	2.75E-6	1.49E-5
EP-m	kg N eq.	1.90E-3	3.66E-4	0.00E+0	2.26E-3	5.59E-4	2.82E-3
EP-T	mol N eq.	1.94E-2	4.03E-3	0.00E+0	2.35E-2	6.16E-3	2.96E-2
POCP	kg NMVOC eq.	9.78E-3	1.04E-3	0.00E+0	1.08E-2	1.76E-3	1.26E-2
ADP-mm	kg Sb-eq.	5.14E-6	6.77E-7	0.00E+0	5.82E-6	6.93E-6	1.27E-5
ADP-f	MJ	5.20E+1	1.09E+0	0.00E+0	5.31E+1	4.12E+0	5.72E+1
WDP	m3 world eq.	7.42E-1	5.15E-3	0.00E+0	7.47E-1	1.47E-2	7.62E-1

GWP-total=Global Warming Potential total (GWP-total) | **GWP-f**=Global Warming Potential fossil fuels (GWP-fossil) | **GWP-b**=Global Warming Potential biogenic (GWP-biogenic) | **GWP-luluc**=Global Warming Potential land use and land use change (GWP-luluc) | **ODP**=Depletion potential of the stratosperic ozon layer (ODP) | **AP**=Acidification potential, Accumulated Exceedance (AP) | **EP-fw**=Eutrophication potential, fraction of nutrients reaching freshwater end compartment (EP-freshwater) | **EP-m**=Eutrophication potential, fraction of nutrients reaching marine end compartment (EP-marine) | **EP-T**=Eutrophication potential, Accumulated Exceedance (EP-terrestrial) | **POCP**=Formation potential of tropospheric ozone (POCP) | **ADP-mm**=Abiotic depletion potential for non fossil resources (ADP mm) | **ADP-f**=Abiotic depletion for fossil resources potential (ADP fossil) | **WDP**=Water (user) deprication potential, deprivation-weighted water consumption (WDP)

ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS EN15804+A2

Abbr.	Unit	A1	A2	A3	A1-A3	A4	Total
PM	disease incidence	6.50E-8	1.96E-9	0.00E+0	6.70E-8	2.45E-8	9.15E-8
IR	kBq U235 eq.	3.61E-2	4.74E-3	0.00E+0	4.09E-2	1.73E-2	5.81E-2

PM=Potential incidence of disease due to PM emissions (PM) | **IR**=Potential Human exposure efficiency relative to U235 (IRP) | **ETP-fw**=Potential Comparative Toxic Unit for ecosystems (ETP-fw) | **HTP-c**=Potential Comparative Toxic Unit for humans (HTP-c) | **HTP-nc**=Potential Comparative Toxic Unit for humans (HTP-nc) | **SQP**=Potential soil quality idex (SQP)

3 Results

Abbr.	Unit	A1	A2	A3	A1-A3	A4	Total
ETP-fw	CTUe	9.07E+1	9.65E-1	0.00E+0	9.17E+1	3.68E+0	9.54E+1
HTP-c	CTUh	3.03E-10	4.09E-11	0.00E+0	3.44E-10	1.19E-10	4.63E-10
HTP-nc	CTUh	1.64E-8	6.62E-10	0.00E+0	1.70E-8	4.03E-9	2.11E-8
SQP	Pt	4.73E+0	8.35E-1	0.00E+0	5.56E+0	3.57E+0	9.13E+0

PM=Potential incidence of disease due to PM emissions (PM) | **IR**=Potential Human exposure efficiency relative to U235 (IRP) | **ETP-fw**=Potential Comparative Toxic Unit for ecosystems (ETP-fw) | **HTP-c**=Potential Comparative Toxic Unit for humans (HTP-c) | **HTP-nc**=Potential Comparative Toxic Unit for humans (HTP-nc) | **SQP**=Potential soil quality idex (SQP)

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

ILCD classification	Indicator	Disclaimer
ILCD type / level 1	Global warming potential (GWP)	None
	Depletion potential of the stratospheric ozone layer (ODP)	None
	Potential incidence of disease due to PM emissions (PM)	None
ILCD type / level 2	Acidification potential, Accumulated Exceedance (AP)	None
	Eutrophication potential, Fraction of nutrients reaching freshwater end compartment (EP-freshwater)	None
	Eutrophication potential, Fraction of nutrients reaching marine end compartment (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
	Potential Comparative Toxic Unit for humans (HTP-c)	2
	Potential Comparative Toxic Unit for humans (HTP-nc)	2
	Potential Soil quality index (SQP)	2

3 Results

ILCD classification	Indicator	Disclaimer
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.		

CORE ENVIRONMENTAL IMPACT INDICATORS EN15804+A1

Abbr.	Unit	A1	A2	A3	A1-A3	A4	Total
ADPE	kg Sb eq.	5.14E-6	6.77E-7	0.00E+0	5.82E-6	6.93E-6	1.27E-5
GWP	kg CO_2 eq.	1.10E+0	8.55E-2	0.00E+0	1.19E+0	2.71E-1	1.46E+0
ODP	kg CFC 11 eq.	1.15E-7	1.23E-8	0.00E+0	1.27E-7	4.80E-8	1.75E-7
POCP	kg ethene eq.	2.64E-3	5.03E-5	0.00E+0	2.69E-3	1.63E-4	2.86E-3
AP	kg SO_2 eq.	7.63E-3	6.11E-4	0.00E+0	8.24E-3	1.19E-3	9.43E-3
EP	Kg PO43- eq.	8.10E-4	1.37E-4	0.00E+0	9.47E-4	2.35E-4	1.18E-3

ADPE=Depletion of abiotic resources-elements | **GWP**=Global warming | **ODP**=Ozone layer depletion | **POCP**=Photochemical oxidants creation | **AP**=Acidification of soil and water | **EP**=Eutrophication

NATIONAL ANNEX NMD

Abbr.	Unit	A1	A2	A3	A1-A3	A4	Total
ADPF	kg Sb eq.	2.45E-2	5.27E-4	0.00E+0	2.50E-2	1.99E-3	2.70E-2
HTP	kg 1,4 DB eq.	2.99E-1	2.08E-2	0.00E+0	3.20E-1	1.14E-1	4.34E-1
FAETP	kg 1,4 DB eq.	3.81E-2	5.21E-4	0.00E+0	3.86E-2	3.33E-3	4.19E-2
MAETP	kg 1,4 DB eq.	1.64E+2	1.65E+0	0.00E+0	1.66E+2	1.20E+1	1.77E+2
TETP	kg 1,4 DB eq.	4.92E-3	1.02E-4	0.00E+0	5.02E-3	4.03E-4	5.42E-3

ADPF=Depletion of abiotic resources-fossil fuels | **HTP**=Human toxicity | **FAETP**=Ecotoxicity. fresh water | **MAETP**=Ecotoxicity. marine water | **TETP**=Ecotoxicity. terrestric

3 Results

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

PARAMETERS DESCRIBING RESOURCE USE

Abbr.	Unit	A1	A2	A3	A1-A3	A4	Total
PERE	MJ	2.16E-1	2.57E-2	0.00E+0	2.42E-1	5.16E-2	2.93E-1
PERM	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PERT	MJ	2.89E-1	2.57E-2	0.00E+0	3.15E-1	5.16E-2	3.66E-1
PENRE	MJ	2.40E+1	1.16E+0	0.00E+0	2.52E+1	4.38E+0	2.95E+1
PENRM	MJ	2.94E+1	0.00E+0	0.00E+0	2.94E+1	0.00E+0	2.94E+1
PENRT	MJ	5.52E+1	1.16E+0	0.00E+0	5.64E+1	4.38E+0	6.08E+1
SM	Kg	4.35E-5	0.00E+0	0.00E+0	4.35E-5	0.00E+0	4.35E-5
RSF	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
NRSF	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
FW	m^3	1.76E-2	2.09E-4	0.00E+0	1.78E-2	5.02E-4	1.83E-2

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

OTHER ENVIRONMENTAL INFORMATION DESCRIBING WASTE CATEGORIES

Abbr.	Unit	A1	A2	A3	A1-A3	A4	Total
HWD	Kg	2.63E-5	2.85E-6	0.00E+0	2.91E-5	1.04E-5	3.96E-5
NHWD	Kg	1.19E-1	5.34E-3	0.00E+0	1.25E-1	2.61E-1	3.86E-1
RWD	Kg	3.73E-5	7.08E-6	0.00E+0	4.43E-5	2.71E-5	7.15E-5

HWD=Hazardous waste disposed | **NHWD**=Non-hazardous waste disposed | **RWD**=Radioactive waste disposed

3 Results

ENVIRONMENTAL INFORMATION DESCRIBING OUTPUT FLOWS

Abbr.	Unit	A1	A2	A3	A1-A3	A4	Total
CRU	Kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
MFR	Kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
MER	Kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
EE	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
EET	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
EEE	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0

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

3 Results

3.3 INFORMATION ON BIOGENIC CARBON CONTENT PER SQUARE METER

BIOGENIC CARBON CONTENT

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

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

3 Results

3.4 ENVIRONMENTAL COST INDICATOR NL PER SQUARE METER

Using the environmental cost indicator (ECI) method, which is presented in the NMD Determination Method (2020), the results are aggregated to the single-point score. The ECI is a relevant valuation method, especially in the Dutch construction sector. In the Netherlands, it is a prerequisite for public tenders. The aim of the indicator is to show the shadow price for environmental impacts of a product or project. The application of single-point scores is an additional assessment tool for eco-balance results. However, it must be pointed out that weightings are always based on a value maintenance and not on a scientific basis (EN 14040). The ECI results are shown in the following table.

Module EN15804	ECI NL 2010	Share in total (%)
A1 Raw Materials Supply	€ 0.15	77,4 %
A2 Transport	€ 0.01	5,4 %
A3 Manufacturing	€ 0.00	0,0 %
A4 Transport from the gate to the site	€ 0.03	17,2 %
ECI NL 2010 per functional unit	**€ 0.19**	

4 Contact information

Publisher	Operator	Owner of declaration
Bouwend Nederland, commissie Wegdek Onderhouds Technieken (WOT) Zilverstraat 69 2718 RP Zoetermeer, NL	**Bouwend Nederland, commissie Wegdek Onderhouds Technieken (WOT)** Zilverstraat 69 2718 RP Zoetermeer, NL	**Bouwend Nederland, commissie Wegdek Onderhouds Technieken (WOT)** Zilverstraat 69 2718 RP Zoetermeer, NL
E-mail: info@bouwendnederland.nl **Website:** https://wegdekonderhoudstechnieken.nl/	**E-mail:** info@bouwendnederland.nl **Website:** https://wegdekonderhoudstechnieken.nl/	**E-mail:** info@bouwendnederland.nl **Website:** https://wegdekonderhoudstechnieken.nl/