EN 15804+A2 EPD

ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804+A2.
Owner of the Declaration – Colas Bitumen Emulsion

Declaration number: EPDIE-24-135
Issue date 2nd December 2024
Valid to 1st December 2029

EPD Programme - EPD Ireland
Programme Operator - Irish Green Building Council
www.epdireland.org

WE OPEN THE WAY

COLAS Bitumen Emulsions

Cold-mix Asphalt

1. General information

PROGRAMME OPERATOR	OWNER OF DECLARATION
Irish Green Building Council 19 Mountjoy Square, Dublin, D01 E8P5 info@igbc.ie	Colas Bitumen Emulsion West Deerpark Industrial Estate, Oranmore, Co. Galway, H91 D934 +353 (0)91 484 800; info@colas.ie
DECLARATION NUMBER	**PRODUCTION SITE**
EPDIE-24-135	Colas Bitumen Emulsion West Deerpark Industrial Estate, Oranmore, Co. Galway, H91 D934 +353 (0)91 484 800; info@colas.ie
ECO PLATFORM EPD	**DECLARED UNIT**
Yes	1 tonne of bitumen emulsion
APPLICABLE PRODUCT CATEGORY RULES	**DECLARED PRODUCT**
1. EN 15804:2012+A2:2019 2. EPD Ireland PCR Part A, Version 2.0, 2021	1 tonne of Cold-mix Asphalt bitumen emulsion
DATE OF ISSUE	**SCOPE OF EPD**
2nd December 2024	Cradle-to-gate, with additional options A4 and A5
DATE OF EXPIRY	**LCA CONSULTANT OR PERSON RESPONSIBLE FOR LCA**
1st December 2029	Ecoreview, Kilkenny, Ireland. +353 (087) 258 9783 www.ecoreview.ie
TYPE OF EPD: SINGLE OR MULTI PRODUCT	**LCA SOFTWARE AND DEVELOPER IF APPLICABLE**
Single product EPD	Ecochain version 3.5.8
PRODUCT CLASSIFICATION OR NACE CODE	**NAME AND VERSION OF INVENTORY USED**
NACE code 22.14	Ecoinvent version 3.8
COMPARABILITY	
Environmental Product Declarations from different programmes may not be directly comparable if not compliant with EN 15804:2012+A2:2019. Comparability is further dependent on the specific product category rules, system boundaries and allocations, and background data sources. See clause 5.3 of EN 15804:2012+A2:2019	
The CEN Norm /EN 15804 serves as the core PCR	
Independent verification of the declaration according to ISO 14025	

Internally ☐ Externally ×

SIGNATURE OF PROGRAMME OPERATOR	SIGNATURE VERIFIER
Pat Barry - CEO - Irish Green Building Council  IGBC IRISH GREEN BUILDING COUNCIL	Callum Hill  JCH INDUSTRIAL ECOLOGY LTD

2. Scope and Type of EPD

Scope

This EPD is Cradle-to-gate, with additional options A4 and A5. The Modules that are declared are shown in the table below. The product is physically integrated with other products during installation, and is no longer identifiable at end of life. The products contain a small amount of biogenic carbon, although the biogenic carbon containing materials comprise much less than 5% of the product mass.

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	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	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MDT	MDT	MDT	OP	OP	OP	OP	OP	OP	OP	OP	OP	MDT	MDT	MDT	MDT	MDT

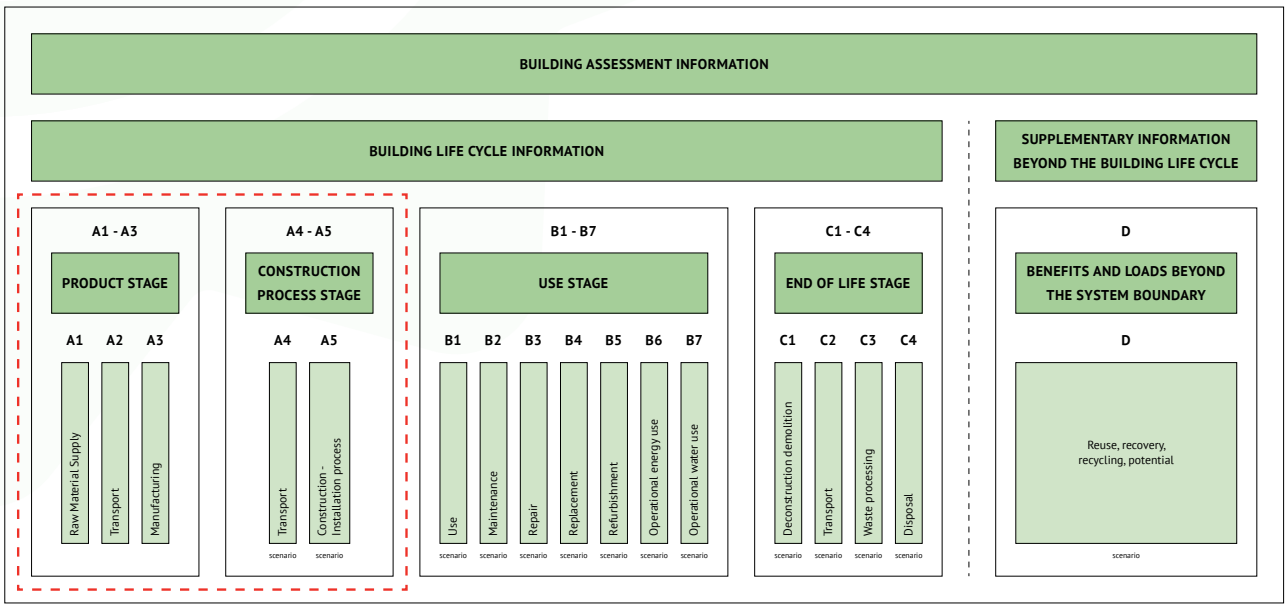
X = Module declared; ND = Module not declared; MDT = Mandatory; OP = Optional.

Declared Units

1 tonne of Cold-mix Asphalt bitumen emulsion, bulk density, bulk density 1,000 ± 5 kg/m³ @ 25 °C.

System Boundaries

This LCA covers the Product stage (A1 - A3) and Construction Process (A4 - A5).

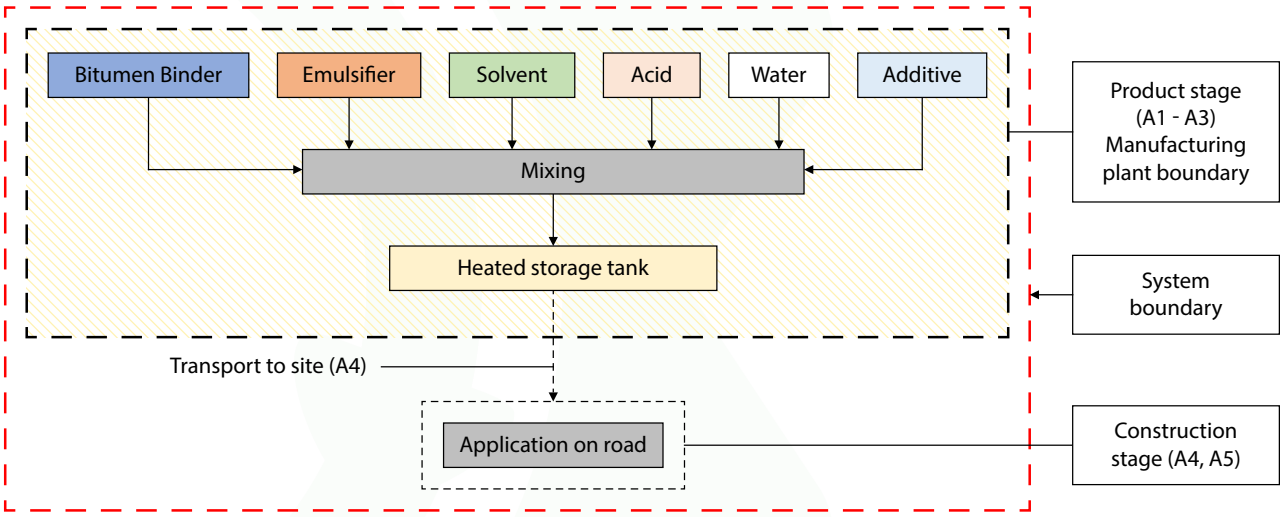


3. Detailed product description

This EPD is for Cold-mix Asphalt bitumen emulsion. It is manufactured at the COLAS Bitumen Emulsion production facility at Deerpark Industrial Estate, Oranmore, Co. Galway, Ireland. The main components of the bitumen emulsion are: bitumen, water, emulsifier, solvent, acid and additives. The bitumen emulsion is mixed on-site with site-won planed asphalt as a stabilising agent to enable planed asphalt to be re-laid on the road surface.

3.1 Manufacturing Process Description

The bitumen emulsions are a mixture of two pre-mixed liquids: (a) bitumen phase: comprising bitumen, solvent and additive, and (b) water phase: comprising water, emulsifier and acid. The bitumen raw material delivered to the production site is stored in a heated bitumen storage tank at high temperature prior to mixing. After a milling process using a colloidal mill, the bitumen emulsions are stored on site in heated at tanks, at approximately 80 °C, before dispatch to site.



4.1. LCA results - COLAS Cold-mix Asphalt bitumen emulsion

Core Environmental impact per 1 tonne of Cold-mix Asphalt bitumen emulsion

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-total	[kg CO_2 eq.]	3.27E+02	2.93E+01	2.71E+01	3.84E+02	2.48E+01	0.00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GWP-fossil	[kg CO_2 eq.]	3.30E+02	2.93E+01	2.71E+01	3.87E+02	2.48E+01	0.00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GWP-biogenic*	[kg CO_2 eq.]	0.00E+00	2.16E-02	9.68E-03	3.13E-02	1.80E-02	0.00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GWP-luluc	[kg CO_2 eq.]	9.85E-02	1.38E-02	2.66E-03	1.15E-01	7.36E-03	0.00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ODP	[kg CFC-11 eq.]	4.78E-04	6.61E-06	5.30E-06	4.90E-04	5.58E-06	0.00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
AP	[mol H+ eq.]	3.40E+00	2.10E-01	2.49E-01	3.86E+00	1.34E-01	0.00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
EP-freshwater[1]	[kg P eq.]	3.18E-03	1.93E-04	1.15E-04	3.49E-03	1.44E-04	0.00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
EP-marine	[kg N eq.]	4.40E-01	4.68E-02	1.08E-01	5.94E-01	4.81E-02	0.00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
EP-terrestrial	[mol N eq.]	4.59E+00	5.21E-01	1.18E+00	6.30E+00	5.30E-01	0.00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
POCP	[kg NMVOC eq.]	2.78E+00	1.55E-01	3.26E-01	3.26E+00	1.57E-01	0.00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ADP-minerals&metals[2]	[kg Sb eq.]	1.37E-03	9.43E-05	4.96E-05	1.52E-03	6.21E-05	0.00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ADP-fossils[2]	[MJ] ncv	2.92E+04	4.32E+02	3.76E+02	3.00E+04	3.63E+02	0.00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
WDP[2]	m^3 world eq. deprived	2.10E+01	1.25E+00	8.79E-01	2.31E+01	9.33E-01	0.00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

**The biogenic CO_2 of the product is not declared here, as the biogenic carbon containing materials in the product is less than 5 % of the mass of the product, as per EN 15804+A2. However the biogenic carbon content of the product is given in Section 6 of this EPD.*

GWP-total = Global Warming Potential total; GWP-fossil = Global Warming Potential fossil fuels (GWP-fossil; 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-fossils = Abiotic depletion potential for fossil resources; WDP = Water (user) deprivation potential, deprivation-weighted water consumption.

[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.

ND = Module not declared; INA = Indicator not assessed.

4.2. LCA results - COLAS Cold-mix Asphalt bitumen emulsion

Resource use per 1 tonne of Cold-mix Asphalt bitumen emulsion

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	[MJ]	1.88E+02	5.76E+00	2.00E+01	2.13E+02	4.18E+00	0.00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PERM	[MJ]	1.57E+01	0.00E+00	0.00E+00	1.57E+01	0.00E+00	0.00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PERT	[MJ]	2.03E+02	5.76E+00	2.00E+01	2.29E+02	4.18E+00	0.00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PENRE	[MJ]	3.10E+04	4.59E+02	4.01E+02	3.18E+04	3.86E+02	0.00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PENRM	[MJ]	3.37E+00	0.00E+00	0.00E+00	3.37E+00	0.00E+00	0.00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PENRT	[MJ]	3.10E+04	4.59E+02	4.01E+02	3.18E+04	3.86E+02	0.00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SM	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
RSF	[MJ]	2.74E-02	0.00E+00	0.00E+00	2.74E-02	0.00E+00	0.00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
NRSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
FW	[m^3]	7.29E-01	4.59E-02	2.95E-02	8.05E-01	3.46E-02	0.00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

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 = Use of net fresh water.

ND = Module not declared; INA = Indicator not assessed.

4.3. LCA results - COLAS Cold-mix Asphalt bitumen emulsion

Output flows and waste categories per 1 tonne of Cold-mix Asphalt bitumen emulsion

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	[kg]	3.03E-02	1.03E-03	9.32E-04	3.22E-02	9.63E-04	0.00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
NHWD	[kg]	1.32E+01	1.96E+01	6.22E-01	3.34E+01	1.31E+01	0.00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
RWD	[kg]	2.01E-01	2.93E-03	2.20E-03	2.06E-01	2.47E-03	0.00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CRU	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MFR	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MER	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
EEE	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
EET	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy.

CRU, MFR, MER, EEE, EET are not calculated by the EcoChain software.

ND = Module not declared; INA = Indicator not assessed.

4.4. LCA results - COLAS Cold-mix Asphalt bitumen emulsion

Additonal Environmental impact per 1 tonne of Cold-mix Asphalt bitumen emulsion

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PM	Disease incidence	1.77E-05	2.11E-06	6.47E-06	2.63E-05	3.67E-06	0.00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
IRP[1]	kBq U235 eq	1.23E+02	1.87E+00	1.36E+00	1.26E+02	1.57E+00	0.00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ETP-fw[2]	CTUe	1.57E+04	3.30E+02	2.27E+02	1.63E+04	2.62E+02	0.00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
HTP-c[2]	CTUe	1.84E-07	1.25E-08	8.70E-09	2.06E-07	8.86E-09	0.00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
HTP-nc[2]	CTUe	4.63E-06	3.20E-07	1.68E-07	5.12E-06	2.45E-07	0.00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SQP[2]	dimensionless	4.12E+03	2.67E+02	4.57E+01	4.43E+03	1.87E+02	0.00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

PM = Potential incidence of disease due to PM emissions, IRP = Potential Human exposure efficiency relative to U235, ETP-fw = Potential Comparative Toxic Unit for ecosystems; HTP-c:Potential Comparative Toxic Unit for humans, HTP-nc = Potential Comparative Toxic Unit for humans, SQP = Potential soil quality index.

[1] This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuelcycle. 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.

[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.

ND = Module not declared; INA = Indicator not assessed.

5. Calculation rules

The measurement of environmental impacts in this EPD uses the LCIA methodologies recommended for PEF3.1. The process descriptions and quantities in this study are reproducible in accordance to the reference standards that have been used. The references of all sources, both primary and public sources and literature, have been documented in the LCA report. The 'polluter pays' and 'modularity' principles have been followed.

In addition, to facilitate the reproducibility of this LCA, a full set of data records has been generated which can be accessed via the LCA tool. This data portfolio contains a summary of all the data used in this LCA.

Electricity modelling

The electricity supplied is based on a mix of fuel types: natural gas, coal, renewable (wind, onshore) and peat. The mean CO_2 intensity of this electricty mix is 0.394 kg CO_2 (GWPt) per kWh.

Cut-off criteria

The cut-off criteria of section 6.3.6 of EN15804 +A2 have been followed.

Data Quality

The dataset is representative for the production processes used in 2022. The data Quality Level, according to Table E.1 of EN 15804 +A2, Annex E, is as follows:

- Time Representativeness is considered to be very good
- Geographical Representativeness is considered to be very good
- Technical Representativeness is considered to be very good

Allocations

Allocation of electricity and diesel and amounts thereof to the various manufacturing processes has been provided by COLAS. Allocation of impacts to the products is based on product mass.

6. Scenarios and additional technical information

The product and data used in this EPD are based on the being manufactured in the Republic of Ireland, and transported from the production site in Co. Wicklow, to customers within the island of Ireland.

A4. Transport to customer

Distance to the customer is 100 km.

Parameter	Value / Description
Transport vehicle type	Freight lorry 16-32 metric ton, EURO6
Distance	100 km
Capacity Utilisation	64%
Bulk density of transported goods	1,000 ± 5 kg/m³ @ 25 °C

A5. Installation

There are no installation losses, and no energy in application.

C. End of Life Scenarios, Module

N/A.

D. Reuse – Recovery – Recycling potential

N/A.

Declaration of biogenic carbon content at the production gate

Biogenic carbon (kg C per declared unit)	Cold-mix Asphalt bitumen emulsion	Unit
Biogenic carbon content in product	0.9	kg C
Biogenic carbon content in packaging	N/A	kg C

The biogenic C of the product is given in the table above. Note that the biogenic CO_2 of the product is not given in the table of Core Environmental Impacts, because the biogenic carbon containing materials in the product is less than 5% of the mass of the product, as allowed under EN15804+A2.

7. Mandatory additional information on release of dangerous substances to indoor air, soil and water

None of the substances contained in the product are listed in the "Candidate List of Substances of Very High Concern for authorisation", or they do not exceed the limit for registration with the European Chemicals Agency.

8. Other optional additional environmental information

N/A.

9. References

[1] ISO 14040: Environmental management - Life cycle assessment - Principles and Framework, International Organization for Standardization, ISO14040:2006.

[2] ISO 14044: Environmental management - Life cycle assessment - Requirements and guidelines, International Organization for Standardization, ISO14044:2006.

[3] ISO 14025: Environmental labels and declarations - Type III environmental declarations - Principles and procedures, International Organization for Standardization, ISO14025:2006.

[4] EN 15804:2012+A2:2019: Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products EN 15804:2012+A2:2019.

[5] Ecochain 4.3.0, 2023, web: http://app.Ecochain.com.

[6] Product Category Rules: Part A, Implementation and use of EN 15804:2012+A2:2019 and CEN TR 16970:2016 in Ireland for the development of Environmental Product Declarations; Version 2.0, issue date: 17.08.2021, published by the EPD Ireland Programme operator (Irish Green Building Council).

[7] Transport Infrastructure Ireland, Complementary Product Category Rules for Bituminous Mixtures (c-PCR Bituminous Mixtures), DN-PAV-03077, October 2023.

[8] https://eplca.jrc.ec.europa.eu/LCDN/developerEF.html.

10. Annex

N/A.