ENVIRONMENTAL PRODUCT DECLARATION

In accordance with ISO 14025 and EN15804+A2

Asphalt SMA 14 surf PMB 65/105 des PSV

Owner of the declaration:
McGraths Limestone Cong Ltd.

Product:
Asphalt SMA 14 surf PMB 65/105 des PSV

Declared unit:
1 tonne

This declaration is based on Product Category Rules:
EN 15804:2012+A2:2019, EPD Ireland PCR Part A, Version 2.1, 2022
Complementary Product Category Rules for Bituminous Mixtures (c-PCR Bituminous Mixtures) DN-PAV-03077 May 2024

Program operator:
EPD Ireland - Irish Green Building Council

Declaration number:
EPDIE-25-229

Issue date:
13.10.2025

Valid to:
12.10.2030

General information

Product

Asphalt SMA 14 surf PMB 65/105 des PSV

Owner of the declaration:

McGraths Limestone Cong Ltd.
Contact person: Padraic McGrath
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Program operator:

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Manufacturer:

McGraths Limestone Cong Ltd.

Declaration number:

EPDIE-25-229

Place of production:

McGraths Limestone Cong Ltd.
Cregaree, Cong, Co mayo
F31 W425 Cong, Ireland

This declaration is based on Product Category Rules:

EN 15804:2012+A2:2019, EPD Ireland PCR Part A, Version 2.1, 2022 Complementary Product Category Rules for Bituminous Mixtures (c-PCR Bituminous Mixtures) DN-PAV-03077 May 2024

Statement of liability:

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

Type of EPD

Specific product EPD

Issue date:

13.10.2025

Declared unit:

1 tonne Asphalt SMA 14 surf PMB 65/105 des PSV

Valid to:

12.10.2030

Scope of the EPD:

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

Year of study:

2023

Functional unit:

Function Unit not used. This EPD is for a Declared Unit.

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

LCA consultant or person responsible for LCA: .
EcoReview, Peter Seymour

Verification:

Independent verification of the declaration and data, according to ISO14025:2010

Approved:

SIGNATURE OF PROGRAMME OPERATOR

Third party verifier:
Jane Anderson

Pat Barry, CEO - Irish Green Building Council

Product

Product description:

Asphalt raw materials comprise: fine and coarse aggregates, mineral filler, bitumen and in some cases specialist admixtures. Asphalt is produced by heating and mixing the raw materials to obtain a homogenous mix at a target temperature. The heated asphalt is transported to the construction site and laid on the road/paving sub-base material using specialised asphalt laying equipment.

Product specification:

The asphalt is manufactured to the EN governing standard for the manufacturing of asphalts, I.S. EN 13108, parts 1-9, 21, 22 and 31.

Technical data:

Bitumen content: 4 - 7 % by mass
Density: 2,336 kg/m3
Softening point: 50 - 60 degrees centigrade
Viscosity: As per pen grade in product name
Marshall Stability: 8-16 kN, depending on traffic loading
Resilient modulus: 2,000-5,000 Mpa at 20 degrees centigrade
Rut resistance: Min 10mm deformation under standard wheel tracking tests
Fatigue life: > 1 million load cycles in well-designed mixes
Permeability: < 10-5 cm/s

Property	Quantity	Unit
Bitumen content	4 - 7	Percentage
Density	2,336	kg/m3
Softening point	50 to 60	degrees centigrade
Viscosity	as per pen grade in product name	cP
Marshall stability	8 to 16	kN
Resilient modulus	2,000 to 5,000 @ 20 degrees C	Mpa
Rut resistance	Min 10mm deformation under standard wheel tracking tests	mm
Fatigue life	> 1 million load cycles in well-designed mixes	no.
Permeability	< 10 to 5	cm/s

Market/Geographical Area:

The asphalt is delivered to and used on construction sites in the Republic of Ireland.

Reference service life, product

No reference service life is applied to the product.

Reference service life, building or construction works

LCA: Calculation rules

Declared unit:

1 tonne Asphalt SMA 14 surf PMB 65/105 des PSV

kg per Declared unit 1000

Cut-off criteria:

All relevant inputs and outputs - like emissions, energy and materials - have been taken into account in this LCA, and in accordance with EN15804+A2:2019. The study covers at least 95% of the materials and energy per module and at least 99% of the total use of materials and energy of each unit process. Long term emissions have been excluded from the study.

Allocation:

The source of default unit processes or activities is the Ecoinvent database version 3.8, system model “Allocation, cut-off by classification”. The measurement of environmental impacts in this EPD uses the LCIA methodologies recommended for PEF 3.0. In this EPD, the waste processes are allocated in the relevant module. In the case of the use of secondary materials or energy recovered from secondary fuels, the system boundary between the system under study and the previous system (providing the secondary materials) is set where outputs of the previous system, e.g. materials, products, building elements or energy, reach the end-of-waste state. The modularity and the polluter payer principles have been followed.

Data quality:

Time Representativeness: In this LCA the data relating to the usages, emissions and materials, and the data relating to the bespoke background processes for environmental impacts are less than 3 years apart, and also the Ecoinvent database version 3.8. The datasets for the raw material constituents that have the largest environmental impact (being bitumens) are from Ecoinvent V 3.8.
Time Representativeness is considered to be Very good.

Geographical Representativeness: The processes used in the production of the asphalt products are geographically representative, insofar as the production location (Ireland) lies within the region for which the relevant Ecoinvent (version 3.8) and any other bespoke environmental records have been selected. The dataset is up-to-date and representative for the current technology used in the processes of manufacturing the asphalt products.
Geographical Representativeness is considered to be Very good.

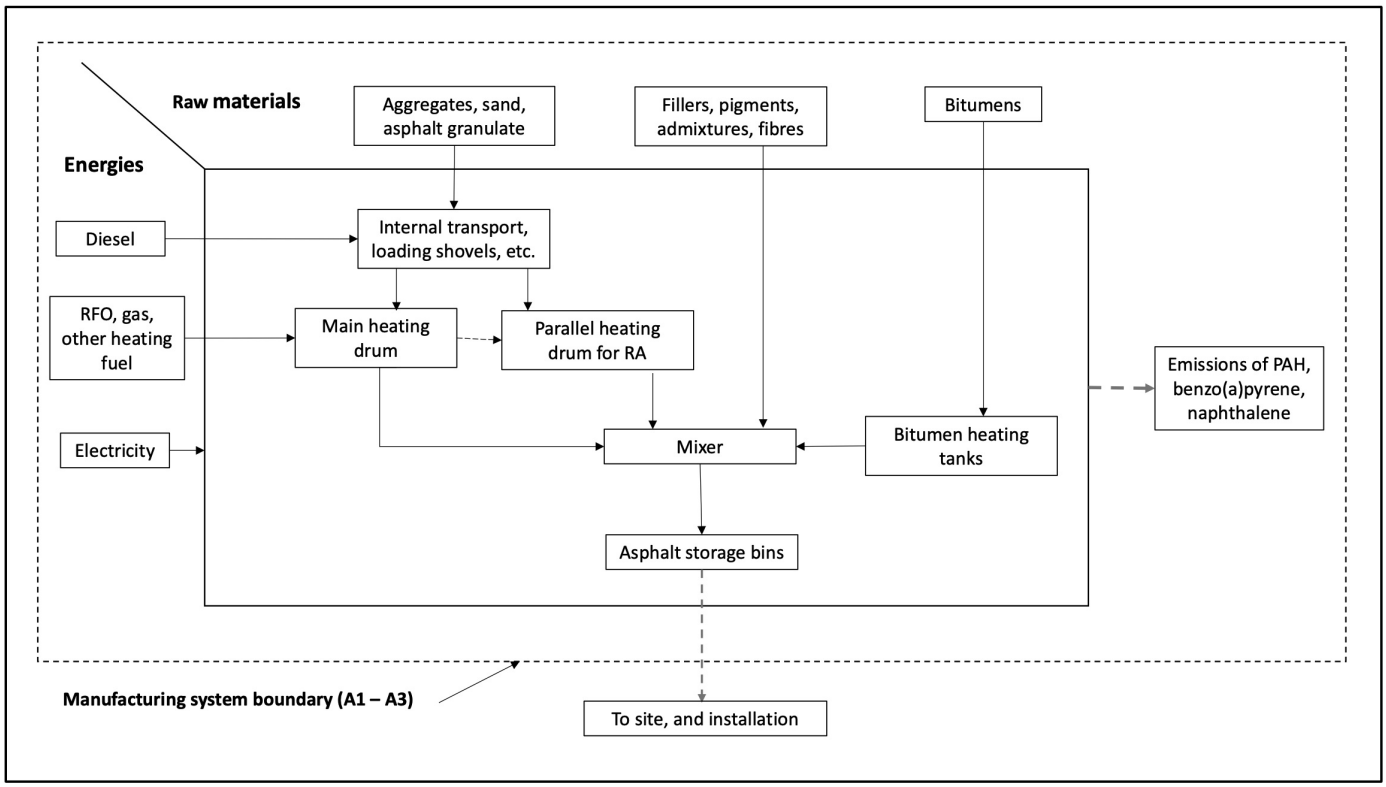
Technical Representativeness: Processes and energies used in the process have been modelled exactly as described by the asphalt manufacturer, and are based directly on the production data supplied by the manufacturer, in relation to processes, fuels used and emissions, and without any significant need for improvement.
Technical Representativeness is considered to be Very good.

Scope and type of EPD (X = Module declared; ND = Module not declared)

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	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X

System boundary:

This LCA covers the Product (A1, A2 and A3), Transport to site (A4), Construction Process (A5), End of Life (C1 to C4) and Benefits/loads beyond the system boundary (D) Stages, as indicated above. This is termed: "Cradle to gate with options, modules C1 to C4, and module D". A schematic of these stages is presented in the flow diagram below.



Additional technical information:

Electricity modelling
This LCA calculates the electricity impact based on the market-based approach. The CO2 intensity of the electricity is determined to be 0.312 kg CO2eq per kWh.

LCA: Scenarios and additional technical information

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

A4. Transport to customer
As per the TII cPCR (section 6.5.3.5.1), the transport distance of the asphalt to the customer is 100km, with a 70/30 split of empty/fully loaded return journeys being assumed. Thus the modelled effective transport distance is 88.8 km.
Vehicle type: 16-32 tonne capacity truck; EURO6 engine.
Bulk density of transported goods: 2,300 kg/m3 (range: 2,200 - 2,400 kg/m3).

A5. Installation
The default unit processes rates for laying of asphalt as given in Table 6.5 of the TII cPCR are used, being as follows:
• Laying of surface courses, for mix types: AC surf, SMA surf, HRA surf, PA surf. Machinery powered by diesel, conforming to Stage IIIb/IV emissions standards, with a laying output of 400 tonnes/day.
• Laying of base and binder courses, for mix types: AC bin, AC base, SMA bin. Machinery powered by diesel, conforming to Stage IIIb/IV emissions standards, with a laying output of 1,000 tonnes/day.

B. Use Stage
This stage is not included in the LCA.

C1. De-construction demolition
The default unit processes rates for removal of asphalt given in Table 6.6 of the TII cPCR are used, being as follows:

• Removal of surface courses, for mix types: AC surf, SMA surf, HRA surf, PA surf. Machinery powered by diesel, conforming to Stage IIIb/IV emissions standards, with a removal output of 400 tonnes/day.
• Removal of base and binder courses, for mix types: AC bin, AC base, SMA bin. Machinery powered by diesel, conforming to Stage IIIb/IV emissions standards, with a removal output of 1,000 tonnes/day.

C2. Transport
As per the TII cPCR (section 6.5.3.5.2), the transport distance of the removed asphalt to the reprocessing location is 100km, with a 70/30 split of empty/fully loaded return journeys being assumed. Thus the modelled effective transport distance is 88.8 km.
Vehicle type: 16-32 tonne capacity truck; EURO6 engine.
Bulk density of transported goods: 2,300 kg/m3 (range: 2,200 - 2,400 kg/m3).

C3. Waste processing
It is assumed that 100% of the site-won asphalt is recycled and for use as reclaimed asphalt. No material is directly re-used, and no material is used for energy recovery.

The default unit processes rates for processing the reclaimed asphalt are as given in Table 6.8 of the TII cPCR and are:
• Crane and digger using 0.185 litres of diesel per tonne
• Crusher using 0.185 litres of diesel per tonne

C4. Disposal
Module C4 is not applicable as 100% of site-won asphalt is assumed to be processed to reclaimed asphalt for reuse.

D. Benefits and Loads Beyond the System Boundary
100% of site-won asphalt is processed to reclaimed asphalt for re-use

Of the reclaimed asphalt:
• 55% is recycled into unbound foundation material
• 45% is recycled into new bituminous mixtures

The details of the modelling, covering mass balance assumptions and flows, raw material equivalents and default unit processes for Module D calculations are set out in section 6.3.5.6 and Appendix B of the TII cPCR.

The avoided production quantities of the raw materials that arise from the recycling process, per declared unit, are set out in Table 6.10 of the TII cPCR.

Biogenic Carbon
There is no Biogenic Carbon in the product.

Database used: Ecoinvent v 3.8

LCA tool used: Ecochain Helix v 4.3.1

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	7.86E+01	1.63E+01	2.56E+00	1.45E+00	1.63E+01	1.63E+00	0.00E+00	-1.84E+01
	GWP-fossil	kg CO_2 -eq	7.85E+01	1.63E+01	2.56E+00	1.45E+00	1.63E+01	1.63E+00	0.00E+00	-1.83E+01
	GWP-biogenic	kg CO_2 -eq	2.10E-01	1.48E-02	7.22E-04	4.11E-04	1.48E-02	4.59E-04	0.00E+00	-1.06E-01
	GWP-luluc	kg CO_2 -eq	2.93E-02	6.51E-03	1.89E-04	1.07E-04	6.51E-03	1.20E-04	0.00E+00	-1.57E-02
	ODP	kg CFC11 -eq	4.71E-05	3.77E-06	4.09E-07	2.33E-07	3.77E-06	2.61E-07	0.00E+00	-1.61E-05
	AP	mol H+ -eq	6.11E-01	4.62E-02	1.46E-02	5.55E-03	4.62E-02	7.88E-03	0.00E+00	-2.02E-01
	EP-FreshWater	kg P -eq	7.08E-04	1.16E-04	6.35E-06	3.62E-06	1.16E-04	4.07E-06	0.00E+00	-4.28E-04
	EP-Marine	kg N -eq	9.97E-02	9.19E-03	6.36E-03	2.17E-03	9.19E-03	3.30E-03	0.00E+00	-4.30E-02
	EP-Terrestial	mol N -eq	1.17E+00	1.02E-01	6.97E-02	2.38E-02	1.02E-01	3.63E-02	0.00E+00	-5.41E-01
	POCP	kg NMVOC -eq	4.52E-01	3.94E-02	1.77E-02	6.29E-03	3.94E-02	9.32E-03	0.00E+00	-1.80E-01
	ADP-minerals&metals[1]	kg Sb-eq	2.44E+03	5.77E-05	9.84E-07	5.60E-07	5.77E-05	6.29E-07	0.00E+00	-1.04E-04
	ADP-fossil[1]	MJ	5.06E+02	2.47E+02	2.63E+01	1.49E+01	2.47E+02	1.68E+01	0.00E+00	-1.04E+03
	WDP[1]	m^3	3.02E+00	7.52E-01	4.09E-02	2.33E-02	7.52E-01	2.61E-02	0.00E+00	-1.03E+01

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"
*INA Indicator Not Assessed

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 on environmental impacts

For the following indicators: GWP biogenic, PERE, PERM, PENRE, PENRM, NRSF, there are potential uncertainties for these indicators in some of the biogenic, bitumen and recovered fuel datasets in the current c-PCR for bituminous mixtures. These datasets are currently under review.

For the following indicators: ADP-minerals and metals, ADP-fossil, WDP, ETP, HTP-C, HTP-nc, the results shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.

For the following indicators: IRP and SQP, these deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. They do 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 these indicators.

Biogenic Carbon
As the amount of biogenic carbon in product or packaging does not exceed 5% of the total mass, the biogenic carbon is not reported.

Additional environmental impact indicators

Indicator		Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
	PM	Disease incidence	6.84E-06	1.31E-06	5.50E-08	2.34E-08	1.31E-06	3.10E-08	0.00E+00	-2.07E-06
	IRP[2]	kgBq U235 -eq	1.27E+01	1.07E+00	1.12E-01	6.38E-02	1.07E+00	7.14E-02	0.00E+00	-4.61E+00
	ETP-fw[1]	CTUe	3.82E+03	1.94E+02	1.53E+01	8.70E+00	1.94E+02	9.77E+00	0.00E+00	-2.48E+03
	HTP-c[1]	CTUh	3.67E-08	6.23E-09	5.94E-10	3.38E-10	6.23E-09	3.77E-10	0.00E+00	-1.23E-08
	HTP-nc[1]	CTUh	8.05E-07	1.96E-07	1.08E-08	4.91E-09	1.96E-07	5.99E-09	0.00E+00	-2.31E-07
	SQP[1]	dimensionless	1.23E+03	1.72E+02	3.34E+00	1.90E+00	1.72E+02	2.13E+00	0.00E+00	-7.54E+02

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"
*INA Indicator Not Assessed

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	5.08E+01	3.53E+00	1.50E-01	8.52E-02	3.53E+00	9.55E-02	0.00E+00	-6.49E+00
	PERM	MJ	4.61E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PERT	MJ	5.54E+01	3.53E+00	1.50E-01	8.52E-02	3.53E+00	9.55E-02	0.00E+00	-6.49E+00
	PENRE	MJ	1.08E+03	2.62E+02	2.79E+01	1.59E+01	2.62E+02	1.78E+01	0.00E+00	-8.09E+01
	PENRM	MJ	2.05E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PENRT	MJ	3.13E+03	2.62E+02	2.79E+01	1.59E+01	2.62E+02	1.78E+01	0.00E+00	-8.09E+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
	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
	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
	FW	m^3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

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"
*INA Indicator Not Assessed

End of life - Waste

Indicator		Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
	HWD	kg	1.81E-03	6.45E-04	7.19E-05	4.09E-05	6.45E-04	4.59E-05	0.00E+00	-4.10E-04
	NHWD	kg	1.91E+01	1.29E+01	3.50E-02	1.99E-02	1.29E+01	2.23E-02	0.00E+00	-9.50E-01
	RWD	kg	1.96E-02	1.67E-03	1.81E-04	1.03E-04	1.67E-03	1.16E-04	0.00E+00	-6.66E-03

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"
*INA Indicator Not Assessed

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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	MFR	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
	MER	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
	EEE	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
	EET	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

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"
*INA Indicator Not Assessed

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	0.00E+00

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

Additional requirements

Dangerous substances

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.

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

Bibliography

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

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

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

[4] I.S. 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/AC:2021.

[5] Product Category Rules: Part A, Implementation and use of EN 15804:2012+A1:2013, EN 15804:2012+A2:2019 and CEN TR 16970:2016 in Ireland for the development of Environmental Product Declarations", version 2.1, issued on 05/03/2022.

[6] Complementary Product Category Rules for Bituminous Mixtures (c-PCR Bituminous Mixtures), Transport Infrastructure Ireland, DN-PAV-03077, May, 2024.

[7] Environmental Footprint Reference Packages from EC-JRC, https://eplca.jrc.ec.europa.eu/LCDN/developerEF.html

[8] Ecochain Helix 4.3.1, 2023, web: http://app.ecochain.com.

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