



ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804 + A1
Owner of the Declaration – Chemoran

Declaration number: EPDIE-21-54
Issue date 13th September 2021
Valid to 13th September 2026

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

**Chemoran's bitumen
additives for warm-mix
asphalt**

CWM and CWM-BG1

1. General information

PROGRAMME OPERATOR	OWNER OF DECLARATION
Irish Green Building Council, 19 Mountjoy Square, Dublin D01 E8P5	Chemoran Deerpark Industrial Estate, Oranmore, Co. Galway, Republic of Ireland, H91 D934
DECLARATION NUMBER	PRODUCTION SITE
EPDIE-21-54	Chemoran Deerpark Industrial Estate, Oranmore, Co. Galway, Republic of Ireland, H91 D934
ECO PLATFORM EPD	DECLARED UNIT
Yes	1 kg of warm mix additive
APPLICABLE PRODUCT CATEGORY RULES	DECLARED PRODUCT
EN 15804:2012+A1:2013, EPD Ireland PCR Part A.	1 kg of CWM and 1 kg of CWM-BG1 warm mix additives
DATE OF ISSUE	SCOPE OF EPD
13.09.2021	A1 - A3 Cradle to gate
DATE OF EXPIRY	LCA CONSULTANT OR PERSON RESPONSIBLE FOR LCA
13.09.2026	EcoReview, Kilkenny, Co. Kilkenny, Ireland, +353 87 258 9783 / +31 646 264 9327 info@ecoreview.ie / www.ecoreview.ie
TYPE OF EPD: SINGLE OR MULTI PRODUCT	LCA SOFTWARE AND DEVELOPER IF APPLICABLE
Multiproduct	Ecochain LCA tool version 2.10
PRODUCT CLASSIFICATION OR NACE CODE	NAME AND VERSION OF INVENTORY USED
Nace code 20.4	Ecoinvent v 3.5
COMPARABILITY	
Environmental Product Declarations from different programmes may not be directly comparable if not compliant with EN 15804:2012+A1:2013. 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+A1:2013	
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  	Kim Allbury - Intertek Deutschland GmbH  

2. Scope and Type of EPD

This is a Cradle to Gate EPD. The Modules that are declared are shown in the table below.

PRODUCT STAGE			CONSTRUCTION ON 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	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

X - Module declared.

MND - Module not declared.

3. Detailed product description

CWM and CWM-BG1 are surface active agents used as bitumen additives in the manufacture of warm-mix asphalt, in the road construction industry. The addition of these additives enables asphalt producers to lower their mixing temperature by the order of 35°C, compared to the temperatures normally used to make the more conventional “hot-mix” asphalt. Both CWM and CWM-BG1 are produced and supplied, by Chemoran, in liquid form. They are usually supplied to customers in returnable/re-useable intermediate bulk containers (IBCs).

They are manufactured by the reacting and blending of a variety of bio-based and organic chemicals.

Technical and functional characteristics are given in the table below:

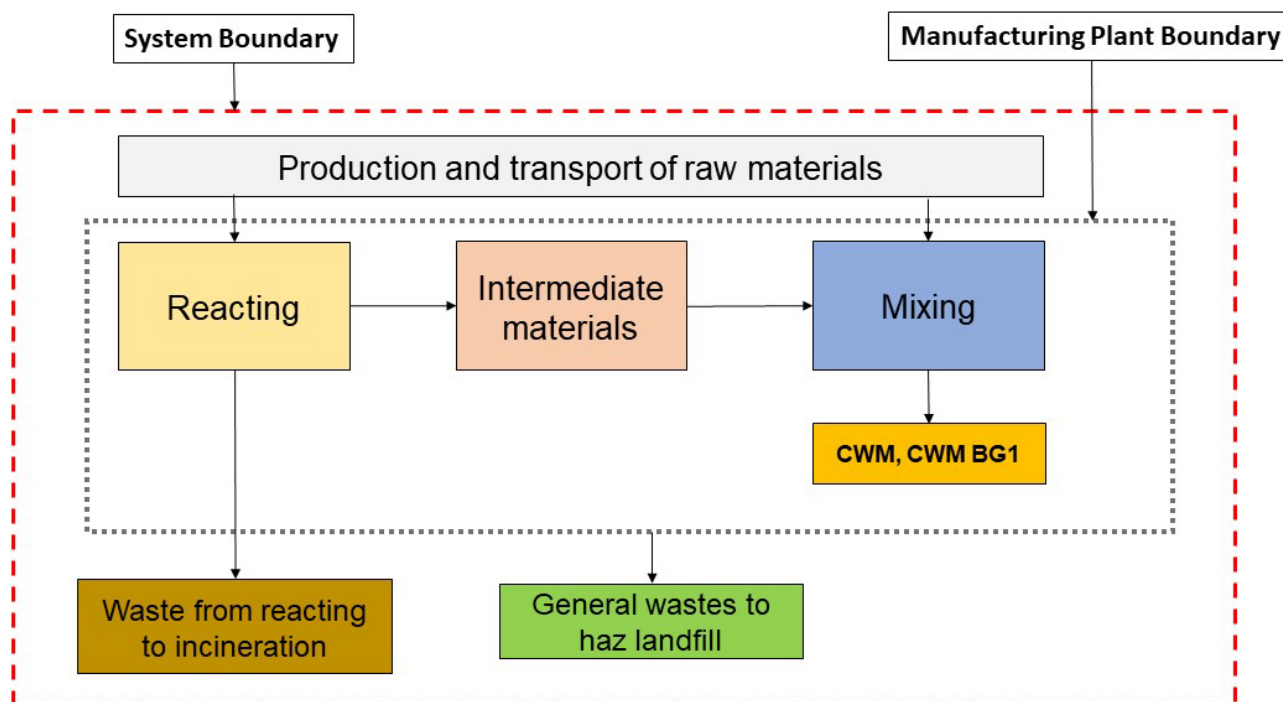
	CWM		CWM BG-1	
	Specifications	Typical values	Specifications	Typical values
Physical state at 20°C	Liquid		Liquid	
Alkalinity index (mg HCl/g)	> 120	160	> 120	
Density at 20°C (g/cm ³)	0.99 +/- 0.05		0.98 +/- 0.05	
Flash point, closed cup (°C)	> 200	220	> 130	140
Viscosity at 25°C (mPa.s)		470		355
Cloud point		< -5°C		< -0°C

Further technical details can be found at:

<http://www.chemoran.ie/dl/pdf/products/CWM.pdf>

http://www.chemoran.ie/dl/pdf/products/CWM_BG1.pdf

The manufacturing process flowchart is shown below:



4.1 LCA results - CWM warm mix additive

Environmental impact per kg

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWPf	[kg CO ₂ -Eq.]	3.90E+00	9.98E-02	1.89E-01	4.19E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
GWPb	[kg CO ₂ -Eq.]	-1.04E+00	0.00E+00	0.00E+00	-1.04E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
GWPt	[kg CO ₂ -Eq.]	2.85E+00	9.98E-02	1.89E-01	3.14E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
ODP	[kg CFC11-Eq.]	9.46E-07	1.78E-08	2.35E-08	9.87E-07	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
AP	[kg SO ₂ -Eq.]	1.71E-02	7.00E-04	9.51E-04	1.88E-02	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
EP	[kg (PO ₄)-Eq.]	6.95E-03	7.56E-05	1.96E-04	7.22E-03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
POCP	[kg ethene-Eq.]	1.98E-03	6.39E-05	1.44E-04	2.19E-03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
ADPE	[kg Sb-Eq.]	1.76E-05	2.35E-07	1.34E-07	1.80E-05	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
ADPF	[MJ]	8.69E+01	1.50E+00	2.35E+00	9.07E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources.

Note - MND - Module not declared INA - Indicator not assessed

4.1 LCA results - CWM warm mix additive

Resource use per kg

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	[MJ]	1.55E+01	2.05E-02	1.96E-01	1.58E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
PERM	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
PERT	[MJ]	1.55E+01	2.05E-02	1.96E-01	1.58E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
PENRE	[MJ]	6.96E+01	1.61E+00	2.44E+00	7.37E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
PENRM	[MJ]	2.45E+01	0.00E+00	0.00E+00	2.45E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
PENRT	[MJ]	9.41E+01	1.61E+00	2.44E+00	9.81E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
SM	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
RSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
NRSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
FW	[m ³]	8.85E-02	2.55E-04	3.32E-04	8.91E-02	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

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. INA = Indicator not assessed. MND = Module not declared.

SM, RSF and NRSF are not calculated by the EcoChain software.

4.1 LCA results - CWM warm mix additive

Output flows and waste categories per kg

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	[kg]	7.89E-05	9.47E-07	1.31E-03	1.39E-03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
NHWD	[kg]	3.43E-01	5.59E-02	1.30E-02	4.12E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
RWD	[kg]	2.15E-04	1.01E-05	1.10E-05	2.36E-04	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
CRU	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
MFR	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
MER	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
EEE	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
EET	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

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.

4.2 LCA results - CWM BG-1 warm mix additive

Environmental impact per kg

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWPf	[kg CO ₂ -Eq.]	3.24E+00	2.50E-01	2.25E-01	3.72E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
GWPb	[kg CO ₂ -Eq.]	-3.36E-01	0.00E+00	0.00E+00	-3.36E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
GWPt	[kg CO ₂ -Eq.]	2.91E+00	2.50E-01	2.25E-01	3.38E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
ODP	[kg CFC11-Eq.]	3.74E-07	4.34E-08	2.69E-08	4.44E-07	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
AP	[kg SO ₂ -Eq.]	1.40E-02	2.69E-03	1.10E-03	1.78E-02	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
EP	[kg (PO ₄)-Eq.]	5.09E-03	2.65E-04	2.26E-04	5.58E-03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
POCP	[kg ethene-Eq.]	3.00E-03	1.90E-04	1.62E-04	3.35E-03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
ADPE	[kg Sb-Eq.]	1.37E-05	4.47E-07	1.76E-07	1.44E-05	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
ADPF	[MJ]	6.86E+01	3.73E+00	2.90E+00	7.53E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources.

Note - MND - Module not declared INA - Indicator not assessed

4.2 LCA results - CWM BG-1 warm mix additive

Resource use per kg

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	[MJ]	1.68E+01	5.98E-02	2.93E-01	1.71E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
PERM	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
PERT	[MJ]	1.68E+01	5.98E-02	2.93E-01	1.71E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
PENRE	[MJ]	5.88E+01	3.98E+00	3.02E+00	6.58E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
PENRM	[MJ]	1.33E+01	0.00E+00	0.00E+00	1.33E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
PENRT	[MJ]	7.21E+01	3.98E+00	3.02E+00	7.91E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
SM	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
RSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
NRSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
FW	[m ³]	7.73E-02	6.50E-04	3.93E-04	7.83E-02	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

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. INA = Indicator not assessed. MND = Module not declared.

SM, RSF and NRSF are not calculated by the EcoChain software.

4.2 LCA results - CWM BG-1 warm mix additive

Output flows and waste categories per kg

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	[kg]	4.79E-05	2.31E-06	1.31E-03	1.36E-03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
NHWD	[kg]	2.98E-01	1.04E-01	1.42E-02	4.17E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
RWD	[kg]	1.13E-04	2.50E-05	1.25E-05	1.51E-04	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
CRU	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
MFR	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
MER	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
EEE	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
EET	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

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.

5.1 LCA results - Additional Impact Indicators - CWM warm mix additive

Environmental impact per kg

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Human toxicity potential	kg 1,4-DB-eq	1.64E+00	4.02E-02	4.88E-02	1.72E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Freshwater aquatic ecotoxicity potential	kg 1,4-DB-eq	3.09E-02	9.88E-04	7.44E-03	3.93E-02	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Marine aquatic ecotoxicity potential	kg 1,4-DB-eq	9.69E+01	3.98E+00	1.04E+01	1.11E+02	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Terrestrial ecotoxicity potential	kg 1,4-DB-eq	8.56E-03	1.37E-04	3.91E-04	9.09E-03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

Note - MND - Module not declared INA - Indicator not assessed.

5.2 LCA results - Additional Impact Indicators - CWM BG-1 warm mix additive

Environmental impact per kg

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Human toxicity potential	kg 1,4-DB-eq	1.60E+00	1.05E-01	5.67E-02	1.76E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Freshwater aquatic ecotoxicity potential	kg 1,4-DB-eq	5.80E+00	2.36E-03	7.08E-03	5.81E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Marine aquatic ecotoxicity potential	kg 1,4-DB-eq	6.99E+01	9.93E+00	1.06E+01	9.04E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Terrestrial ecotoxicity potential	kg 1,4-DB-eq	2.57E+00	3.49E-04	5.60E-04	2.57E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

Note - MND - Module not declared INA - Indicator not assessed.

6. LCA Results - Additional LCI Indicators

Biogenic content of CWM and CWM-BG1

Some of the raw materials used in the CWM and CWM-BG1 products are bio-based, and have sequestered CO₂ during their growth. The manufacturers of these bio-based raw materials have supplied data on the biogenic contents of the raw materials. For clarity in the EPD, the biogenic CO₂ is reported separately so that the biogenic CO₂ component can be incorporated into any end-of-life scenarios, where these are considered.

Taking into account the biogenic CO₂, the net CO₂ for the Chemoran products “at the factory gate”, i.e. as they leave the production plant is given in the table below.

Net CO₂-eq for CWM and CWM-BG1 at factory gate (kg per kg of product)

	Fossil CO ₂ per product	Biogenic CO ₂ per product	Net CO ₂ per product at factory gate
CWM	4.182	-1.0449	3.137
CWM-BG1	3.715	-0.3361	3.379

7. Calculation rules

Methodology and reproducibility

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. The cut-off criteria of section 6.3.5 of EN 15804 have been followed. Allocation of electricity types and fuels used to the various manufacturing processes has been provided by Chemoran; allocation of impacts to the products is based on the product composition mass. The measurement of environmental impacts uses the CML 2 baseline method. In addition, to facilitate the reproducibility of this LCA, a full set of data records has been generated which can be accessed via the EcoChain tool. This data portfolio contains a summary of all the data used in this LCA, and correspondingly, in the Chemoran Ecochain account.

Data quality

Data flows have been modeled as realistically as possible. Data quality assessment is based on the principle that the primary data used for processes occurring at the production site is selected in the first instance. Where this is not available, other reference data is selected from appropriate sources.

Data collection period

The dataset is representative for the production processes used in 2019.

8. Scenarios and additional technical information

A1. Raw materials supply

This module considers the extraction and processing of all raw materials and energy which occur upstream to the Chemoran production facility, as well as waste processing up to the end-of waste state.

A2. Transport of raw materials to manufacturer

This includes the transport distance of the raw materials to the manufacturing facility via road and sea.

A3. Manufacturing

This module covers the manufacturing of the Chemoran CWM and CWM-BG1 products, and includes all processes linked to production such as reacting and mixing of the raw materials. Use of electricity and fuels used for production is taken into account, as well as treatment of wastes generated from production.

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

N/A

10. Other optional additional environmental information

N/A

11. References

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. EN 15804: Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products', NEN-EN 15804:2012+A1:2013.
5. EcoChain, 2017, web: <http://app.ecochain.com>.
6. Product Category Rules : Part A Implementation and use of I.S. EN 15804:2012 and CEN TR 16970:2016 in Ireland. www.epdireland.org