ENVIRONMENTAL PRODUCT DECLARATION

Adbri Asphalt Products - Western Australia ASPHALT

1G1050D GRAN 10MM 50B 20% RAP asphalt

In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021

EPD Registration no. EPD-IES-0013591:002
Date of publication: 2024-11-15
Date of revision: 2025-10-02
Date of validity: 2029-11-15
Geographical scope: Australia

Programme: The International EPD® System
www.environdec.com
Programme operator: EPD International AB
Regional Programme: EPD Australasia
www.epd-australasia.com

EPD of a single asphalt product from one location.

An EPD should provide current information and may be updated if conditions change.
The stated validity is therefore subject to the continued registration and publication at www.environdec.com

Revision Number	Revision Date	Summary of Changes
2.0	02.10.2025	This Environmental Product Declaration (EPD) was originally issued by BGC Concrete and has been updated to reflect the name of the new supplier, Swan Materials Pty Ltd, following the transfer of relevant assets and business operations.

Contents

Disclaimer

EPDs within the same product category but registered in different EPD programmes, or not compliant with EN 15804, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

Swan Materials

We believe in doing business responsibly - keeping our people and communities safe, meeting the needs of our customers, and contributing to a more sustainable future. As a proud Australian company with an extensive local manufacturing presence, we are agile in delivering solutions that support our customers and our communities.

For nearly 100 years, Swan Cement has been trusted by Western Australians - from its beginnings on the Swan River to its home today at Cockburn Cement's Kwinana facility. Our products have helped build the foundations of homes, roads, and essential infrastructure across the state.

Now, the Swan name is evolving beyond cement. With an expanded capability across concrete, quarries, transport, asphalt, and a materials technology centre – within the Adbri family – Swan Materials is positioned to deliver a broader range of sustainable, locally made solutions.

Together, as Swan Materials, we are building a stronger, more sustainable future.

Asphalt

Our Location

Swan Materials Asphalt's manufacturing facility is located at Hazelmere, within the Perth Metropolitan Region. The facility has an approved licence capacity of up to 1.345 million tonnes per year which includes the use of up to 20 thousand tonnes of recycled asphalt pavement.

Figure 1: Location of Swan Materials Asphalt plant in Hazelmere, WA

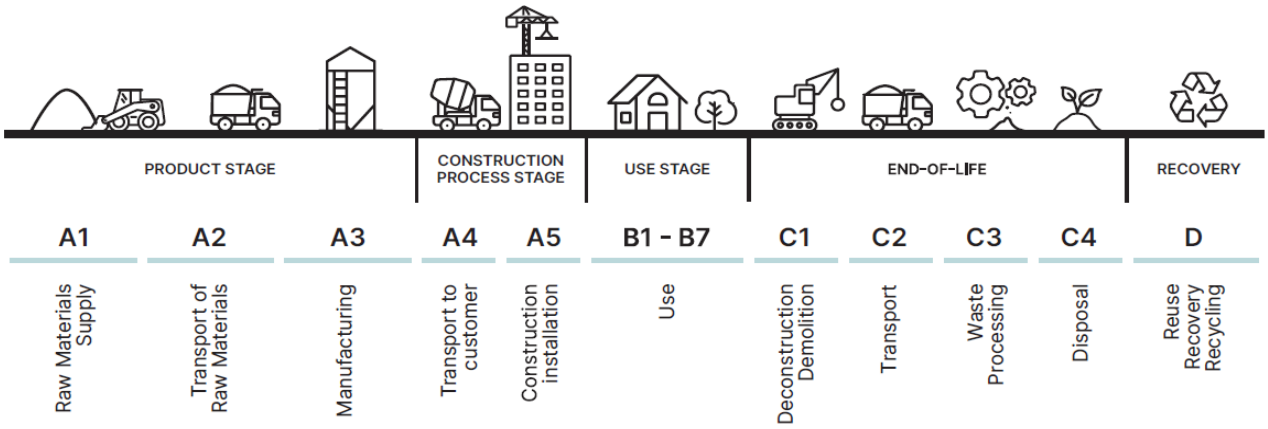
Asphalt

Product Life Cycle

Creating an EPD is an extensive process based on a set of Product Category Rules (PCR) and a Life Cycle Assessment (LCA). Environmental data such as electricity and fuel consumption from the raw material process through to asphalt production is evaluated, modelled and then reported through an independently verified EPD.

This EPD is based on a cradle-to-gate LCA with the end-of-life modules C1-C4 and D stages included. The construction process stage (modules A4-A5) and use stages (B1-B7) have not been modelled as these are best modelled at the building or infrastructure project level.

Figure 2: Product Life Cycle



Asphalt Production

Swan Materials operates a batch production process in Hazelmere.
In batch production, the components of the asphalt mixture are first weighed before being mixed in batches in an asphalt mixer according to a specific recipe. This process is more flexible as the recipe for the mixture can be changed for each batch. What is more, a greater mixing quality can be achieved due to the more precise quantities added and adapted mixing cycles.
Common operations in an asphalt batching plant encompass the feeding of cold aggregates into the drying drum, aggregate heating and drying, transferring aggregates to hot bins, screening hot aggregates, thorough mixing of aggregates with bitumen and filler materials, storage and heating of bitumen, storage of filler materials, efficient pollution control through a bag filter unit, and continuous monitoring and control of the entire process from a central control panel.

Product Description

This EPD covers 1G1050D GRAN 10MM 50B 20% RAP

Asphalt products are typically made using a bitumen binder, coarse and fine aggregates, and fillers. Other additives may be used to achieve desired material properties. Recycled Asphalt Product (RAP) may be added to reduce the reliance on virgin bitumen and aggregates. The exact composition of each asphalt product is designed to create the characteristics that make the product fit-for-purpose.

Content Declaration

The product content is presented in Table 1. For reasons of confidentiality, a range is provided.

Table 1: Product content

Ingredient	Proportion (% m/m)	Post-consumer recycled material, weight (%)	Biogenic material, weight (%)	Biogenic material, kg C / declared unit
Bitumen	3.5-6.5%	0%	0%	0
Fine aggregates (<5 mm) - natural sand	0-5%	0%	0%	0
Fine aggregates (<5 mm) - manufactured sand	10-58%	0%	0%	0
Coarse aggregates (>5 mm) - crushed rock	31-83%	0%	0%	0
Anti-strip agents - hydrated lime	1-2%	0%	0%	0
Recycled Asphalt Product (RAP)	9-20%	0%*	0%	0
Fibres - cellulose	n/a	0%	0%	0
Iron oxide	n/a	0%	0%	0
Total	**1,000 kg/tonne**	**0%**	**0%**	**0**

** RAP used by Swan Materials consists of 60% material returned from construction jobs (pre-consumer recycled material) and 40% internally recovered material. None of the RAP is post-consumer recycled material (i.e. old pavement millings).*

Asphalt is provided in bulk and therefore packaging materials are not relevant for the products considered in this EPD. Furthermore, the products included in this EPD do not contain any substances of very high concern as defined by European REACH regulation[1] in concentrations > 0.1% (m/m). Although some of the raw materials contain crystalline silica, asphalt does not contain respirable crystalline silica. (Respirable crystalline silica is a hazardous substance but is not a SVHC.)

[1] This information is in line with https://echa.europa.eu/substance-information/-/substanceinfo/100.029.531

Technical Information

Technical Compliance

Swan Materials Asphalt products comply with relevant technical standards and specifications, applicable legislation, regulations, industry standards and project requirements, including:

- AS 2150:2020 "Asphalt - A guide to good practice"
- MRWA 502 "Stone Mastic Asphalt"
- MRWA 504 "Dense Graded Asphalt Wearing Course"
- MRWA 510 "Asphalt Intermediate Course"
- MRWA 511 "Materials for Bituminous Treatments"

Swan Materials Asphalt maintains ISO 9001, ISO 14001, and ISO 45001 certified Quality Systems to ensure we meet Australian Standards in the construction industry. Asphalt is sampled and tested by a NATA certified laboratory to ensure compliance with AS 2150-2020.

Industry Classification

The UN CPC and ANZSIC codes applicable to asphalt products are:

- UN CPC 3794 (Bituminous mixtures based on natural and artificial stone materials and bitumen, natural asphalt or related substances as a binder)
- ANZSIC 3101 (Hot-mix bituminous paving manufacturing and/or laying).

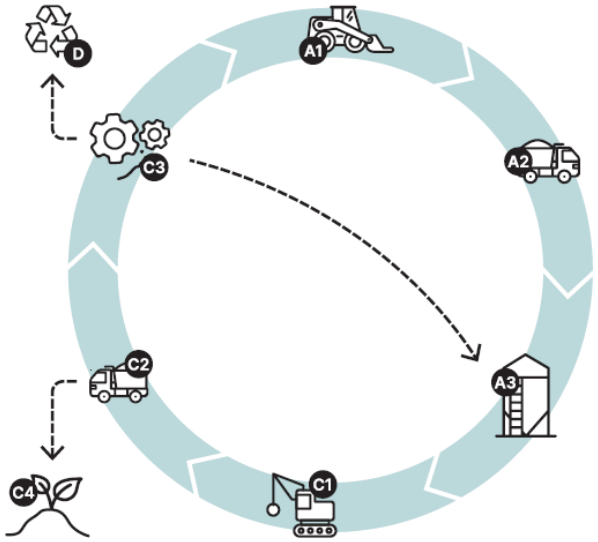
Declared Unit

"1 metric tonne of manufactured asphalt mixture"

System Boundary

This EPD covers the cradle-to-gate plus end-of-life life cycle stages (modules A1-A3, C1-C4, D).

Figure 3: Product Stage (A1-A3) and End-of-Life (C1-C4 & D)



A4-A5 and B1-B7 are excluded from the EPD and therefore not shown in this figure.

Construction and use stages have not been included as we cannot define a typical scenario for our range of asphalt products. These stages are better defined at building or infrastructure project level. The modules declared, geographical scope, share of specific data (in GWP-GHG indicator) and data variation are shown in Table 2.

Table 2: Scope of the EPD

	Product Stage			Construction Stage		Use Stage							End-of-life Stage				Benefits beyond system boundary
	Raw Materials	Transport	Production	Transport	Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction/Demolition	Transport	Waste Processing	Disposal	Reuse, recovery, recycling potential
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules Declared	✓	✓	✓	ND	ND	ND	ND	ND	ND	ND	ND	ND	✓	✓	✓	✓	✓
Geography	AU GLO	AU	AU	-	-	-	-	-	-	-	-	-	AU	AU	AU	AU	AU
Share of specific data	62%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation products	0%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation sites	0%			-	-	-	-	-	-	-	-	-	-	-	-	-	-

✓: Module is included in this study
ND: module is not declared. When a module is not accounted for, the stage is marked with "ND" (Not Declared).
ND is used when we cannot define a typical scenario.

Life Cycle Stages

Product stage (A1-A3)

Investigates the environmental impacts related to the manufacturing of asphalt before it leaves the asphalt plant.

A1 Raw Material Supply
Extraction of fine and coarse aggregates, and processing of raw materials such as crude oil to produce bitumen, and limestone to produce hydrated lime.

A2 Transportation
Transport of raw materials to the Swan Materials Asphalt plant in Hazelmere.

A3 Manufacturing
Manufacturing of asphalt begins with raw materials handling. The ingredients are added to a rotating drum in carefully dosed quantities, then heated to around 170°C to achieve effective coating of the aggregates with bitumen. The hot mix is loaded in trucks, ready for transport to a construction site.

End-of-Life (C1-C4 & D)

Investigates the environmental impacts related to the asphalt after it has reached the end of its useful life.

C1 Demolition
Module C1 covers demolition of the asphalt at the end of its service life.

C2 Transport
Module C2 comprises the transport from the demolition site to a recycling site (30km).

C3 Waste Processing
Module C3 encompasses the recycling process (i.e. crushing of asphalt). As this occurs at the asphalt plant, no impacts are assigned to module C3 as per Technical Guidance document (EPD Australasia 2022).

C4 Disposal
Module C4 represents disposal of asphalt in a landfill site. As all asphalt is recycled at end-of-life, module C4 is not relevant.

D Resource Recovery Stage
Module D includes any benefits and loads from net flows leaving the product system (that have passed the end-of-waste state).

The end-of-life modules for asphalt are based on generic scenarios, in line with the Technical Guidance document (EPD Australasia 2022). The scenarios included are currently in use and are representative for one of the most probable alternatives.

For this EPD, we applied the end-of-life scenario for pavement in metro areas. This scenario assumes 90% of asphalt is recycled into new asphalt, while the remaining 10% is downcycled into a granular subbase material.

The recycling of asphalt at its end-of-life leads to a reduction in the demand for virgin materials. Recycled bitumen replaces new bitumen, while recovered aggregates (both coarse and fine) substitute virgin crushed rock and sand. When downcycled, recycled asphalt is used for road base applications, leading to the replacement of virgin materials typically used in such constructions, thereby extending the usefulness of the reclaimed materials. These substitutions are beneficial as they reduce the need for processes involved in extracting and refining new materials. The benefits are reflected in the negative result values (= credits) in module D.

Any primary material collected for recycling and processed in Module C3, is considered to go through to Module D. In determining the net output flow, secondary materials (RAP) are excluded from going to module D (in a deviation from the Technical Guidelines). Other end-of-life modelling choices are in line with the Technical Guidelines, see Table 3.

Note that recycling processes that may be expected in module C3, are covered by module A1-A3 to avoid double counting. This is explained in section 2.3 of the Technical Guidance document (EPD Australasia 2022). We have listed the parameter Materials for Recycling (MFR) in module C3 to capture the amount of material collected for recycling at end-of-life.

Table 3: End-of-life scenario parameters

Processes	Quantity per t of asphalt	Unit
Collection process specified by type	1,000 0	kg collected separately kg collected with mixed construction waste
Transport from demolition site to recovery / disposal sites	30	km transport
Recovery system specified by type	0 1,000 0	kg for re-use kg for recycling (90% recycling; 10% downcycling) kg for energy recovery
Disposal to landfill	0	kg product or material for final deposition
Assumptions for scenario development		Module C1 (demolition) requires: 14.7 MJ diesel for milling; 5.0 MJ diesel for screening, and 5.4L of water

Life Cycle Assessment (LCA) Methodology

Background Data

Swan Materials Asphalt has collected and supplied the primary data for the asphalt LCA based on the FY22 reporting period (1 July 2021 – 30 June 2022). Background data are sourced from AusLCI and the AusLCI shadow database v1.42 (AusLCI 2023), in line with the prescribed data sources defined in the Technical Guidance document (EPD Australasia 2022). Key exceptions are the data for coarse aggregates and manufactured sand, which have been sourced from Swan Materials Quarries, and the data for hydrated lime, which have been sourced from the supplier's EPD. Water inputs into key processes are adjusted to reflect regional (Swan Coast) WDP factors (in line with EPD Australasia 2024).

The Life Cycle Inventory (LCI) data for bitumen and hydrated lime have a significant effect on the results of an asphalt LCA. When comparing asphalt EPDs it is therefore important to understand which background LCI data are used.

Primary data are less than three years old and background data are reviewed/confirmed within the last 10 years.

Methodological choices have been applied in line with EN 15804:2012+A2:2019 and the Technical Guidance document (EPD Australasia 2022); deviations have been recorded.

Allocation

The key processes that require allocation are:

- **Production of asphalt mixes**: the composition of the asphalt mix affects the amount of energy required to drive off moisture and heat up the raw materials to the required temperature. To determine the energy requirements for each mix design, start2see has applied Method A (EPD Australasia 2022; section 2.5): Determine the energy use for each mix design based on the composition, specific heat capacity of components, moisture content of raw materials and the plant's overall efficiency. All shared processes (e.g. site electricity use, fuel use for equipment and water use) are attributed to asphalt products based on their mass.
- **RAP:** Reclaimed Asphalt Pavement (RAP) reaches the end-of-waste state when the reclaimed, milled material has been collected in a truck and transported to a storage pile, ready to be processed for further use. Swan Materials processes RAP at its asphalt plant. Any energy use for RAP processing is covered by the energy data for the asphalt plant. ISO 14021 states that recycled content of products should only cover recycled materials from pre-consumer (post-industrial) and post-consumer scraps, but not recycled material made from internal scrap. Swan Materials has indicated that around 60% of RAP is material returned from construction sites (pre-consumer) and 40% of RAP originates from production waste (internal). Therefore, each 1.0 kg of RAP used in Swan Materials asphalt amounts to 0.6 kg of Secondary Material (SM).

Cut-off criteria

The cut-off criteria applied are 1% of renewable and non-renewable primary energy usage, 1% of the total mass input of a process and 1% of environmental impacts.

- Fibres and oxides (used in minor quantities: up to 1% by mass) are supplied in packaged format. As the packaging used for these products is well below the materiality cut-off and is often recyclable or reusable, the packaging materials have been omitted from the analysis. The impact on the footprint of asphalt products is negligible.
- Greases, lubricants and other minor ancillary materials used during asphalt production have been excluded. The impact on the footprint of asphalt products is negligible.
- The contribution of capital goods (production equipment and infrastructure) and personnel is excluded, as these processes are non-attributable, and reasonable data are not available.

Key assumptions

- The asphalt composition of each product is provided by Swan Materials and has been accepted as is.
- The end-of-life scenario (90% recycling into asphalt; 10% downcycling as granular subbase) is based on the default scenario in metro areas, as per the Technical Guidance document (EPD Australasia 2022).

Electricity

Electricity has been modelled for processes that Swan Materials Asphalt controls (asphalt production and aggregates quarry) using adjusted AusLCI data to represent the estimated residual electricity grid mix in Western Australia. This is done by removing renewables from the Australian Energy Statistics 2024 data (Table O5). The GWP-GHG of the electricity is 0.79 kg CO_2e / kWh. The proxy residual grid mix is made up of natural gas (74.1%), black coal (19.9%) and oil products (6.0%). The selection of the electricity grid mix has a minor effect on the results. If a location-based approach was taken, the carbon footprint would be around 3% lower. If a national residual grid mix approach was taken, the carbon footprint would be around 2% higher. The electricity accounting approach should be considered when comparing this EPD against other asphalt EPDs.


ALmix

Environmental Impact Indicators

Global Warming Potential (GWP)
Is due to the heat absorbed by greenhouse gases, causing the rise of the global temperature.

Photochemical Smog (POCP)
Is due to a mixture of pollutants which includes volatile organic compounds, particulates, nitrogen oxides and ozone. It's harmful to human health (causing lung irritation problems, coughing and wheezing) and the environment (damage to plants and crops).

Acidification Potential (AP)
Is due to emissions of acidic substances, causing the degradation of materials such as metals, limestone and concrete, and damage to trees and life in lakes and rivers.

Abiotic Resource Depletion (ADP)
Is due to extraction and consumption of non-renewable resources such as oil, coal and metals, causing a decrease in future availability of functions supplied by these resources.

Eutrophication Potential (EP)
Is due to emissions of nutrients, causing blooms of algae. The degradation of dead algae consumes oxygen leading to the loss of plants and animals.

Ozone Depletion Potential (ODP)
Is due to emissions which destroy the ozone layer causing higher levels of UV light to reach earth which damages DNA in humans, animals and plants.

Water Deprivation Potential (WDP)
Is due to water availability versus demand. The less water remaining per area, the more likely another user will be deprived.

The environmental indicators associated with impact categories, resource use, waste categories and output flows described in this EPD are summarised in the table below. All further tables will contain the abbreviation of the indicator for simplicity.

Table 4: Environmental indicators legend (EN 15804+A2)

Indicator	Acronym	Unit
Core indicators		
Climate change – total	GWP-total	kg CO_2 equivalent
Climate change – fossil	GWP-fossil	kg CO_2 equivalent
Climate change – biogenic	GWP-biogenic	kg CO_2 equivalent
Climate change – land use and land use change	GWP-luluc	kg CO_2 equivalent
Ozone layer depletion	ODP	kg CFC-11 equivalent
Acidification	AP	mol H+ equivalent
Eutrophication aquatic freshwater	EP-freshwater	kg P equivalent
Eutrophication aquatic marine	EP-marine	kg N equivalent
Eutrophication terrestrial	EP-terrestrial	mol N equivalent
Photochemical ozone formation	POCP	kg NMVOC equivalent
Abiotic depletion potential – elements[2]	ADP minerals & metals	kg Sb equivalent
Abiotic depletion potential – fossil fuels[2]	ADP fossil	MJ, net calorific value
Water use[2]	WDP	m^3 world equivalent deprived
Additional indicators		
Global Warming Potential – Greenhouse gases	GWP-GHG	kg CO_2 equivalent
Particulate matter emissions	PM	disease incidence
Ionising radiation, human health[1]	IRP	kBq U235 equivalent
Ecotoxicity (freshwater)[2]	ETP-fw	CTUe
Human toxicity, cancer effects[2]	HTP-c	CTUh
Human toxicity, non-cancer effects[2]	HTP-nc	CTUh
Land use related impacts / soil quality[2]	SQP	- (dimensionless)
Additional GHG indicator		
Carbon footprint in line with IPCC AR5[3]	**GWP-GHG (IPCC AR5)**	**kg CO_2 eq**

[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 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 experience with the indicator.
[3] Note regarding various GWP indicators: GWP-total is calculated using the European Union's Joint Research Centre's characterisation factors (CFs) based on the "EF 3.1 package" for CFs to be used in the EU's Product Environmental Footprint (PEF) framework. CFs listed by JRC are based on the IPCC AR6 method (IPCC 2021) and include indirect radiative forcing, which results in higher numerical Global Warming Potential (GWP) values than the CFs in the internationally accepted (IPCC 2013). The GWP-GHG indicator is identical to GWP-total except that the CFs for biogenic CO_2 are set to zero. The GWP-GHG indicator in PCR 2019:14 v1.3.4 differs from the GWP-GHG in earlier (pre v1.3) PCR 2019:14 versions. The "GWP-GHG (IPCC AR5)" indicator is determined using the IPCC AR5 GWPs with a 100-year time horizon (IPCC 2013). This indicator is aligned with Australia's greenhouse gas reporting frameworks.

Table 5: Legend for parameters describing resource use, waste and output flows

Parameter	Acronym	Unit
Parameters describing resource use		
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	PERE	MJ_{NCV}
Use of renewable primary energy resources used as raw materials	PERM	MJ_{NCV}
Total use of renewable primary energy resources	PERT	MJ_{NCV}
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	PENRE	MJ_{NCV}
Use of non-renewable primary energy resources used as raw materials	PENRM	MJ_{NCV}
Total use of non-renewable primary energy resources	PENRT	MJ_{NCV}
Use of secondary material	SM	kg
Use of renewable secondary fuels	RSF	MJ_{NCV}
Use of non-renewable secondary fuels	NRSF	MJ_{NCV}
Use of net fresh water	FW	m^3
Waste categories		
Hazardous waste disposed	HWD	kg
Non-Hazardous waste disposed	NHWD	kg
Radioactive waste disposed	RWD	kg
Output flows		
Components for re-use	CRU	kg
Materials for recycling	MFR	kg
Materials for energy recovery	MER	kg
Exported energy	EE	MJ

Table 6: Legend for EN 15804+A1 indicators

Indicator	Acronym	Unit
Global warming potential	GWP	kg CO_2 equivalent
Ozone layer depletion potential	ODP	kg CFC-11 equivalent
Acidification potential	AP	kg SO_2 equivalent
Eutrophication potential	EP	kg PO_4^{3-} equivalent
Photochemical oxidation (Photochemical ozone creation) potential	POCP	kg ethylene equivalent
Abiotic depletion potential - elements	ADPE	kg Sb equivalent
Abiotic depletion potential – fossil fuels	ADPF	MJ_{NCV}

VARIATION (A1-A3) PER IMPACT CATEGORY

The results of the LCA are for a single product from one location. Therefore, variation is not relevant.

Life Cycle Assessment (LCA) Results

Environmental Profiles for 1G1050D GRAN 10MM 50B 20% RAP

The background Life Cycle Assessment serves as the foundation for this EPD. A Life Cycle Assessment analyses the environmental processes in the value chain of a product. It provides a comprehensive evaluation of all upstream (and sometimes downstream) material and energy inputs and outputs. The results are provided for a range of environmental impact categories, in line with EN 15804:2012+A2:2019/AC:2021. The results have been calculated with SimaPro software v9.5.0.0, using the EFv3.1 set of characterisation factors. To separate the use of primary energy into energy used as raw material and energy used as energy carrier, Option B from Annex 3 of PCR 2019:14 has been applied.

Please consider the following mandatory statements when interpreting the results:

"*The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks".*

"*The use of the results of modules A1-A3 (A1-A5 for services) without considering the results of module C is discouraged"*.

The results are expressed per tonne of asphalt.

Table 7: Environmental indicators EN 15804+A2, 1G1050D GRAN 10MM 50B 20% RAP asphalt, per tonne

Environmental Indicator	Unit	Module A1-A3	Module C1	Module C2	Module C3	Module C4	Module D
Core Indicators							
GWP-total	kg CO_2-eq.	5.42E+01	1.71E+00	3.84E+00	0.00E+00	0.00E+00	-2.17E+01
GWP-fossil	kg CO_2-eq.	5.42E+01	1.71E+00	3.84E+00	0.00E+00	0.00E+00	-2.17E+01
GWP-biogenic	kg CO_2-eq.	1.27E-02	1.70E-04	2.37E-04	0.00E+00	0.00E+00	-1.28E-02
GWP-luluc	kg CO_2-eq.	1.81E-04	8.69E-07	1.81E-06	0.00E+00	0.00E+00	-1.32E-04
ODP	kg CFC11-eq.	2.77E-05	2.72E-07	6.06E-07	0.00E+00	0.00E+00	-2.47E-05
AP	mol H+ eq.	4.14E-01	1.87E-02	3.37E-02	0.00E+00	0.00E+00	-3.23E-01
EP-freshwater	kg P eq.	1.85E-05	2.29E-07	2.31E-07	0.00E+00	0.00E+00	-1.29E-05
EP-marine	kg N eq.	5.02E-02	8.15E-03	1.06E-02	0.00E+00	0.00E+00	-2.98E-02
EP-terrestrial	mol N eq.	5.57E-01	8.94E-02	1.16E-01	0.00E+00	0.00E+00	-3.31E-01
POCP	kg NMVOC eq.	1.65E-01	2.39E-02	2.84E-02	0.00E+00	0.00E+00	-1.02E-01
ADP minerals & metals [2]	kg Sb eq.	2.26E-07	2.04E-09	4.46E-09	0.00E+00	0.00E+00	-3.42E-07
ADP fossil [2]	MJ (NCV)	2.84E+03	2.38E+01	5.28E+01	0.00E+00	0.00E+00	-2.18E+03
WDP [2]	m^3 world eq. deprived	1.97E+01	4.09E-01	3.33E-01	0.00E+00	0.00E+00	-4.16E+01
Additional indicators							
GWP-GHG	kg CO_2-eq.	5.42E+01	1.71E+00	3.84E+00	0.00E+00	0.00E+00	-2.17E+01
PM	Disease incidence	2.40E-06	4.96E-07	1.90E-07	0.00E+00	0.00E+00	-1.15E-06
IRP [1]	kBq U235 eq.	3.94E-03	3.53E-05	7.70E-05	0.00E+00	0.00E+00	-3.39E-03
ETP-fw [2]	CTUe	5.33E+02	5.27E+00	1.16E+01	0.00E+00	0.00E+00	-4.76E+02
HTP-c [2]	CTUh	1.46E-08	6.59E-11	1.65E-11	0.00E+00	0.00E+00	-5.47E-10
HTP-nc [2]	CTUh	5.11E-08	3.51E-10	3.14E-10	0.00E+00	0.00E+00	-1.31E-08
SQP [2]	-	1.16E+02	1.27E-01	2.37E-01	0.00E+00	0.00E+00	-1.13E+02
Carbon footprint							
GWP-GHG (IPCC AR5)	kg CO_2 eq	54.3	1.71	3.84	0.00E+00	0.00E+00	-2.18E+01

Footnotes:

[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 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 experience with the indicator.

Table 8: Parameters, 1G1050D GRAN 10MM 50B 20% RAP asphalt, per tonne

Parameter	Unit	Module A1-A3	Module C1	Module C2	Module C3	Module C4	Module D
PERE	MJ_{NCV}	3.46E+00	4.34E-02	7.57E-02	0.00E+00	0.00E+00	-3.89E+00
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	3.46E+00	4.34E-02	7.57E-02	0.00E+00	0.00E+00	-3.89E+00
PENRE	MJ_{NCV}	5.21E+02	2.38E+01	5.28E+01	0.00E+00	0.00E+00	-9.63E+01
PENRM	MJ_{NCV}	2.80E+03	0.00E+00	0.00E+00	-2.80E+03	0.00E+00	-2.08E+03
PENRT	MJ_{NCV}	3.32E+03	2.38E+01	5.28E+01	-2.80E+03	0.00E+00	-2.18E+03
SM	kg	1.20E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	5.28E-01	8.85E-03	7.64E-03	0.00E+00	0.00E+00	-9.47E-01
HWD	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NHWD	kg	1.48E-02	1.11E-04	2.24E-04	0.00E+00	0.00E+00	-1.19E-02
RWD	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	3.10E+01	0.00E+00	0.00E+00	1.00E+03	0.00E+00	-5.25E-03
MER	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 9: EN 15804+A1 indicators, 1G1050D GRAN 10MM 50B 20% RAP asphalt, per tonne

Environmental Indicator	Unit	Module A1-A3	Module C1	Module C2	Module C3	Module C4	Module D
GWP	kg CO_2 eq	5.38E+01	1.70E+00	3.83E+00	0.00E+00	0.00E+00	-2.14E+01
ODP	kg CFC11 eq	2.19E-05	2.15E-07	4.78E-07	0.00E+00	0.00E+00	-1.95E-05
AP	kg SO_2 eq	3.32E-01	1.33E-02	1.87E-02	0.00E+00	0.00E+00	-2.71E-01
EP	kg PO_4^{3-} eq	1.77E-02	2.74E-03	3.58E-03	0.00E+00	0.00E+00	-1.05E-02
POCP	kg C_2H_4 eq	2.16E-02	1.31E-03	1.21E-03	0.00E+00	0.00E+00	-1.52E-02
ADPE	kg Sb eq	2.29E-07	2.07E-09	4.51E-09	0.00E+00	0.00E+00	-3.45E-07
ADPF	MJ_{NCV}	2.84E+03	2.38E+01	5.28E+01	0.00E+00	0.00E+00	-2.18E+03

* Note: the indicators and characterisation methods are from EN 15804:2012+A1:2013 (based on the CML-baseline method v4.2), but other LCA rules (system boundaries, allocation, etc.) are according to EN 15804:2012+A2:2019; i.e., the results of the “A1 indicators” shall not be claimed to be compliant with EN 15804:2012+A1:2013.


VÖGELE

Programme information and verification

An Environmental Product Declaration (EPD) is a standardised way of quantifying the potential environmental impacts of a product or system. EPDs are produced according to a consistent set of rules – Product Category Rules (PCR) – that define the requirements within a given product category. These rules are a key part of ISO 14025 as they enable transparency and comparability between EPDs. This EPD provides environmental indicators for a single product, manufactured at Swan Materials Asphalt's facility in Hazelmere, Western Australia. This EPD is a "cradle-to-gate plus modules C1-C4, D" declaration covering production and end-of-life modules. This EPD is verified to be compliant with EN 15804. EPDs of construction products may not be comparable if they do not comply with EN15804. EPDs within the same product category but from different programs, or utilising different PCR documents, may not be comparable. See the disclaimer on the content page at the front of this document. As the EPD owner, Adbri has the sole ownership, liability, and responsibility for the EPD.

Declaration Owner:	**Adbri Pty Ltd** Address: Level 4, 151 Pirie Street Adelaide, SA 5000 Web: www.swanmaterials.com.au Phone: 08 8223 8000 Email: sales@swanmaterials.com.au
Program	**The International EPD® System,** Address: Valhallavägen 81, 114 27 Stockholm, Sweden Web: www.environdec.com
Program operator	**EPD International AB** Box 210 60, SE-100 31 Stockholm, Sweden, Email: info@environdec.com
Regional program	**EPD Australasia Limited** Address: 6 Cube Court, Richmond, Tasman 7020 New Zealand Web: www.epd-australasia.com Email: info@epd-australasia.com Phone: +61 2 8005 8206 (AU)
LCA and EPD accountability:	**start2see Pty Ltd** 36 Renaissance Bvd, Mernda, VIC 3754, Australia Web: www.start2see.com.au Email: Rob.Rouwette@start2see.com.au Phone: +61 403 834 470
EPD registration number:	EPD-IES-0013591:002
Date of publication (issue):	2025-10-02
Version:	2.0
Date of validity:	2029-11-15 (5 years)
Reference year for data:	2021-07-01 – 2022-06-30
CEN standard EN 15804 served as the core PCR	
PCR:	PCR 2019:14 Construction Products, Version 1.3.4, 2024-04-30 (valid until 2025-06-20) Technical guidance for developing EPDs according to EN 15804+A2:2019 for Asphalt mixtures – Australia, EPD Australasia, 27 April 2022
PCR review was conducted by:	The Technical Committee of the International EPD® System. See www.environdec.com for a list of members. Review chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat www.environdec.com/contact.
Independent third-party verification of the declaration and data, according to ISO 14025:2006:	☒ EPD verification by individual verifier
Third party verifier: Approved by EPD Australasia Ltd	Andrew D. Moore, Life Cycle Logic Web: www.lifecyclelogic.com.au Email: andrew@lifecyclelogic.com.au Phone: +61 4 2432 0057
Procedure for follow-up of data during EPD validity involves third-party verifier:	☐ Yes ☒ No

References

AS 2150	AS 2150:2020, Asphalt - A guide to good practice. Standards Australia, 09 November 2020
AusLCI 2023	Australian Life Cycle Inventory database v1.42 published by the Australian Life Cycle Assessment Society, 2023
ECHA 2024	European Chemicals Association, Candidate List of substances of very high concern for Authorisation, published in accordance with Article 59(10) of the REACH Regulation, Helsinki Accessed on 1 March 2024 from: https://echa.europa.eu/candidate-list-table
Environdec 2021	International EPD System, General Programme Instructions for the International EPD System, Version 4.0, 29 March 2021
EN 15804+A2	EN 15804:2012+A2:2019/AC:2021, Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products, European Committee for Standardization (CEN), Brussels, August 2021
EN 15804+A1	Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products, European Committee for Standardization (CEN), Brussels, November 2013
EPD Australasia 2022	Technical guidance for developing EPDs according to EN 15804+A2:2019 for Asphalt mixtures – Australia, EPD Australasia, 27 April 2022
EPD Australasia 2024	Instructions of the Australasian EPD Programme; EPD Australasia Limited, v4.2 - A regional annex to the general programme instructions of the International EPD® System, 12 April 2024
ISO 14021	ISO 14021:2016, Environmental labels and declarations - Self-declared environmental claims (Type II environmental labelling). International Organization for Standardization, Geneva, Switzerland, 2016
ISO 14025	Environmental labels and declarations - Type III environmental declarations - Principles and procedures. International Organization for Standardization, Geneva, Switzerland, 2006
ISO 14040	Environmental management - Life cycle assessment - Principles and framework. International Organization for Standardization, Geneva, Switzerland, 2006
ISO 14044	Environmental management - Life cycle assessment - Requirements and guidelines. International Organization for Standardization, Geneva, Switzerland, 2006
MRWA – 502	Specification 502 Stone Mastic Asphalt, Main Roads Western Australia – 05/8797, Issued 04 April 2022
MRWA – 504	Specification 504 Dense Graded Asphalt Wearing Course, Main Roads Western Australia – 04/10112-002, Issued 05 February 2024
MRWA – 510	Specification 510 Asphalt Intermediate Course, Main Roads Western Australia – 07/5856-02, Issued 06 April 2022
MRWA – 511	Specification 511 Materials for Bituminous Treatments, Main Roads Western Australia – 10/4287-002, Issued 25 May 2023
PCR 2019:14	Product category rules for Construction products (EN 15804:2012+A2:2019), registration number 2019:14, version 1.3.4, published on 30 April 2024

Contact information

Contact your Swan Materials Asphalt Representative today for more information

Phone:	(08) 9442 2388
Address:	Whadjuk Country Lot 4, Striling Cr, Hazelmere WA 6000
Web:	www.swanmaterials.com.au
Email:	sales@swanmaterials.com.au