

ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH ISO 14025:2006 AND ISO 21930:2017

SmartEPD-2026-110-0728-01

Fly ash



Date of Issue:	Expiration:	Last updated:
Jan 08, 2026	Jan 08, 2031	Jan 08, 2026

Refer to the EPD Library at www.smartepd.com for the latest EPD listing information



General Information

Ashcor Technologies

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Product Name:	Fly ash
Declared Unit:	1 metric ton
Declaration Number:	SmartEPD-2026-110-0728-01
Date of Issue:	January 08, 2026
Expiration:	January 08, 2031
Last updated:	January 08, 2026
EPD Scope:	Cradle to gate A1 - A3
Market(s) of Applicability:	North America

General Organization Information

Ashcor has been delivering high-quality supplementary cementitious materials (SCMs) since 1998, starting with fly ash from coal-fired power plants. As regions shifted away from burning coal, the supply of fly ash declined, resulting in regional ash shortages. In anticipation of this shift and the growing need for reliable sources of fly ash, we didn't wait—we innovated.

Our proprietary RAM™ technology reclaims stored coal ash from landfills and impoundments, and transforms it into consistent, high-performance, technically-specified SCMs—helping our partners lower costs, meet sustainability ambitions, and secure long-term supply.

Further information can be found at: <https://ashcor.atco.com/en-ca.html>

Limitations, Liability and Ownership

The EPD owner has sole ownership, liability, and responsibility for the EPD.

Environmental declarations from different programs (ISO 14025) may not be comparable. Comparison of the environmental performance of products using EPD information shall be based on the product's use and impacts at the building or construction works level, and therefore EPDs may not be used for comparability purposes when not considering the whole building life cycle. EPD comparability is only possible when all stages of a life cycle have been considered. However, variations and deviations are possible. Example of variations: Different LCA software and background LCI datasets may lead to differences in results upstream or downstream of the life cycle stages declared.

The environmental impact results of products in this document are based on a declared unit and therefore do not provide sufficient information to establish comparisons. The results shall not be used for comparisons without knowledge of how the physical properties of the product impact the precise function at the construction level. The environmental impact results shall be converted to a functional unit basis before any comparison is attempted.

A manufacturer shall not make claims based on an industry-average EPD which leads the market to believe the industry-average is representative of manufacturer-specific or product-specific results.

Reference Standards

Standard(s):	ISO 14025:2006 and ISO 21930:2017
Core PCR:	Smart EPD® Part A Product Category Rules for Building and Construction Products and Services, 1000, v1.2 Date of issue: March 14, 2025
Sub-category PCR:	Smart EPD® Part B PCR for Supplementary Cementitious Materials, 1000-002, v1.0 Date of issue: May 07, 2024 Valid until: May 07, 2029
Sub-category PCR review panel:	 Contact Smart EPD for more information.
General Program Instructions:	 Smart EPD General Program Instructions v.2.0, March 2025

Verification Information

LCA Author/Creator:	 Melissa Diaz  Climate Earth  melissa@climateearth.com
EPD Program Operator:	 Smart EPD  info@smartepd.com  www.smartepd.com  585 Grove St., Ste. 145, Herndon, VA 20170, USA
Verification:	Independent critical review of the LCA and data, according to ISO 14044 and ISO 14071:  Gaurav Das  gd30gcc@gmail.com Independent external verification of EPD, according to ISO 14025 and reference PCR(s):  Gaurav Das  gd30gcc@gmail.com

External

External

Product Information

Declared Unit:	1 metric ton
Mass:	1000 kg
Product Specificity:	 Product Average  Product Specific
Variation in GWP Result (Products):	0% to 0%
Variation in GWP Result (Facilities):	0% to 0%

Product Description

Ashcor's manufactured ash is produced by harvesting and processing impounded coal ash to create consistent, high-quality material. It is fully certified to CSA A3000 and ASTM C618 standards, making it a reliable supplementary cementitious material for durable and sustainable concrete.

Product Specifications

Product Classification Codes:	UNCPC - 153
SCM Class:	Coal Ash (ASTM C618, Class C and F, AASHTO M 295, CSA A3001, CSA A3002, NMX-C-179)
SCM Sub-category:	Fly ash
Relative Density:	2.2-2.4 m2/kg

Material Composition

Material/Component Category	Origin	% Mass
Silicone dioxide (SiO2)	Alberta, Canada	60.13
Aluminum Dioxide (Al2O3)	Alberta, Canada	19.27
Iron Oxide (Fe2O3)	Alberta, Canada	4.83
Sulphur trioxide (SO3)	Alberta, Canada	0.25
Calcium oxide (CaO)	Alberta, Canada	6.37
Magnesium oxide (MgO)	Alberta, Canada	1.37
Sodium Oxide (Na2O)	Alberta, Canada	2.91
Potassium Oxide (K2O)	Alberta, Canada	1.43
Titanium Dioxide (TiO2)	Alberta, Canada	0.47
Phosphorous Pentoxide (P2O5)	Alberta, Canada	0.32
Manganese (III) oxide (Mn2O3)	Alberta, Canada	0.05
Strontium oxide (SrO)	Alberta, Canada	0.12
Chromium (III) Oxide (Cr2O3)	Alberta, Canada	<0.01
Zinc Oxide (ZnO)	Alberta, Canada	<0.01
Barium Oxide (BaO)	Alberta, Canada	0.33
Loss on ignition	Alberta, Canada	2.15

Hazardous Materials

No regulated hazardous or dangerous substances are included in this product.

EPD Data Specificity

- Primary Data Year:2024
- Manufacturing Specificity:

✗

 Industry Average

✗

 Manufacturer Average

✓

 Facility Specific

Averaging:
Averaging was not conducted for this EPD.

System Boundary

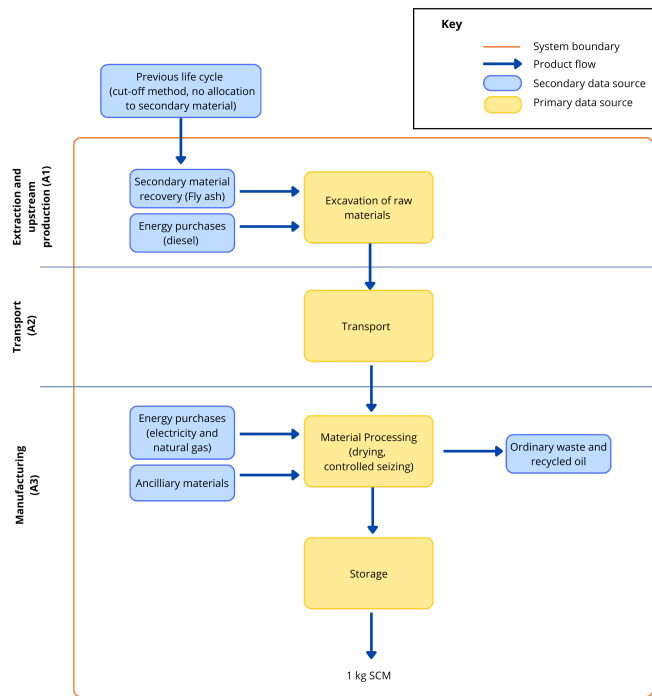
Production	A1	Raw material supply	✓
	A2	Transport	✓
	A3	Manufacturing	✓
Construction	A4	Transport to site	ND
	A5	Assembly / Install	ND
Use	B1	Use	ND
	B2	Maintenance	ND
	B3	Repair	ND
	B4	Replacement	ND
	B5	Refurbishment	ND
	B6	Operational Energy Use	ND
	B7	Operational Water Use	ND
End of Life	C1	Deconstruction	ND
	C2	Transport	ND
	C3	Waste Processing	ND
	C4	Disposal	ND

Benefits & Loads Beyond System Boundary	D	Recycling, Reuse Recovery Potential	ND
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Note:

ND = Module not declared

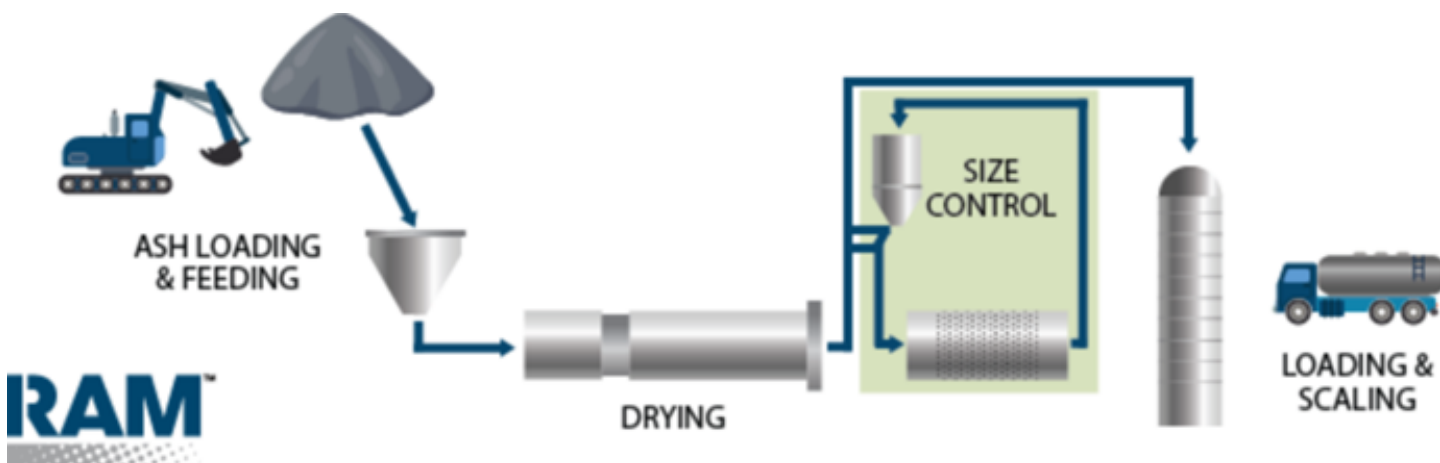
Product Composition Diagram



Plants

 Ashcor Battle River 40205 Alberta 855, Halkirk, AB, Canada

Product Flow Diagram



Ashcor fly ash production includes the extraction of the material from a fly ash dump site (A1), the transport to the production plant (A2) and the processing on the material (A3), which involves drying, controlled sizing, storage and truck loading and scaling.

Software And Database

LCA Software:

Simapro v. 9.1.0

LCI Foreground Database(s):

Ecoinvent v. 3.10 | RoW and CA-AB |
Allocation, cut-off by classification (cut-off model)

LCI Background Database(s):

Ecoinvent v. 3.10 | RoW and CA-AB |
Allocation, cut-off by classification (cut-off model)

A foreground LCI database is the database used to model the primary, site-specific data collected for this EPD. A background LCI database is the database used to model generic or non-specific data.

Data Quality

Ashcor Technologies plant data consists of both measured and estimated data. Primary data is derived from plant-level questionnaires from the baseline period of 2024. For background (generic) data, representative processes were selected from ecoinvent 3.10 allocation, cut-off by classification (ecoinvent, 2023) databases.

Data quality for each dataset is rated “very good”, “good”, “fair”, or “poor” for the following characteristics:

- **Technological representativeness (technology):** the degree to which the data reflects the actual technology(ies) used.
- **Temporal representativeness (time):** the degree to which the information collected reflects the actual time of the study. Foreground data shall be the average of twelve consecutive months during the last five years. Background data should not be older than ten years.
- **Geographical representativeness (geography):** the degree to which the data reflects the actual geographic location of the activity. The geographic region of the relevant life-cycle stages included in the calculation of data should be documented.
- **Completeness:** the degree to which the data are statistically representative of the relevant activity and obtained over an adequate period of time to even out normal fluctuations.
- **Reliability:** the degree to which the sources, data collection methods, and verification procedures used to obtain the data are dependable.

Life Cycle Module Description

Ashcor A1 module consists in the extraction of fly ash from a dump site, using heavy machinery that consumes fuels. The fly ash is then transported to the production site (A2) in freight trucks for about 3.5 km. Lastly, the material is processed at a manufacturing facility which involves controlled sizing, drying, storage, truck loading and scaling.

LCA Discussion

Allocation Procedure

No allocation was done in this study.

Cut-off Procedure

All inputs and outputs to a unit process have been included in the calculation, for which data are available. Data gaps have been filled by conservative assumptions with average or generic data. Any assumptions for such choices have been documented. When data was not reasonably available, the following cutoff criteria as specified in ISO 21930:2017 section 7.1.8 and the referenced PCR (Smart EPD Part A, 2025) were used:

- Mass | If a flow is less than 1% of the cumulative mass of the model flows, it may be excluded, provided its environmental relevance is minor.
- Energy | If a flow is less than 1% of the cumulative energy of the system model, it may be excluded, provided its environmental relevance is minor.
- Environmental relevance | Material and energy flows known or expected to have the potential to cause environmentally relevant emissions into air, water, or soil related to the environmental indicators of the PCR shall be included unless justification for exclusion is documented.
- The total of neglected input flows shall be a maximum of 5% of energy usage and mass.

Excluded flows: maintenance parts were excluded from the study. It is assumed that maintenance parts are less than 1% of the cumulative mass of the model flows.

Renewable Electricity

Energy Attribute Certificates (EACs) such as Renewable Energy Certificates (RECs) or Power Purchase Agreements (PPAs) are included in the baseline reported results:

✗ No

Results

Environmental Impact Assessment Results

IPCC AR6 GWP 100, TRACI 2.2,

per 1 metric ton of product.

LCIA results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins or risks.

Impact Category	Unit	Method	A1 - A3
GWP-total	kg CO2 eq	IPCC AR6 GWP 100	9.90e+1
GWP-fossil	kg CO2 eq	IPCC AR6 GWP 100	9.89e+1
GWP-biogenic	kg CO2 eq	IPCC AR6 GWP 100	4.74e-2
GWP-luluc	kg CO2 eq	IPCC AR6 GWP 100	1.44e-2
ODP	kg CFC 11 eq	TRACI 2.2	7.40e-7
AP	kg SO2 eq	TRACI 2.2	1.41e-1
EP-freshwater	kg P eq	TRACI 2.2	2.24e-1
POCP	kg O3 eq	TRACI 2.2	3.13e+0
HTP-c	CTUh	TRACI 2.2	9.38e-6
HTP-nc	CTUh	TRACI 2.2	8.34e-6
ETP-fw	CTUe	TRACI 2.2	4.40e+2
PM	kg PM2.5 eq	TRACI 2.2	1.61e-2
ND	ND	ND	ND

Note:

Not all abbreviated indicators listed below may be present in the results above. The inclusion of indicators varies based on PCR requirements.

Abbreviations:

GWP = Global Warming Potential, 100 years (may also be denoted as GWP-total, GWP-fossil (fossil fuels), GWP-biogenic (biogenic sources), GWP-luluc (land use and land use change)), ODP = Ozone Depletion Potential, AP = Acidification Potential, EP = Eutrophication Potential, SFP = Smog Formation Potential, POCP = Photochemical oxidant creation potential, ADP-Fossil = Abiotic depletion potential for fossil resources, ADP-Minerals&Metals = Abiotic depletion potential for non-fossil resources, WDP = Water deprivation potential, PM = Particulate Matter Emissions, IRP = Ionizing radiation, human health, ETP-fw = Eco-toxicity (freshwater), HTP-c = Human toxicity (cancer), HTP-nc = Human toxicity (non-cancer), SQP = Soil quality index.

Comparisons cannot be made between product-specific or industry average EPDs at the design stage of a project, before a building has been specified. Comparisons may be made between product-specific or industry average EPDs at the time of product purchase when product performance and specifications have been established and serve as a functional unit for comparison. Environmental impact results shall be converted to a functional unit basis before any comparison is attempted. Any comparison of EPDs shall be subject to the requirements of ISO 21930 or EN 15804. EPDs are not comparative assertions and are either not comparable or have limited comparability when they have different system boundaries. EPDs are not comparative assertions and are either not comparable or have limited comparability when they have different system boundaries, are based on different product category rules or are missing relevant environmental impacts. Such comparison can be inaccurate, and could lead to erroneous selection of materials or products which are higher-impact, at least in some impact categories.

Resource Use Indicator

per 1 metric ton of product.

Indicator	Unit	A1 - A3
RPRE	MJ	4.00e+1
RPRM	MJ	0
RPRT	MJ	4.00e+1
NRPRE	MJ	1.27e+2
NRPRM	MJ	0
NRPRT	MJ	1.27e+2
SM	kg	0
RSF	MJ	0
NRSF	MJ	0
FW	m3	1.32e-1
RE	MJ	0

Note:

Not all abbreviated indicators listed below may be present in the results above. The inclusion of indicators varies based on PCR requirements.

Abbreviations:

RPRE or PERE = Renewable primary resources used as energy carrier (fuel), RPRM or PERM = Renewable primary resources with energy content used as material, RPRT or PERT = Total use of renewable primary resources with energy content, NRPRE or PENRE = Non-renewable primary resources used as an energy carrier (fuel), NRPRM or PENRM = Non-renewable primary resources with energy content used as material, NRPRT or PENRT = Total non-renewable primary resources with energy content, SM = Secondary materials, RSF = Renewable secondary fuels, NRSF = Non-renewable secondary fuels, RE = Recovered energy, ADPF = Abiotic depletion potential, FW = Use of net freshwater resources, VOCs = Volatile Organic Compounds.

Waste and Output Flow Indicators

per 1 metric ton of product.

Indicator	Unit	A1 - A3
HWD	kg	0
NHWD	kg	7.96e-2
HLRW	kg	1.32e-8
ILLRW	kg	2.68e-8
CRU	kg	0
MFR	kg	0
MER	kg	0
EEE	MJ	0
EET	MJ	0

Note:

Not all abbreviated indicators listed below may be present in the results above. The inclusion of indicators varies based on PCR requirements.

Abbreviations:

HWD = Hazardous waste disposed, NHWD = Non-hazardous waste disposed, RWD = Radioactive waste disposed, HLRW = High-level radioactive waste, ILLRW = Intermediate- and low-level radioactive waste, CRU = Components for re-use, MFR or MR = Materials for recycling, MER = Materials for energy recovery, MNER = Materials for incineration, no energy recovery, EE or EEE = Recovered energy exported from the product system, EET = Exported thermal energy.

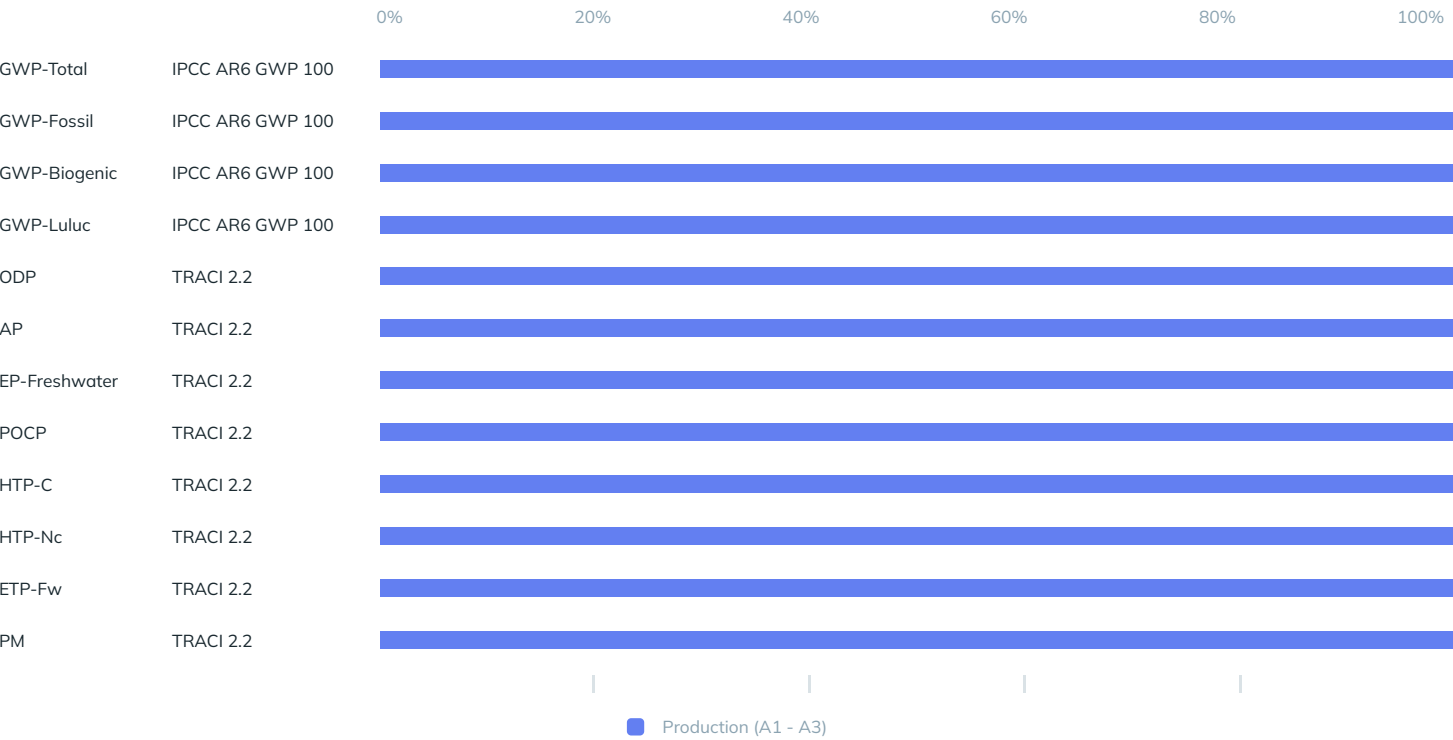
Interpretation

Ashcor fly ash production includes the extraction of the material from a fly ash dump site (A1), the transport to the production plant (A2) and the processing on the material (A3), which involves drying, controlled sizing, storage and truck loading and scaling. The manufacturing module (A3) drives most of the potential environmental impacts for Ashcor Technologies. These impacts come primarily from the plant processing of fly ash, secondly from the raw material extraction, and in a third place by the A2 transport from the dumps site to the plant.

Fly ash represents a waste product from coal production, therefore it follows the “polluter pays principle” stated in ISO 21930 (2017), where processes relevant to waste processing are assigned to the product system that generates the waste. Only the materials, water, energy, emissions, and other elementary flows associated with extracting, handling, transporting, sorting, and reprocessing from the point of the generating industrial process to their use in the SCM production process are considered, following Smart EPD Part B for SCM (2024).

Sensitivities

Several LCI data sources are older than ten years. These datasets, rated “poor” for temporal representativeness, were chosen due to lack of alternatives.



Additional Environmental Information

Ashcor transforms coal ash waste into a valuable resource. With over 25 years of industry expertise, we’ve pioneered our patented Reclaimed Ash Management (RAM™) technology to recover and process ash from ponds and landfills into premium pozzolans for concrete. The result: a consistent, sustainable supply that supports stronger infrastructure while reducing environmental impact.

As a supplementary cementitious material (SCM), Ashcor's fly ash plays a critical role in reducing carbon emissions associated with concrete production. By partially replacing cement—the most carbon-intensive component of concrete—SCMs significantly reduce CO₂ output.

References

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