

# Environmental Product Declaration



In accordance with ISO 14025 and EN 15804:2012+A2:2019 for:

## Recycled aggregate products

from

**Argent Materials Inc.**



Programme:

The International EPD® System, [www.environdec.com](http://www.environdec.com)

Programme operator:

EPD International AB

EPD registration number:

S-P-03101

Publication date:

2021-03-18

Valid until:

2026-03-09

*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](http://www.environdec.com)*



## General information

### Programme information

<b>Programme:</b>	The International EPD® System
<b>Address:</b>	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
<b>Website:</b>	<a href="http://www.environdec.com">www.environdec.com</a>
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CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product category rules (PCR): PCR 2019:14 Construction Products, version 1.1. UN CPC 89420
PCR review was conducted by: The Technical Committee of the International EPD® System. See <a href="http://www.environdec.com/about-us/the-international-epd-system-about-the-system">www.environdec.com/about-us/the-international-epd-system-about-the-system</a> for a list of members. Review chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat <a href="http://www.environdec.com/contact-us">www.environdec.com/contact-us</a>
Independent third-party verification of the declaration and data, according to ISO 14025:2006:  <input type="checkbox"/> EPD process certification <input checked="" type="checkbox"/> EPD verification
Third party verifier: <i>Håkan Strippel, IVL Swedish Environmental Research Institute</i> <i>P.O. Box 53021, SE-400 14 Gothenburg, Sweden</i> <i>Hakan.Strippel@IVL.se, www.IVL.se</i>
Accredited by: Håkan Strippel is an independent individual verifier in the International EPD® System.
Procedure for follow-up of data during EPD validity involves third party verifier:  <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

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

EPDs within the same product category but from different programmes may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804. It should be noted in particular that there are differences between the present version of EN 15804 and earlier versions. For further information about comparability, see EN 15804 and ISO 14025.

## Company information

Owner of the EPD: Argent Materials Inc.

Contact: Bill Crotinger, President, bill@argentmaterials.com

Website: www.argentmaterials.com

Description of the organization: Oakland's leading concrete and asphalt recycler. Argent Materials' core business is sorting, crushing, and recycling debris that result from the demolition of both large and small construction projects. Argent provides a reliable resource for aggregate products within the East Bay while contributing to local zero-waste goals by diverting construction debris from landfills and reducing the need for mining and quarrying.

Argent is firmly committed to sustainable development and utilizes renewable diesel fuels and 100 % renewable electricity to process their materials. Argent adapts to the needs of the construction world, while maintaining high quality products and respect for the environment.

Name and location of production site(s):



Argent Materials Inc., 8300 Baldwin Street, Oakland, CA 94621

## Product information

Product name: Recycled aggregate products.



Product description: Argent Materials operates sorting and crushing equipment to recycle construction and demolition waste into high-value aggregate products used for new construction projects. Argent accepts various construction debris materials for processing, including clean concrete, clean asphalt, oversize concrete with steel, and mixed concrete and asphalt. The current recycled aggregate products processed for sale vary in size and construction application, as illustrated and described in Table 1 below. All products are derived from one and the same manufacturing process.

Table 1 Recycled aggregate products covered by this EPD. Scale in pictures are in inches

Recycled aggregate products	Description
	<p><b>Class 2 AB</b> (Base Rock) (3/4 AB) (Road Base)</p> <p>1" base used as a compactable and gradable surface for under concrete or asphalt pavement and stone or brick paver pathways.</p>
	<p><b>3/4 Drain Rock</b> (ASTM #57) (Class 1 Type B) (San Francisco Pipe Bedding)</p> <p>A clean crushed aggregate ranging in size between 3/8" and 1". This material is used around drains and drain structures and in trenches for drainage.</p>

 <p>1 1/2 Drain Rock</p>	<p><b>1 1/2 Drain Rock</b></p>	<p>A crushed drainage rock ranging in size between 3/4" and 1 3/4". This material can be used for stability around drain boxes while allowing the required drainage.</p>
 <p>ASTM #2 1" x 3"</p>	<p><b>ASTM #2 (1 by 3)</b></p>	<p>A crushed aggregate ranging in size from 1" to 3". This material is primarily used as a bridging material to bring stability to subsurface areas that are unstable due to a high clay or mud content.</p>
 <p>3" x 5" Entry Construction Entrance Rock</p>	<p><b>Entry (3" x 5") (Construction Entrance Rock) (Site Entry)</b></p>	<p>A 3" by 5" crushed concrete product placed at construction entrances to clean the tires of exiting vehicles per storm water requirement.</p>
 <p>3/8 Pea Gravel Class 1 Type A</p>	<p><b>Pea Gravel (ASTM #8) (Class 1 type A)</b></p>	<p>A 3/8" sized crushed aggregate used for drainage in areas with tanks and trenchwork with limited access or may require placement by hand.</p>
 <p>Crushed Concrete Fines Utility Sand</p>	<p><b>Sand (Utility Sand) (Backfill Sand) (Concrete Sand)</b></p>	<p>A high-quality crushed concrete fines utility sand with particles ranging from minus #200 mesh to 1/4" used around utilities, for paver or stone path underlayment and for use in non-structural concrete.</p>



	<b>Backfill (3/8")</b> (Structural Backfill) (Engineered Fill) (Trench Backfill)	A high performing crushed compactible backfill used for subgrade, above grade and trench backfilling.
	<b>Class 2 Permeable</b>	A clean crushed compactible 1" minus aggregate used to provide a material used in areas requiring drainage and compaction.

UN CPC code: UN CPC 89420 (Non-metal waste and scrap recovery (recycling) services, on a fee or contract basis).

## LCA information

Functional unit/declared unit: 1 metric tonne of recycled aggregate products.

Reference service life: RSL is not relevant for this EPD.

Time representativeness: The data represent the year 2020.

Database(s) & LCA software used: LCA software GaBi (version 10.0.0.71), using GaBi Professional database and Ecoinvent 3.6.

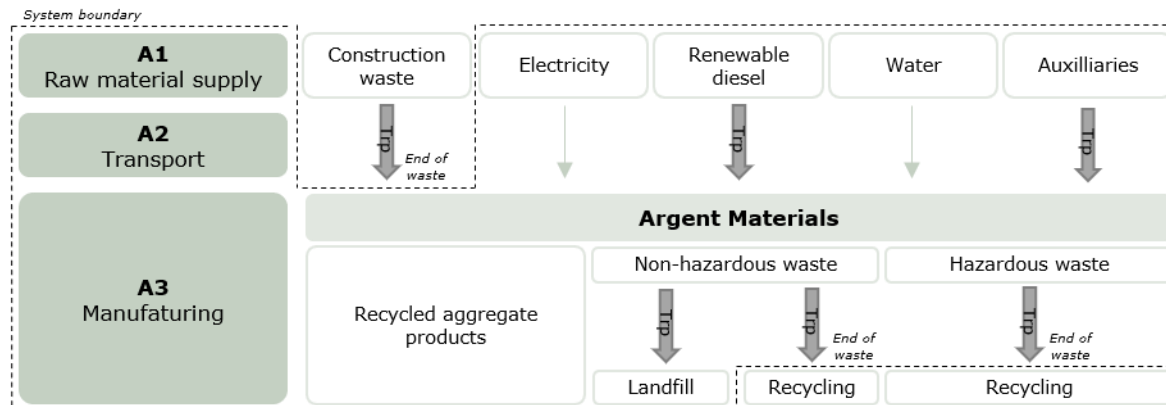
Units & Quantities: The International System of Units (SI units) is used, the thousand separator and decimal mark follows SI style English (i.e. 1 000.00). Three significant figures are applied for results.

### LCA practitioner(s):

Agnes Rönnblom & David Althoff Palm, Ramboll Sweden AB  
Ayah Hassan & Amy Malick, Ramboll US Consulting, Inc.

Description of system boundaries: Cradle to gate (A1-A3). The life cycle stages A4-A5, B, C and D were excluded from the assessment.

### System diagram:



### Manufacturing process:

The construction waste arriving at Argent Materials facility in Oakland is sourced from a variety of projects. When reaching the point of drop-off, the construction waste material is considered to have reached the end-of-waste state. Processes involved in the construction waste's previous life cycle, including its waste processing, are hence excluded in line with the Polluter Pays Principle.

### Cut-offs:

According to the PCR, the life cycle inventory data shall include a minimum of 95 % of total inflows (mass and energy) per life cycle module. A cut-off has been performed for equipment cleaning solvent, which amounts to 0.000004 % of total inflow of material resources used for manufacturing (2.7 % of inflow, not including from construction waste).

### Allocation:

All environmental impacts within the system boundaries are allocated to the recycled aggregate products.

### Data Quality:

In accordance with the PCR, specific data shall be used for (at least) the processes for which the producer has operational control, i.e. A3 for construction goods. All underlying data on amounts are specific data and have been obtained by measurements made during the year 2020. A data quality assessment on applied datasets has been performed in accordance with PEF and EN 15804:2012+A2:2019, Annex E.

### Greenhouse gas emission from the use of electricity in the manufacturing phase:

Argent has committed to 100 % Renewable Portfolio Standard, purchasing their electricity from East Bay Community Energy. The electricity mix is comprised of 50 % solar and 50 % wind power.

Electricity specification	Emissions of CO <sub>2</sub> equivalents	Unit
50/50 % wind/solar in the USA	0.0211	kg CO <sub>2</sub> eq./kWh

Modules declared, geographical scope, share of specific data (in GWP-GHG indicator) and data variation:

	Product stage		Construction process stage			Use stage							End of life stage				Resource recovery stage
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction 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	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Geography	USA	USA	USA	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Specific data used	66 %*			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	Not relevant					-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	Not relevant					-	-	-	-	-	-	-	-	-	-	-	-

\* Specific data for renewable diesel not available, which represents the remaining 34 %.

## Content information

Product components	Weight, kg	Post-consumer material, weight-%	Renewable material, weight-%
Construction waste	1000	100 %	0 %
TOTAL	1000	100 %	0 %
Packaging materials	Weight, kg	Weight-% (versus the product)	
TOTAL*	0	0 %	

\* No packaging materials.

Dangerous substances from the candidate list of SVHC for Authorization	EC No.	CAS No.	Weight-% per functional or declared unit
TOTAL*	-	-	0 %

\* No dangerous substances.



## Environmental Information

### Potential environmental impact – mandatory indicators according to EN 15804

Results per functional or declared unit			
Indicator		Unit	Total A1-A3
GWP	Fossil	kg CO <sub>2</sub> eq.	5.90E-01
	Biogenic	kg CO <sub>2</sub> eq.	1.00E-02
	LULUC	kg CO <sub>2</sub> eq.	8.22E-03
	Total	kg CO <sub>2</sub> eq.	6.03E-01
ODP		kg CFC 11 eq.	4.92E-08
AP		mol H <sup>+</sup> eq.	1.46E-02
EP	Freshwater	kg PO <sub>4</sub> <sup>3-</sup> eq.	3.06E-03
	Freshwater	kg P eq.	1.10E-04
	Marine	kg N eq.	7.00E-03
	Terrestrial	mol N eq.	7.60E-02
POCP		kg NMVOC eq.	1.93E-02
ADP	Minerals & metals*	kg Sb eq.	2.90E-05
	Fossil*	MJ	6.47E+00
WDP		m <sup>3</sup>	8.35E-01
Acronyms		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	

\* Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.

### Potential environmental impact – additional mandatory and voluntary indicators

Results per functional or declared unit			
Indicator		Unit	Total A1-A3
GWP	GHG <sup>1</sup>	kg CO <sub>2</sub> eq.	5.81E-01

<sup>1</sup> The indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is thus equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

## Use of resources

Results per functional or declared unit		
Indicator	Unit	Total A1-A3
PERE	MJ	9.96E+01
PERM	MJ	0.00E+00
PERT	MJ	9.96E+01
PENRE	MJ	6.48E+00
PENRM	MJ	0.00E+00
PENRT	MJ	6.48E+00
SM	kg	1.00E+03
RSF	MJ	0.00E+00
NRSF	MJ	0.00E+00
FW	m <sup>3</sup>	2.29E-02
Acronyms	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 re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water	

## Waste production and output flows

### Waste production

Results per functional or declared unit		
Indicator	Unit	Total A1-A3
Hazardous waste disposed	kg	1.26E-08
Non-hazardous waste disposed	kg	2.83E-01
Radioactive waste disposed	kg	7.27E-05

### Output flows

Results per functional or declared unit		
Indicator	Unit	Total A1-A3
Components for re-use	kg	0.00E+00
Material for recycling	kg	4.12E-01
Materials for energy recovery	kg	0.00E+00
Exported energy, electricity	MJ	0.00E+00
Exported energy, thermal	MJ	0.00E+00

## Information on biogenic carbon content

Results per functional or declared unit		
BIOGENIC CARBON CONTENT	Unit	QUANTITY
Biogenic carbon content in product	kg C	0
Biogenic carbon content in packaging*	kg C	0

\* No packaging.

## Additional information

No additional information.

## Differences versus previous versions

This is the first version of the EPD.

## References

General Programme Instructions of the International EPD® System. Version 3.01.

EN 15804:2012+A2:2019 Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products

Product Category Rules. PCR 2019:14 Construction Products. version 1.1

