



Pyrocrete Series Pyrocrete 239, 241, 341 & 40

Carboline's Pyrocrete products offer high-performance, cost-effective fire protection solutions for both interior and exterior steel structures and assemblies where the highest level of physical performance and durability are paramount. These wet mix, Portland cement based products have been formulated to meet any performance criteria and IBC building code requirements for commercial and industrial environments, providing specifiers the ultimate flexibility in design and construction. The Pyrocrete Series has been tested and certified for a variety of exposures and has successful performance in actual hydrocarbon fires in refining and petrochemical facilities around the world.



Performance dashboard

Features & functionality

Certifications include UL 263, ASTM E119, UL 1709, BS 476, Jet Fire

Cryogenic protection and fire protection in one
Asbestos-free – complies with EPA and OSHA regulations

Off-site and on-site application options

Cost effective fireproofing solution

Visit Carboline for more product information

[Pyrocrete 239](#)

[Pyrocrete 241](#)

[Pyrocrete 341](#)

[Pyrocrete 40](#)

Environment & materials

Improved by:

UL 1709 Rapid Rise Hydrocarbon Fire

BS476-20 Appendix D Hydrocarbon Pool Fire

NFPA 290 Torch & Hose Stream

FM Global (Factory Mutual)

Post-consumer recycled content used

Certifications & rating systems:

Environmental Product Declaration (EPD)

Tested and certified to the UL 2431 Durability of Fire Resistive Coatings and Materials, Category I-A

ASTM E84 - 0/0

SCAQMD Rule 1113 Compliant

Tested to meet (CDPH) Standard Method v1.2



MasterFormat® 07 81 00

Pyrocrete Series Product Data Sheets:

[Pyrocrete 239](#), [Pyrocrete 241](#), [Pyrocrete 341](#),

[Pyrocrete 40](#)

For spec help, [contact us](#) or call 281.414.9710

[See LCA, interpretation & rating systems](#)



SM Transparency Report (EPD)™

VERIFICATION

LCA

3rd-party reviewed



Transparency Report (EPD)

3rd-party verified



The declaration is intended for use in Business-to-Consumer (B-to-C) communication.

Validity: 20230213 – 20280212

Decl #: CAR-20230213-004

This environmental product declaration (EPD) was externally verified, according to ASTM PCR for Spray-applied Fire Resistive Materials, and ISO 14025:2006, by Jack Geibig, President, Ecoform.

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SUMMARY

Reference PCR

ASTM PCR for Spray-applied Fire Resistive Materials

Regions; system boundaries

North America; Cradle to gate

Declared unit / reference service life:

1,000 kg of product

LCIA methodology: TRACI 2.1

LCA software; LCI database

SimaPro Developer 9.4
EcoInvent 3.8, US-EI 2.2, and ELCD databases.

LCA conducted by: Sustainable Minds

Public LCA:

Life Cycle Assessment of Carboline Spray-Applied Fire-Resistive Materials

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Contact us

LCA results & interpretation

Pyrocrete Series

Life cycle assessment

Scope and summary

Cradle to gate Cradle to gate with options Cradle to grave

Product description

Carboline's Pyrocrete products are Portland cement-based, cementitious fireproofing that is mixed with clean, potable water onsite before application. The products are spray applied to the substrate using either piston or rotor stator or squeeze type pumps. Pyrocrete products provide fire protection for structural steel and can also be used to upgrade the fire resistance of existing concrete. They are high density cementitious fireproofing products designed for the fire protection of exterior and interior structural steel.

Carboline's Pyrocrete series includes four products: Pyrocrete 239, Pyrocrete 241, Pyrocrete 341, and Pyrocrete 40. The impacts are presented for these four products covered in this report. The kraft paper bag packaging weight for these products as delivered are 1.66 kg, 1.54 kg, 0.56kg, and 1.66 kg, respectively.

Declared unit

The declared unit is 1,000 kg of product. The results in this report are expressed in terms of potential impacts per 1,000 kg of product from cradle to gate.

Manufacturing data

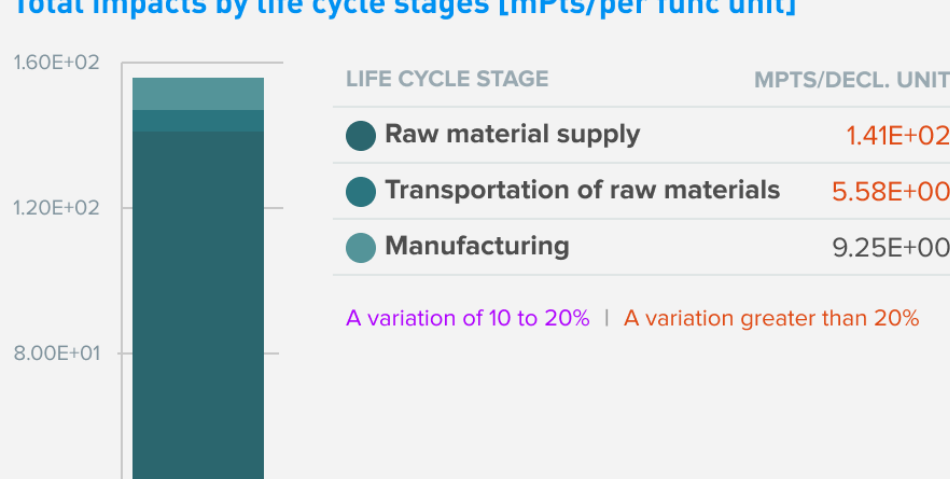
Time coverage: The data covers annual manufacturing data for the 2021 calendar year from Carboline's manufacturing plant in Lake Charles, Louisiana. This period of time was chosen in order to capture a representative picture of businesses activities at Carboline.

Geographical coverage: The geographical coverage for this study is based on United States system boundaries for all processes and products.

Material composition greater than 1% by weight

MATERIAL	AVG % WT.
Cement	50-60%
Mica	10-20%
Vermiculite	10-20%
Ceramic	10-20%
Thickener	5-10%
Additives	5-10%

Total impacts by life cycle stages [mPts/per func unit]



What's causing the greatest impacts

All life cycle stages

Activities during the supply of raw materials (A1) are responsible for much of the impacts in each impact category. The next highest impact contributor is manufacturing (A3) in most of the impact categories.

Raw material supply

Raw material supply (A1) includes raw material extraction and upstream processing. This module dominates the results for most of the impact categories. For example, A1 accounts for over 65% of the impact of global warming, smog, and acidification. It also contributes to over 50% of ozone depletion and eutrophication.

Transportation

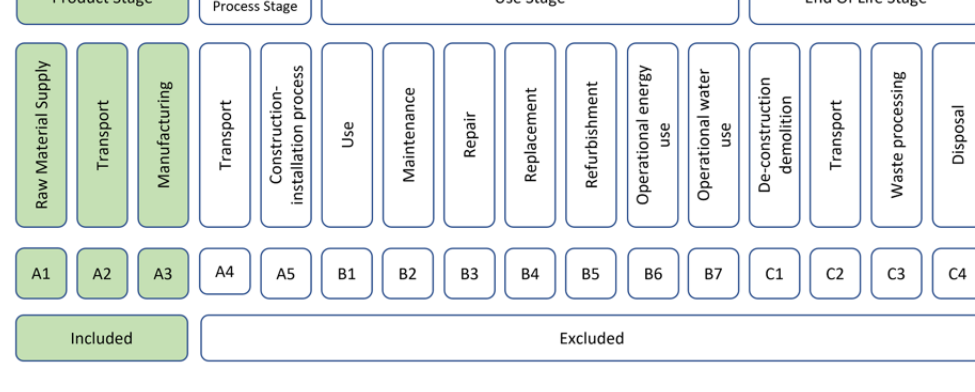
Average transportation distances and modes of transport are included for the transportation of raw materials to the production facility. Typical vehicles used include trucks and ships. Transportation of raw materials is a relatively small contributor to all product life cycle impacts.

Manufacturing

Manufacturing (A3) is the second highest contributor to eight impact categories for Pyrocrete 239, seven impact categories for Pyrocrete 241, five impact categories for Pyrocrete 341, and six impact categories for Pyrocrete 40.

System boundary

The figure below illustrates the system boundary for the LCA, defining which life cycle stages are included and which are excluded. For this report, the system boundary is cradle-to-gate, which includes modules A1, A2, and A3: raw materials extraction, processing, transportation, and manufacturing/final assembly for both the product and its associated packaging. All other life cycle stages are excluded from the analysis.



Sensitivity analysis

Sensitivity analyses were performed to check the robustness of the results where the highest potential environmental impacts are occurring. As the bulk of impacts are attributed to raw materials acquisition and processing, the mass of specified raw materials was changed by +/-20%. These raw materials were chosen based on a combination of relatively higher contribution to the results.

Global warming potential was evaluated for sensitivity since Carboline is interested in the potential CO2-equivalent emissions of its products. The range of change in total life cycle impacts was in a +/-6-12% change.

Carboline is committed to finding new and efficient alternatives in manufacturing, raw material sourcing, and logistics to improve sustainability efforts. One of Carboline's most impactful contributions is the creation of the SLOB Program (slow moving and obsolete inventory). To reduce hazardous waste generation, the SLOB Program was designed to provide optics to Carboline's Inventory Analytics Team to review inventory close to expiration. Preventative measures are taken to rework inventory or sell this material at a discounted rate, with the ultimate goal of preventing little to zero waste of unused material. As an RPM company, Carboline is dedicated to working towards reaching the goals that have been set through RPM's Building a Better World Program. These goals include reducing energy consumption, landfill contributions, and water reuse/conservation opportunities.

[See how we make it greener](#)

LCA results

LIFE CYCLE STAGE	PRODUCTION STAGE	PRODUCTION STAGE	PRODUCTION STAGE
Information modules: Included (X) Excluded* (MND)	A1 Raw material supply	A2 Transport	A3 Manufacturing
*Modules A4, A5, B, C, and D are excluded.			

SM Single Score [Learn about SM Single Score results](#)

Impacts per 1,000kg of coating	1.41E+02 mPts	5.58E+00 mPts	9.25E+00 mPts
Materials or processes contributing >20% to total impacts in each life cycle stage	Energy used for raw material extraction (electricity and fuels).	Truck and trailer transportation (fuel consumption).	Energy and electricity consumed for coating production.

Pyrocrete 239: TRACI v2.1 results per declared unit

LIFE CYCLE STAGE	A1 RAW MATERIAL SUPPLY	A2 TRANSPORT	A3 MANUFACTURING
------------------	------------------------	--------------	------------------

Ecological damage

Impact category	Unit	A1	A2	A3
Acidification	kg SO ₂ eq	2.10E+00	1.00E-01	4.73E-01
Eutrophication	kg N eq	3.36E-01	1.95E-02	1.52E-01
Global warming (embodied carbon)	kg CO ₂ eq	6.41E+02	5.33E+01	1.78E+02
Ozone depletion	kg CFC-11 eq	2.85E-05	1.27E-05	7.59E-06

Human health damage

Impact category	Unit	A1	A2	A3
Carcinogenics	CTU _h	1.89E-05	4.89E-08	1.05E-06
Non-carcinogenics	CTU _h	6.01E-05	7.45E-06	8.85E-06
Respiratory effects	kg PM _{2.5} eq	2.80E-01	1.91E-02	6.86E-02
Smog	kg O ₃ eq	3.73E+01	1.32E+00	6.97E+00

Additional environmental information

Impact category	Unit	A1	A2	A3
Fossil fuel depletion	MJ, LHV	3.38E+02	1.13E+02	2.44E+02
Ecotoxicity	CTU _e	4.10E+02	1.51E+02	2.14E+02

See the additional content required by the ASTM PCR for spray-applied fire-resistive materials on page 4 of the [Transparency Report PDF](#).

Pyrocrete 241: TRACI v2.1 results per declared unit

LIFE CYCLE STAGE	A1 RAW MATERIAL SUPPLY	A2 TRANSPORT	A3 MANUFACTURING
------------------	------------------------	--------------	------------------

Ecological damage

Impact category	Unit	A1	A2	A3
Acidification	kg SO ₂ eq	2.19E+00	1.38E-01	4.52E-01
Eutrophication	kg N eq	1.88E-01	2.89E-02	1.59E-01
Global warming - IPCC (Embodied Carbon)	kg CO ₂ eq	5.78E+02	7.97E+01	1.94E+02
Ozone depletion	kg CFC-11 eq	3.31E-05	1.90E-05	7.33E-06

Human health damage

Impact category	Unit	A1	A2	A3
Carcinogenics	CTU _h	8.32E-05	7.31E-08	1.07E-06
Non-carcinogenics	CTU _h	1.61E-04	1.12E-05	8.48E-06
Respiratory effects	kg PM _{2.5} eq	3.09E-01	2.79E-02	6.46E-02
Smog	kg O ₃ eq	3.18E+01	1.78E+00	6.61E+00

Additional environmental information

Impact category	Unit	A1	A2	A3
Fossil fuel depletion	MJ, LHV	3.39E+02	1.69E+02	2.41E+02
Ecotoxicity	CTU _e	1.12E+03	2.26E+02	2.05E+02

See the additional content required by the ASTM PCR for spray-applied fire-resistive materials on page 4 of the [Transparency Report PDF](#).

Pyrocrete 341: TRACI v2.1 results per declared unit

LIFE CYCLE STAGE	A1 RAW MATERIAL SUPPLY	A2 TRANSPORT	A3 MANUFACTURING
------------------	------------------------	--------------	------------------

Ecological damage

Impact category	Unit	A1	A2	A3
Acidification	kg SO ₂ eq	2.91E+00	2.26E-01	2.70E-01
Eutrophication	kg N eq	3.36E-01	4.39E-02	1.17E-01
Global warming - IPCC (Embodied Carbon)	kg CO ₂ eq	9.57E+02	1.20E+02	1.98E+02
Ozone depletion	kg CFC-11 eq	7.00E-05	2.85E-05	5.01E-06

Human health damage

Impact category	Unit	A1	A2	A3
Carcinogenics	CTU _h	7.33E-05	1.10E-07	6.96E-07
Non-carcinogenics	CTU _h	1.65E-04	1.67E-05	4.51E-06
Respiratory effects	kg PM _{2.5} eq	2.58E+00	4.28E-02	3.02E-02
Smog	kg O ₃ eq	4.18E+01	2.99E+00	3.43E+00

Additional environmental information

Impact category	Unit	A1	A2	A3
Fossil fuel depletion	MJ, LHV	1.31E+03	2.53E+02	2.13E+02
Ecotoxicity	CTU _e	1.16E+03	3.38E+02	9.94E+01

See the additional content required by the ASTM PCR for spray-applied fire-resistive materials on page 4 of the [Transparency Report PDF](#).

Pyrocrete 40: TRACI v2.1 results per declared unit

LIFE CYCLE STAGE	A1 RAW MATERIAL SUPPLY	A2 TRANSPORT	A3 MANUFACTURING
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Ecological damage

Impact category	Unit	A1	A2	A3
Acidification	kg SO ₂ eq	2.13E+00	1.65E-01	4.75E-01
Eutrophication	kg N eq	2.82E-01	3.31E-02	1.66E-01
Global warming - IPCC (Embodied Carbon)	kg CO ₂ eq	6.60E+02	9.07E+01	1.96E+02
Ozone depletion	kg CFC-11 eq	2.98E-05	2.16E-05	7.61E-06

Human health damage

Impact category	Unit	A1	A2	A3
Carcinogenics	CTU _h	4.95E-05	8.31E-08	1.12E-06
Non-carcinogenics	CTU _h	6.92E-05	1.27E-05	8.97E-06
Respiratory effects	kg PM _{2.5} eq	3.13E-01	3.21E-02	6.88E-02
Smog	kg O ₃ eq	3.39E+01	2.15E+00	7.00E+00

Additional environmental information

Impact category	Unit	A1	A2	A3
Fossil fuel depletion	MJ, LHV	4.79E+02	1.92E+02	2.44E+02
Ecotoxicity	CTU _e	7.01E+02	2.57E+02	2.19E+02

See the additional content required by the ASTM PCR for spray-applied fire-resistive materials on page 4 of the [Transparency Report PDF](#).

References

LCA Background Report

Carboline Spray-Applied Fire-Resistive Materials LCA Background Report (public version), Carboline 2022; SimaPro Analyst 9.4; Ecoinvent 3.4 and US ecoinvent (US-EI 2.2) database; TRACI 2.1

PCRs

Valid for Spray-applied Fire-Resistive Materials (SFRM)

Valid through Feb. 29, 2023. PCR review conducted by Thomas P. Gloria (Industrial Ecology Consultants), Ph. D.; Jeffrey E. Gould (FM Approvals); Karl D. Houser, (Intertek Building and Construction).

ISO 14025, "Sustainability in buildings and civil engineering works -- Core rules for environmental product declarations of construction products and services"

Download PDF SM Transparency Report, which includes the additional EPD content required by the ASTM PCR.

SM Transparency Reports (TR) are ISO 14025 Type III environmental declarations (EPD) that enable purchasers and users to compare the potential environmental performance of products on a life cycle basis. Environmental declarations from different programs (using different PCR) may not be comparable. In order to support comparative assertions, this EPD meets all comparability requirements stated in ISO 14025:2006. However, differences in certain assumptions, data quality, and variability between LCA data sets may still exist. As such, caution should be exercised when evaluating EPDs from different manufacturers, as the EPD results may not be entirely comparable. Any EPD comparison must be carried out at the building level per ISO 21930 guidelines. The results of this EPD reflect an average performance by the product and its actual impacts may vary on a case-to-case basis.

Rating systems

The intent is to reward project teams for selecting products from manufacturers who have verified improved life-cycle environmental performance.

LEED BD+C: New Construction | v4 - LEED v4

Building product disclosure and optimization

Environmental product declarations

<input type="radio"/> Industry-wide (generic) EPD	1/2 product
<input checked="" type="radio"/> Product-specific Type III EPD	1 product

LEED BD+C: New Construction | v4.1 - LEED v4.1

Building product disclosure and optimization

Environmental product declarations

<input type="radio"/> Industry-wide (generic) EPD	1 product
<input checked="" type="radio"/> Product-specific Type III EPD	1.5 product

BREEAM New Construction 2018

Mat 02 - Environmental impacts from construction products

Environmental Product Declarations (EPD)

<input type="radio"/> Industry-average EPD	.5 points
<input type="radio"/> Multi-product specific EPD	.75 points
<input checked="" type="radio"/> Product-specific EPD	1 point

SM Transparency Report (EPD)™

VERIFICATION
3rd-party reviewed
Transparency Report (EPD)
3rd-party verified

The declaration is intended for use in Business-to-Consumer (B-to-C) communication.
Validity: 20230213 – 20280212
Decl #: CAR-20230213-004

This environmental product declaration (EPD) was externally verified, according to ASTM PCR for Spray-applied Fire Resistive Materials, and ISO 14025:2006, by Jack Geibig, President, Ecoform.

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SUMMARY

Reference PCR
ASTM PCR for Spray-applied Fire Resistive Materials
Regions; system boundaries
North America; Cradle to gate

Declared unit / reference service life:
1,000 kg of product
LCA methodology: TRACI 2.1
LCA software; LCI database
SimaPro Developer 9.4
EcoInvent 3.8, US-EI 2.2, and ELCD databases.

LCA conducted by: Sustainable Minds

Public LCA:
Life Cycle Assessment of Carboline Spray-Applied Fire-Resistive Materials

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Contact us

How we make it greener

Pyrocrete Series

Collapse all

[See LCA results by life cycle stage](#)

RAW MATERIAL ACQUISITION

Carboline is dedicated to improving raw material sustainability efforts. These initiatives include researching alternative methods to acquire raw materials, while being conscience of their environmental impact and opting for suppliers who place emphasis on sustainable manufacturing techniques/renewable energy processes.



TRANSPORTATION

In an effort to reduce multiple long distance LTL shipments, Carboline has initiated pooling orders from local warehousing sites vs. shipping individual orders from multiple manufacturing and warehousing locations throughout the country.



MANUFACTURING

Carboline is always exploring solutions to reduce energy usage throughout the production process. Some of these initiatives include –

- Installing VFD drives to reduce electrical usage for mixing units
- Upgrading air driers with the intent of generating better air, which could result in using less air in the production process
- Researching solar installation at Carboline’s Dayton, Nevada manufacturing site



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Contact us

**Additional EPD content required by:
ASTM PCR: Spray-applied Fire-Resistive Materials (SFRM)**

Pyrocrete Series

Data

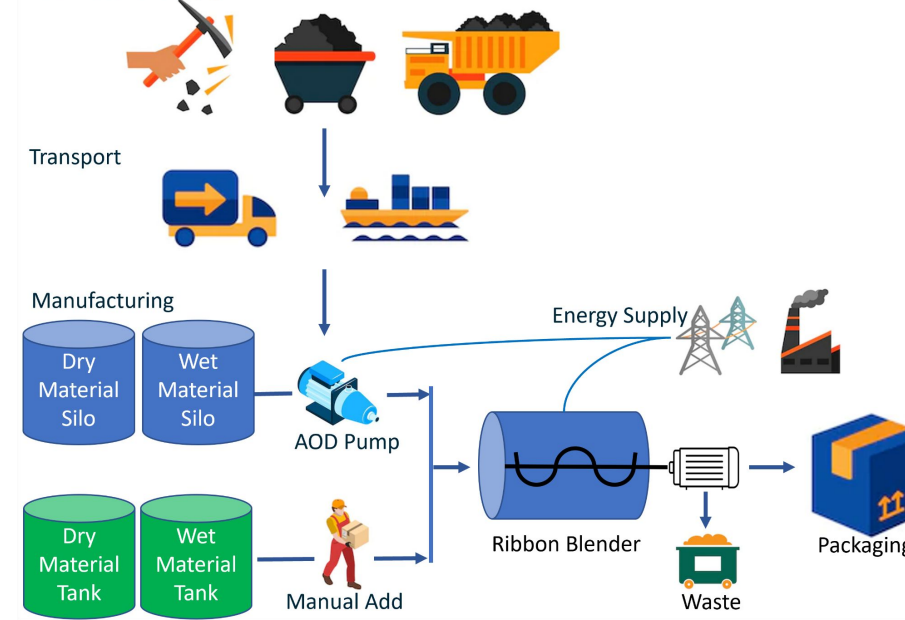
Background This product-specific declaration was created by collecting life cycle data for the Pyrocrete Series for a declared unit of 1,000 kg of product. Data adopted in the model include ecoinvent v3, US-EI 2.2, and ELCD databases.

Allocation The manufacturing inputs that needed allocation were electricity and natural gas since there are only one electric use meter and one gas use meter that include the production of multiple Carboline fire-resistive materials. The allocation of electricity and natural gas were based on the percentage of production for the individual product divided by total site production output. In addition, there is no co-product produced in the manufacturing process.

Cut-off criteria A minimum of 95% of the total mass, energy, and environmental relevance for the system were captured. The total of neglected input flows per module does not exceed 5% of energy usage, mass, and environmental impacts. The cut-off rules do not apply to hazardous and toxic properties, which must be listed even when the given process unit is under the cut-off criterion. No known flows are deliberately excluded from this declaration; therefore, these criteria have been met. No biogenic carbon enters the product system.

Quality All primary data were collected for one year to ensure representativeness of annual business activities and post-consumer contents. Except for overseas transportation, secondary datasets for the US were used since Carboline products are expected to be applied in the US.

Flow Diagram:



Scenarios and additional technical information

PARAMETER (for 1,000 kg finished product)	VALUE	UNIT
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Additional technical information

Color	Non-Uniform, Speckled Gray	
Application Thickness (Initial pass)	Pyrocrete 239 & 241 & 40 1/2" - 5/8" (12.7 - 15.9 mm) Pyrocrete 341 3/4" - 1 1/2" (19 - 38.1 mm)	
Preferred waste management option for used products	Landfill	

The reinforcement is not relevant to the products.
Pyrocrete series does not contain any materials considered hazardous that must be reported.

Product Stage [A1-A3]

Road - Vehicle type	Lorry, 16-32 ton
Ocean - Vehicle type	Ocean freight
Scrap in production	0.8 - 2.9 %
Packaging for finished products	Kraft paper bag
Associated packaging Pyrocrete 239	0.073 %
Associated packaging Pyrocrete 241	0.068 %
Associated packaging Pyrocrete 341	0.025 %
Associated packaging Pyrocrete 40	0.073 %

Major assumptions and limitations:

- Material input and transportation distances are averages and do not reflect changes in material efficiency and supplier locations.
- Proxy materials were used when matching secondary data sets were not identified.
- Generic data sets used for material inputs, transport, and waste processing are considered good quality, but actual impacts from material suppliers, transport carriers, and local waste processing may vary.
- LCA results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins or risks.
- This EPD covers only the cradle-to-gate impacts of products using a declared unit. The results listed in this EPD cannot be used to compare between products.

Major system boundary exclusions:

- Capital goods & infrastructure; maintenance and operation of support equipment;
- Manufacture & transport of packaging materials not associated with final product;
- Human labor and employee transport;
- Building operational energy and water use not associated with final product.

Pyrocrete 239: LCIA results, resource use, output and waste flows, and carbon emissions & removals per declared unit

Parameter	Unit	A1	A2	A3	Total
LCIA results (per 1,000kg)					
Ozone depletion	kg CFC-11 eq	2.85E-05	1.27E-05	7.59E-06	4.88E-05
Global warming	kg CO ₂ eq	6.41E+02	5.33E+01	1.78E+02	8.72E+02
Smog	kg O ₃ eq	3.73E+01	1.32E+00	6.97E+00	4.56E+01
Acidification	kg SO ₂ eq	2.10E+00	1.00E-01	4.73E-01	2.68E+00
Eutrophication	kg N eq	3.36E-01	1.95E-02	1.52E-01	5.08E-01
Carcinogenics	CTUh	1.89E-05	4.89E-08	1.05E-06	2.00E-05
Non-carcinogenics	CTUh	6.01E-05	7.45E-06	8.85E-06	7.64E-05
Respiratory effects	kg PM _{2.5} eq	2.80E-01	1.91E-02	6.86E-02	3.68E-01
Ecotoxicity	CTUe	4.10E+02	1.51E+02	2.14E+02	7.75E+02
Fossil fuel depletion	MJ surplus	3.38E+02	113E+02	2.44E+02	6.95E+02
Total primary energy consumption					
Nonrenewable fossil	MJ, HHV	3.37E+03	8.00E+02	1.96E+03	6.14E+03
Nonrenewable nuclear	MJ, HHV	2.59E+02	8.25E-01	1.86E+02	4.46E+02
Renewable (solar, wind, hydroelectric, and geothermal)	MJ, HHV	1.19E+02	7.20E-01	3.88E+01	1.59E+02
Renewable (biomass)	MJ, HHV	4.90E+02	2.62E-01	2.54E+03	3.03E+03
Material resources consumption					
Nonrenewable material resources	kg	0	0	9.96E+02	9.96E+02
Renewable material resources	kg	0	0	7.30E+01	7.30E+01
Net fresh water	m ³	2.34E+01	2.30E-01	9.25E+00	3.28E+01
Nonhazardous waste generated	kg	0	0	1.94E-01	1.94E-01
Hazardous waste generated	kg	0	0	0	0
Carbon emissions and removals					
Biogenic Carbon Removal from Product	kg CO ₂	0	0	0	0
Biogenic Carbon Emission from Product	kg CO ₂	0	0	0	0
Biogenic Carbon Removal from Packaging	kg CO ₂	0	0	3.22E+01	3.22E+01
Biogenic Carbon Emission from Packaging	kg CO ₂	0	0	0	0
Biogenic Carbon Emission from Combustion of Waste from Renewable Sources Used in Production Processes	kg CO ₂	0	0	0	0
Calcination Carbon Emissions	kg CO ₂	0	0	0	0
Carbonation Carbon Removals	kg CO ₂	0	0	0	0
Carbon Emissions from Combustion of Waste from Non-Renewable Sources used in Production Processes	kg CO ₂	0	0	0	0

Pyrocrete 241: LCIA results, resource use, output and waste flows, and carbon emissions & removals per declared unit

Parameter	Unit	A1	A2	A3	Total
LCIA results (per 1,000kg)					
Ozone depletion	kg CFC-11 eq	3.31E-05	1.90E-05	7.33E-06	5.94E-05
Global warming	kg CO ₂ eq	5.78E+02	7.97E+01	1.94E+02	8.51E+02
Smog	kg O ₃ eq	3.18E+01	1.78E+00	6.61E+00	4.02E+01
Acidification	kg SO ₂ eq	2.19E+00	1.38E-01	4.52E-01	2.78E+00
Eutrophication	kg N eq	1.88E-01	2.89E-02	1.59E-01	3.75E-01
Carcinogenics	CTUh	8.32E-05	7.31E-08	1.07E-06	8.44E-05
Non-carcinogenics	CTUh	1.61E-04	1.12E-05	8.48E-06	1.81E-04
Respiratory effects	kg PM _{2.5} eq	3.09E-01	2.79E-02	6.46E-02	4.01E-01
Ecotoxicity	CTUe	1.12E+03	2.26E+02	2.05E+02	1.55E+03
Fossil fuel depletion	MJ surplus	3.39E+02	1.69E+02	2.41E+02	7.49E+02
Total primary energy consumption					
Nonrenewable fossil	MJ, HHV	3.70E+03	1.20E+03	1.93E+03	6.82E+03
Nonrenewable nuclear	MJ, HHV	4.27E+02	1.23E+00	1.83E+02	6.12E+02
Renewable (solar, wind, hydroelectric, and geothermal)	MJ, HHV	8.59E+02	1.08E+00	3.66E+01	8.97E+02
Renewable (biomass)	MJ, HHV	3.61E+01	3.92E-01	2.36E+03	2.40E+03
Material resources consumption					
Nonrenewable material resources	kg	0	0	1.00E+03	1.00E+03
Renewable material resources	kg	0	0	6.78E+01	6.78E+01
Net fresh water	m ³	2.46E+01	2.97E-01	6.56E+00	3.15E+01
Nonhazardous waste generated	kg	0	0	5.13E-02	5.13E-02
Hazardous waste generated	kg	0	0	0	0
Carbon emissions and removals					
Biogenic Carbon Removal from Product	kg CO ₂	0	0	0	0
Biogenic Carbon Emission from Product	kg CO ₂	0	0	0	0
Biogenic Carbon Removal from Packaging	kg CO ₂	0	0	2.99E+01	2.99E+01
Biogenic Carbon Emission from Packaging	kg CO ₂	0	0	0	0
Biogenic Carbon Emission from Combustion of Waste from Renewable Sources Used in Production Processes	kg CO ₂	0	0	0	0
Calcination Carbon Emissions	kg CO ₂	0	0	0	0
Carbonation Carbon Removals	kg CO ₂	0	0	0	0
Carbon Emissions from Combustion of Waste from Non-Renewable Sources used in Production Processes	kg CO ₂	0	0	0	0

Pyrocrete 341: LCIA results, resource use, output and waste flows, and carbon emissions & removals per declared unit

Parameter	Unit	A1	A2	A3	Total
LCIA results (per 1,000kg)					
Ozone depletion	kg CFC-11 eq	7.00E-05	2.85E-05	5.01E-06	1.04E-04
Global warming	kg CO ₂ eq	9.57E+02	1.20E+02	1.98E+02	1.27E+03
Smog	kg O ₃ eq	4.18E+01	2.99E+00	3.43E+00	4.83E+01
Acidification	kg SO ₂ eq	2.91E+00	2.26E-01	2.70E-01	3.41E+00
Eutrophication	kg N eq	3.36E-01	4.39E-02	1.77E-01	4.96E-01
Carcinogenics	CTUh	7.33E-05	1.10E-07	6.96E-07	7.41E-05
Non-carcinogenics	CTUh	1.65E-04	1.67E-05	4.51E-06	1.86E-04
Respiratory effects	kg PM _{2.5} eq	2.58E+00	4.28E-02	3.02E-02	2.65E+00
Ecotoxicity	CTUe	1.16E+03	3.38E+02	9.94E+01	1.59E+03
Fossil fuel depletion	MJ surplus	1.31E+03	2.53E+02	2.13E+02	1.78E+03
Total primary energy consumption					
Nonrenewable fossil	MJ, HHV	1.12E+04	1.79E+03	1.60E+03	1.46E+04
Nonrenewable nuclear	MJ, HHV	7.30E+02	1.85E+00	1.59E+02	8.91E+02
Renewable (solar, wind, hydroelectric, and geothermal)	MJ, HHV	3.25E+02	1.61E+00	1.80E+01	3.45E+02
Renewable (biomass)	MJ, HHV	1.07E+02	5.89E-01	8.63E+02	9.70E+02
Material resources consumption					
Nonrenewable material resources	kg	0	0	9.62E+02	9.62E+02
Renewable material resources	kg	0	0	2.46E+01	2.46E+01
Net fresh water	m ³	3.60E+01	3.62E-01	2.03E+00	3.83E+01
Nonhazardous waste generated	kg	0	0	4.59E-01	4.59E-01
Hazardous waste generated	kg	0	0	0	0
Carbon emissions and removals					
Biogenic Carbon Removal from Product	kg CO ₂	0	0	0	0
Biogenic Carbon Emission from Product	kg CO ₂	0	0	0	0
Biogenic Carbon Removal from Packaging	kg CO ₂	0	0	9.88E+00	9.88E+00
Biogenic Carbon Emission from Packaging	kg CO ₂	0	0	0	0
Biogenic Carbon Emission from Combustion of Waste from Renewable Sources Used in Production Processes	kg CO ₂	0	0	0	0
Calcination Carbon Emissions	kg CO ₂	0	0	0	0
Carbonation Carbon Removals	kg CO ₂	0	0	0	0
Carbon Emissions from Combustion of Waste from Non-Renewable Sources used in Production Processes	kg CO ₂	0	0	0	0

Pyrocrete 40: LCIA results, resource use, output and waste flows, and carbon emissions & removals per declared unit

Parameter	Unit	A1	A2	A3	Total
LCIA results (per 1,000kg)					
Ozone depletion	kg CFC-11 eq	2.98E-05	2.16E-05	7.61E-06	5.90E-05
Global warming	kg CO ₂ eq	6.60E+02	9.07E+01	1.96E+02	9.47E+02
Smog	kg O ₃ eq	3.39E+01	2.15E+00	7.00E+00	4.31E+01
Acidification	kg SO ₂ eq	2.13E+00	1.65E-01	4.75E-01	2.77E+00
Eutrophication	kg N eq	2.82E-01	3.31E-02	1.66E-01	4.82E-01
Carcinogenics	CTUh	4.95E-05	8.31E-08	1.12E-06	5.07E-05
Non-carcinogenics	CTUh	6.92E-05	1.27E-05	8.97E-06	9.09E-05
Respiratory effects	kg PM _{2.5} eq	3.13E-01	3.21E-02	6.88E-02	4.14E-01
Ecotoxicity	CTUe	7.01E+02	2.57E+02	2.19E+02	1.18E+03
Fossil fuel depletion	MJ surplus	4.79E+02	1.92E+02	2.44E+02	9.16E+02
Total primary energy consumption					
Nonrenewable fossil	MJ, HHV	4.32E+03	1.36E+03	1.97E+03	7.65E+03
Nonrenewable nuclear	MJ, HHV	6.00E+02	1.40E+00	1.86E+02	7.88E+02
Renewable (solar, wind, hydroelectric, and geothermal)	MJ, HHV	2.02E+03	1.22E+00	3.88E+01	2.06E+03
Renewable (biomass)	MJ, HHV	9.26E+01	4.46E-01	2.54E+03	2.63E+03
Material resources consumption					
Nonrenewable material resources	kg	0	0	9.94E+02	9.94E+02
Renewable material resources	kg	0	0	7.30E+01	7.30E+01
Net fresh water	m ³	2.47E+01	4.18E-01	9.73E+00	3.49E+01
Nonhazardous waste generated	kg	0	0	5.76E-01	5.76E-01
Hazardous waste generated	kg	0	0	0	0
Output flows and waste category indicators					
Hazardous waste disposed	kg	0	0	0	0
Non-hazardous waste disposed	kg	0	0	5.76E-01	5.76E-01
High-level radioactive waste, conditioned, to final repository	kg	6.70E-01	4.42E-04	1.82E-02	6.88E-01
Intermediate- and low-level radioactive waste, conditioned, to final repository	kg	3.03E-04	1.90E-04	6.09E-05	5.54E-04
Components for re-use	kg	0	0	0	0
Materials for recycling	kg	0	0	0	0
Materials for energy recovery	kg	0	0	0	0
Exported energy	MJ, HHV	0	0	0	0
Carbon emissions and removals					
Biogenic Carbon Removal from Product	kg CO ₂	0	0	0	0
Biogenic Carbon Emission from Product	kg CO ₂	0	0	0	0
Biogenic Carbon Removal from Packaging	kg CO ₂	0	0	3.22E+01	3.22E+01
Biogenic Carbon Emission from Packaging	kg CO ₂	0	0	0	0
Biogenic Carbon Emission from Combustion of Waste from Renewable Sources Used in Production Processes	kg CO ₂	0	0	0	0
Calcination Carbon Emissions	kg CO ₂	0	0	0	0
Carbonation Carbon Removals	kg CO ₂	0	0	0	0
Carbon Emissions from Combustion of Waste from Non-Renewable Sources used in Production Processes	kg CO ₂	0	0	0	0