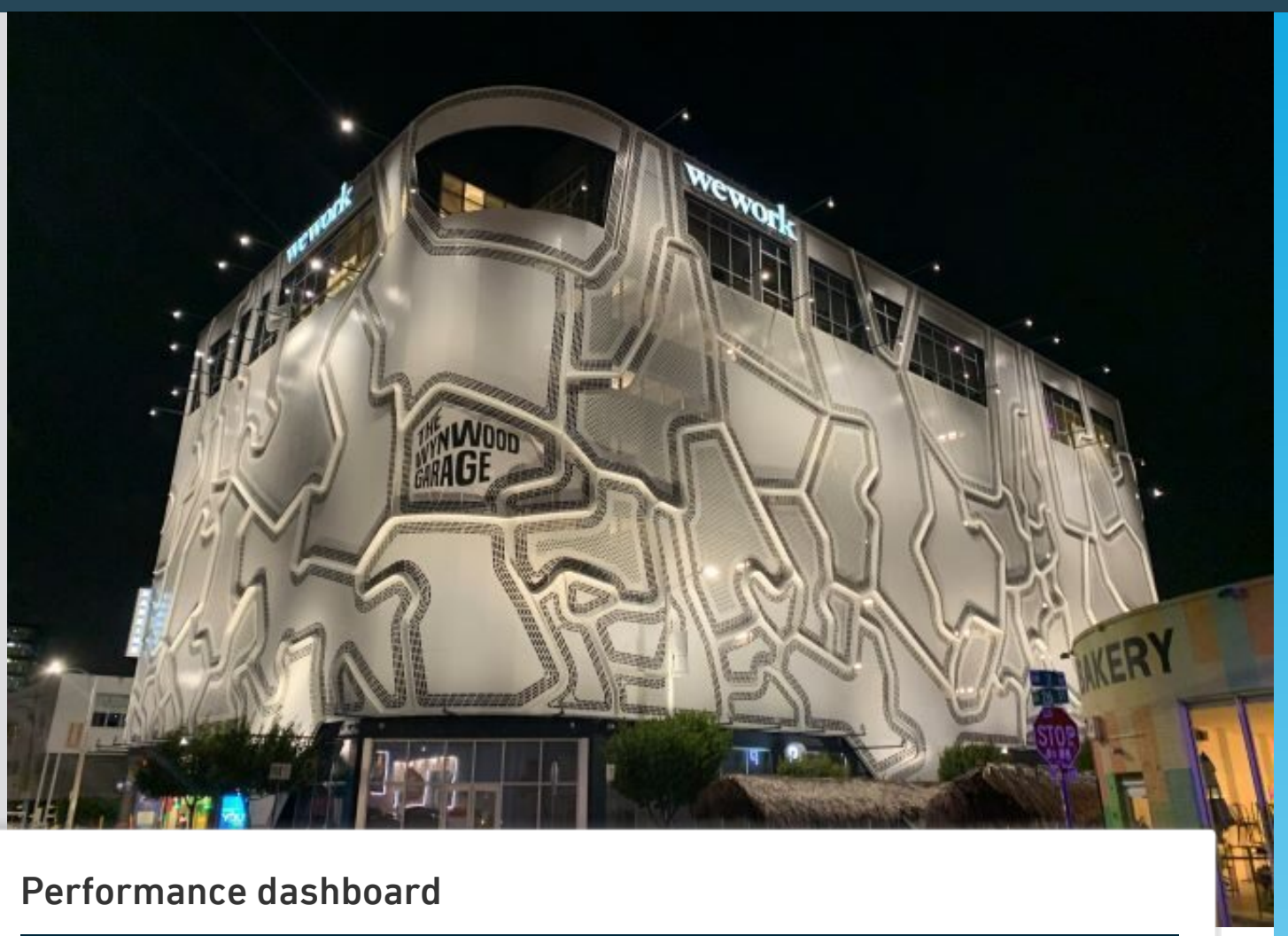
carboline® Coatings - Linings - Fireproofing

Southwest Type 5 Series
Southwest Type 5GP & 5MD

Carboline's Southwest Type 5 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, gypsum 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 & construction.



Performance dashboard

Features & functionality

Economical options - Type 5GP for buildings up to 75', Type 5MD for taller buildings, per IBC

Design flexibility with over 100 UL designs

Can be injected with Accelerator A-20 for fast set and increased yield

Ratings up to 4 hrs for interior structural columns, beams, joists, decks, walls, roofs, girders, floors and pre-cast concrete units

Visit Carboline for more product information

Southwest Type 5GP
Southwest Type 5MD

Environment & materials

Improved by:

Declare, Red List Free

Post-consumer recycled content used

Mineral Wool free – no airborne fibers

Asbestos-free – compliant with EPA and OSHA

Certifications & rating systems:

Environmental Product Declaration (EPD)

ASTM E84 - 0/0

SCAQMD Rule 1113 Compliant

Tested to meet (CDPH) Standard Method v1.2

MasterFormat® 07 81 00

Southwest Type 5 Series Guide Specs
For spec help, contact us or call 281.414.9710

See LCA, interpretation & rating systems

South Coast AQMD | UL | Declare. | Red List Free

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-20230213-005

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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ecoform CLEAN PRODUCT INNOVATIONS

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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https://www.carboline.com/
314-644-1000

Contact us

LCA results & interpretation

Southwest Type 5 Series

Life cycle assessment

Scope and summary

☑ Cradle to gate ○ Cradle to gate with options ○ Cradle to grave

Product description
Carboline's Southwest Type 5 series are gypsum-based Spray-applied Fire Resistive Material (SFRM) designed for the fire protection of interior structural steel. The products are mixed with clean, potable water onsite before application and spray applied to the substrate using either piston or rotor stator or squeeze type pumps. Southwest Type 5 series is formulated and applied to meet the minimum bond strength requirements of the IBC Code listed in the "High Rise Building Section" for buildings.

Carboline's Southwest Type 5 series includes two products: Southwest Type 5GP and Southwest Type 5MD. The impacts are presented for these two products covered in this report. The kraft paper bag packaging weight for these products as delivered is 0.63 kg.

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.
Gypsum	60-70%
Vermiculite	20-30%
Stucco	0-10%
Cellulose	0-10%

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

LIFE CYCLE STAGE	MPTS/DECL. UNIT
Raw material supply	9.57E+00
Transportation of raw materials	8.03E-01
Manufacturing	6.44E+00

A variation of 10 to 20% | A variation greater than 20%

What's causing the greatest impacts

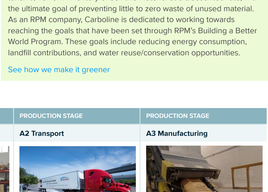
All life cycle stages
Activities during the supply of raw materials (A1) are responsible for much of the impacts in each impact category. The next highest impact contributor is manufacturing (A3) for eutrophication, ecotoxicity, and fossil fuel depletion.

Raw material supply
Raw material supply (A1) includes raw material extraction and upstream processing. This module is the major contributor to seven impact categories. For example, A1 accounts for over 70% of the impact of smog and acidification. It also contributes to over 55% of ozone depletion and global warming.

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 all impact categories. Moreover, A3 is the highest contributor to ecotoxicity and fossil fuel depletion.

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.



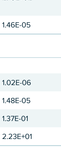
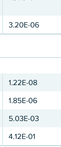
Sensitivity analysis
Sensitivity analyses were performed to check the robustness of the results where the highest contributing processes or materials are occurring. As the bulk of impacts are attributed to raw materials acquisition and processing, the mass of specified raw materials was changed by +/-20%. 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 +/-9% 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* (IND) *Modules A4, A5, B, C, and D are excluded.	**A1 Raw material supply**	**A2 Transport**	**A3 Manufacturing**
			

SM Single Score

Learn about SM Single Score results

Impacts per 1,000kg of coating	9.57E+00 mPts	8.03E-01 mPts	6.44E+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.

Southwest Type 5GP: TRACI v2.1 results per declared unit

LIFE CYCLE STAGE	A1 RAW MATERIAL SUPPLY	A2 TRANSPORT	A3 MANUFACTURING
Ecological damage			
Impact category / Unit			
Acidification — kg SO_2 eq	1.25E+00	2.00E-02	2.74E-01
Eutrophication — kg N eq	8.92E-02	4.10E-03	9.41E-02
Global warming (embodied carbon) — kg CO_2 eq	2.11E+02	1.13E+01	1.62E+02
Ozone depletion — kg CFC-11 eq	1.48E-05	2.69E-06	4.48E-06
Human health damage			
Impact category / Unit			
Carcinogenics — CTU_h	8.88E-07	1.04E-08	5.91E-07
Non-carcinogenics — CTU_h	1.17E-05	1.58E-06	4.18E-06
Respiratory effects — kg $PM_{2.5}$ eq	1.36E-01	3.97E-03	3.14E-02
Smog — kg O_3 eq	2.29E+01	2.58E-01	3.54E+00
Additional environmental information			
Impact category / Unit			
Fossil fuel depletion — MJ, LHV	1.59E+02	2.39E+01	2.09E+02
Ecotoxicity — CTU_e	7.32E+01	3.20E+01	9.14E+01

See the additional content required by the ASTM PCR for spray-applied fire-resistive materials on page 4 of the **Transparency Report PDF**.

Southwest Type 5MD: TRACI v2.1 results per declared unit

LIFE CYCLE STAGE	A1 RAW MATERIAL SUPPLY	A2 TRANSPORT	A3 MANUFACTURING
Ecological damage			
Impact category / Unit			
Acidification — kg SO_2 eq	1.23E+00	2.98E-02	2.74E-01
Eutrophication — kg N eq	8.88E-02	5.06E-03	8.85E-02
Global warming - IPCC (Embodied Carbon) — kg CO_2 eq	2.18E+02	1.34E+01	1.55E+02
Ozone depletion — kg CFC-11 eq	1.46E-05	3.20E-06	4.47E-06
Human health damage			
Impact category / Unit			
Carcinogenics — CTU_h	1.02E-06	1.22E-08	5.62E-07
Non-carcinogenics — CTU_h	1.48E-05	1.85E-06	4.13E-06
Respiratory effects — kg $PM_{2.5}$ eq	1.37E-01	5.03E-03	3.13E-02
Smog — kg O_3 eq	2.23E+01	4.12E-01	3.53E+00
Additional environmental information			
Impact category / Unit			
Fossil fuel depletion — MJ, LHV	1.62E+02	2.84E+01	2.09E+02
Ecotoxicity — CTU_e	8.63E+01	3.74E+01	8.96E+01

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

PCR 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

○ Industry-wide (generic) EPD	½product
☑ 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

○ Industry-wide (generic) EPD	1 product
☑ Product-specific Type III EPD	1.5 product

BREEAM New Construction 2018
Mat 02 · Environmental impacts from construction products
Environmental Product Declarations (EPD)

○ Industry-average EPD	.5 points
○ Multi-product specific EPD	.75 points
☑ Product-specific EPD	1 point

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-20230213-005

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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ecoform
Sustainability Solutions

SUMMARY
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Contact us

How we make it greener

Southwest Type 5 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

SM Transparency Report (EPD)™

VERIFICATION	LCA
3rd-party reviewed	✓
Transparency Report (EPD)	
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Contact us

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

Southwest Type 5 Series

Data

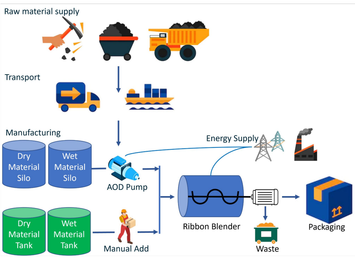
Background This product-specific declaration was created by collecting life cycle data for the Southwest Type 5 Series for a declared unit of 1,000 kg of product. Data adopted in the model include ecoinvent v3, US-EI 2.2, and ELCD databases.

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:



This flow diagram has been designed using assets from Freepik.com

Scenarios and additional technical information

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

Additional technical information

Color	Non-Uniform Tan
Application Thickness (Initial pass) Southwest Type 5GP & 5MD	1/2" - 5/8" (12.7 - 15.9 mm)
Preferred waste management option for used products	Landfill

The reinforcement is not relevant to the products.

Southwest Type 5 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	1.8 - 2.6	%
Packaging for finished products	Kraft paper bag	
Associated packaging Southwest Type 5GP	0.028	%
Associated packaging Southwest Type 5MD	0.028	%

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.

Southwest Type 5GP: LCIA results, resource use, output & 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	1.48E-05	2.69E-06	4.48E-06	**2.20E-05**
Global warming	kg CO_2 eq	2.11E+02	1.13E+01	1.62E+02	**3.85E+02**
Smog	kg O_3 eq	2.29E+01	2.58E-01	3.54E+00	**2.67E+01**
Acidification	kg SO_2 eq	1.25E+00	2.00E-02	2.74E-01	**1.55E+00**
Eutrophication	kg N eq	8.92E-02	4.10E-03	9.41E-02	**1.87E-01**
Carcinogenics	CTUh	8.88E-07	1.04E-08	5.91E-07	**1.49E-06**
Non-carcinogenics	CTUh	1.17E-05	1.58E-06	4.18E-06	**1.75E-05**
Respiratory effects	kg $PM_{2.5}$ eq	1.36E-01	3.97E-03	3.14E-02	**1.71E-01**
Ecotoxicity	CTUe	7.32E+01	3.20E+01	9.14E+01	**1.97E+02**
Fossil fuel depletion	MJ surplus	1.59E+02	2.39E+01	2.09E+02	**3.92E+02**
Total primary energy consumption					
Nonrenewable fossil	MJ, HHV	1.53E+03	1.69E+02	1.58E+03	**3.28E+03**
Nonrenewable nuclear	MJ, HHV	6.63E+01	1.75E-01	1.61E+02	**2.27E+02**
Renewable (solar, wind, hydroelectric, and geothermal)	MJ, HHV	5.01E+01	1.52E-01	1.93E+01	**6.95E+01**
Renewable (biomass)	MJ, HHV	1.14E+02	5.56E-02	9.67E+02	**1.08E+03**
Material resources consumption					
Nonrenewable material resources	kg	0	0	1.00E+03	**1.00E+03**
Renewable material resources	kg	0	0	2.76E+01	**2.76E+01**
Net fresh water	m^3	2.39E+01	1.01E-01	7.22E+00	**3.13E+01**
Nonhazardous waste generated	kg	0	0	2.31E-03	**2.31E-03**
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	1.22E+01	**1.22E+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**

Southwest Type 5MD: LCIA results, resource use, output % 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	1.46E-05	3.20E-06	4.47E-06	**2.23E-05**
Global warming	kg CO_2 eq	2.18E+02	1.34E+01	1.55E+02	**3.86E+02**
Smog	kg O_3 eq	2.23E+01	4.12E-01	3.53E+00	**2.63E+01**
Acidification	kg SO_2 eq	1.23E+00	2.98E-02	2.74E-01	**1.53E+00**
Eutrophication	kg N eq	8.88E-02	5.06E-03	8.85E-02	**1.82E-01**
Carcinogenics	CTUh	1.02E-06	1.22E-08	5.62E-07	**1.59E-06**
Non-carcinogenics	CTUh	1.48E-05	1.85E-06	4.13E-06	**2.08E-05**
Respiratory effects	kg $PM_{2.5}$ eq	1.37E-01	5.03E-03	3.13E-02	**1.73E-01**
Ecotoxicity	CTUe	8.63E+01	3.74E+01	8.96E+01	**2.13E+02**
Fossil fuel depletion	MJ surplus	1.62E+02	2.84E+01	2.09E+02	**3.99E+02**
Total primary energy consumption					
Nonrenewable fossil	MJ, HHV	1.58E+03	2.01E+02	1.58E+03	**3.36E+03**
Nonrenewable nuclear	MJ, HHV	7.29E+01	2.08E-01	1.61E+02	**2.34E+02**
Renewable (solar, wind, hydroelectric, and geothermal)	MJ, HHV	5.52E+01	1.81E-01	1.93E+01	**7.47E+01**
Renewable (biomass)	MJ, HHV	1.11E+02	6.60E-02	9.67E+02	**1.08E+03**
Material resources consumption					
Nonrenewable material resources	kg	0	0	9.84E+02	**9.84E+02**
Renewable material resources	kg	0	0	2.76E+01	**2.76E+01**
Net fresh water	m^3	2.48E+01	1.12E-01	6.62E+00	**3.16E+01**
Nonhazardous waste generated	kg	0	0	8.50E-03	**8.50E-03**
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	1.22E+01	**1.22E+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**