

## Environmental Product Declaration

# Southwire 5KV-25KV RhinoSheild®, RhinoFlex®, RhinoPower® Mining Cables



Southwire Company, LLC is one of North America's largest wire and cable producers. As a family business, Southwire proudly continues building on our commitment to environmental stewardship and corporate sustainability by prioritizing stakeholder expectations, and supporting the wellbeing of our communities and the environment in which we live. To help us meet this commitment, we organize our sustainability strategy around five core tenets: Growing Green, Living Well, Giving Back, Doing Right, and Building Worth.

Our five core tenets allow us to deepen our vision and commitments by strengthening and aligning our programs, goals, and governance. Driven by the highest standard of excellence, we appreciate the need for continued improvement and are proud that our results continue to build a stronger Southwire. The use of environmental product declarations is growing rapidly in the wire and cable market. Southwire is developing its product stewardship program to evaluate and reduce the impacts of our products and processes throughout the organization.



Southwire 5KV-25KV RhinoSheild®, RhinoFlex®, RhinoPower® Mining Cables



# Environmental Product Declaration

Southwire 5KV-25KV RhinoShield®, RhinoFlex®, RhinoPower® Mining Cables

Handling Cable



According to  
**ISO 14025, EN 15804,**  
**and ISO 21930:2017**

This declaration is an environmental product declaration (EPD) in accordance with ISO 14025, EN15804, and ISO 21930-2017. EPDs rely on Life Cycle Assessment (LCA) to provide information on a number of environmental impacts of products over their life cycle. Exclusions: EPDs do not indicate that any environmental or social performance benchmarks are met, and there may be impacts that they do not encompass. LCAs do not typically address the site-specific environmental impacts of raw material extraction, nor are they meant to assess human health toxicity. EPDs can complement but cannot replace tools and certifications that are designed to address these impacts and/or set performance thresholds – e.g. Type 1 certifications, health assessments and declarations, environmental impact assessments, etc. Accuracy of Results: EPDs regularly rely on estimations of impacts, and the level of accuracy in estimation of effect differs for any particular product line and reported impact. Comparability: EPDs are not comparative assertions and are either not comparable or have limited comparability when they cover different life cycle stages, are based on different product category rules or are missing relevant environmental impacts. EPDs from different programs may not be comparable.

EPD PROGRAM AND PROGRAM OPERATOR NAME, ADDRESS, LOGO, AND WEBSITE	UL ENVIRONMENT 333 Pfingsten Rd, Northbrook, IL 60062	WWW.UL.COM WWW.SPOT.UL.COM
GENERAL PROGRAM INSTRUCTIONS AND VERSION NUMBER	Program Operator Rules v 2.7 2022	
MANUFACTURER NAME AND ADDRESS	Southwire Company One Southwire Drive Carrollton, GA 30119	
DECLARATION NUMBER	4790297660.121.1	
DECLARED PRODUCT & FUNCTIONAL UNIT OF DECLARED UNIT	Southwire 5KV-25KV RhinoShield®, RhinoFlex®, RhinoPower® Mining Cables Functional Unit = 1 meter of installed cable over a 60 year building lifetime	
REFERENCE PCR AND VERSION NUMBER	The Norwegian EPD Foundation: NPCR Part A: Construction Products and Services, v1.0, 2017. The Norwegian EPD Foundation: NPCR 027 Part B: Electrical Cables and Wires, v1.0, October 2020.	
DESCRIPTION OF PRODUCT APPLICATION/USE	Southwire cable products are primarily used in commercial, residential, industrial, utility, and institutional settings.	
PRODUCT RSL DESCRIPTION	10 Years	
MARKETS OF APPLICABILITY	North America	
DATE OF ISSUE	December 1, 2022	
PERIOD OF VALIDITY	5 Years	
EPD TYPE	Product Specific	
DATASET VARIABILITY	N/A	
EPD SCOPE	Cradle-to-Grave	
YEAR(S) OF REPORTED PRIMARY DATA	2020	
LCA SOFTWARE & VERSION NUMBER	SimaPro v9.2	
LCI DATABASE(S) & VERSION NUMBER	Ecoinvent v3.5 & USLCI v2.0	
LCIA METHODOLOGY & VERSION NUMBER	TRACI 2.1; CML 4.1	
The sub-category PCR review was conducted by:	UL Environment - PCR Review Panel - epd@ul.com	
This declaration was independently verified in accordance with ISO 14025: 2006. EN 15804 serves as the core PCR, with additional considerations from The Norwegian EPD Foundation: NPCR Part A: Construction Products and Services, v1.0, 2017 and The Norwegian EPD Foundation: NPCR 027 Part B: Electrical Cables and Wires, v1.0, October 2020.	 Cooper McCollum, UL Environment	
<input type="checkbox"/> INTERNAL <input checked="" type="checkbox"/> EXTERNAL	Sustainable Solutions Corporation	
This life cycle assessment was conducted in accordance with ISO 14044 and the reference PCR by:	James Mellentine, Thrive ESG 	

Environmental declarations from different programs (ISO 14025) may not be comparable. Comparison of the environmental performance using EPD information shall consider all relevant information modules over the full life cycle of the products within the building.

This PCR allows EPD comparability only when the same functional requirements between products are ensured and the requirements of ISO 21930:2017 §5.5 are met. It should be noted that different LCA software and background LCI datasets may lead to differences results for upstream or downstream of the life cycle stages declared.



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## General Information

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### Description of Company/Organization

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A leader in technology and innovation, Southwire Company, LLC is one of North America's largest wire and cable producers. Southwire and its subsidiaries manufacture building wire and cable, metal-clad cable, portable and electronic cord products, overhead and underground transmission and distribution wire and cable products, original equipment manufacturer (OEM) wire products and engineered products. In addition, Southwire supplies assembled products and components, contractor equipment and hand tools, and designs and manufactures systems that produce copper and aluminum rod.



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### Product Description

4/C CU 2000V Type G RHINOFLEXTM CPE Mining Cable 90°C

This product is manufactured with flexible Tin Coated Copper conductors, Ethylene Propylene Rubber (EPR) insulation, extra heavy duty two-layer Chlorinated Polyethylene (CPE) Jacket.

3/C CU 2000V Type G-GC RHINOFLEXTM CPE Mining Cable 90°C

This product is manufactured with flexible Tin Coated Copper conductors, Ethylene Propylene Rubber (EPR) insulation, extra heavy duty two-layer Chlorinated Polyethylene (CPE) Jacket.

3/C CU 2000V Type SHD-GC RHINOSHIELDTM CPE Mining Cable 90°C

This product is manufactured with flexible Tin Coated Copper conductors, EPR insulation, Cu/Nylon braid shield, extra heavy duty two-layer Chlorinated Polyethylene (CPE) Jacket.

3/C CU 5KV Type SHD-GC RHINOSHIELDTM CPE Mining Cable 90°C

This product is manufactured with flexible Tin Coated Copper conductors, EPR 100% insulation level, Cu/Nylon braid shield, extra heavy duty two-layer Chlorinated Polyethylene (CPE) jacket.

3/C CU 8KV Type SHD-GC RHINOSHIELDTM CPE Mining Cable 90°C

This product is manufactured with flexible Tin Coated Copper conductors, EPR 100% insulation level, Cu/Nylon braid shield, extra heavy duty two-layer Chlorinated Polyethylene (CPE) jacket.

3/C CU 15KV Type SHD-GC RHINOSHIELDTM CPE Mining Cable 90°C

This product is manufactured with flexible Tin Coated Copper conductors, EPR 100% insulation level, Cu/Nylon braid shield, extra heavy duty two-layer Chlorinated Polyethylene (CPE) jacket

3/C CU 25KV Type SHD-GC RHINOSHIELDTM CPE Mining Cable 90°C

This product is manufactured with flexible Tin Coated Copper conductors, EPR 100% insulation level, Cu/Nylon braid shield, extra heavy duty two-layer Chlorinated Polyethylene (CPE) jacket.

3/C CU 5KV 100% & 133% EPR/CPE RHINOPOWER™ Type MP-GC

This product is manufactured with Tin Coated Class B Copper conductors, Ethylene Propylene Rubber (EPR) 100% & 133% insulation level, Copper tape shield, 90°C Chlorinated Polyethylene (CPE) Jacket.

This EPD includes results for the following products: 58902199 (500/3), 57024899 (4/0-3), 57026199 (500/4), 57849799 (3/0-3), 58053399 (350/3), 58181299 (350/3), 58464899 (1/0-3), 58638799 (3/0-3), 58691299 (3/0-3), 58701399 (250/2), 58765799 (500/3), 58918899 (350/3), 59750999 (350/3), 67950299 (500/3).



# Environmental Product Declaration

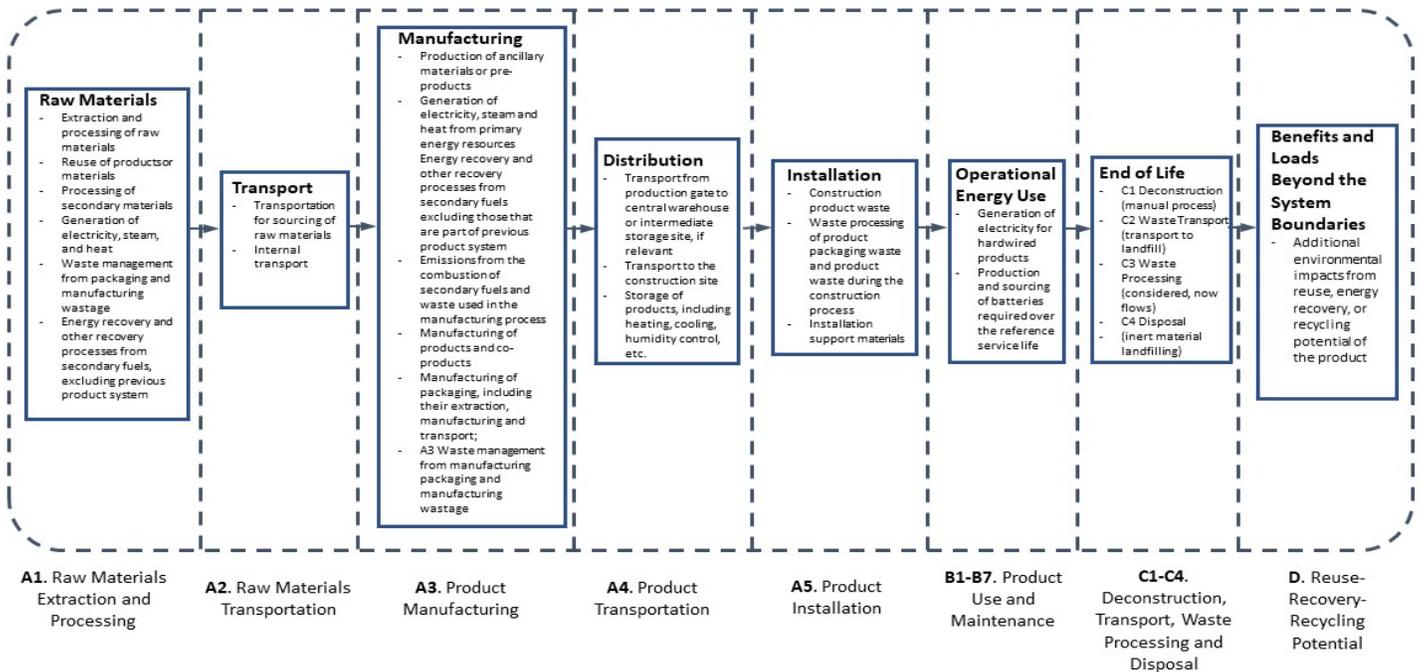
Southwire 5KV-25KV RhinoShield®, RhinoFlex®, RhinoPower® Mining Cables



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Handling Cable

## Flow Diagram



## Manufacturer Specific EPD

An impact assessment was completed for each product listed within the EPD. Each product within the EPD is the largest product size currently available, meaning that the same product may be sold in smaller sizes, and for the specific product recipe with the corresponding number of conductors. Completing an impact assessment for the largest product size within each group ensures that the products with the highest mass per functional unit are represented in the EPD. If impacts for a product within a product group did not fall within the typically allowable variance of  $\pm 10\%$ , impacts for each product were reported in the EPD for clarity.

## Application

RHINOFLEX(TM) Type G, RHINOSHIELD(TM) Type SHD-GC, and RHINOPOWER(TM) Type MP-GC are MSHA approved mining cables manufacture where a heavy-duty cable for use when flexibility, maximum protection and power is required. Applications for use are portable, temporary, and permanent power applications such as mobile or stationary mining equipment, shuttle cars, mobile drills, pumps, roof bolters, conveyors, and any portable power where equipment grounding is required. Additional use can be with mobile, reeling, or stationary mining equipment, continuous mining machines, longwall mining systems, and blast hole drillers and for permanent or semi-portable applications with power transmission in deep mines, surface mines, open pits, tunnels, in conduit or duct.



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## Material Composition

The primary product components and/or materials must be indicated as a percentage mass to enable the user of the EPD to understand the composition of the product in delivery status.

The average composition of a Southwire CU Mining Cable Handling cable is as follows:

Material	Percentage in mass (%)								
	58902199 (500/3)	57024899 (4/0-3)	57026199 (500/4)	57849799 (3/0-3)	58053399 (350/3)	58181299 (350/3)	58464899 (1/0-3)	58638799 (3/0-3)	58691299 (3/0-3)
Colorant	0.01%	0.47%	0.26%	0.28%	0.00%	0.01%	0.87%	0.02%	0.00%
Conductor	68.90%	61.30%	72.99%	89.39%	67.09%	63.36%	60.37%	67.02%	82.40%
Cross Filler	0.26%	2.31%	1.29%	1.29%	1.50%	3.01%	3.61%	0.01%	1.24%
Drain Wire	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Insulation	12.60%	30.69%	0.00%	0.02%	0.00%	0.00%	0.00%	0.00%	8.48%
Jacketing	16.25%	0.00%	25.03%	8.90%	28.22%	31.04%	27.92%	31.61%	7.23%
Rip Cord	0.55%	0.09%	0.04%	0.00%	0.23%	0.07%	0.11%	0.51%	0.00%
Tape	1.44%	5.15%	0.38%	0.11%	2.96%	2.51%	7.10%	0.83%	0.64%
Other	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Material	Percentage in mass (%)				
	58701399 (250/2)	58765799 (500/3)	58918899 (350/3)	59750999 (350/3)	67950299 (500/3)
Colorant	0.01%	0.27%	0.00%	0.01%	0.01%
Conductor	63.78%	76.83%	93.11%	51.59%	61.48%
Cross Filler	2.23%	2.69%	0.00%	0.24%	0.20%
Drain Wire	0.00%	0.00%	0.00%	0.00%	0.00%
Insulation	0.00%	0.00%	1.66%	0.00%	0.00%
Jacketing	29.67%	16.75%	5.23%	46.15%	36.85%
Rip Cord	0.06%	0.05%	0.00%	0.45%	0.17%
Tape	4.24%	3.42%	0.00%	1.57%	1.29%
Other	0.00%	0.00%	0.00%	0.00%	0.00%
Total	100.00%	100.00%	100.00%	100.00%	100.00%



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### Placing on the Market / Application Rules

Southwire's Mining Cable meet or exceed the following specifications:

- ASTM B33 Standard Specification for Tin-Coated Soft or Annealed Copper Wire
- ASTM B172 Standard Specification for Rope-Lay-Stranded Copper Conductors Having Bunch-Stranded Copper Conductors
- ICEA S-75-381 Portable and Power Feeder Cables for Use in Mines
- MSHA Approved

### Properties of Declared Product as Shipped

Southwire CU Mining Cable Handling cables are delivered as a complete unit, inclusive of all installation materials and instructions.

## Methodological Framework

### Functional Unit

The declaration refers to the functional unit of 1 meter of installed cable as specified in the PCR.

Declared unit		1 meter of installed cable		
Product Number	Gauge Size	Number of Conductors	Weight (kg/m)	Conversion factor to 1 kg
58902199	500 KCMIL	3	13.58	0.07
57024899	4/0AWG	3	6.14	0.16
57026199	500 KCMIL	4	15.22	0.07
57849799	3/0AWG	3	5.54	0.18
58053399	350 KCMIL	3	13.42	0.07
58181299	350 KCMIL	3	9.53	0.10
58464899	1/0AWG	3	3.20	0.31
58638799	3/0AWG	3	5.74	0.17
58691299	3/0AWG	3	4.64	0.22
58701399	250 KCMIL	2	7.11	0.14
58765799	500 KCMIL	3	11.78	0.08
58918899	350 KCMIL	3	9.49	0.11
59750999	350 KCMIL	3	12.48	0.08
67950299	500 KCMIL	3	15.22	0.07



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## System Boundary

This is a cradle to grave Environmental Product Declaration. The following life cycle phases were considered:

Product Stage			Construction Process Stage		Use Stage							End of Life Stage*				Benefits and Loads Beyond the System Boundaries
Raw material supply	Transport	Manufacturing	Transport from gate to the site	Construction/ installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction /demolition	Transport	Waste processing	Disposal	Reuse-Recovery- Recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Description of the System Boundary Stages Corresponding to the PCR  
(X = Included; MND = Module Not Declared)

\*This includes provision of all materials, products and energy, packaging processing and its transport, as well as waste processing up to the end-of waste state or disposal of final residues.

## Reference Service Life

The reference service life of a properly installed Southwire CU Mining Cable Handling cable is 10 years. The building estimated service life is 60 years.

## Allocation

Allocation was determined on a per meter basis.

## Cut-off Criteria

Processes whose total contribution to the final result, with respect to their mass and in relation to all considered impact categories, is less than 1% can be neglected. The sum of the neglected processes may not exceed 5% by mass of the considered impact categories. For that a documented assumption is admissible.

For Hazardous Substances the following requirements apply:

- The Life Cycle Inventory (LCI) of hazardous substances will be included, if the inventory is available.
- If the LCI for a hazardous substance is not available, the substance will appear as an input in the LCI of the product, if its mass represents more than 0.1% of the product composition.
- If the LCI of a hazardous substance is approximated by modeling another substance, documentation will be provided.

This EPD is in compliance with the cut-off criteria. No processes were neglected or excluded unless specifically stated in the EPD. Capital items for the production processes (machine, buildings, etc.) were not taken into consideration.



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## Data Sources

Primary data were collected for every process in the product system under the control of Southwire. Secondary data from the ecoinvent database were utilized when necessary. These data were evaluated and have temporal, geographic, and technical coverage appropriate to the scope of the product category.

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## Data Quality

The data sources used are complete and representative of North American systems in terms of the geographic and technological coverage and are a recent vintage (i.e. less than ten years old). The data used for primary data are based on direct information sources of the manufacturers. Secondary data sets were used for raw materials extraction and processing, end of life, transportation, and energy production flows. Wherever secondary data is used, the study adopts critically reviewed data for consistency, precision, and reproducibility to limit uncertainty.

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## Period Under Review

The period under review is the full calendar year of 2020.

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## Treatment of Biogenic Carbon

The uptake and release of biogenic carbon throughout the product life cycle follows ISO 21930:2017 Section 7.2.7.

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## Comparability and Benchmarking

A comparison or an evaluation of EPD data is only possible if all data sets to be compared were created according to EN 15804 and the building context, respectively the product-specific characteristics of performance, are taken into account. Environmental declarations from different programs may not be comparable. Full conformance with the PCR allows for EPD comparability only when all stages a product's life cycle have been considered. However, variations and deviations are possible.

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## Units

The LCA results within this EPD are reported in SI units.

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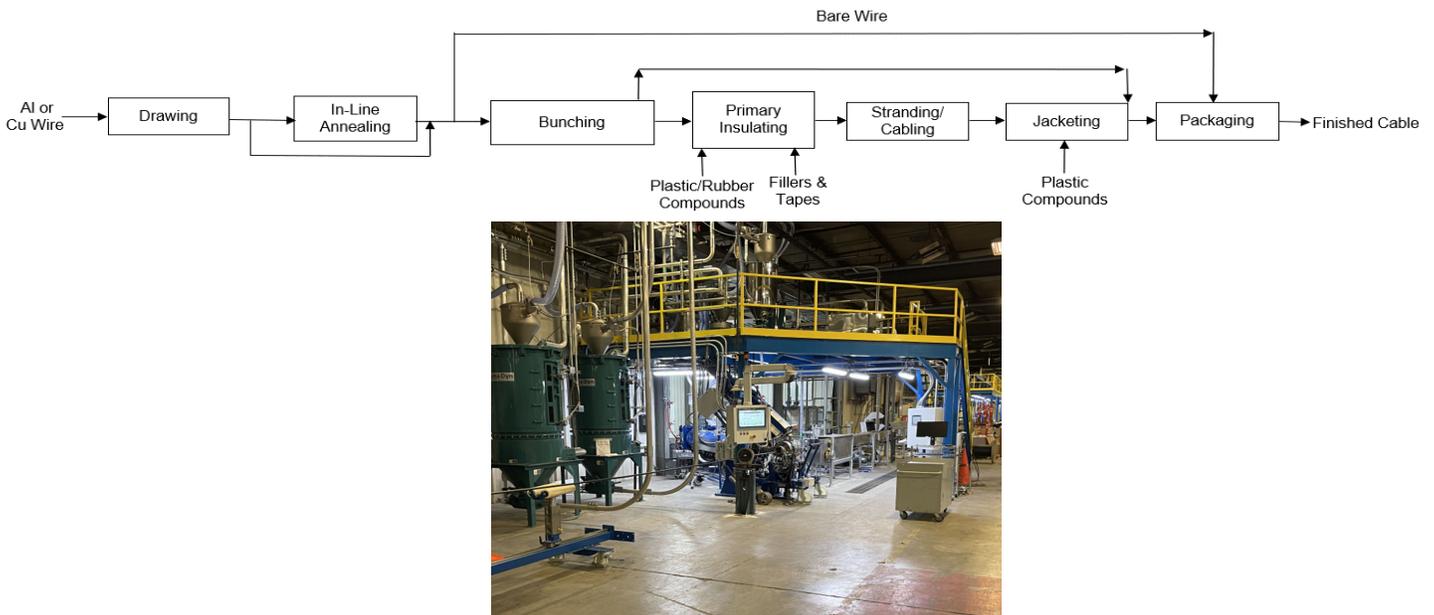
## Additional Environmental Information

### Background data

For life cycle modeling of the considered products, the SimaPro v9.2 Software System for Life Cycle Engineering, developed by PRe Sustainability, is used. The ecoinvent database contains consistent and documented datasets which are documented online. To ensure comparability of results in the LCA, the basic data of the ecoinvent database were used for energy, transportation, and auxiliary materials.

### Manufacturing

All wire and cable products in this study include a conductor. The conductor is made of some metal, primarily copper or aluminum, and is annealed and formed into strands by a drawing process. The conductors are bunched together, sometimes after having an insulating material applied in an extrusion process. Cables that are not bare cables include some sort of insulation and possibly a jacket. The cables that include jacketing go through jacket extrusion after the wires have been bunched.



### Packaging

All packaging is fully recyclable. The packaging material is composed primarily of wood, with cardboard and plastic materials used for individual product packaging. Packaging can vary based on final product size and length. The percent breakdown of packaging is based on manufacturing facilities but actual amounts will be based on the product's final weight or density.

Material	Quantity (% By Weight)
	Value
Cardboard	0.00%
Other	0.75%
Plastic	0.09%
Wood	99.17%
Total	100.00%



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## Transformation

Transport to Building Site (A4)		
Name	Value	Unit
Fuel type	Diesel	
Liters of fuel	38	l/100km
Transport distance	300	km
Capacity utilization (including empty runs)	-	%
Gross density of products transported	-	kg/m <sup>3</sup>
Weight of products transported	-	kg
Volume of products transported	-	m <sup>3</sup>
Capacity utilization volume factor	0.9	-

## Product Installation

Southwire CU Mining Cable Handling cables are distributed through and installed by trained installation technicians adhering to local/national standards and requirements. Installation accounts for the energy consumption, material wastage, and support materials use during the installation process, as well as waste treatment of packaging materials. The installation scrap was assumed to be a 5% average in accordance with the PCR. Installation is typically completed using battery-powered equipment, but this is below the cut-off criteria.

Installation into the building (A5)									
Name	58902199 (500/3)	57024899 (4/0-3)	57026199 (500/4)	57849799 (3/0-3)	58053399 (350/3)	58181299 (350/3)	58464899 (1/0-3)	58638799 (3/0-3)	Unit
Auxiliary materials	-	-	-	-	-	-	-	-	kg
Water consumption	-	-	-	-	-	-	-	-	m <sup>3</sup>
Other resources	-	-	-	-	-	-	-	-	kg
Electricity consumption	-	-	-	-	-	-	-	-	kWh
Other energy carriers	-	-	-	-	-	-	-	-	MJ
Product loss per functional unit	0.679	0.307	0.761	0.277	0.671	0.476	0.160	0.287	kg
Waste materials at construction site	0.679	0.307	0.761	0.277	0.671	0.476	0.160	0.287	kg
Output substance (recycle)	0.398	0.160	0.472	0.211	0.383	0.257	0.082	0.163	kg
Output substance (landfill)	0.070	0.028	0.083	0.037	0.068	0.045	0.015	0.029	kg
Output substance (incineration)	0.211	0.119	0.206	0.029	0.221	0.175	0.063	0.095	kg
Packaging waste (recycle)	1.122	0.507	1.257	0.458	1.108	0.787	0.265	0.474	kg
Packaging waste (landfill)	0.300	0.136	0.336	0.122	0.296	0.210	0.071	0.127	kg
Packaging waste (incineration)	0.075	0.034	0.084	0.031	0.074	0.053	0.018	0.032	kg
Direct emissions to ambient air*, soil, and water	0.386	0.174	0.433	0.157	0.381	0.271	0.091	0.163	kg CO <sub>2</sub>
VOC emissions	-	-	-	-	-	-	-	-	kg

\*CO2 emissions to air from disposal of packaging



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Installation into the building (A5)							
Name	58691299 (3/0-3)	58701399 (250/2)	58765799 (500/3)	58918899 (350/3)	59750999 (350/3)	67950299 (500/3)	Unit
Auxiliary materials	-	-	-	-	-	-	kg
Water consumption	-	-	-	-	-	-	m <sup>3</sup>
Other resources	-	-	-	-	-	-	kg
Electricity consumption	-	-	-	-	-	-	kWh
Other energy carriers	-	-	-	-	-	-	MJ
Product loss per functional unit	0.232	0.356	0.589	0.475	0.624	0.761	kg
Waste materials at construction site	0.232	0.356	0.589	0.475	0.624	0.761	kg
Output substance (recycle)	0.162	0.193	0.385	0.376	0.274	0.398	kg
Output substance (landfill)	0.029	0.034	0.068	0.066	0.048	0.070	kg
Output substance (incineration)	0.041	0.129	0.136	0.033	0.302	0.293	kg
Packaging waste (recycle)	0.383	0.588	0.973	0.784	1.031	1.257	kg
Packaging waste (landfill)	0.102	0.157	0.260	0.210	0.276	0.336	kg
Packaging waste (incineration)	0.026	0.039	0.065	0.052	0.069	0.084	kg
Direct emissions to ambient air*, soil, and water	0.132	0.202	0.335	0.270	0.355	0.432	kg CO <sub>2</sub>
VOC emissions	-	-	-	-	-	-	kg

\*CO2 emissions to air from disposal of packaging

Reference Service Life		
Name	Value	Unit
Reference Service Life	10	years
Estimated Building Service Life	60	years
Number of Replacements	5	number



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## Product Use

No cleaning, maintenance, repair, or refurbishment is required.

Operational energy use was modeled as use phase losses determined by the IEC 61156-5 standard. The maximum loss values for each cable category are detailed in the table below and were used in the B6 stage.

Operational Energy Use (B6)										
Name	58902199 (500/3)	57024899 (4/0-3)	57026199 (500/4)	57849799 (3/0-3)	58053399 (350/3)	58181299 (350/3)	58464899 (1/0-3)	58638799 (3/0-3)	58691299 (3/0-3)	Unit
Water consumption (from	-	-	-	-	-	-	-	-	-	m <sup>3</sup>
Electricity consumption	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.019	kWh
Other energy carriers	-	-	-	-	-	-	-	-	-	MJ
Equipment output	-	-	-	-	-	-	-	-	-	kW
Direct emissions to ambient air, soil, and water	-	-	-	-	-	-	-	-	-	kg

Operational Energy Use (B6)						
Name	58701399 (250/2)	58765799 (500/3)	58918899 (350/3)	59750999 (350/3)	67950299 (500/3)	Unit
Water consumption (from	-	-	-	-	-	m <sup>3</sup>
Electricity consumption	0.019	0.019	0.019	0.019	0.019	kWh
Other energy carriers	-	-	-	-	-	MJ
Equipment output	-	-	-	-	-	kW
Direct emissions to ambient air, soil, and water	-	-	-	-	-	kg

## Disposal

The product can be mechanically disassembled to separate the different materials. 85% of the metals used are recyclable, the remaining 15% of metals are sent to landfill. The remainder of components are disposed of through waste incineration with energy recovery, in accordance with the PCR.

End of life (C1-C4)										
Name	58902199 (500/3)	57024899 (4/0-3)	57026199 (500/4)	57849799 (3/0-3)	58053399 (350/3)	58181299 (350/3)	58464899 (1/0-3)	58638799 (3/0-3)	58691299 (3/0-3)	Unit
Collected separately	7.95	3.20	9.45	4.21	7.65	5.13	1.64	3.27	3.25	kg
Collected as mixed construction waste	5.63	2.94	5.78	1.33	5.77	4.40	1.56	2.47	1.39	kg
Reuse	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	kg
Recycling	7.95	3.20	9.45	4.21	7.65	5.13	1.64	3.27	3.25	kg
Landfilling	1.40	0.56	1.67	0.74	1.35	0.91	0.29	0.58	0.57	kg
Incineration with energy recovery	4.22	2.37	4.11	0.59	4.42	3.49	1.27	1.89	0.82	kg
Energy conversion	44.00	44.00	44.00	44.00	44.00	44.00	44.00	44.00	44.00	%
Removals of biogenic carbon	-	-	-	-	-	-	-	-	-	kg



# Environmental Product Declaration

Southwire 5KV-25KV RhinoShield®, RhinoFlex®, RhinoPower® Mining Cables

Handling Cable



According to  
ISO 14025, EN 15804,  
and ISO 21930:2017

End of life (C1-C4)							
Name	58701399 (250/2)	58765799 (500/3)	58918899 Routing (500/3)	58918899 (350/3)	59750999 (350/3)	67950299 (500/3)	Unit
Collected separately	3.86	7.69	0.21	7.51	5.47	7.95	kg
Collected as mixed construction waste	3.26	4.09	0.24	1.98	7.01	7.26	kg
Reuse	0.00	0.00	0.00	0.00	0.00	0.00	kg
Recycling	3.86	7.69	0.21	7.51	5.47	7.95	kg
Landfilling	0.68	1.36	0.04	1.33	0.97	1.40	kg
Incineration with energy recovery	2.58	2.73	0.20	0.65	6.04	5.86	kg
Energy conversion	44.00	44.00	44.00	44.00	44.00	44.00	%
Removals of biogenic carbon	-	-	-	-	-	-	kg

## Re-use Phase

Re-use of the product is not common due to the nature of hard-wiring the product into the building system.

Re-Use, recovery, And/Or Recycling Potential (D)										
Name	58902199 (500/3)	57024899 (4/0-3)	57026199 (500/4)	57849799 (3/0-3)	58053399 (350/3)	58181299 (350/3)	58464899 (1/0-3)	58638799 (3/0-3)	58691299 (3/0-3)	Unit
Net energy benefit from energy recovery from waste treatment declared as exported energy in C3 (R>0.6)	80.65	40.90	78.72	5.64	78.08	63.45	15.03	35.49	12.71	MJ
Net energy benefit from thermal energy due to treatment of waste declared as exported energy in C4 (R<0.6)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	MJ
Net energy benefit from material flow declared in C3 for energy recovery	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	MJ
Process and conversion efficiencies										
Further assumptions for scenario development (e.g. further processing technologies, assumptions on correction factors);										



# Environmental Product Declaration

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RhinoPower® Mining Cables

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According to  
ISO 14025, EN 15804,  
and ISO 21930:2017

Re-Use, recovery, And/Or Recycling Potential (D)							
Name	58701399 (250/2)	58765799 (500/3)	58918899 Routing (500/3)	58918899 (350/3)	59750999 (350/3)	67950299 (500/3)	Unit
Net energy benefit from energy recovery from waste treatment declared as exported energy in C3 (R>0.6)	44.85	35.35	3.92	12.15	112.93	110.06	MJ
Net energy benefit from thermal energy due to treatment of waste declared as exported energy in C4 (R<0.6)	0.00	0.00	0.00	0.00	0.00	0.00	MJ
Net energy benefit from material flow declared in C3 for energy recovery	0.00	0.00	0.00	0.00	0.00	0.00	MJ
Process and conversion efficiencies							
Further assumptions for scenario development (e.g. further processing technologies, assumptions on correction factors);							



# Environmental Product Declaration

Southwire 5KV-25KV RhinoShield®, RhinoFlex®, RhinoPower® Mining Cables

Handling Cable



According to  
ISO 14025, EN 15804,  
and ISO 21930:2017

## LCA Results - 58902199 (500/3)

Results shown below were calculated using TRACI 2.1 Methodology.

TRACI 2.1 Impact Assessment											
Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
GWP	Global warming potential	kg CO <sub>2</sub> -Eq.	3.1E+01	1.2E-01	1.1E-02	1.8E+02	3.7E-03	3.8E-02	3.8E+00	8.9E-02	-1.1E+02
ODP	Depletion potential of the stratospheric ozone layer	kg CFC-11 Eq.	2.6E-06	4.6E-12	3.4E-10	1.4E-05	6.0E-14	1.5E-12	7.4E-08	6.1E-09	-6.8E-06
AP Air	Acidification potential for air emissions	kg SO <sub>2</sub> -Eq.	4.5E-01	7.2E-04	3.6E-05	2.3E+00	3.2E-05	2.3E-04	1.7E-03	2.6E-04	-2.0E+00
EP	Eutrophication potential	kg N-Eq.	2.9E+00	4.0E-05	6.7E-04	1.4E+01	4.3E-07	1.3E-05	8.6E-04	7.8E-04	-1.3E+01
SP	Smog formation potential	kg O <sub>3</sub> -Eq.	9.5E+00	2.0E-02	9.8E-04	4.8E+01	2.1E-04	6.3E-03	2.6E-02	5.4E-03	-4.2E+01
FFD	Fossil Fuel Depletion	MJ-surplus	4.3E+01	2.3E-01	1.2E-02	2.2E+02	3.2E-03	7.4E-02	3.5E-01	6.2E-02	-1.2E+02

\*All use phase and disposal stages have been considered and only those with non-zero values have been reported

Results shown below were calculated using CML 2001 - April 2013 Methodology.

CML 4.1 Impact Assessment											
Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
GWP	Global warming potential	kg CO <sub>2</sub> -Eq.	3.1E+01	1.2E-01	1.3E-02	1.8E+02	3.7E-03	3.8E-02	3.8E+00	8.9E-02	-1.1E+02
ODP	Depletion potential of the stratospheric ozone layer	kg CFC-11 Eq.	2.0E-06	4.6E-12	2.6E-10	1.0E-05	6.0E-14	1.5E-12	7.4E-08	6.1E-09	-6.8E-06
AP Air	Acidification potential for air emissions	kg SO <sub>2</sub> -Eq.	3.7E-01	6.0E-04	3.0E-05	1.8E+00	3.2E-05	2.3E-04	1.7E-03	2.6E-04	-2.0E+00
EP	Eutrophication potential	kg(PO <sub>4</sub> ) <sup>3</sup> -Eq.	1.3E+00	1.1E-04	2.5E-04	6.3E+00	4.3E-07	1.3E-05	8.6E-04	7.8E-04	-1.3E+01
POCP	Formation potential of tropospheric ozone photochemical oxidants	kg ethane-Eq.	8.3E-03	2.8E-05	2.8E-06	2.3E-01	2.1E-04	6.3E-03	2.6E-02	5.4E-03	-4.2E+01
ADPE	Abiotic depletion potential for non-fossil resources	kg Sb-Eq.	8.3E-03	0.0E+00	4.0E-09	2.4E+00	3.2E-03	7.4E-02	3.5E-01	6.2E-02	-1.2E+02
ADPF	Abiotic depletion potential for fossil resources	MJ	4.0E+02	1.6E+00	7.9E-02	2.0E+03	3.8E-03	3.9E-02	3.8E+00	8.9E-02	-1.1E+02

\*All use phase and disposal stages have been considered and only those with non-zero values have been reported

Results below contain the resource use throughout the life cycle of the product.

Resource Use											
Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
RPR <sub>E</sub>	Renewable primary energy as energy carrier	MJ	4.2E+02	0.0E+00	1.6E-03	2.1E+03	0.0E+00	0.0E+00	1.0E+00	7.9E-02	-1.5E+03
RPR <sub>M</sub>	Renewable primary energy resources as material utilization	MJ	2.4E+01	0.0E+00	1.2E+00	1.2E+02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
NRPR <sub>E</sub>	Nonrenewable primary energy as energy carrier	MJ	1.3E+03	5.1E+00	2.6E-01	6.5E+03	1.7E-01	1.6E+00	1.1E+01	1.9E+00	-4.4E+03
NRPR <sub>M</sub>	Nonrenewable primary energy as material utilization	MJ	1.8E+02	0.0E+00	9.2E+00	9.6E+02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SM	Use of secondary material	kg	0.0E+00								
RSF	Use of renewable secondary fuels	MJ	0.0E+00								
NRSF	Use of nonrenewable secondary fuels	MJ	0.0E+00								
RE	Energy recovered from disposed waste	MJ	0.0E+00	-5.9E+03							
FW	Use of net fresh water	m <sup>3</sup>	9.9E-01	0.0E+00	6.2E-05	6.6E+00	0.0E+00	0.0E+00	3.4E-01	9.8E-04	-3.4E+00

\*All use phase and disposal stages have been considered and only those with non-zero values have been reported



# Environmental Product Declaration

Southwire 5KV-25KV RhinoShield®, RhinoFlex®, RhinoPower® Mining Cables

Handling Cable



According to  
ISO 14025, EN 15804,  
and ISO 21930:2017

Results below contain the output flows and wastes throughout the life cycle of the product.

Output Flows and Waste Categories											
Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
HWD	Hazardous waste disposed	kg	2.5E-01	0.0E+00	1.2E-02	1.3E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
NHWD	Non-hazardous waste disposed	kg	5.9E-01	0.0E+00	3.3E-01	1.2E+01	0.0E+00	0.0E+00	0.0E+00	1.4E+00	0.0E+00
HLRW	High-level radioactive waste	kg	9.9E-01	0.0E+00	6.2E-05	5.0E+00	0.0E+00	0.0E+00	5.0E-05	9.2E-06	0.0E+00
ILLRW	Intermediate- and low-level radioactive waste	kg	0.0E+00								
CRU	Components for re-use	kg	0.0E+00								
MR	Materials for recycling	kg	3.0E-01	0.0E+00	1.1E+00	4.7E+01	0.0E+00	0.0E+00	8.0E+00	0.0E+00	0.0E+00
MER	Materials for energy recovery	kg	0.0E+00	0.0E+00	7.5E-02	2.1E+01	0.0E+00	0.0E+00	4.2E+00	0.0E+00	0.0E+00
EE	Recovered energy exported from system	MJ	0.0E+00	0.0E+00	0.0E+00	4.0E+02	0.0E+00	0.0E+00	8.1E+01	0.0E+00	0.0E+00

\*All use phase and disposal stages have been considered and only those with non-zero values have been reported

Results below contain direct greenhouse gas emissions and removals throughout the life cycle of the product.

Resource Use											
Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
BCRP	Biogenic Carbon Removal from Product	kg CO <sub>2</sub>	0.0E+00								
BCEP	Biogenic Carbon Emissions from Product	kg CO <sub>2</sub>	0.0E+00								
BCRK	Biogenic Carbon Removal from Packaging	kg CO <sub>2</sub>	3.9E-01	0.0E+00	0.0E+00	1.9E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
BCEK	Biogenic Carbon Emissions from Packaging	kg CO <sub>2</sub>	0.0E+00	0.0E+00	3.9E-01	1.9E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
BCEW	Biogenic Carbon Emissions from Combustion of Waste from Renewable Sources Used in Production Process	kg CO <sub>2</sub>	0.0E+00								
CCE	Calcination Carbon Emissions	kg CO <sub>2</sub>	0.0E+00								
CCR	Carbonation Carbon Removal	kg CO <sub>2</sub>	0.0E+00								
CWNR	Carbon Emissions from Combustion of Waste from Non-renewable Sources Used in Production Process	kg CO <sub>2</sub>	0.0E+00								

\*All use phase and disposal stages have been considered and only those with non-zero values have been reported



# Environmental Product Declaration

Southwire 5KV-25KV RhinoShield®, RhinoFlex®, RhinoPower® Mining Cables

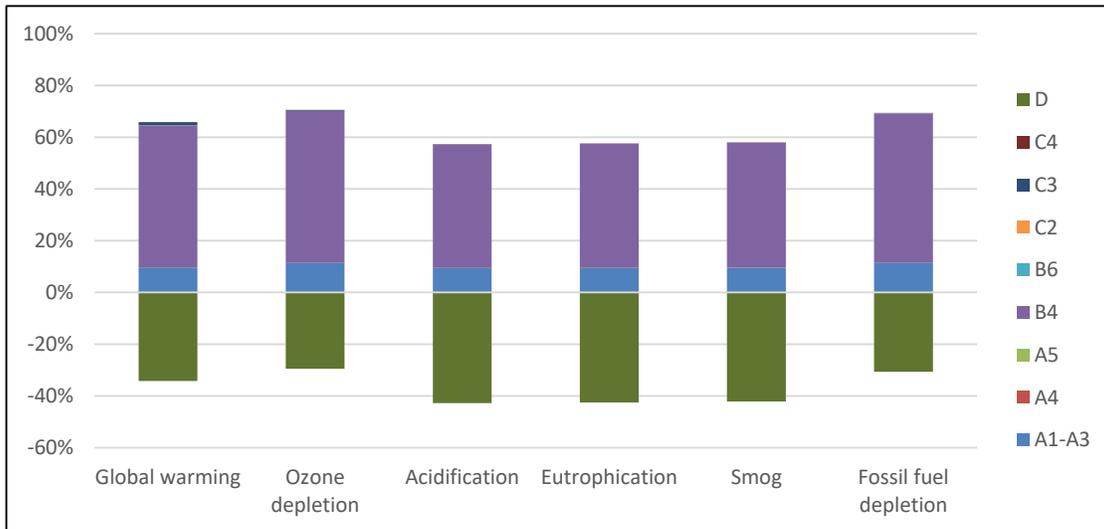
Handling Cable



According to  
**ISO 14025, EN 15804,**  
**and ISO 21930:2017**

## LCA Interpretation - 58902199 (500/3)

The production life cycle stage (A1-A3) and in life energy usage (B6) dominate the impacts across all impact categories. This is due to the upstream production of materials used in the product, along with electricity use in the manufacturing of the product and the consumption of electricity during the cable's usage. With five replacements required over a life-span of a building, the replacement stage (B4) dominates from duplicating these stages. Module B4 excludes operational energy use and all benefits and loads beyond the system boundary. As five replacements occur in the specified building service life, module B6 includes the energy usage of six products and module D includes the benefits of six products.



# Environmental Product Declaration

Southwire 5KV-25KV RhinoShield®, RhinoFlex®, RhinoPower® Mining Cables

Handling Cable



According to  
ISO 14025, EN 15804,  
and ISO 21930:2017

## LCA Results - 57024899 (4/0-3)

Results shown below were calculated using TRACI 2.1 Methodology.

TRACI 2.1 Impact Assessment											
Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
GWP	Global warming potential	kg CO <sub>2</sub> -Eq.	1.4E+01	5.5E-02	5.1E-03	8.0E+01	3.7E-03	1.7E-02	2.0E+00	4.6E-02	-4.9E+01
ODP	Depletion potential of the stratospheric ozone layer	kg CFC-11 Eq.	2.1E-06	2.1E-12	1.5E-10	1.1E-05	6.0E-14	6.6E-13	3.9E-08	3.2E-09	-2.7E-06
AP Air	Acidification potential for air emissions	kg SO <sub>2</sub> -Eq.	1.8E-01	3.3E-04	1.6E-05	9.3E-01	3.2E-05	1.0E-04	8.7E-04	1.3E-04	-8.5E-01
EP	Eutrophication potential	kg N-Eq.	1.2E+00	1.8E-05	3.0E-04	5.8E+00	4.3E-07	5.8E-06	4.5E-04	4.1E-04	-5.1E+00
SP	Smog formation potential	kg O <sub>3</sub> -Eq.	3.9E+00	8.9E-03	4.4E-04	1.9E+01	2.1E-04	2.8E-03	1.4E-02	2.8E-03	-1.7E+01
FFD	Fossil Fuel Depletion	MJ-surplus	2.1E+01	1.0E-01	5.3E-03	1.0E+02	3.2E-03	3.3E-02	1.8E-01	3.2E-02	-5.4E+01

\*All use phase and disposal stages have been considered and only those with non-zero values have been reported

Results shown below were calculated using CML 2001 - April 2013 Methodology.

CML 4.1 Impact Assessment											
Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
GWP	Global warming potential	kg CO <sub>2</sub> -Eq.	1.4E+01	5.5E-02	5.7E-03	8.0E+01	3.7E-03	1.7E-02	2.0E+00	4.6E-02	-4.9E+01
ODP	Depletion potential of the stratospheric ozone layer	kg CFC-11 Eq.	1.6E-06	2.1E-12	1.2E-10	8.2E-06	6.0E-14	6.6E-13	3.9E-08	3.2E-09	-2.7E-06
AP Air	Acidification potential for air emissions	kg SO <sub>2</sub> -Eq.	1.5E-01	2.7E-04	1.3E-05	7.6E-01	3.2E-05	1.0E-04	8.7E-04	1.3E-04	-8.5E-01
EP	Eutrophication potential	kg(PO <sub>4</sub> ) <sup>3</sup> -Eq.	5.1E-01	4.8E-05	1.1E-04	2.5E+00	4.3E-07	5.8E-06	4.5E-04	4.1E-04	-5.1E+00
POCP	Formation potential of tropospheric ozone photochemical oxidants	kg ethane-Eq.	3.7E-03	1.2E-05	1.3E-06	1.2E-01	2.1E-04	2.8E-03	1.4E-02	2.8E-03	-1.7E+01
ADPE	Abiotic depletion potential for non-fossil resources	kg Sb-Eq.	3.3E-03	0.0E+00	1.8E-09	1.2E+00	3.2E-03	3.3E-02	1.8E-01	3.2E-02	-5.4E+01
ADPF	Abiotic depletion potential for fossil resources	MJ	1.9E+02	7.0E-01	3.6E-02	9.4E+02	3.8E-03	1.7E-02	2.0E+00	4.6E-02	-4.9E+01

\*All use phase and disposal stages have been considered and only those with non-zero values have been reported

Results below contain the resource use throughout the life cycle of the product.

Resource Use											
Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
RPR <sub>E</sub>	Renewable primary energy as energy carrier	MJ	1.7E+02	0.0E+00	7.2E-04	8.7E+02	0.0E+00	0.0E+00	5.3E-01	4.1E-02	-6.2E+02
RPR <sub>M</sub>	Renewable primary energy resources as material utilization	MJ	1.1E+01	0.0E+00	5.4E-01	5.6E+01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
NRPR <sub>E</sub>	Nonrenewable primary energy as energy carrier	MJ	5.9E+02	2.3E+00	1.2E-01	3.0E+03	1.7E-01	7.3E-01	5.5E+00	9.9E-01	-2.0E+03
NRPR <sub>M</sub>	Nonrenewable primary energy as material utilization	MJ	9.3E+01	0.0E+00	4.6E+00	4.9E+02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SM	Use of secondary material	kg	0.0E+00								
RSF	Use of renewable secondary fuels	MJ	0.0E+00								
NRSF	Use of nonrenewable secondary fuels	MJ	0.0E+00								
RE	Energy recovered from disposed waste	MJ	0.0E+00	-2.6E+03							
FW	Use of net fresh water	m <sup>3</sup>	4.2E-01	0.0E+00	2.8E-05	3.0E+00	0.0E+00	0.0E+00	1.8E-01	5.1E-04	-1.4E+00

\*All use phase and disposal stages have been considered and only those with non-zero values have been reported



# Environmental Product Declaration

Southwire 5KV-25KV RhinoShield®, RhinoFlex®, RhinoPower® Mining Cables

Handling Cable



According to  
ISO 14025, EN 15804,  
and ISO 21930:2017

Results below contain the output flows and wastes throughout the life cycle of the product.

Output Flows and Waste Categories											
Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
HWD	Hazardous waste disposed	kg	1.1E-01	0.0E+00	5.6E-03	5.9E-01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
NHWD	Non-hazardous waste disposed	kg	2.7E-01	0.0E+00	1.5E-01	4.9E+00	0.0E+00	0.0E+00	0.0E+00	5.6E-01	0.0E+00
HLRW	High-level radioactive waste	kg	4.2E-01	0.0E+00	2.8E-05	2.1E+00	0.0E+00	0.0E+00	2.6E-05	4.8E-06	0.0E+00
ILLRW	Intermediate- and low-level radioactive waste	kg	0.0E+00								
CRU	Components for re-use	kg	0.0E+00								
MR	Materials for recycling	kg	1.4E-01	0.0E+00	5.1E-01	1.9E+01	0.0E+00	0.0E+00	3.2E+00	0.0E+00	0.0E+00
MER	Materials for energy recovery	kg	0.0E+00	0.0E+00	3.4E-02	1.2E+01	0.0E+00	0.0E+00	2.4E+00	0.0E+00	0.0E+00
EE	Recovered energy exported from system	MJ	0.0E+00	0.0E+00	0.0E+00	2.0E+02	0.0E+00	0.0E+00	4.1E+01	0.0E+00	0.0E+00

\*All use phase and disposal stages have been considered and only those with non-zero values have been reported

Results below contain direct greenhouse gas emissions and removals throughout the life cycle of the product.

Resource Use											
Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
BCRP	Biogenic Carbon Removal from Product	kg CO <sub>2</sub>	0.0E+00								
BCEP	Biogenic Carbon Emissions from Product	kg CO <sub>2</sub>	0.0E+00								
BCRK	Biogenic Carbon Removal from Packaging	kg CO <sub>2</sub>	1.7E-01	0.0E+00	0.0E+00	8.7E-01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
BCEK	Biogenic Carbon Emissions from Packaging	kg CO <sub>2</sub>	0.0E+00	0.0E+00	1.7E-01	8.7E-01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
BCEW	Biogenic Carbon Emissions from Combustion of Waste from Renewable Sources Used in Production Process	kg CO <sub>2</sub>	0.0E+00								
CCE	Calcination Carbon Emissions	kg CO <sub>2</sub>	0.0E+00								
CCR	Carbonation Carbon Removal	kg CO <sub>2</sub>	0.0E+00								
CWNR	Carbon Emissions from Combustion of Waste from Non-renewable Sources Used in Production Process	kg CO <sub>2</sub>	0.0E+00								

\*All use phase and disposal stages have been considered and only those with non-zero values have been reported



# Environmental Product Declaration

Southwire 5KV-25KV RhinoShield®, RhinoFlex®, RhinoPower® Mining Cables

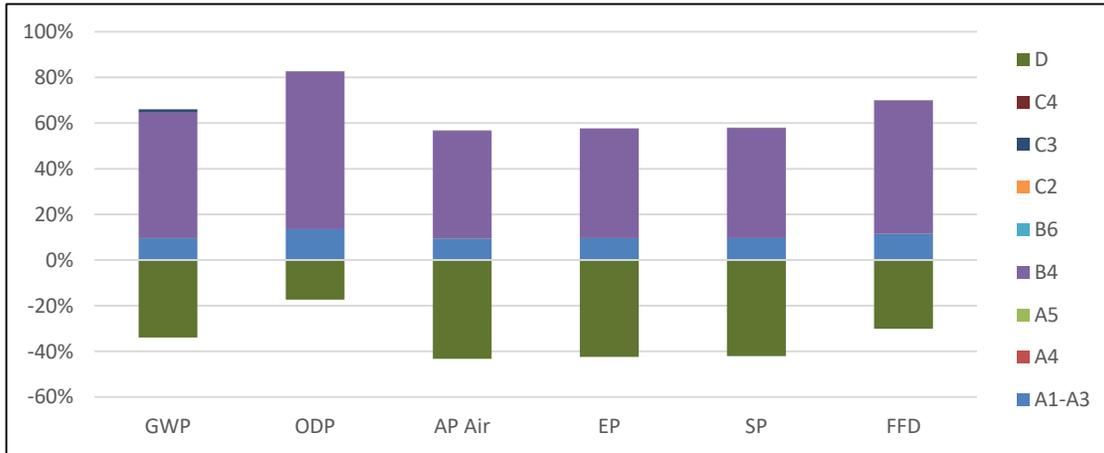
Handling Cable



According to  
**ISO 14025, EN 15804,**  
 and **ISO 21930:2017**

## LCA Interpretation - 57024899 (4/0-3)

The production life cycle stage (A1-A3) and in life energy usage (B6) dominate the impacts across all impact categories. This is due to the upstream production of materials used in the product, along with electricity use in the manufacturing of the product and the consumption of electricity during the cable's usage. With five replacements required over a life-span of a building, the replacement stage (B4) dominates from duplicating these stages. Module B4 excludes operational energy use and all benefits and loads beyond the system boundary. As five replacements occur in the specified building service life, module B6 includes the energy usage of six products and module D includes the benefits of six products.



## LCA Results - 57026199 (500/4)

Results shown below were calculated using TRACI 2.1 Methodology.

TRACI 2.1 Impact Assessment											
Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
GWP	Global warming potential	kg CO <sub>2</sub> -Eq.	3.6E+01	1.4E-01	1.3E-02	2.0E+02	3.7E-03	4.3E-02	3.9E+00	9.0E-02	-1.3E+02
ODP	Depletion potential of the stratospheric ozone layer	kg CFC-11 Eq.	3.1E-06	5.2E-12	3.8E-10	1.6E-05	6.0E-14	1.6E-12	7.6E-08	6.3E-09	-8.1E-06
AP Air	Acidification potential for air emissions	kg SO <sub>2</sub> -Eq.	5.3E-01	8.1E-04	4.1E-05	2.7E+00	3.2E-05	2.6E-04	1.7E-03	2.6E-04	-2.3E+00
EP	Eutrophication potential	kg N-Eq.	3.4E+00	4.5E-05	7.5E-04	1.7E+01	4.3E-07	1.4E-05	8.8E-04	8.0E-04	-1.5E+01
SP	Smog formation potential	kg O <sub>3</sub> -Eq.	1.1E+01	2.2E-02	1.1E-03	5.6E+01	2.1E-04	7.0E-03	2.7E-02	5.6E-03	-4.9E+01
FFD	Fossil Fuel Depletion	MJ-surplus	4.7E+01	2.6E-01	1.3E-02	2.4E+02	3.2E-03	8.2E-02	3.5E-01	6.3E-02	-1.3E+02

\*All use phase and disposal stages have been considered and only those with non-zero values have been reported



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Handling Cable



According to  
**ISO 14025, EN 15804,**  
and **ISO 21930:2017**

Results shown below were calculated using CML 2001 - April 2013 Methodology.

## CML 4.1 Impact Assessment

Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
GWP	Global warming potential	kg CO <sub>2</sub> -Eq.	3.6E+01	1.4E-01	1.4E-02	2.0E+02	3.7E-03	4.3E-02	3.9E+00	9.0E-02	-1.3E+02
ODP	Depletion potential of the stratospheric ozone layer	kg CFC-11 Eq.	2.3E-06	5.1E-12	2.9E-10	1.2E-05	6.0E-14	1.6E-12	7.6E-08	6.3E-09	-8.1E-06
AP Air	Acidification potential for air emissions	kg SO <sub>2</sub> -Eq.	4.3E-01	6.7E-04	3.3E-05	2.2E+00	3.2E-05	2.6E-04	1.7E-03	2.6E-04	-2.3E+00
EP	Eutrophication potential	kg(PO <sub>4</sub> ) <sup>3</sup> -Eq.	1.5E+00	1.2E-04	2.8E-04	7.5E+00	4.3E-07	1.4E-05	8.8E-04	8.0E-04	-1.5E+01
POCP	Formation potential of tropospheric ozone photochemical oxidants	kg ethane-Eq.	9.5E-03	3.1E-05	3.1E-06	2.5E-01	2.1E-04	7.0E-03	2.7E-02	5.6E-03	-4.9E+01
ADPE	Abiotic depletion potential for non-fossil resources	kg Sb-Eq.	9.8E-03	0.0E+00	4.5E-09	2.5E+00	3.2E-03	8.2E-02	3.5E-01	6.3E-02	-1.3E+02
ADPF	Abiotic depletion potential for fossil resources	MJ	4.4E+02	1.7E+00	8.9E-02	2.2E+03	3.8E-03	4.3E-02	3.9E+00	9.1E-02	-1.3E+02

\*All use phase and disposal stages have been considered and only those with non-zero values have been reported

Results below contain the resource use throughout the life cycle of the product.

## Resource Use

Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
RPR <sub>E</sub>	Renewable primary energy as energy carrier	MJ	4.9E+02	0.0E+00	1.8E-03	2.5E+03	0.0E+00	0.0E+00	1.0E+00	8.1E-02	-1.8E+03
RPR <sub>M</sub>	Renewable primary energy resources as material utilization	MJ	2.7E+01	0.0E+00	1.3E+00	1.4E+02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
NRPR <sub>E</sub>	Nonrenewable primary energy as energy carrier	MJ	1.5E+03	5.7E+00	2.9E-01	7.4E+03	1.7E-01	1.8E+00	1.1E+01	1.9E+00	-5.0E+03
NRPR <sub>M</sub>	Nonrenewable primary energy as material utilization	MJ	1.8E+02	0.0E+00	8.9E+00	9.4E+02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SM	Use of secondary material	kg	0.0E+00								
RSF	Use of renewable secondary fuels	MJ	0.0E+00								
NRSF	Use of nonrenewable secondary fuels	MJ	0.0E+00								
RE	Energy recovered from disposed waste	MJ	0.0E+00	-6.8E+03							
FW	Use of net fresh water	m <sup>3</sup>	1.1E+00	0.0E+00	7.0E-05	7.4E+00	0.0E+00	0.0E+00	3.4E-01	1.0E-03	-4.0E+00

\*All use phase and disposal stages have been considered and only those with non-zero values have been reported



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Handling Cable



According to  
ISO 14025, EN 15804,  
and ISO 21930:2017

Results below contain the output flows and wastes throughout the life cycle of the product.

## Output Flows and Waste Categories

Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
HWD	Hazardous waste disposed	kg	2.8E-01	0.0E+00	1.4E-02	1.5E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
NHWD	Non-hazardous waste disposed	kg	6.6E-01	0.0E+00	3.7E-01	1.3E+01	0.0E+00	0.0E+00	0.0E+00	1.7E+00	0.0E+00
HLRW	High-level radioactive waste	kg	1.1E+00	0.0E+00	7.0E-05	5.7E+00	0.0E+00	0.0E+00	5.1E-05	9.4E-06	0.0E+00
ILLRW	Intermediate- and low-level radioactive waste	kg	0.0E+00								
CRU	Components for re-use	kg	0.0E+00								
MR	Materials for recycling	kg	3.4E-01	0.0E+00	1.3E+00	5.5E+01	0.0E+00	0.0E+00	9.4E+00	0.0E+00	0.0E+00
MER	Materials for energy recovery	kg	0.0E+00	0.0E+00	8.4E-02	2.1E+01	0.0E+00	0.0E+00	4.1E+00	0.0E+00	0.0E+00
EE	Recovered energy exported from system	MJ	0.0E+00	0.0E+00	0.0E+00	3.9E+02	0.0E+00	0.0E+00	7.9E+01	0.0E+00	0.0E+00

\*All use phase and disposal stages have been considered and only those with non-zero values have been reported

Results below contain direct greenhouse gas emissions and removals throughout the life cycle of the product.

## Resource Use

Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
BCRP	Biogenic Carbon Removal from Product	kg CO <sub>2</sub>	0.0E+00								
BCEP	Biogenic Carbon Emissions from Product	kg CO <sub>2</sub>	0.0E+00								
BCRK	Biogenic Carbon Removal from Packaging	kg CO <sub>2</sub>	4.3E-01	0.0E+00	0.0E+00	2.2E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
BCEK	Biogenic Carbon Emissions from Packaging	kg CO <sub>2</sub>	0.0E+00	0.0E+00	4.3E-01	2.2E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
BCEW	Biogenic Carbon Emissions from Combustion of Waste from Renewable Sources Used in Production Process	kg CO <sub>2</sub>	0.0E+00								
CCE	Calcination Carbon Emissions	kg CO <sub>2</sub>	0.0E+00								
CCR	Carbonation Carbon Removal	kg CO <sub>2</sub>	0.0E+00								
CWNR	Carbon Emissions from Combustion of Waste from Non-renewable Sources Used in Production Process	kg CO <sub>2</sub>	0.0E+00								

\*All use phase and disposal stages have been considered and only those with non-zero values have been reported



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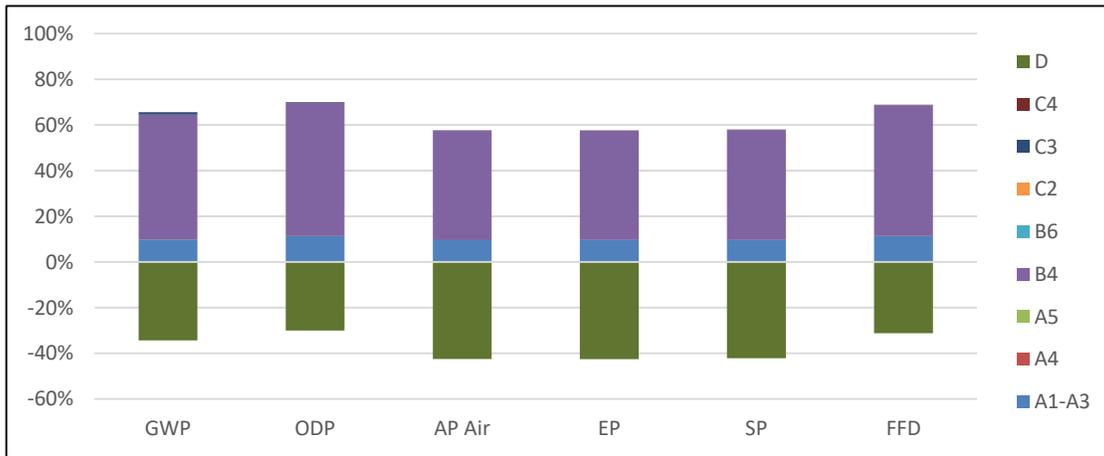
Handling Cable



According to  
**ISO 14025, EN 15804,**  
 and **ISO 21930:2017**

## LCA Interpretation - 57026199 (500/4)

The production life cycle stage (A1-A3) and in life energy usage (B6) dominate the impacts across all impact categories. This is due to the upstream production of materials used in the product, along with electricity use in the manufacturing of the product and the consumption of electricity during the cable's usage. With five replacements required over a life-span of a building, the replacement stage (B4) dominates from duplicating these stages. Module B4 excludes operational energy use and all benefits and loads beyond the system boundary. As five replacements occur in the specified building service life, module B6 includes the energy usage of six products and module D includes the benefits of six products.



## LCA Results - 57849799 (3/0-3)

Results shown below were calculated using TRACI 2.1 Methodology.

TRACI 2.1 Impact Assessment											
Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
GWP	Global warming potential	kg CO <sub>2</sub> -Eq.	1.5E+01	4.9E-02	4.6E-03	7.8E+01	3.7E-03	1.6E-02	9.0E-01	2.1E-02	-5.2E+01
ODP	Depletion potential of the stratospheric ozone layer	kg CFC-11 Eq.	1.3E-06	1.9E-12	1.4E-10	6.4E-06	6.0E-14	6.0E-13	1.8E-08	1.4E-09	-3.6E-06
AP Air	Acidification potential for air emissions	kg SO <sub>2</sub> -Eq.	2.3E-01	2.9E-04	1.5E-05	1.2E+00	3.2E-05	9.3E-05	3.9E-04	6.1E-05	-1.0E+00
EP	Eutrophication potential	kg N-Eq.	1.5E+00	1.6E-05	2.7E-04	7.5E+00	4.3E-07	5.2E-06	2.0E-04	1.8E-04	-6.7E+00
SP	Smog formation potential	kg O <sub>3</sub> -Eq.	4.9E+00	8.1E-03	4.0E-04	2.5E+01	2.1E-04	2.6E-03	6.2E-03	1.3E-03	-2.2E+01
FFD	Fossil Fuel Depletion	MJ-surplus	1.7E+01	9.4E-02	4.7E-03	8.7E+01	3.2E-03	3.0E-02	8.2E-02	1.5E-02	-5.0E+01

*\*All use phase and disposal stages have been considered and only those with non-zero values have been reported*



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According to  
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Results shown below were calculated using CML 2001 - April 2013 Methodology.

## CML 4.1 Impact Assessment

Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
GWP	Global warming potential	kg CO <sub>2</sub> -Eq.	1.5E+01	4.9E-02	5.2E-03	7.8E+01	3.7E-03	1.6E-02	9.0E-01	2.1E-02	-5.2E+01
ODP	Depletion potential of the stratospheric ozone layer	kg CFC-11 Eq.	9.5E-07	1.9E-12	1.0E-10	4.8E-06	6.0E-14	6.0E-13	1.8E-08	1.4E-09	-3.6E-06
AP Air	Acidification potential for air emissions	kg SO <sub>2</sub> -Eq.	1.9E-01	2.4E-04	1.2E-05	9.4E-01	3.2E-05	9.3E-05	3.9E-04	6.1E-05	-1.0E+00
EP	Eutrophication potential	kg(PO <sub>4</sub> ) <sup>3</sup> -Eq.	6.6E-01	4.3E-05	1.0E-04	3.3E+00	4.3E-07	5.2E-06	2.0E-04	1.8E-04	-6.7E+00
POCP	Formation potential of tropospheric ozone photochemical oxidants	kg ethane-Eq.	3.9E-03	1.1E-05	1.1E-06	7.0E-02	2.1E-04	2.6E-03	6.2E-03	1.3E-03	-2.2E+01
ADPE	Abiotic depletion potential for non-fossil resources	kg Sb-Eq.	4.4E-03	0.0E+00	1.6E-09	6.5E-01	3.2E-03	3.0E-02	8.2E-02	1.5E-02	-5.0E+01
ADPF	Abiotic depletion potential for fossil resources	MJ	1.7E+02	6.3E-01	3.3E-02	8.5E+02	3.8E-03	1.6E-02	9.0E-01	2.1E-02	-5.2E+01

\*All use phase and disposal stages have been considered and only those with non-zero values have been reported

Results below contain the resource use throughout the life cycle of the product.

## Resource Use

Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
RPR <sub>E</sub>	Renewable primary energy as energy carrier	MJ	2.1E+02	0.0E+00	6.5E-04	1.1E+03	0.0E+00	0.0E+00	2.4E-01	1.9E-02	-8.2E+02
RPR <sub>M</sub>	Renewable primary energy resources as material utilization	MJ	9.7E+00	0.0E+00	4.9E-01	5.1E+01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
NRPR <sub>E</sub>	Nonrenewable primary energy as energy carrier	MJ	6.2E+02	2.1E+00	1.1E-01	3.1E+03	1.7E-01	6.6E-01	2.5E+00	4.5E-01	-2.0E+03
NRPR <sub>M</sub>	Nonrenewable primary energy as material utilization	MJ	1.3E+01	0.0E+00	6.4E-01	6.7E+01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SM	Use of secondary material	kg	0.0E+00								
RSF	Use of renewable secondary fuels	MJ	0.0E+00								
NRSF	Use of nonrenewable secondary fuels	MJ	0.0E+00								
RE	Energy recovered from disposed waste	MJ	0.0E+00	-2.8E+03							
FW	Use of net fresh water	m <sup>3</sup>	4.7E-01	0.0E+00	2.5E-05	2.8E+00	0.0E+00	0.0E+00	8.0E-02	2.3E-04	-1.8E+00

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Handling Cable



According to  
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and ISO 21930:2017

Results below contain the output flows and wastes throughout the life cycle of the product.

Output Flows and Waste Categories											
Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
HWD	Hazardous waste disposed	kg	1.0E-01	0.0E+00	5.1E-03	5.4E-01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
NHWD	Non-hazardous waste disposed	kg	2.4E-01	0.0E+00	1.3E-01	5.6E+00	0.0E+00	0.0E+00	0.0E+00	7.4E-01	0.0E+00
HLRW	High-level radioactive waste	kg	4.7E-01	0.0E+00	2.5E-05	2.4E+00	0.0E+00	0.0E+00	1.2E-05	2.2E-06	0.0E+00
ILLRW	Intermediate- and low-level radioactive waste	kg	0.0E+00								
CRU	Components for re-use	kg	0.0E+00								
MR	Materials for recycling	kg	1.2E-01	0.0E+00	4.6E-01	2.4E+01	0.0E+00	0.0E+00	4.2E+00	0.0E+00	0.0E+00
MER	Materials for energy recovery	kg	0.0E+00	0.0E+00	3.1E-02	3.1E+00	0.0E+00	0.0E+00	5.9E-01	0.0E+00	0.0E+00
EE	Recovered energy exported from system	MJ	0.0E+00	0.0E+00	0.0E+00	2.8E+01	0.0E+00	0.0E+00	5.6E+00	0.0E+00	0.0E+00

\*All use phase and disposal stages have been considered and only those with non-zero values have been reported

Results below contain direct greenhouse gas emissions and removals throughout the life cycle of the product.

Resource Use											
Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
BCRP	Biogenic Carbon Removal from Product	kg CO <sub>2</sub>	0.0E+00								
BCEP	Biogenic Carbon Emissions from Product	kg CO <sub>2</sub>	0.0E+00								
BCRK	Biogenic Carbon Removal from Packaging	kg CO <sub>2</sub>	1.6E-01	0.0E+00	0.0E+00	7.9E-01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
BCEK	Biogenic Carbon Emissions from Packaging	kg CO <sub>2</sub>	0.0E+00	0.0E+00	1.6E-01	7.9E-01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
BCEW	Biogenic Carbon Emissions from Combustion of Waste from Renewable Sources Used in Production Process	kg CO <sub>2</sub>	0.0E+00								
CCE	Calcination Carbon Emissions	kg CO <sub>2</sub>	0.0E+00								
CCR	Carbonation Carbon Removal	kg CO <sub>2</sub>	0.0E+00								
CWNR	Carbon Emissions from Combustion of Waste from Non-renewable Sources Used in Production Process	kg CO <sub>2</sub>	0.0E+00								

\*All use phase and disposal stages have been considered and only those with non-zero values have been reported



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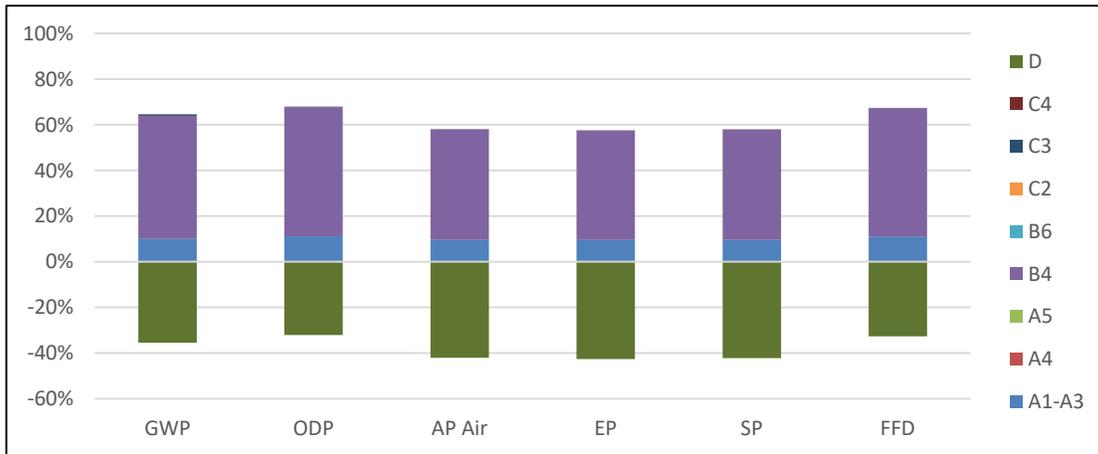
Handling Cable



According to  
**ISO 14025, EN 15804,**  
 and **ISO 21930:2017**

## LCA Interpretation - 57849799 (3/0-3)

The production life cycle stage (A1-A3) and in life energy usage (B6) dominate the impacts across all impact categories. This is due to the upstream production of materials used in the product, along with electricity use in the manufacturing of the product and the consumption of electricity during the cable's usage. With five replacements required over a life-span of a building, the replacement stage (B4) dominates from duplicating these stages. Module B4 excludes operational energy use and all benefits and loads beyond the system boundary. As five replacements occur in the specified building service life, module B6 includes the energy usage of six products and module D includes the benefits of six products.



## LCA Results - 58053399 (350/3)

Results shown below were calculated using TRACI 2.1 Methodology.

TRACI 2.1 Impact Assessment											
Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
GWP	Global warming potential	kg CO <sub>2</sub> -Eq.	3.1E+01	1.2E-01	1.1E-02	1.8E+02	3.7E-03	3.8E-02	3.9E+00	9.0E-02	-1.1E+02
ODP	Depletion potential of the stratospheric ozone layer	kg CFC-11 Eq.	4.0E-06	4.5E-12	3.4E-10	2.1E-05	6.0E-14	1.4E-12	7.6E-08	6.2E-09	-6.6E-06
AP Air	Acidification potential for air emissions	kg SO <sub>2</sub> -Eq.	4.4E-01	7.1E-04	3.6E-05	2.2E+00	3.2E-05	2.3E-04	1.7E-03	2.6E-04	-1.9E+00
EP	Eutrophication potential	kg N-Eq.	2.8E+00	4.0E-05	6.7E-04	1.4E+01	4.3E-07	1.3E-05	8.8E-04	7.9E-04	-1.2E+01
SP	Smog formation potential	kg O <sub>3</sub> -Eq.	9.1E+00	2.0E-02	9.7E-04	4.6E+01	2.1E-04	6.2E-03	2.7E-02	5.5E-03	-4.0E+01
FFD	Fossil Fuel Depletion	MJ-surplus	4.2E+01	2.3E-01	1.2E-02	2.1E+02	3.2E-03	7.3E-02	3.5E-01	6.3E-02	-1.1E+02

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According to  
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Results shown below were calculated using CML 2001 - April 2013 Methodology.

## CML 4.1 Impact Assessment

Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
GWP	Global warming potential	kg CO <sub>2</sub> -Eq.	3.1E+01	1.2E-01	1.2E-02	1.8E+02	3.7E-03	3.8E-02	3.9E+00	9.0E-02	-1.1E+02
ODP	Depletion potential of the stratospheric ozone layer	kg CFC-11 Eq.	3.0E-06	4.5E-12	2.5E-10	1.6E-05	6.0E-14	1.4E-12	7.6E-08	6.2E-09	-6.6E-06
AP Air	Acidification potential for air emissions	kg SO <sub>2</sub> -Eq.	3.6E-01	5.9E-04	3.0E-05	1.8E+00	3.2E-05	2.3E-04	1.7E-03	2.6E-04	-1.9E+00
EP	Eutrophication potential	kg(PO <sub>4</sub> ) <sup>3</sup> -Eq.	1.2E+00	1.0E-04	2.4E-04	6.1E+00	4.3E-07	1.3E-05	8.8E-04	7.9E-04	-1.2E+01
POCP	Formation potential of tropospheric ozone photochemical oxidants	kg ethane-Eq.	8.2E-03	2.7E-05	2.8E-06	2.3E-01	2.1E-04	6.2E-03	2.7E-02	5.5E-03	-4.0E+01
ADPE	Abiotic depletion potential for non-fossil resources	kg Sb-Eq.	8.0E-03	0.0E+00	4.0E-09	2.5E+00	3.2E-03	7.3E-02	3.5E-01	6.3E-02	-1.1E+02
ADPF	Abiotic depletion potential for fossil resources	MJ	3.9E+02	1.5E+00	7.9E-02	2.0E+03	3.8E-03	3.8E-02	3.9E+00	9.0E-02	-1.1E+02

\*All use phase and disposal stages have been considered and only those with non-zero values have been reported

Results below contain the resource use throughout the life cycle of the product.

## Resource Use

Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
RPR <sub>E</sub>	Renewable primary energy as energy carrier	MJ	4.1E+02	0.0E+00	1.6E-03	2.1E+03	0.0E+00	0.0E+00	1.0E+00	8.1E-02	-1.5E+03
RPR <sub>M</sub>	Renewable primary energy resources as material utilization	MJ	2.3E+01	0.0E+00	1.2E+00	1.2E+02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
NRPR <sub>E</sub>	Nonrenewable primary energy as energy carrier	MJ	1.3E+03	5.0E+00	2.6E-01	6.5E+03	1.7E-01	1.6E+00	1.1E+01	1.9E+00	-4.2E+03
NRPR <sub>M</sub>	Nonrenewable primary energy as material utilization	MJ	1.8E+02	0.0E+00	8.9E+00	9.3E+02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SM	Use of secondary material	kg	0.0E+00								
RSF	Use of renewable secondary fuels	MJ	0.0E+00								
NRSF	Use of nonrenewable secondary fuels	MJ	0.0E+00								
RE	Energy recovered from disposed waste	MJ	0.0E+00	-5.7E+03							
FW	Use of net fresh water	m <sup>3</sup>	9.8E-01	0.0E+00	6.2E-05	6.6E+00	0.0E+00	0.0E+00	3.4E-01	1.0E-03	-3.3E+00

\*All use phase and disposal stages have been considered and only those with non-zero values have been reported



# Environmental Product Declaration

Southwire 5KV-25KV RhinoShield®, RhinoFlex®, RhinoPower® Mining Cables

Handling Cable



According to  
ISO 14025, EN 15804,  
and ISO 21930:2017

Results below contain the output flows and wastes throughout the life cycle of the product.

Output Flows and Waste Categories											
Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
HWD	Hazardous waste disposed	kg	2.5E-01	0.0E+00	1.2E-02	1.3E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
NHWD	Non-hazardous waste disposed	kg	5.8E-01	0.0E+00	3.3E-01	1.1E+01	0.0E+00	0.0E+00	0.0E+00	1.4E+00	0.0E+00
HLRW	High-level radioactive waste	kg	9.8E-01	0.0E+00	6.2E-05	4.9E+00	0.0E+00	0.0E+00	5.1E-05	9.3E-06	0.0E+00
ILLRW	Intermediate- and low-level radioactive waste	kg	0.0E+00								
CRU	Components for re-use	kg	0.0E+00								
MR	Materials for recycling	kg	3.0E-01	0.0E+00	1.1E+00	4.5E+01	0.0E+00	0.0E+00	7.7E+00	0.0E+00	0.0E+00
MER	Materials for energy recovery	kg	0.0E+00	0.0E+00	7.4E-02	2.2E+01	0.0E+00	0.0E+00	4.4E+00	0.0E+00	0.0E+00
EE	Recovered energy exported from system	MJ	0.0E+00	0.0E+00	0.0E+00	3.9E+02	0.0E+00	0.0E+00	7.8E+01	0.0E+00	0.0E+00

\*All use phase and disposal stages have been considered and only those with non-zero values have been reported

Results below contain direct greenhouse gas emissions and removals throughout the life cycle of the product.

Resource Use											
Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
BCRP	Biogenic Carbon Removal from Product	kg CO <sub>2</sub>	0.0E+00								
BCEP	Biogenic Carbon Emissions from Product	kg CO <sub>2</sub>	0.0E+00								
BCRK	Biogenic Carbon Removal from Packaging	kg CO <sub>2</sub>	3.8E-01	0.0E+00	0.0E+00	1.9E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
BCEK	Biogenic Carbon Emissions from Packaging	kg CO <sub>2</sub>	0.0E+00	0.0E+00	3.8E-01	1.9E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
BCEW	Biogenic Carbon Emissions from Combustion of Waste from Renewable Sources Used in Production Process	kg CO <sub>2</sub>	0.0E+00								
CCE	Calcination Carbon Emissions	kg CO <sub>2</sub>	0.0E+00								
CCR	Carbonation Carbon Removal	kg CO <sub>2</sub>	0.0E+00								
CWNR	Carbon Emissions from Combustion of Waste from Non-renewable Sources Used in Production Process	kg CO <sub>2</sub>	0.0E+00								

\*All use phase and disposal stages have been considered and only those with non-zero values have been reported



# Environmental Product Declaration

Southwire 5KV-25KV RhinoShield®, RhinoFlex®, RhinoPower® Mining Cables

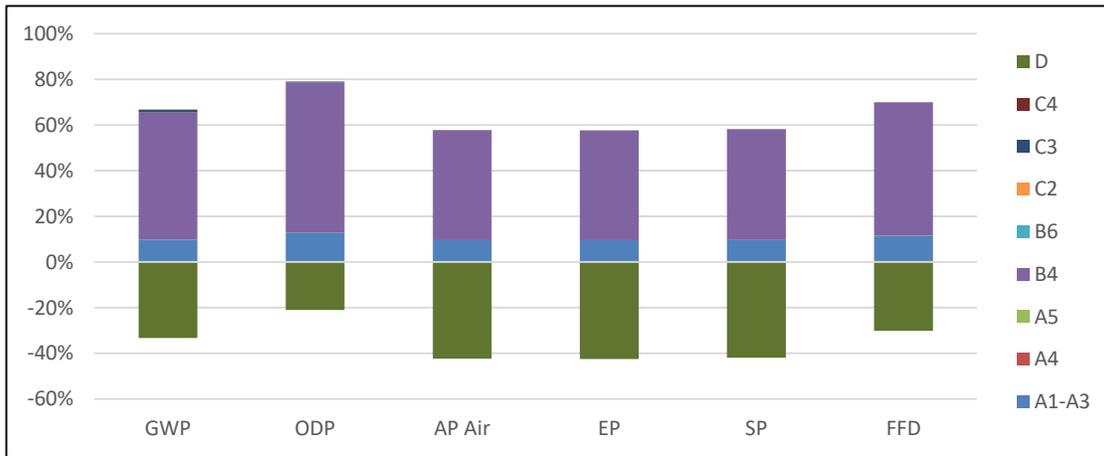
Handling Cable



According to  
ISO 14025, EN 15804,  
and ISO 21930:2017

## LCA Interpretation - 58053399 (350/3)

The production life cycle stage (A1-A3) and in life energy usage (B6) dominate the impacts across all impact categories. This is due to the upstream production of materials used in the product, along with electricity use in the manufacturing of the product and the consumption of electricity during the cable's usage. With five replacements required over a life-span of a building, the replacement stage (B4) dominates from duplicating these stages. Module B4 excludes operational energy use and all benefits and loads beyond the system boundary. As five replacements occur in the specified building service life, module B6 includes the energy usage of six products and module D includes the benefits of six products.



## LCA Results - 5818299 (350/3)

Results shown below were calculated using TRACI 2.1 Methodology.

TRACI 2.1 Impact Assessment											
Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
GWP	Global warming potential	kg CO <sub>2</sub> -Eq.	2.1E+01	8.5E-02	7.9E-03	1.2E+02	3.7E-03	2.7E-02	3.0E+00	6.9E-02	-7.5E+01
ODP	Depletion potential of the stratospheric ozone layer	kg CFC-11 Eq.	2.6E-06	3.2E-12	2.4E-10	1.3E-05	6.0E-14	1.0E-12	5.8E-08	4.8E-09	-4.4E-06
AP Air	Acidification potential for air emissions	kg SO <sub>2</sub> -Eq.	2.9E-01	5.1E-04	2.5E-05	1.5E+00	3.2E-05	1.6E-04	1.3E-03	2.0E-04	-1.3E+00
EP	Eutrophication potential	kg N-Eq.	1.8E+00	2.8E-05	4.7E-04	9.3E+00	4.3E-07	9.0E-06	6.7E-04	6.1E-04	-8.2E+00
SP	Smog formation potential	kg O <sub>3</sub> -Eq.	6.2E+00	1.4E-02	6.9E-04	3.1E+01	2.1E-04	4.4E-03	2.1E-02	4.2E-03	-2.7E+01
FFD	Fossil Fuel Depletion	MJ-surplus	3.0E+01	1.6E-01	8.1E-03	1.5E+02	3.2E-03	5.2E-02	2.7E-01	4.8E-02	-8.1E+01

\*All use phase and disposal stages have been considered and only those with non-zero values have been reported



# Environmental Product Declaration

Southwire 5KV-25KV RhinoShield®, RhinoFlex®, RhinoPower® Mining Cables

Handling Cable



According to  
ISO 14025, EN 15804,  
and ISO 21930:2017

Results shown below were calculated using CML 2001 - April 2013 Methodology.

## CML 4.1 Impact Assessment

Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
GWP	Global warming potential	kg CO <sub>2</sub> -Eq.	2.2E+01	8.5E-02	8.8E-03	1.2E+02	3.7E-03	2.7E-02	3.0E+00	6.9E-02	-7.5E+01
ODP	Depletion potential of the stratospheric ozone layer	kg CFC-11 Eq.	2.0E-06	3.2E-12	1.8E-10	1.0E-05	6.0E-14	1.0E-12	5.8E-08	4.8E-09	-4.4E-06
AP Air	Acidification potential for air emissions	kg SO <sub>2</sub> -Eq.	2.4E-01	4.2E-04	2.1E-05	1.2E+00	3.2E-05	1.6E-04	1.3E-03	2.0E-04	-1.3E+00
EP	Eutrophication potential	kg(PO <sub>4</sub> ) <sup>3</sup> -Eq.	8.2E-01	7.4E-05	1.7E-04	4.1E+00	4.3E-07	9.0E-06	6.7E-04	6.1E-04	-8.2E+00
POCP	Formation potential of tropospheric ozone photochemical oxidants	kg ethane-Eq.	5.6E-03	1.9E-05	1.9E-06	1.7E-01	2.1E-04	4.4E-03	2.1E-02	4.2E-03	-2.7E+01
ADPE	Abiotic depletion potential for non-fossil resources	kg Sb-Eq.	5.4E-03	0.0E+00	2.8E-09	1.9E+00	3.2E-03	5.2E-02	2.7E-01	4.8E-02	-8.1E+01
ADPF	Abiotic depletion potential for fossil resources	MJ	2.7E+02	1.1E+00	5.6E-02	1.4E+03	3.8E-03	2.7E-02	3.0E+00	6.9E-02	-7.5E+01

\*All use phase and disposal stages have been considered and only those with non-zero values have been reported

Results below contain the resource use throughout the life cycle of the product.

## Resource Use

Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
RPR <sub>E</sub>	Renewable primary energy as energy carrier	MJ	2.8E+02	0.0E+00	1.1E-03	1.4E+03	0.0E+00	0.0E+00	7.9E-01	6.2E-02	-1.0E+03
RPR <sub>M</sub>	Renewable primary energy resources as material utilization	MJ	1.7E+01	0.0E+00	8.3E-01	8.8E+01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
NRPR <sub>E</sub>	Nonrenewable primary energy as energy carrier	MJ	8.7E+02	3.6E+00	1.8E-01	4.4E+03	1.7E-01	1.1E+00	8.2E+00	1.5E+00	-3.0E+03
NRPR <sub>M</sub>	Nonrenewable primary energy as material utilization	MJ	1.4E+02	0.0E+00	7.2E+00	7.6E+02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SM	Use of secondary material	kg	0.0E+00								
RSF	Use of renewable secondary fuels	MJ	0.0E+00								
NRSF	Use of nonrenewable secondary fuels	MJ	0.0E+00								
RE	Energy recovered from disposed waste	MJ	0.0E+00	-4.0E+03							
FW	Use of net fresh water	m <sup>3</sup>	6.6E-01	0.0E+00	4.4E-05	4.6E+00	0.0E+00	0.0E+00	2.6E-01	7.7E-04	-2.2E+00

\*All use phase and disposal stages have been considered and only those with non-zero values have been reported



# Environmental Product Declaration

Southwire 5KV-25KV RhinoShield®, RhinoFlex®, RhinoPower® Mining Cables

Handling Cable



According to  
ISO 14025, EN 15804,  
and ISO 21930:2017

Results below contain the output flows and wastes throughout the life cycle of the product.

## Output Flows and Waste Categories

Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
HWD	Hazardous waste disposed	kg	1.8E-01	0.0E+00	8.8E-03	9.2E-01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
NHWD	Non-hazardous waste disposed	kg	4.1E-01	0.0E+00	2.3E-01	7.8E+00	0.0E+00	0.0E+00	0.0E+00	9.1E-01	0.0E+00
HLRW	High-level radioactive waste	kg	6.6E-01	0.0E+00	4.4E-05	3.3E+00	0.0E+00	0.0E+00	3.9E-05	7.1E-06	0.0E+00
ILLRW	Intermediate- and low-level radioactive waste	kg	0.0E+00								
CRU	Components for re-use	kg	0.0E+00								
MR	Materials for recycling	kg	2.1E-01	0.0E+00	8.0E-01	3.1E+01	0.0E+00	0.0E+00	5.1E+00	0.0E+00	0.0E+00
MER	Materials for energy recovery	kg	0.0E+00	0.0E+00	5.3E-02	1.8E+01	0.0E+00	0.0E+00	3.5E+00	0.0E+00	0.0E+00
EE	Recovered energy exported from system	MJ	0.0E+00	0.0E+00	0.0E+00	3.2E+02	0.0E+00	0.0E+00	6.3E+01	0.0E+00	0.0E+00

\*All use phase and disposal stages have been considered and only those with non-zero values have been reported

Results below contain direct greenhouse gas emissions and removals throughout the life cycle of the product.

## Resource Use

Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
BCRP	Biogenic Carbon Removal from Product	kg CO <sub>2</sub>	0.0E+00								
BCEP	Biogenic Carbon Emissions from Product	kg CO <sub>2</sub>	0.0E+00								
BCRK	Biogenic Carbon Removal from Packaging	kg CO <sub>2</sub>	2.7E-01	0.0E+00	0.0E+00	1.4E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
BCEK	Biogenic Carbon Emissions from Packaging	kg CO <sub>2</sub>	0.0E+00	0.0E+00	2.7E-01	1.4E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
BCEW	Biogenic Carbon Emissions from Combustion of Waste from Renewable Sources Used in Production Process	kg CO <sub>2</sub>	0.0E+00								
CCE	Calcination Carbon Emissions	kg CO <sub>2</sub>	0.0E+00								
CCR	Carbonation Carbon Removal	kg CO <sub>2</sub>	0.0E+00								
CWNR	Carbon Emissions from Combustion of Waste from Non-renewable Sources Used in Production Process	kg CO <sub>2</sub>	0.0E+00								

\*All use phase and disposal stages have been considered and only those with non-zero values have been reported



# Environmental Product Declaration

Southwire 5KV-25KV RhinoShield®, RhinoFlex®, RhinoPower® Mining Cables

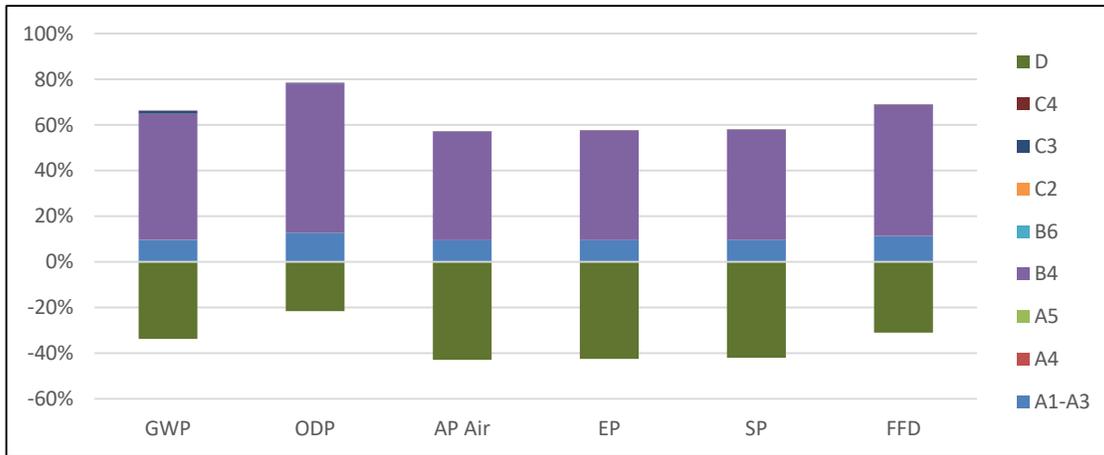
Handling Cable



According to  
ISO 14025, EN 15804,  
and ISO 21930:2017

## LCA Interpretation - 5818299 (350/3)

The production life cycle stage (A1-A3) and in life energy usage (B6) dominate the impacts across all impact categories. This is due to the upstream production of materials used in the product, along with electricity use in the manufacturing of the product and the consumption of electricity during the cable's usage. With five replacements required over a life-span of a building, the replacement stage (B4) dominates from duplicating these stages. Module B4 excludes operational energy use and all benefits and loads beyond the system boundary. As five replacements occur in the specified building service life, module B6 includes the energy usage of six products and module D includes the benefits of six products.



## LCA Results - 58464899 (1/0-3)

Results shown below were calculated using TRACI 2.1 Methodology.

TRACI 2.1 Impact Assessment											
Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
GWP	Global warming potential	kg CO <sub>2</sub> -Eq.	7.3E+00	2.8E-02	2.6E-03	4.2E+01	3.7E-03	9.0E-03	1.1E+00	2.4E-02	-2.4E+01
ODP	Depletion potential of the stratospheric ozone layer	kg CFC-11 Eq.	1.6E-06	1.1E-12	8.0E-11	8.3E-06	6.0E-14	3.4E-13	2.0E-08	1.7E-09	-1.4E-06
AP Air	Acidification potential for air emissions	kg SO <sub>2</sub> -Eq.	9.6E-02	1.7E-04	8.6E-06	4.8E-01	3.2E-05	5.4E-05	4.6E-04	7.1E-05	-4.2E-01
EP	Eutrophication potential	kg N-Eq.	5.9E-01	9.5E-06	1.6E-04	3.0E+00	4.3E-07	3.0E-06	2.4E-04	2.2E-04	-2.6E+00
SP	Smog formation potential	kg O <sub>3</sub> -Eq.	2.0E+00	4.7E-03	2.3E-04	1.0E+01	2.1E-04	1.5E-03	7.3E-03	1.5E-03	-8.6E+00
FFD	Fossil Fuel Depletion	MJ-surplus	9.3E+00	5.5E-02	2.7E-03	4.8E+01	3.2E-03	1.7E-02	9.6E-02	1.7E-02	-2.5E+01

\*All use phase and disposal stages have been considered and only those with non-zero values have been reported



# Environmental Product Declaration

Southwire 5KV-25KV RhinoShield®, RhinoFlex®, RhinoPower® Mining Cables

Handling Cable



According to  
ISO 14025, EN 15804,  
and ISO 21930:2017

Results shown below were calculated using CML 2001 - April 2013 Methodology.

## CML 4.1 Impact Assessment

Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
GWP	Global warming potential	kg CO <sub>2</sub> -Eq.	7.3E+00	2.9E-02	3.0E-03	4.2E+01	3.7E-03	9.0E-03	1.1E+00	2.4E-02	-2.4E+01
ODP	Depletion potential of the stratospheric ozone layer	kg CFC-11 Eq.	1.3E-06	1.1E-12	6.1E-11	6.6E-06	6.0E-14	3.4E-13	2.0E-08	1.7E-09	-1.4E-06
AP Air	Acidification potential for air emissions	kg SO <sub>2</sub> -Eq.	7.9E-02	1.4E-04	7.0E-06	4.0E-01	3.2E-05	5.4E-05	4.6E-04	7.1E-05	-4.2E-01
EP	Eutrophication potential	kg(PO <sub>4</sub> ) <sup>3</sup> -Eq.	2.6E-01	2.5E-05	5.8E-05	1.3E+00	4.3E-07	3.0E-06	2.4E-04	2.2E-04	-2.6E+00
POCP	Formation potential of tropospheric ozone photochemical oxidants	kg ethane-Eq.	1.9E-03	6.5E-06	6.6E-07	6.1E-02	2.1E-04	1.5E-03	7.3E-03	1.5E-03	-8.6E+00
ADPE	Abiotic depletion potential for non-fossil resources	kg Sb-Eq.	1.7E-03	0.0E+00	9.4E-10	6.6E-01	3.2E-03	1.7E-02	9.6E-02	1.7E-02	-2.5E+01
ADPF	Abiotic depletion potential for fossil resources	MJ	8.9E+01	3.7E-01	1.9E-02	4.5E+02	3.8E-03	9.1E-03	1.1E+00	2.5E-02	-2.4E+01

\*All use phase and disposal stages have been considered and only those with non-zero values have been reported

Results below contain the resource use throughout the life cycle of the product.

## Resource Use

Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
RPR <sub>E</sub>	Renewable primary energy as energy carrier	MJ	9.1E+01	0.0E+00	3.8E-04	4.5E+02	0.0E+00	0.0E+00	2.8E-01	2.2E-02	-3.2E+02
RPR <sub>M</sub>	Renewable primary energy resources as material utilization	MJ	5.6E+00	0.0E+00	2.8E-01	2.9E+01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
NRPR <sub>E</sub>	Nonrenewable primary energy as energy carrier	MJ	3.0E+02	1.2E+00	6.2E-02	1.5E+03	1.7E-01	3.8E-01	2.9E+00	5.3E-01	-9.4E+02
NRPR <sub>M</sub>	Nonrenewable primary energy as material utilization	MJ	3.4E+01	0.0E+00	1.7E+00	1.8E+02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SM	Use of secondary material	kg	0.0E+00								
RSF	Use of renewable secondary fuels	MJ	0.0E+00								
NRSF	Use of nonrenewable secondary fuels	MJ	0.0E+00								
RE	Energy recovered from disposed waste	MJ	0.0E+00	-1.3E+03							
FW	Use of net fresh water	m <sup>3</sup>	2.2E-01	0.0E+00	1.5E-05	1.6E+00	0.0E+00	0.0E+00	9.3E-02	2.7E-04	-7.0E-01

\*All use phase and disposal stages have been considered and only those with non-zero values have been reported



# Environmental Product Declaration

Southwire 5KV-25KV RhinoShield®, RhinoFlex®, RhinoPower® Mining Cables

Handling Cable



According to  
ISO 14025, EN 15804,  
and ISO 21930:2017

Results below contain the output flows and wastes throughout the life cycle of the product.

Output Flows and Waste Categories											
Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
HWD	Hazardous waste disposed	kg	5.9E-02	0.0E+00	2.9E-03	3.1E-01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
NHWD	Non-hazardous waste disposed	kg	1.4E-01	0.0E+00	7.8E-02	2.5E+00	0.0E+00	0.0E+00	0.0E+00	2.9E-01	0.0E+00
HLRW	High-level radioactive waste	kg	2.2E-01	0.0E+00	1.5E-05	1.1E+00	0.0E+00	0.0E+00	1.4E-05	2.5E-06	0.0E+00
ILLRW	Intermediate- and low-level radioactive waste	kg	0.0E+00								
CRU	Components for re-use	kg	0.0E+00								
MR	Materials for recycling	kg	7.1E-02	0.0E+00	2.7E-01	9.9E+00	0.0E+00	0.0E+00	1.6E+00	0.0E+00	0.0E+00
MER	Materials for energy recovery	kg	0.0E+00	0.0E+00	1.8E-02	6.4E+00	0.0E+00	0.0E+00	1.3E+00	0.0E+00	0.0E+00
EE	Recovered energy exported from system	MJ	0.0E+00	0.0E+00	0.0E+00	7.5E+01	0.0E+00	0.0E+00	1.5E+01	0.0E+00	0.0E+00

\*All use phase and disposal stages have been considered and only those with non-zero values have been reported

Results below contain direct greenhouse gas emissions and removals throughout the life cycle of the product.

Resource Use											
Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
BCRP	Biogenic Carbon Removal from Product	kg CO <sub>2</sub>	0.0E+00								
BCEP	Biogenic Carbon Emissions from Product	kg CO <sub>2</sub>	0.0E+00								
BCRK	Biogenic Carbon Removal from Packaging	kg CO <sub>2</sub>	9.1E-02	0.0E+00	0.0E+00	4.6E-01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
BCEK	Biogenic Carbon Emissions from Packaging	kg CO <sub>2</sub>	0.0E+00	0.0E+00	9.1E-02	4.6E-01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
BCEW	Biogenic Carbon Emissions from Combustion of Waste from Renewable Sources Used in Production Process	kg CO <sub>2</sub>	0.0E+00								
CCE	Calcination Carbon Emissions	kg CO <sub>2</sub>	0.0E+00								
CCR	Carbonation Carbon Removal	kg CO <sub>2</sub>	0.0E+00								
CWNR	Carbon Emissions from Combustion of Waste from Non-renewable Sources Used in Production Process	kg CO <sub>2</sub>	0.0E+00								

\*All use phase and disposal stages have been considered and only those with non-zero values have been reported



# Environmental Product Declaration

Southwire 5KV-25KV RhinoShield®, RhinoFlex®, RhinoPower® Mining Cables

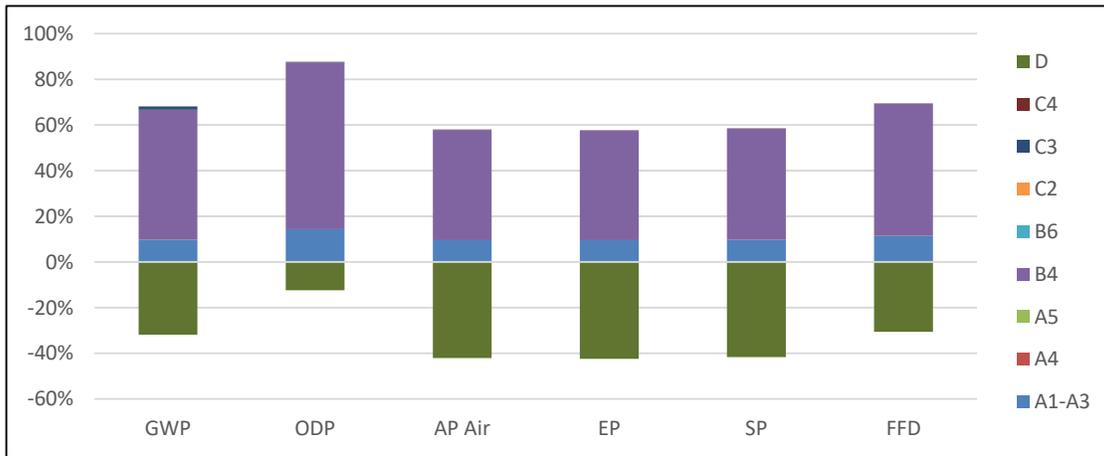
Handling Cable



According to  
ISO 14025, EN 15804,  
and ISO 21930:2017

## LCA Interpretation - 58464899 (1/0-3)

The production life cycle stage (A1-A3) and in life energy usage (B6) dominate the impacts across all impact categories. This is due to the upstream production of materials used in the product, along with electricity use in the manufacturing of the product and the consumption of electricity during the cable's usage. With five replacements required over a life-span of a building, the replacement stage (B4) dominates from duplicating these stages. Module B4 excludes operational energy use and all benefits and loads beyond the system boundary. As five replacements occur in the specified building service life, module B6 includes the energy usage of six products and module D includes the benefits of six products.



## LCA Results - 58638799 (3/0-3)

Results shown below were calculated using TRACI 2.1 Methodology.

TRACI 2.1 Impact Assessment											
Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
GWP	Global warming potential	kg CO <sub>2</sub> -Eq.	1.3E+01	5.1E-02	4.7E-03	7.5E+01	3.7E-03	1.6E-02	1.7E+00	3.9E-02	-4.6E+01
ODP	Depletion potential of the stratospheric ozone layer	kg CFC-11 Eq.	1.3E-06	1.9E-12	1.4E-10	6.4E-06	6.0E-14	6.2E-13	3.3E-08	2.7E-09	-2.8E-06
AP Air	Acidification potential for air emissions	kg SO <sub>2</sub> -Eq.	1.9E-01	3.1E-04	1.5E-05	9.3E-01	3.2E-05	9.7E-05	7.3E-04	1.1E-04	-8.3E-01
EP	Eutrophication potential	kg N-Eq.	1.2E+00	1.7E-05	2.8E-04	5.9E+00	4.3E-07	5.4E-06	3.8E-04	3.4E-04	-5.2E+00
SP	Smog formation potential	kg O <sub>3</sub> -Eq.	3.9E+00	8.4E-03	4.1E-04	2.0E+01	2.1E-04	2.7E-03	1.2E-02	2.4E-03	-1.7E+01
FFD	Fossil Fuel Depletion	MJ-surplus	1.8E+01	9.8E-02	4.9E-03	8.9E+01	3.2E-03	3.1E-02	1.5E-01	2.7E-02	-4.9E+01

\*All use phase and disposal stages have been considered and only those with non-zero values have been reported



# Environmental Product Declaration

Southwire 5KV-25KV RhinoShield®, RhinoFlex®,  
RhinoPower® Mining Cables



According to  
**ISO 14025, EN 15804,**  
and **ISO 21930:2017**

Handling Cable

Results shown below were calculated using CML 2001 - April 2013 Methodology.

## CML 4.1 Impact Assessment

Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
GWP	Global warming potential	kg CO <sub>2</sub> -Eq.	1.3E+01	5.1E-02	5.3E-03	7.5E+01	3.7E-03	1.6E-02	1.7E+00	3.9E-02	-4.6E+01
ODP	Depletion potential of the stratospheric ozone layer	kg CFC-11 Eq.	9.5E-07	1.9E-12	1.1E-10	4.9E-06	6.0E-14	6.2E-13	3.3E-08	2.7E-09	-2.8E-06
AP Air	Acidification potential for air emissions	kg SO <sub>2</sub> -Eq.	1.5E-01	2.5E-04	1.3E-05	7.6E-01	3.2E-05	9.7E-05	7.3E-04	1.1E-04	-8.3E-01
EP	Eutrophication potential	kg(PO <sub>4</sub> ) <sup>3</sup> -Eq.	5.2E-01	4.5E-05	1.0E-04	2.6E+00	4.3E-07	5.4E-06	3.8E-04	3.4E-04	-5.2E+00
POCP	Formation potential of tropospheric ozone photochemical oxidants	kg ethane-Eq.	3.5E-03	1.2E-05	1.2E-06	1.0E-01	2.1E-04	2.7E-03	1.2E-02	2.4E-03	-1.7E+01
ADPE	Abiotic depletion potential for non-fossil resources	kg Sb-Eq.	3.4E-03	0.0E+00	1.7E-09	1.1E+00	3.2E-03	3.1E-02	1.5E-01	2.7E-02	-4.9E+01
ADPF	Abiotic depletion potential for fossil resources	MJ	1.6E+02	6.6E-01	3.4E-02	8.4E+02	3.8E-03	1.6E-02	1.7E+00	3.9E-02	-4.6E+01

*\*All use phase and disposal stages have been considered and only those with non-zero values have been reported*

Results below contain the resource use throughout the life cycle of the product.

## Resource Use

Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
RPR <sub>E</sub>	Renewable primary energy as energy carrier	MJ	1.7E+02	0.0E+00	6.7E-04	8.7E+02	0.0E+00	0.0E+00	4.5E-01	3.5E-02	-6.3E+02
RPR <sub>M</sub>	Renewable primary energy resources as material utilization	MJ	1.0E+01	0.0E+00	5.0E-01	5.3E+01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
NRPR <sub>E</sub>	Nonrenewable primary energy as energy carrier	MJ	5.3E+02	2.2E+00	1.1E-01	2.7E+03	1.7E-01	6.8E-01	4.6E+00	8.4E-01	-1.8E+03
NRPR <sub>M</sub>	Nonrenewable primary energy as material utilization	MJ	8.1E+01	0.0E+00	4.0E+00	4.2E+02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SM	Use of secondary material	kg	0.0E+00								
RSF	Use of renewable secondary fuels	MJ	0.0E+00								
NRSF	Use of nonrenewable secondary fuels	MJ	0.0E+00								
RE	Energy recovered from disposed waste	MJ	0.0E+00	-2.5E+03							
FW	Use of net fresh water	m <sup>3</sup>	4.1E-01	0.0E+00	2.6E-05	2.8E+00	0.0E+00	0.0E+00	1.5E-01	4.3E-04	-1.4E+00

*\*All use phase and disposal stages have been considered and only those with non-zero values have been reported*



# Environmental Product Declaration

Southwire 5KV-25KV RhinoShield®, RhinoFlex®, RhinoPower® Mining Cables

Handling Cable



According to  
ISO 14025, EN 15804,  
and ISO 21930:2017

Results below contain the output flows and wastes throughout the life cycle of the product.

Output Flows and Waste Categories											
Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
HWD	Hazardous waste disposed	kg	1.1E-01	0.0E+00	5.3E-03	5.5E-01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
NHWD	Non-hazardous waste disposed	kg	2.5E-01	0.0E+00	1.4E-01	4.8E+00	0.0E+00	0.0E+00	0.0E+00	5.8E-01	0.0E+00
HLRW	High-level radioactive waste	kg	4.1E-01	0.0E+00	2.6E-05	2.0E+00	0.0E+00	0.0E+00	2.2E-05	4.0E-06	0.0E+00
ILLRW	Intermediate- and low-level radioactive waste	kg	0.0E+00								
CRU	Components for re-use	kg	0.0E+00								
MR	Materials for recycling	kg	1.3E-01	0.0E+00	4.8E-01	1.9E+01	0.0E+00	0.0E+00	3.3E+00	0.0E+00	0.0E+00
MER	Materials for energy recovery	kg	0.0E+00	0.0E+00	3.2E-02	9.6E+00	0.0E+00	0.0E+00	1.9E+00	0.0E+00	0.0E+00
EE	Recovered energy exported from system	MJ	0.0E+00	0.0E+00	0.0E+00	1.8E+02	0.0E+00	0.0E+00	3.5E+01	0.0E+00	0.0E+00

\*All use phase and disposal stages have been considered and only those with non-zero values have been reported

Results below contain direct greenhouse gas emissions and removals throughout the life cycle of the product.

Resource Use											
Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
BCRP	Biogenic Carbon Removal from Product	kg CO <sub>2</sub>	0.0E+00								
BCEP	Biogenic Carbon Emissions from Product	kg CO <sub>2</sub>	0.0E+00								
BCRK	Biogenic Carbon Removal from Packaging	kg CO <sub>2</sub>	1.6E-01	0.0E+00	0.0E+00	8.1E-01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
BCEK	Biogenic Carbon Emissions from Packaging	kg CO <sub>2</sub>	0.0E+00	0.0E+00	1.6E-01	8.1E-01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
BCEW	Biogenic Carbon Emissions from Combustion of Waste from Renewable Sources Used in Production Process	kg CO <sub>2</sub>	0.0E+00								
CCE	Calcination Carbon Emissions	kg CO <sub>2</sub>	0.0E+00								
CCR	Carbonation Carbon Removal	kg CO <sub>2</sub>	0.0E+00								
CWNR	Carbon Emissions from Combustion of Waste from Non-renewable Sources Used in Production Process	kg CO <sub>2</sub>	0.0E+00								

\*All use phase and disposal stages have been considered and only those with non-zero values have been reported



# Environmental Product Declaration

Southwire 5KV-25KV RhinoShield®, RhinoFlex®, RhinoPower® Mining Cables

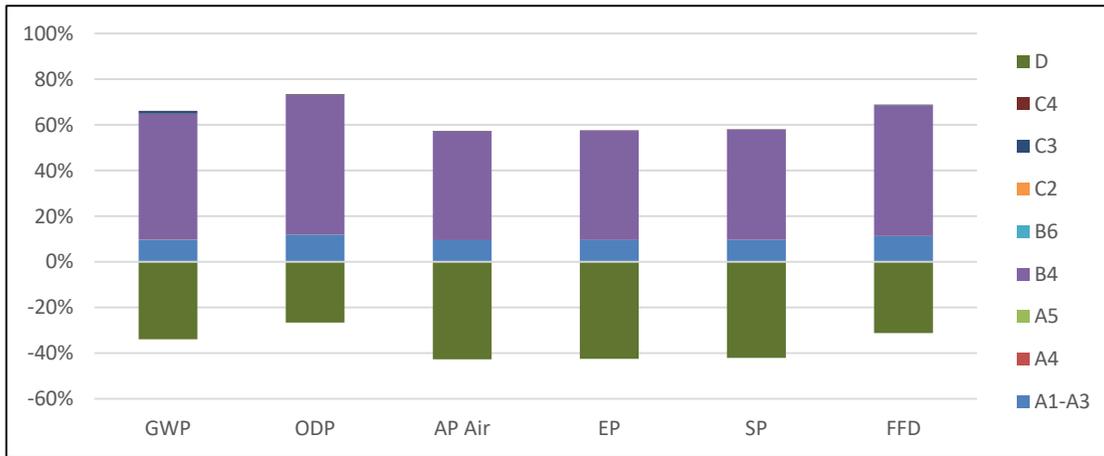
Handling Cable



According to  
ISO 14025, EN 15804,  
and ISO 21930:2017

## LCA Interpretation - 58638799 (3/0-3)

The production life cycle stage (A1-A3) and in life energy usage (B6) dominate the impacts across all impact categories. This is due to the upstream production of materials used in the product, along with electricity use in the manufacturing of the product and the consumption of electricity during the cable's usage. With five replacements required over a life-span of a building, the replacement stage (B4) dominates from duplicating these stages. Module B4 excludes operational energy use and all benefits and loads beyond the system boundary. As five replacements occur in the specified building service life, module B6 includes the energy usage of six products and module D includes the benefits of six products.



## LCA Results - 58691299 (3/0-3)

Results shown below were calculated using TRACI 2.1 Methodology.

TRACI 2.1 Impact Assessment											
Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
GWP	Global warming potential	kg CO <sub>2</sub> -Eq.	1.2E+01	4.1E-02	3.8E-03	6.8E+01	3.7E-03	1.3E-02	9.4E-01	2.2E-02	-4.2E+01
ODP	Depletion potential of the stratospheric ozone layer	kg CFC-11 Eq.	1.0E-06	1.6E-12	1.2E-10	5.1E-06	6.0E-14	5.0E-13	1.8E-08	1.5E-09	-2.8E-06
AP Air	Acidification potential for air emissions	kg SO <sub>2</sub> -Eq.	1.8E-01	2.5E-04	1.2E-05	9.1E-01	3.2E-05	7.8E-05	4.1E-04	6.4E-05	-7.9E-01
EP	Eutrophication potential	kg N-Eq.	1.2E+00	1.4E-05	2.3E-04	5.8E+00	4.3E-07	4.4E-06	2.1E-04	1.9E-04	-5.2E+00
SP	Smog formation potential	kg O <sub>3</sub> -Eq.	3.8E+00	6.8E-03	3.3E-04	1.9E+01	2.1E-04	2.1E-03	6.5E-03	1.3E-03	-1.7E+01
FFD	Fossil Fuel Depletion	MJ-surplus	1.5E+01	7.9E-02	4.0E-03	7.5E+01	3.2E-03	2.5E-02	8.5E-02	1.5E-02	-4.2E+01

\*All use phase and disposal stages have been considered and only those with non-zero values have been reported



# Environmental Product Declaration

Southwire 5KV-25KV RhinoShield®, RhinoFlex®, RhinoPower® Mining Cables

Handling Cable



According to  
ISO 14025, EN 15804,  
and ISO 21930:2017

Results shown below were calculated using CML 2001 - April 2013 Methodology.

## CML 4.1 Impact Assessment

Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
GWP	Global warming potential	kg CO <sub>2</sub> -Eq.	1.3E+01	4.1E-02	4.3E-03	6.8E+01	3.7E-03	1.3E-02	9.4E-01	2.2E-02	-4.2E+01
ODP	Depletion potential of the stratospheric ozone layer	kg CFC-11 Eq.	7.6E-07	1.6E-12	8.8E-11	3.9E-06	6.0E-14	5.0E-13	1.8E-08	1.5E-09	-2.8E-06
AP Air	Acidification potential for air emissions	kg SO <sub>2</sub> -Eq.	1.5E-01	2.0E-04	1.0E-05	7.4E-01	3.2E-05	7.8E-05	4.1E-04	6.4E-05	-7.9E-01
EP	Eutrophication potential	kg(PO <sub>4</sub> ) <sup>3</sup> -Eq.	5.1E-01	3.6E-05	8.4E-05	2.6E+00	4.3E-07	4.4E-06	2.1E-04	1.9E-04	-5.2E+00
POCP	Formation potential of tropospheric ozone photochemical oxidants	kg ethane-Eq.	3.2E-03	9.4E-06	9.5E-07	6.6E-02	2.1E-04	2.1E-03	6.5E-03	1.3E-03	-1.7E+01
ADPE	Abiotic depletion potential for non-fossil resources	kg Sb-Eq.	3.4E-03	0.0E+00	1.4E-09	6.5E-01	3.2E-03	2.5E-02	8.5E-02	1.5E-02	-4.2E+01
ADPF	Abiotic depletion potential for fossil resources	MJ	1.4E+02	5.3E-01	2.7E-02	7.1E+02	3.8E-03	1.3E-02	9.4E-01	2.2E-02	-4.2E+01

\*All use phase and disposal stages have been considered and only those with non-zero values have been reported

Results below contain the resource use throughout the life cycle of the product.

## Resource Use

Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
RPR <sub>E</sub>	Renewable primary energy as energy carrier	MJ	1.6E+02	0.0E+00	5.4E-04	8.2E+02	0.0E+00	0.0E+00	2.5E-01	2.0E-02	-6.3E+02
RPR <sub>M</sub>	Renewable primary energy resources as material utilization	MJ	8.1E+00	0.0E+00	4.1E-01	4.3E+01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
NRPR <sub>E</sub>	Nonrenewable primary energy as energy carrier	MJ	5.0E+02	1.7E+00	9.0E-02	2.5E+03	1.7E-01	5.5E-01	2.6E+00	4.7E-01	-1.6E+03
NRPR <sub>M</sub>	Nonrenewable primary energy as material utilization	MJ	2.9E+01	0.0E+00	1.4E+00	1.5E+02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SM	Use of secondary material	kg	0.0E+00								
RSF	Use of renewable secondary fuels	MJ	0.0E+00								
NRSF	Use of nonrenewable secondary fuels	MJ	0.0E+00								
RE	Energy recovered from disposed waste	MJ	0.0E+00	-2.3E+03							
FW	Use of net fresh water	m <sup>3</sup>	3.8E-01	0.0E+00	2.1E-05	2.3E+00	0.0E+00	0.0E+00	8.3E-02	2.4E-04	-1.4E+00

\*All use phase and disposal stages have been considered and only those with non-zero values have been reported



# Environmental Product Declaration

Southwire 5KV-25KV RhinoShield®, RhinoFlex®, RhinoPower® Mining Cables

Handling Cable



According to  
ISO 14025, EN 15804,  
and ISO 21930:2017

Results below contain the output flows and wastes throughout the life cycle of the product.

Output Flows and Waste Categories											
Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
HWD	Hazardous waste disposed	kg	8.5E-02	0.0E+00	4.3E-03	4.5E-01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
NHWD	Non-hazardous waste disposed	kg	2.0E-01	0.0E+00	1.1E-01	4.4E+00	0.0E+00	0.0E+00	0.0E+00	5.7E-01	0.0E+00
HLRW	High-level radioactive waste	kg	3.8E-01	0.0E+00	2.1E-05	1.9E+00	0.0E+00	0.0E+00	1.2E-05	2.3E-06	0.0E+00
ILLRW	Intermediate- and low-level radioactive waste	kg	0.0E+00								
CRU	Components for re-use	kg	0.0E+00								
MR	Materials for recycling	kg	1.0E-01	0.0E+00	3.9E-01	1.9E+01	0.0E+00	0.0E+00	3.2E+00	0.0E+00	0.0E+00
MER	Materials for energy recovery	kg	0.0E+00	0.0E+00	2.6E-02	4.2E+00	0.0E+00	0.0E+00	8.2E-01	0.0E+00	0.0E+00
EE	Recovered energy exported from system	MJ	0.0E+00	0.0E+00	0.0E+00	6.4E+01	0.0E+00	0.0E+00	1.3E+01	0.0E+00	0.0E+00

\*All use phase and disposal stages have been considered and only those with non-zero values have been reported

Results below contain direct greenhouse gas emissions and removals throughout the life cycle of the product.

Resource Use											
Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
BCRP	Biogenic Carbon Removal from Product	kg CO <sub>2</sub>	0.0E+00								
BCEP	Biogenic Carbon Emissions from Product	kg CO <sub>2</sub>	0.0E+00								
BCRK	Biogenic Carbon Removal from Packaging	kg CO <sub>2</sub>	1.3E-01	0.0E+00	0.0E+00	6.6E-01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
BCEK	Biogenic Carbon Emissions from Packaging	kg CO <sub>2</sub>	0.0E+00	0.0E+00	1.3E-01	6.6E-01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
BCEW	Biogenic Carbon Emissions from Combustion of Waste from Renewable Sources Used in Production Process	kg CO <sub>2</sub>	0.0E+00								
CCE	Calcination Carbon Emissions	kg CO <sub>2</sub>	0.0E+00								
CCR	Carbonation Carbon Removal	kg CO <sub>2</sub>	0.0E+00								
CWNR	Carbon Emissions from Combustion of Waste from Non-renewable Sources Used in Production Process	kg CO <sub>2</sub>	0.0E+00								

\*All use phase and disposal stages have been considered and only those with non-zero values have been reported



# Environmental Product Declaration

Southwire 5KV-25KV RhinoShield®, RhinoFlex®, RhinoPower® Mining Cables

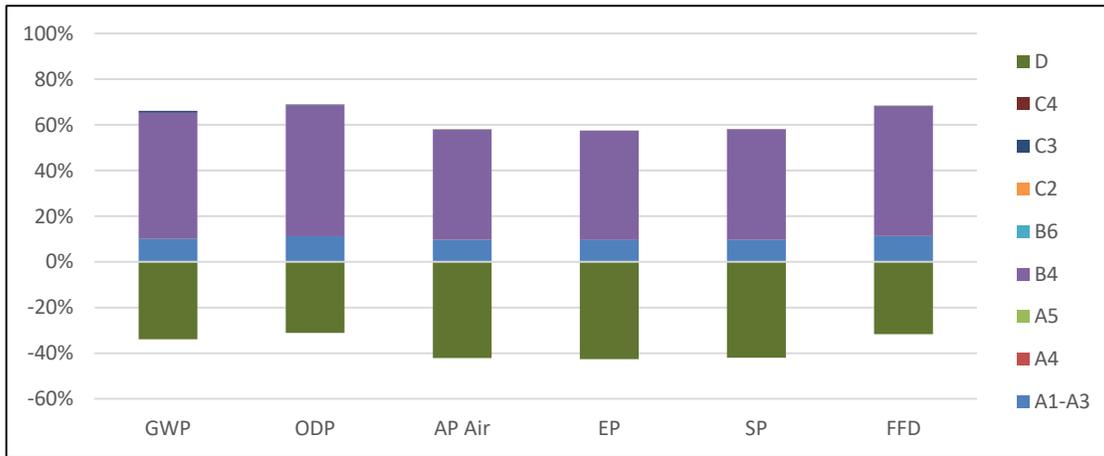
Handling Cable



According to  
**ISO 14025, EN 15804,**  
 and **ISO 21930:2017**

## LCA Interpretation - 58691299 (3/0-3)

The production life cycle stage (A1-A3) and in life energy usage (B6) dominate the impacts across all impact categories. This is due to the upstream production of materials used in the product, along with electricity use in the manufacturing of the product and the consumption of electricity during the cable's usage. With five replacements required over a life-span of a building, the replacement stage (B4) dominates from duplicating these stages. Module B4 excludes operational energy use and all benefits and loads beyond the system boundary. As five replacements occur in the specified building service life, module B6 includes the energy usage of six products and module D includes the benefits of six products.



## LCA Results - 58701399 (350/3)

Results shown below were calculated using TRACI 2.1 Methodology.

TRACI 2.1 Impact Assessment											
Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
GWP	Global warming potential	kg CO <sub>2</sub> -Eq.	1.6E+01	6.3E-02	5.9E-03	9.3E+01	3.7E-03	2.0E-02	2.2E+00	5.1E-02	-5.6E+01
ODP	Depletion potential of the stratospheric ozone layer	kg CFC-11 Eq.	2.4E-06	2.4E-12	1.8E-10	1.2E-05	6.0E-14	7.7E-13	4.3E-08	3.5E-09	-3.3E-06
AP Air	Acidification potential for air emissions	kg SO <sub>2</sub> -Eq.	2.2E-01	3.8E-04	1.9E-05	1.1E+00	3.2E-05	1.2E-04	9.6E-04	1.5E-04	-1.0E+00
EP	Eutrophication potential	kg N-Eq.	1.4E+00	2.1E-05	3.5E-04	7.0E+00	4.3E-07	6.7E-06	5.0E-04	4.5E-04	-6.2E+00
SP	Smog formation potential	kg O <sub>3</sub> -Eq.	4.6E+00	1.0E-02	5.1E-04	2.3E+01	2.1E-04	3.3E-03	1.5E-02	3.1E-03	-2.0E+01
FFD	Fossil Fuel Depletion	MJ-surplus	2.2E+01	1.2E-01	6.1E-03	1.1E+02	3.2E-03	3.9E-02	2.0E-01	3.6E-02	-6.0E+01

*\*All use phase and disposal stages have been considered and only those with non-zero values have been reported*



# Environmental Product Declaration

Southwire 5KV-25KV RhinoShield®, RhinoFlex®, RhinoPower® Mining Cables

Handling Cable



According to  
**ISO 14025, EN 15804,**  
 and **ISO 21930:2017**

Results shown below were calculated using CML 2001 - April 2013 Methodology.

## CML 4.1 Impact Assessment

Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
GWP	Global warming potential	kg CO <sub>2</sub> -Eq.	1.6E+01	6.3E-02	6.6E-03	9.3E+01	3.7E-03	2.0E-02	2.2E+00	5.1E-02	-5.6E+01
ODP	Depletion potential of the stratospheric ozone layer	kg CFC-11 Eq.	1.8E-06	2.4E-12	1.3E-10	9.1E-06	6.0E-14	7.7E-13	4.3E-08	3.5E-09	-3.3E-06
AP Air	Acidification potential for air emissions	kg SO <sub>2</sub> -Eq.	1.8E-01	3.1E-04	1.6E-05	9.2E-01	3.2E-05	1.2E-04	9.6E-04	1.5E-04	-1.0E+00
EP	Eutrophication potential	kg(PO <sub>4</sub> ) <sup>3</sup> -Eq.	6.1E-01	5.5E-05	1.3E-04	3.1E+00	4.3E-07	6.7E-06	5.0E-04	4.5E-04	-6.2E+00
POCP	Formation potential of tropospheric ozone photochemical oxidants	kg ethane-Eq.	4.3E-03	1.4E-05	1.5E-06	1.3E-01	2.1E-04	3.3E-03	1.5E-02	3.1E-03	-2.0E+01
ADPE	Abiotic depletion potential for non-fossil resources	kg Sb-Eq.	4.0E-03	0.0E+00	2.1E-09	1.4E+00	3.2E-03	3.9E-02	2.0E-01	3.6E-02	-6.0E+01
ADPF	Abiotic depletion potential for fossil resources	MJ	2.1E+02	8.1E-01	4.2E-02	1.0E+03	3.8E-03	2.0E-02	2.2E+00	5.1E-02	-5.6E+01

*\*All use phase and disposal stages have been considered and only those with non-zero values have been reported*

Results below contain the resource use throughout the life cycle of the product.

## Resource Use

Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
RPR <sub>E</sub>	Renewable primary energy as energy carrier	MJ	2.1E+02	0.0E+00	8.4E-04	1.0E+03	0.0E+00	0.0E+00	5.8E-01	4.6E-02	-7.5E+02
RPR <sub>M</sub>	Renewable primary energy resources as material utilization	MJ	1.2E+01	0.0E+00	6.2E-01	6.5E+01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
NRPR <sub>E</sub>	Nonrenewable primary energy as energy carrier	MJ	6.5E+02	2.7E+00	1.4E-01	3.3E+03	1.7E-01	8.5E-01	6.1E+00	1.1E+00	-2.2E+03
NRPR <sub>M</sub>	Nonrenewable primary energy as material utilization	MJ	1.0E+02	0.0E+00	5.1E+00	5.4E+02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SM	Use of secondary material	kg	0.0E+00								
RSF	Use of renewable secondary fuels	MJ	0.0E+00								
NRSF	Use of nonrenewable secondary fuels	MJ	0.0E+00								
RE	Energy recovered from disposed waste	MJ	0.0E+00	-3.0E+03							
FW	Use of net fresh water	m <sup>3</sup>	5.0E-01	0.0E+00	3.3E-05	3.5E+00	0.0E+00	0.0E+00	1.9E-01	5.7E-04	-1.6E+00

*\*All use phase and disposal stages have been considered and only those with non-zero values have been reported*



# Environmental Product Declaration

Southwire 5KV-25KV RhinoShield®, RhinoFlex®, RhinoPower® Mining Cables

Handling Cable



According to  
ISO 14025, EN 15804,  
and ISO 21930:2017

Results below contain the output flows and wastes throughout the life cycle of the product.

Output Flows and Waste Categories											
Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
HWD	Hazardous waste disposed	kg	1.3E-01	0.0E+00	6.5E-03	6.9E-01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
NHWD	Non-hazardous waste disposed	kg	3.1E-01	0.0E+00	1.7E-01	5.8E+00	0.0E+00	0.0E+00	0.0E+00	6.8E-01	0.0E+00
HLRW	High-level radioactive waste	kg	5.0E-01	0.0E+00	3.3E-05	2.5E+00	0.0E+00	0.0E+00	2.9E-05	5.3E-06	0.0E+00
ILLRW	Intermediate- and low-level radioactive waste	kg	0.0E+00								
CRU	Components for re-use	kg	0.0E+00								
MR	Materials for recycling	kg	1.6E-01	0.0E+00	6.0E-01	2.3E+01	0.0E+00	0.0E+00	3.9E+00	0.0E+00	0.0E+00
MER	Materials for energy recovery	kg	0.0E+00	0.0E+00	3.9E-02	1.3E+01	0.0E+00	0.0E+00	2.6E+00	0.0E+00	0.0E+00
EE	Recovered energy exported from system	MJ	0.0E+00	0.0E+00	0.0E+00	2.2E+02	0.0E+00	0.0E+00	4.5E+01	0.0E+00	0.0E+00

\*All use phase and disposal stages have been considered and only those with non-zero values have been reported

Results below contain direct greenhouse gas emissions and removals throughout the life cycle of the product.

Resource Use											
Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
BCRP	Biogenic Carbon Removal from Product	kg CO <sub>2</sub>	0.0E+00								
BCEP	Biogenic Carbon Emissions from Product	kg CO <sub>2</sub>	0.0E+00								
BCRK	Biogenic Carbon Removal from Packaging	kg CO <sub>2</sub>	2.0E-01	0.0E+00	0.0E+00	1.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
BCEK	Biogenic Carbon Emissions from Packaging	kg CO <sub>2</sub>	0.0E+00	0.0E+00	2.0E-01	1.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
BCEW	Biogenic Carbon Emissions from Combustion of Waste from Renewable Sources Used in Production Process	kg CO <sub>2</sub>	0.0E+00								
CCE	Calcination Carbon Emissions	kg CO <sub>2</sub>	0.0E+00								
CCR	Carbonation Carbon Removal	kg CO <sub>2</sub>	0.0E+00								
CWNR	Carbon Emissions from Combustion of Waste from Non-renewable Sources Used in Production Process	kg CO <sub>2</sub>	0.0E+00								

\*All use phase and disposal stages have been considered and only those with non-zero values have been reported



# Environmental Product Declaration

Southwire 5KV-25KV RhinoShield®, RhinoFlex®, RhinoPower® Mining Cables

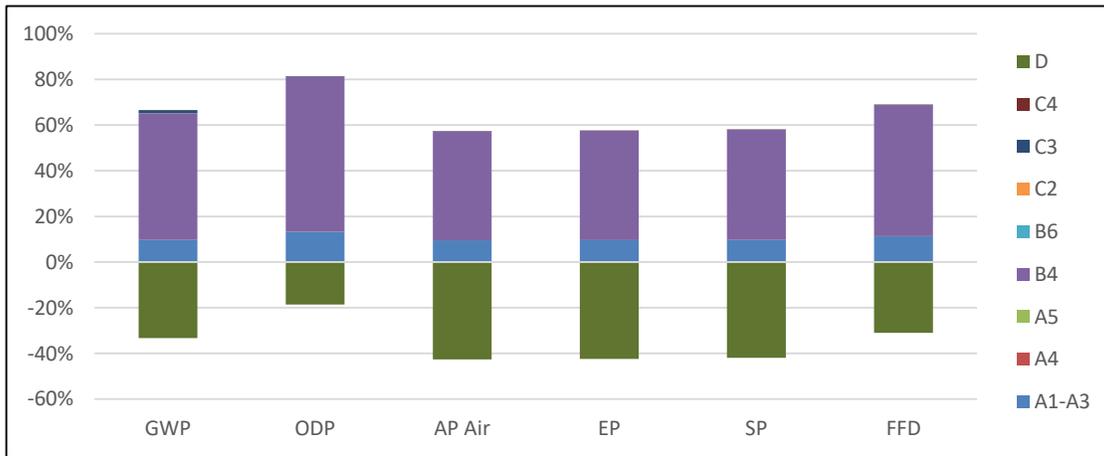
Handling Cable



According to  
ISO 14025, EN 15804,  
and ISO 21930:2017

## LCA Interpretation - 58701399(350/3)

The production life cycle stage (A1-A3) and in life energy usage (B6) dominate the impacts across all impact categories. This is due to the upstream production of materials used in the product, along with electricity use in the manufacturing of the product and the consumption of electricity during the cable's usage. With five replacements required over a life-span of a building, the replacement stage (B4) dominates from duplicating these stages. Module B4 excludes operational energy use and all benefits and loads beyond the system boundary. As five replacements occur in the specified building service life, module B6 includes the energy usage of six products and module D includes the benefits of six products.



## LCA Results - 58765799 (350/2)

Results shown below were calculated using TRACI 2.1 Methodology.

TRACI 2.1 Impact Assessment											
Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
GWP	Global warming potential	kg CO <sub>2</sub> -Eq.	2.9E+01	1.1E-01	9.7E-03	1.6E+02	3.7E-03	3.3E-02	2.8E+00	6.4E-02	-1.0E+02
ODP	Depletion potential of the stratospheric ozone layer	kg CFC-11 Eq.	4.2E-06	4.0E-12	3.0E-10	2.1E-05	6.0E-14	1.3E-12	5.4E-08	4.5E-09	-6.6E-06
AP Air	Acidification potential for air emissions	kg SO <sub>2</sub> -Eq.	4.3E-01	6.3E-04	3.2E-05	2.2E+00	3.2E-05	2.0E-04	1.2E-03	1.9E-04	-1.9E+00
EP	Eutrophication potential	kg N-Eq.	2.8E+00	3.5E-05	5.8E-04	1.4E+01	4.3E-07	1.1E-05	6.3E-04	5.7E-04	-1.2E+01
SP	Smog formation potential	kg O <sub>3</sub> -Eq.	9.1E+00	1.7E-02	8.5E-04	4.6E+01	2.1E-04	5.5E-03	1.9E-02	4.0E-03	-4.0E+01
FFD	Fossil Fuel Depletion	MJ-surplus	3.4E+01	2.0E-01	1.0E-02	1.7E+02	3.2E-03	6.4E-02	2.5E-01	4.5E-02	-1.0E+02

\*All use phase and disposal stages have been considered and only those with non-zero values have been reported



# Environmental Product Declaration

Southwire 5KV-25KV RhinoShield®, RhinoFlex®, RhinoPower® Mining Cables

Handling Cable



According to  
ISO 14025, EN 15804,  
and ISO 21930:2017

Results shown below were calculated using CML 2001 - April 2013 Methodology.

## CML 4.1 Impact Assessment

Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
GWP	Global warming potential	kg CO <sub>2</sub> -Eq.	2.9E+01	1.1E-01	1.1E-02	1.6E+02	3.7E-03	3.3E-02	2.8E+00	6.4E-02	-1.0E+02
ODP	Depletion potential of the stratospheric ozone layer	kg CFC-11 Eq.	3.3E-06	4.0E-12	2.2E-10	1.7E-05	6.0E-14	1.3E-12	5.4E-08	4.5E-09	-6.6E-06
AP Air	Acidification potential for air emissions	kg SO <sub>2</sub> -Eq.	3.5E-01	5.2E-04	2.6E-05	1.8E+00	3.2E-05	2.0E-04	1.2E-03	1.9E-04	-1.9E+00
EP	Eutrophication potential	kg(PO <sub>4</sub> ) <sup>3</sup> -Eq.	1.2E+00	9.2E-05	2.1E-04	6.1E+00	4.3E-07	1.1E-05	6.3E-04	5.7E-04	-1.2E+01
POCP	Formation potential of tropospheric ozone photochemical oxidants	kg ethane-Eq.	7.7E-03	2.4E-05	2.4E-06	1.8E-01	2.1E-04	5.5E-03	1.9E-02	4.0E-03	-4.0E+01
ADPE	Abiotic depletion potential for non-fossil resources	kg Sb-Eq.	8.0E-03	0.0E+00	3.5E-09	1.8E+00	3.2E-03	6.4E-02	2.5E-01	4.5E-02	-1.0E+02
ADPF	Abiotic depletion potential for fossil resources	MJ	3.4E+02	1.4E+00	6.9E-02	1.7E+03	3.8E-03	3.3E-02	2.8E+00	6.5E-02	-1.0E+02

\*All use phase and disposal stages have been considered and only those with non-zero values have been reported

Results below contain the resource use throughout the life cycle of the product.

## Resource Use

Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
RPR <sub>E</sub>	Renewable primary energy as energy carrier	MJ	4.0E+02	0.0E+00	1.4E-03	2.0E+03	0.0E+00	0.0E+00	7.4E-01	5.8E-02	-1.5E+03
RPR <sub>M</sub>	Renewable primary energy resources as material utilization	MJ	2.1E+01	0.0E+00	1.0E+00	1.1E+02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
NRPR <sub>E</sub>	Nonrenewable primary energy as energy carrier	MJ	1.2E+03	4.4E+00	2.3E-01	5.9E+03	1.7E-01	1.4E+00	7.7E+00	1.4E+00	-3.9E+03
NRPR <sub>M</sub>	Nonrenewable primary energy as material utilization	MJ	8.0E+01	0.0E+00	4.0E+00	4.2E+02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SM	Use of secondary material	kg	0.0E+00								
RSF	Use of renewable secondary fuels	MJ	0.0E+00								
NRSF	Use of nonrenewable secondary fuels	MJ	0.0E+00								
RE	Energy recovered from disposed waste	MJ	0.0E+00	-5.4E+03							
FW	Use of net fresh water	m <sup>3</sup>	9.0E-01	0.0E+00	5.4E-05	5.7E+00	0.0E+00	0.0E+00	2.5E-01	7.2E-04	-3.3E+00

\*All use phase and disposal stages have been considered and only those with non-zero values have been reported



# Environmental Product Declaration

Southwire 5KV-25KV RhinoShield®, RhinoFlex®, RhinoPower® Mining Cables

Handling Cable



According to  
ISO 14025, EN 15804,  
and ISO 21930:2017

Results below contain the output flows and wastes throughout the life cycle of the product.

Output Flows and Waste Categories											
Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
HWD	Hazardous waste disposed	kg	2.2E-01	0.0E+00	1.1E-02	1.1E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
NHWD	Non-hazardous waste disposed	kg	5.1E-01	0.0E+00	2.9E-01	1.1E+01	0.0E+00	0.0E+00	0.0E+00	1.4E+00	0.0E+00
HLRW	High-level radioactive waste	kg	9.0E-01	0.0E+00	5.4E-05	4.5E+00	0.0E+00	0.0E+00	3.6E-05	6.7E-06	0.0E+00
ILLRW	Intermediate- and low-level radioactive waste	kg	0.0E+00								
CRU	Components for re-use	kg	0.0E+00								
MR	Materials for recycling	kg	2.6E-01	0.0E+00	9.9E-01	4.5E+01	0.0E+00	0.0E+00	7.7E+00	0.0E+00	0.0E+00
MER	Materials for energy recovery	kg	0.0E+00	0.0E+00	6.5E-02	1.4E+01	0.0E+00	0.0E+00	2.7E+00	0.0E+00	0.0E+00
EE	Recovered energy exported from system	MJ	0.0E+00	0.0E+00	0.0E+00	1.8E+02	0.0E+00	0.0E+00	3.5E+01	0.0E+00	0.0E+00

\*All use phase and disposal stages have been considered and only those with non-zero values have been reported

Results below contain direct greenhouse gas emissions and removals throughout the life cycle of the product.

Resource Use											
Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
BCRP	Biogenic Carbon Removal from Product	kg CO <sub>2</sub>	0.0E+00								
BCEP	Biogenic Carbon Emissions from Product	kg CO <sub>2</sub>	0.0E+00								
BCRK	Biogenic Carbon Removal from Packaging	kg CO <sub>2</sub>	3.3E-01	0.0E+00	0.0E+00	1.7E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
BCEK	Biogenic Carbon Emissions from Packaging	kg CO <sub>2</sub>	0.0E+00	0.0E+00	3.3E-01	1.7E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
BCEW	Biogenic Carbon Emissions from Combustion of Waste from Renewable Sources Used in Production Process	kg CO <sub>2</sub>	0.0E+00								
CCE	Calcination Carbon Emissions	kg CO <sub>2</sub>	0.0E+00								
CCR	Carbonation Carbon Removal	kg CO <sub>2</sub>	0.0E+00								
CWNR	Carbon Emissions from Combustion of Waste from Non-renewable Sources Used in Production Process	kg CO <sub>2</sub>	0.0E+00								

\*All use phase and disposal stages have been considered and only those with non-zero values have been reported



# Environmental Product Declaration

Southwire 5KV-25KV RhinoShield®, RhinoFlex®, RhinoPower® Mining Cables

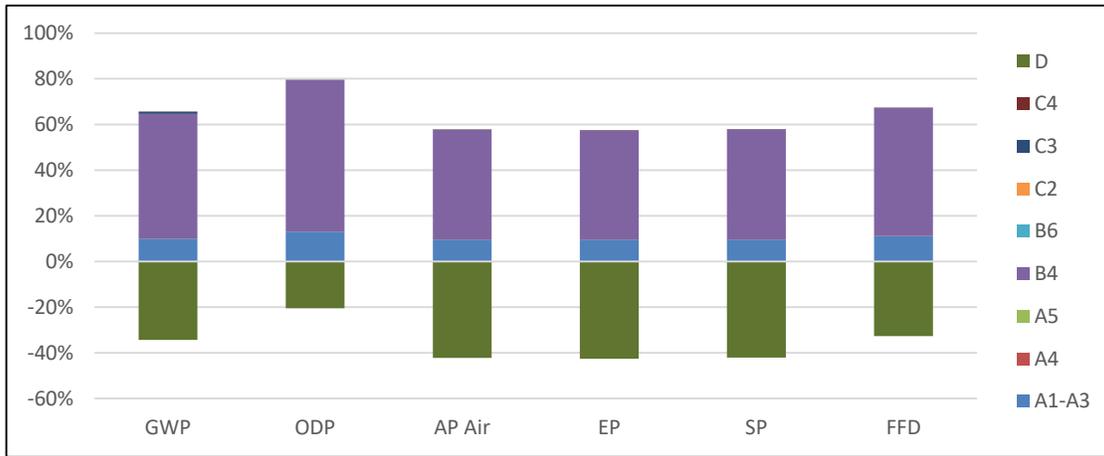
Handling Cable



According to  
**ISO 14025, EN 15804,**  
 and **ISO 21930:2017**

## LCA Interpretation - 58765799 (350/2)

The production life cycle stage (A1-A3) and in life energy usage (B6) dominate the impacts across all impact categories. This is due to the upstream production of materials used in the product, along with electricity use in the manufacturing of the product and the consumption of electricity during the cable's usage. With five replacements required over a life-span of a building, the replacement stage (B4) dominates from duplicating these stages. Module B4 excludes operational energy use and all benefits and loads beyond the system boundary. As five replacements occur in the specified building service life, module B6 includes the energy usage of six products and module D includes the benefits of six products.



## LCA Results - 58918899 (350/3)

Results shown below were calculated using TRACI 2.1 Methodology.

TRACI 2.1 Impact Assessment											
Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
GWP	Global warming potential	kg CO <sub>2</sub> -Eq.	2.5E+01	8.4E-02	7.8E-03	1.3E+02	3.7E-03	2.7E-02	1.3E+00	3.1E-02	-9.1E+01
ODP	Depletion potential of the stratospheric ozone layer	kg CFC-11 Eq.	2.0E-06	3.2E-12	2.4E-10	1.0E-05	6.0E-14	1.0E-12	2.6E-08	2.1E-09	-6.4E-06
AP Air	Acidification potential for air emissions	kg SO <sub>2</sub> -Eq.	4.1E-01	5.0E-04	2.5E-05	2.0E+00	3.2E-05	1.6E-04	5.8E-04	9.0E-05	-1.8E+00
EP	Eutrophication potential	kg N-Eq.	2.7E+00	2.8E-05	4.7E-04	1.3E+01	4.3E-07	8.9E-06	3.0E-04	2.7E-04	-1.2E+01
SP	Smog formation potential	kg O <sub>3</sub> -Eq.	8.7E+00	1.4E-02	6.9E-04	4.4E+01	2.1E-04	4.4E-03	9.3E-03	1.9E-03	-3.9E+01
FFD	Fossil Fuel Depletion	MJ-surplus	2.8E+01	1.6E-01	8.1E-03	1.4E+02	3.2E-03	5.1E-02	1.2E-01	2.2E-02	-8.9E+01

\*All use phase and disposal stages have been considered and only those with non-zero values have been reported



# Environmental Product Declaration

Southwire 5KV-25KV RhinoShield®, RhinoFlex®, RhinoPower® Mining Cables

Handling Cable



According to  
ISO 14025, EN 15804,  
and ISO 21930:2017

Results shown below were calculated using CML 2001 - April 2013 Methodology.

## CML 4.1 Impact Assessment

Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
GWP	Global warming potential	kg CO <sub>2</sub> -Eq.	2.5E+01	8.5E-02	8.8E-03	1.3E+02	3.7E-03	2.7E-02	1.3E+00	3.1E-02	-9.1E+01
ODP	Depletion potential of the stratospheric ozone layer	kg CFC-11 Eq.	1.5E-06	3.2E-12	1.8E-10	7.8E-06	6.0E-14	1.0E-12	2.6E-08	2.1E-09	-6.4E-06
AP Air	Acidification potential for air emissions	kg SO <sub>2</sub> -Eq.	3.3E-01	4.2E-04	2.1E-05	1.7E+00	3.2E-05	1.6E-04	5.8E-04	9.0E-05	-1.8E+00
EP	Eutrophication potential	kg(PO <sub>4</sub> ) <sup>3</sup> -Eq.	1.2E+00	7.4E-05	1.7E-04	5.9E+00	4.3E-07	8.9E-06	3.0E-04	2.7E-04	-1.2E+01
POCP	Formation potential of tropospheric ozone photochemical oxidants	kg ethane-Eq.	6.8E-03	1.9E-05	1.9E-06	1.1E-01	2.1E-04	4.4E-03	9.3E-03	1.9E-03	-3.9E+01
ADPE	Abiotic depletion potential for non-fossil resources	kg Sb-Eq.	7.8E-03	0.0E+00	2.8E-09	1.0E+00	3.2E-03	5.1E-02	1.2E-01	2.2E-02	-8.9E+01
ADPF	Abiotic depletion potential for fossil resources	MJ	2.8E+02	1.1E+00	5.6E-02	1.4E+03	3.8E-03	2.7E-02	1.3E+00	3.1E-02	-9.1E+01

\*All use phase and disposal stages have been considered and only those with non-zero values have been reported

Results below contain the resource use throughout the life cycle of the product.

## Resource Use

Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
RPR <sub>E</sub>	Renewable primary energy as energy carrier	MJ	3.7E+02	0.0E+00	1.1E-03	1.9E+03	0.0E+00	0.0E+00	3.6E-01	2.8E-02	-1.5E+03
RPR <sub>M</sub>	Renewable primary energy resources as material utilization	MJ	1.7E+01	0.0E+00	8.3E-01	8.7E+01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
NRPR <sub>E</sub>	Nonrenewable primary energy as energy carrier	MJ	1.0E+03	3.6E+00	1.8E-01	5.2E+03	1.7E-01	1.1E+00	3.7E+00	6.7E-01	-3.5E+03
NRPR <sub>M</sub>	Nonrenewable primary energy as material utilization	MJ	2.8E+01	0.0E+00	1.4E+00	1.4E+02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SM	Use of secondary material	kg	0.0E+00								
RSF	Use of renewable secondary fuels	MJ	0.0E+00								
NRSF	Use of nonrenewable secondary fuels	MJ	0.0E+00								
RE	Energy recovered from disposed waste	MJ	0.0E+00	-5.0E+03							
FW	Use of net fresh water	m <sup>3</sup>	8.1E-01	0.0E+00	4.4E-05	4.6E+00	0.0E+00	0.0E+00	1.2E-01	3.4E-04	-3.2E+00

\*All use phase and disposal stages have been considered and only those with non-zero values have been reported



# Environmental Product Declaration

Southwire 5KV-25KV RhinoShield®, RhinoFlex®,  
RhinoPower® Mining Cables

Handling Cable



According to  
**ISO 14025, EN 15804,**  
and **ISO 21930:2017**

Results below contain the output flows and wastes throughout the life cycle of the product.

Output Flows and Waste Categories											
Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
HWD	Hazardous waste disposed	kg	1.7E-01	0.0E+00	8.7E-03	9.2E-01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
NHWD	Non-hazardous waste disposed	kg	4.1E-01	0.0E+00	2.3E-01	9.8E+00	0.0E+00	0.0E+00	0.0E+00	1.3E+00	0.0E+00
HLRW	High-level radioactive waste	kg	8.1E-01	0.0E+00	4.4E-05	4.0E+00	0.0E+00	0.0E+00	1.8E-05	3.2E-06	0.0E+00
ILLRW	Intermediate- and low-level radioactive waste	kg	0.0E+00								
CRU	Components for re-use	kg	0.0E+00								
MR	Materials for recycling	kg	2.1E-01	0.0E+00	7.9E-01	4.3E+01	0.0E+00	0.0E+00	7.5E+00	0.0E+00	0.0E+00
MER	Materials for energy recovery	kg	0.0E+00	0.0E+00	5.2E-02	3.5E+00	0.0E+00	0.0E+00	6.5E-01	0.0E+00	0.0E+00
EE	Recovered energy exported from system	MJ	0.0E+00	0.0E+00	0.0E+00	6.1E+01	0.0E+00	0.0E+00	1.2E+01	0.0E+00	0.0E+00

*\*All use phase and disposal stages have been considered and only those with non-zero values have been reported*

Results below contain direct greenhouse gas emissions and removals throughout the life cycle of the product.

Resource Use											
Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
BCRP	Biogenic Carbon Removal from Product	kg CO <sub>2</sub>	0.0E+00								
BCEP	Biogenic Carbon Emissions from Product	kg CO <sub>2</sub>	0.0E+00								
BCRK	Biogenic Carbon Removal from Packaging	kg CO <sub>2</sub>	2.7E-01	0.0E+00	0.0E+00	1.3E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
BCEK	Biogenic Carbon Emissions from Packaging	kg CO <sub>2</sub>	0.0E+00	0.0E+00	2.7E-01	1.3E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
BCEW	Biogenic Carbon Emissions from Combustion of Waste from Renewable Sources Used in Production Process	kg CO <sub>2</sub>	0.0E+00								
CCE	Calcination Carbon Emissions	kg CO <sub>2</sub>	0.0E+00								
CCR	Carbonation Carbon Removal	kg CO <sub>2</sub>	0.0E+00								
CWNR	Carbon Emissions from Combustion of Waste from Non-renewable Sources Used in Production Process	kg CO <sub>2</sub>	0.0E+00								

*\*All use phase and disposal stages have been considered and only those with non-zero values have been reported*



# Environmental Product Declaration

Southwire 5KV-25KV RhinoShield®, RhinoFlex®, RhinoPower® Mining Cables

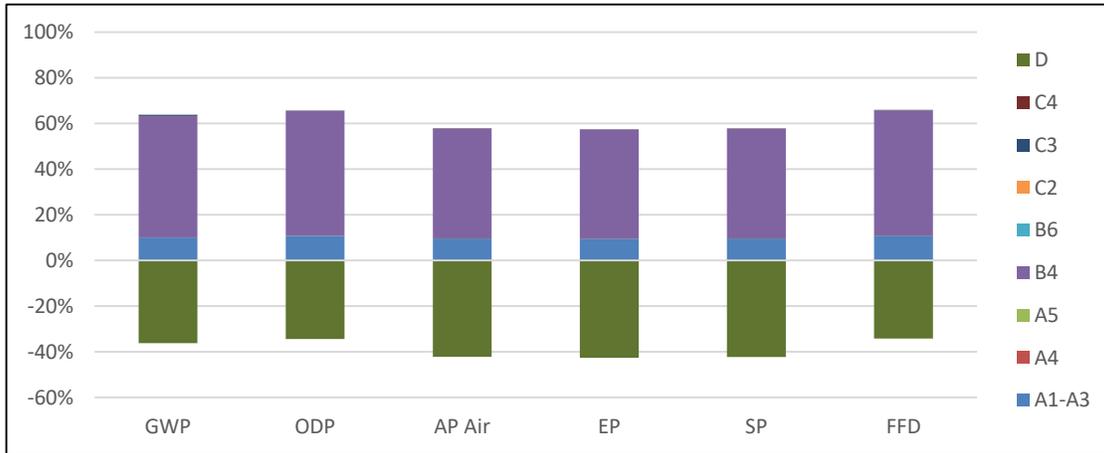
Handling Cable



According to  
ISO 14025, EN 15804,  
and ISO 21930:2017

## LCA Interpretation - 58918899 (350/3)

The production life cycle stage (A1-A3) and in life energy usage (B6) dominate the impacts across all impact categories. This is due to the upstream production of materials used in the product, along with electricity use in the manufacturing of the product and the consumption of electricity during the cable's usage. With five replacements required over a life-span of a building, the replacement stage (B4) dominates from duplicating these stages. Module B4 excludes operational energy use and all benefits and loads beyond the system boundary. As five replacements occur in the specified building service life, module B6 includes the energy usage of six products and module D includes the benefits of six products.



## LCA Results - 59750999 (350/3)

Results shown below were calculated using TRACI 2.1 Methodology.

TRACI 2.1 Impact Assessment											
Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
GWP	Global warming potential	kg CO <sub>2</sub> -Eq.	2.7E+01	1.1E-01	1.0E-02	1.6E+02	3.7E-03	3.5E-02	4.7E+00	1.1E-01	-8.9E+01
ODP	Depletion potential of the stratospheric ozone layer	kg CFC-11 Eq.	3.1E-06	4.2E-12	3.1E-10	1.6E-05	6.0E-14	1.3E-12	9.2E-08	7.6E-09	-4.7E-06
AP Air	Acidification potential for air emissions	kg SO <sub>2</sub> -Eq.	3.3E-01	6.6E-04	3.3E-05	1.7E+00	3.2E-05	2.1E-04	2.1E-03	3.2E-04	-1.5E+00
EP	Eutrophication potential	kg N-Eq.	2.0E+00	3.7E-05	6.2E-04	9.9E+00	4.3E-07	1.2E-05	1.1E-03	9.7E-04	-8.7E+00
SP	Smog formation potential	kg O <sub>3</sub> -Eq.	6.8E+00	1.8E-02	9.0E-04	3.4E+01	2.1E-04	5.8E-03	3.3E-02	6.8E-03	-2.9E+01
FFD	Fossil Fuel Depletion	MJ-surplus	4.3E+01	2.1E-01	1.1E-02	2.2E+02	3.2E-03	6.8E-02	4.3E-01	7.7E-02	-1.0E+02

\*All use phase and disposal stages have been considered and only those with non-zero values have been reported



# Environmental Product Declaration

Southwire 5KV-25KV RhinoShield®, RhinoFlex®, RhinoPower® Mining Cables

Handling Cable



According to  
ISO 14025, EN 15804,  
and ISO 21930:2017

Results shown below were calculated using CML 2001 - April 2013 Methodology.

## CML 4.1 Impact Assessment

Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
GWP	Global warming potential	kg CO <sub>2</sub> -Eq.	2.7E+01	1.1E-01	1.2E-02	1.6E+02	3.7E-03	3.5E-02	4.7E+00	1.1E-01	-8.9E+01
ODP	Depletion potential of the stratospheric ozone layer	kg CFC-11 Eq.	2.4E-06	4.2E-12	2.4E-10	1.2E-05	6.0E-14	1.3E-12	9.2E-08	7.6E-09	-4.7E-06
AP Air	Acidification potential for air emissions	kg SO <sub>2</sub> -Eq.	2.7E-01	5.5E-04	2.7E-05	1.4E+00	3.2E-05	2.1E-04	2.1E-03	3.2E-04	-1.5E+00
EP	Eutrophication potential	kg(PO <sub>4</sub> ) <sup>3</sup> -Eq.	8.8E-01	9.7E-05	2.3E-04	4.4E+00	4.3E-07	1.2E-05	1.1E-03	9.7E-04	-8.7E+00
POCP	Formation potential of tropospheric ozone photochemical oxidants	kg ethane-Eq.	7.0E-03	2.5E-05	2.5E-06	2.6E-01	2.1E-04	5.8E-03	3.3E-02	6.8E-03	-2.9E+01
ADPE	Abiotic depletion potential for non-fossil resources	kg Sb-Eq.	5.7E-03	0.0E+00	3.7E-09	2.9E+00	3.2E-03	6.8E-02	4.3E-01	7.7E-02	-1.0E+02
ADPF	Abiotic depletion potential for fossil resources	MJ	3.8E+02	1.4E+00	7.3E-02	1.9E+03	3.8E-03	3.5E-02	4.7E+00	1.1E-01	-8.9E+01

\*All use phase and disposal stages have been considered and only those with non-zero values have been reported

Results below contain the resource use throughout the life cycle of the product.

## Resource Use

Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
RPR <sub>E</sub>	Renewable primary energy as energy carrier	MJ	3.2E+02	0.0E+00	1.5E-03	1.6E+03	0.0E+00	0.0E+00	1.3E+00	9.9E-02	-1.1E+03
RPR <sub>M</sub>	Renewable primary energy resources as material utilization	MJ	2.2E+01	0.0E+00	1.1E+00	1.1E+02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
NRPR <sub>E</sub>	Nonrenewable primary energy as energy carrier	MJ	1.1E+03	4.7E+00	2.4E-01	5.8E+03	1.7E-01	1.5E+00	1.3E+01	2.4E+00	-3.6E+03
NRPR <sub>M</sub>	Nonrenewable primary energy as material utilization	MJ	2.6E+02	0.0E+00	1.3E+01	1.3E+03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SM	Use of secondary material	kg	0.0E+00								
RSF	Use of renewable secondary fuels	MJ	0.0E+00								
NRSF	Use of nonrenewable secondary fuels	MJ	0.0E+00								
RE	Energy recovered from disposed waste	MJ	0.0E+00	-4.7E+03							
FW	Use of net fresh water	m <sup>3</sup>	8.4E-01	0.0E+00	5.7E-05	6.3E+00	0.0E+00	0.0E+00	4.2E-01	1.2E-03	-2.3E+00

\*All use phase and disposal stages have been considered and only those with non-zero values have been reported



# Environmental Product Declaration

Southwire 5KV-25KV RhinoShield®, RhinoFlex®, RhinoPower® Mining Cables

Handling Cable



According to  
ISO 14025, EN 15804,  
and ISO 21930:2017

Results below contain the output flows and wastes throughout the life cycle of the product.

Output Flows and Waste Categories											
Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
HWD	Hazardous waste disposed	kg	2.3E-01	0.0E+00	1.1E-02	1.2E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
NHWD	Non-hazardous waste disposed	kg	5.4E-01	0.0E+00	3.0E-01	9.1E+00	0.0E+00	0.0E+00	0.0E+00	9.7E-01	0.0E+00
HLRW	High-level radioactive waste	kg	8.4E-01	0.0E+00	5.7E-05	4.2E+00	0.0E+00	0.0E+00	6.2E-05	1.1E-05	0.0E+00
ILLRW	Intermediate- and low-level radioactive waste	kg	0.0E+00								
CRU	Components for re-use	kg	0.0E+00								
MR	Materials for recycling	kg	2.8E-01	0.0E+00	1.0E+00	3.4E+01	0.0E+00	0.0E+00	5.5E+00	0.0E+00	0.0E+00
MER	Materials for energy recovery	kg	0.0E+00	0.0E+00	6.9E-02	3.1E+01	0.0E+00	0.0E+00	6.0E+00	0.0E+00	0.0E+00
EE	Recovered energy exported from system	MJ	0.0E+00	0.0E+00	0.0E+00	5.6E+02	0.0E+00	0.0E+00	1.1E+02	0.0E+00	0.0E+00

\*All use phase and disposal stages have been considered and only those with non-zero values have been reported

Results below contain direct greenhouse gas emissions and removals throughout the life cycle of the product.

Resource Use											
Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
BCRP	Biogenic Carbon Removal from Product	kg CO <sub>2</sub>	0.0E+00								
BCEP	Biogenic Carbon Emissions from Product	kg CO <sub>2</sub>	0.0E+00								
BCRK	Biogenic Carbon Removal from Packaging	kg CO <sub>2</sub>	3.5E-01	0.0E+00	0.0E+00	1.8E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
BCEK	Biogenic Carbon Emissions from Packaging	kg CO <sub>2</sub>	0.0E+00	0.0E+00	3.5E-01	1.8E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
BCEW	Biogenic Carbon Emissions from Combustion of Waste from Renewable Sources Used in Production Process	kg CO <sub>2</sub>	0.0E+00								
CCE	Calcination Carbon Emissions	kg CO <sub>2</sub>	0.0E+00								
CCR	Carbonation Carbon Removal	kg CO <sub>2</sub>	0.0E+00								
CWNR	Carbon Emissions from Combustion of Waste from Non-renewable Sources Used in Production Process	kg CO <sub>2</sub>	0.0E+00								

\*All use phase and disposal stages have been considered and only those with non-zero values have been reported



# Environmental Product Declaration

Southwire 5KV-25KV RhinoShield®, RhinoFlex®, RhinoPower® Mining Cables

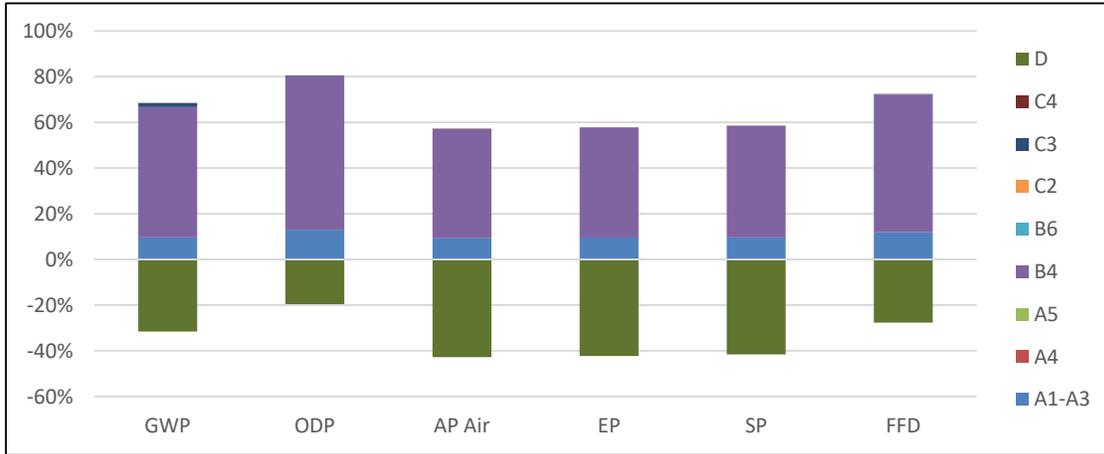
Handling Cable



According to  
ISO 14025, EN 15804,  
and ISO 21930:2017

## LCA Interpretation - 59750999 (350/3)

The production life cycle stage (A1-A3) and in life energy usage (B6) dominate the impacts across all impact categories. This is due to the upstream production of materials used in the product, along with electricity use in the manufacturing of the product and the consumption of electricity during the cable's usage. With five replacements required over a life-span of a building, the replacement stage (B4) dominates from duplicating these stages. Module B4 excludes operational energy use and all benefits and loads beyond the system boundary. As five replacements occur in the specified building service life, module B6 includes the energy usage of six products and module D includes the benefits of six products.



## LCA Results - 67950299 (500/3)

Results shown below were calculated using TRACI 2.1 Methodology.

TRACI 2.1 Impact Assessment											
Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
GWP	Global warming potential	kg CO <sub>2</sub> -Eq.	3.4E+01	1.4E-01	1.2E-02	1.9E+02	3.7E-03	4.3E-02	4.9E+00	1.1E-01	-1.2E+02
ODP	Depletion potential of the stratospheric ozone layer	kg CFC-11 Eq.	3.5E-06	5.2E-12	3.8E-10	1.8E-05	6.0E-14	1.6E-12	9.5E-08	7.9E-09	-6.8E-06
AP Air	Acidification potential for air emissions	kg SO <sub>2</sub> -Eq.	4.6E-01	8.1E-04	4.1E-05	2.3E+00	3.2E-05	2.6E-04	2.1E-03	3.3E-04	-2.1E+00
EP	Eutrophication potential	kg N-Eq.	2.9E+00	4.5E-05	7.5E-04	1.4E+01	4.3E-07	1.4E-05	1.1E-03	1.0E-03	-1.3E+01
SP	Smog formation potential	kg O <sub>3</sub> -Eq.	9.6E+00	2.2E-02	1.1E-03	4.8E+01	2.1E-04	7.0E-03	3.4E-02	7.0E-03	-4.2E+01
FFD	Fossil Fuel Depletion	MJ-surplus	4.8E+01	2.6E-01	1.3E-02	2.4E+02	3.2E-03	8.2E-02	4.4E-01	7.9E-02	-1.3E+02

\*All use phase and disposal stages have been considered and only those with non-zero values have been reported



# Environmental Product Declaration

Southwire 5KV-25KV RhinoShield®, RhinoFlex®, RhinoPower® Mining Cables

Handling Cable



According to  
ISO 14025, EN 15804,  
and ISO 21930:2017

Results shown below were calculated using CML 2001 - April 2013 Methodology.

## CML 4.1 Impact Assessment

Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
GWP	Global warming potential	kg CO <sub>2</sub> -Eq.	3.4E+01	1.4E-01	1.4E-02	1.9E+02	3.7E-03	4.3E-02	4.9E+00	1.1E-01	-1.2E+02
ODP	Depletion potential of the stratospheric ozone layer	kg CFC-11 Eq.	2.6E-06	5.1E-12	2.9E-10	1.4E-05	6.0E-14	1.6E-12	9.5E-08	7.9E-09	-6.8E-06
AP Air	Acidification potential for air emissions	kg SO <sub>2</sub> -Eq.	3.8E-01	6.7E-04	3.3E-05	1.9E+00	3.2E-05	2.6E-04	2.1E-03	3.3E-04	-2.1E+00
EP	Eutrophication potential	kg(PO <sub>4</sub> ) <sup>3</sup> -Eq.	1.3E+00	1.2E-04	2.7E-04	6.3E+00	4.3E-07	1.4E-05	1.1E-03	1.0E-03	-1.3E+01
POCP	Formation potential of tropospheric ozone photochemical oxidants	kg ethane-Eq.	8.8E-03	3.1E-05	3.1E-06	2.8E-01	2.1E-04	7.0E-03	3.4E-02	7.0E-03	-4.2E+01
ADPE	Abiotic depletion potential for non-fossil resources	kg Sb-Eq.	8.3E-03	0.0E+00	4.5E-09	3.1E+00	3.2E-03	8.2E-02	4.4E-01	7.9E-02	-1.3E+02
ADPF	Abiotic depletion potential for fossil resources	MJ	4.4E+02	1.7E+00	8.9E-02	2.2E+03	3.8E-03	4.3E-02	4.9E+00	1.1E-01	-1.2E+02

\*All use phase and disposal stages have been considered and only those with non-zero values have been reported

Results below contain the resource use throughout the life cycle of the product.

## Resource Use

Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
RPR <sub>E</sub>	Renewable primary energy as energy carrier	MJ	4.3E+02	0.0E+00	1.8E-03	2.2E+03	0.0E+00	0.0E+00	1.3E+00	1.0E-01	-1.5E+03
RPR <sub>M</sub>	Renewable primary energy resources as material utilization	MJ	2.7E+01	0.0E+00	1.3E+00	1.4E+02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
NRPR <sub>E</sub>	Nonrenewable primary energy as energy carrier	MJ	1.4E+03	5.7E+00	2.9E-01	6.9E+03	1.7E-01	1.8E+00	1.4E+01	2.4E+00	-4.8E+03
NRPR <sub>M</sub>	Nonrenewable primary energy as material utilization	MJ	2.5E+02	0.0E+00	1.3E+01	1.3E+03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SM	Use of secondary material	kg	0.0E+00								
RSF	Use of renewable secondary fuels	MJ	0.0E+00								
NRSF	Use of nonrenewable secondary fuels	MJ	0.0E+00								
RE	Energy recovered from disposed waste	MJ	0.0E+00	-6.3E+03							
FW	Use of net fresh water	m <sup>3</sup>	1.0E+00	0.0E+00	6.9E-05	7.4E+00	0.0E+00	0.0E+00	4.3E-01	1.3E-03	-3.4E+00

\*All use phase and disposal stages have been considered and only those with non-zero values have been reported



# Environmental Product Declaration

Southwire 5KV-25KV RhinoShield®, RhinoFlex®, RhinoPower® Mining Cables

Handling Cable



According to  
**ISO 14025, EN 15804,**  
 and **ISO 21930:2017**

Results below contain the output flows and wastes throughout the life cycle of the product.

Output Flows and Waste Categories											
Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
HWD	Hazardous waste disposed	kg	2.8E-01	0.0E+00	1.4E-02	1.5E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
NHWD	Non-hazardous waste disposed	kg	6.6E-01	0.0E+00	3.7E-01	1.2E+01	0.0E+00	0.0E+00	0.0E+00	1.4E+00	0.0E+00
HLRW	High-level radioactive waste	kg	1.0E+00	0.0E+00	6.9E-05	5.2E+00	0.0E+00	0.0E+00	6.4E-05	1.2E-05	0.0E+00
ILLRW	Intermediate- and low-level radioactive waste	kg	0.0E+00								
CRU	Components for re-use	kg	0.0E+00								
MR	Materials for recycling	kg	3.4E-01	0.0E+00	1.3E+00	4.8E+01	0.0E+00	0.0E+00	8.0E+00	0.0E+00	0.0E+00
MER	Materials for energy recovery	kg	0.0E+00	0.0E+00	8.4E-02	3.0E+01	0.0E+00	0.0E+00	5.9E+00	0.0E+00	0.0E+00
EE	Recovered energy exported from system	MJ	0.0E+00	0.0E+00	0.0E+00	5.5E+02	0.0E+00	0.0E+00	1.1E+02	0.0E+00	0.0E+00

*\*All use phase and disposal stages have been considered and only those with non-zero values have been reported*

Results below contain direct greenhouse gas emissions and removals throughout the life cycle of the product.

Resource Use											
Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
BCRP	Biogenic Carbon Removal from Product	kg CO <sub>2</sub>	0.0E+00								
BCEP	Biogenic Carbon Emissions from Product	kg CO <sub>2</sub>	0.0E+00								
BCRK	Biogenic Carbon Removal from Packaging	kg CO <sub>2</sub>	4.3E-01	0.0E+00	0.0E+00	2.2E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
BCEK	Biogenic Carbon Emissions from Packaging	kg CO <sub>2</sub>	0.0E+00	0.0E+00	4.3E-01	2.2E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
BCEW	Biogenic Carbon Emissions from Combustion of Waste from Renewable Sources Used in Production Process	kg CO <sub>2</sub>	0.0E+00								
CCE	Calcination Carbon Emissions	kg CO <sub>2</sub>	0.0E+00								
CCR	Carbonation Carbon Removal	kg CO <sub>2</sub>	0.0E+00								
CWNR	Carbon Emissions from Combustion of Waste from Non-renewable Sources Used in Production Process	kg CO <sub>2</sub>	0.0E+00								

*\*All use phase and disposal stages have been considered and only those with non-zero values have been reported*



# Environmental Product Declaration

Southwire 5KV-25KV RhinoShield®, RhinoFlex®, RhinoPower® Mining Cables

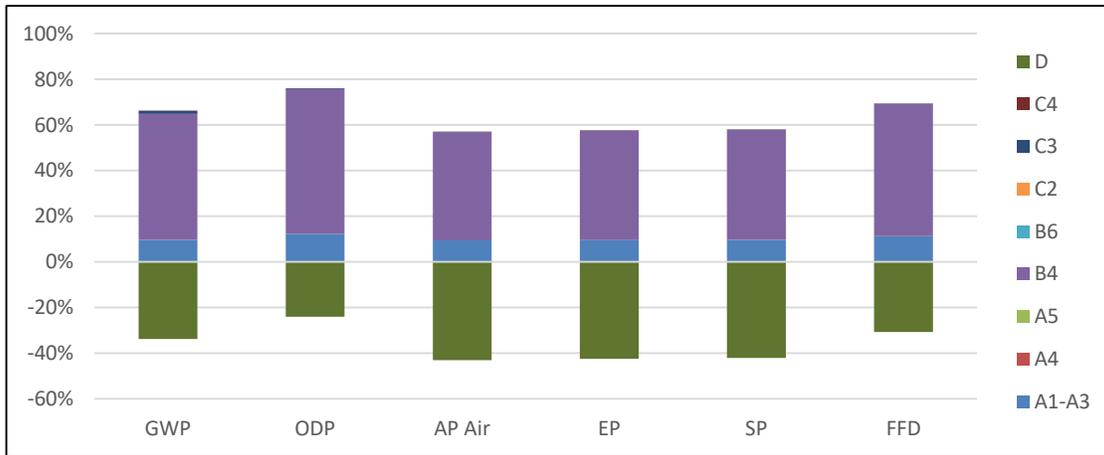
Handling Cable



According to  
ISO 14025, EN 15804,  
and ISO 21930:2017

## LCA Interpretation - 67950299 (500/3)

The production life cycle stage (A1-A3) and in life energy usage (B6) dominate the impacts across all impact categories. This is due to the upstream production of materials used in the product, along with electricity use in the manufacturing of the product and the consumption of electricity during the cable's usage. With five replacements required over a life-span of a building, the replacement stage (B4) dominates from duplicating these stages. Module B4 excludes operational energy use and all benefits and loads beyond the system boundary. As five replacements occur in the specified building service life, module B6 includes the energy usage of six products and module D includes the benefits of six products.



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### Additional Environmental Information

#### Environmental and Health During Manufacturing

At Southwire, we nurture the culture of a “Southwire family” and we work each day to enhance the lives of our employees by building a workplace that is diverse, supportive and engaging. Safety and health are top priorities, and we will always treat each other with dignity and respect. Southwire is committed to operating its facilities in compliance with applicable local, state/provincial, and federal environmental, health and safety (EHS) regulations, as well as implementing more stringent internal standards when necessary to protect our environment, our employees, and the general public. We are dedicated to prevent, reduce or eliminate pollution and health and safety risks at the source and are committed to continual improvement of our management systems to enhance performance, engage employees, and work toward a culture of zero incidents. Southwire recognizes the universal need for care and protection of our natural resources. In addition, Southwire acknowledges that our greatest asset is our people, and we seek to create a workplace where employee safety and health are always top priority.

#### Environmental and Health During Installation

There is no harmful emissive potential. No damage to health or impairment is expected under normal use corresponding to the intended use of the product.

#### Extraordinary Effects

**Fire**  
Cable is specified for use up to 60C and complies with EN50575 EuroClass performance such as Dca, s2, d2, a1 or the IEC 60332-1 flammability test.

**Water**

None.

**Mechanical Destruction**

None.

#### Delayed Emissions

Global warming potential is calculated using the TRACI 2.1 and CML 4.1 impact assessment methodologies. Delayed emissions are not considered.

#### Environmental Activities and Certifications

Southwire monitors and changes processes and/or raw materials, where feasible, to reduce the volume and toxicity of waste generated. Wastes that are unavoidably generated are managed in accordance with regulatory agency-approved methods, and we recycle and reuse waste materials to the greatest extent feasible. Healthy air is vital to the well-being of the Southwire employees, the general public, and the environment. Through a variety of control technologies and operational measures, Southwire strives to minimize our pollutant emissions from our activities. In addition, we have established voluntary targets to reduce some of our air emissions beyond regulatory requirements. Southwire recognizes that water is an essential natural resource that is critical to our communities, the environment, and our business operations. We conserve water by minimizing the water consumption intensity associated with our operations and activities. We also seek to reduce or eliminate wastewaters from our processes where feasible and maintain the quality of our wastewater discharges within applicable regulatory limits. Southwire has achieved ISO 14001 certification at several of our manufacturing facilities.

#### Further Information

Southwire Company  
One Southwire Drive  
Carrollton, GA 30119  
USA



# Environmental Product Declaration

Southwire 5KV-25KV RhinoShield®, RhinoFlex®,  
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Handling Cable



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### Contact Information

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#### LCA Practitioner



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