

Environmental Product Declaration

Southwire Aluminum SIMpull® THHN Wire



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 Aluminum SIMpull® THHN Wire



Environmental Product Declaration

Southwire Aluminum SIMpull® THHN Wire

Residential, Industrial, Tertiary 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	4790297660.132.1	
DECLARED PRODUCT & FUNCTIONAL UNIT OF DECLARED UNIT	Southwire Aluminum SIMpull® THHN Wire 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	30 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 	
This life cycle assessment was independently verified in accordance with ISO 14044 and the reference PCR by:		

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.



Environmental Product Declaration

Southwire Aluminum SIMpull® THHN Wire

Residential, Industrial, Tertiary Cable



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

General Information

Description of Company/Organization

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.

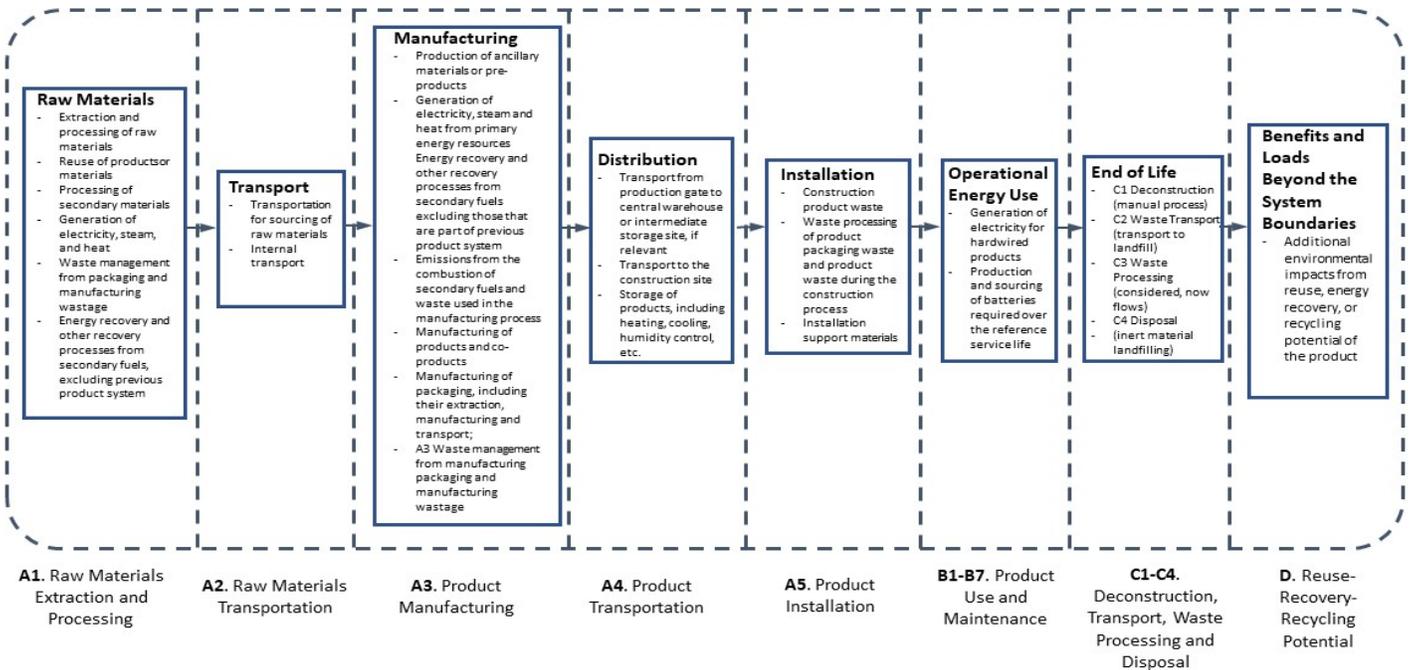
Product Description

Product Type: SIMpull® THHN Aluminum THHN

Product Characteristic: Wire & Cable

The Southwire SIMpull® THHN conductors 8 AWG through 1000 KCMIL are AlumaFlex® Brand AA-8000 series aluminum alloy, compact stranded. Insulated with a tough heat and moisture-resistant polyvinyl chloride (PVC), over which a nylon jacket is applied. This EPD includes results for the following products: 56044201 (1000KCMIL), 56268099 (1000KCMIL).

Flow Diagram



Environmental Product Declaration

Southwire Aluminum SIMpull® THHN Wire

Residential, Industrial, Tertiary Cable



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

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

Southwire SIMpull® THHN Aluminum THHN Wire & Cable with Alumaflex® Brand conductors are primarily used in conduit and cable trays for services, feeders and branch circuits in commercial or industrial applications as specified in the 2011 National Electrical Code. When used as Type THHN or T90 Nylon conductor is suitable for use in dry locations at temperatures not to exceed 90°C. When used as Type THWN-2 or TWN75, conductor is suitable for use in wet or dry locations at temperatures not to exceed 90°C or not to exceed 75°C when exposed to oil or coolant. Voltage for all applications is 600 volts. This cable should be installed without application of pulling lubricant.

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 Aluminum SIMpull® THHN Wire Residential, Industrial, Tertiary cable is as follows:

Material	Percentage in mass (%)	
	56044201 (1000KCMIL)	56268099 (1000KCMIL)
Colorant	0.09%	0.08%
Conductor	81.64%	83.76%
Cross Filler	0.00%	0.00%
Drain Wire	0.00%	0.00%
Insulation	0.00%	0.00%
Jacketing	18.26%	16.16%
Rip Cord	0.00%	0.00%
Tape	0.00%	0.00%
Other	0.00%	0.00%
Total	100.00%	100.00%



Environmental Product Declaration

Southwire Aluminum SIMpull® THHN Wire

Residential, Industrial, Tertiary Cable



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

Placing on the Market / Application Rules

Southwire Aluminum SIMpull® THHN conductors comply with the following:

- ASTM B-800 and B-801
- UL Standard 83
- CSA
- Federal Specification A-A-59544
- VW-1 – Sizes 4 through 1 AWG
- CT - Sizes 1/0 AWG and larger Sizes Rated for CT use
- FT1 - Sizes 4 AWG through 750 kcmil
- T90 Nylon – Sizes 4 AWG through 750 kcmil
- TWN 75 – Sizes 8 AWG through 750 kcmil
- National Electrical Code, NFPA 70, 2011 Edition
- NEMA WC-70 Construction Requirements

Properties of Declared Product as Shipped

Southwire Aluminum SIMpull® THHN Wire Residential, Industrial, Tertiary 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
56044201	1000 KCMIL	1	0.86	1.16
56268099	1000 KCMIL	1	1.67	0.60



Environmental Product Declaration

Southwire Aluminum SIMpull® THHN Wire

Residential, Industrial, Tertiary Cable



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

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 Aluminum SIMpull® THHN Wire Residential, Industrial, Tertiary cable is 30 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.



Environmental Product Declaration

Southwire Aluminum SIMpull® THHN Wire

Residential, Industrial, Tertiary Cable



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

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.

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.

Period Under Review

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

Treatment of Biogenic Carbon

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

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.

Units

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



Environmental Product Declaration

Southwire Aluminum SIMpull® THHN Wire

Residential, Industrial, Tertiary Cable



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

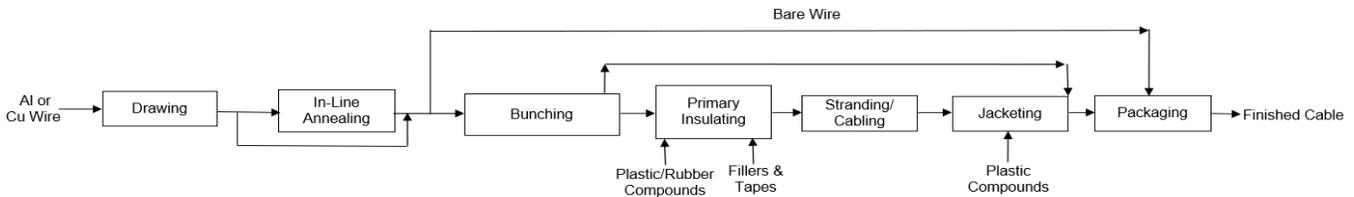
Additional Environmental Information

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)
Cardboard	0.00%
Other	0.23%
Plastic	0.04%
Wood	99.73%
Total	100.00%



Environmental Product Declaration

Southwire Aluminum SIMpull® THHN Wire

Residential, Industrial, Tertiary Cable



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

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 ³
Weight of products transported	-	kg
Volume of products transported	-	m ³
Capacity utilization volume factor	0.9	-

Product Installation

Southwire Aluminum SIMpull® THHN Wire Residential, Industrial, Tertiary 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	56044201 (1000KCMIL)	56268099 (1000KCMIL)	Unit
Auxiliary materials	-	-	kg
Water consumption	-	-	m ³
Other resources	-	-	kg
Electricity consumption	-	-	kWh
Other energy carriers	-	-	MJ
Product loss per functional unit	0.043	0.084	kg
Waste materials at construction site	0.043	0.084	kg
Output substance (recycle)	0.030	0.060	kg
Output substance (landfill)	0.005	0.011	kg
Output substance (incineration)	0.008	0.014	kg
Packaging waste (recycle)	0.408	0.795	kg
Packaging waste (landfill)	0.109	0.212	kg
Packaging waste (incineration)	0.027	0.053	kg
Direct emissions to ambient air*, soil, and water	0.141	0.275	kg CO ₂
VOC emissions	-	-	kg

*CO2 emissions to air from disposal of packaging

Reference Service Life		
Name	Value	Unit
Reference Service Life	30	years
Estimated Building Service Life	60	years
Number of Replacements	1	number



Environmental Product Declaration

Southwire Aluminum SIMpull® THHN Wire

Residential, Industrial, Tertiary Cable



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

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	56044201 (1000KCMIL)	56268099 (1000KCMIL)	Unit
Water consumption (from tap, to sewer)	-	-	m ³
Electricity consumption	0.020	0.020	kWh
Other energy carriers	-	-	MJ
Equipment output	-	-	kW
Direct emissions to ambient air, soil, and water	-	-	kg

The equation below was used to calculate the electricity used in the B6 stage.

$$E = Z \times I^2 \times \Delta t \quad \text{(Equation 1)}$$

Where Z is the linear resistivity of the cable, I is the current, and t is the time that they are used for.

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	56044201 (1000KCMIL)	56268099 (1000KCMIL)	Unit
Collected separately	0.596	1.192	kg
Collected as mixed construction waste	0.263	0.482	kg
Reuse	0.000	0.000	kg
Recycling	0.596	1.192	kg
Landfilling	0.105	0.210	kg
Incineration with energy recovery	0.158	0.272	kg
Energy conversion	44.000	44.000	%
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	56044201 (1000KCMIL)	56268099 (1000KCMIL)	Unit
Net energy benefit from energy recovery from waste treatment declared as exported energy in C3 (R>0.6)	1.389	2.399	MJ
Net energy benefit from thermal energy due to treatment of waste declared as exported energy in C4 (R<0.6)	0.000	0.000	MJ
Net energy benefit from material flow declared in C3 for energy recovery	0.000	0.000	MJ
Process and conversion efficiencies			
Further assumptions for scenario development (e.g. further processing technologies, assumptions on correction factors);			



Environmental Product Declaration

Southwire Aluminum SIMpull® THHN Wire

Residential, Industrial, Tertiary Cable



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

LCA Results - 56044201 (1000KCMIL)

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 ₂ -Eq.	1.8E+01	2.5E-02	1.3E-02	1.8E+01	1.8E-02	8.0E-03	5.8E-01	1.4E-02	-2.5E+01
ODP	Depletion potential of the stratospheric ozone layer	kg CFC-11 Eq.	9.7E-07	9.6E-13	4.0E-10	9.8E-07	2.8E-13	3.0E-13	1.1E-08	9.4E-10	-8.9E-07
AP Air	Acidification potential for air emissions	kg SO ₂ -Eq.	1.4E-01	1.5E-04	4.3E-05	1.4E-01	1.5E-04	4.8E-05	2.5E-04	3.9E-05	-2.0E-01
EP	Eutrophication potential	kg N-Eq.	8.7E-02	8.3E-06	8.0E-04	8.8E-02	2.1E-06	2.7E-06	1.3E-04	1.2E-04	-1.3E-01
SP	Smog formation potential	kg O ₃ -Eq.	1.2E+00	4.1E-03	1.2E-03	1.3E+00	1.0E-03	1.3E-03	4.0E-03	8.3E-04	-1.8E+00
FFD	Fossil Fuel Depletion	MJ-surplus	8.0E+00	4.8E-02	1.4E-02	8.1E+00	1.5E-02	1.5E-02	5.3E-02	9.5E-03	-9.0E+00

*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 ₂ -Eq.	1.8E+01	2.5E-02	1.4E-02	1.8E+01	1.8E-02	8.0E-03	5.8E-01	1.4E-02	-2.5E+01
ODP	Depletion potential of the stratospheric ozone layer	kg CFC-11 Eq.	7.6E-07	9.5E-13	3.1E-10	7.8E-07	2.8E-13	3.0E-13	1.1E-08	9.4E-10	-8.9E-07
AP Air	Acidification potential for air emissions	kg SO ₂ -Eq.	1.4E-01	1.2E-04	3.5E-05	1.4E-01	1.5E-04	4.8E-05	2.5E-04	3.9E-05	-2.0E-01
EP	Eutrophication potential	kg(PO ₄) ³ -Eq.	4.2E-02	2.2E-05	2.9E-04	4.2E-02	2.1E-06	2.7E-06	1.3E-04	1.2E-04	-1.3E-01
POCP	Formation potential of tropospheric ozone photochemical oxidants	kg ethane-Eq.	7.1E-03	5.7E-06	3.1E-06	1.3E-02	1.0E-03	1.3E-03	4.0E-03	8.3E-04	-1.8E+00
ADPE	Abiotic depletion potential for non-fossil resources	kg Sb-Eq.	2.1E-05	0.0E+00	4.7E-09	7.8E-02	1.5E-02	1.5E-02	5.3E-02	9.5E-03	-9.0E+00
ADPF	Abiotic depletion potential for fossil resources	MJ	1.7E+02	3.2E-01	9.5E-02	1.7E+02	1.8E-02	8.0E-03	5.8E-01	1.4E-02	-2.5E+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 _E	Renewable primary energy as energy carrier	MJ	2.1E+01	0.0E+00	5.7E-04	2.1E+01	0.0E+00	0.0E+00	4.7E-02	3.7E-03	-4.3E+00
RPR _M	Renewable primary energy resources as material utilization	MJ	8.6E+00	0.0E+00	4.3E-01	9.1E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
NRPR _E	Nonrenewable primary energy as energy carrier	MJ	1.8E+02	3.2E-01	9.6E-02	1.8E+02	2.5E-01	1.0E-01	4.9E-01	8.9E-02	-2.5E+02
NRPR _M	Nonrenewable primary energy as material utilization	MJ	3.2E+00	0.0E+00	1.6E-01	3.3E+00	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+02							
FW	Use of net fresh water	m ³	4.4E-02	0.0E+00	2.2E-05	6.0E-02	0.0E+00	0.0E+00	1.6E-02	4.6E-05	-5.4E-02

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



Environmental Product Declaration

Southwire Aluminum SIMpull® THHN Wire

Residential, Industrial, Tertiary 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-05	0.0E+00	6.3E-07	1.3E-05	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
NHWD	Non-hazardous waste disposed	kg	7.9E-03	0.0E+00	1.1E-01	2.2E-01	0.0E+00	0.0E+00	0.0E+00	1.1E-01	0.0E+00
HLRW	High-level radioactive waste	kg	4.4E-02	0.0E+00	2.2E-05	4.4E-02	0.0E+00	0.0E+00	2.3E-06	4.3E-07	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	2.5E-02	0.0E+00	4.1E-01	1.0E+00	0.0E+00	0.0E+00	6.0E-01	0.0E+00	0.0E+00
MER	Materials for energy recovery	kg	0.0E+00	0.0E+00	2.7E-02	1.8E-01	0.0E+00	0.0E+00	1.6E-01	0.0E+00	0.0E+00
EE	Recovered energy exported from system	MJ	0.0E+00	0.0E+00	0.0E+00	1.4E+00	0.0E+00	0.0E+00	1.4E+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 ₂	0.0E+00								
BCEP	Biogenic Carbon Emissions from Product	kg CO ₂	0.0E+00								
BCRK	Biogenic Carbon Removal from Packaging	kg CO ₂	1.4E-01	0.0E+00	0.0E+00	1.4E-01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
BCEK	Biogenic Carbon Emissions from Packaging	kg CO ₂	0.0E+00	0.0E+00	1.4E-01	1.4E-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 ₂	0.0E+00								
CCE	Calcination Carbon Emissions	kg CO ₂	0.0E+00								
CCR	Carbonation Carbon Removal	kg CO ₂	0.0E+00								
CWNR	Carbon Emissions from Combustion of Waste from Non-renewable Sources Used in Production Process	kg CO ₂	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 Aluminum SIMpull® THHN Wire

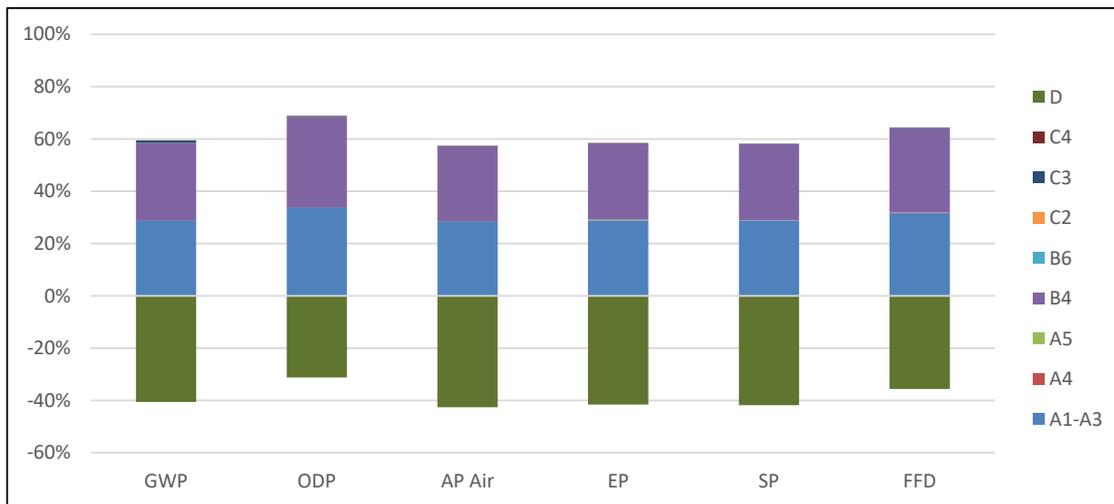
Residential, Industrial, Tertiary Cable



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

LCA Interpretation - 56044201 (1000KCMIL)

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 one replacement 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 one replacement occurs in the specified building service life, module B6 includes the energy usage of two products and module D includes the benefits of two products.



Environmental Product Declaration

Southwire Aluminum SIMpull® THHN Wire

Residential, Industrial, Tertiary Cable



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

LCA Results - 56268099(1000KCML)

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 ₂ -Eq.	3.5E+01	4.9E-02	1.3E-02	3.6E+01	1.8E-02	1.5E-02	1.1E+00	2.5E-02	-5.0E+01
ODP	Depletion potential of the stratospheric ozone layer	kg CFC-11 Eq.	1.8E-06	1.9E-12	4.0E-10	1.9E-06	2.8E-13	5.9E-13	2.1E-08	1.7E-09	-1.8E-06
AP Air	Acidification potential for air emissions	kg SO ₂ -Eq.	2.7E-01	2.9E-04	4.3E-05	2.7E-01	1.5E-04	9.2E-05	4.6E-04	7.2E-05	-4.0E-01
EP	Eutrophication potential	kg N-Eq.	1.7E-01	1.6E-05	8.0E-04	1.7E-01	2.1E-06	5.2E-06	2.4E-04	2.2E-04	-2.5E-01
SP	Smog formation potential	kg O ₃ -Eq.	2.5E+00	8.0E-03	1.2E-03	2.5E+00	1.0E-03	2.5E-03	7.4E-03	1.5E-03	-3.6E+00
FFD	Fossil Fuel Depletion	MJ-surplus	1.6E+01	9.3E-02	1.4E-02	1.6E+01	1.5E-02	3.0E-02	9.7E-02	1.7E-02	-1.7E+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 ₂ -Eq.	3.5E+01	4.9E-02	1.4E-02	3.6E+01	1.8E-02	1.5E-02	1.1E+00	2.5E-02	-5.0E+01
ODP	Depletion potential of the stratospheric ozone layer	kg CFC-11 Eq.	1.4E-06	1.8E-12	3.1E-10	1.5E-06	2.8E-13	5.9E-13	2.1E-08	1.7E-09	-1.8E-06
AP Air	Acidification potential for air emissions	kg SO ₂ -Eq.	2.8E-01	2.4E-04	3.5E-05	2.8E-01	1.5E-04	9.2E-05	4.6E-04	7.2E-05	-4.0E-01
EP	Eutrophication potential	kg(PO ₄) ³ -Eq.	8.3E-02	4.3E-05	2.9E-04	8.3E-02	2.1E-06	5.2E-06	2.4E-04	2.2E-04	-2.5E-01
POCP	Formation potential of tropospheric ozone photochemical oxidants	kg ethane-Eq.	1.4E-02	1.1E-05	3.1E-06	2.6E-02	1.0E-03	2.5E-03	7.4E-03	1.5E-03	-3.6E+00
ADPE	Abiotic depletion potential for non-fossil resources	kg Sb-Eq.	4.0E-05	0.0E+00	4.7E-09	1.4E-01	1.5E-02	3.0E-02	9.7E-02	1.7E-02	-1.7E+01
ADPF	Abiotic depletion potential for fossil resources	MJ	3.3E+02	6.3E-01	9.5E-02	3.3E+02	1.8E-02	1.6E-02	1.1E+00	2.5E-02	-5.0E+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 _E	Renewable primary energy as energy carrier	MJ	1.6E+01	0.0E+00	5.7E-04	1.6E+01	0.0E+00	0.0E+00	8.6E-02	6.7E-03	-8.7E+00
RPR _M	Renewable primary energy resources as material utilization	MJ	1.7E+01	0.0E+00	8.4E-01	1.8E+01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
NRPR _E	Nonrenewable primary energy as energy carrier	MJ	3.6E+02	6.3E-01	9.6E-02	3.6E+02	1.6E-01	2.0E-01	9.0E-01	1.6E-01	-5.0E+02
NRPR _M	Nonrenewable primary energy as material utilization	MJ	5.5E+00	0.0E+00	2.7E-01	5.7E+00	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	-5.1E+02							
FW	Use of net fresh water	m ³	8.6E-02	0.0E+00	2.2E-05	1.1E-01	0.0E+00	0.0E+00	2.9E-02	8.4E-05	-1.1E-01

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



Environmental Product Declaration

Southwire Aluminum SIMpull® THHN Wire

Residential, Industrial, Tertiary 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-05	0.0E+00	1.2E-06	2.6E-05	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
NHWD	Non-hazardous waste disposed	kg	1.5E-02	0.0E+00	2.1E-01	4.4E-01	0.0E+00	0.0E+00	0.0E+00	2.1E-01	0.0E+00
HLRW	High-level radioactive waste	kg	8.6E-02	0.0E+00	2.2E-05	8.6E-02	0.0E+00	0.0E+00	4.3E-06	7.8E-07	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	4.9E-02	0.0E+00	8.0E-01	2.0E+00	0.0E+00	0.0E+00	1.2E+00	0.0E+00	0.0E+00
MER	Materials for energy recovery	kg	0.0E+00	0.0E+00	5.3E-02	3.2E-01	0.0E+00	0.0E+00	2.7E-01	0.0E+00	0.0E+00
EE	Recovered energy exported from system	MJ	0.0E+00	0.0E+00	0.0E+00	2.4E+00	0.0E+00	0.0E+00	2.4E+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 ₂	0.0E+00								
BCEP	Biogenic Carbon Emissions from Product	kg CO ₂	0.0E+00								
BCRK	Biogenic Carbon Removal from Packaging	kg CO ₂	2.7E-01	0.0E+00	0.0E+00	2.7E-01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
BCEK	Biogenic Carbon Emissions from Packaging	kg CO ₂	0.0E+00	0.0E+00	2.7E-01	2.7E-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 ₂	0.0E+00								
CCE	Calcination Carbon Emissions	kg CO ₂	0.0E+00								
CCR	Carbonation Carbon Removal	kg CO ₂	0.0E+00								
CWNR	Carbon Emissions from Combustion of Waste from Non-renewable Sources Used in Production Process	kg CO ₂	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 Aluminum SIMpull® THHN Wire

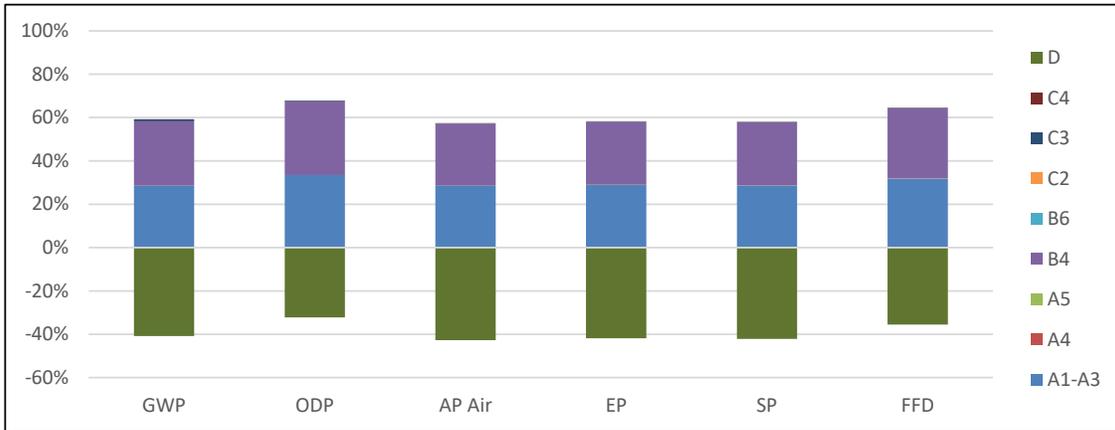
Residential, Industrial, Tertiary Cable



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

LCA Interpretation - 56268099(1000KCMIL)

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 one replacement 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 one replacement occurs in the specified building service life, module B6 includes the energy usage of two products and module D includes the benefits of two products.



Environmental Product Declaration

Southwire Aluminum SIMpull® THHN Wire

Residential, Industrial, Tertiary Cable



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

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 Aluminum SIMpull® THHN Wire

Residential, Industrial, Tertiary Cable



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

References

- PCR Part A The Norwegian EPD Foundation: NPCR Part A: Construction Products and Services, v1.0, 2017.
- PCR Part B The Norwegian EPD Foundation: NPCR 027 Part B: Electrical Cables and Wires, v1.0, October 2020.
- Secondary PCR Part PEP ecopassport Program: Product Category Rules for Electrical, Electronic and HVAC-R Products, v3.0, April 2015. A
- Secondary PCR Part PEP ecopassport Program: Product Specific Rules for Wores, Cables and Accessories, v3.0, October 2015. B
- SimaPro v9.2 PRe Sustainability. SimaPro Life Cycle Assessment version 9.2 (software).
- ISO 14025 ISO 14025:2011-10, Environmental labels and declarations — Type III environmental declarations — Principles and procedures.
- ISO 14040 ISO 14040:2009-11, Environmental management — Life cycle assessment — Principles and framework.
- ISO 14044 ISO 14044:2006-10, Environmental management — Life cycle assessment — Requirements and guidelines.
- EN 15804 EN 15804:2012-04: Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction product
- ULE 2020 UL Environment, General Program Instructions, v2.5, March 2020.
- ISO 21930: 2017 ISO 21930:2017, Sustainability in buildings and civil engineering works - Core rules for environmental product declarations of construction products and services.
- Characterization Method IPCC. 2014. Climate Change 2013. The Physical Science Basis. Cambridge University Press. (<http://www.ipcc.ch/report/ar5/wg1/>).
- Characterization Method Hauschild M.Z., & Wenzel H. Environmental Assessment of Products. Springer, US, Vol. 2, 1998.
- Characterization Method Heijungs R., Guinée J.B., Huppes G., Lankreijer R.M., Udo de Haes H.A., Wegener Sleeswijk A. Environmental Life Cycle Assessment of Products: Guide and Backgrounds. CML. Leiden University, Leiden, 1992.
- Characterization Method Jenkin M.E., & Hayman G.D. Photochemical ozone creation potentials for oxygenated volatile organic compounds: sensitivity to variations in kinetic and mechanistic parameters. Atmospheric Environment. 1999, 33 (8) pp. 1275-1293.
- Characterization Method WMO. 1999. Scientific Assessment of Ozone Depletion: 1998, World Meteorological Organization Global Ozone Research and Monitoring Project - Report No. 44, WMO, Geneva.
- Characterization Method Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources using Environmental Chambers- version 1.2, January 2017.
- IEC 60228:2004 Conductors of Insulated Cables



Environmental Product Declaration

Southwire Aluminum SIMpull® THHN Wire

Residential, Industrial, Tertiary Cable



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

Contact Information

Study Commissioner



Mark Rogers
Sr. Product Stewardship Coordinator
Southwire Company
One Southwire Drive
Carrollton, Georgia 30119
Tel: (770) 832-5359
Email: mark.rogers@southwire.com

LCA Practitioner



Sustainable Solutions Corporation
155 Railroad Plaza, Suite 203
Royersford, PA 19468 USA
(+1) 610 569-1047
info@sustainablesolutionscorporation.com
www.sustainablesolutionscorporation.com

