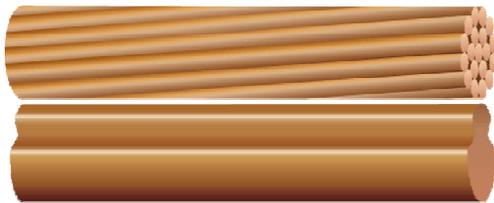


Environmental Product Declaration Southwire Transit Cable- Copper Overhead Catenary Cable



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 Transit Cable- Copper Overhead Catenary Cable



Environmental Product Declaration

Southwire Transit Cable- Copper Overhead Catenary Cable

Railway Networks 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 | 4790297660.134.1 | |
| DECLARED PRODUCT & FUNCTIONAL UNIT OF DECLARED UNIT | Southwire Transit Cable- Copper Overhead Catenary Cable 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: | 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.



Environmental Product Declaration

Southwire Transit Cable- Copper Overhead Catenary Cable

Railway Networks 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.

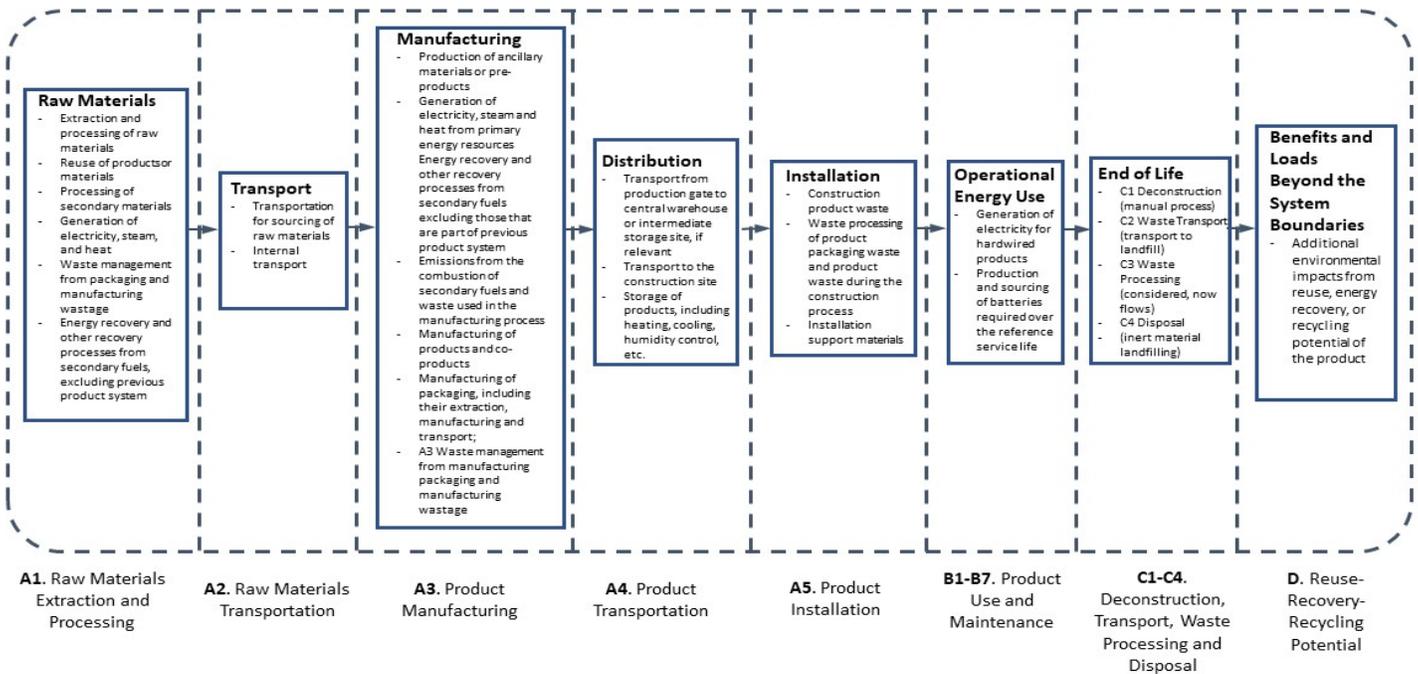
Product Description

Copper Overhead Catenary Wire: Spec 48301 and Copper Hard Drawn Overhead Catenary Systems Messenger Wire: Spec 48303

This product offers the industry's most commonly used, best conductivity, wear characteristics and tensile strength properties. Hard Drawn Copper contact/trolley wire is available in the ASTM configurations: grooved, figure 8, or figure 9

This EPD includes results for the following products: 58874499 (500KCMIL), 58757899 (350KCMIL).

Flow Diagram



Environmental Product Declaration

Southwire Transit Cable- Copper Overhead Catenary Cable

Railway Networks 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's Overhead Catenary Wire is for use as an overhead power source on streetcars, trolleys, electric trolley buses, light rail, commuter rail and heavy mass transit systems. Also used on electrically powered mine trains, and industrial cranes. Southwire hard drawn copper trolley wire is ideal for line speeds of up to 100 mph (160 km/h).

- Mechanically Rugged
- Industry Standard Tensile Strength and Breaking Load
- Increase in Conductivity over CuMG, CuAG, and CuSN
- High Tensile Strength and Breaking Load
- Qualifies for SouthWear™ 30% wear marking
- Available with top lobe identification marking per IEEE 1896-2016
- Stable and Reliable for Long Term use
- Buy America Compliant

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 Copper Overhead Catenary Railway Networks cable is as follows:

| Material | Percentage in mass (%) | |
|--------------|------------------------|------------------------|
| | 58874499 (500KCMIL) | 58757899 (350KCMIL) |
| Colorant | 0.00% | 0.00% |
| Conductor | 100.00% | 100.00% |
| Cross Filler | 0.00% | 0.00% |
| Drain Wire | 0.00% | 0.00% |
| Insulation | 0.00% | 0.00% |
| Jacketing | 0.00% | 0.00% |
| 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 Transit Cable- Copper Overhead Catenary Cable

Railway Networks Cable



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

Placing on the Market / Application Rules

Southwire's Overhead Catenary Wire meets or exceeds the following ASTM specifications:

- ASTM B47 Copper Trolley Wire
- ASTM B116 Figure-9 deep-section grooved and Figure-8 copper trolley wire for use in industrial haulage
- EN 50149 Railway Applications. Fixed Installations. Electric Traction. Copper and Copper Alloy Grooved Contact Wires.

Properties of Declared Product as Shipped

Southwire Copper Overhead Catenary Railway Networks cables are delivered as a complete unit, inclusive of all installation materials and instructions.



Environmental Product Declaration

Southwire Transit Cable- Copper Overhead Catenary Cable

Railway Networks Cable



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

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 |
| 58874499 | 500 KCMIL | - | 2.30 | 0.44 |
| 58757899 | 350 KCMIL | - | 1.58 | 0.63 |

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 Copper Overhead Catenary Railway Networks cable is 30 years. The building estimated service life is 60 years.

Allocation

Allocation was determined on a per meter basis.



Environmental Product Declaration

Southwire Transit Cable- Copper Overhead Catenary Cable

Railway Networks Cable



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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.

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 Transit Cable- Copper Overhead Catenary Cable

Railway Networks Cable



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

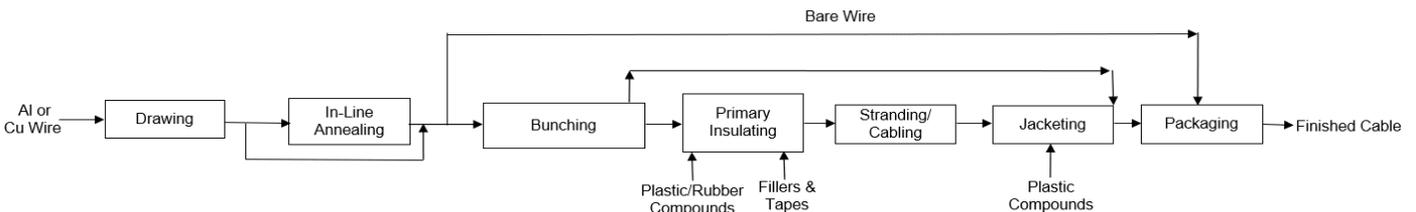
Additional Environmental Information

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) |
|-----------|------------------------|
| | Value |
| Cardboard | 0.00% |
| Other | 0.75% |
| Plastic | 0.09% |
| Wood | 99.17% |
| Total | 100.00% |



Environmental Product Declaration

Southwire Transit Cable- Copper Overhead Catenary Cable

Railway Networks Cable



According to
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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 Copper Overhead Catenary Railway Networks 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 | 58874499 (500KCMIL) | 58757899 (350KCMIL) | Unit |
| Auxiliary materials | - | - | kg |
| Water consumption | - | - | m ³ |
| Other resources | - | - | kg |
| Electricity consumption | - | - | kWh |
| Other energy carriers | - | - | MJ |
| Product loss per functional unit | 0.115 | 0.079 | kg |
| Waste materials at construction site | 0.115 | 0.079 | kg |
| Output substance (recycle) | 0.098 | 0.067 | kg |
| Output substance (landfill) | 0.017 | 0.012 | kg |
| Output substance (incineration) | 0.000 | 0.000 | kg |
| Packaging waste (recycle) | 0.190 | 0.131 | kg |
| Packaging waste (landfill) | 0.051 | 0.035 | kg |
| Packaging waste (incineration) | 0.013 | 0.009 | kg |
| Direct emissions to ambient air*, soil, and water | 0.065 | 0.045 | 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 Transit Cable- Copper Overhead Catenary Cable

Railway Networks 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 | 58874499 (500KCMIL) | 58757899 (350KCMIL) | Unit |
| Water consumption (from tap, to sewer) | - | - | m ³ |
| Electricity consumption | 0.06 | 0.10 | 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.



Environmental Product Declaration

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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 | 58874499 (500KCMIL) | 58757899 (350KCMIL) | Unit |
| Collected separately | 1.95 | 1.34 | kg |
| Collected as mixed construction waste | 0.34 | 0.24 | kg |
| Reuse | 0.00 | 0.00 | kg |
| Recycling | 1.95 | 1.34 | kg |
| Landfilling | 0.34 | 0.24 | kg |
| Incineration with energy recovery | 0.00 | 0.00 | kg |
| Energy conversion | 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 | 58874499 (500KCMIL) | 58757899 (350KCMIL) | Unit |
| Net energy benefit from energy recovery from waste treatment declared as exported energy in C3 (R>0.6) | 0.0041 | 0.0028 | MJ |
| Net energy benefit from thermal energy due to treatment of waste declared as exported energy in C4 (R<0.6) | 0.0000 | 0.0000 | MJ |
| Net energy benefit from material flow declared in C3 for energy recovery | 0.0000 | 0.0000 | 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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LCA Results - 58874499 (500KCMIL)

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. | 6.7E+00 | 6.7E-02 | 6.2E-03 | 1.1E+01 | 3.9E-02 | 2.1E-02 | 4.3E+00 | 9.9E-02 | -4.7E+00 |
| ODP | Depletion potential of the stratospheric ozone layer | kg CFC-11 Eq. | 6.2E-07 | 2.6E-12 | 1.9E-10 | 7.1E-07 | 6.2E-13 | 8.1E-13 | 8.3E-08 | 6.9E-09 | -3.5E-07 |
| AP Air | Acidification potential for air emissions | kg SO ₂ -Eq. | 7.2E-02 | 4.0E-04 | 2.0E-05 | 7.4E-02 | 3.3E-04 | 1.3E-04 | 1.9E-03 | 2.9E-04 | -9.5E-02 |
| EP | Eutrophication potential | kg N-Eq. | 4.5E-01 | 2.2E-05 | 3.7E-04 | 4.5E-01 | 4.5E-06 | 7.1E-06 | 9.7E-04 | 8.7E-04 | -6.5E-01 |
| SP | Smog formation potential | kg O ₃ -Eq. | 1.5E+00 | 1.1E-02 | 5.4E-04 | 1.5E+00 | 2.2E-03 | 3.5E-03 | 3.0E-02 | 6.1E-03 | -2.1E+00 |
| FFD | Fossil Fuel Depletion | MJ-surplus | 8.2E+00 | 1.3E-01 | 6.5E-03 | 8.8E+00 | 3.4E-02 | 4.1E-02 | 3.9E-01 | 6.9E-02 | -4.5E+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. | 6.7E+00 | 6.7E-02 | 7.0E-03 | 1.1E+01 | 3.9E-02 | 2.1E-02 | 4.3E+00 | 9.9E-02 | -4.7E+00 |
| ODP | Depletion potential of the stratospheric ozone layer | kg CFC-11 Eq. | 4.8E-07 | 2.5E-12 | 1.4E-10 | 5.7E-07 | 6.2E-13 | 8.1E-13 | 8.3E-08 | 6.9E-09 | -3.5E-07 |
| AP Air | Acidification potential for air emissions | kg SO ₂ -Eq. | 5.9E-02 | 3.3E-04 | 1.7E-05 | 6.2E-02 | 3.3E-04 | 1.3E-04 | 1.9E-03 | 2.9E-04 | -9.5E-02 |
| EP | Eutrophication potential | kg(PO ₄) ³ -Eq. | 2.0E-01 | 5.9E-05 | 1.4E-04 | 2.0E-01 | 4.5E-06 | 7.1E-06 | 9.7E-04 | 8.7E-04 | -6.5E-01 |
| POCP | Formation potential of tropospheric ozone photochemical oxidants | kg ethane-Eq. | 1.4E-03 | 1.5E-05 | 1.5E-06 | 4.1E-02 | 2.2E-03 | 3.5E-03 | 3.0E-02 | 6.1E-03 | -2.1E+00 |
| ADPE | Abiotic depletion potential for non-fossil resources | kg Sb-Eq. | 1.2E-03 | 0.0E+00 | 2.2E-09 | 5.0E-01 | 3.4E-02 | 4.1E-02 | 3.9E-01 | 6.9E-02 | -4.5E+00 |
| ADPF | Abiotic depletion potential for fossil resources | MJ | 7.7E+01 | 8.6E-01 | 4.4E-02 | 8.3E+01 | 3.9E-02 | 2.1E-02 | 4.3E+00 | 1.0E-01 | -4.7E+00 |

*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 | 2.7E+01 | 0.0E+00 | 2.7E-04 | 2.8E+01 | 0.0E+00 | 0.0E+00 | 3.5E-01 | 2.7E-02 | -2.4E+01 |
| RPR _M | Renewable primary energy resources as material utilization | MJ | 4.0E+00 | 0.0E+00 | 2.0E-01 | 4.2E+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 | 9.2E+01 | 8.6E-01 | 4.5E-02 | 9.7E+01 | 5.4E-01 | 2.7E-01 | 3.6E+00 | 6.5E-01 | -5.5E+01 |
| NRPR _M | Nonrenewable primary energy as material utilization | MJ | 9.3E-03 | 0.0E+00 | 4.6E-04 | 9.7E-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 | -7.9E+01 |
| FW | Use of net fresh water | m ³ | 5.0E-02 | 0.0E+00 | 1.1E-05 | 1.7E-01 | 0.0E+00 | 0.0E+00 | 1.2E-01 | 3.4E-04 | -5.3E-02 |

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



Environmental Product Declaration

Southwire Transit Cable- Copper Overhead Catenary Cable

Railway Networks 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 | 4.2E-02 | 0.0E+00 | 2.1E-03 | 4.4E-02 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| NHWD | Non-hazardous waste disposed | kg | 1.0E-01 | 0.0E+00 | 5.6E-02 | 5.0E-01 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 3.4E-01 | 0.0E+00 |
| HLRW | High-level radioactive waste | kg | 5.0E-02 | 0.0E+00 | 1.1E-05 | 5.0E-02 | 0.0E+00 | 0.0E+00 | 1.7E-05 | 3.1E-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 | 5.1E-02 | 0.0E+00 | 1.9E-01 | 2.2E+00 | 0.0E+00 | 0.0E+00 | 2.0E+00 | 0.0E+00 | 0.0E+00 |
| MER | Materials for energy recovery | kg | 0.0E+00 | 0.0E+00 | 1.3E-02 | 1.3E-02 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| EE | Recovered energy exported from system | MJ | 0.0E+00 | 0.0E+00 | 0.0E+00 | 4.1E-03 | 0.0E+00 | 0.0E+00 | 4.1E-03 | 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 | 6.5E-02 | 0.0E+00 | 0.0E+00 | 6.5E-02 | 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 | 6.5E-02 | 6.5E-02 | 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 Transit Cable- Copper Overhead Catenary Cable

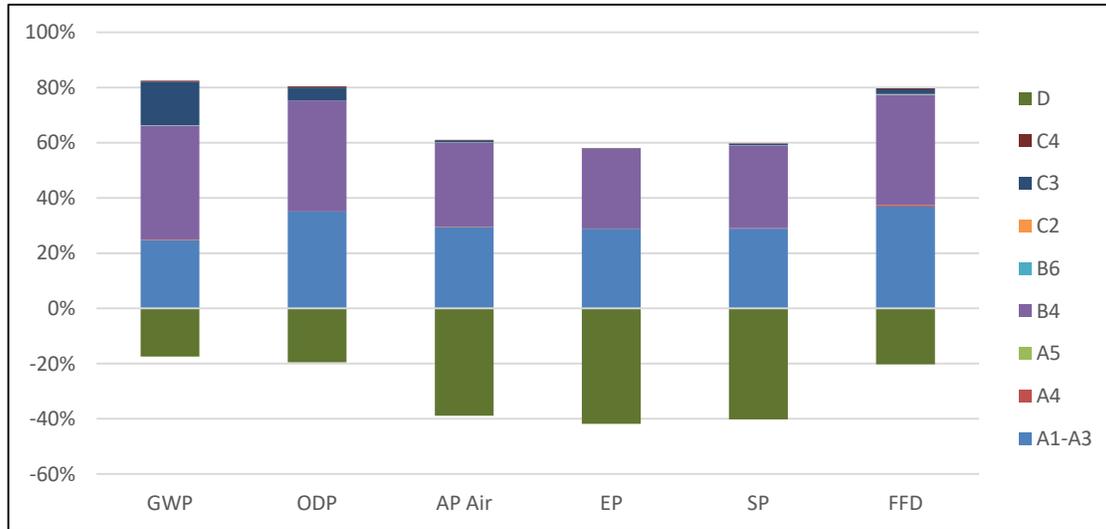
Railway Networks Cable



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

LCA Interpretation - 58874499 (500KCMIL)

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 Transit Cable- Copper Overhead Catenary Cable

Railway Networks Cable



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

LCA Results - 58757899 (350KCMIL)

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. | 1.4E+01 | 4.6E-02 | 4.3E-03 | 1.5E+01 | 6.6E-02 | 1.5E-02 | 5.2E-01 | 1.2E-02 | -1.7E+01 |
| ODP | Depletion potential of the stratospheric ozone layer | kg CFC-11 Eq. | 1.1E-06 | 1.8E-12 | 1.3E-10 | 1.2E-06 | 1.1E-12 | 5.6E-13 | 1.0E-08 | 8.4E-10 | -1.3E-06 |
| AP Air | Acidification potential for air emissions | kg SO ₂ -Eq. | 2.4E-01 | 2.8E-04 | 1.4E-05 | 2.4E-01 | 5.7E-04 | 8.7E-05 | 2.3E-04 | 3.5E-05 | -3.5E-01 |
| EP | Eutrophication potential | kg N-Eq. | 1.6E+00 | 1.5E-05 | 2.6E-04 | 1.6E+00 | 7.7E-06 | 4.9E-06 | 1.2E-04 | 1.1E-04 | -2.3E+00 |
| SP | Smog formation potential | kg O ₃ -Eq. | 5.1E+00 | 7.5E-03 | 3.7E-04 | 5.1E+00 | 3.8E-03 | 2.4E-03 | 3.6E-03 | 7.5E-04 | -7.5E+00 |
| FFD | Fossil Fuel Depletion | MJ-surplus | 1.5E+01 | 8.8E-02 | 4.4E-03 | 1.5E+01 | 5.8E-02 | 2.8E-02 | 4.8E-02 | 8.5E-03 | -1.6E+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. | 1.4E+01 | 4.6E-02 | 4.8E-03 | 1.5E+01 | 6.6E-02 | 1.5E-02 | 5.2E-01 | 1.2E-02 | -1.7E+01 |
| ODP | Depletion potential of the stratospheric ozone layer | kg CFC-11 Eq. | 8.6E-07 | 1.7E-12 | 9.8E-11 | 8.7E-07 | 1.1E-12 | 5.6E-13 | 1.0E-08 | 8.4E-10 | -1.3E-06 |
| AP Air | Acidification potential for air emissions | kg SO ₂ -Eq. | 1.9E-01 | 2.3E-04 | 1.1E-05 | 1.9E-01 | 5.7E-04 | 8.7E-05 | 2.3E-04 | 3.5E-05 | -3.5E-01 |
| EP | Eutrophication potential | kg(PO ₄) ³ -Eq. | 7.0E-01 | 4.0E-05 | 9.4E-05 | 7.0E-01 | 7.7E-06 | 4.9E-06 | 1.2E-04 | 1.1E-04 | -2.3E+00 |
| POCP | Formation potential of tropospheric ozone photochemical oxidants | kg ethane-Eq. | 3.9E-03 | 1.0E-05 | 1.1E-06 | 1.1E-02 | 3.8E-03 | 2.4E-03 | 3.6E-03 | 7.5E-04 | -7.5E+00 |
| ADPE | Abiotic depletion potential for non-fossil resources | kg Sb-Eq. | 4.3E-03 | 0.0E+00 | 1.5E-09 | 8.9E-02 | 5.8E-02 | 2.8E-02 | 4.8E-02 | 8.5E-03 | -1.6E+01 |
| ADPF | Abiotic depletion potential for fossil resources | MJ | 1.5E+02 | 5.9E-01 | 3.0E-02 | 1.6E+02 | 6.7E-02 | 1.5E-02 | 5.2E-01 | 1.2E-02 | -1.7E+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 | 6.6E+01 | 0.0E+00 | 1.9E-04 | 6.6E+01 | 0.0E+00 | 0.0E+00 | 4.3E-02 | 3.3E-03 | -8.7E+01 |
| RPR _M | Renewable primary energy resources as material utilization | MJ | 2.8E+00 | 0.0E+00 | 1.4E-01 | 2.9E+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 | 5.9E-01 | 3.1E-02 | 1.8E+02 | 9.3E-01 | 1.9E-01 | 4.4E-01 | 8.0E-02 | -2.0E+02 |
| NRPR _M | Nonrenewable primary energy as material utilization | MJ | 6.4E-03 | 0.0E+00 | 3.2E-04 | 6.7E-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 | -2.9E+02 |
| FW | Use of net fresh water | m ³ | 1.4E-01 | 0.0E+00 | 7.2E-06 | 1.5E-01 | 0.0E+00 | 0.0E+00 | 1.4E-02 | 4.1E-05 | -1.9E-01 |

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



Environmental Product Declaration

Southwire Transit Cable- Copper Overhead Catenary Cable

Railway Networks 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 | 2.9E-02 | 0.0E+00 | 1.5E-03 | 3.1E-02 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| NHWD | Non-hazardous waste disposed | kg | 6.9E-02 | 0.0E+00 | 3.8E-02 | 3.4E-01 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 2.4E-01 | 0.0E+00 |
| HLRW | High-level radioactive waste | kg | 1.4E-01 | 0.0E+00 | 7.2E-06 | 1.4E-01 | 0.0E+00 | 0.0E+00 | 2.1E-06 | 3.8E-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 | 3.5E-02 | 0.0E+00 | 1.3E-01 | 1.5E+00 | 0.0E+00 | 0.0E+00 | 1.3E+00 | 0.0E+00 | 0.0E+00 |
| MER | Materials for energy recovery | kg | 0.0E+00 | 0.0E+00 | 8.7E-03 | 8.7E-03 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| EE | Recovered energy exported from system | MJ | 0.0E+00 | 0.0E+00 | 0.0E+00 | 2.8E-03 | 0.0E+00 | 0.0E+00 | 2.8E-03 | 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 | 4.5E-02 | 0.0E+00 | 0.0E+00 | 4.5E-02 | 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 | 4.5E-02 | 4.5E-02 | 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 Transit Cable- Copper Overhead Catenary Cable

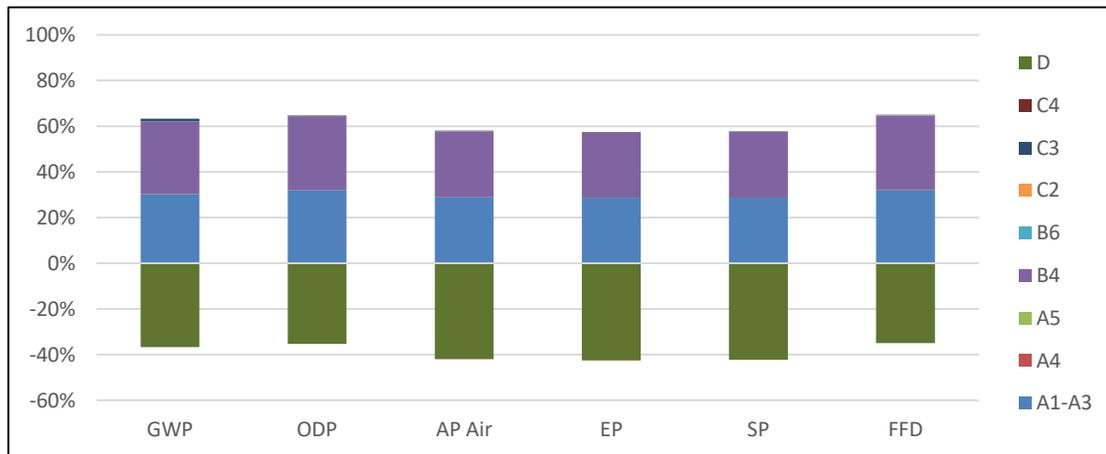
Railway Networks Cable



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

LCA Interpretation - 58757899 (350KCMIL)

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.



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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 Transit Cable- Copper Overhead Catenary Cable

Railway Networks Cable



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

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Southwire Transit Cable- Copper Overhead Catenary Cable

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

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