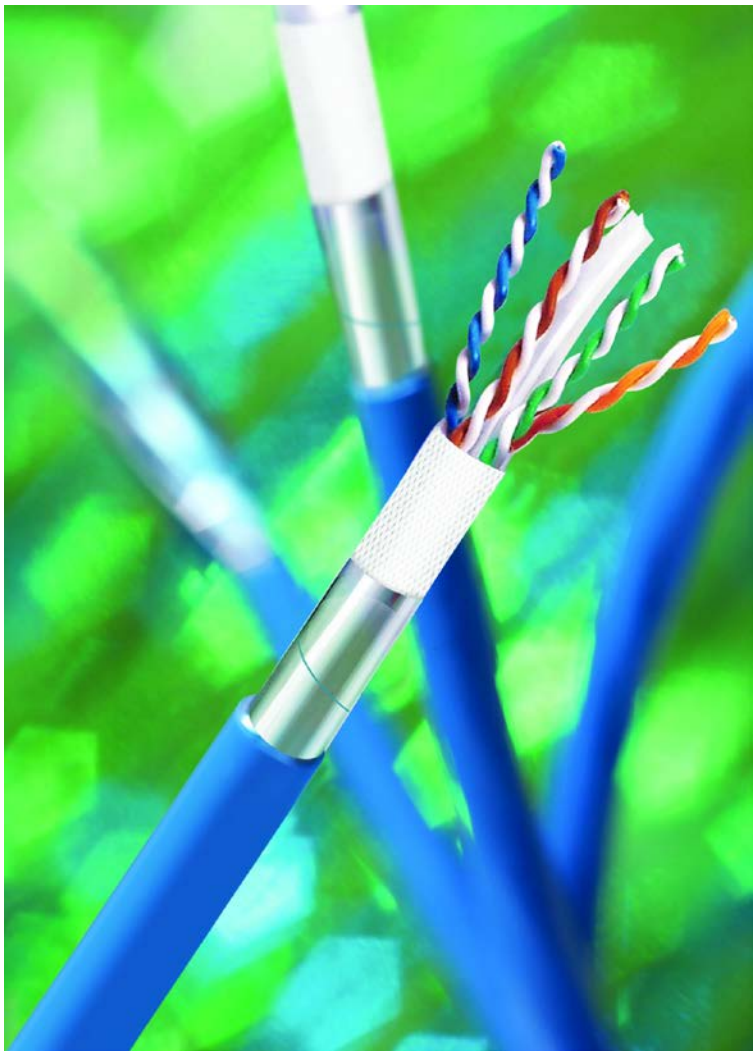
General Cable

4-Pair Plenum Copper Datacom Cables

Environmental Product Declaration



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Prysmian Group

General Cable

This declaration is an environmental product declaration (EPD) in accordance with ISO 14025 and EN15804. EPDs rely on Life Cycle Assessment (LCA) to provide information on a number of environmental impacts of products over their life cycle.

Independent verification of the declaration according to EN ISO 14025:2010 by ASTM International ☐ INTERNAL ☒EXTERNAL Tim Brooke, ASTM International	Independent verification of the life cycle assessment according to ISO 14044 and the reference PCR by Industrial Ecology ☐ INTERNAL ☒EXTERNAL Thomas Gloria, Ph. D, Industrial Ecology
CEN Standard EN 15804 serves as the core PCR (Product Category Rule)	
NPCR Part A: Construction Products and Services Version 1.0 Issue date: 07.04.2017 Valid to: 07.04.2022 Published by Norwegian EPD Foundation	NPCR 027 PCR – Part B for electrical cables and wires Version 1.0 Issue date: 10.02.2020 Valid to: 10.02.2025 Published by Norwegian EPD Foundation

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. for any particular product line and reported impact.

Accuracy of Results: EPDs regularly rely on estimations of impacts, and the level of accuracy in estimation of effect differs

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.

Product Definition and Information

Company Description

General Cable is a global leader in the development, design, manufacture, marketing and distribution of aluminum, copper and fiber optic wire and cable products for the energy, construction, industrial, specialty, and communications markets. General Cable was the first cable manufacturer to obtain certification for its environmental management system, in accordance with the ISO 14001 and EMAS Standards. General Cable has accelerated its environmental commitment, addressing its green alternative approach by identifying greener opportunities and promoting green cabling solutions wherever feasible. This includes promoting our existing green products, partnering with key customers in their green endeavors, identifying and providing resources for green product gaps, becoming a member of the United States Green Building Council (USGBC) and participating in collaborative ventures such as the Green Suppliers Network (GSN). For a comprehensive account of General Cable's sustainability strategies, please visit: gnca.us/sustainability.

Product Description

Plenum cables are installed in the plenum spaces of buildings and must meet associated fire safety test standards. In this declaration, Fifteen premises 4-pair plenum copper data cable products are covered. All products listed below are UL Listed CMP and have been UL or ETL verified as Category 6A, Category 6, or Category 5e products.
Please note the part numbers listed below represent the most common color / put-up combination; for additional offerings please visit www.generalcable.com.

GenSPEED® 10 MTP™ Category 6A, Part number: 7141849

GenSPEED 10 MTP unshielded twisted-pair (UTP), utilizing innovative Mosaic™ Variable Cut Tape to provide industry-leading protection from alien crosstalk with guaranteed 8 dB of headroom over the ANSI/TIA 568.2-D standard for alien crosstalk (PSANEXT and PSAACRF). Mosaic Variable Laser Cut Tape is a thin metallic tape of segmented sections separated by an insulating layer. Since there is no metal-to-metal contact, there is no path for current to flow longitudinally, and thus, no need for grounding. An ideal product for high-power PoE applications, rated to 105°C GenSPEED 10 MTP is UL Listed CMP-LP (0.7A) and able to support up to 140 watts using 50 volts over all four pairs.

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Gen*SPEED*® 10,000 Category 6A U/FTP (STP), Part number: 7131786 / 7141819

The individually shielded pairs of Gen*SPEED* 10,000 Category 6A U/FTP (STP) allow for maximum pair separation, increasing key electrical performance parameters. The electromagnetic interference (EMI) protection provided by the shielded design makes this an excellent product for digital video, broadband and baseband analog video applications.

Gen*SPEED*® 10 Category 6A F/UTP (ScTP), Part number: 7141586

Gen*SPEED* 10 Category 6A F/UTP is an overall shielded cable, requiring grounding and providing 6 dB of guaranteed headroom over the ANSI/TIA 568.2-D standard for alien crosstalk (PSANEXT and PSAACRF). The internal separator optimizes internal pair geometry to yield superior electrical performance while maintaining flexibility. Rated to 105°C for greater protection against increased operating temperatures, Gen*SPEED* 10 F/UTP is UL Listed CMP-LP (0.7A) and able to support PoE applications up to 140 watts using 50 volts over four pairs.

Gen*SPEED*® 10 Category 6A, Part number: 7141819

This Category 6A standards-compliant cable utilizes a crossweb separator with patented design which locks the pairs into a systematic orientation within the cable providing superior internal electrical characteristics. An ideal product for high-power PoE applications, rated to 105°C GenSPEED 10 UTP is UL Listed CMP-LP (0.7A) and able to support up to 140 watts using 50 volts over all four pairs.

GenSPEED® 10 Category 6A Indoor/Outdoor, Part number: 7141007

This Category 6A product is intended for installation in below-grade conduit, duct, and other wet environments. An ideal product for high-power PoE applications, rated to 125°C GenSPEED 10 Indoor/Outdoor is UL Listed CMP-LP (0.8A) and able to support up to 160 watts using 50 volts over all four pairs.

Gen*SPEED*® 6500 Premium Category 6, Part number: 7131970

Designed and engineered with precision balance, Gen*SPEED* 6500 utilizes an improved internal separator to allow for more pair separation.With performance guaranteed to 350 MHz, this product provides 7 dB of headroom over ANSI/TIA 568.2-D standard for internal crosstalk. Rated to 105°C for greater protection against increased operating temperatures, Gen*SPEED* 6500 is UL Listed CMP-LP (0.7A) and able to support PoE applications up to 140 watts using 50 volts over four pairs.

Gen*SPEED*® 6000 Enhanced Category 6, Part number: 7131900

Optimally balanced, Gen*SPEED* 6000 utilizes an innovative crossweb design allowing for maximum pair separation. With performance guaranteed to 350 MHz, this product provides 5 dB of headroom over the ANSI/TIA 568.2-D standard for internal crosstalk. Rated to 105°C for greater protection against increased operating temperatures, Gen*SPEED* 6000 is UL Listed CMP-LP (0.6A) and able to suport PoE applications up to 120 watts using 50 volts over four pairs.

Gen*SPEED*® 6 Category 6, Part number: 7131800

Standards-compliant with performance guaranteed to 350 MHz, Gen*SPEED* 6 Category 6 utilizes 23 AWG copper and a unique separator design engineered for consistent electrical performance. Rated to 105°C for greater protection against increased operating temperatures, Gen*SPEED* 6 is UL Listed CMP-LP (0.6A) and able to support PoE applications up to 120 watts using 50 volts over four pairs.

GenSPEED® 6 EfficienCMAX® 22AWG Category 6, Part number: 8131800

This cable meets all Category 6 requirements under 100 meters with a certified LP listing of 0.7A. It also provides power and bandwidth at extended distances beyond the IEEE standard. The same industry-trusted high powered PoE cable that has been in the market since 2015 is now guaranteed to meet your extended distance needs, providing maximum versatility to challenging installations.

Gen*SPEED*® 6 Category 6 F/UTP (ScTP), Part number: 6131785

This Category 6 standards-compliant cable employs a foil shield to reduce electromagnetic interference (EMI) for optimal performance. Rated to 105°C for greater protection against increased operating temperatures,Gen*SPEED* 6 F/UTP is UL Listed CMP-LP (0.7A) and able to support PoE applications up to 140 watts using 50 volts over four pairs.

Gen*SPEED*® 5500 Premium Category 5E, Part number: 6131278

With performance guaranteed to 350 MHz, Gen*SPEED* 5500 ensures increased headroom for future applications, lower bit-error rates and higher signal transmission quality while also providing enhanced signal-to-noise ratio for improved bit-error rate.

Gen*SPEED*® 5350 Enhanced Category 5E, Part number: 6131690

With performance guaranteed to 350 MHz, Gen*SPEED* 5350 features a 24 AWG design and ensures headroom over the ANSI/TIA 568-C.2 performance standard.

Gen*SPEED*® 5000 Category 5E, Part number: 5131278E

Standards-compliant with performance guaranteed to 200 MHz, Gen*SPEED* 5000 is engineered to provide stable and continuous performance.

Gen*SPEED*® 5000 Category 5E F/UTP (ScTP), Part number: 2131611E

Standards–compliant, GenSPEED 5000 F/UTP features a foil-shield for reduced electromagnetic interference (EMI) and optimal performance.

Functional Unit

Environmental impacts are reported per functional unit of a product and the functional unit is the basis for comparison in an LCA. For the copper data cable, the functional unit is one meter of cable to be installed for 60 years in a buliding.

(Note: while cable itself may have a service life of 60 years, with innovations in technology in this data field, the product may be replaced with faster, more modern alternates as the building ages. For the sake of this study and simplicity, a similar replacement to the existing cable is assumed to occur after 30 years.)

Manufacturing Locations

These data cables are manufactured in Lawrenceburg, Kentucky and Jackson, Tennessee. Primary data for the life cycle assessment has been provided by each of these facilities and a weighted average has been conducted for each product.

Applications and Uses

These products are used in the plenum spaces of buildings. Applications for the plenum products include: IEEE 802.3: 10 through 10GBASE-T LAN and WLAN applications; Power over Ethernet – 802.3AF (PoE), 802.3at (PoE+); HDBT and digital video; broadband and baseband analog video; CDDI, Token Ring, ATM.

Life Cycle Assessment Description

System Boundary

This project considers the life cycle activities from resource extraction through installation and end-of-life effects. The boundary covers raw material acquisition, manufacturing, marketing, use and waste disposal as seen in Table 3.

Table 1 - System Boundary

Product			Construction		Use							End of Life				
Raw Material Supply	Raw Material Transport	Product manufacturing	Final Product Transport	Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational Energy Consumption	Operational Water Consumption	Deconstruction/ Demoliotion	Waste Transport	Waste Processing	Disposal	Reuse/Recovery/ Recycling Beneifts
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

**MND = module not disclosed*

Allocation

Allocation for manufacturing energy, water, and waste items was conducted per length of production based on manufacturing zones of each facility.

Cut-off Criteria

For any impact category, should the sum of various impacts from a specific process/activity be less than 1% of the impact equivalent in that category, the process/activity may be neglected during the inventory analysis. Nonetheless, the accumulated impact of neglected process/activity may not exceed 5%. Components and materials omitted from the LCA shall be documented.

This EPD is in compliance with the cut-off criteria. Components and materials omitted from the LCA shall be documented and include installation energy from signal testing devices in the installation of data communication cable. Capital items for the production processes (machines, buildings, etc.) were not taken into consideration.

Period under Consideration

Primary data used refer to the production processes of the two manufacturing facilities and were derived from calendar year 2019.

Software and Background Data

SimaPro v9.1.1 Software System for Life Cycle Engineering, an internationally recognized LCA modeling software program, was used for life cycle impact assessment modeling. Background and secondary datasets were modeled using the US LCI database, developed by the National Renewable Energy Laboratory, as well as the ecoinvent v3 database, which is developed by the Swiss Centre for Life Cycle Inventories. FEP material impact data was obtained from an LCA on data cable conducted for the Environmental Protection Agency.

Data Quality

The data sources used are complete and representative of global 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.

Treatment of Biogenic Carbon

The uptake and release of biogenic carbon througout the produc tlife 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.

Cradle-to-Grave Assumptions

A1. Material Inputs

The raw material inputs for the Plenum data cables are listed in Table 1. Table 2 details the average packaging associated with with each product.

Table 2 - Cable Component Formulations (kg/m)

Material	GenSPEED 10 MTP Category 6A	GenSPEED 10,000 Category 6A U/FTP (STP) Cable	GenSPEED 10,000 Category 6A F/UTP (ScTP) Cable	GenSPEED 10 Category 6A Cable	GenSPEED 10 Indoor/ Outdoor CMP Cable	GenSPEED 6500 Premium Category 6 Cable	GenSPEED 6000 Enhanced Category 6 Cable
Copper	0.018	0.022	0.020	0.020	0.018	0.021	0.018
FEP Insulation	0.013	0.016	0.013	0.013	0.013	0.008	0.008
Jacketing	0.012	0.022	0.012	0.012	0.017	0.012	0.010
Tapes	0.004	0.007	0.005	0.005	0.004	-	-
Others	0.001	0.001	0.002	0.002	0.002	0.003	0.002
Total	**0.048**	**0.070**	**0.050**	**0.050**	**0.054**	**0.045**	**0.038**
Material	**GenSPEED 6 Category 6 Cable**	**GenSPEED 6 EfficienCMAX® Category 6 22AWG Cable**	**GenSPEED 6 Category 6A F/UTP (ScTP) Cable**	**GenSPEED 5500 Premium Category 5E Cable**	**GenSPEED 5350 Enhanced Category 5E Cable**	**GenSPEED 5000 Category 5E Cable**	**GenSPEED 5000 Category 5E F/UTP (ScTP) Cable**
Copper	0.017	0.028	0.018	0.016	0.015	0.015	0.019
FEP Insulation	0.008	0.013	0.013	0.008	0.007	0.007	0.010
Jacketing	0.009	0.010	0.011	0.008	0.009	0.009	0.015
Tapes	0.001	0.001	0.004	-	-	-	0.004
Others	0.000	0.000	0.003	0.000	0.000	0.000	0.000
Total	**0.035**	**0.052**	**0.050**	**0.032**	**0.031**	**0.031**	**0.048**

A2. Raw Material Transportation

General Cable provided resource transportation mode and location data to support the calculation of raw material transportation flows. The transportation LCI data from the US LCI database (kg-km basis) were used to develop the resource transportation LCI profile.

A3. Manufacturing Process

Copper wire goes through two drawing processes with an immediate subsequent annealing process. The wire continues down the line to an extruder where the insulation material is applied to the wire. Cooling and drying of the insulated wire then occurs. Two of these insulated wires are then twinned together around each other. Four twinned wire pairs, along with other cable components such as separator tape and/or shielding material, are then bunched together. Subsequently, the bunched wire has a jacket extruded around the bunched cable. After the jacket is applied, the cable is cooled and packaged. Various packaging options exist, but most product is shipped in 1000-foot length spools and/or boxes.

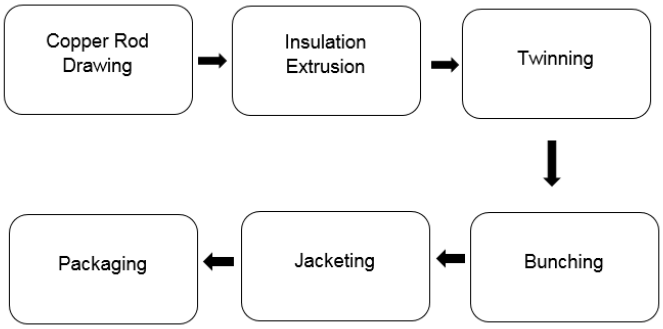


Figure 1 - Manufacturing Process Flow of Plenum Copper Data Cable

Packaging

All packaging is fully recyclable. The packaging material is composed primarily of wood, with cardboard and plastic materials used for individual product packaging.

Table 3 - Packaging Distribution

Material	Percentage
Cardboard	36.38%
Other	0.65%
Plastic	0.15%
Wood	62.82%
Total	100.00%

A4. Final Product Transportation

An assumed distance of 1,000 miles (1,600 km) was assumed for shipment from the manufacturing facility to the final building site for installation.

Table 4 - Final Product Transportation Details

Description	Quantity	Unit
Vehicle Type	Combination Truck	n/a
Fuel Type	Diesel	n/a
Fuel Consumption	38	Km/liters
Distance	300	Km
Bulk Density of Transported Products	100 - 210	kg/m^3
Volume Capacity Utilization Factor	0.5 - 0.9	n/a

A5. Installation

A scrap rate of 5% was assumed in the installation of the product in the use stage for this study. This rate was based on the expertise of General Cable. Installers routinely use signal testing devices to ensure cable has been installed properly; however, this device has negligible energy consumption compared to the rest of the installation and life cycle impacts and so was excluded from the study as allowed by the cut-off criteria.

Table 5 - Installation

Installation into the building (A5)			
Name	**Min**	**Max**	**Unit**
Auxiliary materials	-	-	kg
Water consumption	-	-	m^3
Other resources	-	-	kg
Electricity consumption	-	-	kWh
Other energy carriers	-	-	MJ
Product loss per functional unit	2.4E-03	3.5E-03	kg
Waste materials at construction site	2.4E-03	3.5E-03	kg
Output substance (recycle)	7.9E-04	9.9E-04	kg
Output substance (landfill)	1.4E-04	1.7E-04	kg
Output substance (incineration)	1.5E-03	2.3E-03	kg
Packaging waste (recycle)	4.3E-03	4.3E-03	kg
Packaging waste (landfill)	1.1E-03	1.1E-03	kg
Packaging waste (incineration)	2.9E-04	2.9E-04	kg
Direct emissions to ambient air*, soil, and water	2.0E-03	2.0E-03	kg CO_2
VOC emissions	-	-	kg

*CO_2 emissions to air from disposal of packaging

B. Use Stage

The lifetimes of these products are widely variable and most often data cable is replaced due to increased bandwith and data speed requirements, and not because of product performance or degradation. No cleaning, maintenance, repair, or refurbishment is required.

Table 6 - Reference Service Life

Reference Service Life

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

B2. Replacements

As the lifetimes are these products are widely variable, the assumption of service life is assumed to be 30 years. This value was suggested by the *Product Specific Rules for Wires and Cables* published by the PEP-ecopassport program. Most often data cable is replaced due to increased technology requirements and not due to product performance. As the lifetime of a building is 60 years, the product would be replaced once.

B6. Operational Energy Use

Copper data cables are assumed to be used in bulidings for 30 years. The utlization rate of use is 70%. Based on the Product Specific Rules for Wires, Cables and Accessories published by the P.E.P ecopoassport® program in 2015, the following use phase energy consumption assumptions may be made.

Table 7 - Operational Energy Use

Description	Power Consumption (mW/m)	Energy Consumption (kWh/75 yr)	Energy Consumption (MJ/75 yr)
Category 5e	0.454 on 2-pair	0.418	1.503
Category 6	0.565 on 2-pair	0.520	1.871
Category 6A	1.364 on 4-pair	0.627	2.258
Category 7	1.363 on 4-pair	0.627	2.257

C. Disposal

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

Table 8 - End of Life Assumptions

End of life (C1-C4)			
Name	**Min**	**Max**	**Unit**
Collected separately	1.6E-02	2.0E-02	kg
Collected as mixed construction waste	3.2E-02	5.0E-02	kg
Reuse	0.0E+00	0.0E+00	kg
Recycling	1.6E-02	2.0E-02	kg
Landfilling	2.8E-03	3.5E-03	kg
Incineration with energy recovery	3.0E-02	4.7E-02	kg
Energy conversion	44	44	%
Removals of biogenic carbon	-	-	kg

D. Re-Use Phase

Reuse of the product is not common due to the nature of hard-wiring products into the building, as well as the continual technological advances in the data networking industry. However, materials can be recycled at the end of life for material and energy recovery.

Table 9 - Re-use, Recovery and Recycling Potential

Re-Use, Recovery, and/or Recycling Potential (D)			
Name	**Min**	**Max**	**Unit**
Net energy benefit from energy recovery from waste treatment declared as exported energy in C3 (R>0.6)	3.8E-01	5.9E-12	MJ
Net energy benefit from thermal energy due to treatment of waste declared as exported energy in C4 (R<0.6)	0.0E+00	0.0E+00	MJ
Net energy benefit from material flow declared in C3 for energy recovery	0.0E+00	0.0E+00	MJ
Process and conversion efficiencies	44%		

Life Cycle Impact Assessment

The environmental impacts listed below were assessed throughout the life cycle of the Plenum data cable products as defined above, per one meter of cable. The environmental impacts were analyzed using TRACI 2.1 methodology. For each category, the product with the most potential towards environmental impacts (i.e. conservative) was chosen; all other products per category will be less than the results provided.

Category 6A

Life Cycle Impact Assessment

Table 10: GenSPEED Category 6A Minimum and Maximum Life Cycle TRACI Impact Assessment Results per One Meter of Cable

TRACI 2.1 Impact Assessment												
Parameter	GWP		ODP		AP Air		EP		SP		FFD	
Category	Global warming potential		Ozone layer depletion potential		Acidification potential		Eutrophication potential		Smog formation potential		Fossil fuel depletion	
Unit	kg CO_2-Eq.		kg CFC-11 Eq.		kg SO_2-Eq.		kg N-Eq.		kg O_3-Eq.		MJ-surplus	
Stage	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
A1-A3	2.9E-01	5.0E-01	1.9E-06	3.4E-06	2.9E-03	4.8E-03	1.8E-02	2.2E-02	6.1E-02	7.9E-02	4.8E-01	8.9E-01
A4	1.5E-03	2.1E-03	5.6E-14	7.8E-14	8.8E-06	1.2E-05	4.9E-07	6.8E-07	2.4E-04	3.4E-04	2.8E-03	3.9E-03
A5	6.2E-04	6.2E-04	4.6E-12	4.6E-12	5.5E-07	5.5E-07	8.4E-06	8.4E-06	1.3E-05	1.3E-05	1.5E-04	1.5E-04
B4	3.7E-01	6.2E-01	1.9E-06	3.4E-06	2.9E-03	4.9E-03	1.8E-02	2.2E-02	6.2E-02	8.1E-02	4.9E-01	9.0E-01
B6	3.3E-01	3.3E-01	5.4E-12	5.4E-12	2.9E-03	2.9E-03	3.9E-05	3.9E-05	1.9E-02	1.9E-02	2.9E-01	2.9E-01
C2	4.7E-04	6.5E-04	1.8E-14	2.5E-14	2.8E-06	3.9E-06	1.6E-07	2.2E-07	7.7E-05	1.1E-04	9.0E-04	1.2E-03
C3	7.8E-02	1.2E-01	1.5E-09	2.2E-09	3.4E-05	5.0E-05	1.8E-05	2.6E-05	5.4E-04	8.0E-04	7.1E-03	1.0E-02
C4	1.8E-03	2.7E-03	1.3E-10	1.9E-10	5.3E-06	7.8E-06	1.6E-05	2.4E-05	1.1E-04	1.6E-04	1.3E-03	1.9E-03
D	-2.1E-01	-3.3E-01	-1.5E-08	-1.7E-08	-4.1E-03	-5.5E-03	-2.7E-02	-3.2E-02	-8.8E-02	-1.1E-01	-2.0E-01	-3.1E-01

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

Table 11: GenSPEED Category 6A Minimum and Maximum Life Cycle CML Impact Assessment Results per One Meter of Cable

CML 4.1 Impact Assessment												
Parameter	GWP		ODP		AP Air		EP		POCP		ADPE	
Category	Global warming potential		Depletion potential of the stratospheric ozone layer		Acidification potential for air emissions		Eutrophication potential		Formation potential of tropospheric ozone photochemical oxidants		Abiotic depletion potential for non-fossil resources	
Unit	kg CO_2-Eq.		kg CFC-11 Eq.		kg SO_2-Eq.		kg$(PO_4)^{3-}$Eq.		kg ethane-Eq.		kg Sb-Eq.	
Stage	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
A1-A3	2.9E-01	5.0E-01	1.9E-06	3.4E-06	2.3E-03	4.4E-03	8.0E-03	9.7E-03	1.1E-04	2.3E-04	5.0E-05	8.6E-05
A4	1.5E-03	2.1E-03	5.6E-14	7.7E-14	7.3E-06	1.0E-05	1.3E-06	1.8E-06	3.4E-07	4.7E-07	0.0E+00	0.0E+00
A5	7.6E-04	7.6E-04	3.5E-12	3.5E-12	4.4E-07	4.4E-07	3.1E-06	3.1E-06	1.7E-07	1.7E-07	7.2E-11	7.2E-11
B4	3.7E-01	6.2E-01	1.9E-06	3.4E-06	2.4E-03	4.4E-03	8.0E-03	9.7E-03	8.4E-04	1.3E-03	9.3E-03	1.4E-02
B6	3.3E-01	3.3E-01	5.4E-12	5.4E-12	2.9E-03	2.9E-03	3.9E-05	3.9E-05	1.9E-02	1.9E-02	2.9E-01	2.9E-01
C2	4.7E-04	6.5E-04	1.8E-14	2.5E-14	2.8E-06	3.9E-06	1.6E-07	2.2E-07	7.7E-05	1.1E-04	9.0E-04	1.2E-03
C3	7.8E-02	1.2E-01	1.5E-09	2.2E-09	3.4E-05	5.0E-05	1.8E-05	2.6E-05	5.4E-04	8.0E-04	7.1E-03	1.0E-02
C4	1.8E-03	2.7E-03	1.3E-10	1.9E-10	5.3E-06	7.8E-06	1.6E-05	2.4E-05	1.1E-04	1.6E-04	1.3E-03	1.9E-03
D	-2.1E-01	-3.3E-01	-1.5E-08	-1.7E-08	-4.1E-03	-5.5E-03	-2.7E-02	-3.2E-02	-8.8E-02	-1.1E-01	-2.0E-01	-3.1E-01

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

Use of Resources

Table 12 - GenSPEED Category 6A Minimum and Maximum Use of Resources per One Meter of Cable

Parameter	RPRE		RPRM		NRPRE		NRPRM		SM	
Category	Renewable primary energy as energy carrier		Renewable primary energy resources as material utilization		Nonrenewable primary energy as energy carrier		Nonrenewable primary energy as material utilization		Use of secondary material	
Unit	MJ		MJ		MJ		MJ		kg	
Stage	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
A1-A3	8.0E-01	1.0E+00	3.3E+00	6.2E+00	3.3E+00	6.2E+00	8.7E-01	1.3E+00	0.0E+00	0.0E+00
A4	0.0E+00	0.0E+00	1.9E-02	2.6E-02	1.9E-02	2.6E-02	0.0E+00	0.0E+00	0.0E+00	0.0E+00
A5	-4.6E-03	-4.6E-03	-2.5E+00	-2.5E+00	-2.5E+00	-2.5E+00	2.5E+00	2.5E+00	0.0E+00	0.0E+00
B4	8.0E-01	1.0E+00	8.5E-01	3.9E+00	8.5E-01	3.9E+00	3.4E+00	3.9E+00	0.0E+00	0.0E+00
B6	0.0E+00	0.0E+00	4.6E+00	4.6E+00	4.6E+00	4.6E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
C2	0.0E+00	0.0E+00	6.0E-03	8.4E-03	6.0E-03	8.4E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00
C3	6.3E-03	9.4E-03	6.6E-02	9.7E-02	6.6E-02	9.7E-02	0.0E+00	0.0E+00	0.0E+00	0.0E+00
C4	4.9E-04	7.3E-04	1.2E-02	1.8E-02	1.2E-02	1.8E-02	0.0E+00	0.0E+00	0.0E+00	0.0E+00
D	-1.0E+00	-1.2E+00	-2.5E+00	-4.1E+00	-2.5E+00	-4.1E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

Parameter	RSF		NRSF		RE		FW	
Category	Use of renewable secondary fuels		Use of nonrenewable secondary fuels		Energy recovered from disposed waste		Freshwater use	
Unit	MJ		MJ		MJ		m^3	
Stage	Min	Max	Min	Max	Min	Max	Min	Max
A1-A3	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.8E-03	3.2E-03
A4	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
A5	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	4.1E-07	4.1E-07
B4	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.9E-03	6.4E-03
B6	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
C2	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
C3	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.1E-03	3.1E-03
C4	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	6.1E-06	9.1E-06
D	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	-2.2E-03	-2.6E-03

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

Output Flows and Waste

Table 13 - GenSPEED Category 6A Cable Minimum and Maximum Waste per One Meter of Cable

Output Flows and Waste Categories								
Parameter	HWD		NHWD		HLRW		ILLRW	
Category	Hazardous waste disposed		Non-hazardous waste disposed		High-level radioactive waste		Intermediate- and low-level radioactive waste	
Unit	kg		kg		kg		kg	
Stage	Min	Max	Min	Max	Min	Max	Min	Max
A1-A3	8.7E-06	8.7E-06	3.5E-04	3.5E-04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
A4	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
A5	4.4E-07	4.4E-07	1.2E-03	1.2E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00
B4	9.2E-06	9.2E-06	4.3E-03	5.0E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00
B6	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
C2	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
C3	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
C4	0.0E+00	0.0E+00	2.8E-03	3.5E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00
D	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Parameter	CRU		MR		MER		EE	
Category	Components for re-use		Materials for recycling		Materials for energy recovery		Recovered energy exported from system	
Unit	kg		kg		kg		MJ	
Stage	Min	Max	Min	Max	Min	Max	Min	Max
A1-A3	0.0E+00	0.0E+00	4.4E-03	4.4E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00
A4	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
A5	0.0E+00	0.0E+00	4.5E-03	4.5E-03	2.9E-04	2.9E-04	0.0E+00	0.0E+00
B4	0.0E+00	0.0E+00	2.5E-02	2.9E-02	3.0E-02	4.7E-02	3.8E-01	5.9E-01
B6	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
C2	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
C3	0.0E+00	0.0E+00	1.6E-02	2.0E-02	3.0E-02	4.7E-02	3.8E-01	5.9E-01
C4	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
D	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+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*

Carbon Removals and Emissions

Table 14 - GenSPEED Category 6A Cable Minimum and Maximum Greenhouse Gas Emissions and Removals per One Meter of Cable

Greenhouse Gas Emissions and Removals								
Parameter	BCRP		BCEP		BCRK		BCEK	
Category	Biogenic Carbon Removal from Product		Biogenic Carbon Emissions from Product		Biogenic Carbon Removal from Packaging		Biogenic Carbon Emissions from Combustion of Waste from Renewable Sources Used in Production Process	
Unit	kg CO_2		kg CO_2		kg CO_2		kg CO_2	
Stage	Min	Max	Min	Max	Min	Max	Min	Max
A1-A3	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.0E-03	2.0E-03	0.0E+00	0.0E+00
A4	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
A5	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.0E-03	2.0E-03
B4	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.0E-03	2.0E-03	2.0E-03	2.0E-03
B6	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
C2	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
C3	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
C4	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
D	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Parameter	BCEW		CCE		CCR		CWNR	
Category	Biogenic Carbon Emissions from Combustion of Waste from Renewable Sources Used in Production Process		Calcination Carbon Emissions		Carbonation Carbon Removal		Carbon Emissions from Combustion of Waste from Non-renewable Sources Used in Production Process	
Unit	kg CO_2		kg CO_2		kg CO_2		kg CO_2	
Stage	Min	Max	Min	Max	Min	Max	Min	Max
A1-A3	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
A4	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
A5	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
B4	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
B6	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
C2	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
C3	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
C4	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
D	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+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*

Category 6

Life Cycle Impact Assessment

Table 15: GenSPEED Category 6 Minimum and Maximum Life Cycle TRACI Impact Assessment Results per One Meter of Cable

TRACI 2.1 Impact Assessment												
Parameter	GWP		ODP		AP Air		EP		SP		FFD	
Category	Global warming potential		Ozone layer depletion potential		Acidification potential		Eutrophication potential		Smog formation potential		Fossil fuel depletion	
Unit	kg CO_2-Eq.		kg CFC-11 Eq.		kg SO_2-Eq.		kg N-Eq.		kg O_3-Eq.		MJ-surplus	
Stage	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
A1-A3	2.6E-01	4.1E-01	1.6E-06	2.7E-06	2.8E-03	4.2E-03	1.8E-02	2.8E-02	6.0E-02	9.1E-02	4.4E-01	6.8E-01
A4	1.1E-03	1.5E-03	4.2E-14	5.8E-14	6.6E-06	9.1E-06	3.7E-07	5.1E-07	1.8E-04	2.5E-04	2.1E-03	2.9E-03
A5	6.2E-04	6.2E-04	4.6E-12	4.6E-12	5.5E-07	5.5E-07	8.4E-06	8.4E-06	1.3E-05	1.3E-05	1.5E-04	1.5E-04
B4	3.2E-01	4.7E-01	1.6E-06	2.7E-06	2.8E-03	4.3E-03	1.8E-02	2.8E-02	6.1E-02	9.2E-02	4.5E-01	6.9E-01
B6	2.8E-01	2.8E-01	4.5E-12	4.5E-12	2.4E-03	2.4E-03	3.2E-05	3.2E-05	1.6E-02	1.6E-02	2.4E-01	2.4E-01
C2	3.5E-04	4.8E-04	1.3E-14	1.8E-14	2.1E-06	2.9E-06	1.2E-07	1.6E-07	5.8E-05	7.9E-05	6.8E-04	9.3E-04
C3	5.0E-02	6.2E-02	9.7E-10	1.2E-09	2.2E-05	2.7E-05	1.1E-05	1.4E-05	3.5E-04	4.3E-04	4.5E-03	5.7E-03
C4	1.2E-03	1.5E-03	8.0E-11	1.0E-10	3.4E-06	4.2E-06	1.0E-05	1.3E-05	7.1E-05	8.9E-05	8.1E-04	1.0E-03
D	2.6E-01	-3.5E-01	-1.5E-08	-2.2E-08	-4.3E-03	-6.5E-03	-2.7E-02	-4.2E-02	-8.9E-02	-1.4E-01	-2.2E-01	-3.3E-01

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

Table 16: GenSPEED Category 6 Minimum and Maximum Life Cycle CML Impact Assessment Results per One Meter of Cable

CML 4.1 Impact Assessment												
Parameter	GWP		ODP		AP Air		EP		POCP		ADPE	
Category	Global warming potential		Depletion potential of the stratospheric ozone layer		Acidification potential for air emissions		Eutrophication potential		Formation potential of tropospheric ozone photochemical oxidants		Abiotic depletion potential for non-fossil resources	
Unit	kg CO_2-Eq.		kg CFC-11 Eq.		kg SO_2-Eq.		kg$(PO_4)^{3-}$Eq.		kg ethane-Eq.		kg Sb-Eq.	
Stage	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
A1-A3	2.7E-01	4.1E-01	1.6E-06	2.7E-06	2.3E-03	3.4E-03	8.0E-03	1.2E-02	9.7E-05	1.5E-04	5.0E-05	7.6E-05
A4	1.1E-03	1.5E-03	4.2E-14	5.7E-14	5.5E-06	7.5E-06	9.7E-07	1.3E-06	2.5E-07	3.5E-07	0.0E+00	0.0E+00
A5	7.6E-04	7.6E-04	3.5E-12	3.5E-12	4.4E-07	4.4E-07	3.1E-06	3.1E-06	1.7E-07	1.7E-07	7.2E-11	7.2E-11
B4	3.2E-01	4.7E-01	1.6E-06	2.7E-06	2.3E-03	3.5E-03	8.0E-03	1.2E-02	5.7E-04	7.5E-04	6.1E-03	7.7E-03
B6	2.8E-01	2.8E-01	4.5E-12	4.5E-12	2.4E-03	2.4E-03	3.2E-05	3.2E-05	1.6E-02	1.6E-02	2.4E-01	2.4E-01
C2	3.5E-04	4.8E-04	1.3E-14	1.8E-14	2.1E-06	2.9E-06	1.2E-07	1.6E-07	5.8E-05	7.9E-05	6.8E-04	9.3E-04
C3	5.0E-02	6.2E-02	9.7E-10	1.2E-09	2.2E-05	2.7E-05	1.1E-05	1.4E-05	3.5E-04	4.3E-04	4.5E-03	5.7E-03
C4	1.2E-03	1.5E-03	8.0E-11	1.0E-10	3.4E-06	4.2E-06	1.0E-05	1.3E-05	7.1E-05	8.9E-05	8.1E-04	1.0E-03
D	-2.4E-01	-3.5E-01	-1.5E-08	-2.2E-08	-4.3E-03	-6.5E-03	-2.7E-02	-4.2E-02	-8.9E-02	-1.4E-01	-2.2E-01	-3.3E-01

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

Use of Resources

Table 17 - GenSPEED Category 6 Minimum and Maximum Use of Resources per One Meter of Cable

Parameter	RPRE		RPRM		NRPRE		NRPRM		SM	
Category	Renewable primary energy as energy carrier		Renewable primary energy resources as material utilization		Nonrenewable primary energy as energy carrier		Nonrenewable primary energy as material utilization		Use of secondary material	
Unit	MJ		MJ		MJ		MJ		kg	
Stage	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
A1-A3	7.8E-01	1.1E+00	3.0E+00	5.0E+00	3.0E+00	5.0E+00	8.7E-01	8.7E-01	0.0E+00	0.0E+00
A4	0.0E+00	0.0E+00	1.4E-02	2.0E-02	1.4E-02	2.0E-02	0.0E+00	0.0E+00	0.0E+00	0.0E+00
A5	-4.6E-03	-4.6E-03	-2.5E+00	-2.5E+00	-2.5E+00	-2.5E+00	2.5E+00	2.5E+00	0.0E+00	0.0E+00
B4	7.8E-01	1.1E+00	5.1E-01	2.6E+00	5.1E-01	2.6E+00	3.4E+00	3.4E+00	0.0E+00	0.0E+00
B6	0.0E+00	0.0E+00	3.8E+00	3.8E+00	3.8E+00	3.8E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
C2	0.0E+00	0.0E+00	4.5E-03	6.2E-03	4.5E-03	6.2E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00
C3	4.1E-03	5.1E-03	4.2E-02	5.3E-02	4.2E-02	5.3E-02	0.0E+00	0.0E+00	0.0E+00	0.0E+00
C4	3.2E-04	4.0E-04	7.6E-03	9.5E-03	7.6E-03	9.5E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00
D	-1.0E+00	-1.5E+00	-2.9E+00	-4.2E+00	-2.9E+00	-4.2E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

Parameter	RSF		NRSF		RE		FW	
Category	Use of renewable secondary fuels		Use of nonrenewable secondary fuels		Energy recovered from disposed waste		Freshwater use	
Unit	MJ		MJ		MJ		m^3	
Stage	Min	Max	Min	Max	Min	Max	Min	Max
A1-A3	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.8E-03	2.6E-03
A4	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
A5	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	4.1E-07	4.1E-07
B4	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.1E-03	4.3E-03
B6	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
C2	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
C3	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.3E-03	1.7E-03
C4	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.9E-06	4.9E-06
D	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	-2.2E-03	-3.4E-03

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

Output Flows and Waste

Table 18 - GenSPEED Category 6 Cable Minimum and Maximum Waste per One Meter of Cable

Output Flows and Waste Categories								
Parameter	HWD		NHWD		HLRW		ILLRW	
Category	Hazardous waste disposed		Non-hazardous waste disposed		High-level radioactive waste		Intermediate- and low-level radioactive waste	
Unit	kg		kg		kg		kg	
Stage	Min	Max	Min	Max	Min	Max	Min	Max
A1-A3	8.7E-06	8.7E-06	3.5E-04	3.5E-04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
A4	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
A5	4.4E-07	4.4E-07	1.2E-03	1.2E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00
B4	9.2E-06	9.2E-06	4.3E-03	4.3E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00
B6	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
C2	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
C3	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
C4	0.0E+00	0.0E+00	2.8E-03	2.8E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00
D	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Parameter	CRU		MR		MER		EE	
Category	Components for re-use		Materials for recycling		Materials for energy recovery		Recovered energy exported from system	
Unit	kg		kg		kg		MJ	
Stage	Min	Max	Min	Max	Min	Max	Min	Max
A1-A3	0.0E+00	0.0E+00	4.4E-03	4.4E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00
A4	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
A5	0.0E+00	0.0E+00	4.5E-03	4.5E-03	2.9E-04	2.9E-04	0.0E+00	0.0E+00
B4	0.0E+00	0.0E+00	2.5E-02	2.5E-02	3.0E-02	3.0E-02	3.8E-01	3.8E-01
B6	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
C2	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
C3	0.0E+00	0.0E+00	1.6E-02	1.6E-02	3.0E-02	3.0E-02	3.8E-01	3.8E-01
C4	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
D	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+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*

Carbon Removals and Emissions

Table 19 - GenSPEED Category 6 Cable Minimum and Maximum Greenhouse Gas Emissions and Removals per One Meter of Cable

Greenhouse Gas Emissions and Removals								
Parameter	BCRP		BCEP		BCRK		BCEK	
Category	Biogenic Carbon Removal from Product		Biogenic Carbon Emissions from Product		Biogenic Carbon Removal from Packaging		Biogenic Carbon Emissions from Combustion of Waste from Renewable Sources Used in Production Process	
Unit	kg CO_2		kg CO_2		kg CO_2		kg CO_2	
Stage	Min	Max	Min	Max	Min	Max	Min	Max
A1-A3	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.0E-03	2.0E-03	0.0E+00	0.0E+00
A4	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
A5	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.0E-03	2.0E-03
B4	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.0E-03	2.0E-03	2.0E-03	2.0E-03
B6	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
C2	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
C3	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
C4	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
D	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Parameter	BCEW		CCE		CCR		CWNR	
Category	Biogenic Carbon Emissions from Combustion of Waste from Renewable Sources Used in Production Process		Calcination Carbon Emissions		Carbonation Carbon Removal		Carbon Emissions from Combustion of Waste from Non-renewable Sources Used in Production Process	
Unit	kg CO_2		kg CO_2		kg CO_2		kg CO_2	
Stage	Min	Max	Min	Max	Min	Max	Min	Max
A1-A3	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
A4	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
A5	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
B4	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
B6	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
C2	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
C3	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
C4	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
D	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+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*

Category 5e

Life Cycle Impact Assessment

Table 20: GenSPEED Category 5e Minimum and Maximum Life Cycle TRACI Impact Assessment Results per One Meter of Cable

TRACI 2.1 Impact Assessment												
Parameter	GWP		ODP		AP Air		EP		SP		FFD	
Category	Global warming potential		Ozone layer depletion potential		Acidification potential		Eutrophication potential		Smog formation potential		Fossil fuel depletion	
Unit	kg CO_2-Eq.		kg CFC-11 Eq.		kg SO_2-Eq.		kg N-Eq.		kg O_3-Eq.		MJ-surplus	
Stage	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
A1-A3	2.4E-01	3.4E-01	1.6E-06	2.1E-06	2.4E-03	4.0E-03	1.6E-02	1.7E-02	5.3E-02	6.1E-02	4.0E-01	5.8E-01
A4	9.3E-04	1.4E-03	3.5E-14	5.4E-14	5.5E-06	8.4E-06	3.1E-07	4.7E-07	1.5E-04	2.3E-04	1.8E-03	2.7E-03
A5	6.2E-04	6.2E-04	4.6E-12	4.6E-12	5.5E-07	5.5E-07	8.4E-06	8.4E-06	1.3E-05	1.3E-05	1.5E-04	1.5E-04
B4	2.8E-01	4.2E-01	1.6E-06	2.1E-06	2.5E-03	4.0E-03	1.6E-02	1.7E-02	5.3E-02	6.1E-02	4.1E-01	6.0E-01
B6	2.2E-01	2.2E-01	3.6E-12	3.6E-12	1.9E-03	1.9E-03	2.6E-05	2.6E-05	1.3E-02	1.3E-02	1.9E-01	1.9E-01
C2	2.9E-04	4.5E-04	1.1E-14	1.7E-14	1.8E-06	2.7E-06	9.8E-08	1.5E-07	4.8E-05	7.3E-05	5.6E-04	8.5E-04
C3	4.0E-02	7.5E-02	7.8E-10	1.5E-09	1.8E-05	3.3E-05	9.1E-06	1.7E-05	2.8E-04	5.2E-04	3.6E-03	6.9E-03
C4	9.3E-04	1.8E-03	6.5E-11	1.2E-10	2.7E-06	5.1E-06	8.2E-06	1.5E-05	5.7E-05	1.1E-04	6.5E-04	1.2E-03
D	-2.1E-01	-2.5E-01	-1.3E-08	-1.3E-08	-3.8E-03	-4.2E-03	-2.4E-02	-2.5E-02	-7.8E-02	-8.2E-02	-2.0E-01	-2.3E-01

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

Table 21: GenSPEED Category 5e Minimum and Maximum Life Cycle CML Impact Assessment Results per One Meter of Cable

CML 4.1 Impact Assessment												
Parameter	GWP		ODP		AP Air		EP		POCP		ADPE	
Category	Global warming potential		Depletion potential of the stratospheric ozone layer		Acidification potential for air emissions		Eutrophication potential		Formation potential of tropospheric ozone photochemical oxidants		Abiotic depletion potential for non-fossil resources	
Unit	kg CO_2-Eq.		kg CFC-11 Eq.		kg SO_2-Eq.		kg$(PO_4)^{3-}$Eq.		kg ethane-Eq.		kg Sb-Eq.	
Stage	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
A1-A3	2.4E-01	3.4E-01	1.5E-06	2.1E-06	2.0E-03	3.7E-03	7.0E-03	7.5E-03	8.9E-05	1.7E-04	4.4E-05	7.5E-05
A4	9.3E-04	1.4E-03	3.5E-14	5.3E-14	4.6E-06	6.9E-06	8.1E-07	1.2E-06	2.1E-07	3.2E-07	0.0E+00	0.0E+00
A5	7.6E-04	7.6E-04	3.5E-12	3.5E-12	4.4E-07	4.4E-07	3.1E-06	3.1E-06	1.7E-07	1.7E-07	7.2E-11	7.2E-11
B4	2.8E-01	4.2E-01	1.5E-06	2.1E-06	2.0E-03	3.7E-03	7.0E-03	7.6E-03	4.7E-04	8.8E-04	4.9E-03	9.0E-03
B6	2.2E-01	2.2E-01	3.6E-12	3.6E-12	1.9E-03	1.9E-03	2.6E-05	2.6E-05	1.3E-02	1.3E-02	1.9E-01	1.9E-01
C2	2.9E-04	4.5E-04	1.1E-14	1.7E-14	1.8E-06	2.7E-06	9.8E-08	1.5E-07	4.8E-05	7.3E-05	5.6E-04	8.5E-04
C3	4.0E-02	7.5E-02	7.8E-10	1.5E-09	1.8E-05	3.3E-05	9.1E-06	1.7E-05	2.8E-04	5.2E-04	3.6E-03	6.9E-03
C4	9.3E-04	1.8E-03	6.5E-11	1.2E-10	2.7E-06	5.1E-06	8.2E-06	1.5E-05	5.7E-05	1.1E-04	6.5E-04	1.2E-03
D	-2.1E-01	-2.5E-01	-1.3E-08	-1.3E-08	-3.8E-03	-4.2E-03	-2.4E-02	-2.5E-02	-7.8E-02	-8.2E-02	-2.0E-01	-2.3E-01

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

Use of Resources

Table 22 - GenSPEED Category 5e Minimum and Maximum Use of Resources per One Meter of Cable

Parameter	RPRE		RPRM		NRPRE		NRPRM		SM	
Category	Renewable primary energy as energy carrier		Renewable primary energy resources as material utilization		Nonrenewable primary energy as energy carrier		Nonrenewable primary energy as material utilization		Use of secondary material	
Unit	MJ		MJ		MJ		MJ		kg	
Stage	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
A1-A3	7.0E-01	7.9E-01	2.6E+00	4.2E+00	2.6E+00	4.2E+00	8.7E-01	8.7E-01	0.0E+00	0.0E+00
A4	0.0E+00	0.0E+00	1.2E-02	1.8E-02	1.2E-02	1.8E-02	0.0E+00	0.0E+00	0.0E+00	0.0E+00
A5	-4.6E-03	-4.6E-03	-2.5E+00	-2.5E+00	-2.5E+00	-2.5E+00	2.5E+00	2.5E+00	0.0E+00	0.0E+00
B4	7.0E-01	7.9E-01	1.3E-01	1.7E+00	1.3E-01	1.7E+00	3.4E+00	3.4E+00	0.0E+00	0.0E+00
B6	0.0E+00	0.0E+00	3.1E+00	3.1E+00	3.1E+00	3.1E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
C2	0.0E+00	0.0E+00	3.8E-03	5.7E-03	3.8E-03	5.7E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00
C3	3.3E-03	6.1E-03	3.4E-02	6.4E-02	3.4E-02	6.4E-02	0.0E+00	0.0E+00	0.0E+00	0.0E+00
C4	2.5E-04	4.8E-04	6.1E-03	1.2E-02	6.1E-03	1.2E-02	0.0E+00	0.0E+00	0.0E+00	0.0E+00
D	-8.9E-01	-9.1E-01	-2.5E+00	-3.0E+00	-2.5E+00	-3.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

Parameter	RSF		NRSF		RE		FW	
Category	Use of renewable secondary fuels		Use of nonrenewable secondary fuels		Energy recovered from disposed waste		Freshwater use	
Unit	MJ		MJ		MJ		m^3	
Stage	Min	Max	Min	Max	Min	Max	Min	Max
A1-A3	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.5E-03	2.4E-03
A4	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
A5	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	4.1E-07	4.1E-07
B4	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.6E-03	4.5E-03
B6	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
C2	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
C3	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.1E-03	2.0E-03
C4	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.2E-06	5.9E-06
D	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	-1.9E-03	-2.0E-03

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

Output Flows and Waste

Table 23 - GenSPEED Category 5e Cable Minimum and Maximum Waste per One Meter of Cable

Output Flows and Waste Categories								
Parameter	HWD		NHWD		HLRW		ILLRW	
Category	Hazardous waste disposed		Non-hazardous waste disposed		High-level radioactive waste		Intermediate- and low-level radioactive waste	
Unit	kg		kg		kg		kg	
Stage	Min	Max	Min	Max	Min	Max	Min	Max
A1-A3	8.7E-06	8.7E-06	3.5E-04	3.5E-04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
A4	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
A5	4.4E-07	4.4E-07	1.2E-03	1.2E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00
B4	9.2E-06	9.2E-06	4.3E-03	4.3E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00
B6	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
C2	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
C3	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
C4	0.0E+00	0.0E+00	2.8E-03	2.8E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00
D	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Parameter	CRU		MR		MER		EE	
Category	Components for re-use		Materials for recycling		Materials for energy recovery		Recovered energy exported from system	
Unit	kg		kg		kg		MJ	
Stage	Min	Max	Min	Max	Min	Max	Min	Max
A1-A3	0.0E+00	0.0E+00	4.4E-03	4.4E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00
A4	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
A5	0.0E+00	0.0E+00	4.5E-03	4.5E-03	2.9E-04	2.9E-04	0.0E+00	0.0E+00
B4	0.0E+00	0.0E+00	2.5E-02	2.5E-02	3.0E-02	3.0E-02	3.8E-01	3.8E-01
B6	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
C2	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
C3	0.0E+00	0.0E+00	1.6E-02	1.6E-02	3.0E-02	3.0E-02	3.8E-01	3.8E-01
C4	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
D	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+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*

Carbon Removals and Emissions

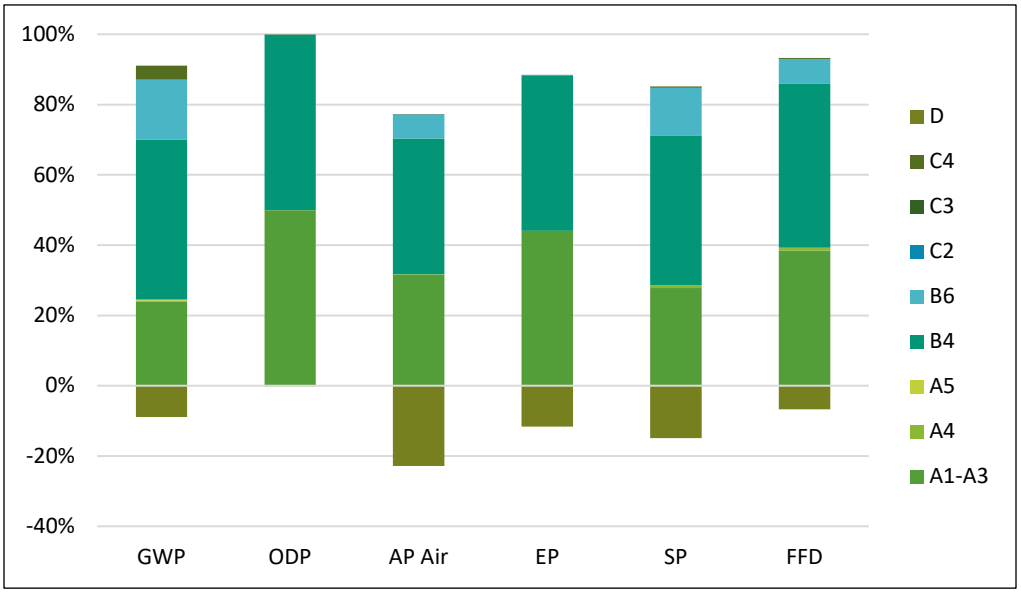
Table 24 - GenSPEED Category 5e Cable Minimum and Maximum Greenhouse Gas Emissions and Removals per One Meter of Cable

Greenhouse Gas Emissions and Removals								
Parameter	BCRP		BCEP		BCRK		BCEK	
Category	Biogenic Carbon Removal from Product		Biogenic Carbon Emissions from Product		Biogenic Carbon Removal from Packaging		Biogenic Carbon Emissions from Combustion of Waste from Renewable Sources Used in Production Process	
Unit	kg CO_2		kg CO_2		kg CO_2		kg CO_2	
Stage	Min	Max	Min	Max	Min	Max	Min	Max
A1-A3	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.0E-03	2.0E-03	0.0E+00	0.0E+00
A4	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
A5	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.0E-03	2.0E-03
B4	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.0E-03	2.0E-03	2.0E-03	2.0E-03
B6	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
C2	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
C3	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
C4	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
D	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Parameter	BCEW		CCE		CCR		CWNR	
Category	Biogenic Carbon Emissions from Combustion of Waste from Renewable Sources Used in Production Process		Calcination Carbon Emissions		Carbonation Carbon Removal		Carbon Emissions from Combustion of Waste from Non-renewable Sources Used in Production Process	
Unit	kg CO_2		kg CO_2		kg CO_2		kg CO_2	
Stage	Min	Max	Min	Max	Min	Max	Min	Max
A1-A3	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
A4	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
A5	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
B4	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
B6	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
C2	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
C3	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
C4	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
D	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+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*

LCA Interpretation

The replacement (B4) and in life energy usage (B6) dominate the impacts across all impact categories. Outside of reaplacements, the production stage (A1-A3) dominates the impacts due to the upstream production of materials used in the product, along with electricity use in the manufacturing of the product. With one replacement required over a life-span of a building, the replacement stage (B4) dominates from duplicating these stages. Module B4 excludes all benefits and loads on the system. As one replacement occurs in this specified lifetime, module D includes benefits of two products.



Optional Environmental Information

Organizational Third-Party Certification

General Cable is a member of the US Green Building Council, The Green Suppliers Network, and Agenda 21 (Barcelona). In addition, 21 manufacturing facilities around the world are ISO 14001 certified, while another 20 are ISO 14001 equivalent (policies and procedures implemented but not yet certified).

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LCA Development

This EPD and corresponding LCA were prepared by Sustainable Solutions Corporation of Royersford, Pennsylvania.

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