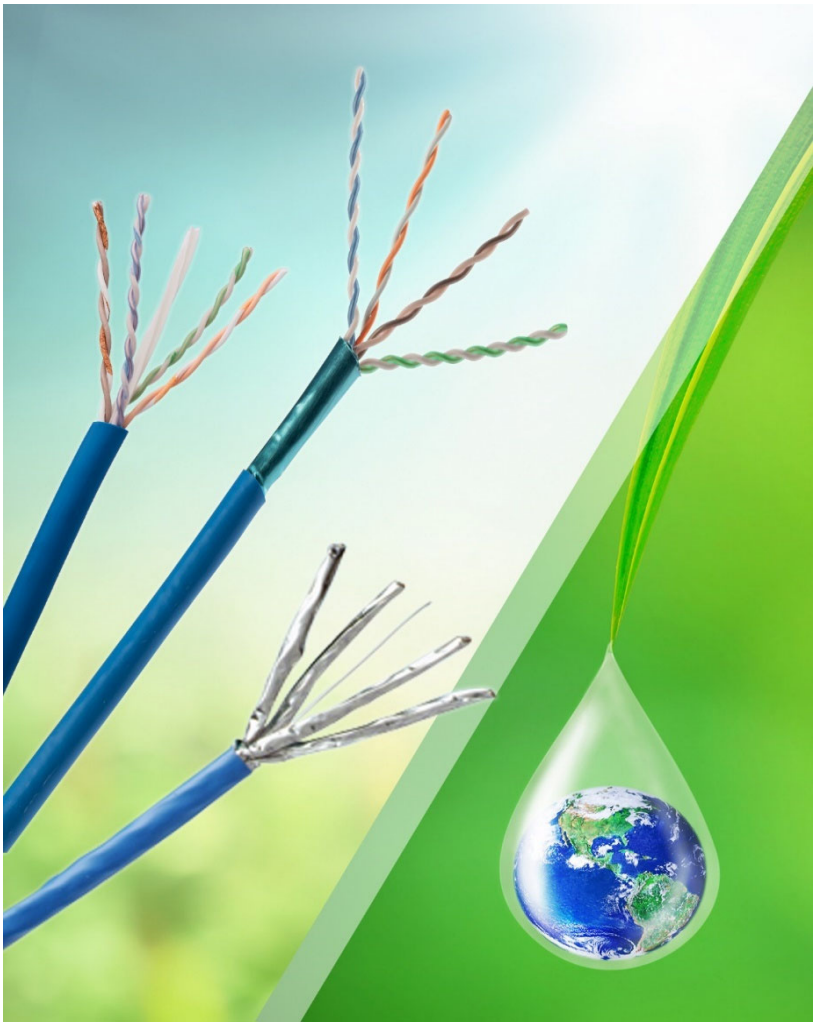
Environmental Product Declaration

Panduit Category 6 Plenum (CMP) Data Networking Cable



Cat 6 Plenum – Panduit TX Series Plenum Copper Cabling

At Panduit, we're serious about sustainability.
Everyone's talking about sustainability these days. Companies are making huge changes in the way they do business to meet the demands for energy efficiency, meet environmental standards and exceed international benchmarks.

At Panduit, sustainability drives our business practices. We are committed to providing you with the most cost-efficient and environmentally sound solutions available. Because sustainable business practices have always been at the core of what we do, it's a natural progression for us to create award-winning solutions that put sustainable business at the foundation of your infrastructure, too.

We walk the talk.
Our world headquarters, a LEED Gold® certified building, is a testament to our commitment to design and implement healthy, energy efficient, and sustainable business environments. Through our experience and expertise, we can help you build an infrastructure that can contribute toward your projects' LEED certification.

UL CERTIFIED
ENVIRONMENTAL PRODUCT DECLARATION
UL.COM/EPD

This declaration is an environmental product declaration (EPD) in accordance with ISO 14025 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 Road Northbrook, IL 60611 https://www.ul.com/ https://spot.ul.com
GENERAL PROGRAM INSTRUCTIONS AND VERSION NUMBER	General Program Instructions v.2.5 March 2020
MANUFACTURER NAME AND ADDRESS	Panduit Corporation 18900 Panduit Drive Tinley Park, IL 60487
DECLARATION NUMBER	4790076521.102.1
DECLARED PRODUCT & FUNCTIONAL UNIT OF DECLARED UNIT	Panduit Category 6 Plenum (CMP) Data Networking Cable Functional Unit = 1 meter of installed cable over a 60 year building lifetime
REFERENCE PCR AND VERSION NUMBER	The Norwegian EPD Foundation: NPCR 027 Part B: Electrical Cables and Wires, v1.0, October 2020.
DESCRIPTION OF PRODUCT APPLICATION/USE	Panduit cable products are primarily used in commercial, residential, and educational settings.
PRODUCT RSL DESCRIPTION	30 Years
MARKETS OF APPLICABILITY	Global
DATE OF ISSUE	December 15, 2021
PERIOD OF VALIDITY	5 Years
EPD TYPE	Product Specific
DATASET VARIABILITY	N/A
EPD SCOPE	Cradle-to-Grave
YEAR(S) OF REPORTED PRIMARY DATA	2019
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:	The Norwegian EPD Foundation - post@epd-norge.no
This declaration was independently verified in accordance with ISO 14025: 2006. The UL Environment "Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Project Report," v3.2 (Dec 2018), based on ISO 21930:2017, serves as the core PCR, with additional considerations from CEN Norm EN 15804 (2013) and the USGBC/UL Environment Part A Enhancement (2017) ☐ INTERNAL ☒ EXTERNAL	CooperMcC Cooper McCollum, UL Environment
This life cycle assessment was conducted in accordance with ISO 14044 and the reference PCR by:	Sustainable Solutions Corporation
This life cycle assessment was independently verified in accordance with ISO 14044 and the reference PCR by:	Thomas P. Gloria, Industrial Ecology Consultants

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.

General Information

Description of Company/Organization

For more than 65 years, Panduit has been providing innovative infrastructure solutions to help connect our world. That innovation continues today with Panduit's delivery of dependable, scalable network connectivity and robust, reliable electrical infrastructure. Each product and solution we create helps modern enterprises make more meaningful connections and thrive.

Product Description

Panduit® Category 6 Plenum (CMP) Copper Cable. Includes the following models:

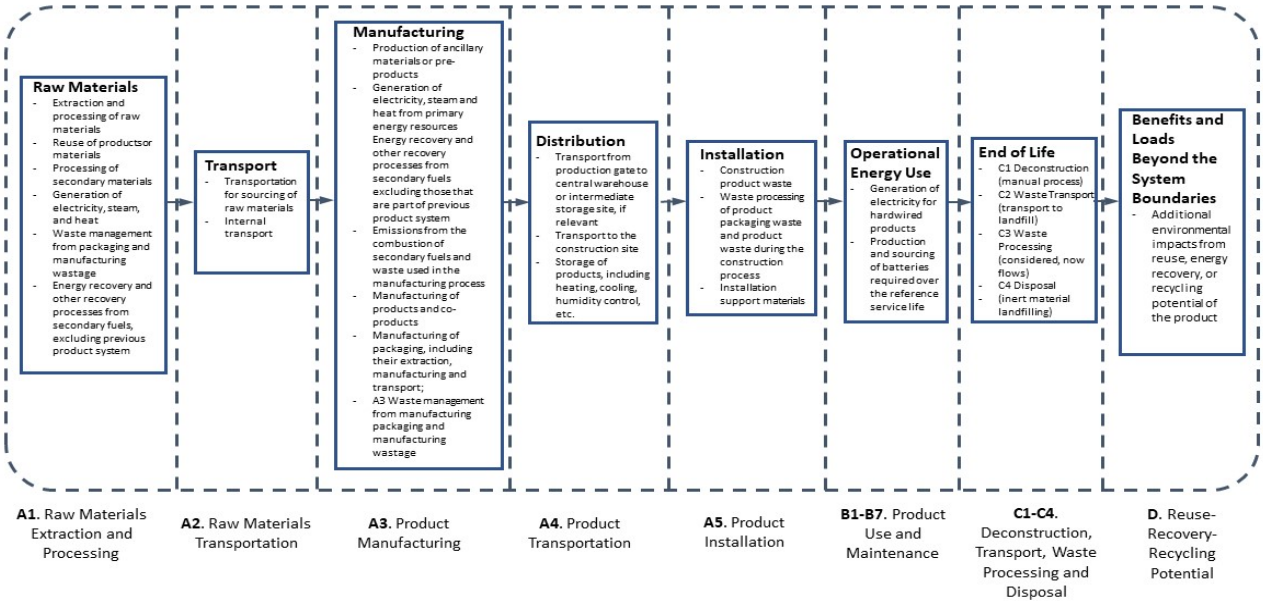
Panduit TX6™ Category 6, U/UTP (Part Number: PUP6C04**)
Category 6, plenum (CMP), 4-pair, U/UTP copper cable. Copper conductors are 23/24 AWG with FEP/polyolefin insulation, twisted in pairs and protected by a low smoke, flame-retardant PVC jacket.

Panduit TX6™ Category 6, U/UTP, 22 AWG (Part Number: PUP6C2204**)
Category 6, plenum (CMP), 4-pair, U/UTP copper cable. Copper conductors are 22 AWG with FEP/polyolefin insulation, twisted in pairs, separated by an integrated pair divider, and protected by a low smoke, flame-retardant PVC jacket.

Panduit TX6000™ Category 6, U/UTP (Part Number: PUP6004**)
Enhanced Category 6, plenum (CMP), 4-pair, U/UTP copper cable. Copper conductors are 23 AWG with FEP/polyolefin insulation, twisted in pairs, separated by an integrated pair divider, and protected by a low smoke, flame-retardant PVC jacket.

Panduit TX6500™ Category 6, U/UTP (Part Number: PUP6504**)
Premium Category 6, plenum (CMP), 4-pair, U/UTP copper cable. Copper conductors are 23 AWG with FEP/polyolefin insulation, twisted in pairs, separated by an integrated pair divider and protected by a low smoke, flame-retardant PVC jacket.

Flow Diagram



Manufacturer Specific EPD

This product-specific EPD was developed based on the cradle-to-grave (modules A1-D) Life Cycle Assessment. The EPD accounts for raw material extraction and processing, transport, product manufacturing, distribution, installation, use, maintenance, disposal, and potential benefits and loads following the end of life disposal. Manufacturing data were gathered directly from company personnel. For any product group EPDs, an impact assessment was completed for each product and the lowest and highest impacts were reported as representations of the product group. Product grouping was considered appropriate if the individual product impacts differed by no more than ±10% in any impact category.

Application

Product Applications:
Plenum cables are installed in plenum spaces of buildings and must meet associated fire safety test standards. In this declaration, Category 6 Plenum (CMP) copper data cables are covered. All products listed below are UL Listed CMP and have been UL or ETL verified.

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 Panduit Category 6 Plenum (CMP) Data Networking cable is as follows:
Note: The minimum and maximum values represent the minimum and maximum impact products within this product family. The increase in impact results from the increased weight of insulation and jacketing materials.

	Percentage in mass (%)	
Material	**Minimum**	**Maximum**
Colorant	0.61%	0.85%
Conductor	41.64%	37.78%
Cross Fill	13.63%	2.19%
Drain Wire	0.00%	0.00%
Insulation	18.92%	21.54%
Jacketing	23.98%	36.58%
Rip Cord	0.26%	0.22%
Tape	0.96%	0.84%
Other	0.00%	0.00%
Total	100.00%	100.00%

Placing on the Market / Application Rules

The standards that can be applied to this product are:
ANSI/TIA 568.2-D and IEC 61156-5
NFPA 262 and CSA FT-6
IEEE 802.3af, IEEE 802.3at and IEEE 802.3bt

Properties of Declared Product as Shipped

Panduit Category 6 Plenum (CMP) Data Networking cables are delivered as a complete unit, inclusive of all installation materials and instructions.

Methological Framework

Functional Unit

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

Name	Value	Unit
Declared unit	1 meter of installed cable	
Minimum Mass	0.04	kg
Conversion factor to 1 kg	23.63	-
Maximum Mass	0.05	kg
Conversion factor to 1 kg	18.46	-

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 Panduit Category 6 Plenum (CMP) Data Networking cable is 30 years. The building estimated service life is 60 years.

Allocation

Allocation was determined on a per meter basis.

Cut-off Criteria

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

For Hazardous Substances the following requirements apply:

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

This EPD is in compliance with the cut-off criteria. No processes were neglected or excluded. 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 Panduit. 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 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.

Period Under Review

The period under review is the full calendar year of 2019.

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.

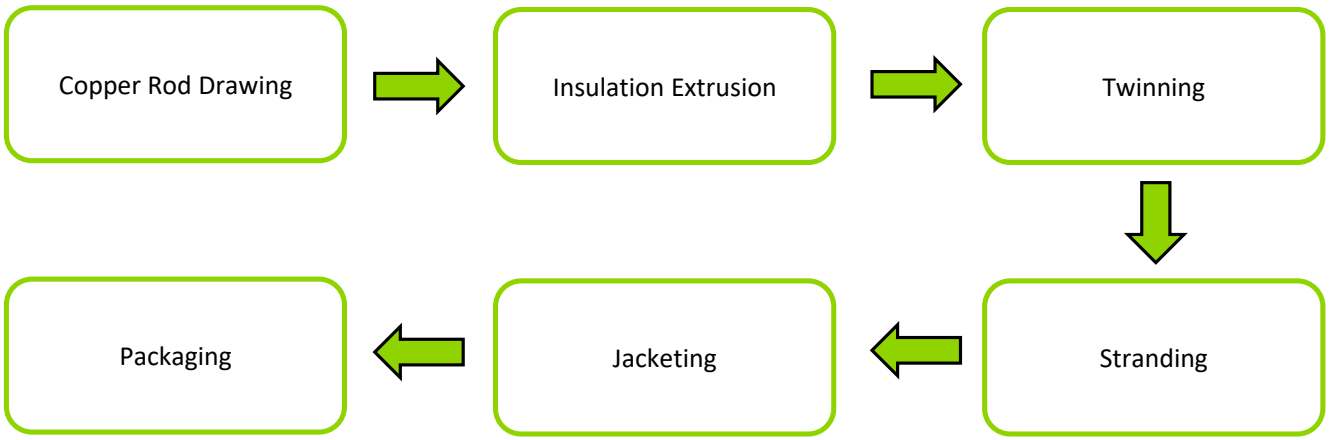
Additional Environmental Information

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

The primary manufacutring processes occur in multiple locations. 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 stranded together. Subsequently, the stranded wire has a jacket extruded around the stranded 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.



Packaging

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

	Quantity (% By Weight)	
Material	**Minimum**	**Maximum**
Cardboard	29.60%	33.05%
Other	0.56%	0.61%
Plastic	3.53%	1.81%
Wood	66.30%	64.54%
Total	100.00%	100.00%

Transportation

Transport to Building Site (A4)			
Name	Min	Max	Unit
Fuel type	Diesel		
Liters of fuel	38	38	l/100km
Transport distance	300	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	-	-	-

Product Installation

Panduit Category 6 Plenum (CMP) Data Networking 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 and can therefore be neglected due to the amount of electricity that is consumed during the use phase.

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	2.1E-03	2.7E-03	kg
Waste materials at construction site	2.1E-03	2.7E-03	kg
Output substance (recycle)	7.5E-04	8.7E-04	kg
Output substance (landfill)	1.3E-04	1.5E-04	kg
Output substance (incineration)	1.2E-03	1.7E-03	kg
Packaging waste (recycle)	4.7E-03	4.4E-03	kg
Packaging waste (landfill)	1.4E-03	1.2E-03	kg
Packaging waste (incineration)	3.5E-04	3.1E-04	kg
Direct emissions to ambient air*, soil, and water	2.1E-03	2.0E-03	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

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	**Min**	**Max**	**Unit**
Water consumption (from tap, to sewer)	-	-	m^3
Electricity consumption	0.42	0.42	kWh
Other energy carriers	-	-	MJ
Equipment output	-	-	kW
Direct emissions to ambient air, soil, and water	-	-	kg

Maximum Loss Values per Cable Type		
Cable Type	**Protocol**	**Power Loss (mW/m)**
CAT5e	Ethernet 100M	0.454
CAT6	1G Ethernet	0.565
CAT6a	10G Ethernet	1.364
CAT7	10G Ethernet	1.363
CAT7a	10G Ethernet	1.356
CAT7+	10G Ethernet	1.351

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, with the exception of fiberglass which would be landfilled.

End of life (C1-C4)			
Name	**Min**	**Max**	**Unit**
Collected separately	1.5E-02	1.7E-02	kg
Collected as mixed construction waste	2.7E-02	3.7E-02	kg
Reuse	0.0E+00	0.0E+00	kg
Recycling	1.5E-02	1.7E-02	kg
Landfilling	2.6E-03	3.1E-03	kg
Incineration with energy recovery	2.5E-02	3.4E-02	kg
Energy conversion	4.4E+01	4.4E+01	%
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	**Min**	**Max**	**Unit**
Net energy benefit from energy recovery from waste treatment declared as exported energy in C3 (R>0.6)	0.29	0.43	MJ
Net energy benefit from thermal energy due to treatment of waste declared as exported energy in C4 (R<0.6)	0.00	0.00	MJ
Net energy benefit from material flow declared in C3 for energy recovery	0.00	0.00	MJ
Process and conversion efficiencies	Assumes 44% waste-to-energy conversion efficiency		
Further assumptions for scenario development (e.g. further processing technologies, assumptions on correction factors);	N/A		

LCA Results - Minimum Impact

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.	4.6E-01	1.4E-03	6.3E-04	5.4E-01	2.8E-01	4.5E-04	7.2E-02	1.7E-03	-2.7E-01
ODP	Depletion potential of the stratospheric ozone layer	kg CFC-11 Eq.	2.5E-06	5.4E-14	4.6E-12	2.5E-06	4.5E-12	1.7E-14	1.4E-09	1.2E-10	-1.5E-08
AP Air	Acidification potential for air emissions	kg SO_2-Eq.	3.4E-03	8.4E-06	5.5E-07	3.4E-03	2.4E-03	2.7E-06	3.2E-05	4.9E-06	-4.6E-03
EP	Eutrophication potential	kg N-Eq.	1.9E-02	4.7E-07	8.4E-06	1.9E-02	3.2E-05	1.5E-07	1.6E-05	1.5E-05	-2.7E-02
SP	Smog formation potential	kg O_3-Eq.	6.7E-02	2.3E-04	1.3E-05	6.8E-02	1.6E-02	7.3E-05	5.0E-04	1.0E-04	-9.1E-02
FFD	Fossil Fuel Depletion	MJ-surplus	7.4E-01	2.7E-03	1.5E-04	7.5E-01	2.4E-01	8.6E-04	6.6E-03	1.2E-03	-2.5E-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.	4.6E-01	1.4E-03	7.7E-04	5.4E-01	2.8E-01	4.5E-04	7.2E-02	1.7E-03	-2.7E-01
ODP	Depletion potential of the stratospheric ozone layer	kg CFC-11 Eq.	2.5E-06	5.3E-14	3.5E-12	2.5E-06	4.5E-12	1.7E-14	1.4E-09	1.2E-10	-1.5E-08
AP Air	Acidification potential for air emissions	kg SO_2-Eq.	2.9E-03	7.0E-06	4.4E-07	2.9E-03	2.4E-03	2.7E-06	3.2E-05	4.9E-06	-4.6E-03
EP	Eutrophication potential	kg$(PO_4)^3$-Eq.	8.4E-03	1.2E-06	3.1E-06	8.4E-03	3.2E-05	1.5E-07	1.6E-05	1.5E-05	-2.7E-02
POCP	Formation potential of tropospheric ozone photochemical oxidants	kg ethane-Eq.	1.5E-04	3.2E-07	1.7E-07	8.3E-04	1.6E-02	7.3E-05	5.0E-04	1.0E-04	-9.1E-02
ADPE	Abiotic depletion potential for non-fossil resources	kg Sb-Eq.	6.2E-05	0.0E+00	7.3E-11	8.7E-03	2.4E-01	8.6E-04	6.6E-03	1.2E-03	-2.5E-01
ADPF	Abiotic depletion potential for fossil resources	MJ	6.3E+00	1.8E-02	1.0E-03	6.4E+00	2.8E-01	4.5E-04	7.2E-02	1.7E-03	-2.7E-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	9.7E-01	0.0E+00	-1.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
RPR_M	Renewable primary energy resources as material utilization	MJ	1.0E-01	0.0E+00	0.0E+00	0.0E+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	6.3E+00	1.8E-02	-2.5E+00	3.9E+00	3.8E+00	5.8E-03	6.1E-02	1.1E-02	-3.2E+00
$NRPR_M$	Nonrenewable primary energy as material utilization	MJ	6.5E-01	0.0E+00	2.5E+00	3.2E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SM	Use of secondary material	kg	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
RSF	Use of renewable secondary fuels	MJ	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
NRSF	Use of nonrenewable secondary fuels	MJ	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
RE	Energy recovered from disposed waste	MJ	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
FW	Use of net fresh water	m^3	3.0E-03	0.0E+00	4.1E-07	5.0E-03	0.0E+00	0.0E+00	2.0E-03	5.7E-06	-2.2E-03

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

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	7.3E-06	0.0E+00	3.7E-07	7.7E-06	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
NHWD	Non-hazardous waste disposed	kg	3.4E-04	0.0E+00	1.4E-03	4.4E-03	0.0E+00	0.0E+00	0.0E+00	2.6E-03	0.0E+00
HLRW	High-level radioactive waste	kg or m^3	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ILLRW	Intermediate- and low-level radioactive waste	kg or m^3	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
CRU	Components for re-use	kg	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
MR	Materials for recycling	kg	4.0E-03	0.0E+00	4.9E-03	2.4E-02	0.0E+00	0.0E+00	1.5E-02	0.0E+00	0.0E+00
MER	Materials for energy recovery	kg	0.0E+00	0.0E+00	3.5E-04	2.5E-02	0.0E+00	0.0E+00	2.5E-02	0.0E+00	0.0E+00
EE	Recovered energy exported from system	MJ	0.0E+00	0.0E+00	0.0E+00	2.9E-01	0.0E+00	0.0E+00	2.9E-01	0.0E+00	0.0E+00

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

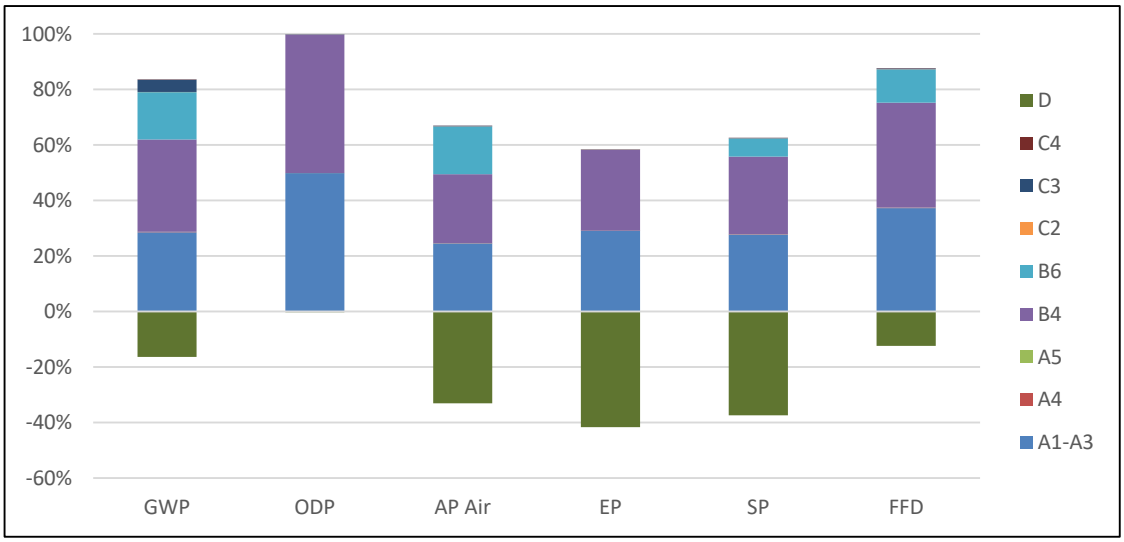
Results below contain direct greenhouse gas emissions and removals throughout the life cycle of the product.

Resource Use											
Parameter	**Parameter**	**Unit**	**A1-A3**	**A4**	**A5**	**B4**	**B6**	**C2**	**C3**	**C4**	**D**
BCRP	Biogenic Carbon Removal from Product	kg CO_2	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
BCEP	Biogenic Carbon Emissions from Product	kg CO_2	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
BCRK	Biogenic Carbon Removal from Packaging	kg CO_2	2.1E-03	0.0E+00	0.0E+00	2.1E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
BCEK	Biogenic Carbon Emissions from Packaging	kg CO_2	0.0E+00	0.0E+00	2.1E-03	2.1E-03	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	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
CCE	Calcination Carbon Emissions	kg CO_2	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
CCR	Carbonation Carbon Removal	kg CO_2	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
CWNR	Carbon Emissions from Combustion of Waste from Non-renewable Sources Used in Production Process	kg CO_2	0.0E+00	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 - Minimum Impact

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 all benefits and loads on the system. As one replacement occurs in this specified lifetime, module D includes benefits of two products.



LCA Results - Maximum Impact

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.	4.2E-01	1.6E-03	6.6E-04	5.1E-01	2.8E-01	5.0E-04	8.1E-02	1.9E-03	-3.3E-01
ODP	Depletion potential of the stratospheric ozone layer	kg CFC-11 Eq.	1.6E-06	6.0E-14	5.0E-12	1.6E-06	4.5E-12	1.9E-14	1.6E-09	1.3E-10	-1.6E-08
AP Air	Acidification potential for air emissions	kg SO_2-Eq.	3.7E-03	9.5E-06	5.8E-07	3.7E-03	2.4E-03	3.0E-06	3.6E-05	5.5E-06	-5.4E-03
EP	Eutrophication potential	kg N-Eq.	2.1E-02	5.3E-07	9.5E-06	2.1E-02	3.2E-05	1.7E-07	1.8E-05	1.7E-05	-3.0E-02
SP	Smog formation potential	kg O_3-Eq.	7.4E-02	2.6E-04	1.4E-05	7.5E-02	1.6E-02	8.2E-05	5.7E-04	1.2E-04	-1.0E-01
FFD	Fossil Fuel Depletion	MJ-surplus	6.6E-01	3.0E-03	1.6E-04	6.7E-01	2.4E-01	9.6E-04	7.4E-03	1.3E-03	-3.1E-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.	4.3E-01	1.6E-03	7.9E-04	5.1E-01	2.8E-01	5.0E-04	8.1E-02	1.9E-03	-3.3E-01
ODP	Depletion potential of the stratospheric ozone layer	kg CFC-11 Eq.	1.6E-06	6.0E-14	3.8E-12	1.6E-06	4.5E-12	1.9E-14	1.6E-09	1.3E-10	-1.6E-08
AP Air	Acidification potential for air emissions	kg SO_2-Eq.	3.1E-03	7.8E-06	4.6E-07	3.1E-03	2.4E-03	3.0E-06	3.6E-05	5.5E-06	-5.4E-03
EP	Eutrophication potential	kg$(PO_4)^3$-Eq.	9.4E-03	1.4E-06	3.5E-06	9.4E-03	3.2E-05	1.7E-07	1.8E-05	1.7E-05	-3.0E-02
POCP	Formation potential of tropospheric ozone photochemical oxidants	kg ethane-Eq.	1.3E-04	3.6E-07	1.6E-07	8.9E-04	1.6E-02	8.2E-05	5.7E-04	1.2E-04	-1.0E-01
ADPE	Abiotic depletion potential for non-fossil resources	kg Sb-Eq.	6.9E-05	0.0E+00	7.7E-11	9.7E-03	2.4E-01	9.6E-04	7.4E-03	1.3E-03	-3.1E-01
ADPF	Abiotic depletion potential for fossil resources	MJ	5.7E+00	2.0E-02	1.1E-03	5.8E+00	2.8E-01	5.0E-04	8.1E-02	1.9E-03	-3.3E-01

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

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

Resource Use

Parameter	Parameter	Unit	A1-A3	A4	A5	B4	B6	C2	C3	C4	D
RPR_E	Renewable primary energy as energy carrier	MJ	1.1E+00	0.0E+00	-1.1E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
RPR_M	Renewable primary energy resources as material utilization	MJ	9.5E-02	0.0E+00	0.0E+00	0.0E+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	5.4E+00	2.0E-02	-2.5E+00	3.0E+00	3.8E+00	6.5E-03	6.9E-02	1.2E-02	-4.1E+00
$NRPR_M$	Nonrenewable primary energy as material utilization	MJ	9.8E-01	0.0E+00	2.5E+00	3.5E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SM	Use of secondary material	kg	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
RSF	Use of renewable secondary fuels	MJ	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
NRSF	Use of nonrenewable secondary fuels	MJ	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
RE	Energy recovered from disposed waste	MJ	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
FW	Use of net fresh water	m^3	3.3E-03	0.0E+00	4.3E-07	5.5E-03	0.0E+00	0.0E+00	2.2E-03	6.4E-06	-2.5E-03

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

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

Output Flows and Waste Categories											
Parameter	**Parameter**	**Unit**	**A1-A3**	**A4**	**A5**	**B4**	**B6**	**C2**	**C3**	**C4**	**D**
HWD	Hazardous waste disposed	kg	8.1E-06	0.0E+00	4.0E-07	8.5E-06	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
NHWD	Non-hazardous waste disposed	kg	3.4E-04	0.0E+00	1.3E-03	4.7E-03	0.0E+00	0.0E+00	0.0E+00	3.1E-03	0.0E+00
HLRW	High-level radioactive waste	kg or m^3	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ILLRW	Intermediate- and low-level radioactive waste	kg or m^3	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
CRU	Components for re-use	kg	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
MR	Materials for recycling	kg	4.2E-03	0.0E+00	4.6E-03	2.6E-02	0.0E+00	0.0E+00	1.7E-02	0.0E+00	0.0E+00
MER	Materials for energy recovery	kg	0.0E+00	0.0E+00	3.1E-04	3.4E-02	0.0E+00	0.0E+00	3.4E-02	0.0E+00	0.0E+00
EE	Recovered energy exported from system	MJ	0.0E+00	0.0E+00	0.0E+00	4.3E-01	0.0E+00	0.0E+00	4.3E-01	0.0E+00	0.0E+00

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

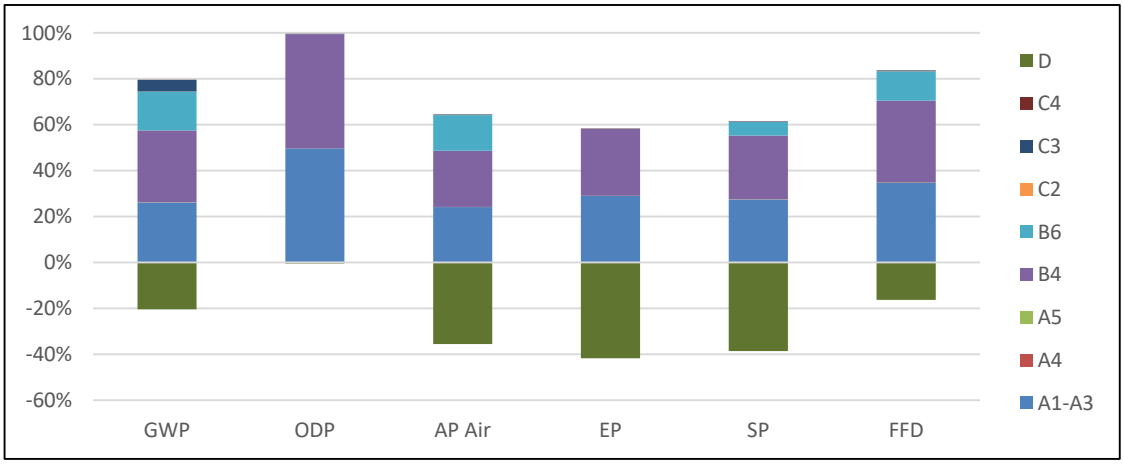
Results below contain direct greenhouse gas emissions and removals throughout the life cycle of the product.

Resource Use											
Parameter	**Parameter**	**Unit**	**A1-A3**	**A4**	**A5**	**B4**	**B6**	**C2**	**C3**	**C4**	**D**
BCRP	Biogenic Carbon Removal from Product	kg CO_2	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
BCEP	Biogenic Carbon Emissions from Product	kg CO_2	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
BCRK	Biogenic Carbon Removal from Packaging	kg CO_2	2.0E-03	0.0E+00	0.0E+00	2.0E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
BCEK	Biogenic Carbon Emissions from Packaging	kg CO_2	0.0E+00	0.0E+00	2.0E-03	2.0E-03	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	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
CCE	Calcination Carbon Emissions	kg CO_2	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
CCR	Carbonation Carbon Removal	kg CO_2	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
CWNR	Carbon Emissions from Combustion of Waste from Non-renewable Sources Used in Production Process	kg CO_2	0.0E+00	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 - Maximum Impact

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 all benefits and loads on the system. As one replacement occurs in this specified lifetime, module D includes benefits of two products.



Additional Environmental Information

Environmental and Health During Manufacturing

Panduit is committed to Environmental, Social, and Governance (ESG) as we establish and meet critical performance benchmarks in the key areas of environmental stewardship, community support, diversity and inclusion, and ethics and compliance.
Our ESG commitments will help shape our journey as we continue to innovate and enable our customers to create more meaningful connections.

Environmental and Health During Installation

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 60°C, 75°C, or 90°C and complies with UL 1666 and CSA FT-6
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.

Environmanetal Activities and Cerifications

Panduit is constantly exploring ways to minimize its ecological footprint—from sustainable manufacturing processes and energy savings initiatives at our facilities, to the use of environmentally friendly materials in our products, to our world headquarters being recognized as a LEED Gold® certified building.
During the past five years, Panduit has achieved a 20% reduction in our global carbon footprint, a 13% reduction in total electricity usage, and a 36% reduction in total fossil fuel usage.

Further Information

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