ENVIRONMENTAL PRODUCT DECLARATION

LEVITON COPPER CONNECTIVITY

COPPER CONNECTIVITY - JACKS AND PATCH PANELS

The image represents Leviton Network Solutions copper data communication Jacks and Panels

Every day, Leviton is engineering possibilities that make the future happen, meeting the needs of today's residential, commercial, and industrial customers globally. From electrical, to lighting, to data networks, and energy management, Leviton develops thoughtful solutions that help make its customers' lives easier, safer, more efficient, and more productive. Leviton is also driven by its commitment to sustainability. Leviton has created CN2030, a set of sustainability goals to achieve company-wide carbon neutrality by 2030, and to achieve net zero by 2050. The CN2030 program is based on the company's refreshed commitment to reduce its environmental impact in several key focus areas: energy, waste, recycling, water, and by creating innovations that empower and enable customers to be more sustainable.

NETWORK SOLUTIONS SVL SYSTEM VERIFICATION LAB

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LEVITON

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Panels and Jacks: EXTREME™ Jack (Unshielded), ATLAS-X1™ Jack (Shielded, Unshielded), Patch Panel (Single Unit, Double Unit)

According to ISO 14025, ISO 21930:2017

EPD PROGRAM AND PROGRAM OPERATOR NAME, ADDRESS, LOGO, AND WEBSITE	UL Solutions 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	Leviton Network Solutions, 22nd Street S.E., Bothell, WA 98021, United States
DECLARATION NUMBER	4790742360.107.1
DECLARED PRODUCT & FUNCTIONAL UNIT OR DECLARED UNIT	Per product
REFERENCE PCR AND VERSION NUMBER	P.E.P Association. PCR for Electrical, Electronic and HVAC-R Products (PEP Program, 2021) P.E.P Association. PSR Specific Rules for Wires, Cables and Accessories ((PEP Program, 2022)
DESCRIPTION OF PRODUCT APPLICATION/USE	Jacks are designed to be used with all QUICKPORT™ panels compatible products
PRODUCT RSL DESCRIPTION (IF APPL.)	30 years with 70% use rate
MARKETS OF APPLICABILITY	North America, International
DATE OF ISSUE	November 1, 2023
PERIOD OF VALIDITY	5 Years
EPD TYPE	Product Specific
RANGE OF DATASET VARIABILITY	Manufacturer Specific
EPD SCOPE	Cradle to Grave
YEAR(S) OF REPORTED PRIMARY DATA	2021
LCA SOFTWARE & VERSION NUMBER	LCA for Experts v10
LCI DATABASE(S) & VERSION NUMBER	Managed LCA Content, CUP 2022.2
LCIA METHODOLOGY & VERSION NUMBER	IPCC AR6, TRACI 2.1, CML

The PCR review was conducted by:	P.E.P. Association PCR Review Panel contact@pep-ecopassport.org
This declaration was independently verified in accordance with ISO 14025: 2006. ☐ INTERNAL ☒ EXTERNAL	Cooper McCollum, UL Solutions
This life cycle assessment was conducted in accordance with ISO 14044 and the reference PCR by:	Sphera
This life cycle assessment was independently verified in accordance with ISO 14044 and the reference PCR by:	Thomas P. Gloria, Industrial Ecology Consultants

LIMITATIONS

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; the level of accuracy in estimation of effect differs for any particular product line and reported impact.

Comparability: EPDs from different programs may not be comparable. Full conformance with a PCR allows EPD comparability only when all stages of a life cycle have been considered. However, variations and deviations are possible". Example of variations: Different LCA software and background LCI datasets may lead to differences results for upstream or downstream of the life cycle stages declared.

1. Product Definition and Information

1.1. Description of Company/Organization

Leviton Network Solutions is a single-source global manufacturer of electronic assessories for optical telecom cabling systems. Leviton Network Solutions is committed to protecting the environment through the design, manufacture, delivery of sustainable network infrastructure for data centers, businesses, schools, hospitals, government facilities, and commercial mixed-use markets around the world. All Leviton products are engineered to exacting standards while considering environmental impact through every step of our ISO 9001 certified product development process, from initial material sourcing to final packaging and logistics. Leviton's primary cable and connectivity factories are ISO 14001 and ISO 50001 certified for environmental and energy management systems, and our EMEA headquarters was the first data communications factory to achieve BSI PAS 2060 Carbon Neutrality. Through these sustainable design and manufacture practices, Leviton Network Solutions produces products that contribute to greater energy savings, less waste, and carbon footprint reduction. Additionally, there are no substances of very high concern in Leviton's products.

1.2. Product Description

Product Identification

In this EPD, Leviton's three jacks and two panels' products are covered in the declaration. Detailed product specifications and descriptions are provided in Table 1 for jacks and Table 2 for panels. Jacks' products that are included in the study are ATLAS-X1™ Shielded and ATLAS-X1 Unshielded jacks, EXTREME™ Unshielded jacks, and panel products are the QUICKPORT™ UTP 1U and 2U Angled.

Table 1: Jacks Product Specification

Jack	Category	Product Type	Part Numbers	Description
Jack 1	5e, 6, 6A and 8	ATLAS-X1 Shielded Jack	81SJK-R*8, 6ASJK-**6, 61SJK-**6, 5ESJK-R*5	The highest-performing category-rated jack with the most extensive range of features and fastest installations. The jack features tool-free termination for fast, easy, and simplified termination and PoE optimized construction for best PoE performance. The jack includes Retention Force Technology to promote consistent network performance over the life of the system and protects critical data from potential EMI/RFI.
Jack 2	5e, 6 and 6A	ATLAS-X1 Unshielded Jack	6AUJK-**6, 61UJK-**6, 5EUJK-R*5	The highest-performing category-rated jack with the most extensive range of features and fastest installations. The jack features tool-free termination for fast, easy, and simplified termination and PoE optimized construction for best PoE performance. Solid metal body dissipates more heat than plastic, minimizing damage from excess heat in PoE applications. The jack includes Retention Force Technology to promote consistent network performance over the life of the system.

Jack	Category	Product Type	Part Numbers	Description
Jack 3	5e, 6, and 6A	EXTREME Unshielded Jack	6110G-**6, 61110-**6, 5G110-**5	High-quality category rated UTP jack with high performance and a user-friendly design to support fast, easy installation and unmatched system longevity. It features patented dual-layer wiring label, cutting ledge, and pair separation tower for fast and simple installation and includes Retention Force Technology™ to promote consistent network performance over the life of the system.

Figure 1: ATLAS-X1 Shielded Jack and EXTREME Unshielded Cat 6 QUICKPORT Jack

Table 2: Patch Panels Product Specification

Panels	Product Type	Part Numbers	Description
Panel 1	QUICKPORT 1U Flat and Angled UTP Patch Panel	49255-*24 49256-*24 49255-Q48 49256-D48	QUICKPORT Patch Panels are compatible with all QUICKPORT modular connectors to maximize versatility with a variety of media applications and enable easy upgrades. The panel fits all industry-standard 19-inch racks and cabinets.
Panel 2	QUICKPORT 2U Angled UTP Patch Panel	49256-H48 49256-W8L	Angled QUICKPORT Patch Panels feature a customizable design for fiber and copper applications, accepting all QUICKPORT Snap-in Modules for optimum rack density on industry-standard racks. The panels feature an angled design to easily route cables into vertical cable managers, eliminating the need for horizontal, front cable management bars.

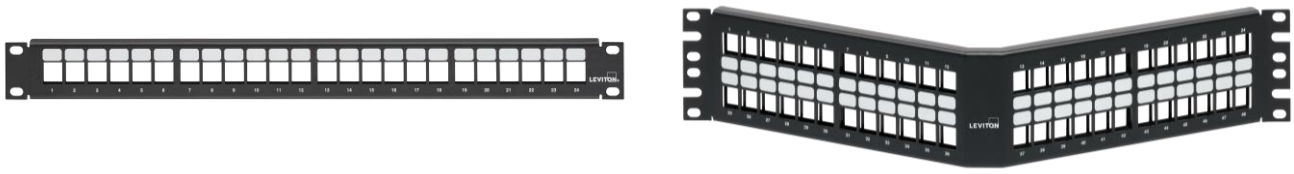

Figure 2: 1U Flat and Angled UTP Patch Panel and 2U Angled UTP Patch Panel

1.3. Product Average

This EPD represents the manufacturer specific products for jacks and panels. Jacks covered are ATLAS-X1™ Shielded and ATLAS-X1 Unshielded, and EXTREME™ Unshielded jacks, and patch panels are QUICKPORT 1U Flat and Angled and QUICKPORT 2U Angled. Leviton's manufacturing information for jacks and panels are directly used in the study.

1.4. Application

Jacks and panels interdependent components in a system. Jacks are designed to be used with all Leviton's QUICKPORT panels compatible products.

ATLAS-X1 Shielded and **Unshielded** Jacks: The jack is designed to be used with all QUICKPORT compatible products. The jack includes patented Retention Force Technology™ which promotes consistent performance over the life of the system. It features tool-free termination for quicker and simplified terminations. The jack is ideal for the most demanding mission-critical network applications and supports emerging technologies and will easily adapt to network trends.

EXTREME Unshielded Jack: The jack is designed to be used with all QUICKPORT compatible products. The jack includes patented Retention Force Technology™ which promotes consistent performance over the life of the system. It features a 90- or 180-degree bi-directional entry which eases cable bend radius in back boxes and allows quicker and easier terminations. The Cat 6A jack features patented CONE OF SILENCE™ cover to provide additional alien crosstalk (AXT) suppression, ensuring industry-leading system performance. The jack is ideal for enterprise applications and supports emerging technologies and will easily adapt to network trends.

PANELS

Patch panels are designed to be used with all QUICKPORT modular connectors to maximize versatility with a variety of media applications and enable easy upgrades. The panels fit all industry-standard 19-inch racks.

1.5. Declaration of Methodological Framework

This EPD is declared under a "Cradle-to-grave," i.e., all stages of the life cycle have been included: manufacturing, distribution, installation, use, and end-of-life. The net benefits and loads beyond the system boundaries (potential for reuse, recovery, and/or recycling), expressed as net benefits or impacts, is also included. The analysis follows the modular structure as defined by ISO 21930.

1.6. Industry Standards

Jacks

- ANSI/TIA-568.2-D
- ISO/IEC 11801-1
- EN 50173-1
- ANSI/TIA-1096-A (formerly FCC Part 68)
- IEC 60603-7 (includes IEC 60512-5-2)
- IEC 60512-99-002
- IEEE 802.3 PoE Type 1, 2, 3, 4 (90 watts max)
- Cisco UPOE, UPOE+ (90 watts max)
- cULus Listed (UL 1863)
- UL 2043 Plenum Certified

PATCH PANELS

- ANSI/TIA-568
- cULus Listed
- ISO 11801-1

1.7. Delivery status

Jacks and panels are delivered in bulk to the customer's specified location using various transportation to distribution centers or stores and cut to desired length.

1.8. Material Composition

The material composition of jacks consists of acrylonitrile butadiene styrene (ABS), glass reinforced epoxy, plastic, and metals like bronze and zinc. Zinc and polycarbonate have the largest percentage share of materials content in the production of ATLAS-X1™ Shielded and ATLAS-X1 Unshielded. On the other hand, ABS and polycarbonate have the highest percentage material content in the production of EXTREME™ Unshielded jacks. Table 3 provides a summary of the raw materials requirements to produce jacks.

Steel is the main material component of panels. The material composition of panels consists of cold rolled and hot rolled steel, carbon steel and polycarbonate. Cold rolled steel has the largest share of materials content in the production of panels 1U Flat and Angled and carbon steel. On the other hand, carbon steel has the highest percentage of material content, followed by stainless steel in the production of panels 2U Angled. Table 3 and Table 4 provides a summary of the raw materials requirements to produce jacks and panels respectively.

Table 3: Material composition for Jacks

MATERIAL	ATLAS-X1 SHIELDED JACK (%)	ATLAS-X1 UNSHIELDED JACK (%)	EXTREME CAT 6 QUICKPORT JACK (%)
Zinc	75%	74%	0%
Polycarbonate	15%	17%	42%
Glass-reinforced Epoxy	3%	3%	11%
Phosphor Bronze	3%	2%	7%
ABS	2%	2%	40%
Polyethyleneimine	1%	1%	0%
Polyimide	<1%	<1%	0%
Polyester Film	<1%	0%	0%

Table 4: Material composition for Panels

MATERIAL	1U FLAT AND ANGLED [%]	2U ANGLED [%]
Stainless steel (cold rolled)	60%	38%
Carbon steel	31%	58%
Stainless steel (hot rolled)	0%	4%
Polycarbonate	9%	0%

1.9. Manufacturing

Leviton jacks are manufactured in the United States. The manufacturing process of jacks involves multiple stages of production, including plastic injection molding, electronic components assembly onto a printed circuit board (PCB), metal forming and coating and final assembly and packaging. The packaged jacks are transported to their destination. Figure 3 shows the jacks manufacturing process.

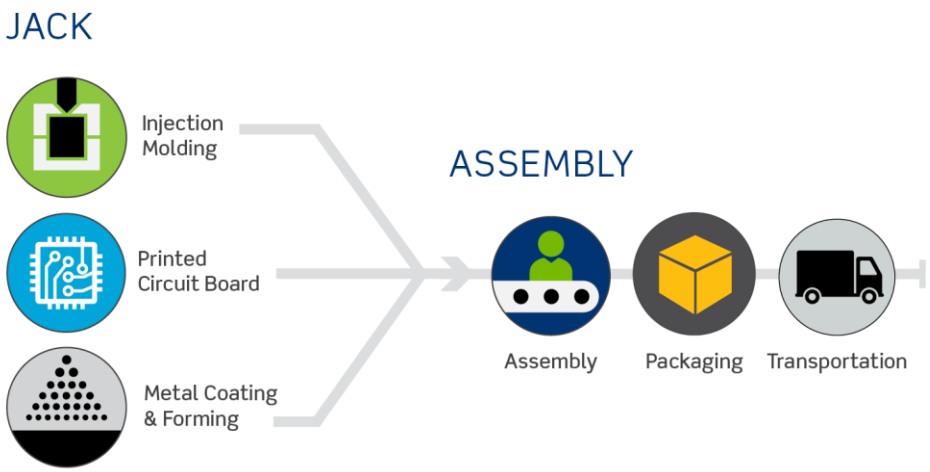

Figure 3: Jacks manufacturing process

Leviton's panels are also manufactured in the United States. The manufacturing process of panels involves shaping and forming metal sheets into the desired form, applying metal coatings, and then the metal panels are assembled and packaged. The packaged panels are transported to their destination. Figure 4 shows the patch panels manufacturing process.

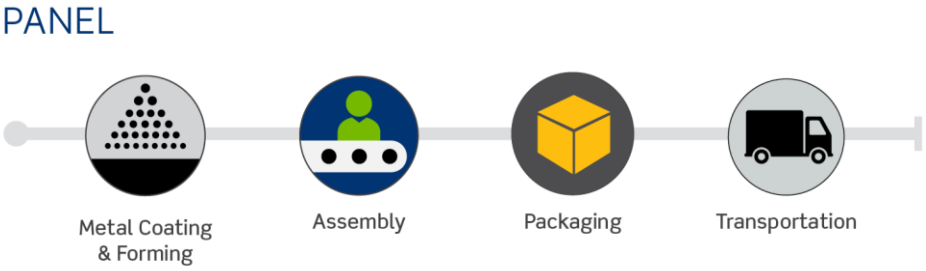

Figure 4: Patch Panels manufacturing process.

1.10. Packaging

Corrugated cardboard and plastic films are used as packaging materials in jacks and only corrugated cardboard is used as packaging material for panels. Cardboard packaging per weight of product has minimal biogenic carbon and therefore, biogenic carbon from packaging is excluded from this assessment.

1.11. Transportation

Transportation includes the inbound freight of raw materials into the manufacturing stage, the outbound transportation of products to their installation sites, and the freight of wastes to their end-of-life disposal site. The only mode of transportation included in the study is by truck. Primary data on transportation distances was used when known, e.g., product distribution distances were provided by Leviton (i.e., 1609 km (1000 mi) distribution distance in US and 800 km in UK). Unknown distances were modelled using the PCR (PEP Program, 2021) assumed distances:

- International transport: 19,000 km (11,806 mi) by boat, 1,000 km (621 mi) by truck
- Domestic transport: 1,000 km (621 mi) by truck

A range of transport distances between 800 km - 2100 km is considered in this study.

1.12. Product Installation

The installation of jacks and panels are assumed to be manual and therefore no energy use is accounted for in this stage. An installation loss of 5% is also assumed for panels.

1.13. Use

The use stage of jacks involves connecting cables and wires to the jack and using it to transmit data or power in a variety of applications such as connecting network cables or electronic devices. Jacks and panels products do not have operational energy consumption. Therefore, use/application of the product installed (B1) and the operational energy use stage (B6) are assumed as zero and there are no use phase impacts from the use of the products.

1.14. Reference Service Life and Estimated Building Service Life

Jacks and panels are assumed to have a reference service life of 30 years with 70% utilization.

1.15. Reuse, Recycling, and Energy Recovery

In the waste processing and disposal stage (C3 to C4), the PCR (PEP Program, 2021), requires that all jacks and panels accessories are assumed to be landfilled including the metal components. The plastic waste from the plant, corrugated board and packaging wastes are assumed to be incinerated and landfilled. Energy and material credits are given to account for the electricity, thermal energy and secondary material generated from the incineration and recycling of wastes. Steel and corrugated wastes from panels products are assumed to be sent for incineration, material recovery. The energy and secondary material generated during the disposal of these wastes can substitute an equivalent amount of virgin energy and materials. Recycling and incineration impacts are accounted in Module C4.

1.16. Disposal

At the end of life, the jacks and panels are removed manually, and metals are sent to landfill. The waste from manufacturing, and packaging are handled based on the 20% incineration and 80% landfill. Additionally, steel, and corrugated cardboard from the production of panels is considered for material recycling. Regarding the transport to EoL (C2), according to the PCR (PEP Program, 2021), the waste is transported 1000 km (621 mi) by truck.

2. Life Cycle Assessment Background Information

2.1. Functional or Declared Unit

The primary function of the jacks and patch panels are to protect and link a connection point for optical telecommunication application in buildings.

Panels are typically mounted on a system. Jacks, on the other hand, are small connectors that are mounted in a wall outlet or patch panel. They are used to provide a connection point for patch cables that run between network devices, such as computers, routers, switches, and servers.

The functional unit selected for the assessment for jacks and patch panels is:

weight per product of an optical telecom accessory comprised of a connection point used to protect and link, or connect for 30 years (reference lifetime) with a 70% use rate.

The functional unit is selected as it serves as the relevant unit to capture the environmental impacts across production, distribution, installation, use and end of life stages depend on the maximum capacity of the reference flow fulfilling the functional unit. Table 5 shows the reference flow for jacks and panels.

Table 5: Reference Flow for jacks and patch panels

PRODUCTS	REFERENCE FLOWS	UNIT
	JACKS	
ATLAS-X1 SHIELDED JACK	0.0176	kg
ATLAS-X1 UNSHIELDED JACK	0.0167	kg
EXTREME UNSHIELDED JACK	0.0058	kg
	PATCH PANELS	
1U Flat and Angled	0.407	kg
2U Angled	0.929	kg

2.2. System Boundary

The system boundary of the EPD follows the modular structure defined by ISO 21930 and the referenced PCRs (PEP Program, 2021), (PEP Program, 2022), (ULE, 2022). The study considers the cradle-to-grave with options covering (module A1-A3), transport to construction site and installation (Module A4-A5), use-stage (Module B6) and end-of-life (Module C1 to C4). The net benefits and loads beyond the system boundaries (potential for reuse, recovery, and/or recycling), expressed as net benefits or impacts, is also included. Table 6 summarizes the major components included and excluded from the study, as defined by the PCR (PEP Program, 2021).

Table 6: System boundaries of the cradle-to-grave study

Production			Installation		Use stage*							End-of-Life				Next product system
Raw material supply (extraction, processing, recycled material)	Transport to manufacturer	Manufacturing	Transport from gate to building site	Installation into building	Use / application	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction / demolition	Transport to EoL	Waste processing for reuse, recovery, or recycling	Disposal	Reuse, recovery, or recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1*	C2	C3	C4	D
X	X	X	X	X	N/A	N/A	N/A	N/A	N/A	X	N/A	X	X	X	X	X

(X = declared module; N/A =Module not applicable)

* Use Stage – B1, B2, B3, B4, B5, B7 is zero they are not applicable and B6 is also zero as no electricity is used by product themselves

*C1 is zero because deconstruction is done manually.

The impacts of the components excluded from the study are expected to be negligible compared to the impacts associated with the rest of the included stages.

As indicated by the PCR PCRs (PEP Program, 2021), impacts related to production, transportation, installation, use and end-of-life, up to final disposal of the flow required to supply the considered stage, shall be accounted in the corresponding stage. Likewise, all impacts related to waste (i.e., transport and processing) are considered in the modules in which the waste arises. In this way, each life cycle stage shall include all aspects related to its inputs and outputs. Key assumptions about the activities included in the declared modules within the system boundary are listed below.

Module A1 to A3

The production stage includes provision of all raw materials and energy, as well as waste processing up to the disposal of final residues during the production stage.

These modules consider the manufacturing of raw materials, the transport to the production sites and the manufacturing of the jacks and panels. The impact of packaging materials is included.

Module A4

Jacks and panels products are manufactured in the US, this module considers 621 miles (1000 km) truck transport to site.

Module A5

An installation material loss of 5% was assumed based on company data. No energy is required for the installation process.

Regarding the treatment and disposal of packaging material wastes, credits are given to account for the electricity and thermal energy generated from the incineration of wastes and landfill gas. The energy generated during these wastes' disposal can substitute an equivalent amount of energy produced from virgin materials. These credits are declared in Module D and affect only the rate of primary material (no secondary materials).

Module B1 to B7

In the use stage, the PSR (PEP Program, 2022) states that the use or application of the product installed (B1), maintenance (B2), repair (B3), replacement (B4), restoration (B5), and water requirements (B7) are not applicable modules in the analysis of jacks and panels products.

Regarding the operational energy use stage (B6), no electricity is used by jacks and panels as products themselves. Therefore, no impact is associated with B6.

Module C1 to C4

For the deconstruction and demolition stages (C1), manual dismantling is assumed. No loading in trucks or containers is needed.

Regarding the transport to EoL (C2), according to the PCR (PEP Program, 2021), a transport distance of 1000 km by truck must be assumed.

In the waste processing and disposal stage (C3 to C4), the PCR (PEP Program, 2021), the jacks and panels are removed manually, and metals waste are sent to landfill. The waste from manufacturing, and packaging are handled based on the 20% incineration and 80% landfill. Additionally, steel and corrugated cardboard from the production of panels is considered for material recycling. Regarding the transport to EoL (C2), according to the PCR (PEP Program, 2021), the waste is transported 1000 km by truck. The energy and secondary material generated during the disposal of these wastes can substitute an equivalent amount of virgin energy and materials. Recycling and incineration impacts are accounted in Module C4.

Module D

The credits for avoided primary production of recycled metals are accounted for in Module D. For the thermal and electrical energy generated in Modules A5 and C3 due to the incineration of packaging and product waste, avoided burdens have been calculated by the inversion of electricity grid mix and thermal energy from natural gas, using regionalized datasets.

No mandatory life cycle stages, relevant processes, or data needs have been omitted.

2.3. Estimates and Assumptions

The analysis uses the following assumptions:

- If inbound transportation distances were not provided for materials used in manufacturing, a default assumption of international transport: 19,000 km (11,806 mi) by boat, 1,000 km (621 mi) by truck and

- domestic transport: 1,000 km (621 mi) by truck were made using the PCR default distance.
- Installation is assumed to be manual (no energy use), and 5% installation loss is assumed for cables.
- Since primary data were not available to describe end-of-life treatment, the default values specified by the PEP PCR (PEP Program, 2021), were applied.

2.4. Cut-off Criteria

No cut-off criteria are defined for this study. As summarized in section 2.2, the system boundary was defined based on relevance to the goal of the study. For the processes within the system boundary, all available energy and material flow data have been included in the model. In cases where no matching life cycle inventories are available to represent a flow, proxy data have been applied based on conservative assumptions regarding environmental impacts.

2.5. Data Sources

The LCA model was created using LCA for Experts Software system for life cycle engineering, developed by Sphera Inc. (Sphera, 2021). Background life cycle inventory data for raw materials and processes were obtained from the Managed LCA Content, 2022.2 database. The information is documented online at https://sphera.com/product-sustainability-gabi-data-search/

Primary manufacturing data for jacks and panels used in the study were provided by Leviton.

2.6. Data Quality

A variety of tests and checks were performed throughout the project to ensure high quality of the completed LCA. Checks included a review of project specific LCA models and the background data used.

Geographical Coverage

In order to satisfy cut-off criteria, proxy datasets were used as needed for raw material inputs to address lack of data for a specific material or for a specific geographical region. These proxy datasets were chosen for their representation of the actual product. Additionally, European data or global data were used when North American data (for raw materials sourced in the US) were not available.

Temporal Coverage

The intended time coverage for the study is the year 2021. Primary data for the foreground system was collected for this reference year, and the results of the study are therefore representative of 2021. The results are expected to be relevant until there is a significant change in e.g., production technology, production of input materials or energy mixes.

The majority of background datasets are based on data from 2017 onwards.

Technological Coverage

The primary data represent production of the products under evaluation. Secondary data were chosen to be specific to the technologies in question (or appropriate proxy data used where necessary).

Completeness

Foreground processes were checked for mass balance and completeness of the emissions inventory. No data was knowingly omitted.

2.7. Period under Review

Primary data collected for jacks and panels represents production during the 2021 calendar year. This analysis is intended to represent production in 2021.

2.8. Allocation

This study uses the substitution allocation approach and reports credits in Module D. A summary of the application of the substitution approach in the different end-of-life fates is given below.

Material recycling (substitution approach): In the study, metal at the end of life is recycled and material credits are applied. The original burden of steels from panels study and corrugated cardboard input are substituted using the mass of recovered secondary material.

Energy recovery (substitution approach): Plastics from the product, and 20% of paper/corrugated board, metal, plastics, and woods used as packaging materials are sent to waste incineration. Credits are assigned for power and heat outputs using the regional grid mix and thermal energy from natural gas. The latter represents the cleanest fossil fuel and therefore results in a conservative estimate of the avoided burden.

Landfilling (substitution approach): Paper/corrugated board, metal, plastics, and woods are sent to landfills, they are linked to an inventory that accounts for waste composition, regional leakage rates, landfill gas capture as well as utilization rates. Credits are assigned for energy recovery from landfill gas due to landfilling of wood and cardboard packaging materials.

Allocation of background data (energy and materials) taken from the Managed LCA Content (MLC) 2022.2 databases is documented online at https://sphera.com/product-sustainability-gabi-data-search/.

3. Life Cycle Assessment Scenarios

Table 7: Transport to the building site (A4)

NAME	JACKS			PANELS		UNIT
	ATLAS-X1 SHIELDED JACK	ATLAS-X1 UNSHIELDED JACK	EXTREME UNSHIELDED JACK	1U Flat and Angled	2U Angled	
Fuel type						
Liters of fuel	55	55	55	55	55	l/100km
Vehicle type	Truck	Truck	Truck	Truck	Truck	
Transport distance	1000	1000	1000	1000	1000	km
Capacity utilization (including empty runs, mass based	70	70	70	70	70	%
Gross density of products transported	-	-	-	-	-	kg/m^3
Weight of products transported (if gross density not reported)	0.018	0.017	0.006			kg
Volume of products transported (if gross density not reported)	-	-	-	-	-	m^3
Capacity utilization volume factor (factor: =1 or <1 or ≥ 1 for compressed or nested packaging products)	<1	<1	<1	<1	<1	-

Table 8: Installation into the building (A5)

NAME	JACKS			PANELS		UNIT
	ATLAS-X1 SHIELDED JACK	ATLAS-X1 UNSHIELDED JACK	EXTREME UNSHIELDED JACK	1U Flat and Angled	2U Angled	
Ancillary materials	0	0	0	0	0	kg
Net freshwater consumption specified by water source and fate (amount evaporated, amount disposed to sewer)	-	-	-	-	-	m^3
Other resources	-	-	-	-	-	kg
Electricity consumption	-	-	-	-	-	kWh
Other energy carriers	-	-	-	-	-	MJ

Product loss per functional unit	0.018	0.017	0.006			kg
Waste materials at the construction site before waste processing, generated by product installation	-	-	-	-	-	kg
Output materials resulting from on-site waste processing (specified by route; e.g., for recycling, energy recovery and/or disposal)	-	-	-	-	-	kg
Biogenic carbon contained in packaging	0.001	0.001	0.001	0.158	0.191	kg CO_2
Direct emissions to ambient air, soil, and water						kg
VOC content						µg/m^3

Table 9: Reference Service Life

	JACKS			PANELS		UNIT
	ATLAS-X1 SHIELDED JACK	ATLAS-X1 UNSHIELDED JACK	EXTREME UNSHIELDED JACK	1U Flat and Angled	2U Angled	
RSL	30	30	30	30	30	years

Table 10: End of life (C1-C4)

NAME		JACKS			PANELS		UNIT
		ATLAS-X1 SHIELDED JACK	ATLAS-X1 UNSHIELDED JACK	EXTREME UNSHIELDED JACK	1U Flat and Angled	2U Angled	
Assumptions for scenario development (description of deconstruction, collection, recovery, disposal method, and transportation)							
Collection process (specified by type)	Collected separately						kg
	Collected with mixed construction waste	0.027	0.026	0.013	1.49	0.74	kg
Recovery (specified by type)	Reuse						kg
	Recycling	0.005	0.005	0.00	0.16	0.36	kg

	Landfill	0.024	0.023	0.012	0.56	1.12	kg
	Incineration	0.005	0.005	0.002	0.03	0.03	kg
	Incineration with energy recovery	0.001	0.001	0.001	0.03	0.03	kg
	Energy conversion efficiency rate						
Disposal (specified by type)	Product or material for final deposition	0.024	0.023	0.012	0.563	1.12	kg
Removals of biogenic carbon (excluding packaging)							kg CO_2

Table 11: Reuse, recovery and/or recycling potentials (D), relevant scenario information

NAME	JACKS			PANELS		UNIT
	ATLAS-X1 SHIELDED JACK	ATLAS-X1 UNSHIELDED JACK	EXTREME UNSHIELDED JACK	1U Flat and Angled	2U Angled	
Net energy benefit from energy recovery from waste treatment declared as exported energy in C3 (R>0.6)	-	-	-	-	-	MJ
Net energy benefit from thermal energy due to treatment of waste declared as exported energy in C4 (R<0.6)	1.39E-04	1.31E-04	1.31E-04	7.99E-02	4.72E-02	MJ
Net energy benefit from material flow declared in C3 for energy recovery	-	-	-	-	-	MJ
Process and conversion efficiencies	-		-		-	
Further assumptions for scenario development (e.g., further processing technologies, assumptions on correction factors);	-	-	-		-	

The energy datasets used to determine the impacts of the manufacturing, installation, use and end-of-life stages for Leviton's jacks and panels are provided in Table 12. Leviton's jacks and panels are manufactured in the US. No energy is used during the installation, use-stage and at the end-of-life stages as installation is assumed to be manual, no electricity is used by jacks and panels as products themselves and at the end of life, the jacks and panels are removed manually, and metals are sent to landfill.

Table 12: Key energy datasets used in inventory analysis

ENERGY	LOCATION	DATASET	DATA PROVIDER	REFERENCE YEAR	PROXY?
Electricity	US	Electricity grid mix	Sphera	2018	No
Technical heat	US	Thermal energy from natural gas	Sphera	2018	No

4. Life Cycle Assessment Results

Environmental Product Declarations (EPDs) created under different Product Environmental Profile (PEP) and Product Category Rules (PCR) are not comparable. Additionally, EPDs based on a declared unit shall not be used for comparisons between products, regardless of the EPDs using the same PCR.

There is no biogenic carbon in the product. The biogenic carbon in the packaging is minimal hence excluded from this assessment.

It shall be noted that the above impact categories represent impact potentials, i.e., they are approximations of environmental impacts that could occur if the emissions would (a) actually follow the underlying impact pathway and (b) meet certain conditions in the receiving environment while doing so. In addition, the inventory only captures that fraction of the total environmental load that corresponds to the functional unit (relative approach). LCIA results are therefore relative expressions only and do not predict actual impacts, the exceeding of thresholds, safety margins, or risks.

4.1. Life Cycle Impact Assessment Results

Cradle-to-grave results for the life cycle impact categories for Leviton's jacks and panels are presented in Table 13 through Table 22. The assessment results are provided using IPCC AR6 for GWP 100, the TRACI 2.1 for ODP, AP, EP, and SFP and CML 2016 for ADP(fossil). Additionally, since the products are intended for markets outside of North America, the Rest of the World impact assessment results using IPCC AR6 (GWP) and CML 2016 are also included in the report. The value of use stage – B1, B2, B3, B4, B5, B7 are zero as they are not applicable for the products under the study and B6 is also zero as no electricity is used by the products themselves. C1 is zero because deconstruction is done manually. Therefore, the results tables below represent non-zeroes cradle-to-grave modules of environmental impacts, resource use, output flows and waste associated with each product of jacks and panels. Lastly, as per the PEP requirements, the total column of the result of the impacts calculated in the LCA does not include the results of the net benefits and loads (module D).

Table 13: North America LCIA results for jacks ATLAS-X1 Shielded

PARAMETERS	UNIT	TOTAL	A1-A3	A4	A5	C2	C4	D
GWP 100	kg CO_2 eq.	1.18E-01	1.11E-01	2.50E-03	2.72E-03	1.19E-03	7.42E-04	-6.88E-03
ODP	kg CFC 11 eq.	5.66E-10	5.66E-10	4.71E-18	7.19E-18	2.24E-18	2.38E-17	-1.56E-15

Parameters	Unit	Total	A1-A3	A4	A5	C2	C4	D
AP	kg SO_2 eq.	4.11E-04	3.86E-04	8.96E-06	7.94E-06	4.27E-06	3.80E-06	-3.54E-05
EP	kg N eq.	3.13E-05	2.67E-05	8.62E-07	1.92E-06	4.10E-07	1.41E-06	-8.87E-06
SFP	kg O_3 eq.	5.27E-03	4.87E-03	2.07E-04	4.00E-05	9.88E-05	5.67E-05	-4.14E-04
ADP (fossil)	MJ	1.66E+00	1.59E+00	3.48E-02	3.43E-03	1.66E-02	1.10E-02	-8.26E-02

Table 14: Rest of the World LCIA results for jacks ATLAS-X1 Shielded

Parameters	Unit	Total	A1-A3	A4	A5	C2	C4	D
GWP – 100	kg CO_2 eq.	2.29E-01	1.11E-01	2.50E-03	2.72E-03	1.19E-03	7.42E-04	-6.88E-03
ODP	kg R11 eq.	9.80E-10	4.90E-10	2.67E-16	4.18E-16	1.27E-16	1.38E-15	-4.50E-15
AP	kg SO_2 eq.	7.69E-04	3.83E-04	6.55E-06	5.04E-06	3.12E-06	2.98E-06	-3.30E-05
EP	kg Phosphate eq.	8.09E-05	3.77E-05	1.95E-06	2.40E-06	9.30E-07	1.61E-06	-8.42E-06
POCP	kg Ethene eq.	8.34E-05	4.33E-05	-1.18E-06	1.18E-06	-5.64E-07	2.73E-08	-2.24E-06

Table 15: North America LCIA results for jacks ATLAS-X1 Unshielded

Parameters	Unit	Total	A1-A3	A4	A5	C2	C4	D
GWP 100	kg CO_2 eq.	1.12E-01	1.05E-01	2.39E-03	2.72E-03	1.12E-03	7.02E-04	-6.54E-03
ODP	kg CFC 11 eq.	5.48E-10	5.48E-10	4.51E-18	7.19E-18	2.12E-18	2.24E-17	-1.48E-15
AP	kg SO_2 eq.	3.91E-04	3.67E-04	8.58E-06	7.94E-06	4.03E-06	3.58E-06	-3.35E-05
EP	kg N eq.	3.00E-05	2.55E-05	8.26E-07	1.92E-06	3.88E-07	1.39E-06	-8.39E-06
SFP	kg O_3 eq.	5.04E-03	4.65E-03	1.99E-04	4.00E-05	9.33E-05	5.36E-05	-3.92E-04
ADP (fossil)	MJ	1.59E+00	1.53E+00	3.33E-02	3.43E-03	1.57E-02	1.04E-02	-7.86E-02

Table 16: Rest of the World LCIA results for jacks ATLAS-X1 Unshielded

Parameters	Unit	Total	A1-A3	A4	A5	C2	C4	D
GWP – 100	kg CO_2 eq.	2.18E-01	1.05E-01	2.39E-03	2.72E-03	1.12E-03	7.02E-04	-6.54E-03
ODP	kg R11 eq.	9.49E-10	4.74E-10	2.55E-16	4.18E-16	1.20E-16	1.31E-15	-4.41E-15

PARAMETERS	UNIT	TOTAL	A1-A3	A4	A5	C2	C4	D
AP	kg SO_2 eq.	7.30E-04	3.64E-04	6.28E-06	5.04E-06	2.95E-06	2.81E-06	-3.12E-05
EP	kg Phosphate eq.	7.77E-05	3.61E-05	1.87E-06	2.40E-06	8.79E-07	1.58E-06	-7.96E-06
POCP	kg Ethene eq.	7.92E-05	4.11E-05	-1.13E-06	1.18E-06	-5.33E-07	2.58E-08	-2.12E-06

Table 17: North America LCIA results for jacks EXTREME™ Unshielded

PARAMETERS	UNIT	TOTAL	A1-A3	A4	A5	C2	C4	D
GWP 100	kg CO_2 eq.	4.58E-02	4.12E-02	1.22E-03	2.72E-03	3.94E-04	2.46E-04	-2.75E-03
ODP	kg CFC 11 eq.	3.51E-10	3.51E-10	2.29E-18	7.19E-18	7.42E-19	7.86E-18	-5.48E-16
AP	kg SO_2 eq.	1.40E-04	1.25E-04	4.36E-06	7.94E-06	1.41E-06	1.09E-06	-1.23E-05
EP	kg N eq.	1.48E-05	1.09E-05	4.20E-07	1.92E-06	1.36E-07	1.44E-06	-2.98E-06
SFP	kg O_3 eq.	2.10E-03	1.91E-03	1.01E-04	4.00E-05	3.27E-05	1.88E-05	-1.46E-04
ADP (fossil)	MJ	8.74E-01	8.45E-01	1.70E-02	3.43E-03	5.48E-03	3.65E-03	-3.32E-02

Table 18: Rest of the World LCIA results for jacks EXTREME™ Unshielded

PARAMETERS	UNIT	TOTAL	A1-A3	A4	A5	C2	C4	D
GWP – 100	kg CO_2 eq.	8.88E-02	4.12E-02	1.22E-03	2.72E-03	3.94E-04	2.46E-04	-2.75E-03
ODP	kg R11 eq.	6.10E-10	3.05E-10	1.30E-16	4.18E-16	4.20E-17	4.58E-16	-3.36E-15
AP	kg SO2 eq.	2.44E-04	1.17E-04	3.19E-06	5.04E-06	1.03E-06	9.86E-07	-1.15E-05
EP	kg Phosphate eq.	3.95E-05	1.61E-05	9.51E-07	2.40E-06	3.08E-07	1.48E-06	-2.85E-06
POCP	kg Ethene eq.	2.40E-05	1.20E-05	-5.77E-07	1.18E-06	-1.87E-07	9.04E-09	-7.87E-07

Table 19: North America LCIA results for Panel - 1U Flat and Angled

PARAMETERS	UNIT	TOTAL	A1-A3	A4	A5	C2	C4	D
GWP 100	kg CO_2 eq.	2.14E+00	1.94E+00	6.42E-02	9.67E-02	2.75E-02	1.71E-02	-2.00E-01
ODP	kg CFC 11 eq.	2.03E-08	2.03E-08	1.21E-16	2.44E-16	5.17E-17	5.48E-16	-7.92E-11
AP	kg SO_2 eq.	7.21E-03	6.38E-03	2.30E-04	4.16E-04	9.84E-05	9.13E-05	-4.60E-04

PARAMETERS	UNIT	TOTAL	A1-A3	A4	A5	C2	C4	D
EP	kg N eq.	6.46E-04	5.18E-04	2.22E-05	8.52E-05	9.47E-06	1.11E-05	-3.02E-05
SFP	kg O_3 eq.	9.33E-02	8.26E-02	5.33E-03	1.78E-03	2.28E-03	1.31E-03	-1.08E-02
ADP (fossil)	MJ	2.78E+01	2.61E+01	8.94E-01	1.11E-01	3.82E-01	2.55E-01	-2.38E+00

Table 20: Rest of the World LCIA results for Panel - 1U Flat and Angled

PARAMETERS	UNIT	TOTAL	A1-A3	A4	A5	C2	C4	D
GWP – 100	kg CO_2 eq.	4.08E+00	1.94E+00	6.42E-02	9.67E-02	2.75E-02	1.71E-02	-2.00E-01
ODP	kg R11 eq.	3.50E-08	1.75E-08	6.85E-15	1.42E-14	2.93E-15	3.19E-14	-7.93E-11
AP	kg SO_2 eq.	1.27E-02	6.23E-03	1.68E-04	2.55E-04	7.20E-05	6.87E-05	-8.79E-04
EP	kg Phosphate eq.	1.62E-03	6.87E-04	5.02E-05	1.11E-04	2.14E-05	1.66E-05	-1.53E-04
POCP	kg Ethene eq.	1.11E-03	5.66E-04	-3.04E-05	6.64E-05	-1.30E-05	6.30E-07	-7.39E-05

Table 21: North America LCIA results for Panel – 2U Angled

PARAMETERS	UNIT	TOTAL	A1-A3	A4	A5	C2	C4	D
GWP 100	kg CO_2 eq.	4.41E+00	4.07E+00	1.25E-01	1.17E-01	6.28E-02	3.91E-02	-4.40E-01
ODP	kg CFC 11 eq.	3.27E-08	3.27E-08	2.36E-16	2.94E-16	1.18E-16	1.25E-15	-1.81E-10
AP	kg SO_2 eq.	1.39E-02	1.25E-02	4.49E-04	5.02E-04	2.25E-04	2.09E-04	-1.03E-03
EP	kg N eq.	1.16E-03	9.71E-04	4.32E-05	1.03E-04	2.16E-05	2.54E-05	-6.72E-05
SFP	kg O_3 eq.	1.79E-01	1.58E-01	1.04E-02	2.15E-03	5.21E-03	2.99E-03	-2.43E-02
ADP (fossil)	MJ	8.53E+01	5.05E+01	3.32E+01	1.34E-01	8.74E-01	5.82E-01	-5.22E+00

Table 22: Rest of the World LCIA results for Panel – 2U Angled

PARAMETERS	UNIT	TOTAL	A1-A3	A4	A5	C2	C4	D
GWP – 100	kg CO_2 eq.	8.38E+00	4.07E+00	1.25E-01	1.17E-01	6.28E-02	3.91E-02	-4.40E-01
ODP	kg R11 eq.	5.64E-08	2.83E-08	1.34E-14	1.71E-14	6.69E-15	7.29E-14	-1.81E-10
AP	kg SO2 eq.	2.45E-02	1.23E-02	3.28E-04	3.08E-04	1.64E-04	1.57E-04	-1.99E-03

PARAMETERS	UNIT	TOTAL	A1-A3	A4	A5	C2	C4	D
EP	kg Phosphate eq.	2.90E-03	1.31E-03	9.78E-05	1.34E-04	4.90E-05	3.79E-05	-3.48E-04
POCP	kg Ethene eq.	1.90E-03	1.04E-03	-5.93E-05	8.01E-05	-2.97E-05	1.44E-06	-1.67E-04

4.2. Visualization of LCIA results

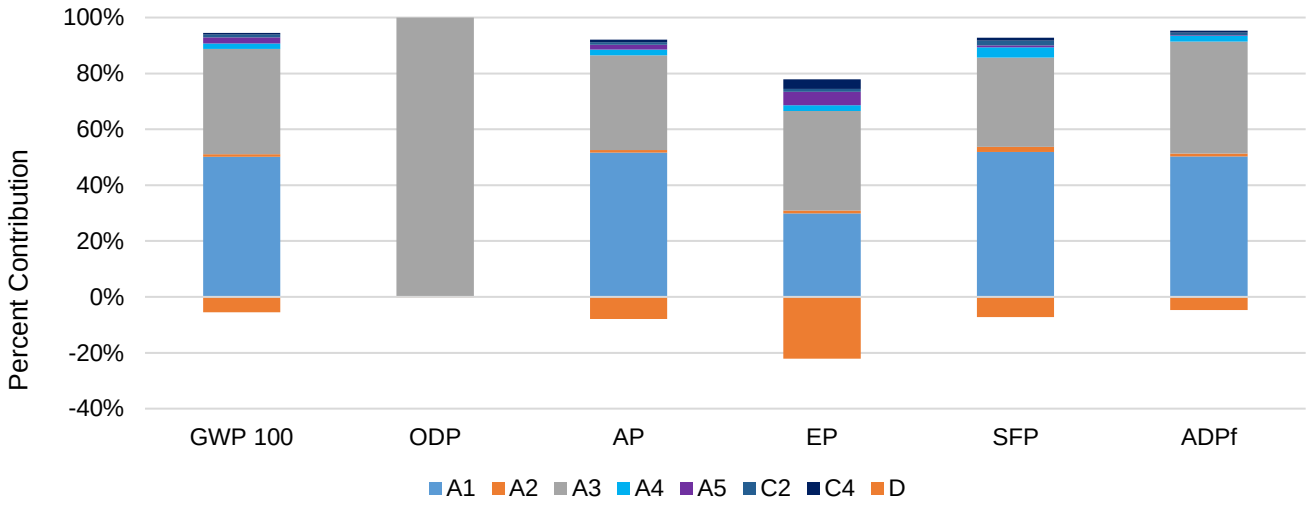

Figure 5: Contributions to the environmental impact categories for ATLAS-X1™ Shielded.

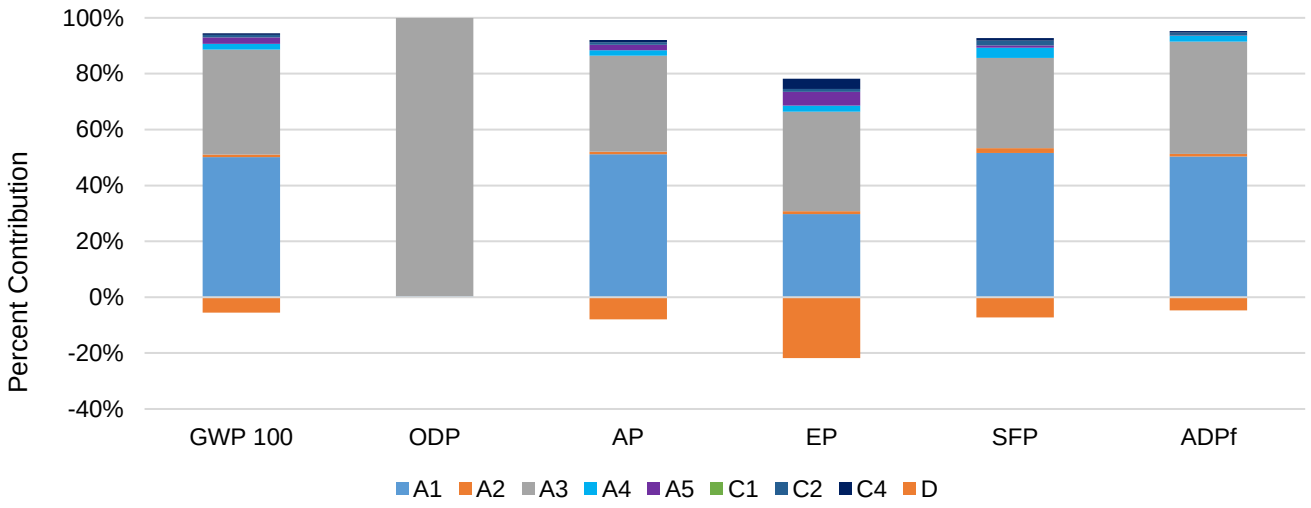

Figure 6: Contributions to the environmental impact categories for ATLAS-X1 Unshielded

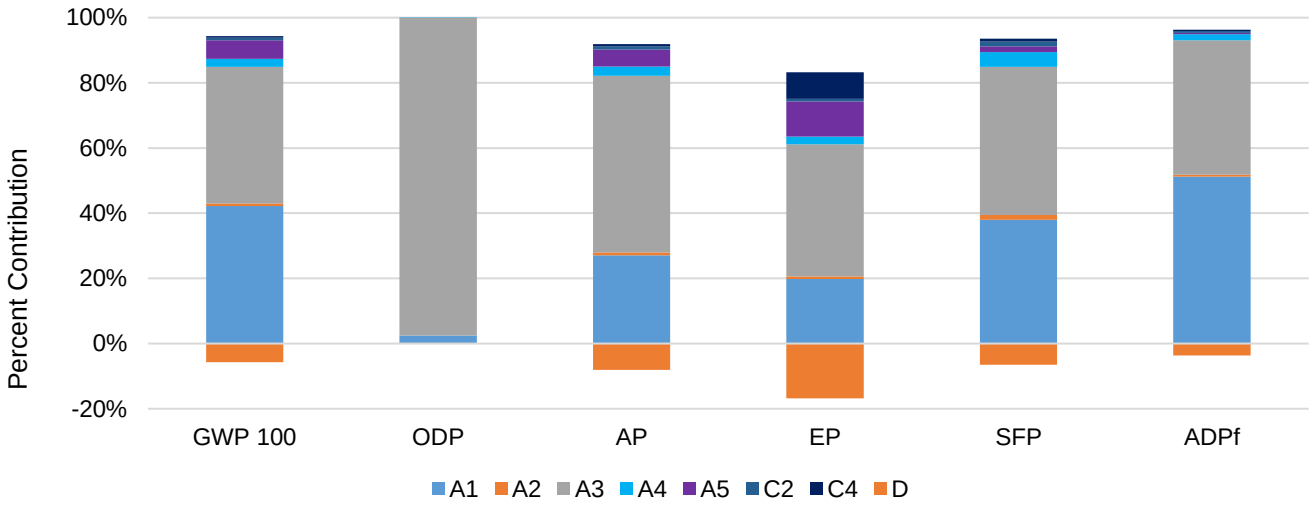

Figure 7: Contributions to the environmental impact categories for EXTREME™ Unshielded jack

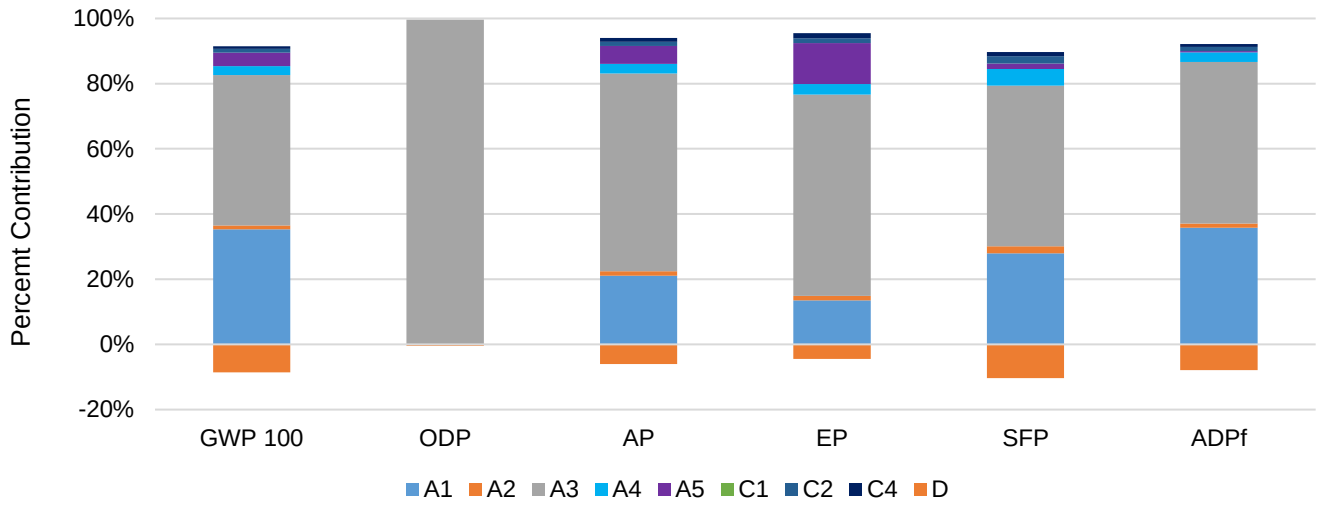

Figure 8: Contributions to the environmental impact categories for Panel 1U Flat and Angled

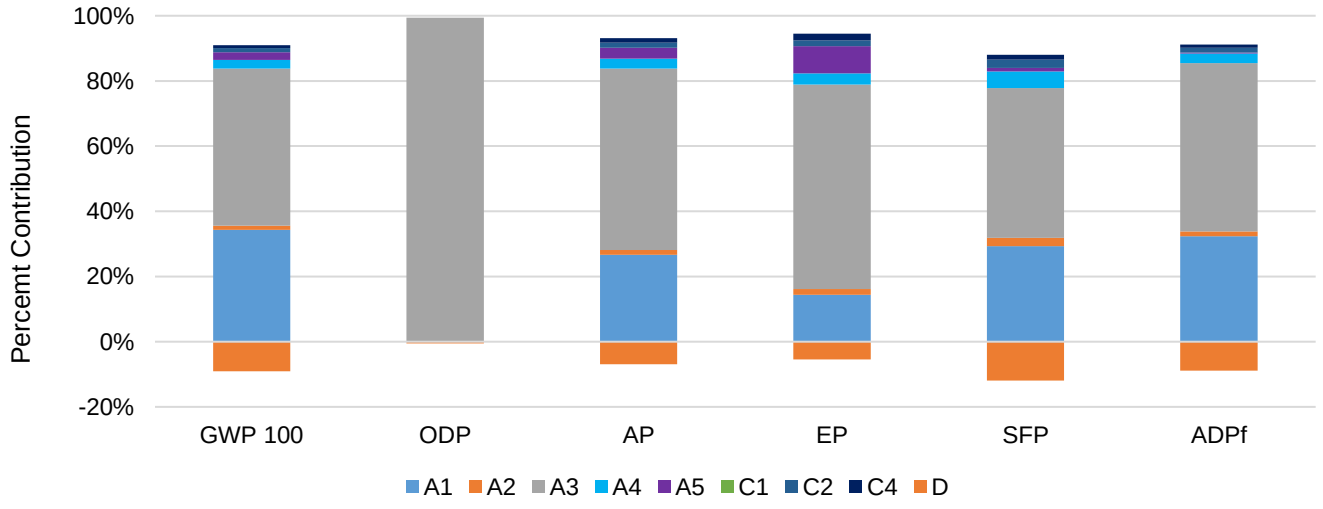

Figure 9: Contributions to the environmental impact categories for Panel 2U Angled

4.3. Life Cycle Inventory Results

Use of resources, generation of wastes and carbon emissions and removals for Leviton's jacks and panels as per ISO 21930 (ISO, 2017) are presented from Table 23 through Table 32.

Table 23: Resource Use for jacks ATLAS-X1™ Shielded

Parameters	Unit	Total	A1-A3	A4	A5	C2	C4	D
RPRe	MJ	2.96E-01	2.92E-01	1.36E-03	3.13E-04	6.49E-04	1.06E-03	-1.31E-01
RPRm	MJ	5.63E-02	5.63E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRPRe	MJ	1.87E+00	1.80E+00	3.51E-02	3.54E-03	1.67E-02	1.13E-02	-9.12E-02
NRPRm	MJ	1.83E-01	1.83E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SM	kg	-	-	-	-	-	-	-
RSF	MJ	-	-	-	-	-	-	-
NRSF	MJ	-	-	-	-	-	-	-
RE	MJ	-	-	-	-	-	-	-
FW	m^3	6.52E-04	6.38E-04	4.90E-06	4.42E-06	2.33E-06	1.62E-06	-5.23E-05

Table 24: Output Flows and Waste Categories for jacks ATLAS-X1 Shielded

Parameters	Unit	Total	A1-A3	A4	A5	C2	C4	D
HWD	kg	7.17E-06	7.17E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NHWD	kg	2.53E-02	2.31E-03	0.00E+00	5.36E-03	0.00E+00	1.76E-02	0.00E+00
HLRW	kg	9.28E-08	9.25E-08	1.15E-10	5.09E-11	5.48E-11	1.13E-10	-4.02E-09
ILLRW	kg	8.26E-05	8.23E-05	9.70E-08	4.39E-08	4.62E-08	9.90E-08	-3.35E-06
CRU	kg	-	-	-	-	-	-	-
MFR	kg	2.08E-03	2.08E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MER	kg	-	-	-	-	-	-	-
EE	MJ	6.31E-03	4.46E-04	0.00E+00	5.86E-03	0.00E+00	0.00E+00	0.00E+00

Table 25: Resource Use for jacks ATLAS-X1™ Unshielded

PARAMETERS	UNIT	TOTAL	A1-A3	A4	A5	C2	C4	D
RPRe	MJ	2.80E-01	2.76E-01	1.31E-03	3.13E-04	6.13E-04	1.00E-03	-1.24E-01
RPRm	MJ	5.63E-02	5.63E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRPRe	MJ	1.79E+00	1.73E+00	3.36E-02	3.54E-03	1.58E-02	1.07E-02	-8.68E-02
NRPRm	MJ	1.84E-01	1.84E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SM	kg	-	-	-	-	-	-	-
RSF	MJ	-	-	-	-	-	-	-
NRSF	MJ	-	-	-	-	-	-	-
RE	MJ	-	-	-	-	-	-	-
FW	m^3	6.20E-04	6.07E-04	4.69E-06	4.42E-06	2.20E-06	1.53E-06	-4.97E-05

Table 26: Output Flows and Waste Categories for jacks ATLAS-X1 Unshielded

PARAMETERS	UNIT	TOTAL	A1-A3	A4	A5	C2	C4	D
HWD	kg	6.78E-06	6.78E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NHWD	kg	2.42E-02	2.18E-03	0.00E+00	5.36E-03	0.00E+00	1.67E-02	0.00E+00
HLRW	kg	8.80E-08	8.77E-08	1.10E-10	5.09E-11	5.18E-11	1.07E-10	-3.86E-09
ILLRW	kg	7.82E-05	7.79E-05	9.29E-08	4.39E-08	4.37E-08	9.36E-08	-3.22E-06
CRU	kg	-	-	-	-	-	-	-
MFR	kg	1.97E-03	1.97E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MER	kg	-	-	-	-	-	-	-
EE	MJ	6.29E-03	4.22E-04	0.00E+00	5.86E-03	0.00E+00	0.00E+00	0.00E+00

Table 27: Resource Use for jacks EXTREME™ Unshielded

PARAMETERS	UNIT	TOTAL	A1-A3	A4	A5	C2	C4	D
RPRe	MJ	7.00E-02	6.84E-02	6.64E-04	3.13E-04	2.15E-04	3.51E-04	-4.47E-02
RPRm	MJ	5.63E-02	5.63E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRPRe	MJ	9.35E-01	9.06E-01	1.71E-02	3.54E-03	5.52E-03	3.74E-03	-3.76E-02

Parameters	Unit	Total	A1-A3	A4	A5	C2	C4	D
NRPRm	MJ	2.12E-01	2.12E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SM	kg	-	-	-	-	-	-	-
RSF	MJ	-	-	-	-	-	-	-
NRSF	MJ	-	-	-	-	-	-	-
RE	MJ	-	-	-	-	-	-	-
FW	m³	2.20E-04	2.12E-04	2.39E-06	4.42E-06	7.72E-07	5.37E-07	-2.00E-05

Table 28: Output Flows and Waste Categories for jacks EXTREME™ Unshielded

Parameters	Unit	Total	A1-A3	A4	A5	C2	C4	D
HWD	kg	2.37E-06	2.37E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NHWD	kg	1.20E-02	7.64E-04	0.00E+00	5.36E-03	0.00E+00	5.83E-03	0.00E+00
HLRW	kg	2.78E-08	2.77E-08	5.61E-11	5.09E-11	1.81E-11	3.74E-11	-2.08E-09
ILLRW	kg	2.34E-05	2.33E-05	4.73E-08	4.39E-08	1.53E-08	3.28E-08	-1.74E-06
CRU	kg	-	-	-	-	-	-	-
MFR	kg	6.88E-04	6.88E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MER	kg	-	-	-	-	-	-	-
EE	MJ	6.01E-03	1.48E-04	0.00E+00	5.86E-03	0.00E+00	0.00E+00	0.00E+00

Table 29: Resource Use for Panels - 1U Flat and Angled

Parameters	Unit	Total	A1-A3	A4	A5	C2	C4	D
RPRe	MJ	3.33E+00	3.24E+00	3.50E-02	1.07E-02	1.50E-02	2.44E-02	-3.02E+00
RPRm	MJ	3.02E+00	3.02E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRPRe	MJ	3.12E+01	2.95E+01	9.01E-01	1.14E-01	3.85E-01	2.61E-01	-2.58E+00
NRPRm	MJ	1.09E+00	1.09E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SM	kg	-	-	-	-	-	-	-
RSF	MJ	-	-	-	-	-	-	-
NRSF	MJ	-	-	-	-	-	-	-

Parameters	Unit	Total	A1-A3	A4	A5	C2	C4	D
RE	MJ	-	-	-	-	-	-	-
FW	m³	1.16E-02	1.12E-02	1.26E-04	1.10E-04	5.38E-05	3.74E-05	-1.21E-03

Table 30: Output Flows and Waste Categories for Panels - 1U Flat and Angled

Parameters	Unit	Total	A1-A3	A4	A5	C2	C4	D
HWD	kg	1.65E-04	1.65E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NHWD	kg	6.44E-01	5.33E-02	0.00E+00	1.84E-01	0.00E+00	4.07E-01	0.00E+00
HLRW	kg	1.57E-06	1.56E-06	2.96E-09	1.57E-09	1.26E-09	2.61E-09	-9.26E-08
ILLRW	kg	1.31E-03	1.30E-03	2.49E-06	1.36E-06	1.07E-06	2.28E-06	-7.72E-05
CRU	kg	-	-	-	-	-	-	-
MFR	kg	9.60E-02	9.60E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MER	kg	-	-	-	-	-	-	-
EE	MJ	1.42E-01	1.03E-02	0.00E+00	1.32E-01	0.00E+00	0.00E+00	0.00E+00

Table 31: Resource Use for Panels - 2U Angled

Parameters	Unit	Total	A1-A3	A4	A5	C2	C4	D
RPRe	MJ	7.21E+00	7.04E+00	6.83E-02	1.29E-02	3.42E-02	5.58E-02	-6.86E+00
RPRm	MJ	3.64E+00	3.64E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRPRe	MJ	6.14E+01	5.81E+01	1.76E+00	1.38E-01	8.80E-01	5.96E-01	-5.63E+00
NRPRm	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SM	kg	-	-	-	-	-	-	-
RSF	MJ	-	-	-	-	-	-	-
NRSF	MJ	-	-	-	-	-	-	-
RE	MJ	-	-	-	-	-	-	-
FW	m³	2.38E-02	2.32E-02	2.45E-04	1.33E-04	1.23E-04	8.55E-05	-2.66E-03

Table 32: Output Flows and Waste Categories for Panels - 2U Angled

Parameters	Unit	Total	A1-A3	A4	A5	C2	C4	D
HWD	kg	3.78E-04	3.78E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NHWD	kg	1.27E+00	1.22E-01	0.00E+00	2.22E-01	0.00E+00	0.00E+00	9.29E-01
HLRW	kg	3.47E-06	3.46E-06	5.77E-09	1.90E-09	0.00E+00	2.89E-09	5.95E-09
ILLRW	kg	2.92E-03	2.91E-03	4.86E-06	1.64E-06	0.00E+00	2.44E-06	5.22E-06
CRU	kg	-	-	-	-	-	-	-
MFR	kg	2.19E-01	2.19E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MER	kg	-	-	-	-	-	-	-
EE	MJ	1.83E-01	2.35E-02	0.00E+00	1.59E-01	0.00E+00	0.00E+00	0.00E+00

5. LCA Interpretation

The results presented in this study provide the cradle-to-grave environmental performance of Leviton's jacks and panels products. Overall, the findings suggest that the environmental impacts of jacks are largely determined by the product stage (A1-A3), with raw materials (A1) and manufacturing (A3) contributing the most to all impact categories. The primary impact is associated with upstream zinc production in the case of ATLAS-X1™ Shielded and Unshielded while the upstream production of upstream ABS and polycarbonate production contributes the maximum in case of EXTREME™ Unshielded jacks. Regarding the installation of jacks, module (A5), its contribution to overall impacts is relatively small. The impacts associated with transportation are also minimal including inbound raw material (A2), transport of finished products to the installation site (A4) and from installation site to disposal transport at EOL (C2). Although, the impacts associated with deconstruction (C1) have been assumed to be zero, the end-of-life impacts from disposal (C4) do account for a small portion of the total impacts, with the exception to EP. Credits earned at the end of-of-life (D) are primarily due to the material recycling of corrugated cardboard.

Similarly, the study of panels suggests that the environmental impacts of panels are largely determined by the product stage (A1-A3), with manufacturing (A3) contributing the most to all impact categories, followed by raw materials (A1). The primary impact is associated with upstream steel that is used as a raw material. Electricity consumption during manufacturing of panels also contribute significantly to the overall impacts. Regarding the installation of jacks, module (A5), its contribution to overall impacts is relatively small. The impacts associated with transportation are also minimal including inbound raw material (A2), transport of finished products to the installation site (A4) and from installation site to disposal transport at EOL (C2). Although, the impacts associated with deconstruction (C1) have been assumed to be zero, the end-of-life impacts from disposal (C4) do account for a small portion of the total impacts, with the exception to EP. Credits earned at the end of-of-life (D) are primarily due to the material recycling of corrugated cardboard.

6. Additional Environmental Information

6.1. Environmental Activities and Certifications

Leviton Network Solutions has long been motivated by sustainability goals. Our copper and fiber cable manufacturing facility in Glenrothes, UK, has been carbon neutral since 2011, a first step toward accomplishing CN2030, our initiative to achieve carbon neutrality across our operations by 2025, with an ambition to be net zero by 2050. Also, Leviton Network Solutions' environmental activities include: the first data communications cable factory to achieve BSI PAS 2060 Carbon Neutrality, all manufacturing facilities are ISO 9001 Certified, and primary cable and connectivity factories are ISO 14001 and ISO 50001 Certified. Also, all manufacturing facilities comply with Conflict Minerals regulations, including supply chain contracts and supplier reviews.

6.2. Further Information

This report has been generated through Leviton’s System Verification Laboratory (SVL).

Leviton's CN2030 sustainability program to achieve carbon neutrality is based on the company’s refreshed commitment to reduce its environmental impact in several focus areas: energy, waste, recycling, water, and by creating innovations that empower and enable customers to be more sustainable. Learn more about Leviton Network Solutions' sustainability commitments: Leviton.com/sustainabilit.

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