Environmental Product Declaration

ETL-A/B and ETL-A/B-CR

SELF-REGULATING HEATING CABLE FOR PIPE FREEZE PROTECTION

RAYCHEM ETL cables feature self-regulating technology.

The heat output automatically adjusts depending on the local temperature at ev point along its length. It never overheats even when overlapped.

chemelex
excellence is everything

Chemelex is a global leader in electrical heat tracing products and services, mineral-insulated fire rated wiring, electrical floor heating systems, and fluid Leak detection systems. The company supports customers with products and services in industries ranging from commercial and residential construction, data centers, energy, industrial process heating and transportation. Its products are marketed globally under leading brands including Raychem, Tracer, NuHeat, Pyrotenax, and Nuheat

Chemelex's Raychem brand is at the forefront of the heat tracing industry. Products include industrial process heating systems, pipe freeze protection, surface snow melting & de-icing, floor heating, and hot water temperature maintenance. Raychem's solutions are vital in sectors including energy, infrastructure, and commercial & residential building. Applications ensure accurate temperature maintenance for operational efficiency, enhanced safety and customer comfort.

UL CERTIFIED ENVIRONMENTAL PRODUCT DECLARATION UL.COM/EPD

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RAYCHEM ETL-A/B and ETL-A/B-CR
Self-regulating heating cable

CERTIFIED
ENVIRONMENTAL PRODUCT DECLARATION
UL.COM/EPD

According to ISO 14025, EN 15804, and EN 50693

EPD PROGRAM AND PROGRAM OPERATOR NAME, ADDRESS, LOGO, AND WEBSITE	UL Solutions www.ul.com 333 Pfingsten Rd, Northbrook, IL 60062 www.spot.ul.com
GENERAL PROGRAM INSTRUCTIONS AND VERSION NUMBER	UL Solutions General Program Instructions v.2.7 2022
MANUFACTURER NAME AND ADDRESS	Chemelex 15375 Memorial Drive, Houston, TX 77079, United States
DECLARATION NUMBER	4791545949.105.1
DECLARED PRODUCT & FUNCTIONAL UNIT	1 km of R-ETL-A cable
REFERENCE PCR AND VERSION NUMBER	Core PCR: EN 15804:2012+A2:2019 Guidance PCR: PEP-PCR-ed4-EN-2021 09 06
DESCRIPTION OF PRODUCT APPLICATION/USE	Pipe freeze protection
PRODUCT RSL DESCRIPTION (IF APPL.)	25 years
MARKETS OF APPLICABILITY	Global
DATE OF ISSUE	April 21, 2025
PERIOD OF VALIDITY	5 Years
EPD TYPE	Product-specific
RANGE OF DATASET VARIABILITY	N/A
EPD SCOPE	Cradle-to-grave
YEAR(S) OF REPORTED PRIMARY DATA	2023
LCA SOFTWARE & VERSION NUMBER	LCA For Experts 10.8
LCI DATABASE(S) & VERSION NUMBER	Sphera MLC 2024.2
LCIA METHODOLOGY & VERSION NUMBER	EF 3.1 (as per EN 15804+A2)

The PCR review was conducted by:	PepEcoPassport 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:	WAP Sustainability
This life cycle assessment was independently verified in accordance with ISO 14044 and the reference PCR by:	Peter Yeon, H.I.P. Pathway

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

Chemelex is a global leader in electric thermal and sensing solutions, protecting the world's critical processes, places and people. With over 50 years of innovation and a commitment to excellence, we develop solutions that ensure safety, reliability, and efficiency in diverse environments – from industrial plants and data centers to people's homes. Chemelex delivers future-ready technologies, advanced engineering capabilities and local expertise backed by global standards. Our offering includes a leading portfolio from our trusted brands: Raychem, Tracer, Pyrotenax, and Nuheat.

1.2. Product Description

Figure 1: ETL-A Product Image

R-ETL-A

The reference product for RAYCHEM ETL self-regulating heating cables is R-ETL-A. This product provides freeze protection to piped services in and around buildings. R-ETL-A cables are used for pipe freeze protection. Heating cables must be used together with an appropriate thermostat to secure against overheating and reduce energy consumption.

Figure 2: ETL-A/B-CR Product Image

R-ETL-A/B-CR

The reference product to represent the ETL-A/B-CR cables is R-ETL-B-CR. This cable product is intended to be used to mount on pipes in or outside of buildings. It will be covered by insulation. Product generates heat for heat loss compensation and will be controlled by an external thermostat / controller.

Table 1: Products covered in the EPD

PRODUCT NUMBER	PRODUCT NAME	NOMINAL POWER OUTPUT, IN-PIPE @ 230V	NOMINAL POWER OUTPUT @ 5°C, 230V	MAX CIRCUIT LENGTH	MAX CIRCUIT LENGTH, IN-PIPE
P000002043	R-ETL-A-CR	-	10 W/m	100 m	-
P000002044	R-ETL-B-CR	-	16 W/m	100 m	-
924269-000	R-ETL-A	16 W/m	10 W/m	100 m	60 m
P000002042	R-ETL-B	25 W/m	16 W/m	100 m	60 m

1.3. Application

R-ETL-A/B are suitable for on- or in-pipe applications, R-ETL-A/B-CR for on-pipe only.

1.4. Technical Requirements

Minimum installation temperature: -20˚C.

The technical requirements are available on the Chemelex product page under engineering specifications: https://www.nvent.com/en-gb/raychem/products/etl-self-regulating-heating-cable-0

1.5. Properties of Declared Product as Delivered

The product is spooled onto an ABS reel and packaged in a cardboard box.

1.6. Material Composition

Table 2: Material composition, per 1 km

MATERIAL	Weight [%]	
	R-ETL-A	R-ETL-B-CR
COPPER	49	49
PLASTIC	41	32
MINERALS AND OTHER ADDITIVES	10	19
TOTAL	**100**	**100**

1.7. Manufacturing

The raw materials are blended and extruded as a masterbatch to create our core compound.Then the compound is extruded onto conductors to build the cable core. The core is run through another extrusion process which applies a dielectric layer called the primary jacket. The product then goes through beaming to induce polymetric cross linking. After beaming, the cable is re-spooled and inspected before going to the braiders to get the grounding braid layer added. The braided cable goes through another extrusion process where the dielectric final jacket is applied. The jacketed product is then sent to the printing line where the batch specific information is applied to the outer layer of the cable. The cable is then respooled onto ABS Reels for shipping and sent to the box line to get put into individual boxes.Samples are sent to QC for testing and release of the batch.

These products are made using renewable electricity in the form of Renewable Energy Certificates (RECs). Chemelex purchases RECs to cover a portion of the electricity used at the manufacturing facility in Redwood City, United States.

1.8. Packaging

The ABS reels are made from recycled materials and are recyclable.

1.9. Transportation

The cables are initially spooled onto master reels in Redwood City, CA, USA. Customer orders are fulfilled by respooling the required length of cables onto smaller recycled plastic reels. These smaller reels are then shipped to distributors via ground deliveries, who subsequently transport the goods to their final installation sites.

1.10. Product Installation

Installation only requires the use of hand tools. No maintainance is required after installation.

1.11. Use

The cable provides 10w/m @ 5°C if powered. The power on duration depends on the surrounding temperature and whether a controller is used. the typical operating temperature range is -20 to 5°C. All product loss of 5% is estimated during the cable installation.

1.12. Reference Service Life

The reference service life (RSL) of the product is 25 years.

1.13. Reuse, Recycling, and Energy Recovery

The end-of-life disposal rates (recycling, energy recovery, and disposal) used in the study were based on EN 50639:2019 – Product category rules for life cycle assessments of electronic and electrical products and systems, Table G.4, as shown in Table 3.

Table 3: End-of-life disposal rates

	Material Recovery Rate (%)	Energy Recovery Rate (%)	Disposal Rate (%)
Copper	60	0	40
Aluminum	70	0	30
Steel	80	0	20
Plastic	20	40	40
Electronics	50	0	50
Minerals and other additives	0	0	100

1.14. Disposal

The copper braid and bus wires are recyclable. The remaining materials will go to a landfill.

2. Life Cycle Assessment Background Information

2.1. Functional Unit

The functional unit is 1 km of cable.

2.2. System Boundary

This EPD is a Cradle-to-Grave study.

2.3. Estimates and Assumptions

All estimates and assumptions are within the requirements of ISO 14040/44 and EN 15804. The primary data was collected as annual totals for electricity usage and production volume. The utility usage information was divided by the production to find a utility consumption per kilometer of cable produced.

2.4. Cut-off Criteria

Material inputs greater than 1% (based on total mass of the final product) were included within the scope of analysis. Material inputs less than 1% were included if sufficient data was available to warrant inclusion and/or the material input was thought to have significant environmental impact. Cumulative excluded material inputs and environmental impacts are less than 5% based on total weight of the functional unit.

2.5. Data Sources

Primary data were collected by facility personnel and from utility bills and was used for all manufacturing processes. Whenever available, supplier data was used for raw materials used in the production process. When primary data did not exist, secondary data for raw material production was utilized from Sphera Managed LCA Content Database 2024.2.

2.6. Data Quality

The geographical scope of the manufacturing portion of all life cycle modules is North America. All primary data were collected from the manufacturer. The geographic coverage of primary data is considered excellent. Time coverage of this data is considered good. Primary data provided by the manufacturer is specific to the technology used in manufacturing their product. It is site-specific and considered of good quality. Data necessary to model cradle-to-gate unit processes was sourced from Sphera Managed LCA Content LCI datasets.

2.7. Period under Review

The period under review is the full calendar year 2023.

2.8. Allocation

General principles of allocation were based on ISO 14040/44. To derive a per-unit value for manufacturing inputs such as electricity, thermal energy and water, allocation based on total production by mass was adopted. As a default, secondary Sphera Managed LCA datasets use a physical basis for allocation.

3. Life Cycle Assessment Scenarios

It is assumed that all raw materials are delivered to the manufacturing facility via truck and ship, based on global region. Distances were calculated using the supplier location and the location of manufacturing.

Table 4. Transport to the building site (A4)

TRANSPORTATION DETAILS	UNIT	TRUCK	RAIL	SHIP	AIR
Vehicle type		Heavy Heavy-duty Diesel Truck / 53,333 lb payload - 8b	Rail transport cargo – Diesel, average train, gross tonne weight 1,000t/726t pay load capacity	Bulk commodity carrier, 1.000 to 250.000 dwt payload capacity, deep sea	Cargo plane, 65t payload
Fuel efficiency for full vehicle		42 l/100km	1.17E-05 kg / kg	15,134 l/100km	0.00175 kg / lb
Capacity utilization (including empty runs, mass based	%	85	40	53	66

TRANSPORTATION INFORMATION	UNIT	R-ETL-A	R-ETL-B-CR
Transport distance - truck	km	5.02E+03	
Gross density of products transported	kg/m^3	n/a	
Weight of products transported (if gross density not reported)	kg/km	7.26E+01	7.13E+01
Volume of products transported (if gross density not reported)	m^3	n/a	

Table 5. Installation into the building (A5)

NAME	R-ETL-A	R-ETL-B-CR	UNIT
Ancillary materials	0.00E+00	0.00E+00	kg
Net freshwater consumption specified by water source and fate (amount evaporated, amount disposed to sewer)	0.00E+00	0.00E+00	m^3
Other resources	0.00E+00	0.00E+00	kg
Electricity consumption	0.00E+00	0.00E+00	MJ
Other energy carriers	0.00E+00	0.00E+00	MJ
Product loss per functional unit	3.61E+00	3.54E+00	kg/m

NAME	R-ETL-A	R-ETL-B-CR	UNIT
Waste materials at the construction site before waste processing, generated by product installation	4.07E+00	4.01E+00	kg
Output materials resulting from on-site waste processing (specified by route; e.g. for recycling, energy recovery and/or disposal)	0.00E+00	0.00E+00	kg
Biogenic carbon contained in packaging	1.21E-01	1.23E-01	kg C
Direct emissions to ambient air, soil and water	0.00E+00	0.00E+00	kg
VOC content	0.00E+00	0.00E+00	µg/m^3

Table 6. Reference Service Life

NAME	R-ETL-A	R-ETL-B-CR	UNIT
RSL	25		years
Declared product properties (at the gate) and finishes, etc.	The thermal cables are spooled on an ABS reel.		Units as appropriate
Design application parameters (if instructed by the manufacturer), including references to the appropriate practices and application codes)	Designed, tested, and 3rd party approved to IEC62395.		
An assumed quality of work, when installed in accordance with the manufacturer's instructions	10 Year Extended product warranty when installed using genuine components of the manufacturer and installed & commissioned as per the manufacturer's instructions.		
Outdoor environment, (if relevant for outdoor applications), e.g. weathering, pollutants, UV and wind exposure, building orientation, shading, temperature	UV resistant, flame resistant in accordance with IEC62395. For use outdoor on-pipe and in-pipe applications including drinking water.	UV resistant, flame resistant in accordance with IEC62395. For use outdoor on-pipe applications.	
Indoor environment, (if relevant for indoor applications), e.g. temperature, moisture, chemical exposure)	Moisture resistant, IP68 rated cable, temperature resistant to +65˚C.		
Use conditions, e.g. frequency of use, mechanical exposure.	For Intermittent or continuous use for pipe freeze protection purposes.		
Maintenance, e.g. required frequency, type and quality of replacement components	No replacements are necessary.		

Table 7. Operational energy use (B6)

NAME	R-ETL-A	R-ETL-B-CR	UNIT
Lifetime of cable	25		years
Power consumption at 5°C	10		W/m
Power consumption over lifetime	1.73E+05		MJ/km

Table 8. End of life (C1-C4)

NAME		R-ETL-A	R-ETL-B-CR	UNIT
Recovery (specified by type)	Reuse	0.00E+00	0.00E+00	kg
	Recycling	2.02E+01	1.98E+01	kg
	Landfill	3.44E+01	3.68E+01	kg

NAME		R-ETL-A	R-ETL-B-CR	UNIT
	Incineration	1.41E+01	1.08E+01	kg
	Incineration with energy recovery	0.00E+00	0.00E+00	kg
Disposal (landfill)	Product or material for final deposition	3.44E+01	3.68E+01	kg
Removals of biogenic carbon (excluding packaging)		0.00E+00	0.00E+00	kg CO_2

Table 9. Reuse, recovery and/or recycling potentials (D), relevant scenario information

NAME	R-ETL-A	R-ETL-B-CR	UNIT
Net energy benefit from energy recovery from waste treatment declared as exported energy in C3 (R>0.6)	0.00E+00	0.00E+00	MJ
Net energy benefit from thermal energy due to treatment of waste declared as exported energy in C4 (R<0.6)	1.20E+02	9.21E+01	MJ
Net energy benefit from material flow declared in C3 for energy recovery	0.00E+00	0.00E+00	MJ

4. Life Cycle Assessment Results

Table 10. Description of the system boundary modules

	PRODUCT STAGE			CONSTRUCT-ION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY
	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
	Raw material supply	Transport	Manufacturing	Transport from gate to site	Assembly/Install	Use	Maintenance	Repair	Replacement	Refurbishment	Building Operational Energy Use During Product Use	Building Operational Water Use During Product Use	Deconstruction	Transport	Waste processing	Disposal	Reuse, Recovery, Recycling Potential
Cradle to Grave	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Modules B1-B5, B7 and C1 to be reported were all zero following the calculation, hence have not been included in the results tables for an easier reading experience.

4.1 Life Cycle Impact Assessment Results: R-ETL-A

Table 11. EF 3.1 Impact Assessment Results, R-ETL-A, per 1 km of product

EF 3.1	A1 - A3	A4	A5	B6	C2	C3	C4	D
GWP_{total} [kg CO_2 eq]	7.71E+02	3.67E+01	4.35E+01	1.98E+04	4.79E+00	3.69E+01	8.37E-01	-7.87E+01
GWP_{fossil} [kg CO_2 eq]	8.07E+02	3.66E+01	3.50E+00	1.95E+04	4.70E+00	3.69E+01	8.36E-01	-7.87E+01
$GWP_{biogenic}$ [kg CO_2 eq]	-3.69E+01	3.56E-02	4.00E+01	2.74E+02	1.13E-02	2.54E-04	-3.10E-03	3.87E-01
$GWP_{land\ use}$ [kg CO_2 eq]	7.62E-01	2.05E-02	4.51E-02	3.83E+00	7.98E-02	1.75E-03	3.53E-03	-3.30E-01
ODP [kg CFC-11 eq]	3.46E-09	5.41E-12	2.52E-12	6.13E-07	6.99E-13	7.85E-12	2.64E-12	-5.79E-10
AP [kg SO_2 eq]	4.91E+00	1.70E-01	3.30E-02	3.06E+01	5.06E-02	4.64E-03	5.21E-03	-1.27E+00
$EP_{freshwater}$ [kg N eq]	9.16E-04	1.87E-04	1.62E-04	1.22E-01	2.03E-05	1.91E-06	2.50E-04	-1.97E-04
EP_{marine} [kg N eq]	3.43E-01	8.43E-02	1.99E-02	9.55E+00	2.55E-02	1.28E-03	1.20E-03	-6.99E-02
$EP_{terrestrial}$ [kg N eq]	3.69E+00	9.30E-01	1.72E-01	9.83E+01	2.81E-01	2.15E-02	1.32E-02	-7.23E-01
POCP [kg O_3 eq]	1.23E+00	1.73E-01	3.75E-02	2.30E+01	4.83E-02	3.70E-03	3.80E-03	-2.47E-01
$ADP_{element}$ [kg Sb-eq]	1.01E+00	4.84E-06	2.68E-07	4.12E-03	4.14E-07	8.13E-08	5.57E-08	-5.82E-02
ADP_{fossil} [MJ, LHV]	6.78E+03	4.85E+02	4.80E+01	2.74E+05	6.25E+01	1.61E+01	1.37E+01	-8.46E+02
WDP [m^3]	1.66E+02	2.19E+00	1.50E-01	6.33E+02	7.35E-02	3.51E+00	1.05E-01	-4.41E+01

Table 12. Resource Use Indicators, R-ETL-A, per 1 km of product

PARAMETER	A1 - A3	A4	A5	B6	C2	C3	C4	D
PERE [MJ]	1.80E+03	2.15E+01	4.58E+00	2.94E+05	5.39E+00	4.29E+00	2.09E+00	-3.59E+02
PERM [MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT [MJ]	1.80E+03	2.15E+01	4.58E+00	2.94E+05	5.39E+00	4.29E+00	2.09E+00	-3.59E+02
PENRE [MJ]	5.56E+03	4.85E+02	4.80E+01	2.74E+05	6.25E+01	1.61E+01	1.37E+01	-8.46E+02
PENRM [MJ]	1.23E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT [MJ]	6.78E+03	4.85E+02	4.80E+01	2.74E+05	6.25E+01	1.61E+01	1.37E+01	-8.46E+02
SM [kg]	1.35E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW [m^3]	3.81E+00	7.14E-02	6.35E-03	9.26E+01	6.00E-03	8.35E-02	3.15E-03	-7.74E-01

Table 13. Output Flows and Waste Categories, R-ETL-A, per 1 km of product

PARAMETER	A1 - A3	A4	A5	B6	C2	C3	C4	D
HWD [kg]	2.57E-06	6.54E-08	4.09E-09	6.77E-04	2.39E-09	9.25E-09	3.34E-09	-4.84E-07
NHWD [kg]	8.06E+01	4.84E-02	1.64E+01	2.77E+02	1.02E-02	3.36E+00	3.61E+01	4.49E+01
RWD [kg]	1.42E-01	1.46E-03	2.42E-04	2.63E+01	1.14E-04	5.44E-04	1.85E-04	-1.09E-02
CRU [kg]	0.00E+00	0.00E+00	1.67E+01	0.00E+00	0.00E+00	2.12E+01	0.00E+00	0.00E+00

MFR [kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MER [kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.71E+01
EEE [MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E+02
EET [MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 14. Additional Indicators, R-ETL-A, per 1 km of product

PARAMETER	A1 - A3	A4	A5	B6	C2	C3	C4	D
PM [disease incidence]	9.29E-05	1.73E-06	3.24E-07	2.41E-04	4.94E-07	5.68E-08	5.79E-08	-1.03E-05
IRP [kBq U235 eq]	1.21E+01	1.24E-01	3.50E-02	2.79E+03	1.65E-02	7.46E-02	2.50E-02	-1.25E+00
ETP [CTUe]	4.71E+03	3.79E+02	5.09E+01	1.02E+05	4.64E+01	1.09E+01	1.97E+01	-6.24E+02
HTCE [CTUh]	1.75E-07	9.16E-09	8.10E-10	5.81E-06	9.46E-10	5.34E-10	3.20E-10	-4.51E-08
HTnCE [CTUh}	1.13E-05	1.50E-07	5.23E-08	8.01E-05	4.22E-08	4.28E-08	7.99E-09	-1.39E-06
LU [Pt]	3.21E+03	9.42E+01	1.83E+01	1.92E+05	3.08E+01	4.24E+00	2.54E+00	-9.63E+02

4.2 Life Cycle Impact Assessment Results: R-ETL-B-CR

Table 15. EF 3.1 Impact Assessment Results, R-ETL-B-CR, per 1 km of product

EF 3.1	A1 - A3	A4	A5	B6	C2	C3	C4	D
GWP_{total} [kg CO_2 eq]	2.57E+02	3.62E+01	4.35E+01	1.98E+04	4.70E+00	2.83E+01	8.23E-01	-7.37E+01
GWP_{fossil} [kg CO_2 eq]	2.94E+02	3.62E+01	3.49E+00	1.95E+04	4.61E+00	2.83E+01	8.23E-01	-7.38E+01
$GWP_{biogenic}$ [kg CO_2 eq]	-3.74E+01	3.52E-02	3.99E+01	2.74E+02	1.11E-02	1.95E-04	-3.44E-03	4.05E-01
$GWP_{land\ use}$ [kg CO_2 eq]	7.35E-01	2.03E-02	4.50E-02	3.83E+00	7.83E-02	1.34E-03	3.70E-03	-3.23E-01
ODP [kg CFC-11 eq]	3.18E-09	5.34E-12	2.51E-12	6.13E-07	6.86E-13	6.02E-12	2.54E-12	-5.17E-10
AP [kg SO_2 eq]	4.45E+00	1.68E-01	3.29E-02	3.06E+01	4.96E-02	3.56E-03	5.23E-03	-1.25E+00
$EP_{freshwater}$ [kg N eq]	7.20E-04	1.84E-04	1.62E-04	1.22E-01	1.99E-05	1.46E-06	1.92E-04	-1.82E-04
EP_{marine} [kg N eq]	3.02E-01	8.32E-02	1.99E-02	9.55E+00	2.50E-02	9.82E-04	1.24E-03	-6.73E-02
$EP_{terrestrial}$ [kg N eq]	3.22E+00	9.18E-01	1.71E-01	9.83E+01	2.76E-01	1.65E-02	1.36E-02	-6.95E-01
POCP [kg O_3 eq]	1.06E+00	1.71E-01	3.74E-02	2.30E+01	4.74E-02	2.83E-03	3.88E-03	-2.38E-01
$ADP_{element}$ [kg Sb-eq]	9.77E-01	4.78E-06	2.67E-07	4.12E-03	4.06E-07	6.23E-08	5.46E-08	-5.71E-02
ADP_{fossil} [MJ, LHV]	4.55E+03	4.79E+02	4.79E+01	2.74E+05	6.14E+01	1.24E+01	1.31E+01	-7.78E+02
WDP [m^3]	1.21E+02	2.17E+00	1.49E-01	6.33E+02	7.21E-02	2.69E+00	1.02E-01	-4.32E+01

Table 16. Resource Use Indicators, R-ETL-B-CR, per 1 km of product

PARAMETER	A1 - A3	A4	A5	B6	C2	C3	C4	D
PERE [MJ]	1.62E+03	2.12E+01	4.57E+00	2.94E+05	5.28E+00	3.29E+00	2.03E+00	-3.27E+02
PERM [MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT [MJ]	1.62E+03	2.12E+01	4.57E+00	2.94E+05	5.28E+00	3.29E+00	2.03E+00	-3.27E+02
PENRE [MJ]	3.02E+03	4.79E+02	4.79E+01	2.74E+05	6.14E+01	1.24E+01	1.31E+01	-7.78E+02
PENRM [MJ]	1.53E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT [MJ]	4.55E+03	4.79E+02	4.79E+01	2.74E+05	6.14E+01	1.24E+01	1.31E+01	-7.78E+02
SM [kg]	1.35E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW [m^3]	2.51E+00	7.04E-02	6.34E-03	9.26E+01	5.89E-03	6.40E-02	3.06E-03	-7.51E-01

Table 17. Output Flows and Waste Categories, R-ETL-B-CR, per 1 km of product

PARAMETER	A1 - A3	A4	A5	B6	C2	C3	C4	D
HWD [kg]	8.27E-05	6.46E-08	4.08E-09	6.77E-04	2.35E-09	7.09E-09	3.20E-09	-4.19E-07
NHWD [kg]	8.61E+01	4.77E-02	1.63E+01	2.77E+02	1.00E-02	2.57E+00	3.87E+01	4.40E+01
RWD [kg]	6.66E-02	1.44E-03	2.41E-04	2.63E+01	1.12E-04	4.17E-04	1.73E-04	-8.51E-03
CRU [kg]	0.00E+00	0.00E+00	1.67E+01	0.00E+00	0.00E+00	2.08E+01	0.00E+00	0.00E+00
MFR [kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

MER [kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.15E+01
EEE [MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.21E+01
EET [MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 18. Additional Indicators, R-ETL-B-CR, per 1 km of product

PARAMETER	A1 - A3	A4	A5	B6	C2	C3	C4	D
PM [disease incidence]	8.64E-05	1.71E-06	3.23E-07	2.41E-04	4.85E-07	4.36E-08	5.95E-08	-1.00E-05
IRP [kBq U235 eq]	6.07E+00	1.22E-01	3.49E-02	2.79E+03	1.62E-02	5.72E-02	2.31E-02	-9.90E-01
ETP [CTUe]	3.86E+03	3.74E+02	5.08E+01	1.02E+05	4.56E+01	8.32E+00	1.67E+01	-6.03E+02
HTCE [CTUh]	1.63E-07	9.04E-09	8.08E-10	5.81E-06	9.28E-10	4.10E-10	2.81E-10	-4.36E-08
HTnCE [CTUh}	1.14E-05	1.48E-07	5.22E-08	8.01E-05	4.14E-08	3.28E-08	7.45E-09	-1.35E-06
LU [Pt]	3.13E+03	9.30E+01	1.83E+01	1.92E+05	3.02E+01	3.25E+00	2.57E+00	-9.28E+02

5. LCA Interpretation

The manufacturing stage (A1-A3) contributes to the majority impacts across the life cycle stages, and across all indicators, except for ADP - elements, as shown in Figures 3 and 4. This is due to the electricity consumed during the use of the product over its lifetime of 25 years. Following the manufacturing stage, the use stage (B1-B7) has significant impacts throughout all indicators, except for ADP – elements.

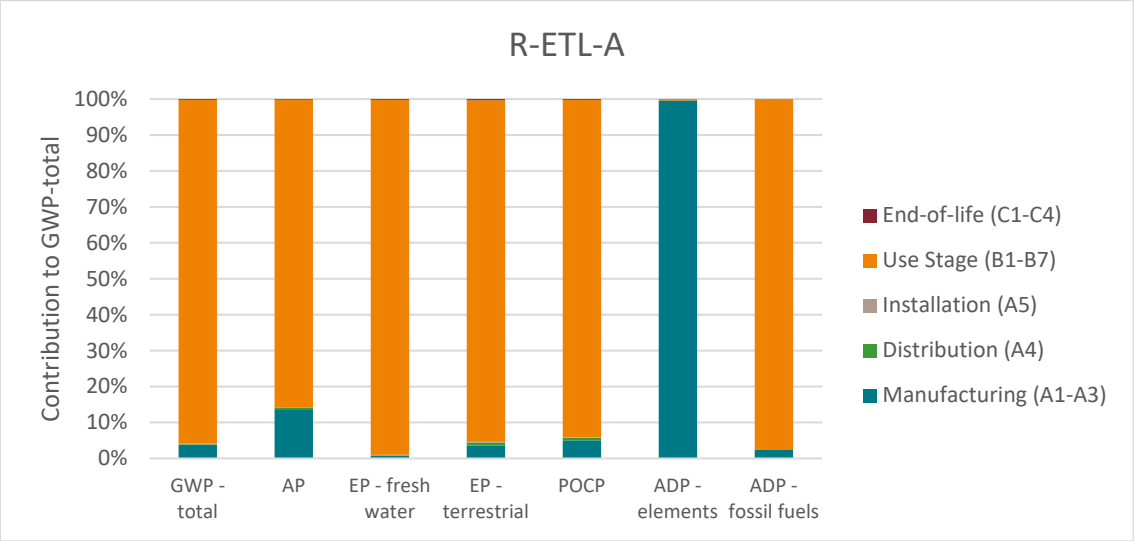

Figure 3: LCA Results for R-ETL-A, by life cycle stage

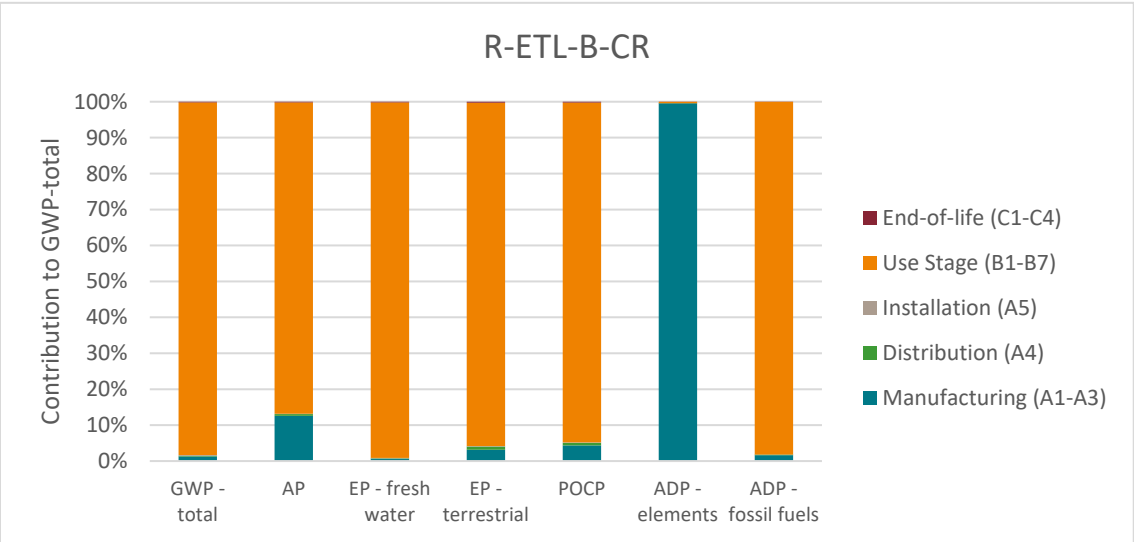

Figure 4: LCA Results for R-ETL-B (CR), by life cycle stage

6. Additional Environmental Information

The carbon emissions of the products covered by this EPD associated with their raw materials and manufacturing processes (cradle-to-gate) are offset using RECs that support renewable energy and to help reduce product environmental impacts.

6.1 Environment and Health During Installation

Further information about the product installation can be found on the Chemelex RAYCHEM website product page:
https://www.nvent.com/en-ae/raychem/products/etl-self-regulating-heating-cable-0

6.2 Further Information

Further information about the product can be found on the Chemelex RAYCHEM website product page:
https://www.nvent.com/en-ae/raychem/products/etl-self-regulating-heating-cable-0

7. References

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