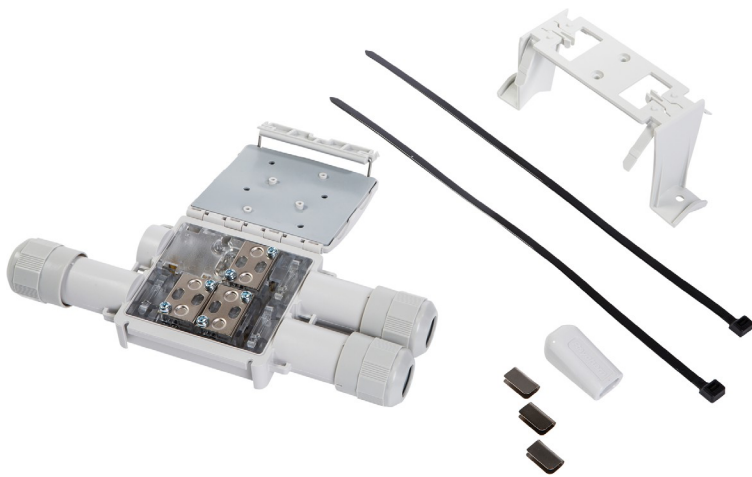


## ENVIRONMENTAL PRODUCT DECLARATION

# RAYCLIC

### CONNECTION KIT



Chemelex RAYCHEM RayClic connection kit is a simple, fast and reliable set of connection kits developed for select nVent RAYCHEM XL-Trace, IceStop and HWAT self-regulating heating cables.



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, 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.



# ENVIRONMENTAL PRODUCT DECLARATION



**RAYCLIC**  
Connection kit



According to ISO 14025  
and EN 15804+A2

|                                                                   |                                                                                                                                                                                |
|-------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EPD PROGRAM AND PROGRAM OPERATOR NAME, ADDRESS, LOGO, AND WEBSITE | UL Solutions<br>333 Pfingsten Rd, Northbrook, IL 60062<br>www.ul.com<br>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                                                | 4791545949.103.2 (Update occurred August 2026)                                                                                                                                 |
| DECLARED PRODUCT & FUNCTIONAL UNIT OR DECLARED UNIT               | 1 unit of RayClic connection kit connecting together self-regulating heating cables, under operating conditions identical to those of the cables, over a lifetime of 25 years. |
| REFERENCE PCR AND VERSION NUMBER                                  | Core PCR: EN 15804:2012+A2:2019<br>Guidance PCR: PEP-PCR-ed4-EN-2021 09 06                                                                                                     |
| DESCRIPTION OF PRODUCT APPLICATION/USE                            | Connection kit for self-regulating heating cables                                                                                                                              |
| 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](mailto: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.

# ENVIRONMENTAL PRODUCT DECLARATION



RAYCHEM RayClic  
Connection kit



According to ISO 14025  
and EN 15804+A2

## 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: RayClic  
Product Image

The reference product for the RAYCHEM RayClic connection kit is the RayClic-T-03. It is a simple, fast and reliable set of connection kits developed for select Chemelex RAYCHEM XL-Trace, IceStop and HWAT self-regulating heating cables. No heat guns or wire stripping are needed, because insulation displacement technology is used to make the electrical connection.

Table 1: Products covered in the EPD

| PRODUCT NUMBER | PRODUCT NAME  | MODEL                                  |
|----------------|---------------|----------------------------------------|
| 364855-000     | RAYCLIC-S-02  | Heating Cable/Heating Cable            |
| 636284-000     | RAYCLIC-PT-02 | Power Connection and T-Branch          |
| 235422-000     | RAYCLIC-CE-02 | Power Connection to One Heating Cable  |
| 716976-000     | RAYCLIC-PS-02 | Power Connection to Two Heating Cables |
| 441524-000     | RAYCLIC-T-02  | T-Branch                               |
| 001013-000     | RAYCLIC-X-02  | X-Branch                               |
| 805979-000     | RAYCLIC-E     | End Seal                               |
| P000000770     | RAYCLIC-LE-03 | Lighted End Seal                       |
| 233053-000     | RAYCLIC-PC-03 | Power Connection to One Heating Cable  |
| 861247-000     | RAYCLIC-PS-03 | Power Connection to Two Heating Cables |
| 804231-000     | RAYCLIC-PT-03 | Power Connection and T-Branch          |
| 559871-000     | RAYCLIC-S-03  | Heating Cable/Heating Cable            |
| 014023-000     | RAYCLIC-T-03  | T-Branch                               |
| 546349-000     | RAYCLIC-X-03  | X-Branch                               |





RAYCHEM RayClic  
Connection kit



According to ISO 14025  
and EN 15804+A2

1.3. Application

The RayClic connection kit acts as a power connection by supplying power to one or more self-regulating heating cables in the system. It also serves as a heating cable connection by linking two or three cables at a single point, and as a heating cable termination.

1.4. Technical Requirements

Minimum installation temperature: -20°C.

The technical requirements are available on the Chemelex product page under engineering specifications:

<https://www.chemelex.com/en-us/raychem/products/rayclic-connection-kit>

1.5. Properties of Declared Product as Delivered

The product is wrapped in a plastic bag and packaged in a cardboard box with the accessories (a replacement end seal, wall mounting bracket and/or pipe mounting bracket).

1.6. Material Composition

Table 2: Material composition, per 1 km

| MATERIAL                     | Weight [%] |
|------------------------------|------------|
| COPPER                       | 3          |
| STEEL                        | 31         |
| PLASTIC                      | 66         |
| MINERALS AND OTHER ADDITIVES | 1          |
| TOTAL                        | 100        |

1.7. Manufacturing

Custom-made individual plastic and metal components are initially assembled into sub-assemblies. These sub-assemblies are subsequently integrated into the final RayClic products through the use of fasteners or welding techniques.

1.8. Packaging

The product is packaged in a labelled plastic bag.





RAYCHEM RayClic  
Connection kit



According to ISO 14025  
and EN 15804+A2

1.9. Transportation

The units are placed into secondary cardboard boxes and stacked on pallets. The pallets are shipped via ocean freight from Suzhou, China to the Chemelex distribution sites in Redwood City, USA and Leuven, Belgium. The units are shipped to distributors and to final installation sites via ground transportation.

1.10. Product Installation

Installation only requires the use of hand tools. Zero product loss is expected during installation. The product packaging (plastic bag) is disposed of following the disposal rates from the US EPA 2018 municipal solid waste figures.

1.11. Use

The RayClic connection kit doesn't require any energy inputs during its use but acts as a connector between one or multiple self-heating cables. No maintenance is required.

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, and 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 product is removed from the building at end-of-life and shipped by truck to the disposal facility. A distance of 1,000 km by truck was assumed based on the PEP PCR default values for the end-of-life treatment scenario. After separation of aluminum and plastic, aluminum can be recycled, plastic can be disposed as per the disposal rates shared in Table 3 above.





RAYCHEM RayGlic  
Connection kit



According to ISO 14025  
and EN 15804+A2

2. Life Cycle Assessment Background Information

2.1. Functional Unit

The functional unit is 1 unit of connection kit connecting together self-regulating heating cables, under operating conditions identical to those of the cables, over a lifetime of 25 years.

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+A2. 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 mass 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 excellent. 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)**

| NAME                                                           | 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 payload 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                       |
| Transport distance                                             | km                | 3.61E+03                                               | -                                                                                             | 1.05E+04                                                                | -                        |
| Gross density of products transported                          | kg/m <sup>3</sup> | n/a                                                    |                                                                                               |                                                                         |                          |
| Weight of products transported (if gross density not reported) | kg                | 8.87E-01                                               |                                                                                               |                                                                         |                          |
| Volume of products transported (if gross density not reported) | m <sup>3</sup>    | n/a                                                    |                                                                                               |                                                                         |                          |

**Table 5. Installation into the building (A5)**

| NAME                                                                                                                               | VALUE    | UNIT           |
|------------------------------------------------------------------------------------------------------------------------------------|----------|----------------|
| Ancillary materials                                                                                                                | 0.00E+00 | kg             |
| Net freshwater consumption specified by water source and fate (amount evaporated, amount disposed to sewer)                        | 0.00E+00 | m <sup>3</sup> |
| Other resources                                                                                                                    | 0.00E+00 | kg             |
| Electricity consumption                                                                                                            | 0.00E+00 | MJ             |
| Other energy carriers                                                                                                              | 0.00E+00 | MJ             |
| Product loss per functional unit                                                                                                   | 0.00E+00 | kg             |
| Waste materials at the construction site before waste processing, generated by product installation                                | 1.97E-01 | kg             |
| Output materials resulting from on-site waste processing (specified by route; e.g. for recycling, energy recovery and/or disposal) | 0.00E+00 | kg             |
| Biogenic carbon contained in packaging                                                                                             | 7.32E-02 | kg C           |

# ENVIRONMENTAL PRODUCT DECLARATION



**RAYCHEM RayClic**  
Connection kit



**According to ISO 14025  
and EN 15804+A2**

|                                                 |          |                   |
|-------------------------------------------------|----------|-------------------|
| Direct emissions to ambient air, soil and water | 0.00E+00 | kg                |
| VOC content                                     | 0.00E+00 | µg/m <sup>3</sup> |

**Table 6. Reference Service Life**

| NAME                                                                                                                                                       | VALUE                                                                                                                                                                                                                                 | UNIT                 |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
| RSL                                                                                                                                                        | 25                                                                                                                                                                                                                                    | years                |
| Declared product properties (at the gate) and finishes, etc.                                                                                               | The product is packaged in a labelled plastic bag.                                                                                                                                                                                    | Units as appropriate |
| Design application parameters (if instructed by the manufacturer), including references to the appropriate practices and application codes)                | Engineered for use with Raychem self-regulating heating cables. Suitable for applications including pipe freeze protection, hot water temperature maintenance, roof & gutter de-icing, and grease line flow maintenance in buildings. |                      |
| An assumed quality of work, when installed in accordance with the manufacturer's instructions                                                              | 10 Year product only extended warranty when installed & commissioned in accordance with the manufacturer's instructions.                                                                                                              |                      |
| Outdoor environment, (if relevant for outdoor applications), e.g. weathering, pollutants, UV and wind exposure, building orientation, shading, temperature | Suitable for outdoor exposure, UV and wind resistant, IP68 rated, and temperature range to +65°C.                                                                                                                                     |                      |
| Indoor environment, (if relevant for indoor applications), e.g. temperature, moisture, chemical exposure)                                                  | Suitable for indoor use.                                                                                                                                                                                                              |                      |
| Use conditions, e.g. frequency of use, mechanical exposure.                                                                                                | Suitable for intermittent or continuous usage.                                                                                                                                                                                        |                      |
| Maintenance, e.g. required frequency, type and quality of replacement components                                                                           | Maintenance free, No replacements are necessary.                                                                                                                                                                                      |                      |

**Table 7. Operational energy use (B6)**

| NAME                            | VALUE | UNIT  |
|---------------------------------|-------|-------|
| Lifetime of product             | 25    | years |
| Power consumption               | n/a   | W/ft  |
| Power consumption over lifetime | n/a   | MJ/km |

**Table 8. End of life (C1-C4)**

| NAME                                              |                                          | VALUE    | UNIT               |
|---------------------------------------------------|------------------------------------------|----------|--------------------|
| Recovery<br>(specified by type)                   | Reuse                                    | 0.00E+00 | kg                 |
|                                                   | Recycling                                | 1.79E-01 | kg                 |
|                                                   | Landfill                                 | 2.82E-01 | kg                 |
|                                                   | Incineration                             | 2.29E-01 | kg                 |
|                                                   | Incineration with energy recovery        | 0.00E+00 | kg                 |
| Disposal<br>(landfill)                            | Product or material for final deposition | 2.82E-01 | kg                 |
| Removals of biogenic carbon (excluding packaging) |                                          | 0.00E+00 | kg CO <sub>2</sub> |



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

| NAME                                                                                                       | VALUE    | UNIT |
|------------------------------------------------------------------------------------------------------------|----------|------|
| Net energy benefit from energy recovery from waste treatment declared as exported energy in C3 (R>0.6)     | 0.00E+00 | MJ   |
| Net energy benefit from thermal energy due to treatment of waste declared as exported energy in C4 (R<0.6) | 1.86E+00 | MJ   |
| Net energy benefit from material flow declared in C3 for energy recovery                                   | 0.00E+00 | MJ   |

## 4. Life Cycle Assessment Results

**Table 10. Description of the system boundary modules**

|                        | PRODUCT STAGE       |           |               | CONSTRUCTION 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          |
| <b>Cradle to Grave</b> | 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

**Table 11. EF 3.1 Impact Assessment Results, per 1 unit of product**

| EF 3.1                                          | A1 – A3   | A4       | A5       | B6       | C2       | C3       | C4        | D         |
|-------------------------------------------------|-----------|----------|----------|----------|----------|----------|-----------|-----------|
| GWP <sub>total</sub> [kg CO <sub>2</sub> eq]    | 1.29E+01  | 2.53E-01 | 1.56E-01 | 0.00E+00 | 4.78E-02 | 5.71E-01 | 7.82E-03  | -5.92E-01 |
| GWP <sub>fossil</sub> [kg CO <sub>2</sub> eq]   | 1.31E+01  | 2.52E-01 | 1.09E-02 | 0.00E+00 | 4.78E-02 | 5.71E-01 | 7.81E-03  | -5.94E-01 |
| GWP <sub>biogenic</sub> [kg CO <sub>2</sub> eq] | -1.75E-01 | 2.03E-04 | 1.45E-01 | 0.00E+00 | 4.65E-05 | 3.93E-06 | -2.30E-05 | 1.92E-03  |
| GWP <sub>land use</sub> [kg CO <sub>2</sub> eq] | 3.59E-03  | 1.20E-04 | 5.97E-06 | 0.00E+00 | 2.68E-05 | 2.70E-05 | 2.96E-05  | -2.20E-04 |
| ODP [kg CFC-11 eq]                              | 2.91E-11  | 3.60E-14 | 4.94E-15 | 0.00E+00 | 7.06E-15 | 1.21E-13 | 2.56E-14  | -5.93E-13 |
| AP [kg SO <sub>2</sub> eq]                      | 3.57E-02  | 1.80E-03 | 1.56E-04 | 0.00E+00 | 2.22E-04 | 7.18E-05 | 4.71E-05  | -1.57E-03 |
| EP <sub>freshwater</sub> [kg N eq]              | 1.75E-05  | 1.07E-06 | 1.00E-06 | 0.00E+00 | 2.43E-07 | 2.95E-08 | 3.86E-06  | -2.29E-07 |
| EP <sub>marine</sub> [kg N eq]                  | 1.16E-02  | 8.32E-04 | 3.96E-05 | 0.00E+00 | 1.10E-04 | 1.98E-05 | 1.03E-05  | -2.06E-04 |
| EP <sub>terrestrial</sub> [kg N eq]             | 1.23E-01  | 9.15E-03 | 7.32E-04 | 0.00E+00 | 1.21E-03 | 3.32E-04 | 1.13E-04  | -2.01E-03 |
| POCP [kg O <sub>3</sub> eq]                     | 3.63E-02  | 1.95E-03 | 9.81E-05 | 0.00E+00 | 2.26E-04 | 5.72E-05 | 3.30E-05  | -7.67E-04 |
| ADP <sub>element</sub> [kg Sb-eq]               | 1.47E-04  | 3.26E-08 | 1.40E-09 | 0.00E+00 | 6.31E-09 | 1.26E-09 | 5.20E-10  | -3.08E-05 |
| ADP <sub>fossil</sub> [MJ, LHV]                 | 2.15E+02  | 3.28E+00 | 1.47E-01 | 0.00E+00 | 6.33E-01 | 2.50E-01 | 1.32E-01  | -7.39E+00 |
| WDP [m <sup>3</sup> ]                           | 1.63E+00  | 1.26E-02 | 8.40E-04 | 0.00E+00 | 2.86E-03 | 5.43E-02 | 1.00E-03  | -7.31E-02 |

**Table 12. Resource Use Indicators**

| PARAMETER            | A1 – A3  | A4       | A5       | B6       | C2       | C3       | C4       | D         |
|----------------------|----------|----------|----------|----------|----------|----------|----------|-----------|
| PERE [MJ]            | 1.51E+01 | 1.26E-01 | 8.30E-03 | 0.00E+00 | 2.80E-02 | 6.63E-02 | 1.99E-02 | -6.21E-01 |
| 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]            | 1.51E+01 | 1.26E-01 | 8.30E-03 | 0.00E+00 | 2.80E-02 | 6.63E-02 | 1.99E-02 | -6.21E-01 |
| PENRE [MJ]           | 1.82E+02 | 3.28E+00 | 1.47E-01 | 0.00E+00 | 6.33E-01 | 2.50E-01 | 1.32E-01 | -7.39E+00 |
| PENRM [MJ]           | 3.33E+01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00  |
| PENRT [MJ]           | 2.15E+02 | 3.28E+00 | 1.47E-01 | 0.00E+00 | 6.33E-01 | 2.50E-01 | 1.32E-01 | -7.39E+00 |
| SM [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  |
| FW [m <sup>3</sup> ] | 3.68E-01 | 4.10E-04 | 2.58E-05 | 0.00E+00 | 9.30E-05 | 1.29E-03 | 3.00E-05 | -3.10E-02 |

**Table 13. Output Flows and Waste Categories**

| PARAMETER | A1 – A3  | A4       | A5       | B6       | C2       | C3       | C4       | D         |
|-----------|----------|----------|----------|----------|----------|----------|----------|-----------|
| HWD [kg]  | 5.16E-08 | 4.43E-10 | 2.24E-11 | 0.00E+00 | 8.53E-11 | 1.43E-10 | 3.24E-11 | -2.33E-08 |
| NHWD [kg] | 2.85E-01 | 3.04E-04 | 5.58E-02 | 0.00E+00 | 6.31E-05 | 5.19E-02 | 2.81E-01 | 5.65E-02  |
| RWD [kg]  | 1.52E-03 | 9.77E-06 | 6.14E-07 | 0.00E+00 | 1.91E-06 | 8.41E-06 | 1.84E-06 | -2.33E-04 |
| CRU [kg]  | 7.32E-01 | 0.00E+00 | 6.82E-02 | 0.00E+00 | 0.00E+00 | 1.79E-01 | 0.00E+00 | 0.00E+00  |

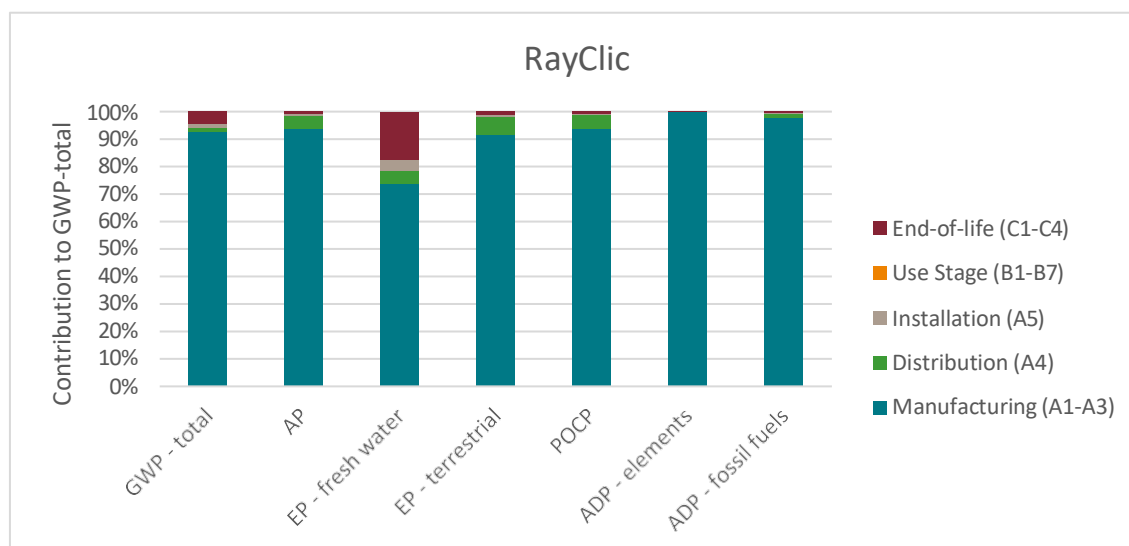
|          |          |          |          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| MFR [kg] | 2.74E-02 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| MER [kg] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.04E+00 |
| EEE [MJ] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.86E+00 |
| 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**

| PARAMETER              | A1 – A3  | A4       | A5       | B6       | C2       | C3       | C4       | D         |
|------------------------|----------|----------|----------|----------|----------|----------|----------|-----------|
| PM [disease incidence] | 4.05E-07 | 3.20E-08 | 1.28E-09 | 0.00E+00 | 2.25E-09 | 8.79E-10 | 4.97E-10 | -1.40E-08 |
| IRP [kBq U235 eq]      | 1.33E-01 | 8.24E-04 | 5.47E-05 | 0.00E+00 | 1.61E-04 | 1.15E-03 | 2.53E-04 | -1.27E-02 |
| ETP [CTUe]             | 9.25E+01 | 2.56E+00 | 4.45E-01 | 0.00E+00 | 4.94E-01 | 1.68E-01 | 2.57E-01 | -1.09E+00 |
| HTCE [CTUh]            | 3.03E-09 | 5.86E-11 | 6.18E-12 | 0.00E+00 | 1.19E-11 | 8.27E-12 | 3.89E-12 | 6.75E-11  |
| HTnCE [CTUh]           | 6.47E-08 | 9.78E-10 | 1.14E-10 | 0.00E+00 | 1.96E-10 | 6.62E-10 | 8.49E-11 | -6.58E-10 |
| LU [Pt]                | 2.93E+01 | 5.36E-01 | 2.63E-02 | 0.00E+00 | 1.23E-01 | 6.56E-02 | 2.26E-02 | -7.06E-01 |

## 5. LCA Interpretation

The manufacturing stage (A1-A3) contributes to the majority impacts across the life cycle stages, and across all indicators, as shown in Figure 2.



**Figure 2: LCA Results for RayClic, by life cycle stage**



RAYCHEM RayClic  
Connection kit



According to ISO 14025  
and EN 15804+A2

## 6. Additional Environmental Information

### 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.chemelex.com/en-us/raychem/products/rayclic-connection-kit>

### 6.2 Further Information

Further information about the product can be found on the Chemelex RAYCHEM website product page:  
<https://www.chemelex.com/en-us/raychem/products/rayclic-connection-kit>

## 7. References

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