

**Environmental  
Product  
Declaration**

According to ISO14025+EN15804 A2 (+indicators A1)

This declaration is for:  
**HENCO PE-RT pipe**

Provided by:  
**Henco Industries NV**



MRPI® registration:  
**1.1.00852.2025**

Program operator:  
**Stichting MRPI®**  
Publisher:  
**Stichting MRPI®**  
**www.mrpi.nl**

Date of first issue:  
**15-11-2024**  
Date of this issue:  
**15-11-2024**  
Expiry date:  
**15-11-2029**



## COMPANY INFORMATION

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<https://www.henco.be/>

## MRPI® REGISTRATION

1.1.00852.2025

## DATE OF THIS ISSUE

15-11-2024

## EXPIRY DATE

15-11-2029

## SCOPE OF DECLARATION

This MRPI®-EPD certificate is verified by Niels Jonkers, PLUK sustainability. The LCA study has been done by Mando Kort, Ecochain Technologies B.V.. The certificate is based on an LCA-dossier according to ISO14025+EN15804 A2 (+indicators A1). It is verified according to the 'MRPI®-EPD verification protocol November 2020.v4.0'. EPDs of construction products may not be comparable if they do not comply with EN15804+A2. Declaration of SVHC that are listed on the 'Candidate list of Substances of Very High Concern for authorisation' when content exceeds the limits for registration with ECHA.

## PROGRAM OPERATOR

Stichting MRPI®  
Kingsfordweg 151  
1043 GR  
Amsterdam

## PRODUCT

HENCO PE-RT pipe

## DECLARED UNIT / FUNCTIONAL UNIT

1 Mass (kg)

## DESCRIPTION OF PRODUCT

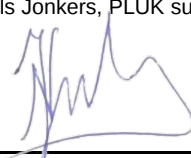
Henco PE-RT pipe is a flexible, full plastic pipe whose inner and outer layers have an EVOH diffusion-tight layer.

## VISUAL PRODUCT



## MORE INFORMATION

<https://www.henco.be/en/5L%20PE-RT>

|                                                                                     |                                                                        |                                                                                                                                                   |  |
|-------------------------------------------------------------------------------------|------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|--|
|  | <b>Ing. L. L. Oosterveen MSc. MBA</b><br><b>Managing Director MRPI</b> | <b>DEMONSTRATION OF VERIFICATION</b>                                                                                                              |  |
|                                                                                     |                                                                        | CEN standard EN15804 serves as the core PCR [1]                                                                                                   |  |
|                                                                                     |                                                                        | Independent verification of the declaration an data according to ISO14025+EN15804 A2 (+indicators A1)<br>Internal: External: X                    |  |
|                                                                                     |                                                                        | Third party verifier: Niels Jonkers, PLUK sustainability<br> |  |
|                                                                                     |                                                                        | [1] PCR = Product Category Rules                                                                                                                  |  |



## DETAILED PRODUCT DESCRIPTION (PART 1)

The HENCO PE-RT TUBE from Henco Industries NV is a flexible, full plastic pipe. The inner and outer layers have an EVOH diffusion-tight layer that fully complies with DIN 4726 approval. This pipe has an inner oxygen-stop layer and is almost exclusively used for underfloor heating used. This type of pipe is sold in rolls only (from 90 to 640 m) and is available in various diameters.

| Components Product (>1%) | (kg/%) |
|--------------------------|--------|
| HDPE                     | 90,45% |
| Vinyl Acetate            | 7,79%  |
| Lubricating oil          | 1,76%  |

## DETAILED PRODUCT DESCRIPTION (PART 2)

Henco Industries NV's focus for packaging of HENCO PE-RT TUBE is mainly on the reuse and/or recyclability of the chosen material.

| Components Packaging (>1%) | (kg/%) |
|----------------------------|--------|
| Wood                       | 3,24%  |
| Plastics                   | 0,88%  |
| Paper and cardboard        | 0,49%  |

## SCOPE AND TYPE

Produced in Belgium, sold in Europe. Based on datasets from Ecoinvent version 3.6, incorporated in Ecochain Helix version 4.3.1. The EPD gives average scores of multiple pipe diameters, all produced by Henco.

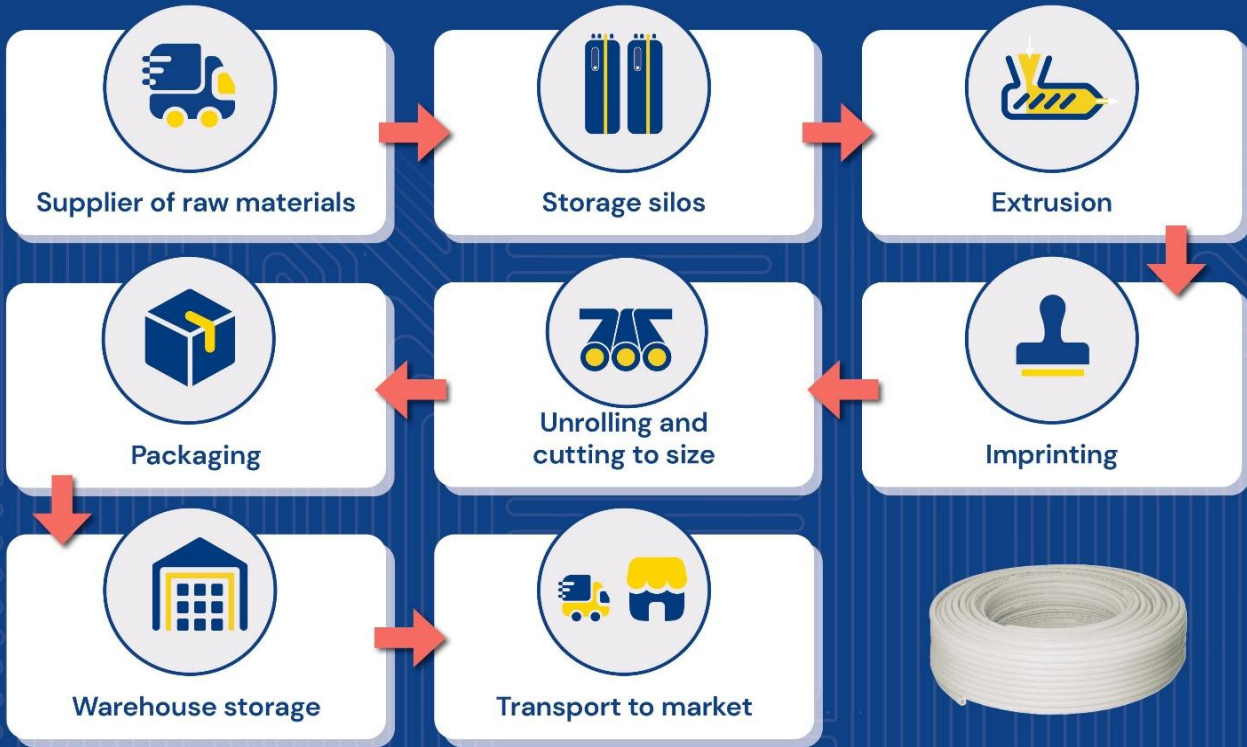
| PRODUCT STAGE       |           |               | CONSTRUCTION PROCESS STAGE |          | USE STAGE |             |        |             |               |                        |                       | END OF LIFE STAGE          |           |                  |          | BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES |
|---------------------|-----------|---------------|----------------------------|----------|-----------|-------------|--------|-------------|---------------|------------------------|-----------------------|----------------------------|-----------|------------------|----------|-------------------------------------------------|
| Raw material supply | Transport | Manufacturing | Transport gate to site     | Assembly | Use       | Maintenance | Repair | Replacement | Refurbishment | Operational energy use | Operational water use | De-construction demolition | Transport | Waste processing | Disposal | Reuse - Recovery - Recycling potential          |
| A1                  | A2        | A3            | A4                         | A5       | B1        | B2          | B3     | B4          | B5            | B6                     | B7                    | C1                         | C2        | C3               | C4       | D                                               |
| X                   | X         | X             | X                          | X        | ND        | ND          | ND     | ND          | ND            | ND                     | ND                    | X                          | X         | X                | X        | X                                               |

X = Modules Assessed

ND = Not Declared

## Production process diagram

Henco tube (PE-RT)



## REPRESENTATIVENESS

This LCA is based on an average kg of this type of pipe and represents the different diameters within this pipe type. A sensitivity analysis has shown that these different diameters have no more than the allowable deviation between them, making this average LCA representative for all available diameters. For further analysis, the weight per linear meter of pipe can be multiplied by the 1 kg results from this EPD to calculate the impact per 1m.

## ENVIRONMENTAL IMPACT per functional unit or declared unit (indicators A1)

|      | Unit           | A1       | A2       | A3       | A1-A3    | A4       | A5       | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1       | C2       | C3       | C4       | D         |
|------|----------------|----------|----------|----------|----------|----------|----------|----|----|----|----|----|----|----|----------|----------|----------|----------|-----------|
| ADPE | kg Sb eq.      | 2,04E-05 | 1,01E-07 | 1,88E-06 | 2,24E-05 | 1,50E-07 | 9,06E-07 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 3,42E-07 | 8,56E-07 | 0,00E+00 | -9,59E-07 |
| ADPF | MJ             | 6,91E+01 | 5,99E-02 | 1,51E+01 | 8,43E+01 | 8,96E-02 | 5,86E-01 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 2,04E-01 | 6,09E-01 | 0,00E+00 | -8,35E+00 |
| GWP  | kg CO2 eq.     | 1,97E+00 | 3,87E-03 | 4,03E-01 | 2,38E+00 | 5,89E-03 | 5,57E-02 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 1,34E-02 | 2,76E+00 | 0,00E+00 | -5,10E-01 |
| ODP  | kg CFC11 eq.   | 7,89E-08 | 7,18E-10 | 1,14E-07 | 1,94E-07 | 1,04E-09 | 3,81E-09 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 2,37E-09 | 4,37E-09 | 0,00E+00 | -5,64E-08 |
| POCP | kg ethene eq.  | 2,09E-03 | 2,32E-06 | 8,66E-05 | 2,18E-03 | 3,55E-06 | 2,09E-05 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 8,07E-06 | 2,47E-05 | 0,00E+00 | -8,72E-05 |
| AP   | kg SO2 eq.     | 6,37E-03 | 1,67E-05 | 6,61E-04 | 7,05E-03 | 2,59E-05 | 1,81E-04 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 5,88E-05 | 3,31E-04 | 0,00E+00 | -4,87E-04 |
| EP   | kg (PO4) 3 eq. | 6,53E-04 | 3,33E-06 | 1,22E-04 | 7,79E-04 | 5,09E-06 | 1,20E-04 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 1,16E-05 | 1,15E-04 | 0,00E+00 | -7,33E-05 |

### Toxicity indicators and ECI (Dutch market)

|       |            |          |          |          |          |          |          |    |    |    |    |    |    |    |          |          |          |          |           |
|-------|------------|----------|----------|----------|----------|----------|----------|----|----|----|----|----|----|----|----------|----------|----------|----------|-----------|
| HTP   | kg DCB eq. | 3,71E-01 | 1,66E-03 | 9,37E-02 | 4,66E-01 | 2,48E-03 | 1,71E-01 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 5,63E-03 | 1,08E-01 | 0,00E+00 | -7,26E-02 |
| FAETP | kg DCB eq. | 9,07E-03 | 4,85E-05 | 2,26E-03 | 1,14E-02 | 7,24E-05 | 9,75E-03 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 1,64E-04 | 3,13E-02 | 0,00E+00 | -9,93E-04 |
| MAETP | kg DCB eq. | 2,53E+01 | 1,73E-01 | 6,48E+00 | 3,20E+01 | 2,60E-01 | 2,85E+01 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 5,92E-01 | 4,59E+01 | 0,00E+00 | -3,41E+00 |
| TETP  | kg DCB eq. | 1,55E-03 | 5,87E-06 | 1,30E-03 | 2,86E-03 | 8,76E-06 | 4,21E-04 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 1,99E-05 | 1,84E-04 | 0,00E+00 | -3,80E-04 |
| ECI   | euro       | 1,76E-01 | 4,68E-04 | 3,37E-02 | 2,10E-01 | 7,10E-04 | 2,83E-02 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 1,61E-03 | 1,56E-01 | 0,00E+00 | -3,59E-02 |
| ADPF  | kg Sb eq.  | 3,39E-02 | 2,84E-05 | 2,51E-03 | 3,64E-02 | 4,33E-05 | 2,82E-04 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 9,84E-05 | 3,09E-04 | 0,00E+00 | -4,42E-03 |

|       |   |                                                                  |
|-------|---|------------------------------------------------------------------|
| ADPE  | = | Abiotic Depletion Potential for non-fossil resources             |
| ADPF  | = | Abiotic Depletion Potential for fossil resources                 |
| GWP   | = | Global Warming Potential                                         |
| ODP   | = | Depletion potential of the stratospheric ozone layer             |
| POCP  | = | Formation potential of tropospheric ozone photochemical oxidants |
| AP    | = | Acidification Potential of land and water                        |
| EP    | = | Eutrophication Potential                                         |
| HTP   | = | Human Toxicity Potential                                         |
| FAETP | = | Fresh water aquatic ecotoxicity potential                        |
| MAETP | = | Marine aquatic ecotoxicity potential                             |
| TETP  | = | Terrestrial ecotoxicity potential                                |
| ECI   | = | Environmental Cost Indicator                                     |
| ADPF  | = | Abiotic Depletion Potential for fossil resources                 |

## ENVIRONMENTAL IMPACT per functional unit or declared unit (core indicators A2)

| Unit                                  | A1        | A2       | A3       | A1-A3     | A4       | A5       | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1       | C2       | C3       | C4       | D         |
|---------------------------------------|-----------|----------|----------|-----------|----------|----------|----|----|----|----|----|----|----|----------|----------|----------|----------|-----------|
| GWP-total<br>kg CO2 eq.               | 1,98E+00  | 3,91E-03 | 4,14E-01 | 2,39E+00  | 5,94E-03 | 1,54E-01 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 1,35E-02 | 2,77E+00 | 0,00E+00 | -5,20E-01 |
| GWP-fossil<br>kg CO2 eq.              | 1,99E+00  | 3,90E-03 | 4,08E-01 | 2,40E+00  | 5,94E-03 | 5,44E-02 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 1,35E-02 | 2,76E+00 | 0,00E+00 | -5,13E-01 |
| GWP-biogenic<br>kg CO2 eq.            | -6,61E-03 | 0,00E+00 | 0,00E+00 | -6,61E-03 | 0,00E+00 | 0,00E+00 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 0,00E+00 | 6,61E-03 | 0,00E+00 | 0,00E+00  |
| GWP-luluc<br>kg CO2 eq.               | 9,25E-04  | 1,38E-06 | 8,90E-04 | 1,82E-03  | 2,18E-06 | 3,13E-05 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 4,95E-06 | 2,58E-05 | 0,00E+00 | -8,53E-05 |
| ODP<br>kg CFC11 eq.                   | 7,92E-08  | 8,99E-10 | 7,97E-08 | 1,60E-07  | 1,31E-09 | 4,30E-09 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 2,98E-09 | 5,11E-09 | 0,00E+00 | -6,33E-08 |
| AP<br>mol H+ eq.                      | 7,41E-03  | 2,22E-05 | 8,56E-04 | 8,28E-03  | 3,44E-05 | 2,32E-04 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 7,83E-05 | 4,61E-04 | 0,00E+00 | -6,16E-04 |
| EP-fresh water<br>kg PO4 eq.          | 3,75E-05  | 3,21E-08 | 8,85E-06 | 4,64E-05  | 5,99E-08 | 2,28E-06 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 1,36E-07 | 8,58E-07 | 0,00E+00 | -3,50E-06 |
| EP-marine<br>kg N eq.                 | 1,26E-03  | 7,95E-06 | 2,12E-04 | 1,48E-03  | 1,21E-05 | 5,49E-05 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 2,76E-05 | 1,97E-04 | 0,00E+00 | -1,63E-04 |
| EP-terrestrial<br>mol N eq.           | 1,41E-02  | 8,77E-05 | 2,55E-03 | 1,68E-02  | 1,34E-04 | 5,81E-04 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 3,04E-04 | 2,13E-03 | 0,00E+00 | -1,77E-03 |
| POCP<br>kg NMVOC eq.                  | 7,18E-03  | 2,51E-05 | 6,70E-04 | 7,87E-03  | 3,82E-05 | 2,19E-04 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 8,68E-05 | 5,40E-04 | 0,00E+00 | -5,67E-04 |
| ADP-minerals & metals<br>kg Sb eq.    | 2,02E-05  | 1,01E-07 | 1,88E-06 | 2,22E-05  | 1,50E-07 | 9,06E-07 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 3,42E-07 | 8,56E-07 | 0,00E+00 | -9,59E-07 |
| ADP-fossil<br>MJ, net calorific value | 6,91E+01  | 5,99E-02 | 1,51E+01 | 8,43E+01  | 8,96E-02 | 5,86E-01 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 2,04E-01 | 6,09E-01 | 0,00E+00 | -8,35E+00 |
| WDP<br>m3 world eq. Deprived          | 1,59E+00  | 1,84E-04 | 1,40E-01 | 1,74E+00  | 3,20E-04 | 3,00E-02 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 7,28E-04 | 1,18E-02 | 0,00E+00 | -4,59E-02 |

GWP-total = Global Warming Potential total

GWP-fossil = Global Warming Potential fossil fuels

GWP-biogenic = Global Warming Potential biogenic

GWP-luluc = Global Warming Potential land use and land use change

ODP = Depletion potential of the stratospheric ozone layer

AP = Acidification Potential, Accumulated Exceedence

EP-freshwater = Eutrophication Potential, fraction of nutrients reaching freshwater end compartment

EP-marine = Eutrophication Potential, fraction of nutrients reaching marine end compartment

EP-terrestrial = Eutrophication Potential, Accumulated Exceedence

POCP = Formation potential of tropospheric ozone photochemical oxidants

ADP-minerals & metals = Abiotic Depletion Potential for non-fossil resources [1]

ADP-fossil = Abiotic Depletion for fossil resources potential [1]

WDP = Water (user) deprivation potential, deprivation-weighted water consumption [1]

Disclaimer [1]:

- The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

## ENVIRONMENTAL IMPACT per functional unit or declared unit (additional indicators A2)

| Unit                    | A1       | A2       | A3       | A1-A3    | A4       | A5       | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1       | C2       | C3       | C4       | D         |
|-------------------------|----------|----------|----------|----------|----------|----------|----|----|----|----|----|----|----|----------|----------|----------|----------|-----------|
| PM<br>Disease incidence | 6,11E-08 | 3,52E-10 | 5,73E-09 | 6,71E-08 | 5,33E-10 | 3,51E-09 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 1,21E-09 | 3,32E-09 | 0,00E+00 | -3,84E-09 |
| IRP<br>kBq U235 eq.     | 5,56E-02 | 2,62E-04 | 1,68E-01 | 2,24E-01 | 3,75E-04 | 2,39E-03 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 8,53E-04 | 1,46E-03 | 0,00E+00 | -7,36E-03 |
| ETP-fw<br>CTUe          | 1,36E+01 | 4,86E-02 | 5,22E+00 | 1,89E+01 | 7,99E-02 | 1,80E+00 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 1,81E-01 | 1,02E+00 | 0,00E+00 | -1,65E+00 |
| HTP-c<br>CTUh           | 5,76E-10 | 1,73E-12 | 1,31E-10 | 7,09E-10 | 2,59E-12 | 1,47E-10 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 5,89E-12 | 1,32E-10 | 0,00E+00 | -8,42E-11 |
| HTP-nc<br>CTUh          | 1,38E-08 | 5,80E-11 | 2,79E-09 | 1,66E-08 | 8,73E-11 | 1,43E-09 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 1,98E-10 | 4,28E-09 | 0,00E+00 | -1,34E-09 |
| SQP<br>-                | 8,78E+00 | 5,13E-02 | 3,95E+00 | 1,28E+01 | 7,77E-02 | 1,21E-01 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 1,77E-01 | 3,65E-01 | 0,00E+00 | -6,11E-01 |

- PM = Potential incidence of disease due to PM emissions
- IRP = Potential Human exposure efficiency relative to U235 [1]
- ETP-fw = Potential Comparative Toxic Unit for ecosystems [2]
- HTP-c = Potential Comparative Toxic Unit for humans, cancer [2]
- HTP-nc = Potential Comparative Toxic Unit for humans, non-cancer [2]
- SQP = Potential soil quality index [2]

### Disclaimer [1]:

- This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste.

### Disclaimer [2]:

- The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

## OUTPUT FLOWS AND WASTE CATEGORIES per functional unit or declared unit (A1 en A2)

|      | Unit | A1       | A2       | A3       | A1-A3    | A4       | A5       | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1       | C2       | C3       | C4       | D         |
|------|------|----------|----------|----------|----------|----------|----------|----|----|----|----|----|----|----|----------|----------|----------|----------|-----------|
| HWD  | kg   | 1,96E-05 | 1,53E-07 | 6,01E-06 | 2,58E-05 | 2,27E-07 | 5,78E-03 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 5,16E-07 | 3,30E-06 | 0,00E+00 | -1,05E-05 |
| NHWD | kg   | 7,75E-02 | 3,71E-03 | 4,60E-02 | 1,27E-01 | 5,68E-03 | 9,83E-02 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 1,29E-02 | 4,27E-02 | 0,00E+00 | -2,59E-02 |
| RWD  | kg   | 5,53E-05 | 4,07E-07 | 1,44E-04 | 1,99E-04 | 5,88E-07 | 2,43E-06 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 1,34E-06 | 1,88E-06 | 0,00E+00 | -8,18E-06 |
| CRU  | kg   | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 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 | ND | ND | ND | ND | ND | ND | ND | 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 | 1,58E-03 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00  |
| EEE  | MJ   | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00  |
| ETE  | MJ   | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00  |

HWD = Hazardous Waste Disposed  
 NHWD = Non Hazardous Waste Disposed  
 RWD = Radioactive Waste Disposed  
 CRU = Components for reuse  
 MFR = Materials for recycling  
 MER = Materials for energy recovery  
 EEE = Exported Electrical Energy  
 ETE = Exported Thermal Energy

## RESOURCE USE per functional unit or declared unit (A1 and A2)

|       | Unit | A1       | A2       | A3       | A1-A3    | A4       | A5        | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1       | C2       | C3       | C4       | D         |
|-------|------|----------|----------|----------|----------|----------|-----------|----|----|----|----|----|----|----|----------|----------|----------|----------|-----------|
| PERE  | MJ   | 2.09E+00 | 8.59E-04 | 1.29E+00 | 3.38E+00 | 1.12E-03 | 1.19E-01  | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 2.55E-03 | 6.61E-03 | 0,00E+00 | 0,00E+00  |
| PERM  | MJ   | 7.29E-02 | 0,00E+00 | 0,00E+00 | 7.29E-02 | 0,00E+00 | -7.29E-02 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 0,00E+00 | 2.30E-02 | 0,00E+00 | -1.19E-01 |
| PERT  | MJ   | 2.16E+00 | 8.59E-04 | 1.29E+00 | 3.45E+00 | 1.12E-03 | 4.65E-02  | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 2.55E-03 | 0,00E+00 | 0,00E+00 | 0,00E+00  |
| PENRE | MJ   | 7.52E+01 | 6.36E-02 | 1.55E+01 | 9.07E+01 | 9.51E-02 | 9.62E-01  | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 2.16E-01 | 2.30E-02 | 0,00E+00 | -1.19E-01 |
| PENRM | MJ   | 1.11E+00 | 0,00E+00 | 0,00E+00 | 1.11E+00 | 0,00E+00 | -3.76E-01 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 0,00E+00 | 6.55E-01 | 0,00E+00 | -9.22E+00 |
| PENRT | MJ   | 7.63E+01 | 6.36E-02 | 1.55E+01 | 9.18E+01 | 9.51E-02 | 5.86E-01  | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 2.16E-01 | 0,00E+00 | 0,00E+00 | 0,00E+00  |
| SM    | kg   | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 3,35E-03  | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00  |
| RSF   | MJ   | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00  | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00  |
| NSRF  | MJ   | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00  | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00  |
| FW    | m3   | 2,61E-02 | 6,78E-06 | 4,32E-03 | 3,05E-02 | 1,09E-05 | 1,55E-03  | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 2,48E-05 | 4,43E-04 | 0,00E+00 | -1,03E-03 |

|       |   |                                                                                                              |
|-------|---|--------------------------------------------------------------------------------------------------------------|
| PERE  | = | Use of renewable energy excluding renewable primary energy used as raw materials                             |
| PERM  | = | Use of renewable primary energy resources used as raw materials                                              |
| PERT  | = | Total use of renewable primary energy resources                                                              |
| PENRE | = | Use of non-renewable primary energy resources excluding non-renewable energy resources used as raw materials |
| PENRM | = | Use of non-renewable primary energy resources used as raw materials                                          |
| PENRT | = | Total use of non-renewable primary energy resources                                                          |
| SM    | = | Use of secondary materials                                                                                   |
| RSF   | = | Use of renewable secondary fuels                                                                             |
| NSRF  | = | Use of non-renewable secondary fuels                                                                         |
| FW    | = | Use of net fresh water                                                                                       |

## BIOGENIC CARBON CONTENT per functional unit or declared unit (A1 and A2)

|       | Unit | A1       | A2       | A3       | A1-A3    | A4       | A5       | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1       | C2       | C3       | C4       | D        |
|-------|------|----------|----------|----------|----------|----------|----------|----|----|----|----|----|----|----|----------|----------|----------|----------|----------|
| BBCpr | kg C | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| BCCpa | kg C | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |

|       |   |                                      |
|-------|---|--------------------------------------|
| BCCpr | = | Biogenic carbon content in product   |
| BCCpa | = | Biogenic carbon content in packaging |

## CALCULATION RULES (PART 1)

Technical product information was requested from the manufacturers and the components were modeled based on the technical product information provided by the manufacturers.

## SCENARIOS AND ADDITIONAL TECHNICAL INFORMATION (PART 1)

All materials (A1) required to produce the tube are included, as is the transport distance from the supplier with the relevant means of transport (A2). All relevant production processes in stage A3, such as potential production losses, have been included in this study. The production of HENCO PE-RT TUBE is done by extrusion. As a final step in the production process, the tubes are cut to the desired length cut and provided with a print. This last step takes place in the uncoiling facility. The finished products finally go to the sales markets. The waste generated during the production process goes to waste treatment.

| Material        | (kg/%) |
|-----------------|--------|
| HDPE            | 90,45% |
| Vinyl Acetate   | 7,79%  |
| Lubricating oil | 1,76%  |

## SCENARIOS AND ADDITIONAL TECHNICAL INFORMATION (PART 2)

In this study, all relevant transport and constructions in the construction and installation process were included (A4). Material required for installation and disposal of packaging waste was taken into account (A5). At the construction site, the products must be made to measure. This usually generates more waste. Moreover, some of the materials are lost through damage or weathering. It is assumed that 5% of materials are lost.

| Packaging processing at installation | Recycling | Energy recovery | Landfill |
|--------------------------------------|-----------|-----------------|----------|
| Plastics                             | 27%       | 26%             | 47%      |
| Paper                                | 75%       | 10%             | 15%      |
| Wood                                 | 38%       | 23%             | 39%      |
| Metal                                | 66%       | 0%              | 34%      |

## SCENARIOS AND ADDITIONAL TECHNICAL INFORMATION (PART 3)

This LCA includes demolition (C1), transport to a waste processor (C2), processes for waste treatment (up to end-of-waste status; C3) and landfill (C4). It is assumed that 90% will be incinerated and 10% recycled.

## SCENARIOS AND ADDITIONAL TECHNICAL INFORMATION (PART 4)

The HENCO PE-RT TUBE has a mono plastic composition and intrinsically lends itself well to recycling. However, because this tube after use and demolition is often contaminated with other building materials, the destination is usually waste incineration with energy recovery.

## DECLARATION OF SVHC

None of the substances in the product are on the 'Candidate List of Substances of Very High Concern for Authorization' (SVHC) or exceed the threshold value of the European Chemicals Agency.

## REFERENCES

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