# ENVIRONMENTAL PRODUCT DECLARATION

as per *ISO 14025* and *EN 15804+A2*

| | |
|---|---|
| Owner of the Declaration | Mueller Europe Ltd |
| Publisher | Institut Bauen und Umwelt e.V. (IBU) |
| Programme holder | Institut Bauen und Umwelt e.V. (IBU) |
| Declaration number | EPD-MUE-20250372-CBA1-EN |
| Issue date | 12/01/2026 |
| Valid to | 11/01/2031 |

## Copper pipe (mixed recycled and new material)

## Mueller Europe Ltd

Institut Bauen und Umwelt e.V.

ECO PLATFORM EPD VERIFIED

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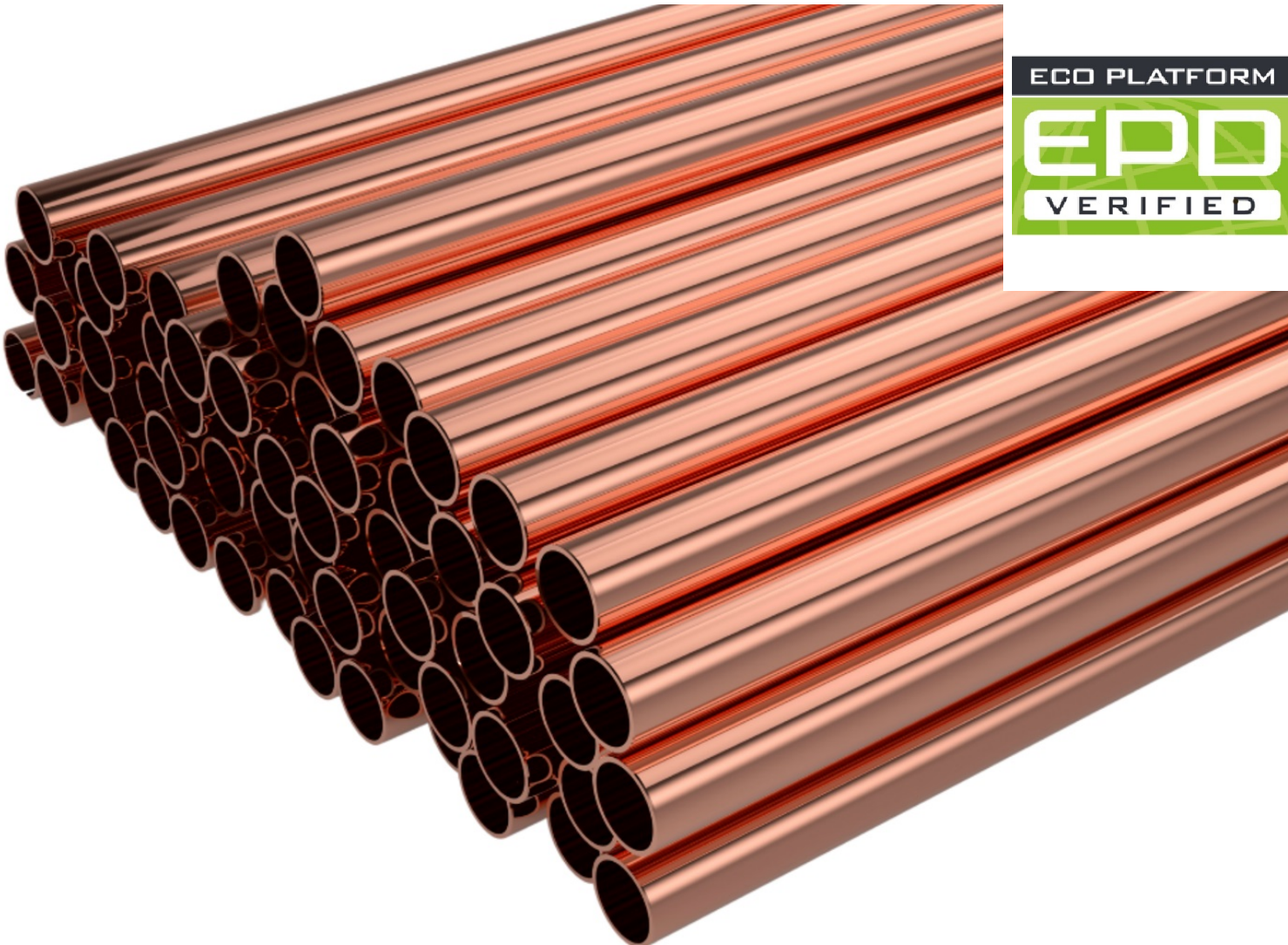


# General Information

## Mueller Europe Ltd

**Programme holder**

IBU – Institut Bauen und Umwelt e.V.
Hegelplatz 1
10117 Berlin
Germany

**Declaration number**

EPD-MUE-20250372-CBA1-EN

**This declaration is based on the product category rules:**

Metal pipes for domestic installations, 01/08/2021
(PCR checked and approved by the SVR)

**Issue date**

12/01/2026

**Valid to**

11/01/2031

Dipl.-Ing. Hans Peters
(Chairman of Institut Bauen und Umwelt e.V.)

Florian Pronold
(Managing Director Institut Bauen und Umwelt e.V.)

## Copper pipe (mixed recycled and new material)

**Owner of the declaration**

Mueller Europe Ltd
Oxford Street n/a
WV14 7DS Bilston
United Kingdom

**Declared product / declared unit**

Copper pipe (mixed recycled and new material) 1kg

**Scope:**

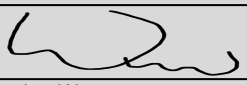
Copper pipe produced at Mueller Europe Wednesbury Copper Tubes production facility in Bilston UK. A range of pipe diameters and wall thickness are produced using the same core processes and inputs. The EPD is for an average copper pipe product per 1kg.

Excludes LDPE lined copper pipes which were deemed to be <5% of production by volume and are used for specialist purposes only.
The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

The EPD was created according to the specifications of EN 15804+A2. In the following, the standard will be simplified as *EN 15804*.

**Verification**

| |
|---|
| The standard EN 15804 serves as the core PCR |
| Independent verification of the declaration and data according to ISO 14025:2011 |
| ☐ internally ☒ externally |



Dr. Jan Werner,
(Independent verifier)

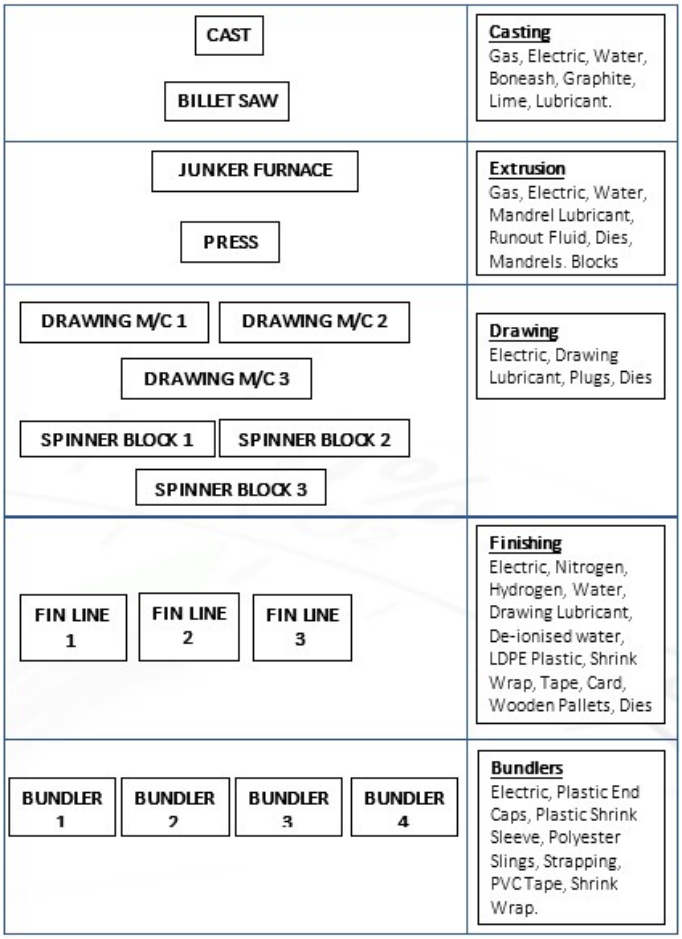
# Product

### Product description/Product definition

Copper pipes for domestic and industrial use, including drinking water and transportation of natural gas.

The full range of pipe diameters and wall thickness which are described as "plain" are covered by this EPD. This excludes LDPE coated pipes in the Protec and Protec 2000 ranges).

A simple process flow for manufacture is provided below.




Copper tubes manufactured to EN1057 and supplied in 3 different tempers

- Half-hard (R250) straight lengths
- Hard (R290) straight lengths
- Soft (R220) coils

For the placing on the market of the product in the European Union/European Free Trade Association (EU/EFTA) (with the exception of Switzerland) Regulation (EU) No. 305/2011 (CPR) applies. The product needs one of the following declarations depending on intended use:

- A declaration of performance taking into consideration *EN 1057:2006 +A1:2010. Copper and copper alloys — Seamless, round copper tubes for water and gas in sanitary and heating applications* and the CE-marking.
- A declaration of performance taking into consideration *EN13348:2016 - Copper and copper alloys - Seamless round tubes for medical gases or vacuum*

For the application and use the respective national provisions apply.

### Application

Pipes are manufactured for a range of domestic and industrial purposes including hot and cold water services, gas and sanitation applications, together with special products such as medical gas tubes.

### Technical Data

The product holds a declaration of performance under EN 1057: 2006 + A1:2010 for which the unique identified product is: **Seamless, round copper tubes for water and gas in sanitary and heating applications to EN1057**

The applicable intended use is

*— distributing networks for hot water and cold water;*
*— hot water heating systems, including panel heating systems (under-floor, wall, overhead);*
*— domestic gas and liquid fuel distribution;*
*— waste water sanitation*

The product holds a declaration of performance under EN13348:2016 - Copper and copper alloys — **Seamless, round copper tubes for medical gases or vacuum**

The applicable intended use is:

*Pipeline systems under vacuum or for distributing the following medical gases intended to be used at operating pressures up to 2 000 kPa:*
*— oxygen, nitrous oxide, nitrogen, helium, carbon dioxide, xenon;*
*— medical air;*
*— specific mixtures of these above-mentioned gases;*
*— air for driving surgical tools;*
*— anaesthetic gases and vapours*

The product described in this EPD has been tested for: reaction to fire; crush strength; internal pressure; dimensional tolerances; temperature resistance; weldability; tightness (to gas and liquid); and durability in accordance with the named standards.

### Constructional data

Plumbing tube is supplied in straight lengths in sizes ranging from 10mm up to 108mm diameter, and in coils in sizes 6mm up to 28mm diameter.
Weight, outer diameter & surface area have been excluded from the table below as the EPD applies to the range of products described rather than a single instance within the range. Thermal conductivity is not a property tested as part of the specified standard, therefore the data is not available or relevant for the product.

| Name | Value | Unit |
|---|---|---|
| Type of used metal | Copper | - |
| Outer diameter of metal pipe | 6 - 108 | mm |
| Temperature limit of application | 120 | °C |
| Wall thickness of metal pipe | 0.6 to 2.5 | mm |

- Performance data of the product in accordance with the declaration of
performance with respect to its essential characteristics according to BS EN 1057:2006+A1:2010. Copper and copper alloys — Seamless, round copper tubes for water and gas in sanitary and heating applications.

- Performance data of the product in accordance with the declaration of
performance with respect to its essential characteristics according to EN13348:2016 - Copper and copper alloys — Seamless, round copper tubes for medical gases or vacuum

**Base materials/Ancillary materials**

At point of delivery to the customer, the product is 99.97% copper, 0.03% phosphorous and described as phosphorus de-oxidised (non-arsenical) copper alloy CW024A.

This product/article/at least one partial article contains substances listed in the candidate list (date: 25.05.2025) exceeding 0.1 percentage by mass: No

This product/article/at least one partial article contains other carcinogenic, mutagenic or reprotoxic (CMR) substances in categories 1A or 1B which are not on the candidate list, exceeding 0.1 percentage by mass: No

**Reference service life**

A reference service life in accordance with ISO 15868 has not been determined for this product.

50 years is considered the reference service life for this product, based on the following evidence:

- Copper pipe is expected to last for the useful life of the building under normal usage conditions. This is given as 60 years by the UK Green Building Council.
- In addition, the "Service lives of components for life cycle

  https://www.nachhaltigesbauen.de/austausch/nutzungsdauern-on-bauteilen/) also provides the service life for copper components of buildings as ≥50 years.

## LCA: Calculation rules

**Declared Unit**

1kg of copper pipe is the declared unit.
Material and process emissions have been divided between all diameters of pipe equally to give the emissions per 1kg finished product.

To achieve this the total material and energy inputs to the production facility in the reference year were compared to the total weight of finished pipe produced and allocated on an "inputs/outputs per tonne finished pipe" basis. This was then divided to give the figures for 1 kg finished product.
Scrap copper is a key material in the process, arriving at site as graded scrap copper with little to no preparatory treatment. Scrap copper as a secondary material without the upstream emissions of primary production associated with the initial use phase. This scrap input is broadly equivalent to the end of life output when pipework is removed from a building, so no further treatment is required for a closed material loop.

To determine the installation and use phases an example European 100m$^2$ apartment has been considered with the associated emissions extrapolated based on the weight of 15mm and 22mm pipe used in that example.
As total annual production figures are used, the figures for primary energy use and material inputs are derived from an extended period of monitoring and are therefore a good representation of the average scenario for the product per 1 kg reference unit.

Upstream extraction and processing impacts for each input material were obtained from ecoinvent using geographical data, where known and available, and global data sets otherwise. Some global data sets take into account the market share of key production where this is known, and the associated proportional variations in emissions in regional energy mix and associated emissions. Overall there were no concerns with the data quality assessment for preliminary products, in terms of representativeness of the final product.

**Declared unit**

| Name | Value | Unit |
|---|---|---|
| Declared unit | 1 | kg |
| Gross density | 8960 | kg/m$^3$ |

*NB Gross density provided for solid copper not bundled copper tube.*

The LCA is product specific to the copper pipes produced from the Bilston manufacturing site of Mueller Europe.

**Data quality**

To produce the LCA the following data was used:

- primary quantitative data on all inputs and outputs to the site, including materials, packaging and machinery consumables
- estimated quantities and characteristics for downstream additional materials using industry standard specification
- LCA inventory data for all inputs (upstream and downstream)
- As far as practicable, LCA inventories have been included for intermediate stages from raw material to factory input, including all major physical and chemical inputs at each stage

A data quality assessment of LCA inventories was completed for all materials in terms of:

- Technology used
- Time (relative to date of assessment)
- Geography
- Reliability

This is included in the methodology report, however the overall findings were Very Good or Good for the majority of indicators. Where data quality was found to be Fair or Poor this was due to necessary use of global data sets rather than geographically specific, and where LCA inventory data was over 10 years old but still deemed to be the most likely manufacturing scenario for the material in question.

**System boundary**

The system boundary used is cradle to grave and module D (A + B + C + D).
A1-3 includes

- pre-processing of all materials used in manufacture
- pre-processing of all factory consumables
- pre-processing and manufacturing of all packaging

- transportation of materials, consumables and packaging to factory
- energy and fuel consumption in manufacture
- WTT emissions from site energy, fuel and transportation to site

A4 includes

- Transportation by road and sea freight from point of manufacture to customer
- Disposal or recycling of packaging

A5 includes

- Installation (based on domestic scenario as described)
- Water used in system commissioning

B1-2 & 6-7 are included but with zero values as detailed in the next section

B3-5 are not relevant to this product

C1 is included but with zero values as detailed in the next section

C2 includes

- Transportation to recycling facility
- Transportation disposal site

C3 is included but with zero values as detailed in the next section
C4 includes disposal of non-recycled material

D is included with reference to net benefits of the product when recycled at end of life

**Geographic Representativeness**

Land or region, in which the declared product system is manufactured, used or handled at the end of the product´s lifespan: United Kingdom

**Comparability**

Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to *EN 15804* and the building context, respectively the product-specific characteristics of performance, are taken into account. The background database used was ecoinvent 3.9.1 with additional emissions factors for production energy taken from UK Defra figures.

## LCA: Scenarios and additional technical information

**Characteristic product properties of biogenic carbon**

No biogenic carbon is found in this product.
Packaging containing biogenic carbon is cardboard and wooden pallets used in transportation.

**Information on describing the biogenic Carbon Content at factory gate**

| Name | Value | Unit |
|---|---|---|
| Biogenic carbon content in product | - | kg C |
| Biogenic carbon content in accompanying packaging | 0.0037 | kg C |

**Transport from the gate to the site (A4)**

To determine an average transportation per kg of product, transportation for the reference year was considered as a whole, by destination and transportation method.

For rigid and articulated road transport commissioned by Mueller, the weekly dispatches by total distance and number of vehicles were reviewed to give an average distance per vehicle. To determine the EPD contribution by vehicle type the total distribution mileage was examined, with 35 % by articulated vehicle and 65 % by rigid vehicle. Tonne.km per kg for each vehicle type was then calculated using the average distance by vehicle type multiplied by share of distribution, to give an average profile split between rigid and articulated.

Seafreight was initially calculated using the distance to the major port of the destination country and the total weight of goods transported to give a tonne.km per destination country. A weighted average seafreight distance was then determined as a typical profile per kg of product sold.

| Name | Value | Unit |
|---|---|---|
| Transport distance road freight per kg product | 275 | km |
| Seafreight per kg product | 6.83 | tonne.km |

**Assembly (A5)**

Assembly calculations are based on the installation of a typical pipework for a 100m$^2$ apartment consisting of 25m of pipe (mix of 15mm and 22mm) with all associated joints, clips and installation. Both brazed solder and press fit joints were considered. A third options of brass compression joints was considered but excluded on the basis that it is rarely used and not applicable to the domestic scenario used for the installation calculations.

In calculating the LCA it has been assumed that 50 % of installations use brazed solder joints and 50 % use press fit joints. Therefore material impacts of joints and clips are included for all, with half values applied for emissions arising solely from each installation method.

"Other resources" listed in the table relate to brazed solder only; "electricity consumption" relates to press fit only. Brazed joints assume soft solder and a portable butane/propane torch; press fit joints assume nitrile rubber O-rings and electricity use.

Dust in the air should not occur during installation. VOC in the air will arise from brazed solder joints however the quantity will be extremely low when applied to 1kg of product and has therefore not been calculated as it will round to zero.

| Name | Value | Unit |
|---|---|---|
| Auxiliary joints and clips | 0.18 | kg |
| Water consumption for flushing | 0.324 | m$^3$ |
| Other resources (brazed installation consumables) | 0.02 | kg |
| Electricity consumption (press fit only) | 0.045 | kWh |
| Material loss | 0.01 | kg |
| Dust in the air | - | kg |
| VOC in the air | - | kg |

**Use phase (B1-7)**

Module B has been omitted as having no impacts associated with the product as follows:

**Use or application of the installed product (B1)**

Use of the product is in conjunction with hot and cold water systems, however none of the emissions from use can be reasonably attributed to the pipework itself as there is is no direct consumption or emission which arises from the pipework when other parts of the system are inactive.

**Maintenance (B2) & Repair (B3)**
Pipework lifespan is expected to match the operational life of any appliance to which it is connected. Failures will normally be in joints and rarely, therefore, maintenance impacts associated with 1kg of copper pipe are negligible.

**Replacement (B4) / Refurbishment (B5)**
Replacement and Refurbishment would be relevant at an installed system level, however, the wide variety of uses of copper pipe and the pipework's subservience to the installed mechanical and electric systems mean that it is not appropriate to attribute these areas to the pipe at a unit weight level.

**Operational energy use (B6) and Operational water use (B7)**
No energy or water are consumed by the product during its lifespan. Although it may be connected to a heating or other system which uses energy, no energy is used by the pipework when the associated system is not operational and the pipework does not require the system to be operational to function. Therefore, no energy or water have been attributed to the product during the use phase.

**End of life (C1-C4)**

C1 - no emissions are associated with removal or decommission of the pipework itself.
C3 - no processing is required to enable waste material to be used as a recycled input.

C2&4 - Based on current practices, it is expected that 95 % of waste copper pipe at end of life will be removed and recovered for recycling as scrap copper with up to 5 % lost in mixed construction waste from which the copper fraction cannot easily be recovered. This fraction is expected to be disposed of as mixed construction waste (small fractions) and sent for incineration with potential for energy recovery.

| Name | Value | Unit |
|---|---|---|
| Collected separately waste type scrap copper | 0.95 | kg |
| Collected as mixed construction waste | 0.05 | kg |
| Recycling | 0.95 | kg |
| Energy recovery | 0.05 | kg |

**Reuse, recovery and/or recycling potentials (D), relevant scenario information**
Copper pipe at end of life is readily recyclable with very minimal processing required between collection as metal waste and becoming a scrap copper feedstock for the next user.

Module D has been calculated based on the impact of recycled material replacing virgin copper in an equivalent industrial manufacturing process. The expected copper to recycling determined in C2 was 95 %, giving 0.95 kg per kg of product. The weight of scrap copper input to manufacturing (A1) was deducted to give the net scrap copper from the process.

GWP and other impacts have been calculated using the emissions by weight for 0.566 kg net scrap copper for the A1 upstream impacts of copper cathode.

Transport emissions have been excluded due to their small impact and the impossibility of predicting the local or regional sourcing of scrap copper at any given facility. From a qualitative perspective it is reasonable to assume that scrap copper will be sourced more locally to the manufacturer using the scrap, when compared to virgin copper transported internationally before arriving as copper cathode feedstock to the factory.

| Name | Value | Unit |
|---|---|---|
| Scrap copper out (based on 95% recycling) | 0.95 | kg |
| Scrap copper in A1 process input | 0.384 | kg |
| Net scrap copper | 0.566 | kg |
| Avoided emissions replacement of copper cathode | 3.74 | kgCO2e |

## LCA: Results

All included modules as described above are detailed in the table below.

- MNR - module not declared as not relevant for the specified product
- 0 - calculated value is 0
- 0 - value falls under the cut-off
- 0 - assumption which exclude any flows

**DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; ND = MODULE OR INDICATOR NOT DECLARED; MNR = MODULE NOT RELEVANT)**

| Product stage | | | Construction process stage | | Use stage | | | | | | | End of life stage | | | | Benefits and loads beyond the system boundaries |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Raw material supply | Transport | Manufacturing | Transport from the gate to the 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 | MND | MND | MNR | MNR | MNR | MND | MND | X | X | X | X | X |

**RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 kg copper pipe**

| Parameter | Unit | A1-A3 | A4 | A5 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|
| GWP-total | kg $CO_2$ eq | 8.7E+00 | 1.66E-01 | 1.57E+00 | 0 | 8.89E-03 | 0 | 3.31E-03 | -3.74E+00 |
| GWP-fossil | kg $CO_2$ eq | 8.62E+00 | 1.66E-01 | 1.55E+00 | 0 | 8.87E-03 | 0 | 2.94E-03 | -3.73E+00 |
| GWP-biogenic | kg $CO_2$ eq | 7.11E-02 | 4.66E-05 | 1.5E-02 | 0 | 6.87E-06 | 0 | 3.65E-04 | -4.03E-03 |
| GWP-luluc | kg $CO_2$ eq | 1.41E-02 | 1.02E-04 | 2.44E-03 | 0 | 4.08E-06 | 0 | 2.62E-06 | -7.31E-03 |
| ODP | kg CFC11 eq | 2.46E-07 | 2.99E-09 | 4.19E-08 | 0 | 1.94E-10 | 0 | 5.66E-11 | -4.2E-08 |
| AP | mol $H^+$ eq | 3.86E-01 | 2.31E-03 | 6.38E-02 | 0 | 1.83E-05 | 0 | 1.22E-05 | -3.05E-01 |
| EP-freshwater | kg P eq | 1.79E-03 | 1.13E-06 | 2.99E-04 | 0 | 7.01E-08 | 0 | 3.99E-08 | -1.32E-03 |
| EP-marine | kg N eq | 2.26E-02 | 5.79E-04 | 3.91E-03 | 0 | 4.44E-06 | 0 | 3.96E-06 | -1.42E-02 |
| EP-terrestrial | mol N eq | 3.1E-01 | 6.37E-03 | 5.33E-02 | 0 | 4.61E-05 | 0 | 4.34E-05 | -2.08E-01 |
| POCP | kg NMVOC eq | 9.32E-02 | 1.91E-03 | 1.59E-02 | 0 | 2.87E-05 | 0 | 1.47E-05 | -5.88E-02 |
| ADPE | kg Sb eq | 4.72E-03 | 3.53E-07 | 8.96E-04 | 0 | 2.84E-08 | 0 | 8.98E-09 | -3.92E-03 |
| ADPF | MJ | 1.37E+02 | 2.28E+00 | 2.48E+01 | 0 | 1.25E-01 | 0 | 3.41E-02 | -4.56E+01 |
| WDP | $m^3$ world eq deprived | 9.24E+00 | 8.6E-03 | 1.46E+00 | 0 | 4.75E-04 | 0 | 1.64E-04 | -4.32E+00 |

GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources; WDP = Water (user) deprivation potential)

**RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1 kg copper pipe**

| Parameter | Unit | A1-A3 | A4 | A5 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|
| PERE | MJ | 2.45E+01 | 2.6E-02 | 4.11E+00 | 0 | 2.19E-03 | 0 | 8.34E-04 | -1.29E+01 |
| PERM | MJ | 1.33E-01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| PERT | MJ | 2.46E+01 | 2.6E-02 | 4.11E+00 | 0 | 2.19E-03 | 0 | 8.34E-04 | -1.29E+01 |
| PENRE | MJ | 1.37E+02 | 2.28E+00 | 2.48E+01 | 0 | 1.25E-01 | 0 | 3.41E-02 | -4.56E+01 |
| PENRM | MJ | 1.84E-01 | 0 | 4.21E-01 | 0 | 0 | 0 | 0 | 0 |
| PENRT | MJ | 1.37E+02 | 2.28E+00 | 2.52E+01 | 0 | 1.25E-01 | 0 | 3.41E-02 | -4.56E+01 |
| SM | kg | 5.05E-01 | 0 | 8.15E-02 | 0 | 0 | 0 | 0 | 5.66E-01 |
| RSF | MJ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| NRSF | MJ | 5.57E-03 | 8.6E-05 | 9.51E-04 | 0 | 3.44E-06 | 0 | 1.14E-05 | -3.82E-03 |
| FW | $m^3$ | 2.49E-01 | 2.87E-04 | 4E-02 | 0 | 1.81E-05 | 0 | 7.75E-06 | -1.07E-01 |

PERE = Use of renewable primary energy excluding renewable primary energy resources 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 excluding non-renewable primary 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 material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water

**RESULTS OF THE LCA – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2: 1 kg copper pipe**

| Parameter | Unit | A1-A3 | A4 | A5 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|
| HWD | kg | 6.91E-03 | 4.96E-05 | 1.55E-03 | 0 | 2.87E-06 | 0 | 5.67E-02 | -1.91E-03 |
| NHWD | kg | 2.47E+00 | 1.09E-01 | 4.16E-01 | 0 | 5.17E-03 | 0 | 8.96E-03 | -1.62E+00 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| RWD | kg | 5.03E-04 | 4.78E-07 | 8.52E-05 | 0 | 4.96E-08 | 0 | 1.2E-08 | -1.03E-04 |
| CRU | kg | 0 | 0 | 4.46E-03 | 0 | 0 | 0 | 0 | 0 |
| MFR | kg | 1.61E-01 | 0 | 5.55E-03 | 0 | 0 | 9.5E-01 | 0 | 0 |
| MER | kg | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EEE | MJ | 0 | 0 | 6.63E-03 | 0 | 0 | 0 | 0 | 0 |
| EET | MJ | 0 | 0 | 1.3E-02 | 0 | 0 | 0 | 0 | 0 |

HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy

**RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional:**
**1 kg copper pipe**

| Parameter | Unit | A1-A3 | A4 | A5 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|
| PM | Disease incidence | 1.07E-06 | 1.08E-08 | 1.85E-07 | 0 | 5.53E-10 | 0 | 2.63E-10 | -6.84E-07 |
| IR | kBq U235 eq | 7.41E-01 | 8.02E-04 | 1.27E-01 | 0 | 7.36E-05 | 0 | 1.9E-05 | -1.7E-01 |
| ETP-fw | CTUe | 4.36E+02 | 1.14E+00 | 7.27E+01 | 0 | 6.34E-02 | 0 | 3.65E-01 | -3.48E+02 |
| HTP-c | CTUh | 5.63E-08 | 7.34E-11 | 9.26E-09 | 0 | 3.68E-12 | 0 | 7.15E-12 | -4.6E-08 |
| HTP-nc | CTUh | 4.87E-06 | 1.27E-09 | 7.96E-07 | 0 | 8.27E-11 | 0 | 1.1E-09 | -4.03E-06 |
| SQP | SQP | 1.29E+02 | 1.32E+00 | 2.15E+01 | 0 | 6.43E-02 | 0 | 3.82E-02 | -9.65E+01 |

PM = Potential incidence of disease due to PM emissions; IR = Potential Human exposure efficiency relative to U235; ETP-fw = Potential comparative Toxic Unit for ecosystems; HTP-c = Potential comparative Toxic Unit for humans (cancerogenic); HTP-nc = Potential comparative Toxic Unit for humans (not cancerogenic); SQP = Potential soil quality index

Disclaimer 1 – for the indicator “Potential Human exposure efficiency relative to U235”. 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 disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

Disclaimer 2 – for the indicators “abiotic depletion potential for non-fossil resources”, “abiotic depletion potential for fossil resources”, “water (user) deprivation potential, deprivation-weighted water consumption”, “potential comparative toxic unit for ecosystems”, “potential comparative toxic unit for humans – cancerogenic”, “Potential comparative toxic unit for humans - not cancerogenic”, “potential soil quality index”. 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 experienced with the indicator.

## References


**Standards**

**EN 1057**
EN 1057:2006 +A1:2010 - Copper and copper alloys — Seamless, round copper tubes for water and gas in sanitary and heating applications

**EN 13348**
EN 13348:2016 - Copper and copper alloys - Seamless round tubes for medical gases or vacuum

**EN 15804**
EN 15804:2012+A2:2019+AC:2021, Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products.

**ISO 14025**
EN ISO 14025:2011, Environmental labels and declarations — Type III environmental declarations — Principles and procedures.

**ISO 15868**
ISO 15686-5:2017 - Buildings and constructed assets — Service life planning

**PCR**

PCR Part A: Building related products and services (IBU version 1.4, 2024)

PCR Part B: Metal pipes for domestic installations (IBU V1 08.2021)

**Software**

SimaPro Desktop (Professional 9.5.0.2)

Libraries:
- ecoInvent 3.9.1 (Dec 2022)
- US Life Cycle Inventory (LCI) Database, last update 2015

**Further References**

**ECHA**
European Chemicals Database - https://chem.echa.europa.eu

**IBU 2021**
Institut Bauen und Umwelt e.V.: General Instructions for the EPD programme of Institut Bauen und Umwelt e.V., Version 2.0, Berlin: Institut Bauen und Umwelt e.V., 2021 www.ibu-epd.com

**Mueller Europe**
Wednesbury Copper Tubes product sizes - https://www.wednesburytube.com/Size-ranges.html

**Nachhaltiges Bauen**
Service lives of components for life cycle - https://www.nachhaltigesbauen.de/austausch/nutzungsdauern-von-bauteilen/

**UKGBC 2019** - Guide to Scope 3 Reporting in Commercial Real Estate
https://ukgbc.s3.eu-west-2.amazonaws.com/wp-content/uploads/2019/07/05150714/Scope-3-guide-for-commercial-real-estate.pdf

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