EPD INTERNATIONAL EPD SYSTEM

ECO PLATFORM EPD VERIFIED

SCT MEMBER OF THE KME GROUP

Environmental Product Declaration

SMISOL® CLIM

Serravalle Copper Tubes S.r.l.

EPD of multiple products, based on the average results of the product group

Programme	The International EPD System, www.environdec.com
Programme operator	EPD International AB
EPD registration number	EPD-IES-0025027
Version date	2025-10-07
Validity date	2030-10-07

The products of the SMISOL® Clim family included in the EPD are the ones identified with the following dimensions

6.35 x 0.8	9.52 x 0.8	12.7 x 0.8	6.35 x 1	9.52 x 1	12.7 x 1	15.87 x 0.8	15.87 x 1	19.05 x 1	22.22 x 1

An EPD may be updated or depublished if conditions change. To find the latest version of the EPD and to confirm its validity, see www.environdec.com

GENERAL

EPD Owner	SCT MEMBER OF THE KME GROUP Serravalle Copper Tubes S.r.l. Via Cassano, 113 15069 Serravalle Scrivia (AL) ITALY info-plumbing@sctubes.com www.sctubes.com www.kme.com/products
Contact	Veronica Repetto Veronica.Repetto@sctubes.com Via Cassano, 113 I-15069 Serravalle Scrivia (AL) ITALY
Programme	The International EPD System
	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
	www.environdec.com
	info@environdec.com
Product Category Rules (PCR)	CEN standard EN 15804 serves as the core Product Category Rules (PCR) Product category rules (PCR): PCR CONSTRUCTION PRODUCTS, PCR 2019:14, VERSION 2.0.1 CPC code: 415 - Semi-finished products of copper, nickel, aluminum, lead, zinc and tin or their alloys.
	PCR review was conducted by the Technical Committee of the Internation EPD System: Chair: Rob Rouwette, Co-Chair: Noa Meron. The review panel may be contacted via support@environdec.com>
Life Cycle Assessment (LCA)	LCA Study performed by Rina Consulting S.p.A. Elena Rocco, Maria Chiara Caruso, Lucrezia Lodi, Selene Varliero
Third-party Verification	External and independent ('third-party') verification of the declaration and data, according to ISO 14025:2006, via EPD verification through: ☒ Individual EPD verification without a pre-verified LCA/EPD tool ☐ Individual EPD verification with a pre-verified LCA/EPD tool ☐ EPD process certification* without a pre-verified LCA/EPD tool ☐ EPD process certification* with a pre-verified LCA/EPD tool ☐ Fully pre-verified EPD tool Third-party verifier: Cristina Vidali and Matteo Riccardi, RINA Services S.p.A. Accredited by: ACCREDIA (Registration number 00005 VV) *EPD process certification involves an accredited certification body certifying and periodically auditing the EPD process and conducting external and independent verification of EPDs that are regularly published. More information can be found in the General Programme Instructions on www.envrondec.com.
	Procedure for follow-up of data during EPD validity involves third-party verifier:**: ☒ Yes ☐ No **Procedure for follow-up the validity of the EPD is at minimum required once a year with the aim of confirming whether the information in the EPD remains valid or if the EPD needs to be updated during its validity period. The follow-up can be organized entirely by the EPD owner or together with the original verifier via an agreement between the two parties. In both approaches, the EPD owner is responsible for the procedure being carried out. If a change that requires an update is identified, the EPD shall be re-verified by a verifier.
Responsibility	The EPD owner has the sole ownership, liability, and responsibility for the EPD.

Comparability	EPDs within the same product category but published in different EPD programmes, may not be comparable. For two EPDs to be comparable, they shall be based on the same PCR (including the same first-digit version number) or be based on fully aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared units); have identical scope in terms of included life-cycle stages (unless the excluded life-cycle stage is demonstrated to be insignificant); apply identical impact assessment methods (including the same version of characterization factors); and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

COMPANY

SCTubes is a leading italian company in the production and commercialization of copper tubes, it is part of the prestigious international KME group. With decades of experience, SCTubes stands out for its wide range of products designed to meet the needs of plumbing and heating systems as well as industrial technologies. This dedication to quality results in greater professionalism and confidence in the work of distributors, designers, and installers, as well as for the industries that use them.
The Serravalle Scrivia (AL) plant is one of the most advanced in Europe for the production of copper tubes, not only for civil uses but also for industrial applications. The integrated production cycle characterizes the plant includes, among other things, insulating sleeves for coated tubes, adding further value to the commercial proposal.
The history of SCTubes is intrinsically linked to the SMI Group, founded in 1886, from which the well-known brand SMISOL® originates, highly regarded in the installation sector. Through organizational and corporate changes over the years — initially under the name Europa Metalli and now as an integral part of the KME Group — the company has been able to adapt and grow, always keeping a close eye on market innovations.
SCTubes benefits from a dedicated foundry and the synergies derived from the various production units of the KME Group. This allows for maximizing efficiency and further improving the quality of the products offered. The company is indeed committed to a process of continuous improvement, relying on certified quality standards, the result of a long tradition and consolidated technological expertise.
The know-how accumulated over the years merges with an effective internal benchmarking strategy, which enables the exchange of expertise among the different entities of the Group. This collaborative model has made it possible to adopt high-quality standards, useful not only for industrial products but also for copper tubes for the plumbing and heating sector.

Values

SCT and the KME Group have adopted a business model that not only focuses on economic efficiency but also integrates social and environmental responsibilities as key factors. This approach recognizes the need to consider the interests of all stakeholders, from employees to suppliers, customers, and local communities.
Excellence and innovation extend beyond production to the way SCT and the KME Group manage human capital and interact with the territory. Sustainability translates into responsible resource management, promoting production practices that limit environmental impact. Company policies are oriented towards reducing CO_2 emissions, recycling materials, and minimizing waste.

Responsibility

The KME Group stands out for its commitment to a sustainable strategy, addressing every aspect of its processes with responsibility. This approach not only enhances customer orientation but is also based on ethical principles and safety that guide every operation.

Customer Orientation and Transparency

The design of products and processes is characterized by clear and transparent communication with the customer. This not only facilitates productive interaction but also builds trust, a crucial element for long-term success.

Company code of conduct

Strict adherence to the Code of Conduct is the cornerstone of our corporate culture. Through this code, we commit to maintaining high ethical standards, promoting responsible behavior among employees and in external relationships.

Occupational Health and Safety

In line with our vision of a "zero-incident" policy, we are dedicated to creating a healthy and safe work environment. The implementation of protective measures and continuous training of our employees are essential to reduce risks and ensure everyone’s well-being.

Risk Assessment and Continuous Improvement

Continuous risk assessment related to operational procedures and future activities enables SCT to anticipate potential issues and adopt preventive measures. Our proactive compliance with regulations and legal requirements ensures that we always operate in accordance with the expectations of customers and the community.

Cutting-Edge Techniques and Procedures

The implementation of the best available techniques is not only a strategic choice but also a duty for the continuous improvement of our processes. This includes developing preventive strategies aimed at avoiding environmental pollution and accidents—key elements to ensure long-term profitability and sustainability.

Energy Efficiency and Recyclability

We are committed to using efficiently materials and energy during the production and supply of our products and services. Manufacturing products that meet requirements such as "safety," "energy efficiency," and "recyclability" demonstrates our commitment to responsible innovation.

Communication and Collaboration

Maintaining open communication is fundamental to building solid and transparent relationships. Promoting a culture where all employees share these values is a priority, as everyone plays a key role in implementing our mission.

Company Guidelines and Global Standards

Our corporate guidelines establish binding global standards for all companies operating within the KME Group. These standards ensure that every entity within our group actively contributes to a more sustainable, responsible, and customer-oriented future.

Certifications

SCT holds ISO 14001, ISO 45001, and ISO 9001 certifications, demonstrating its dedication to environmental protection, workplace safety, and quality. These internationally recognized standards help build trust with customers and partners, showing our commitment to responsible and transparent operations.

PRODUCT

The **SMISOL® Clim** product line represents a significant advancement in the field of air conditioning systems. This copper tube, characterized by CPC number 415, is manufactured in the Serravalle Scrivia (AL) plant according to the EN 12735-1 standard, stands out for its insulating coating made of closed-cell polyethylene foam with regular and uniformly distributed cells, in compliance with EN 15758:2016. It is designed to ensure optimal performance. The insulating sheath is made in accordance with European Regulation No. 1005/2009. The thickness of the sheath is carefully sized to meet the different requirements in the field of installations, ensuring both safety and high performance

Sheat Characteristics:

SMISOL® Clim is distinguished by its closed-cell polyethylene foam coating with an average water vapor diffusion resistance factor "μ" greater than 15.000, representing an advanced solution for thermal insulation and protection of buildings and infrastructure. Insulating sheaths like SMISOL® Clim are designed in compliance with European regulations, particularly European Regulation No. 1005/2009, which prohibits the use of CFCs and HCFCs—substances harmful to both human health and the environment.

SMISOL® Clim not only complies with environmental regulations but also demonstrates excellent fire performance, classified as BLs1d0 according to EN 13501-1. These properties make the product suitable for use in contexts where safety is a fundamental priority.

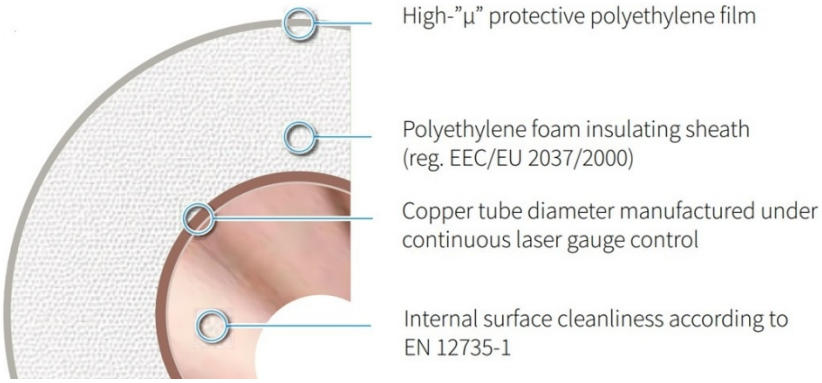
The external polyethylene film is designed to counteract the photodegradation process of the coating, a problem that can compromise the material's integrity over time.

PROPERTIES OF TUBE'S COATING

- Thermal conductivity: $\lambda \leq$ 0.038 W/m°C a 40°C.
- Average water vapor diffusion resistance factor "μ" > 15.000.
- Fire behavior: BLs1d0 (EN 13501-1). Increased resistance to UV rays
- Average coating density: 30 kg/m^3. Free from ammoniacal residues
- Excellent resistance to external chemical agents
- Free from CFCs and HCFCs (Reg. EEC/EU 2037/2000).
- Flame retardant halogen-free

COPPER TUBES CHARACTERISTICS

- Alloy: Cu DHP – CW024A
- Dimensions and tolerances: according to EN 12735-1
- Absolute Roughness e. = 0,0015 mm
- Thermal conductivity at 20°C = 364 W/m°C
- Linear thermal expansion: 0,0166 mm/m°C
- Percentage elongation: A5 min > 40%
- Physical state: R220
- Carbon Residue: 0.38 mg/dm^2



The EPD of **SMISOL® Clim** family includes the following products. The dimensions are in inches as specifically required by EN 12735-1 and the average weight is equal to 181 g/m.

Outer Diameter	Dimensions Ed x Th[1]	Minimum Guaranteed Coil Length	Minimum Coating Thickness
(inch)	(mm)	(m)	(mm)
1/4"	6.35 x 0.8	50	6
3/8"	9.52 x 0.8	50	8
1/2"	12.7 x 0.8	50	10
1/4"	6.35 x 1	50	6
3/8"	9.52 x 1	50	8
1/2"	12.7 x 1	50	10
5/8"	15.87 x 0.8	25	10
5/8"	15.87 x 1	25	10
3/4"	19.05 x 1	25	10
7/8"	22.22 x 1	25	10

The SMISOL® Clim copper tubes derive from copper billets that are pre-heated and subjected to hot extrusion. The extruded tubes undergo a cold rolling process for dimensions' reduction and then the rolled tubes are sent to the drawing process via coils. The tubes are then subjected to a finishing process depending on the intended use of the tubes. Parallelly, the expanded polyethylene coating is produced in an auxiliary section of the tube manufacturing plant. Finally, the tubes are packaged and are finalized in order to be sold.

[1] Ed = External diameter Th = wall thickness

CONTENT DECLARATION

The composition, in terms of input raw materials and packaging materials used to manufacture 1m of SMISOL® Clim products, is reported in the following table.
Given that EPD is provided for multiple products and that the average impacts are declared, also the composition is declared as the weighted average of all the SMISOL® Clim family products. For these products, the weighted average pre-consumer recycled content is equal to 82g per linear meter.
Information regarding the biogenic carbon included in the raw materials and packaging materials is also reported.
The product's composition does not contain substances listed in the "Candidate List of Substances of Very High Concern for authorization" exceeding the limits for registration with the European Chemicals Agency.

Product components	Weight kg	Biogenic material weight-% and kg C/kg
Copper Billets	1,54E-01	-
Polyethylene film	1,44E-02	-
Polyethylene foam	1,05E-02	-
Additives for plastic materials	2,37E-03	-
TOTAL	**1 81E-01**	

Packaging materials	Weight kg	Weight-% (versus the product)	Weight biogenic carbon kg C/kg
Wood	4,90E-04	0,18%	2,45E-04
High density polyethylene	4,00E-05	0,01%	-
Low density polyethylene	1,49E-03	0,54%	-
Rubber	1,86E-04	0,07%	7,25E-05
Paper	3,33E-03	1,20%	1,48E-03
Nylon	2,35E-04	0,08%	-
Printed paper	9,98E-05	0,04%	4,43E-05
TOTAL	5,87E-03		1,84E-03
Hazardous substances from the candidate list of SVHC	EC No.	CAS No.	Mass-% per product or declared unit
Not present	--	--	--

LCA STUDY

Declared unit: 1 m of tubes with a nominal weight/meter value included in the range 124-594 g/m
Reference period for data collection: 2024
Database(s) and software LCA: Ecoinvent 3.11, LCA for Expert software v10.9 (Sphera)
Calculation methodology: EN15804+A2 (EF 3.1)
System boundaries: “Cradle to Gate with Modules C1-C4 and Module D”

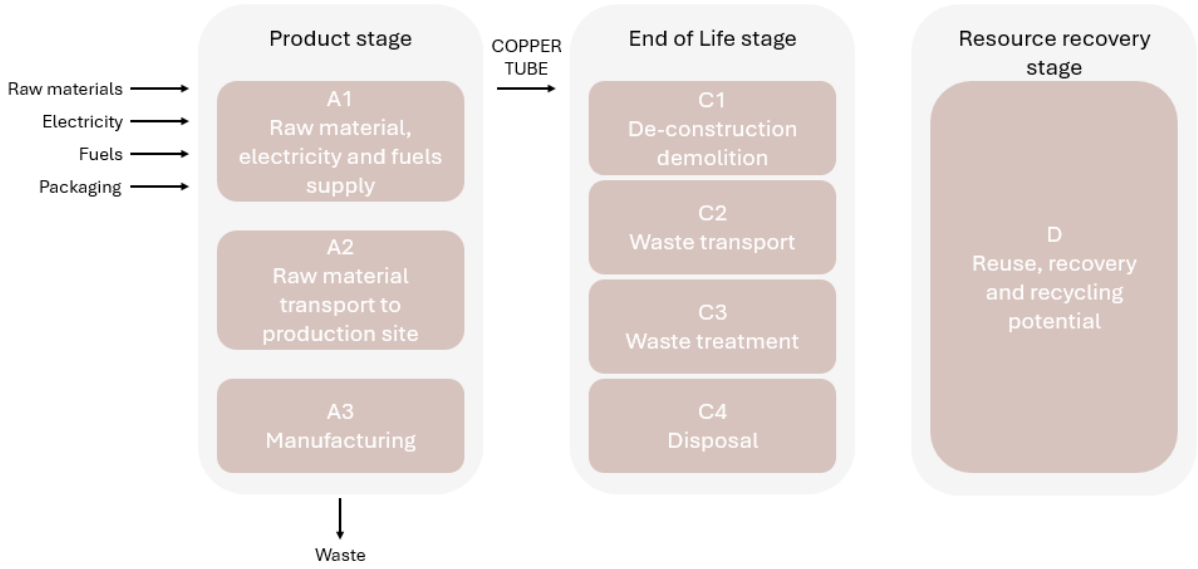


Figure 1: System boundaries

	Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
Module	**A1**	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Modules declared	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	EU	EU	IT	ND	ND	ND	ND	ND	ND	ND	ND	ND	EU	EU	EU	EU	EU
Share of Primary Data[2]	32.23%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	-25% / 126%			-	-	-	-	-	-	-	-	-	-	-	-	-	-

Figure 2: Modules declared (X), Modules Not Declared (ND), Geography (IT = Italy, EU=Europe)

The value referred to the share of primary data, declared for the total GWP-GHG results of modules A1-A3 according to Table 3 of PCR, is reported in the table below.

Process	Data Source	Reference year	Data Category	Share of primary data of GWP-GHG results for A1-A3
Manufacturing of product	Ecoinvent 3.11; Sphera	2024	Secondary	
Packaging	Ecoinvent 3.11	2024	Secondary	
Generation of electricity used in manufacturing of product	Collected data	2024	Primary	14,05%
Inbound Transport	Collected data	2024	Primary	3,67%
Emissions	Collected data	2024	Primary	1,39%
Outbound Transport	Collected data	2024	Primary	0,70%
Site waste processing treatment	Ecoinvent 3.11	2024	Secondary	
Generation of heat used in manufacturing of product	Collected data	2024	Primary	12,42%
Diesel for internal transport	Ecoinvent 3.11	2024	Secondary	
Average total share of primary data of product of GWP-GHG results for A1-A3				**32 23%**

Module A1 includes the supply of copper billets, polyethylene foam and polyethylene film and additives. All the materials are purchased within Europe, and modeled with LCA dataset related to European region, if available. Copper Billets are produced by the recycling process of copper scraps. For 2024, the recycled supplied billets have been composed of 20% of scrap materials supplied by SCT, which are considered pre-consumer scrap, of 34% of scrap purchased from external suppliers, which is precautionary considered pre-consumer scrap

[2] *The share of primary data is calculated based on GWP-GHG results. It is a simplified indicator for data quality that supports the use of more primary data, to increase the representativeness of and comparability between EPDs. Note that the indicator does not capture all relevant aspects of data quality and is not comparable across product categories.*

due to lack of additional information, and of the remaining 46% of virgin copper. Secondary raw materials are modeled in accordance with the "polluter pays" (PP) principle, whereby the environmental impact of processes up to the end-of-waste state for recycled or reused waste must be attributed to the production system that generates the waste. With regard to the allocation criteria, the quantities produced (in tonnes or meters) were used in relation to the total or aggregated production. Any process occurring after the end-of-waste state must be attributed to the production system that utilizes the recycled or reused material flow.
Copper billets, which accounts for more than 70% of the GWP-GHG of Modules A1-A3, has an impact of 2695.6 kg CO□-eq/tonne.

Module A2 includes the transportation of raw materials to the SCT manufacturing site. Transportation is performed via EURO 6 trucks.

Module A3 includes the actual manufacturing of the tubes, i.e. electricity and thermal energy, direct emissions, packaging materials, internal transportation, waste transportation and treatment of process waste. As a precaution, the energy used for services was also accounted for, although they are not directly used in the production process. Moreover, CO_2 emissions were evaluated starting from the Scope 1 of the European Trading Scheme (ETS) developed by SCT.
The production phase represents the core of the system under examination. For this reason, data related to this phase are represented by primary data collected by SCT for the Serravalle Scrivia plant during the reference period of this EPD, covering one year of production (2024). Where possible, data were collected specifically for the product under examination (for example, regarding quantities of materials used). Other data, such as energy consumption or waste produced, were collected at the plant level for the reference period considered. In these cases, such data were allocated according to the meters produced within the plant. Regarding electrical energy consumption, in 2024 SCT purchased electricity with Renewable Energy Guarantee of Origin (REGOs) electronic certificate from Edison energy distribution company for a total of 2340 MWh of consumed energy. Therefore, the renewable energy source was modeled accordingly. The non-renewable energy sources were modelled according to the Edison electricity mix production related to non-renewable energy sources, in 2024. For waste modeling, the "Polluter Pays Principle" has been applied.

Modules C1, C2, C3 and C4 include the deconstruction of the product, the transportation to waste processing, the waste treatment and the disposal, respectively. Therefore, they represent phases that are not under the direct control of the manufacturer and default data provided by Table 4 of PCR 2019:1 was used for modelling.

Module D includes the benefits due to the recycling of materials included in the product. In particular, the proportion of the copper and PE material in the product that are recycled in a subsequent system are equal to 95% and 70 % w/w, respectively according to the Annex C of Product Environmental Footprint Guidance.

In accordance with the relevant PCR and EN 15804:2012+A2:2019, more than 95% of the total flows (mass and energy) have been considered for each module.

Data quality

A data quality assessment that complies with EN 15941 is reported hereafter. This assessment is related to the datasets of copper billets and electricity, that contribute to 80% of the results of the declared environmental impact indicators.

Process	Type of source	Source	Reference year	Data category	Reliability of source[3]	Completeness[4]	Temporal coverage[5]	Geographical coverage[6]	Technological coverage[7]
Copper billets	Collected data	EPD owner, Gabi Professional 2025, Ecoinvent 3.11	2024	Secondary data	1	2	1	2	1
Electricity	Collected data	EPD owner	2024	Primary data	1	1	1	1	1

3 Reliability of source – Score 1 = Verified data based on measurements
4 Completeness – Score 1 = Representative data from a sufficient sample of sites over an adequate period to even out normal fluctuation; Score 2 = Representative data from a smaller sample of sites but for adequate periods
5 Temporal coverage – Score 1 = Less than 1 year of difference to year of study
6 Geographical coverage - Score 1 = Data from area under study; Score 2 = Average data from larger area in which the area under study is included
7 Technological coverage - Score 1 = Data from enterprises, processes and materials under study

ENVIRONMENTAL PERFORMANCE

All the environmental indicators are provided per declared unit, i.e., 1 meter of product. The average (mean) results of the included products are declared.

Indicator according to regulation EN 15804

Average results per 1 linear meter of Copper Tube								
Indicator	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**	**
GWP-fossil	kg CO_2 eq.	1,11E+00	7,25E-05	2,72E-03	5,27E-05	1,12E-04	-3,24E-01	-25% / 124%
GWP-biogenic	kg CO_2 eq.	1,75E-03	8,05E-09	5,81E-07	5,86E-09	3,86E-08	-9,73E-02	-28% / 140%
GWP-luluc	kg CO_2 eq.	9,06E-03	7,42E-09	9,15E-07	5,40E-09	6,38E-08	-7,07E-03	-36% / 181%
GWP-total	kg CO_2 eq.	1,12E+00	7,25E-05	2,72E-03	5,28E-05	1,12E-04	-2,52E-01	-25% / 125%
ODP	kg CFC 11 eq.	1,85E-08	1,08E-12	5,92E-11	7,83E-13	3,13E-12	-1,81E-11	-10% / 50%
AP	mol H^+ eq.	1,99E-02	6,48E-07	5,84E-06	4,71E-07	7,87E-07	4,42E-03	-35% / 175%
EP-freshwater	kg P eq.	6,93E-04	2,34E-09	1,89E-07	1,70E-09	9,83E-09	5,20E-04	-33% / 168%
EP-marine	kg N eq.	1,70E-03	3,02E-07	1,43E-06	2,20E-07	3,03E-07	-3,42E-04	-31% / 157%
EP-terrestrial	mol N eq.	1,93E-02	3,30E-06	1,52E-05	2,40E-06	3,30E-06	-2,68E-03	-32% / 161%
POCP	kg NMVOC eq.	6,62E-03	9,88E-07	9,26E-06	7,19E-07	1,19E-06	-7,01E-04	-28% / 140%
ADP-minerals&metals*	kg Sb eq.	4,24E-04	2,59E-11	9,33E-09	1,88E-11	1,64E-10	-1,22E-04	-37% / 184%
ADP-fossil*	MJ	1,72E+01	9,35E-04	3,87E-02	6,80E-04	2,75E-03	-3,24E+00	-22% / 108%
WDP*	m^3	6,39E-01	2,86E-06	2,10E-04	2,08E-06	1,23E-04	-1,82E-01	-32% / 161%
Acronyms	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 Exceedance; 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 Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption							

** 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*

*** Maximum variation of results in modules A1-A3 within the product family, compared to the average results.*

The results of the end-of-life stage (modules C1-C4) should be considered when using the results of the product stage (modules A1-A3) The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.

Additional mandatory and voluntary impact category indicators

Average results per 1 linear meter of Copper Tube								
Indicator	Unit	A1-A3	C1	C2	C3	C4	D	**
GWP-GHG	kg CO_2 eq.	9,14E-01	6,23E-05	2,34E-03	4,53E-05	9,13E-05	-1,94E-01	-100% / 171%

Resource use indicators

Average results per 1 linear meter of Copper Tube							
Indicator	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	3,20E-01	5,95E-07	6,39E-05	4,33E-07	2,60E-06	-1,39E-01
PERM	MJ	9,73E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	3,30E-01	5,95E-07	6,39E-05	4,33E-07	2,60E-06	-1,39E-01
PENRE	MJ	1,72E+00	9,35E-05	3,88E-03	6,80E-05	4,68E-02	-4,24E-01
PENRM	MJ	1,55E-01	7,70E-10	1,67E-07	5,60E-10	-4,66E-02	2,53E-05
PENRT	MJ	1,88E+00	9,35E-05	3,88E-03	6,80E-05	2,75E-04	-4,24E-01
SM	kg	8,21E-02	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
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m^3	1,32E-03	6,66E-09	4,88E-07	4,85E-09	2,85E-07	-3,44E-04
Acronyms	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 re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water						

Waste indicators

Average results per 1 linear meter of Copper Tube							
Indicator	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed (HWD)	kg	5,57E-03	8,36E-08	3,95E-06	6,08E-08	2,20E-07	5,48E-03
Non-hazardous waste disposed (NHWD)	kg	1,23E-01	6,20E-07	4,25E-05	4,51E-07	2,98E-06	-3,93E-02
Radioactive waste disposed (RWD)	kg	1,43E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-1,84E-05

Output flow indicators

Average results per 1 linear meter of Copper Tube							
Indicator	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Components for re-use (CRU)	kg	5,07E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling (MFR)	kg	6,60E-04	0,00E+00	0,00E+00	1,67E-02	0,00E+00	0,00E+00
Materials for energy recovery (MER)	kg	4,17E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported electrical energy (EEE)	MJ	1,15E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported thermal energy (EET)	MJ	6,54E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Environmental Performance for 100% End-of-Life Scenarios

Copper tubes are subjected to a mix of end-of-life alternatives because they are partly recycled and partly landfilled. In the tables below, the environmental indicators are reported for the End-of-Life scenarios 100% landfill and 100% recycling, considering 1m of product having an average mass equal to 0.181kg.

Indicator according to regulation EN 15804 (100% landfill)

Average results per 1 linear meter of Copper Tube (100% landfill End of Life Scenario)					
Indicator	**Unit**	**C1**	**C2**	**C3**	**C4**
GWP-fossil	kg CO_2 eq.	7,22E-05	2,70E-03	-	1,13E-03
GWP-biogenic	kg CO_2 eq.	8,02E-09	5,78E-07	-	3,90E-07
GWP-luluc	kg CO_2 eq.	7,38E-09	9,10E-07	-	6,44E-07
GWP-total	kg CO_2 eq.	7,22E-05	2,71E-03	-	1,13E-03
ODP	kg CFC 11 eq.	1,07E-12	5,89E-11	-	3,16E-11
AP	mol H^+ eq.	6,45E-07	5,81E-06	-	7,94E-06
EP-freshwater	kg P eq.	2,33E-09	1,88E-07	-	9,92E-08
EP-marine	kg N eq.	3,01E-07	1,42E-06	-	3,06E-06
EP-terrestrial	mol N eq.	3,29E-06	1,51E-05	-	3,33E-05
POCP	kg NMVOC eq.	9,84E-07	9,21E-06	-	1,20E-05
ADP-minerals&metals*	kg Sb eq.	2,58E-11	9,29E-09	-	1,66E-09
ADP-fossil*	MJ	9,31E-04	3,86E-02	-	2,77E-02
WDP*	m^3	2,85E-06	2,09E-04	-	1,24E-03
Acronyms	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 Exceedance; 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 Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption				

** 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*
*** Maximum variation of results in modules A1-A3 within the product family, compared to the average results.*

The results of the end-of-life stage (modules C1-C4) should be considered when using the results of the product stage (modules A1-A3) The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.

Additional mandatory and voluntary impact category indicators (100% landfill)

Average results per 1 linear meter of Copper Tube (100% landfill End of Life Scenario)					
Indicator	Unit	C1	C2	C3	C4
GWP-GHG	kg CO_2 eq.	7,22E-05	2,71E-03	-	1,13E-03

Resource use indicators (100% landfill)

Average results per 1 linear meter of Copper Tube (100% landfill End of Life Scenario)					
Indicator	**Unit**	**C1**	**C2**	**C3**	**C4**
PERE	MJ	5,92E-06	6,36E-04	-	2,62E-04
PERM	MJ	0,00E+00	0,00E+00	-	0,00E+00
PERT	MJ	5,92E-06	6,36E-04	-	2,62E-04
PENRE	MJ	9,31E-04	3,86E-02	-	2,77E-02
PENRM	MJ	0,00E+00	0,00E+00	-	1,55E+00
PENRT	MJ	9,31E-04	3,86E-02	-	1,58E+00
SM	kg	0,00E+00	0,00E+00	-	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	-	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	-	0,00E+00
FW	m^3	2,85E-06	2,09E-04	-	1,24E-03
Acronyms	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 re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water				

Waste indicators (100% landfill)

Average results per 1 linear meter of Copper Tube (100% landfill End of Life Scenario)					
Indicator	**Unit**	**C1**	**C2**	**C3**	**C4**
Hazardous waste disposed (HWD)	kg	8,32E-07	3,93E-05	-	2,22E-05
Non-hazardous waste disposed (NHWD)	kg	6,17E-06	4,23E-04	-	3,01E-04
Radioactive waste disposed (RWD)	kg	0,00E+00	0,00E+00	-	0,00E+00

Output flow indicators (100% landfill)

Average results per 1 linear meter of Copper Tube (100% landfill End of Life Scenario)					
Indicator	**Unit**	**C1**	**C2**	**C3**	**C4**
Components for re-use (CRU)	kg	0,00E+00	0,00E+00	-	0,00E+00
Materials for recycling (MFR)	kg	0,00E+00	0,00E+00	-	0,00E+00
Materials for energy recovery (MER)	kg	0,00E+00	0,00E+00	-	0,00E+00
Exported electrical energy (EEE)	MJ	0,00E+00	0,00E+00	-	0,00E+00
Exported thermal energy (EET)	MJ	0,00E+00	0,00E+00	-	0,00E+00

Indicator according to regulation EN 15804 (100% recycling)

Average results per 1 linear meter of Copper Tube (100% recycling End of Life Scenario)					
Indicator	**Unit**	**C1**	**C2**	**C3**	**C4**
GWP-fossil	kg CO_2 eq.	7,22E-05	2,70E-03	5,25E-05	-
GWP-biogenic	kg CO_2 eq.	8,02E-09	5,78E-07	5,83E-09	-
GWP-luluc	kg CO_2 eq.	7,38E-09	9,10E-07	5,37E-09	-
GWP-total	kg CO_2 eq.	7,22E-05	2,71E-03	5,25E-05	-
ODP	kg CFC 11 eq.	1,07E-12	5,89E-11	7,79E-13	-
AP	mol H^+ eq.	6,45E-07	5,81E-06	4,69E-07	-
EP-freshwater	kg P eq.	2,33E-09	1,88E-07	1,69E-09	-
EP-marine	kg N eq.	3,01E-07	1,42E-06	2,19E-07	-
EP-terrestrial	mol N eq.	3,29E-06	1,51E-05	2,39E-06	-
POCP	kg NMVOC eq.	9,84E-07	9,21E-06	7,15E-07	-
ADP-minerals&metals*	kg Sb eq.	2,58E-11	9,29E-09	1,87E-11	-
ADP-fossil*	MJ	9,31E-04	3,86E-02	6,77E-04	-
WDP*	m^3	2,85E-06	2,09E-04	2,07E-06	-
Acronyms	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 Exceedance; 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 Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption				

** 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*
*** Maximum variation of results in modules A1-A3 within the product family, compared to the average results.*

The results of the end-of-life stage (modules C1-C4) should be considered when using the results of the product stage (modules A1-A3) The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.

Additional mandatory and voluntary impact category indicators (100% recycling)

Average results per 1 linear meter of Copper Tube (100% recycling End of Life Scenario)					
Indicator	Unit	C1	C2	C3	C4
GWP-GHG	kg CO_2 eq.	7,22E-05	2,71E-03	5,25E-05	-

Resource use indicators (100% recycling)

Average results per 1 linear meter of Copper Tube (100% recycling End of Life Scenario)					
Indicator	**Unit**	**C1**	**C2**	**C3**	**C4**
PERE	MJ	5,92E-06	6,36E-04	4,31E-06	-
PERM	MJ	0,00E+00	0,00E+00	0,00E+00	-
PERT	MJ	5,92E-06	6,36E-04	4,31E-06	-
PENRE	MJ	9,31E-04	3,86E-02	6,77E-04	-
PENRM	MJ	0,00E+00	0,00E+00	5,57E-09	-
PENRT	MJ	9,31E-04	3,86E-02	6,77E-04	-
SM	kg	0,00E+00	0,00E+00	0,00E+00	-
RSF	MJ	0,00E+00	0,00E+00	0,00E+00	-
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	-
FW	m^3	2,85E-06	2,09E-04	4,82E-08	-
Acronyms	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 re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water				

Waste indicators (100% recycling)

Average results per 1 linear meter of Copper Tube (100% recycling End of Life Scenario)					
Indicator	**Unit**	**C1**	**C2**	**C3**	**C4**
Hazardous waste disposed (HWD)	kg	8,32E-07	3,93E-05	6,05E-07	-
Non-hazardous waste disposed (NHWD)	kg	6,17E-06	4,23E-04	4,49E-06	-
Radioactive waste disposed (RWD)	kg	0,00E+00	0,00E+00	0,00E+00	-

Output flow indicators (100% recycling)

Average results per 1 linear meter of Copper Tube (100% recycling End of Life Scenario)					
Indicator	**Unit**	**C1**	**C2**	**C3**	**C4**
Components for re-use (CRU)	kg	0,00E+00	0,00E+00	0,00E+00	-
Materials for recycling (MFR)	kg	0,00E+00	0,00E+00	1,45E-01	-
Materials for energy recovery (MER)	kg	0,00E+00	0,00E+00	0,00E+00	-
Exported electrical energy (EEE)	MJ	0,00E+00	0,00E+00	0,00E+00	-
Exported thermal energy (EET)	MJ	0,00E+00	0,00E+00	0,00E+00	-

Additional environmental information

The recycled/recovered/by-products content in the SMISOL® Clim products is reported in the following table, according to ISO 14021:2016+A1:2021, which can be used to claim about the recycled content of materials. The values are reported per 1 m of the SMISOL® Clim family products and are evaluated as weighted average of the recycled/recovered/by-products content of each product. Moreover, the range of minimum and maximum variation is included. Given that the origin of the copper scrap processed in the foundries is fully known only for the portion of copper scrap generated at SCT and resent to the foundries, it is conservatively assumed that the recycled content is entirely composed of pre-consumer scrap.

Indicators	Unit	Average value	Variation
Content of recycled materials	%	45,13%	43,9% / 46,3%
Content of recovered materials	%	-	-
Content of by-products	%	-	-
Total	%	**45,13%**	**43,9% / 46,3%**

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Version history

Original version of the EPD, 2025-10-07

Abbreviations

Abbreviation	Definition
CO_2	Carbon dioxide
CPC	Central Product Classification
EF	Environmental Footprint
EPD	Environmental Product Declaration
GHG	Greenhouse Gas
GWP	Global Warming Potential
ISO	International Organization for Standardization
LCA	Life Cycle Assessment
LCI	Life Cycle Inventory
PCR	Product Category Rules
Lifecycle Stages/Modules	
A1	Raw material supply
A2	Transport
A3	Manufacturing
A4	Transport to site
A5	Construction/Installation
B1	Use
B2	Maintenance
B3	Repair
B4	Replacement
B5	Refurbishment
B6	Operational energy use
B7	Operational water use
C1	Deconstruction/Demolition
C2	Transport to waste processing
C3	Waste processing
C4	Disposal
D	Reuse-recovery-Recycling potential

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Serravalle Copper Tubes S.r.l.
Via Cassano, 113 15069 Serravalle Scrivia (AL) ITALIA
info-plumbing@sctubes.com www.sctubes.com www.kme.com/sctubes

linkedin.com/company/sctubes