European Copper Institute
Copper Alliance

LIFE CYCLE ASSESSMENT DATA
COPPER TUBE

PRODUCT DESCRIPTION

material: **COPPER**
product: **TUBE 15/1**
15 mm diameter, 1 mm thickness
unit: **m**
context: **CRADLE TO GATE**
Without use phase
With use phase

MODELLING PARAMETERS

Process		Allocation of Byproducts
mining:	**GLOBAL**	GOLD (by value)
refining/smelting:	**EUROPEAN**	MOLYBDENUM (by value)
fabricating:	**EUROPEAN**	NICKEL SULPHATE (by value)
recycling:	**EUROPEAN**	SILVER (by value)
		SULPHURIC ACID (by value)
		STEAM (not allocated)

RESULTS

Primary Energy Consumption	0,013	GJ/m
Global Warming Potential	0,93	kg CO_2-equiv/m
Acidification Potential	0,0053	kg SO_2-equiv/m
Eutrophication Potential	0,00031	kg PO_4-equiv/m
Ozone Depletion Potential	5,15 E-08	kg R11-equiv/m
Photochemical Ozone Creation Potential	0,00032	kg Ethene-equiv/m

last updated January 2012

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Explanatory note on Life Cycle Data for Copper Tube

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General remarks

Life Cycle Assessment is a scientific tool to assess the environmental impacts of products. It is increasingly being used during the design phase to optimise across the initial production, the use phase and the end of life, reflecting disposal or recycling. For metals, a typical "cradle to grave" study covers the mining and extraction of raw materials, fabrication, transportation, use, and recycling/disposal, including energy and all other product supplies required. ISO guidelines require the underlying life cycle inventories to have undergone independent peer review.

From this initial concept, Life Cycle Assessment is now being used as a marketing and decision making tool to make comparisons between materials and products for similar end use applications. This use of the assessment of environmental sustainability as a comparison tool in order to select environmentally friendly products needs to be approached with some caution.

In such comparisons, detailed checks must be made to ensure that the system boundaries are comparable. In particular, this must be the case for the scope, the functional unit and the use phase. Life Cycle Assessment results strongly depend on the choice of material. Individual impacts (e.g. global warming, acidification, ozone depletion, etc.) do not have equivalent environmental effects. Only a comparison of identical impact categories leads to appropriate and meaningful statements. The aggregation of impacts to one single indicator should also be avoided when making comparative studies. A preferred approach to decision making is one that takes into account the importance of national or local priorities with regards to the different impact categories .

Comparison of plumbing systems

In comparative studies on tubes for various plumbing systems, e.g. drinking water, heating and gas, it is misleading to simply consider the impact of 1 m of tube made from different materials. Plumbing systems are normally designed to transport specified volumes of fluids, with different tube diameters and wall thicknesses required dependent on the choice of material. In addition, consideration must be given to the different design practices, installation and jointing standards and regulatory requirements for each.

Many cradle to grave life cycle assessment studies have shown that the environmental aspects from the use and end of life phases of products are often much more significant, for example the lower losses from copper in hot water systems. The economic value of copper scrap, based on its ability to be recycled 100% without any loss in performance, must be included in comparative assessments..

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