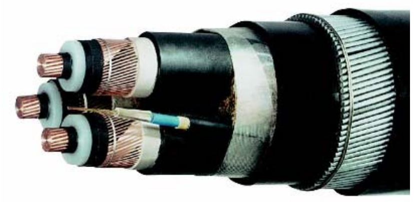
European Copper Institute
Copper Alliance

LIFE CYCLE ASSESSMENT DATA
WIRE

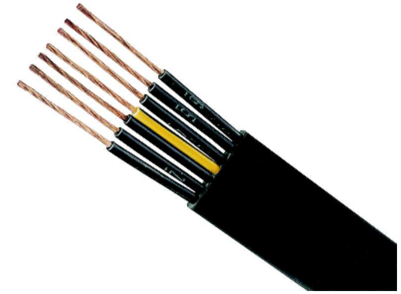


PRODUCTION DESCRIPTION

material:	COPPER
product:	**Wire (high grade)** 1mm^2 section, 1m length
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	0,000472	GJ/m
Global Warming Potential	0,0378	kg CO_2-equiv/m
Acidification Potential	0,00027	kg SO_2-equiv/m
Eutrophication Potential	0,000016	kg PO_4-equiv/m
Ozone Depletion Potential	1,46E-09	kg R11-equiv/m
Photochemical Ozone Creation Potential	0,000016	kg Ethene-equiv/m

last updated January 2012

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Explanatory note on Life Cycle Data for Copper Wire

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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 wire

With the exception of silver, copper has the highest electrical conductivity of all metals, approximately twice that of aluminium and six times that of iron. A material with a lower conductivity requires a larger cross section for the same current carrying capacity. Copper wiring is the standard in residential building wire and its use in transformers and motor driven systems helps to increase energy efficiency. In electrical applications, while the use phase is the most important in the overall life cycle assessment, the economic value of copper scrap, based on its ability to be recycled 100% without any loss in performance, must also be included in comparative assessments.

Given the broad range of wire diameters in use in the market, the data provided is for one metre of uninsulated copper wire, with a cross section of one square millimetre. The data values should be adjusted to fit the exact wire size for any given application. For example, a typical residential building wire has a cross section of 2.5 square millimetres

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