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Environmental impact of metals

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- a more efficient and sustainable construction sector, with a higher level of innovative practice.

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Glossary

Allocation: sharing the input or output flows of a unit process to the product system under study. This may need to be done where a manufacturing process results in products and co-products, eg steel and slag.

Ecopoints: (as used in the BRE Environmental Profiles methodology) the normalised profile values are multiplied by weighting factors developed for each impact category and the results summed to give a single figure.

Environmental impact category: environmental issue being examined, eg climate change, acid deposition and human toxicity to air.

Environmental Profile: the level of impact in each environmental impact category for the functional unit or product being studied.

Functional unit: a qualitative description of function specifically defined for the product/service under study and any alternative products/services to which it is compared. The use of a functional unit means that the alternative designs under study are, in theory, compared fairly. For example, a comparison of external walls may be based on every external wall design in the study achieving a U-value of 0.3 W/m^2K and compliance with building regulations.

Input: material or energy that enters a unit process (can include raw materials and intermediate products).

Intermediate product: material that has already been processed before being used to produce a product.

Life cycle: consecutive and interlinked stages of a product system from raw material acquisition or generation of natural resources to the final disposal.

Life cycle assessment (LCA): compilation and evaluation of the inputs, outputs and the potential environmental impacts of a product system throughout its life cycle.

Normalised profile: The characterised profile is referenced to the environmental impact for each category at the national or global level in one year (usually for one citizen), giving a 'normalised' profile; the values are directly comparable.

Output: material or energy that leaves a unit process (may include raw materials, intermediate products, products, emissions and waste).

Raw material: unprocessed material that is used to produce a product.

1 Introduction

This report provides a review of how metals have been assessed within *The Green Guide to Specification*[1], including the application of the Environmental Profiles methodology[2], which underlies *The Green Guide*. It aims to provide manufacturers and specifiers with a general understanding of the approach and decisions that have been made when applying the Environmental Profiles methodology to metals. The key impacts of metals over their whole life cycle are discussed and opportunities for improvements within the sector are identified.

This report has been produced as part of a series on the production of *The Green Guide to Specification*. Many of the other reports in the series that focus on specific materials, and provide more specific information in each case, may also be of value when considering the environmental impact of specific metals and their uses.

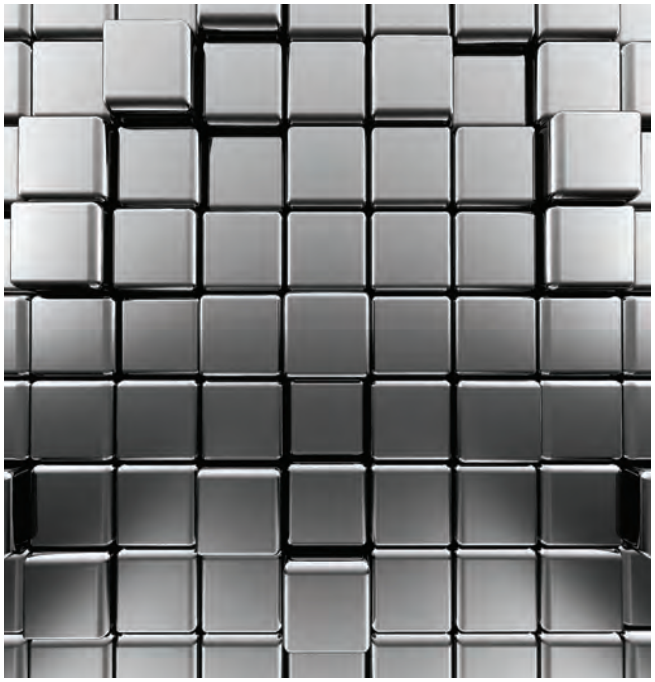
1.1 Metals and *The Green Guide*

Metals are an important material for construction, providing both structural and non-structural functions within the building fabric.

They are required as structural frames in various element specifications, including in walls, flooring/decking and roofs. Decisions such as metal type, profile and surface finish, dimensions and quantity of the metals are made by designers and specifiers based on the intended purpose.

In cases where the metal also fulfils aesthetic functions, eg within roof and wall cladding systems, the surface finish can also be of particular significance, as well as the service life of the element. These details are linked to requirements like visual appearance over time subject to the elements (rain, sunshine, cold and wind) and other requirements like heat and sound insulation.

In *The Green Guide to Specification*, 4th edition, therefore, metals are assessed as integral members of building elements over the 60-year study periods, and the impacts dating back to the mineral extraction through to manufacture, use and end of life are taken into consideration within the context of the overall environmental impact of the respective elements.



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