

Eco Footprint of a generic reference



The European Printing Ink Association (EuPIA) is dedicated to sustainability. Product stewardship is the major pillar of its action, delivering safe and efficient products to use on various substrates and with different print processes.

Due to the application process of printing, a very thin layer of ink is laid down on a relatively thicker substrate and as such previous third party studies have shown that the relative impact of printing inks is negligible versus the overall printed material footprint.

Nevertheless, EuPIA has decided to perform a Life Cycle Assessment (LCA) within a programme set up by CEPE (European Council of the Paint, Printing Ink and Artists' Colours Industry) to gather its own viewpoint on the LCA of printing inks. The sustainability consultancy Ecomatters was commissioned to conduct the study.

Aim of the study

EuPIA has taken the approach of studying the footprint of a generic printing ink formulation that would represent correctly printing inks for all print processes. As such the idea was to focus on the highest possible quality of a limited number of raw materials. Indeed printing inks are made of thousands of raw materials and trying to evaluate all possible combinations would not be an attainable target.

The scope of the study covers the impact from raw material extraction to printing ink production (cradle-to-gate). In addition a downstream simplified analysis has also been

performed to put the results of the study into a meaningful context for printed products.

Models and data sources used in the study

The models for the production of the virtual reference are based on the life cycle inventories (LCI) of raw materials and solvent-borne coatings, as developed by CEPE, as part of its raw materials and coating manufacturing databases.

Generic reference

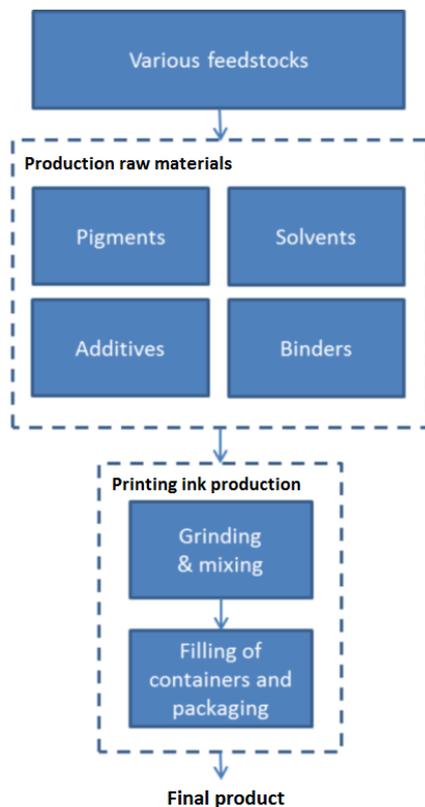
The generic reference is a virtual product representative of the market for printing inks in Europe, as defined and selected by EuPIA.

The formulation of the generic reference is the weighted average of the actual production mix of printing inks in Europe. Therefore it does not represent a real product, but a virtual combination of the raw materials currently used in the production of different types of printing inks.

The cradle-to-gate production process of ink starts with the extraction of feedstock and the production of raw materials. The raw materials are then transported from the supplier to the ink producer, where they undergo various grinding and mixing processes. Finally, the resulting ink is filled into packaging units.

Environmental Footprint Results for 1 kg of Generic Ink product (Cradle-to-Gate)

Impact categories	1 kg of printing ink
Global Warming Potential or Carbon footprint (GWP)	3293 g CO ₂ eq
Ozone Depletion Potential (ODP)	240 µg CFC-11 eq
Photochemical Ozone Creation Potential (POCP)	2839 mg C ₂ H ₄ eq
Acidification Potential (AP)	19,5 g SO ₂ eq
Eutrophication Potential (EP)	7667 mg PO ₄ eq



Life cycle assessment of printed substrate

In addition to the cradle-to-gate footprint a life cycle screening study has been designed by Ecomatters (based on sector selected literature and public data) and validated by EuPIA through a data questionnaire.

The full life cycle of printing inks combines the Eco footprint of the generic reference, as a virtual printing ink, with the downstream scenario (use phase and end-of-life) of two substrates (paper and plastic).

Starting at the factory gate, the packaged generic reference is transported to the printing location, where it is printed on a suitable substrate (paper or plastic). The printed substrate is then distributed, consumed and used, and at the end of its lifetime, it is collected, treated and disposed of or recycled. The recycling of printed matter is however not in the scope of this study, although it is the usual route for printed paper disposals.

The generic reference represents only a very small part of the full life cycle impact. For paper substrate, the role of the printing ink is smaller than 2%, whereas for plastic it is smaller than 4%.