Lighten your carbon footprint!

Water-based technologies for flexible packaging

BASF

We create chemistry

Eco-Efficiency Analysis for printing inks and adhesives for flexible packaging

Key Facts

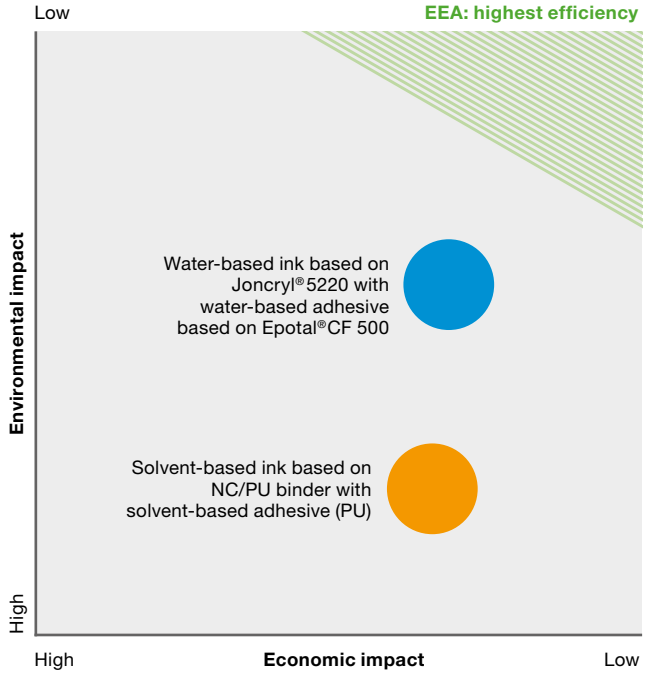
To investigate the environmental and economic impact, BASF compared different combinations of inks and adhesives in one flexible packaging system. An OPP substrate was reverse printed with water-based inks based on Joncryl®FLX 5220 and subsequently laminated to OPP with water-based adhesives based on Epotal®CF 500.

This is a representative substrate combination for general purpose and medium performance applications.

Eco-Efficiency Analysis conducted according to high standards

- The BASF Eco-Efficiency methodology follows the ISO 14040/44 standards for life cycle assessments and ISO 14045 for Eco-Efficiency assessments
- The data and results of the study were collected together with well- known partners and discussed with leading packaging players
- Already 3rd study (cradle-to-grave) for flexible packaging since 2009
- Critical review by DEKRA

Eco-Efficiency Portfolio and Index

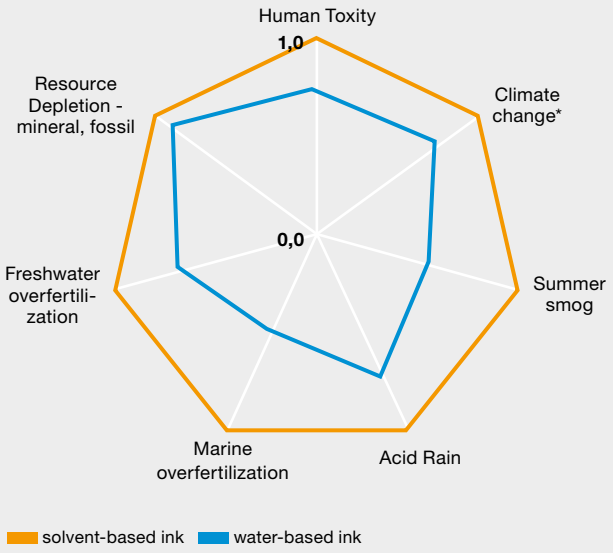


- Water-based inks with water-based adhesives lead to a higher eco-efficiency than solvent-based inks and adhesives.
- The environmental differences between the alternatives are larger than their economic differences.

Comment: Solventless adhesives were also included in the study and showed comparable results to water-based adhesives.

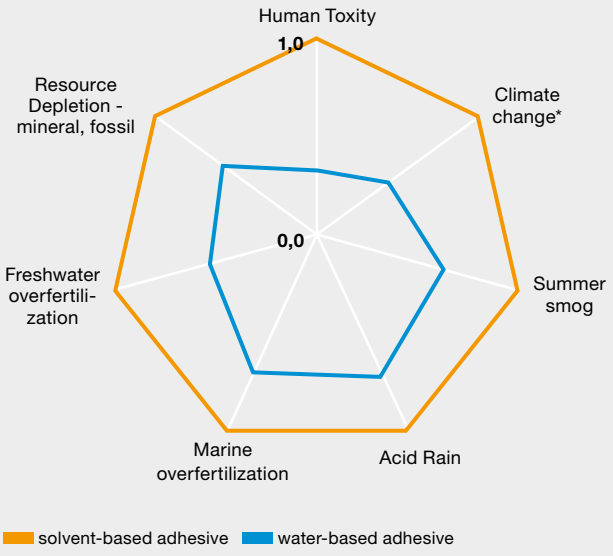
Environmental Fingerprint

Differential Approach (Ink)** – Base Case



Environmental Fingerprint

Differential Approach (Adhesive)** – Base Case



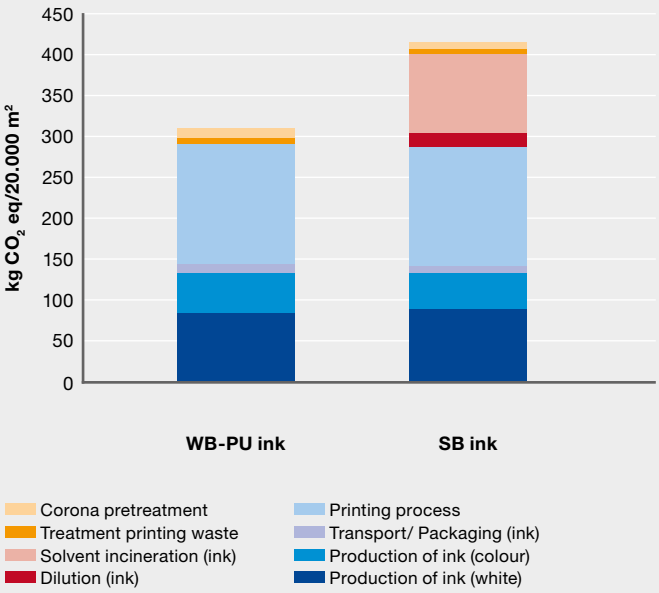
* Carbon Footprint

** This differential approach takes only into account the environmental impacts of ink production, lamination and printing process

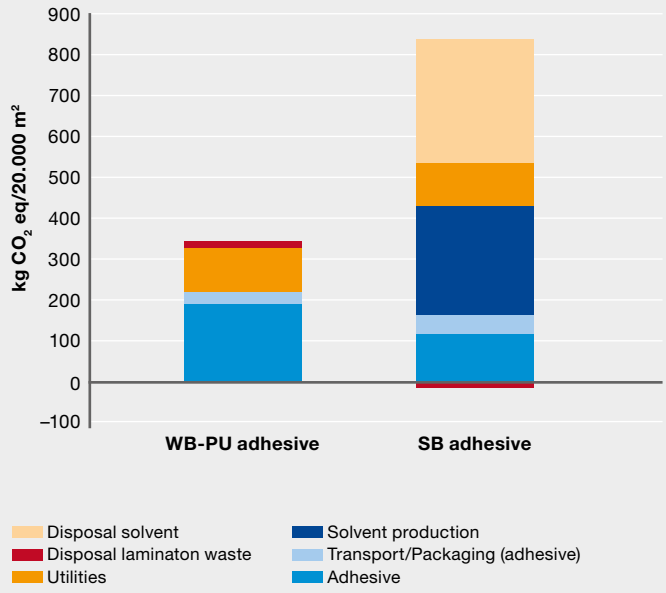
Relative results – smaller values indicate better performance. All product systems are normalized between 0 and 1 by the product system with the highest impact per impact category

Carbon Footprint

Differential Approach* (Ink)



Differential Approach* (Adhesive)



* This differential approach takes only into account the environmental impacts of ink production, lamination and printing process

Sustainability Advantages

- Water-based inks and adhesives are the more sustainable alternative at similar costs and performance
- Proven reduction of the carbon footprint and the environmental impact of your packaging (in all relevant categories)
- Conversion from solvent-based to water-based technologies will provide opportunities to differentiate your offer

Benefits

The replacement of solvents with water-based formulations will reduce costs for:

- Insurance and safety measures
- Investment or maintenance of solvent incineration or recovery
- Tax for emission or disposal of residual solvents (e.g. Chinese VOC Tax)

Compared to solvent-less technology, water-based adhesives enable:

- shortest lead times and lean production
- higest safety standards: no formation of PAAs (Primary Aromatic Amines), no aromatic isocyanates
- reduced bonded capital and warehousing costs

Scenario calculations

In the LCA study scenarios like different printing line speeds, energy demand and solvent recovery were considered, but did not impact the results significantly.

About BASF's Eco-Efficiency Analysis

BASF has pioneered the concept of measurable sustainability launching the Eco-Efficiency Analysis concept already in 1996. Until today BASF conducted more than 650 studies for almost every kind of industry. These studies have helped BASF and its customers to improve decision making, encourage strategic thinking, deploy effective marketing activities and develop more sustainable products and solutions. The Eco-Efficiency Analysis has created new value in a variety of areas for BASF's businesses. Cooperating with different stakeholders, BASF can show that through scientific analysis of results, modern chemistry contributes positively to the development of our global societies.

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