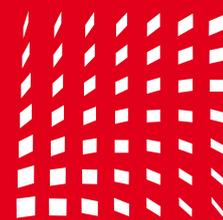


Megatrends in Printing Technologies

What influence do the megatrends of sustainability and digitalization have on processes, products, business models and the future of the industry?



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Recycling

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Circular economy

Digitalization

From print to finishing: 4.0

Artificial intelligence

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Recycling

For the step from resource consumption to resource utilization to succeed, overarching systemic approaches are required. Waste must be consistently collected, then sorted by type and finally returned to the respective material cycles. With the Digital Product Passport initiative, which documents all of the ingredients, spare parts, and production-related emissions of each product, the EU is attempting to create the conditions for the longest possible useful life and consistent recycling.

In some areas, this already works and the more valuable a material is, the better. In Germany, for example, 90 percent of all aluminum packaging and 98 percent of all aluminum beverage cans are recycled. This not only reduces the direct environmental impact of carelessly discarded waste and the environmentally harmful mining of bauxite, but also cuts CO2 emissions by 95 percent* compared with the extraction of new aluminum.

According to the Federal Environment Agency, the recycling rates for glass and paper as well as cardboard are also well above 80 percent. For paper and cardboard, the rate was most recently 87.7 percent. On average, the paper fibers used in Europe are recycled 3.6 times** before they no longer meet the quality criteria required for paper production. The industry is not satisfied with this. To further increase the recycling rate, suppliers of paper systems, Print & Packaging technologies, recycling solutions and research institutes are focusing on cooperation. To keep materials in the loop, important information about these materials and production processes must first make the rounds. In interest groups, such as the paper deinking association INGEDE, the CEPI initiative 4evergreen, the folding carton association FFI, the RECYCLASS platform or even in the VDMA***, the players in the value chain exchange this information, share their findings and jointly promote the design guidelines for recyclable products and packaging as well as networked, digitally controlled process chains for their manufacture.

This cooperation and communication process is now leading to solutions at all levels: Optimized control and regulation concepts enable increasing recycling shares in paper production. Metallization effects and other finishes

are applied in such fine layers that they do not hinder recycling. Recycling concepts are also maturing for carrier films that remain after such effects have been applied. Research groups are experimenting with fine bio-based coatings to increase the barrier properties of paper packaging to liquid media - and without impacting recycling. And these are just a few examples of the cross-industry megatrend.

Stakeholders from all areas of the process chain are working together to drive the switch to recyclable materials. The aim is to optimize them from cradle to grave (cradle-to-grave). This starts with minimizing the environmental footprint of material production: modern pulp mills, as biorefineries use 100 percent of the raw materials they use, generate 2.5 times more green energy than they consume and use water in closed-loop systems. Approaches for decentralized investments that produce paper and green electricity from straw are under development. At the same time, packaging manufacturers and printers are putting their existing material base to the test. Wherever food legislation, barrier requirements, and the necessary process speeds, quality aspects, and cost structures permit, they are replacing hard-to-recycle material sandwiches with fully recyclable monomaterial plastics and metal, glass, or paper packaging with increasing recycled content. Because this is accompanied by significantly more heterogeneous material properties, the suppliers of Print & Packaging technologies and of finishing solutions are in demand. They design their machines for these materials, which are usually much more difficult to process and create the necessary flexibility to attractively design, print, and finish changing materials. At the same time, all players along the newly established process chains have their sights firmly set on subsequent recycling. After all, the goal is clear: the path to the circular economy leads via ever better closed material cycles.



More information

*Gesamtverband der Aluminiumindustrie e.V. (GDA)
<http://www.aluinfo.de/recycling.html>

**Confederation of European Paper Industries (Cepi)
<https://www.cepi.org/key-statistics-2020/>

***INGEDE e. V.
<https://www.ingede.de/>

Cepi-Initiative 4evergreen
<https://4evergreenforum.eu/>

FFI - Fachverband Faltschachtel-Industrie e.V.
<https://www.ffi.de/nachhaltigkeit/>

RecyClass
<https://recyclass.eu>

VDMA
<https://www.vdma.org/drucktechnik-papiertechnik>