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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Resource efficiency

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From print to finishing: 4.0
Artificial intelligence
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Resource efficiency

Modern printing techniques finish a wide range of substrates: paper, cardboard, metal, glass, ceramics, wood-based materials, textiles, and a wide range of plastics. Water- and solvent-based printing inks and often transfer foils are used for print finishing. Adhesives and release agents are also used. Metals are also used, especially in the young field of 3D printing. The energy requirements of the equipment, machines, and systems along the process chain from prepress to pressroom and drying to postpress and binding as well as packaging and shipping also play a role.

Today, suppliers of printing and paper technology use all the available adjusting screws to minimize the raw material and energy requirements in this process chain. This begins with efficient servo drives with energy recovery, continues with the use of energy-optimized drying technology, and does not end with the almost complete recovery of solvents or the consistent reduction of the quantities of adhesives and release agents used. Rather, sophisticated technologies make it possible to apply the lever where the resource requirements are the highest: with the substrates, inks, and films.

Modern packaging machines are processing ever thinner mono-material films with up to 80 percent recycled content. In many applications, the film thickness can be reduced from the high double-digit to the single-digit micrometer range (µm) thanks to optimized process technology. The same amount of plastic previously used to protect a single product is now sufficient for six to ten products. A similar leverage effect can be achieved by minimizing startup losses in printing and finishing processes.

The trend toward ever shorter, often individualized runs is leading to more changeovers and restarts. This development should actually increase paper, board, and ink waste. Process optimization and automation, however, have the opposite effect: start-up waste and misprints can be significantly reduced with the help of state-of-the-art drive technology, automated equipment, and close-meshed process control. Since several thousand tons of paper and several hundred tons of ink are processed in modern printing presses every year, these savings effects are not only reflected positively in resource conservation, but also on users' balance sheets. In finishing, too, the waste rate is now tending toward zero, which is economically compelling even for short runs. The same applies to the energy-saving solutions already available in printing and drying technology. These can save hundreds of thousands of tons of greenhouse gases every year but also relieve Print & Packaging providers of the rapidly rising energy costs.

Future trends such as the use of artificial intelligence are also promising for resource conservation. This can be used to push savings to the limits of what is feasible. For example, if ink consumption is reduced just enough so that the human eye cannot yet detect any loss of quality.

More information

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