

## Hybrid printing systems – is the future already here?

The trend of the last Labelexpo Europe was the “hybrid label printing system”.

Almost every conventional maker offered or announced a combination of digital modules in or on their own conventional platforms. Furthermore, already well known digital system providers offered now near line finishing solutions as well as the transformation of additional conventional applications into digital – such as varnish.

Obviously the two “technology worlds” are beginning to merge – hopefully combining only the strengths of each “technical DNS” – to the benefit of the printers. The situation is exacerbated by the fact that it is so difficult to gain an overview of this emerging market – at Labelexpo 2015, some 30 manufacturers and system integrators exhibited over 50 “new” printing systems.

As readers may already be aware of the advantages and disadvantages of different conventional printing and finishing methods, we will restrict the current discussion to just three aspects useful for further consideration of digital hybrid printing systems.

Currently, the main **advantages** of using digital rather than conventional printing systems are:

- Shorter throughput times for short runs (200 - 1,500 metres)
- Lower tool costs, less waste and shorter setup times
- Lower stock levels and lower storage costs (cf. tools and products)
- New applications (e.g. variable data for traceability or versioning)
- Shorter job pre-processing and processing times. This is an advantage for label buyers and can make higher prices more acceptable.
- Higher average margins per job. The increased flexibility also brings label buyers further benefits (lower stock levels, no need to dispose of old stock, reduced outlay required for quality and reliability, event marketing, etc.).

However, there are still significant **disadvantages** of using digital instead of conventional printing systems:

- Print quality (physical resolution, dot size and colour space) – there are limitations on gradations down to zero, small fonts, symbols (below 4pt) and fine lines.
- Register accuracy – this is critical for covering as large a Pantone colour space as possible with the available CMYK process colours and GOV colour space enlargement colours.
- Production speed (as independent of resolution and colour space as possible)
- System availability due to high maintenance needs, additional automated calibration and cleaning cycles and insufficient system stability
- Choice of substrates (e.g. shrink sleeves, in mold, textured paper)
- Inks and toner properties (adhesion & abrasion, low migration, light-fastness, etc.)
- There are currently very few integrated inline solutions that make it possible to progress from substrate to finished label in a single production run

The **successful use** of digital rather than conventional printing systems **depends on the following conditions being met** – because a digital system is not “just another printing press”:

- In-house prepress expertise (measuring substrates, colour management, optimisation of prepress data for the digital printing method chosen) is absolutely essential – otherwise it is not possible to ensure print quality and flexibility for last-minute changes.
- Efficient processes for bringing in, preparing, producing and delivering the small print jobs (200-1500m) that are also needed.
- Openness towards new business models – web shop sales, delivery to filling line, offering additional logistics services to label buyers...
- Good financial position so that the initial difficulties and learning curves associated with introducing new technology can be properly addressed (in cooperation with system supplier).

Making the right decision can be difficult – which printing system is the right one for a particular label printer to choose? There are several options available:

- Digital printing system with offline converting solution
- Combination of conventional printing press and digital (offline) imprinting
- Digital printing system and use of existing conventional inline printing press for finishing and converting
- Conventional printing press with an integrated digital printing unit, currently known as a **hybrid printing system**

An existing familiarity with conventional production processes can make the concept of a hybrid system appealing to many label printers. However, the additional **challenges** associated with opting for a hybrid printing system need to be taken into account:

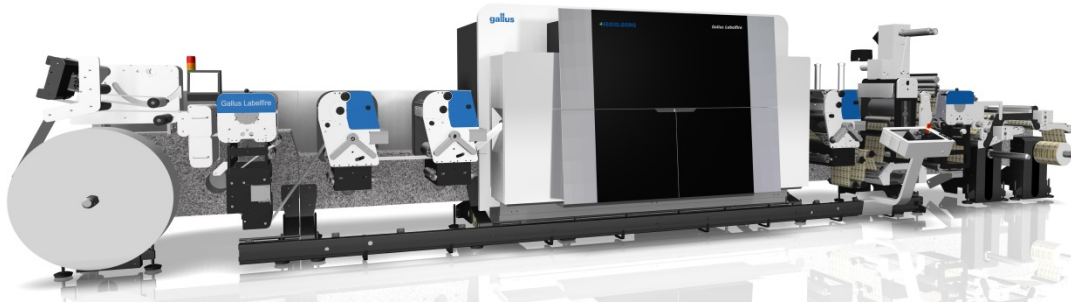
- Synchronising the requirements of digital elements (ideal for short runs) with those of conventional elements (ideal for long runs)
- Integrating the various digital and conventional workflows
- Defining the optimum job spectrum (best possible working point) for the system as a whole and thus the optimum use
- Understanding the complexity of operating combined processes and the different ideas behind their use
- Technical integration and optimisation of both processes (e.g. through automation)
- Appropriate training for operators / task profiles
- Calculation of production costs for labels, as label printing is possible with both digital and conventional methods.

The “Key to Success” is the level of integration: A fully integrated digital converting system adjusts its performance data for all conventional finishing processes to support the characteristics of the primary digital print. As production speed plays a less significant role for shorter runs, it is particularly important to ensure efficient changeover between the individual jobs. The waste, setup times and tool costs of the conventional processes must therefore be minimised before integration takes place, so that the disadvantages of conventional printing do not outweigh the advantages of digital printing and therefore prevent the system as a whole from being worthwhile.

For instance, flexographic printing units should only be used for non-format applications such as primers, varnishes or has to offer efficient pre-setting functions. A semi-rotary die-cutter with pre-setting is preferable to a rotary die-cutter. Similarly, cold foil embossing is preferable to hot foil due to the lower tool costs.

It is also highly important that the different processes are integrated intelligently to ensure maximum user-friendliness of this inherently complex digital converting system. A standardised user interface with a consistent operating concept is just as important as regular monitoring and management of the individual functions. Examples include having a central control desk for centralised management of all UV and LED dryers and centralised monitoring of all filling levels, or a central cockpit that monitors all the production processes required throughout the system.

### **Gallus Labelfire 340 – an exemplary integrated digital converting system.**



Reference was made above to how difficult it is to gain an overview of the many suppliers of narrow-web digital printing systems for self-adhesive labels. The speed of innovation cycles means there will always be a digital printing system with unique selling points that match the current trends. Making a long-term investment in equipment calls for both a comparison of the technical (digital) specifications of the print system and consideration of even more wide-ranging issues regarding the business partner. The following sample questions can provide an initial framework for selecting a system:

- Do my business partner and system supplier understand my company's work and the factors that are critical for success?  
Well-founded application expertise needs to be in place so that the whole system can continue to be developed in the future for addressing new types of application efficiently. This is one of the key conditions for ensuring that the digital printing system selected can make a company's label printing business more competitive.
- Will my business partner be able to provide me with comprehensive support throughout the entire service life of my digital converting system?  
When acquiring a digital printing system to expand the range of solutions offered, it is important to have access to a high level of support at the start to ease the learning curve. System suppliers need to be of a size that enables quick-response support when training or servicing is required, so that the short processing times (48-72 hours) often demanded by print buyers can be complied with.
- Is my business partner capable of managing the complexity of the system as a whole? How many different sub-suppliers and system interfaces does the digital converting system in question involve?  
Successful label printing requires optimum compatibility between the key components, conventional printing and finishing, digital printing, digital prepress processes, inks and toner. Having too many separate suppliers (with their own particular interests) can make problem-solving during servicing more complicated and place limitations on optimising the system as a whole.

Furthermore, a system integrator (as one among many) has only a very restricted means of influencing the other suppliers, who will in turn also have to be accountable to several other system integrators.

- Is the selected supplier's digital printing system based on a consistent and future-focused business model?  
In digital technology, innovation cycles are often relatively short. The capital-intensive development speed required can only be sustained by system suppliers if they also benefit from the consumables and use of the system. Furthermore, it is only this arrangement that can assure the printing system buyer that both partners are working to a common goal – i.e. that they both gain from the intensive use and high availability of the digital printing system.

Summary:

- Even if all the general conditions for successful use of digital printing are in place, the difficulty of gaining an overview of suppliers complicates the process of choosing a digital printing system.
- Existing familiarity with conventional processes for inline production can make a hybrid system seem to be a sensible next step for developing a company's production portfolio.
- However, as hybrid systems are only an intermediate step towards fully integrated digital printing systems, this step and the complex challenges associated with the system must be considered carefully.
- If a digital printing system is decided on, the performance of the business partner must also be taken into account, as this can have just as significant an impact on the long-term success of the investment as the label printer's own business model.



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