The main area to focus on is the inks. For waterless offset they are normally formulated to have higher viscosity and higher working tack than conventional inks. Since there is no water emulsified with the ink it will not decrease as much in tack as a conventional ink on press. This could mean a higher working tack than desired. The ink will also tack up much more quickly than an emulsified ink during a press stop. Even at shorter standstills it may be necessary to spray the rollers with a stay-open compound to keep the ink from tacking up. If the operator is not aware of these factors and does not take appropriate steps to control them, high ink tack may cause delamination.

Hybrid offset presses

Hybrid offset presses are offset presses with additional equipment using other techniques, like flexo or digital printing.

- Offset and flexo: This is an offset press equipped with a flexo unit at the end. The flexo unit is often used for applying water-based varnish but can also be used for special inks. One example of this usage is to print a special spot colour with fluorescent ink. Another example is printing metallic inks. These benefit greatly from being applied in a flexo unit because the flexo technique allows the pigment particles to be larger than in offset ink. The larger particle size increases the metallic shine.

- Offset and digital: Offset presses can also have digital printing equipment mounted. Nowadays there are offset presses with inkjet units for printing very simple designs, e.g. bar codes or dates. In the future it is likely that these hybrids will become increasingly popular. When the speed and quality of digital printing techniques have increased, combinations of offset and digital presses will be further developed. This will make it possible to combine true individualisation of each print with the high and consistent quality of offset printing.

Screen printing

There are two different screen printing methods: the flat bed method and the rotation method, of which the former is more common for printing graphic paperboard. Screen printing is very suitable for substrates that are too stiff to be printed on other presses. Some screen presses are also capable of printing much larger sheets than normal presses. These factors make screen printing ideal for producing large paperboard displays.

Paperboard has some clear advantages in screen printing. A substrate with low amounts of dust and debris is important in all printing methods, but in screen printing it will have more direct effects on the production economy and perhaps also indirect effects on the print quality. Spots in the printed image from loose fibres would eventually force you to stop the press to clean it. As a result you lose production time and the mesh may also become clogged with partly dried ink, distorting the hues and image details.
Paperboard’s smooth coating is another very important advantage, since it will not absorb much excessive ink. Screen inks are expensive and screen printing produces a much thicker ink layer. This, of course, makes the ink layer more resistant to scratches after a good drying period. The ink layer also retains its hue and/or saturation better when exposed to sunlight compared to other printing methods. Inkjet in large format is gradually moving in to replace screen printing for certain applications.

Digital printing

Digital printing is an expression that encompasses all non-impact printing methods (NIP). The main shared feature of these systems is that you are able to reproduce all colours on a single printing unit. In this printing unit the master image is prepared and positioned directly from a computer file, either directly on demand on each sheet or using an intermediate carrier such as a blanket cylinder or an electrically charged cylinder. The required make-ready time is reduced compared to most other printing methods, but conditioning of the paper or paperboard and adjustment of data files is often needed. However, digital printing is most suitable for very short runs and individualised printings, jobs that were previously extremely expensive to do. A few of the NIP printing methods have been around for years. The most frequently used are electrophotography with powder toner, thermography and inkjet in its simplest form. The development of computer capacity as well as more finely tuned imaging devices and inkjet head design has led to improvements in quality and speed. These have permitted the transition from office printing to industrial production. The introduction of liquid toner in electrophotography and UV resistant inks in inkjet has led to further quality advantages and extended end uses.

The large format inkjet printing principle widely used for displays.

Three general types of drop ejection in inkjet, either directly through piezo-electric crystals or indirectly though acoustic pressure.

Paperboard in digital printing

Due to the multitude of available NIP technologies it is difficult to give specific recommendations. For all methods using electrical charges the moisture level of the substrate needs to be controlled, as a lower level has proved to give better results. For liquid toners and liquid inks the surface chemistry and porosity play an important role in enabling sharp image reproduction and good ink adhesion.

For end uses like displays, cards and covers in smaller volumes, paperboard is widely and successfully used in various print engines. Consistency in thickness is an important feature in the feeding of the sheets as well as in the consistent transformation of toner and ink. It may not be possible to use stiff paperboard if there are tight turns in the sheet paths in the machine. The finishing or converting equipment may also be too weak to process stiff and resilient paperboard.