

PRINTING ON FOILS AND PLASTICS IN OFFSET PRINTING

3.5.4.1

Introduction

Printing on foils and especially plastics using the sheetfed offset process is not typical for this type of process. Even using special inks (see [Information Sheet 1.1.8.1](#)) with a composition adjusted to suit the process, there remain a whole series of problems which are difficult to master. These are:

1. The lack of absorbency of the printing stock surface does not allow the absorption of the ink. This means that the inks exclusively dry by oxidation. For this reason, they remain relatively fresh on the surface of many foils for 1-3 hours after printing. This means an extremely high risk of set-off in the stack which can only be counteracted by appropriate dusting and stacking.
2. As a result of the lack of absorbency of the printing stock surface, little or no fountain solution is taken up during the printing process. It is imperative that the level of dampening is at or even fractionally below the scumming limit. The slightest amount of overdampening leads to slower ink drying.
3. If plastics containing plasticizers are being printed, then there is the risk that layers of ink which have already thoroughly dried will be softened again by migration of the plasticizer. This jeopardises the usability of the print.
4. The required degree of dusting leads to reduction of the tactile and visual quality of the print. The unavoidable consequence is to employ measures to prevent or at least minimise the perception of spray powder. This results in additional costs.
5. On some plastics, although good drying results can be obtained, the adhesion of the ink to the printed surface is poor. The result is inadequate scratch resistance which has to be improved by extra varnishing.

Printing Stock

Under the conditions described above, the following materials can be printed using the sheetfed offset process:

Plastic foil matt finished polyester foils, hard PVC foils without plasticizer

Metallic foil laminated and varnished metallic foils
vacuum aluminium coated papers
metalized papers

Other substrates dyed substrates with an extra varnish coating
(e. g. Chromolux-Metallic and the like)

PVC and PE foils can be made usable by corona treatment. Apart from this, plastics can be made suitable for use in offset printing by the application of "primer" - usually by the silk screen process.

Inks

For the above groups of printing stock, inks should be used which are specified by the manufacturer as being suitable (see [Information Sheet 1.1.8.1](#)).

Technical Notes on Printing

Foil printing inks are rapid oxidation-drying inks. For this reason, with prolonged machine down times, drying of the ink on the rollers and in the ink duct must be taken into consideration. The possibility of skin formation in the ink duct must also be considered.

Use of the absolute minimum of fountain solution is a prerequisite for proper functioning. The addition of approx. 15 % isopropyl alcohol to the fountain solution improves ink drying.

Dusting is almost always indispensable. It is extremely important to ensure that the dusting equipment provides even powder distribution and to choose the powder grain size as fine as possible.

Aeration promotes ink drying. For this reason, the printed foil should not be stacked too high and should be aired as soon as possible.

The smooth surface of the foils and their lack of absorbency generally makes adhesion of the ink layer more difficult than with other types of printing stock. For this reason, the drying, adhesion and scratch resistance of the print should be tested in a proof run before commencing the proper print run.

Additional Note

If UV curing inks are used for printing on foils and plastics in combination with a UV drying system, the problems described at the beginning of this section do not occur. For this reason, UV drying is the ideal system for offset printing on these types of printing stock.