

# How can blisters be avoided in commercial web offset?

AN EXPERT REPORTS FROM THE COAL FACE (18).

Blisters were a frequent occurrence with thick ink layers during high speed production at a commercial web offset printer. The printer commissioned the expert to discover the cause of this phenomenon.

A commercial web printer kept on suffering from the appearance of unsightly 'blisters' in areas of high ink coverage during long runs. In order to avoid blisters forming in the future, an expert report was commissioned with a view to making suggestions for quality control and the monitoring of the printing process. Discussions with the relevant suppliers, such as the press manufacturer, ink and paper suppliers, were held to resolve the problem once and for all.

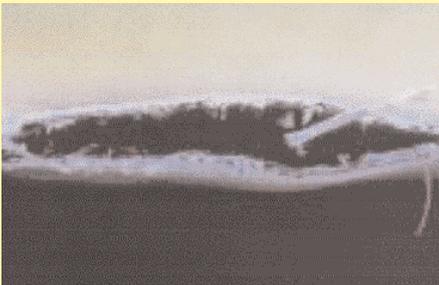


Figure 1: Mechanical disruption of the paper fabric (greatly enlarged).

**HOW DO BLISTERS ARISE?** Blister formation is always in areas of thick ink layers. After printing both sides of the paper in areas of heavy inking, the web is then intensely and rapidly heated in the dryer. In LWC papers, which are coated on both sides, thick layers of ink on both sides of the paper mean that the moisture in the paper fibres cannot escape. The vapour pressure within the fabric of the paper rises steeply and the paper is mechanically disrupted through the tearing of its fibres. The paper is not strong enough to withstand this pressure. Figure 1 provides a high magnification view of this disruption to the fabric of the paper but this blistering effect is already visible to the naked eye. Figure 2 shows the blistering of the printed paper.

**HOW CAN IT BE AVOIDED?** Reducing the drying temperature of the commercial

web press's dryer immediately reduces blistering, but the disadvantage of this is that press speeds have to be reduced in order to allow the ink to dry.

The tendency to 'blister' can also be reduced by reducing the ink layer thickness, but in many cases that does not lie within the printer's room for manoeuvre but falls within the remit of prepress.

It is undoubtedly the paper manufacturer who can do most to avoid the blistering effect, since the equilibrium moisture contents of coated web offset papers have the biggest influence on the appearance or otherwise of blisters.

The maintenance of the natural moisture content (equilibrium moisture content) of the paper needs to be considered not just during transport and storage but also during processing (ideal conditions for web offset paper are a moisture content of around 50% and a temperature of 18° – 20°C).

Measurements of the processed LWC papers that displayed a marked tendency towards blistering revealed that the residual moisture in the paper did not correspond to the



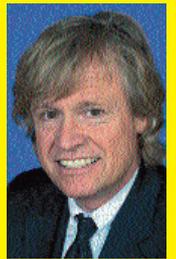
Figure 2: 'Blistering' during printing with heavy ink coverage (greatly enlarged).

guidelines and was considerably different from the target value.

**A DIFFERENT PAPER?** Printing with a different paper, where the residual moisture remained within the target range, and main-

## Problems in the graphics industry

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tenance of the equilibrium moisture content throughout the processing proved to be the solution. The blistering effect was eliminated whilst printing at an unaltered press speed, and with the same ink, inking and unchanged press parameters.

**QUALITY CONTROL.** With the right measurement devices the printer him or herself is able to measure the absolute and relative moisture and the equilibrium moisture in the paper reels, the printed product, the paper store and the press hall quickly and non-destructively. The measurements are recorded and stored online to ensure a quick and reliable response to any blistering problems that might arise.