

Avoiding corrugations and saving paper costs

AN EXPERT REPORTS FROM THE COAL FACE (21). In commercial web offset, corrugations in the paper are a frequent problem and are particularly marked with certain paper grades and high ink densities. The expert has been asked to investigate the factors that influence this phenomenon in printed products on a web offset press—with the aim of stabilizing print quality at the highest possible level.

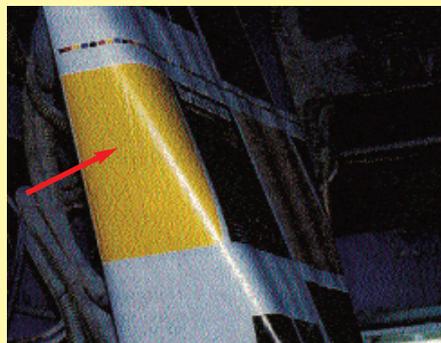
In the course of several production runs it was found that corrugations always arose with light papers and in areas of heavy ink application. Every press and process parameter that could conceivably exert an influence was systematically analysed and evaluated.

PRESS SETTINGS. Corrugations parallel to the direction of travel of the paper (see figure) arise at the web infeed and are caused by the transverse compression of the paper. This transverse compression occurs where the web is pulled tight by the web tension. Such transverse contraction can be reduced simply by lowering the web tension as much as possible, although the process sets lower limits to this. From the use of various dryer settings it became apparent that the corrugations were more marked with the application of more heat. This effect could be lessened by reducing the heating as much as possible but just as with the web tension adjustment this too has a lower limit set by the process. The use and the proper operation of a remoistening unit after the dryer is recommended to reduce corrugations.

Other press adjustments were not found to have any further influence on corrugations.

THE PAPER. Light papers exacerbate corrugations because of their lower stiffness in response to transverse compression. Consequently the highest possible grammage paper should be used for production. Measurement of the initial moisture content of the reels yielded relative moisture contents of 60% to 65%. The initial moisture content was measured after the reels had been stored for at least at least two days at the printer and as shortly before printing as possible. The relative moisture content was measured between the layers of the reel by means of a suit-

able measuring device (hygrometer) and a digital display. Being a porous material, paper contains moisture. The moisture content of the paper must be in equilibrium with the humidity of the air in the immediate vicinity, which means that the relative humidity of the air around the paper layers is the same as the relative moisture content of the paper. Numerous investigations have found that for problem-free handling, the ideal initial



Corrugations in areas with high ink coverage (red arrow).

moisture content for web offset paper for commercial printing is 40% ±5%. The ambient conditions, that is the air during the storage and processing of the paper reels, should have a relative humidity of 50% ± 5%. This guarantees that the moisture content of the paper reels and the humidity of the surrounding air are in equilibrium. In the case of the papers investigated here, there was no such equilibrium between the paper reels and the surrounding air. Although the relative humidity of the ambient conditions was 50% and complied with the requirements, the relative moisture content of the paper after printing and remoistening was 50% (the required relative moisture con-

Problems in the graphics industry

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tent in the paper after printing and remoistening is 30%). This value of 50% was undoubtedly too high and marked corrugation were the consequence.

MORE QUALITY, LOWER COSTS. Undesirable effects following printing such as corrugation and blistering (see part 18, DD 38/2007) can be avoided or at least reduced by means of simple quality checks on the paper. Too high a moisture content in the paper is a result of its manufacture and needs to be discussed with the paper supplier. Added to the that, a printer using paper with an initial moisture content of over 40% is unnecessarily paying a higher price, since moister paper is also heavier.

In this case, discussions between the printer and the paper supplier solved the quality problem and also reduced the effective cost of the paper.