

## CHAPTER 5

### CONCLUSIONS AND SUGGESTIONS

#### Conclusions

Although UV inks are 100% solid and solvent free, certain low viscosity components such as monomers, oligomers and certain liquid photoinitiators can act like solvents by penetrating the surface of the photopolymer plate and lead the plate to swell. The swelling behavior is defined by three characteristic changes in plate physical properties:

- Gain in thickness by swelling
- Loss in Shore A hardness
- Gain in weight

It can be concluded that the swelling of the plate could affect the print quality in terms of:

- More dot gain
- Fill-in of the reverses
- Blurred printing with lack of sharpness
- Gear mark due to high impression in the printing nip
- Reduce the plate run life

The most important factor affecting plate/ink behavior is compatibility.

Choosing the right plate could minimize swelling. However, it cannot totally be

avoided. There are many factors determining the degree and extent of swelling include:

- Plate type
- Thickness of the flexo plate
- Temperature in the inking and printing unit
- Surface of the flexo plate
- Type of UV ink in question
- Run length

In this test, the Nyloflex Sprint showed a very high stability against radical ink. There was no swelling at all in some test results of these plate/ink combinations. Instead, there was an extracting of the photopolymer layer in a very small amount. For the Nyloflex FAH, the plate showed a good resistance against both radical and cationic ink, which implies that it can be used with both inks and able to produce good prints after a long run. From the results in visual assessment, it is obvious that the Nyloflex ACE could produce a high quality print, but it might not suitable to use this plate with UV ink for a long-run job since the print quality may be reduced due to the low resistance of the plate against the ink.

About the print quality, it is necessary to consider all components in the printing process. The results have confirmed that the plate is an important factor for the print quality, but it is only one of the factor that matter. The changing in plates' physical characteristics is less pronounced when printed on a rough and high absorbent substrate. When a smooth and non-absorbent substrate is printed, the changing dramatically affects the print, and reduces the print quality.

The use of UV flexographic printing opens up many opportunities to make a high quality print, but a sound knowledge of the technology is essential for turning the opportunities into actual quality boosts. In order to achieve high quality results, it is necessary that all pertinent parameters in the operation are suited to each other.

### **Suggestions**

Although there are some quality criteria, the visual assessment used in the test is based on personal judgement. The information received can be varied from person to person, since there is no standard available.

The absorbency test used in this work is not a standard test. The purpose of the test is to make use of the achieved data to compare the absorbent characteristic of the printing substrates used in the test, since it is not the main focus of this research.



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