

CHAPTER V

CONCLUSIONS AND SUGGESTION

5.1 Conclusions

The inkjet ink was prepared for printing on four silk fabrics to investigation of the fabrics sharpness. The four silk fabrics were thus investigated for many properties of characteristic of the yarn, texture, gloss, and wicking behavior.

Viscosity is the main factor of inkjet ink, because it is the prime driving parameter for the ink to pass through the nozzles and gives the acceptable print quality. In this study, the viscosity of the inks was between 2.14-2.34 mPa s, which gives the continuous and smooth printed images for all types of fabric.

Silk fabrics A, C and D are the plain weave and the silk fabric B is twill weave. The hydrophilic/hydrophobic properties of the fabrics affect the print qualities. Silk fabric D is more hydrophobic than silk fabrics A, B, and C, respectively. The twill weave silk (silk B) gives better sharpness of the printed silk than those of the plain weave due to the finer weaving crossing over two-fiber weave combining with the less wicking behavior (hydrophobic).

The MTF of silk fabrics can be measured by the sinusoidal test pattern contact method at 45° of beams. The low-pass filtering was used to remove noise and frequency of weave pattern. The peak of FFT spectrum follows the sinusoidal test pattern. The FFT peak contains light scattering of the silk fabric. The low frequency peak was selected for the calculation of the fabrics MTF. The d values are 0.0604, 0.0712, 0.0738, and 0.0873 of silk D, B, A and C, respectively.

The Yule-Nielsen model was studied for comparison with the MTF technique. The n values from the Yule-Nielsen model are 1.636, 1.644, 1.645, and 1.688 for the silk D, B, A and C, respectively. The n values of this model are related to the d values of the MTF. The silk D has the smallest d and n values, i.e. it is of good quality in sharpness because the light scattering in this silk fabric is lowest while silk B has a relatively small d and n values next to those of silk D. After having considered all influencing parameters of weaving technique, and wicking behavior, it could be possible to recommend that the silk B be suitable for printing with the current inkjet ink. Although MTF is a good method for evaluating textile fabric in terms of the light reflection the fabric print quality still greatly depends on physical property of fabrics.

5.2 Suggestions for Future Work

The sinusoidal test pattern projection method has been introduced in the present investigation because the light projection reduces some parameters such as shadow effects, flare light, and the angle of illumination that are of great importance for investigating in calculation accuracy of the MTF. Interaction parameters on the pretreated fabrics to give higher optical density and sharpness are worthwhile investigating because they are the major attributes to comfort, hand, and print quality.

The measuring reflection density should incorporate the vacuum system at the measurement unit $\approx s$ to keep the fabric in a good contact during the measurement because the silk fabric is very dimensionally unstable due to its high flexibility, which affects the shadow areas and fabric direction.