

CHAPTER I

INTRODUCTION



1.1 Scientific Rationale

Inkjet printing is becoming an important technology in printing of textiles. It has the potential to shorten the lead time from design to production, speed up production of samples, and reduce production lot size and hence inventory cost. Printing quality in inkjet printing is strongly dependent on the interactions between ink and media. In inkjet printing on paper, significance of ink-media interactions is well recognized and has been extensively researched. Inkjet printing on textiles, however, is a different matter. While the impact on print quality of the fibrous structure of textile is no surprise, a true understanding of ink-fabric interactions and their effects on print quality. [1]

The sharpness of a photographic imaging system is characterized by a parameter called “Modulation Transfer Function” (MTF), also known as spatial frequency response. A unique visual explanation of MTF relates to image quality.

Image quality of textile print is dependent on the textile characteristic. In general, the quality of a photographic image is determined by its sharpness, graininess, tone reproduction, and color reproduction characteristics. Light scattering phenomena in textile produce optical dot gain, which has a large influence on the tone reproduction characteristics of halftone image. Light scattering phenomena in textile can be represented by the MTF of textile.

1.2 Objectives of the Research Work

To study sharpness of printed silk fabrics by Modulation Transfer Function (MTF) technique.

1.3 Scopes of the Research Work

This research focuses on a method for measuring MTF of silk fabrics and evaluates the data from the MTF technique as a guideline for comparison of print quality of silk fabrics by inkjet printing. The dot gain effect by Yule-Nielsen model is used for confirming the MTF technique. Silk fabrics used in this study are commercially available from Thai Silk Company Limited and were printed by a Canon inkjet printer model BJJF-8500. Printing qualities in terms of sharpness, tone reproduction, solid density and graininess are considered.

1.4 Contents of the Research Work

This thesis consists of five chapters including introduction, theoretical background and literature review, experimental, results and discussion, and conclusion and suggestions. Chapter 1 is an introduction of this thesis. Chapter 2 displays the overview of inkjet printing system, inkjet ink, textile printing, textile fiber, MTF and literature reviews of previous works that give beneficial information and trend for the work. In Chapter 3, the details about experimental materials, the experimental apparatus, and procedures of the experiment in this research are explained. Chapter 4 demonstrates the results and discussion about ink properties, the

characteristics of silk fabrics, the dot gain effect by Yule-Nielsen model and methods for measuring MTF of the silk fabrics. Finally, the conclusion and suggestions for the future works are described in Chapter 5.