CHAPTER 1

INTRODUCTION

1.1 General

Print mottle is a serious quality problem in graphical image reproduction. Mottle here means an unwanted varying reflectance in homogeneous tone areas that expresses itself as stochastic cloudiness or graininess or sometimes in more ordered patterns. It is not visible in text areas, hardly visible in busy images rich in detail but may be clearly visible in calmer image parts like skies or homogeneous background tone plates.

There can be several reasons for print mottle. Unevenness can occur in ink transfer, ink setting and set off as well as in the optical effect of the ink on the paper. These effects can in turn depend on local differences in paper thickness, surface porosity, wettability or optical aspects of the paper surface like light scatter and gloss. The mottle may also stem from problems in the printing press or in the ink.

It is important to remember that it is the local variations that pose the problem. An average change in density is not very disturbing and can be adjusted for, but the mottled image is readily judged visually as bad quality.

Print mottle is a rather common problem feared by the papermaker who sometimes see the problem come and disappear without obvious reasons. The type and frequency of print mottle differ between printing mothods. It is also special importance in the main printing process, lithographic offset.

Mottle is quantified by the measurement of graininess and the extent also the ink non-uniformity using image analytical method.[1]

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This research involved measurements of print mottle samples with image analyzer. The important parameters for mottle indices were mean, standard deviation and specific perimeter. The print samples were produced from a disigned test form on the different paper grades, ranging from poor to high quality. The print samples were observed by customers and printers at various illumination under light carbinet D65. The results represent the relationship between mottle index, illumination and perception of observers. In addition, the model formula for mottling perception (customers and printers) in the region of illumination are derived.

1.4 Content of the Thesis

This thesis consists of 5 Chapters, introduction, theory and literature review, experimental, results and discussion and conclusion. The theory in Chapter 2 gave a print mottle phenomenon, print mottle measurement, image analysis principle and multiple regression model. The experimental in Chapter 3 described the materials, the apparatus and five parts of the procedure which prepared samples, measured mottle values, visual experiment, prepared data for analysis and analyzed data with SPSS program. The results of data analysis of customer observer and printer observer were in Chapter 4. Finally, the conclusion of the relation between the mottle index, illumination and the perception of customers and printers were presented that the statistical results and graphical analysis in Chapter 5.