Principles of Color Reproduction

APPLIED TO PHOTOMECHANICAL REPRODUCTION, COLOR PHOTOGRAPHY, AND THE INK, PAPER, AND OTHER RELATED INDUSTRIES

J. A. C. Yule
Kodak Research Laboratories
Rochester, New York
Contents

1 INTRODUCTION

2 ELEMENTARY PRINCIPLES OF COLOR

3 ELEMENTARY PRINCIPLES OF COLOR REPRODUCTION

4 MASKING METHODS

5 TONE REPRODUCTION AND COLOR BALANCE
6 SPECTRAL SENSITIVITIES FOR COLOR SEPARATION


7 INKS AND PAPER


8 ADDITIVITY AND PROPORTIONALITY OF DENSITIES

Additivity and proportionality rules. Proportionality of densities in halftone and continuous-tone images. Multiple internal reflections. Additivity failure due to first-surface reflection, opacity, trapping and back-transfer, spectral characteristics, halftone structure, light scattering in the paper.

9 GRAPHICAL ANALYSIS OF COLOR CORRECTION


10 MATHEMATICAL ANALYSIS OF COLOR CORRECTION


11 FOUR-COLOR PRINTING AND THE BLACK PRINTER

Need for a black printer. Tone reproduction. Color correction of the black printer. Undercolor removal. Other four- and five-color systems.

12 COLOR SCANNERS

CONTENTS

13 MOIRÉ PATTERNS 328


APPENDIX

A Tables 347
B Calculation of tristimulus values 355
C Calculation of colorimetric quality factor 359
D Calculation of selected ordinates 367
E The Neugebauer Equations 371
F Construction and use of spectroscope 381

REFERENCES 385

AUTHOR INDEX 395

SUBJECT INDEX 399