International Color Consortium®

ICC Color Symposium

22/10/2018 · Hong Kong

Digital Color Management
數碼色彩管理

William Li

Co-Chair, ICC

Color Color Products and

Custom Development Manager, Kodak

Organizers

THE HONG KONG PRINTERS ASSOCIATION 香港印刷業商會

APTEC 印刷科技研究中心 Advanced Printing Technology Centre (A Subsidiary of The Hong Kong Printers Association)

ICC

Digital Color Management
數碼色彩管理

- Why 為何?
- What 什麼?
- How 如何?

Quality Vehicles
有質素的汽車

Attributes 特質:

- Speed速度
- Sound聲音
- Look外型
- Power馬力

What About Steering?
駕駛怎樣？

Avoid This
避免這樣

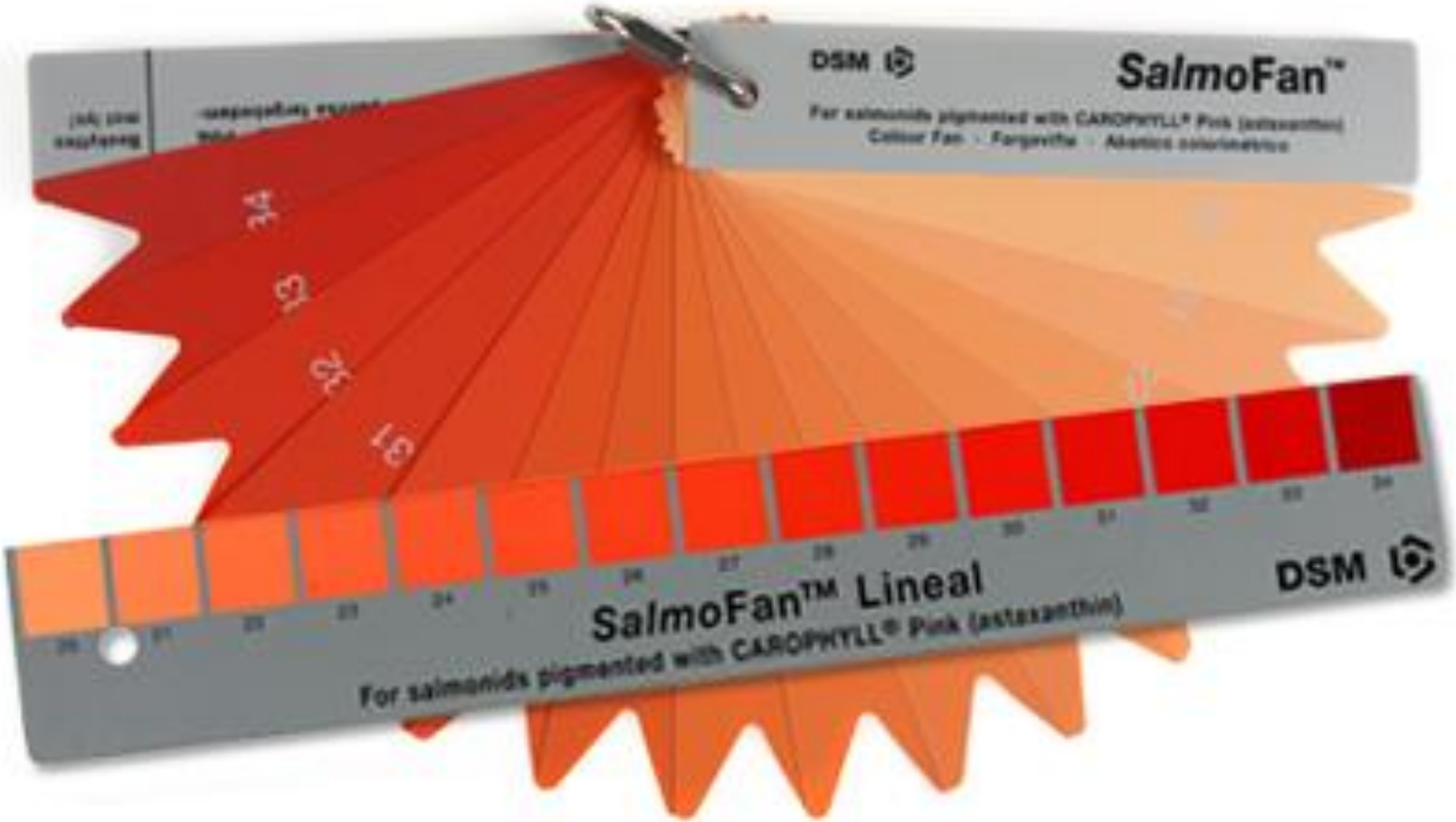
the Right Thing
at
the Right Time

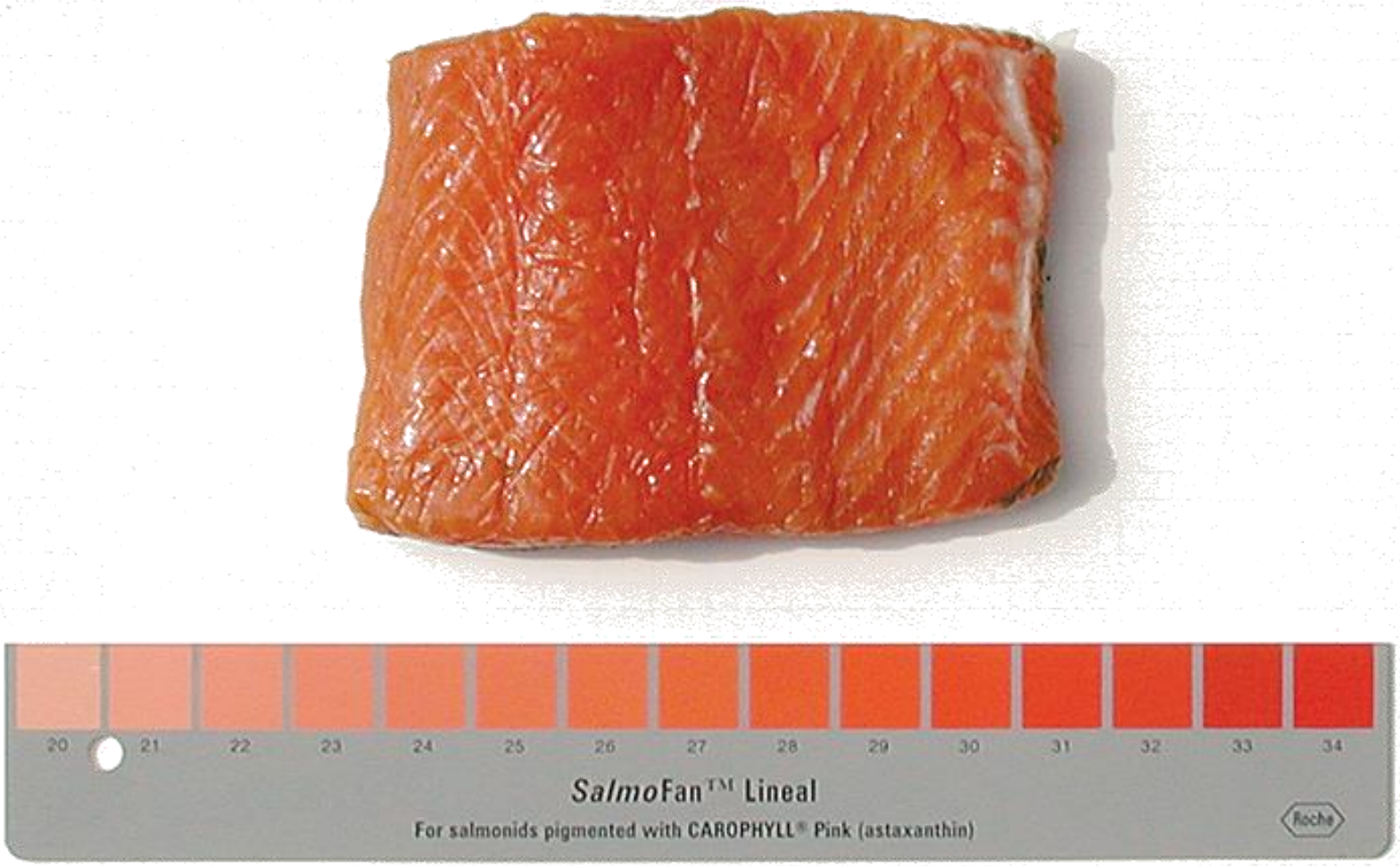
正確的事情
在
正確的時間

International Color Consortium®

Color is Important
顏色是重要的

PLUS
SERIES
50
PANTONE


DSM
SalmoFan™
SalmoFan™ Lineal
For salmonids pigmented with CAROPHYLL® Pink (astaxanthin)
DSM


20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
SalmoFan™ Lineal
For salmonids pigmented with CAROPHYLL® Pink (astaxanthin)
Roche

Color Facts
有關顏色

People make a subconscious judgment about an environment or product within 90 seconds of initial viewing. Between 62% and 90% of that assessment is based on color alone.

Color:

- Improves brand recognition by up to 80%
- Increases comprehension by up to 70%
- Makes ads read up to 42% more often
- Makes an impression that's 40% more memorable

人在初次觀看後90秒內對環境或產品進行潛意識判斷。該評估的62%至90%僅基於顏色。

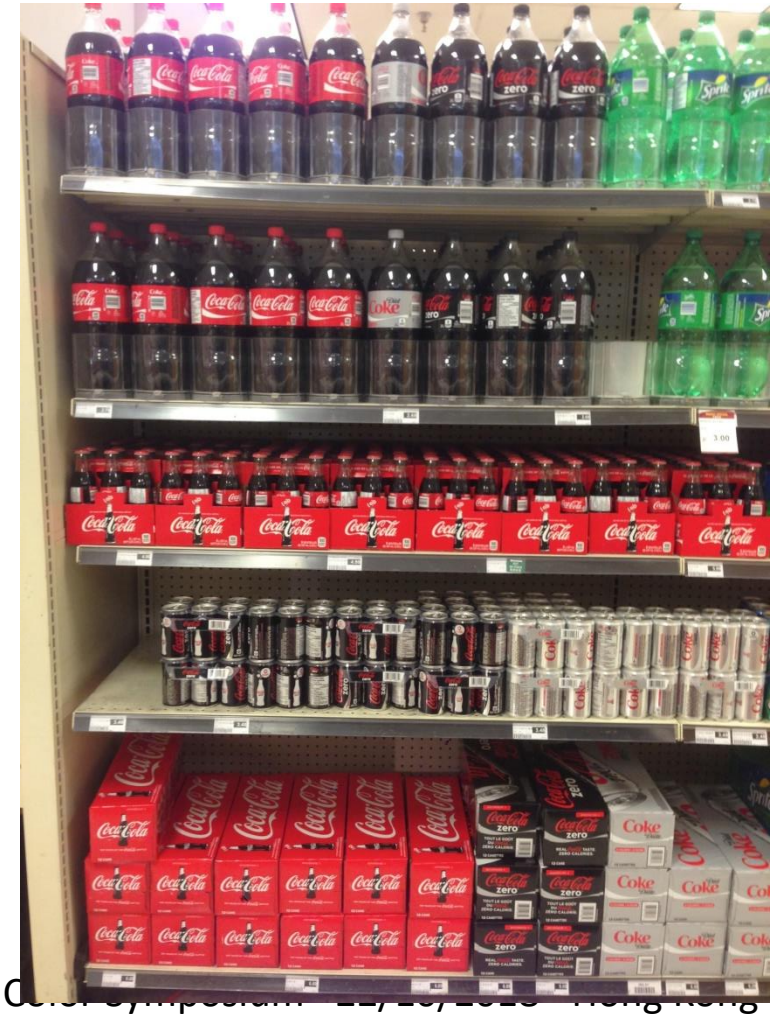
顏色：

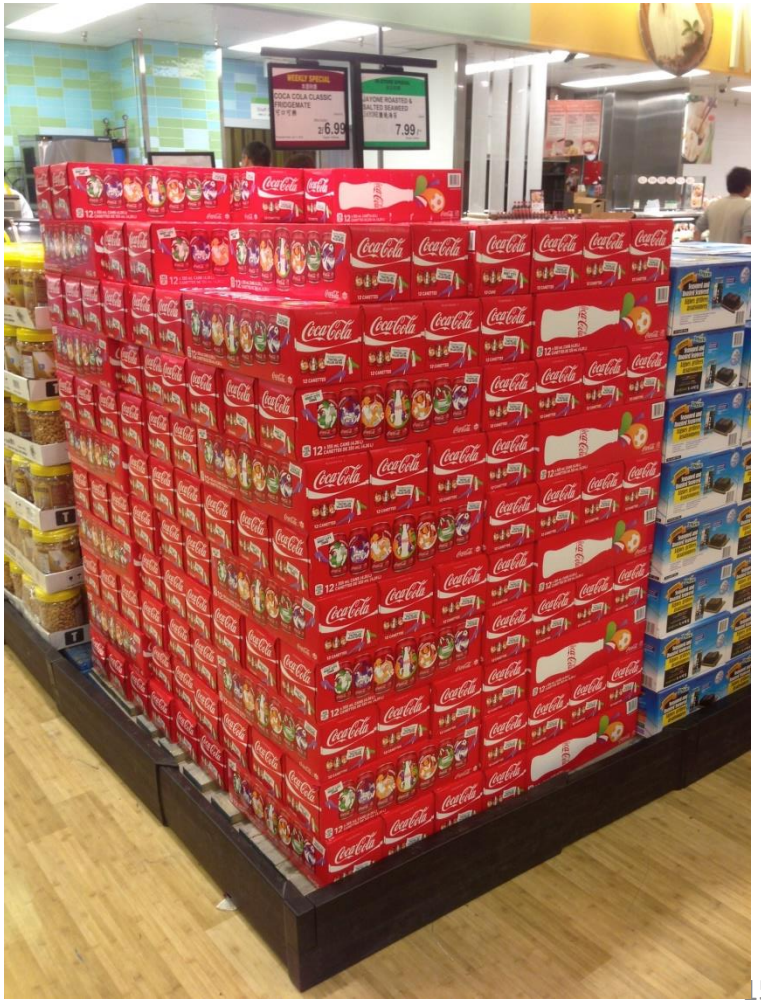
- 將品牌認知度提升高達80%
- 使理解力提高多達70%
- 使廣告讀取次數增加42%
- 給人留下更令人難忘的印象增加40%

Sources: Xerox Corporation and International Communications Research from February 19, 2003 to March 7, 2003

美吾髮
「台灣百大品牌」美髮用品
Top 100 Taiwan Brands Hair Care Products
11.99
14.99
12.99
限定價
$19.99

Packaging = Marketing
包裝 = 推廣

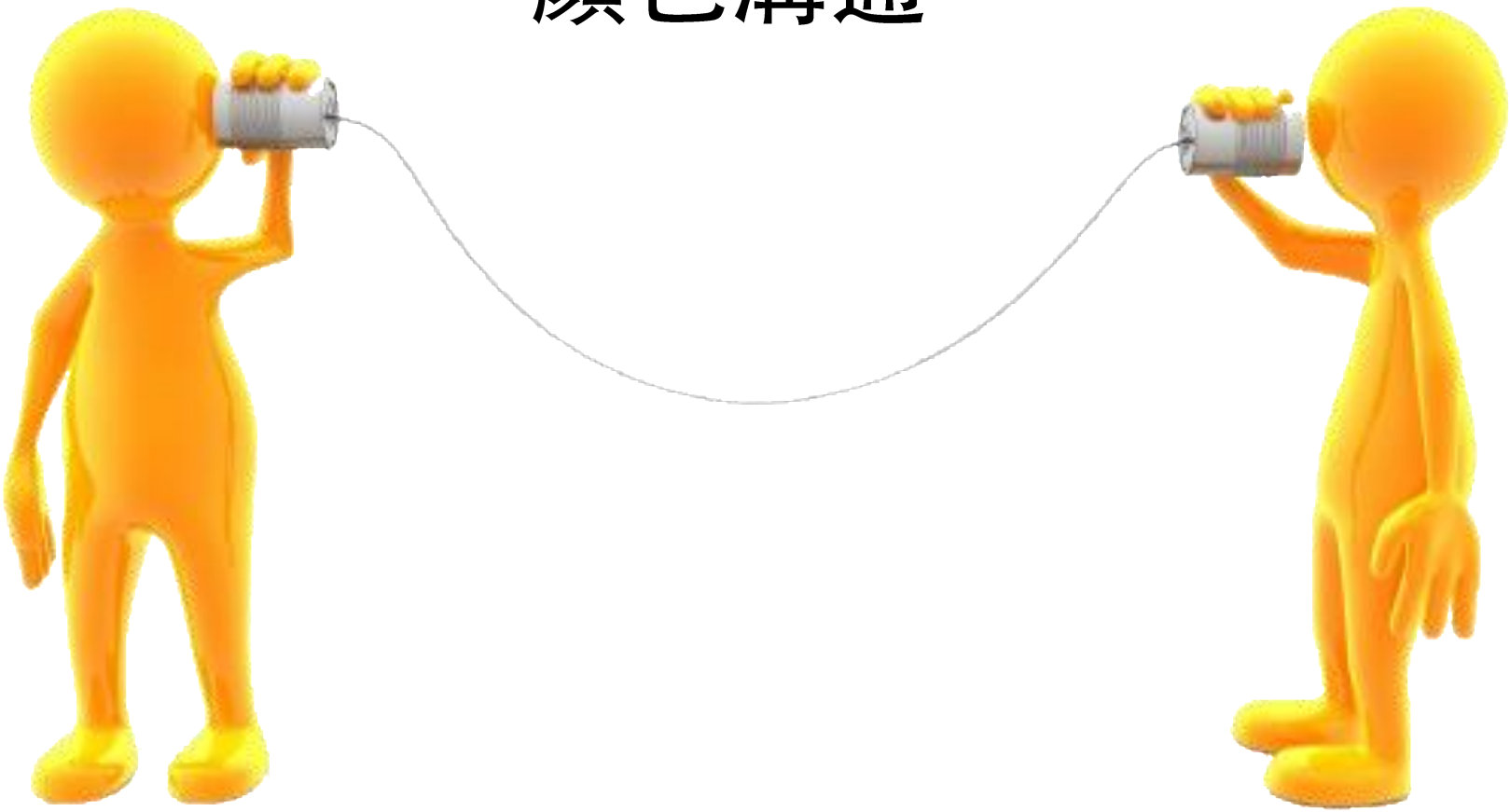




Digital Connectivity
數碼連接

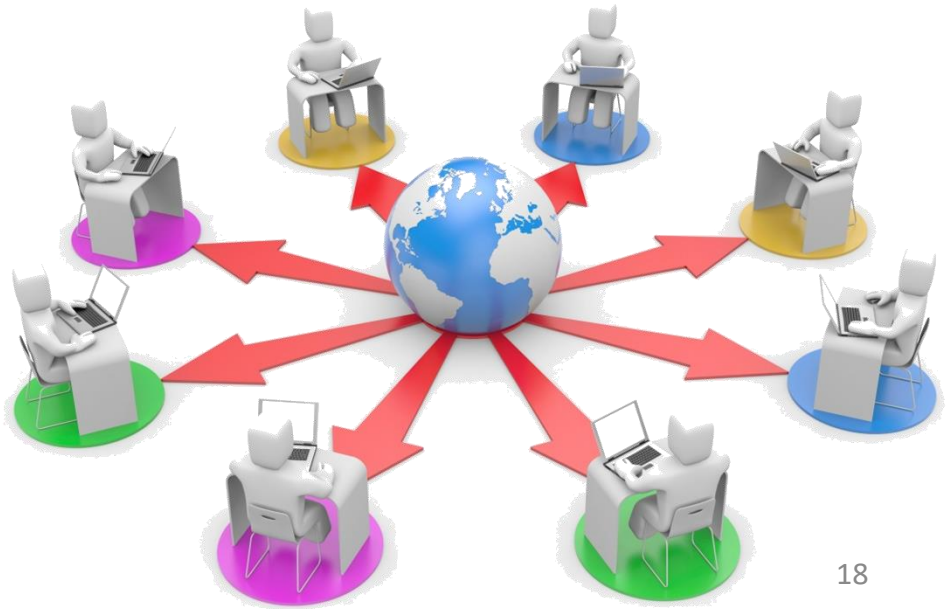
Accessing new markets requires connecting and communicating.
進入新市場需要連接和溝通。

Color Communication
顏色溝通



Different Standards
不同的標準

- Digital workflow & color management provide flexibility, insulate production from specification.
  數碼工作流程和色彩管理提供靈活性，使生產不受規範影響



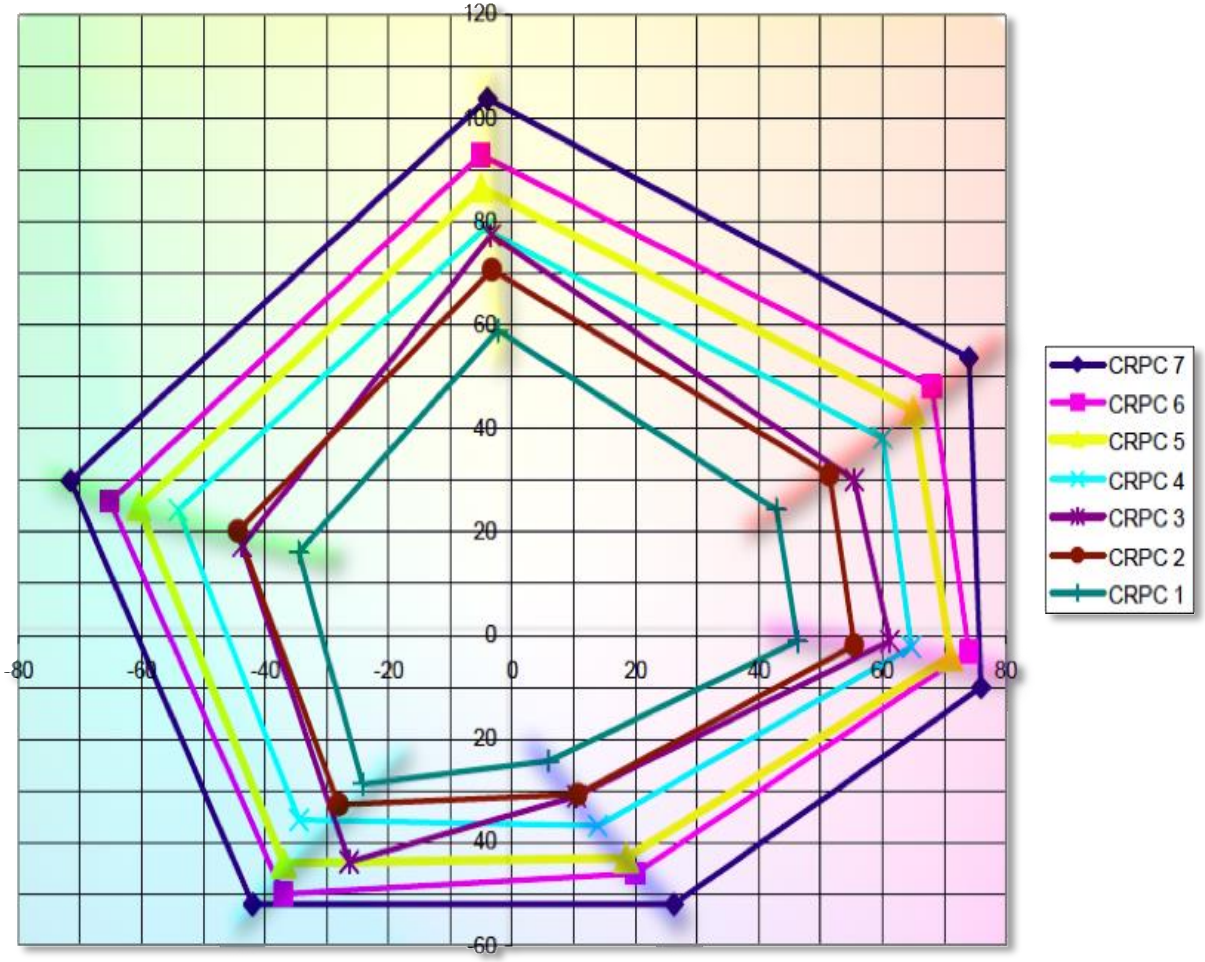
You must be shapeless, formless, like water. When you pour water in a cup, it becomes the cup. When you pour water in a bottle, it becomes the bottle. When you pour water in a teapot, it becomes the teapot. Water can drip and it can crash. Become like water my friend.

- Bruce Lee

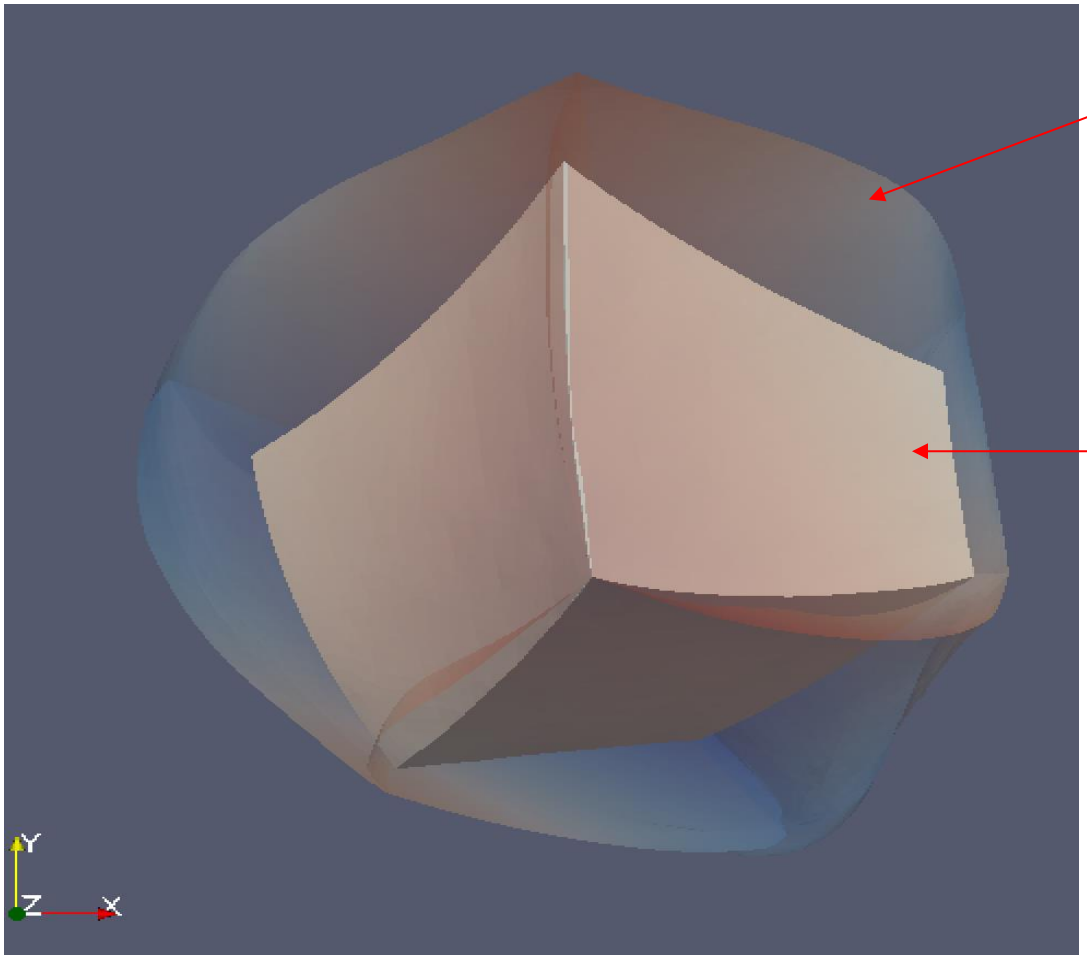
Digital Workflow Considerations
數碼工作流程的考慮

1. Determine targets 決定目標
2. Control devices 控制器材
3. Determine device setup 決定器材設置
4. Control devices 控制器材
5. Control devices 控制器材
6. Control devices 控制器材

Examine Gamut
檢視色域



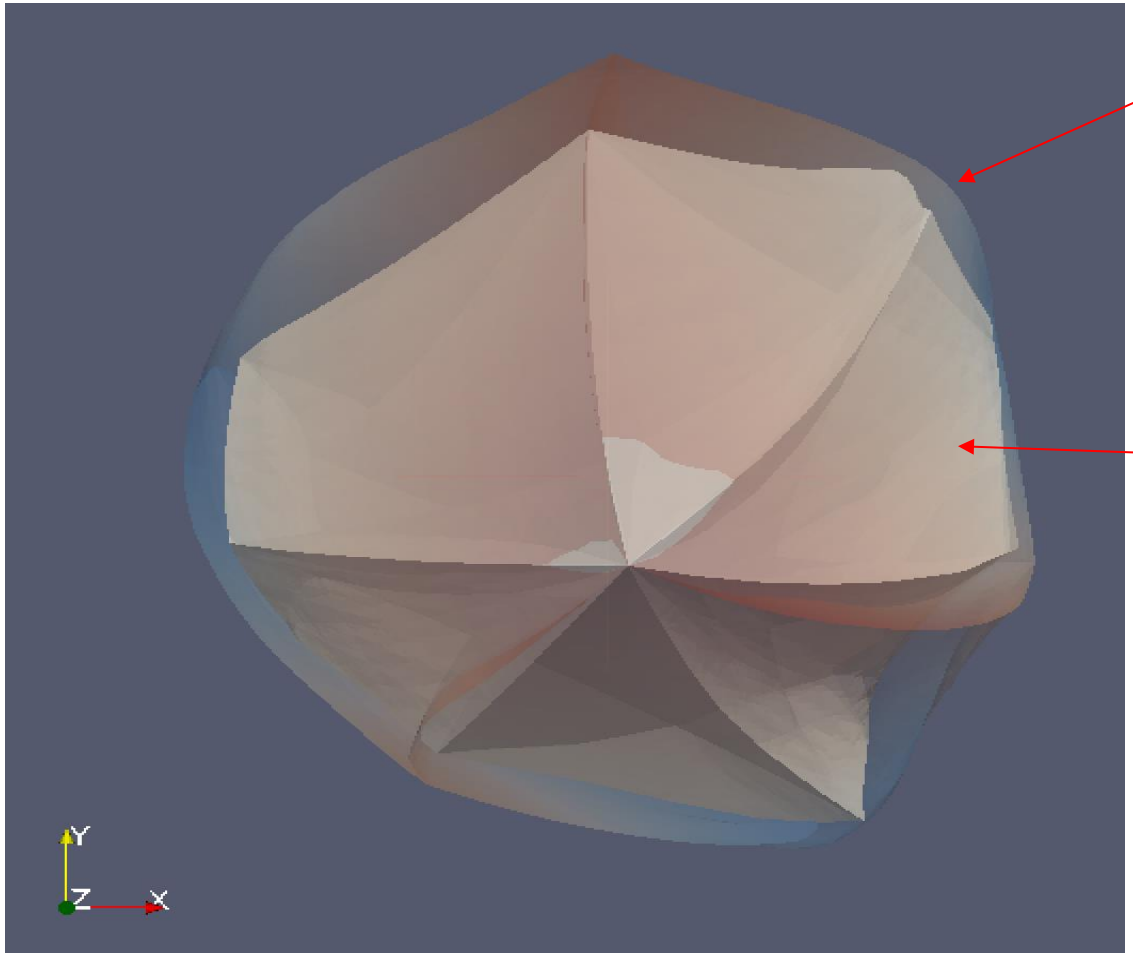
Examine Gamut
檢視色域



Inkjet Proofer
噴墨機

Fogra 39

Examine Gamut
檢視色域

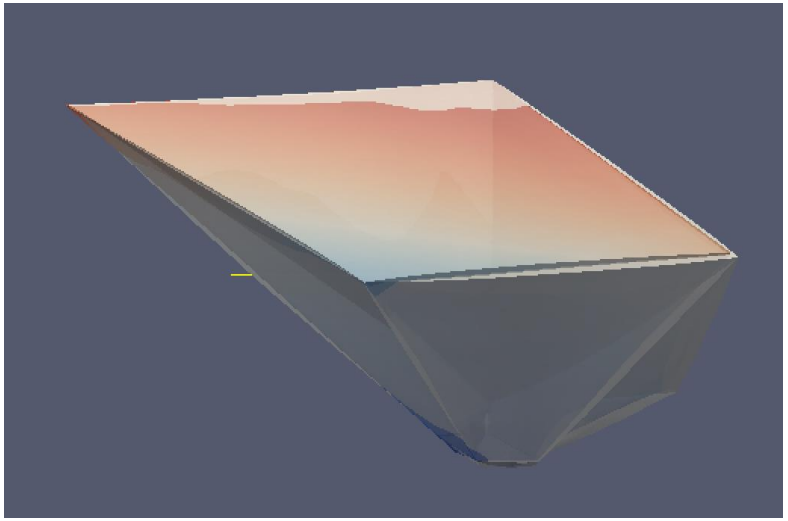


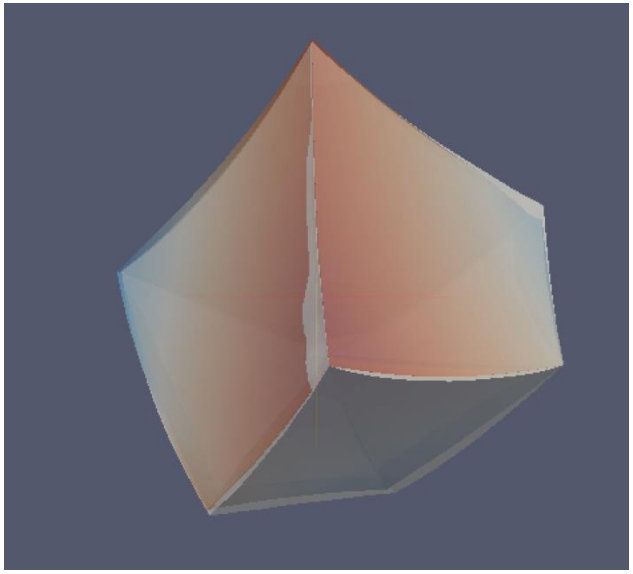
Inkjet Proofer
噴墨機

7c offset

Compare Gamuts
比較色域

Fogra 39 & CRPC-6 almost identical
Fogra 39及CRPC-6差不多相同





International Color Consortium®

Color Profile Construction
結構色彩特性檔的建構

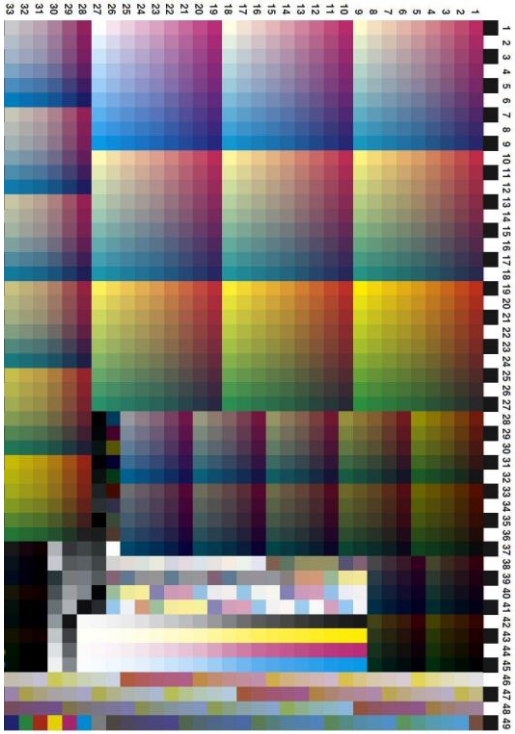
Fundamentals: Profile Creation
基礎： 特性檔的製作

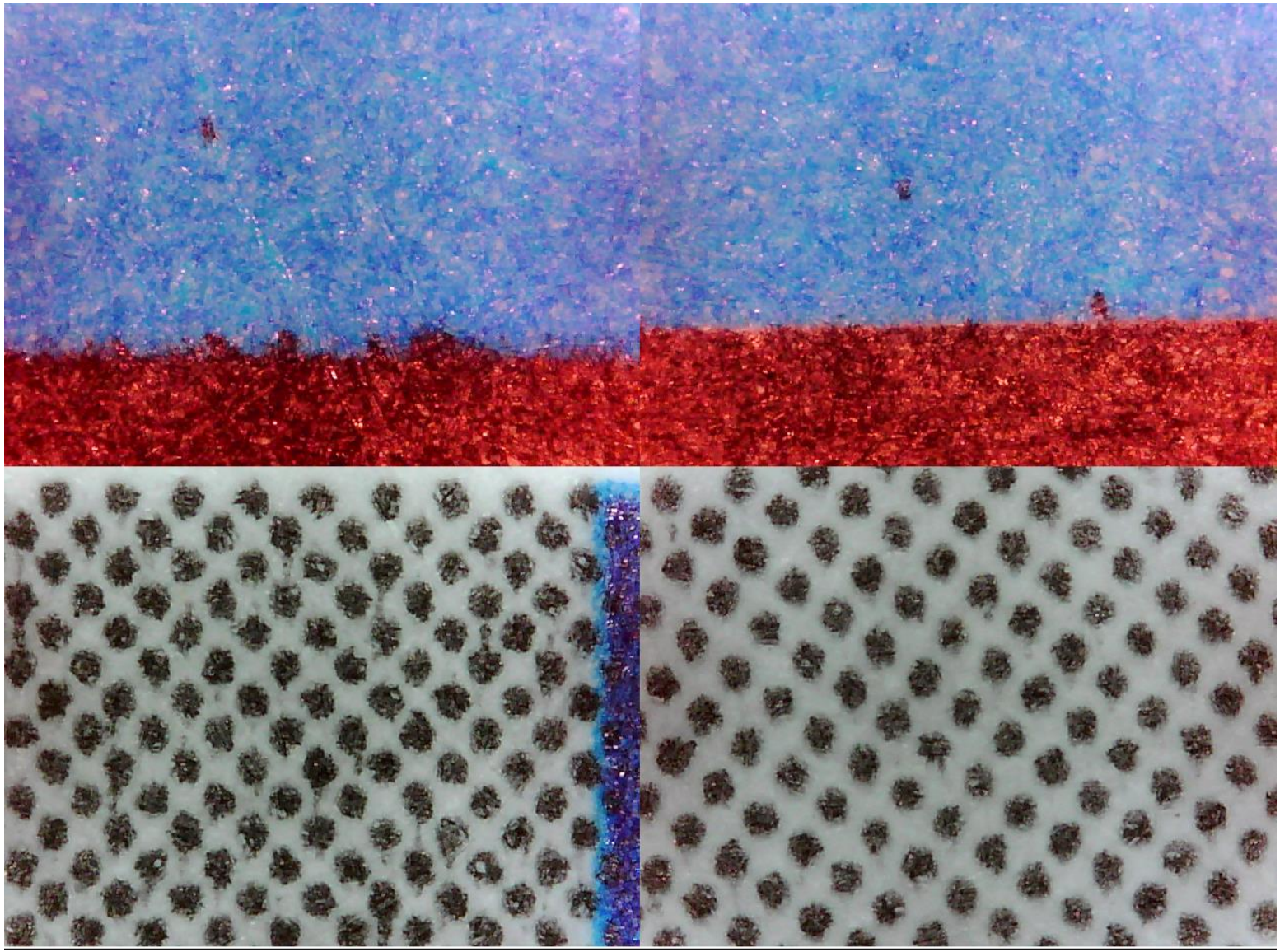
Common conception 共同概念 :

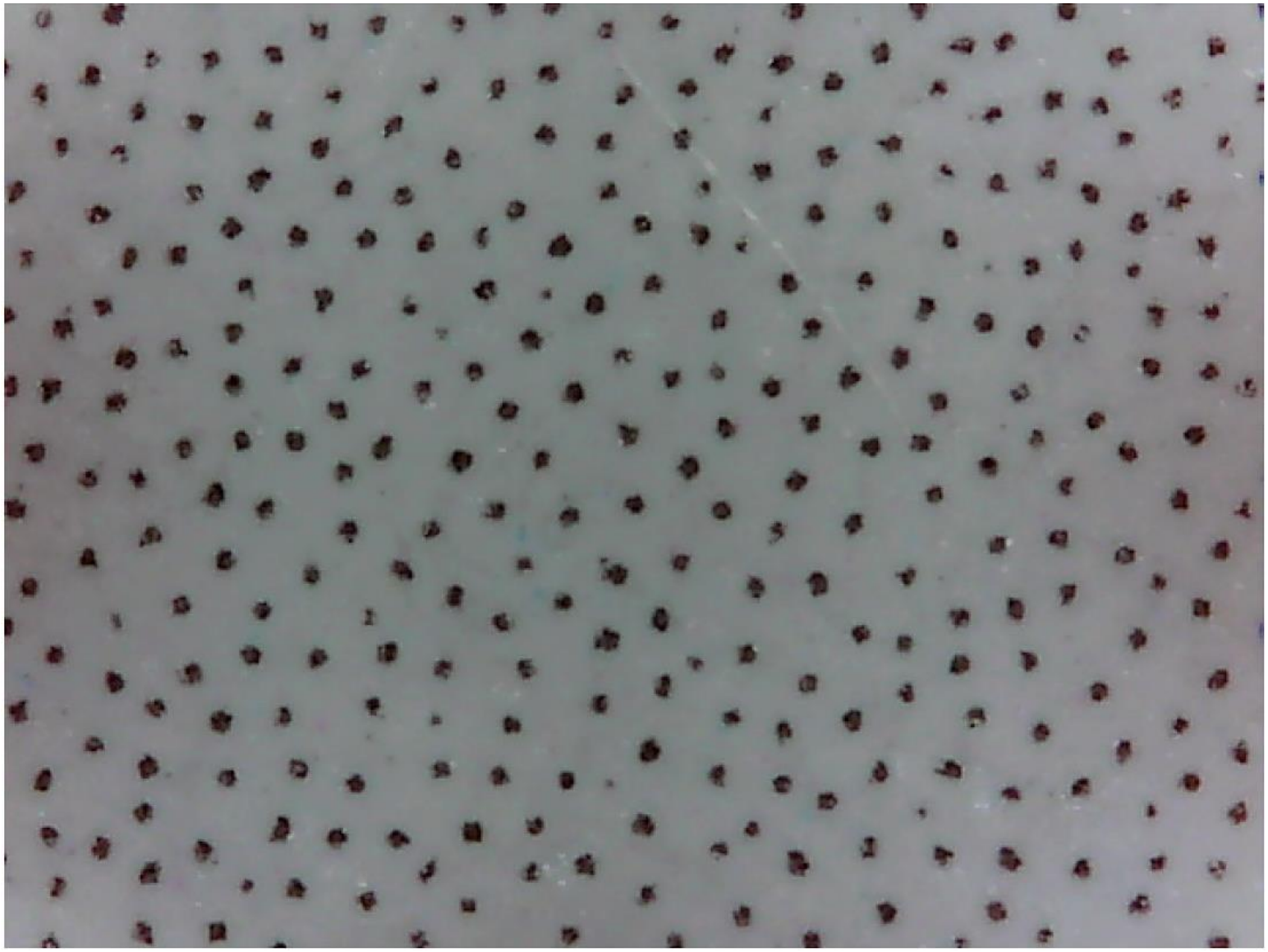
- Print characterization target & measure.
  印刷特性目標及測量

Actual 實際:

- Prepare the ground first before characterizing.
  在特徵化之前預備好基礎







Ink Analysis
油墨分析

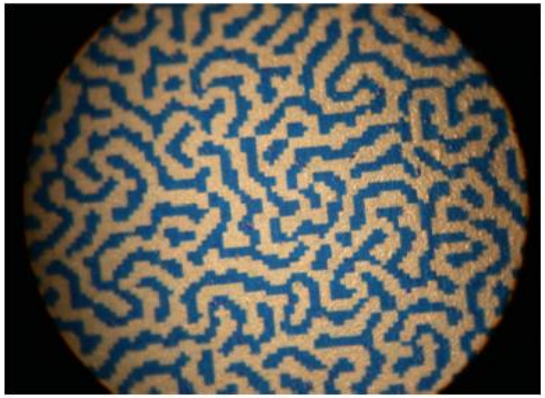
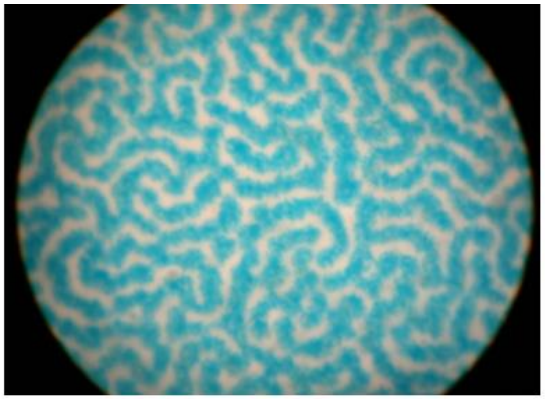
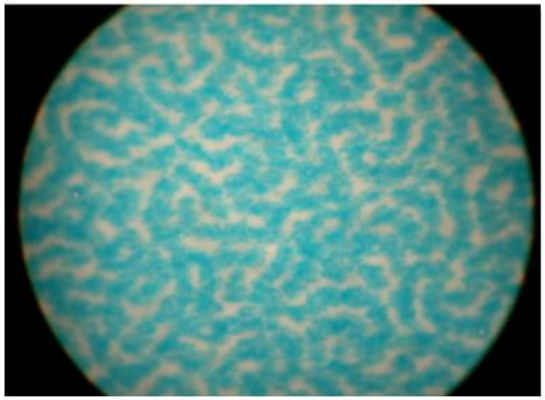


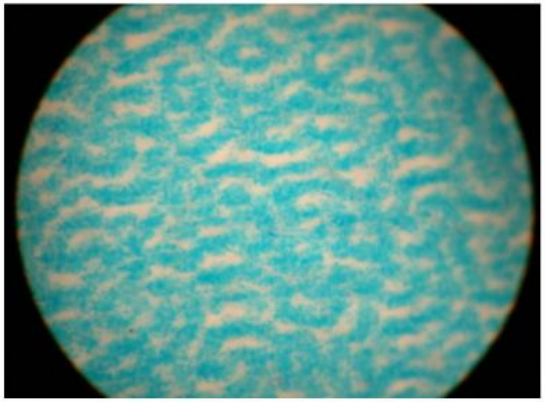
Plate image



Press sheet target



Press sheet marginal

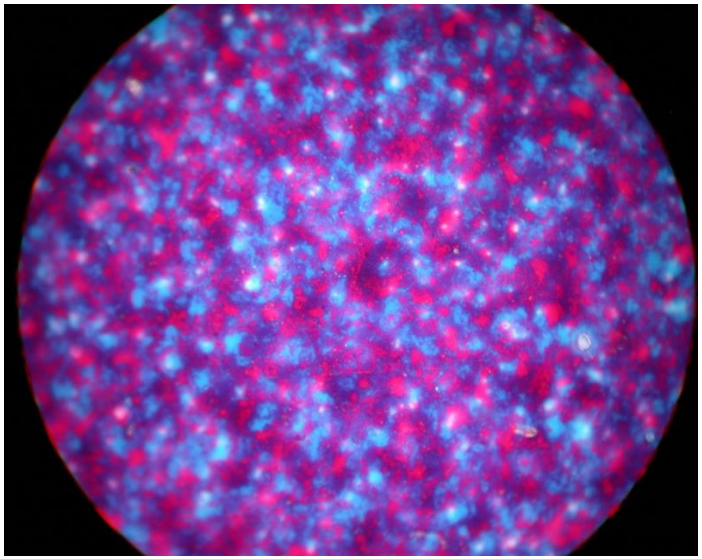


Press sheet no good

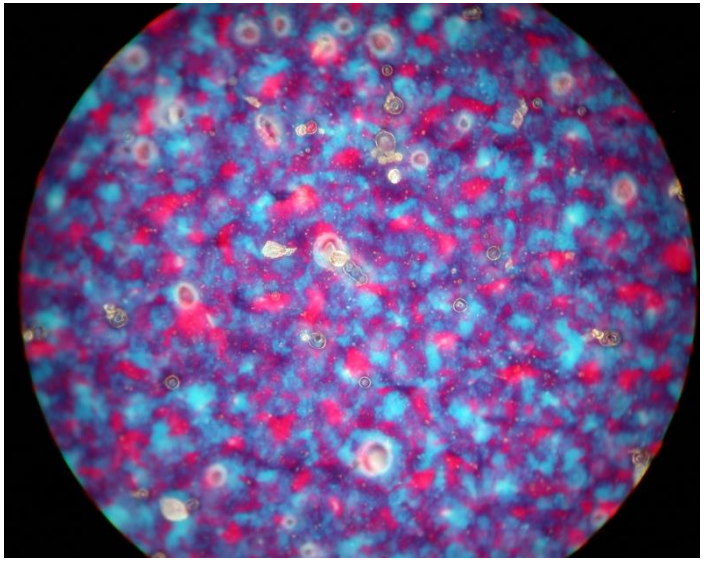
Example: 50% tint cyan ink, Staccato 20

Courtesy Kodak Professional Services

Trap Analysis
疊印分析



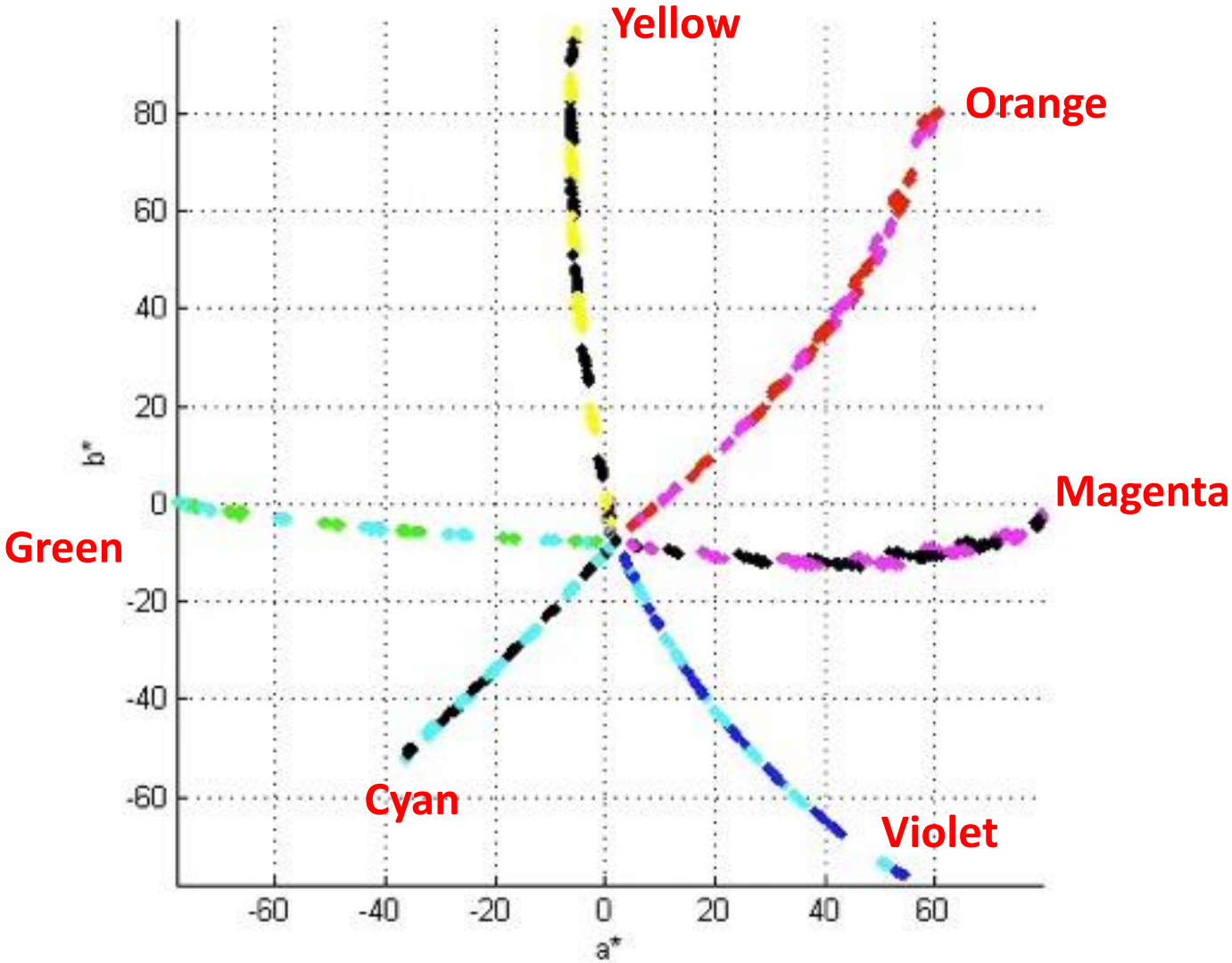
Good Trap

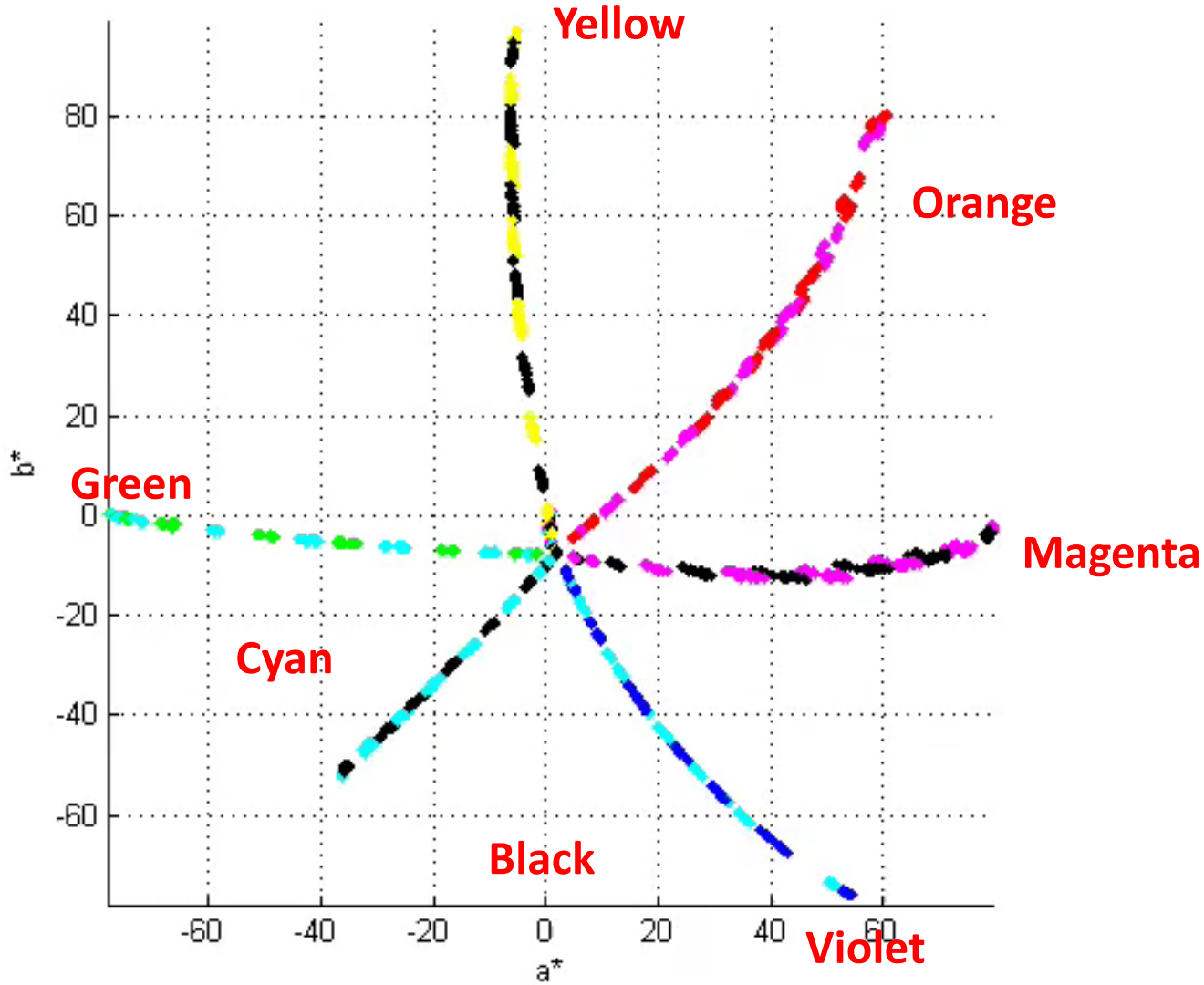


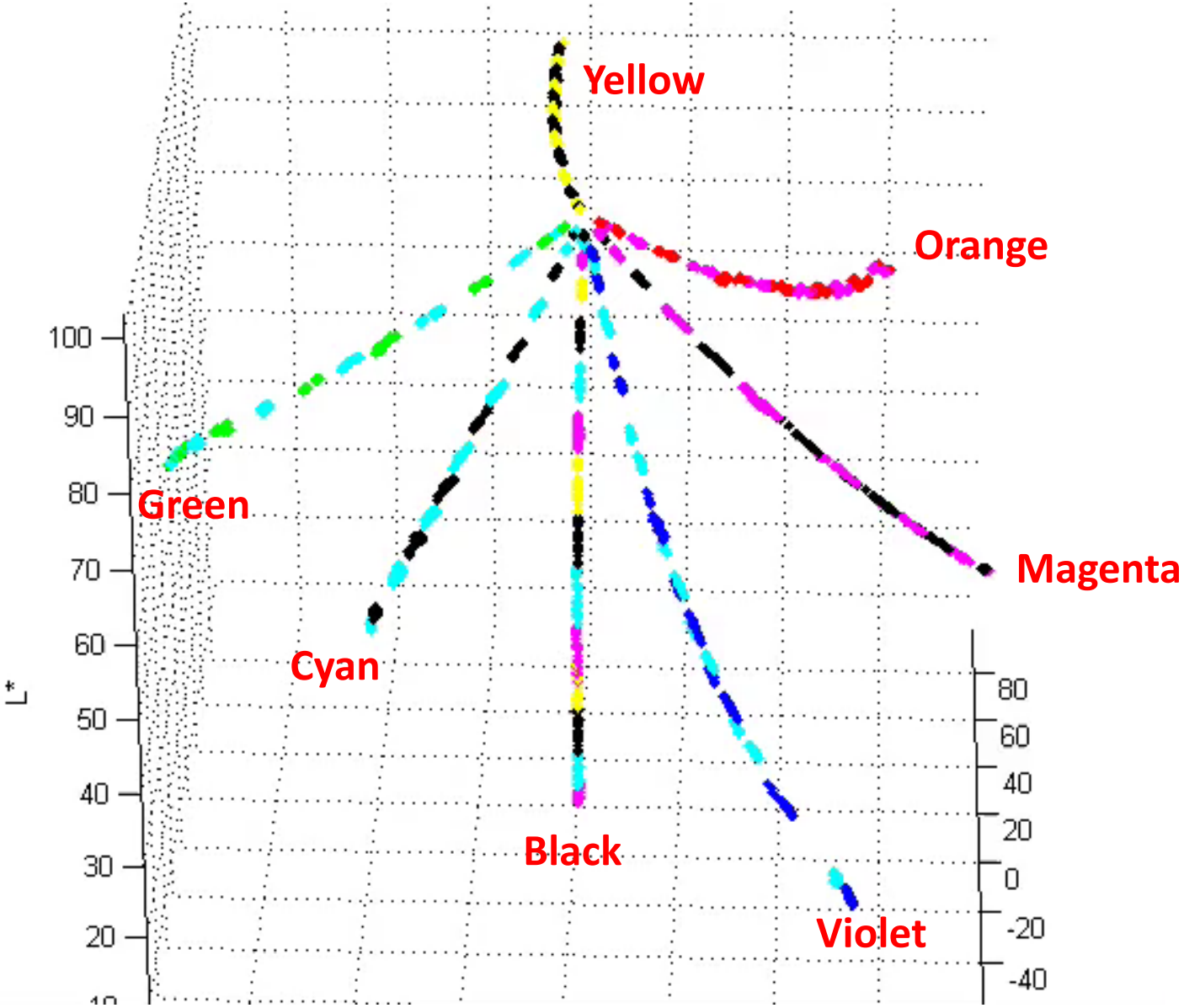
Bad Trap

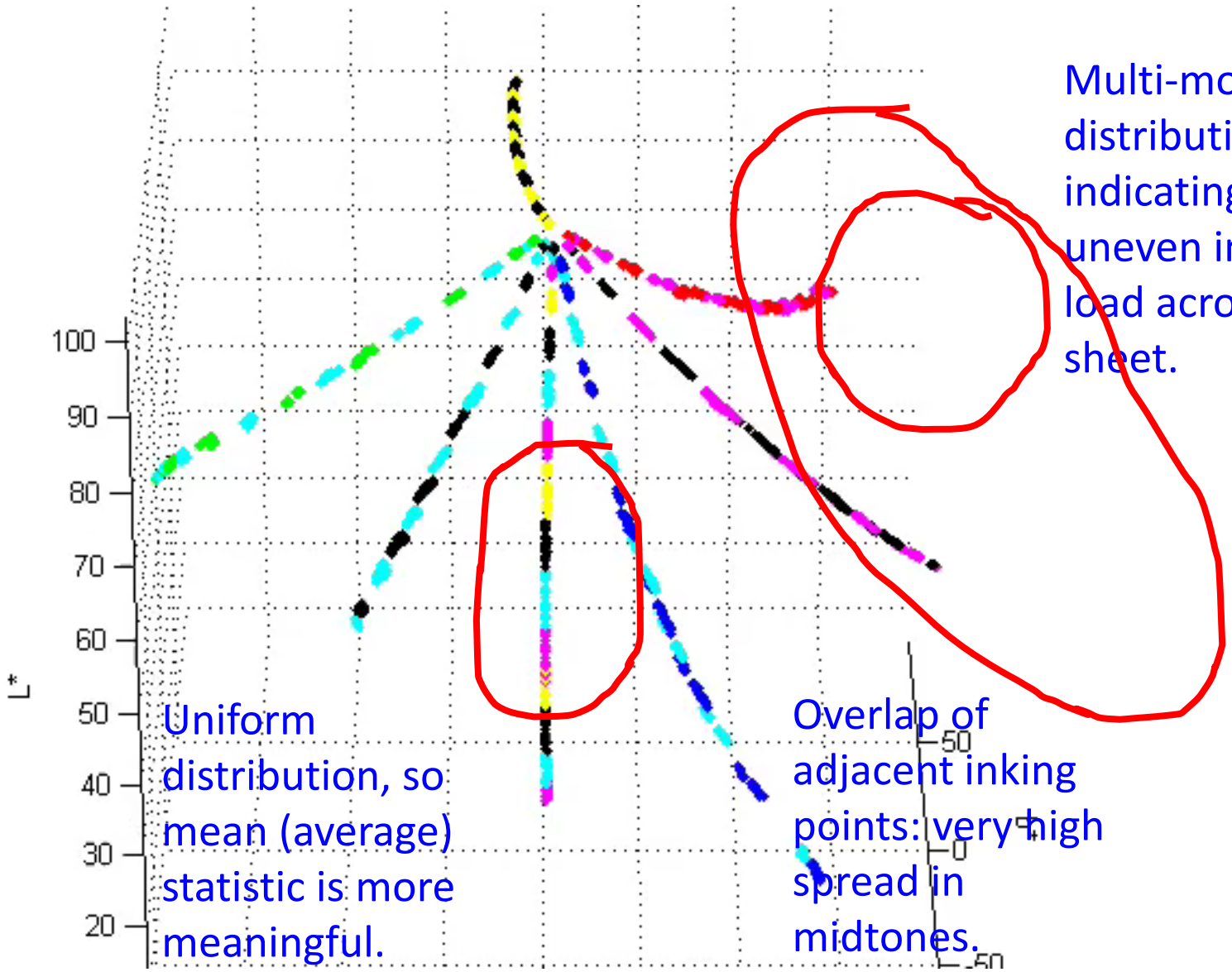
Example: 100% tint blue trap Cyan / Magenta

Courtesy Kodak Professional Services


Yellow
Orange
Magenta
Green
Cyan
Violet
80
60
40
20
0
-20
-40
-60
b*
-60
-40
-20
0
20
40
60
a*


Yellow
Orange
Green
Magenta
Cyan
Black
Violet
80
60
40
20
0
-20
-40
-60
b*
-60
-40
-20
0
20
40
60
a*

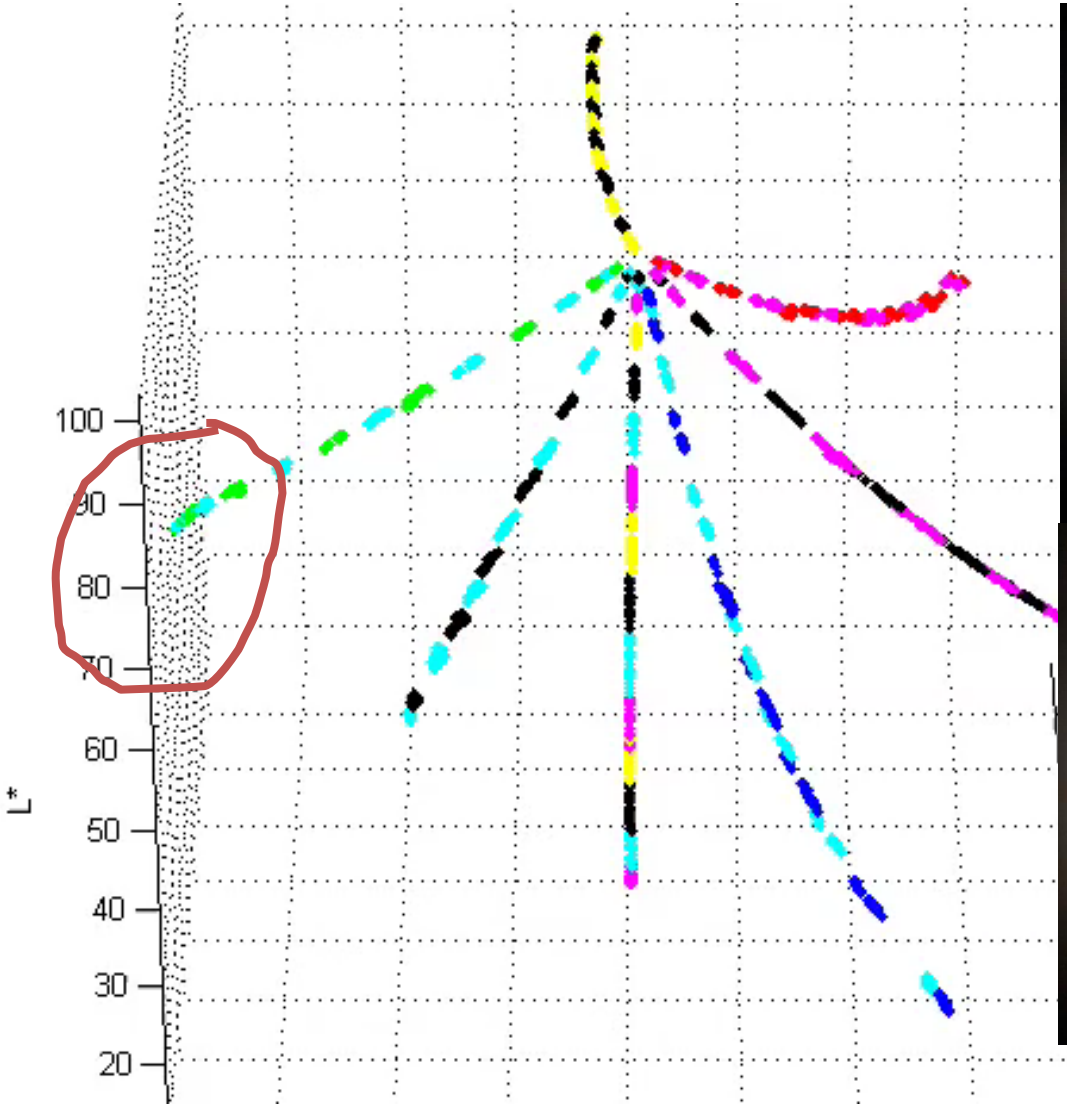

Yellow
Orange
Green
Magenta
Cyan
Black
Violet
L*
100
90
80
70
60
50
40
30
20
80
60
40
20
0
-20
-40

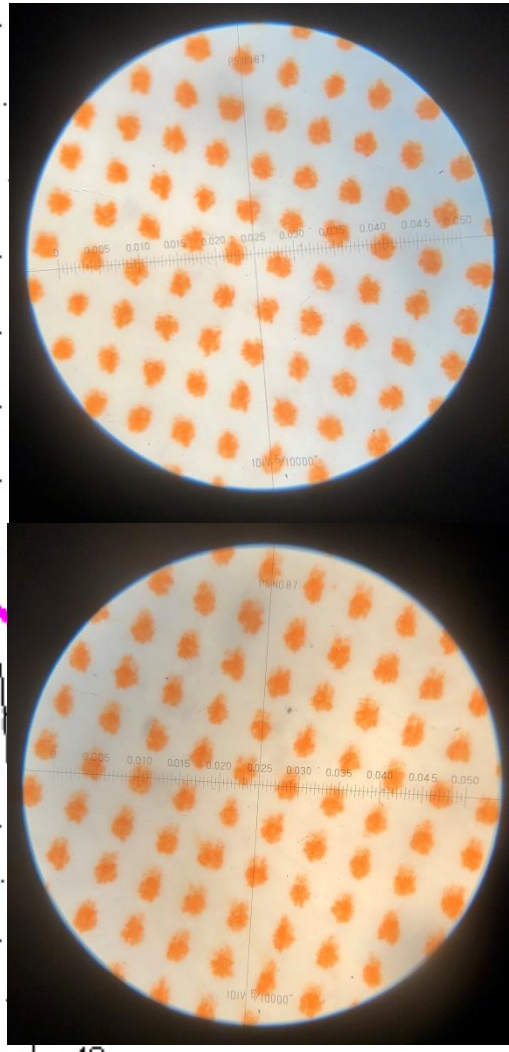


Multi-modal distribution indicating uneven ink load across sheet.

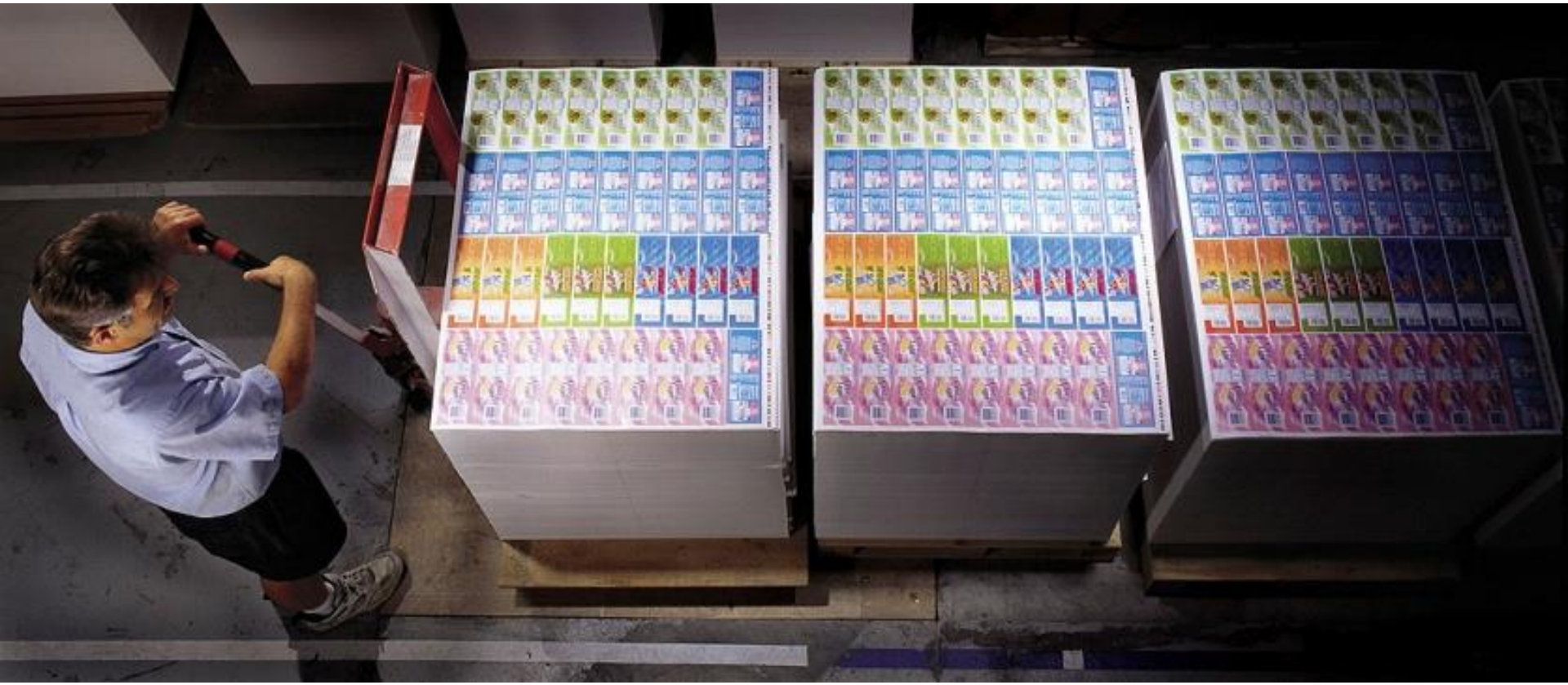
Uniform distribution, so mean (average) statistic is more meaningful.

Overlap of adjacent inking points: very high spread in midtones.


100
90
80
70
60
50
40
30
20
L*
-40



International Color Consortium®



ECG (Extended Color Gamut): Beyond CMYK
濶色域：超越CMYK

Beyond CMYK
超越CMYK

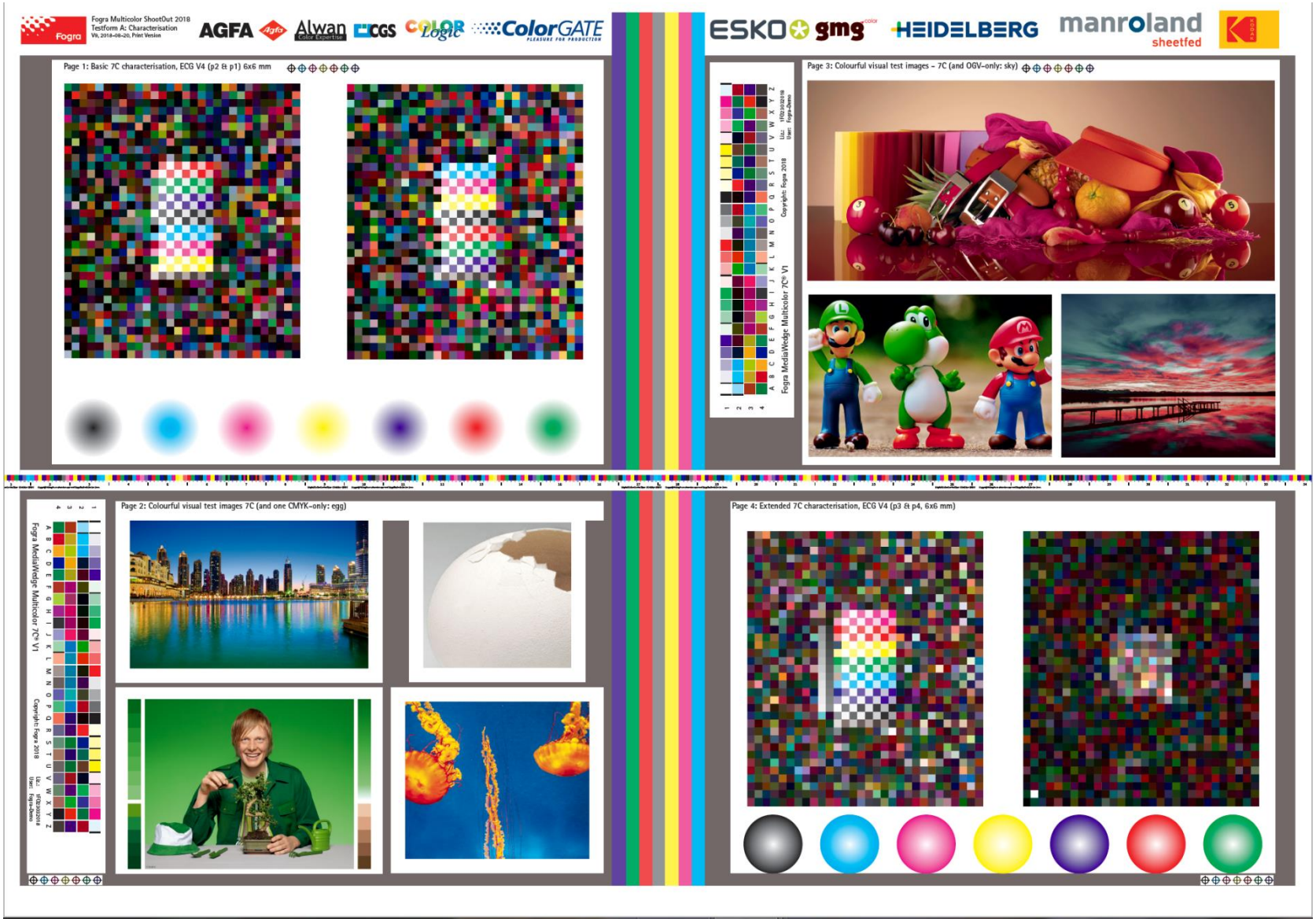
- Emerging standards on characterizing ECG (Extended Color Gamut) printing.
- Widespread adoption of ECG support from multiple vendors and workflows.

- ECG（闊色域）印刷的新標準
- 廣泛採用來自多個供應商和工作流程的ECG支持

Reasons for ECG
使用ECG的原因

- Job ganging to reproduce brand colors.
- Reduction in spot color inventory.
- Improvement in process control long term.
- Additional gamut for images.

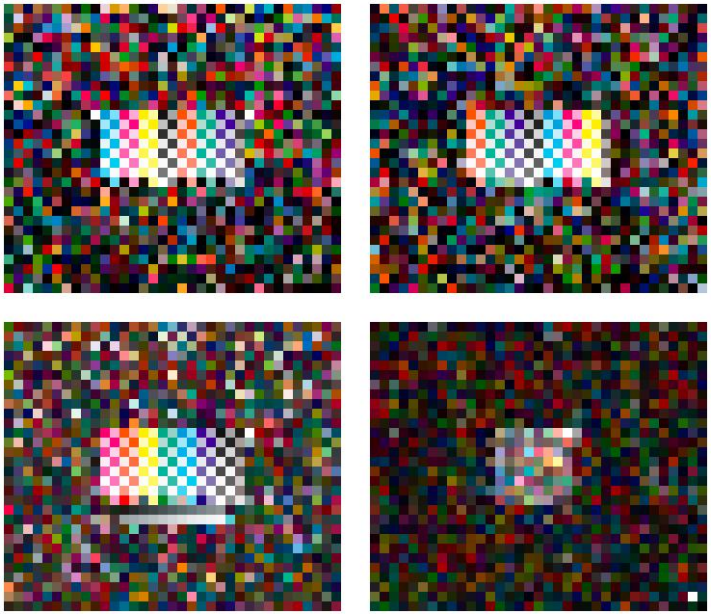
- 合版印刷將品牌顏色重現
- 減少專色庫存
- 長遠改善流程控制
- 圖像的附加色域


Fogra Multicolor ShootOut 2018
Testform A: Characterisation
V6, 2018-08-20, Print Version
AGFA
Alwan
CGS
ColorGATE
ESKO
gmg
HEIDELBERG
manroland
sheetfed
Page 1: Basic 7C characterisation, ECG V4 (p2 & p1) 6x6 mm
Page 3: Colourful visual test images – 7C (and OGV-only: sky)
Page 2: Colourful visual test images 7C (and one CMYK-only: egg)
Page 4: Extended 7C characterisation, ECG V4 (p3 & p4, 6x6 mm)
Fogra MediaWedge Multicolor 7C® V1
Copyright: Fogra 2018

Multi-Vendor Approach for International Standards
針對國際標準的多供應商方法

- ECG target currently under development (since 2017) for 7-colour print systems.

  目前正在開發用於7色打印系統的ECG目標（自2017年起）



ECG Chart Design Principles
ECG圖表的設計原理

- CMYK + 3 intermediate chromatics (R/O, G, B/V).
- Max TAC <= 300%
- Include at least some opponent colour combinations (eg, M+G).
- Based on 0-40-70-100 grid (selective sampling).
- Must fit in under 4 pages for popularly-available measurement devices.
- Work is still underway on chart and sampling design.

- CMYK + 3 中間色譜 (R/O, G, B/V).
- 最大TAC <= 300%
- 包括至少一些相對的顏色組合（例如M + G）
- 基於0-40-70-100格線（選擇性採樣）
- 對於常用的測量設備，必須在4頁以下
- 有關圖表和抽樣設計的工作仍在進行中

Summary
撮要

Color management:

- Buffers between standards.
- Requires control.
- Provides flexibility.

色彩管理：

- 標準之間的緩衝
- 需要控制
- 提供靈活性

International Color Consortium®

Thank you
謝謝

william.li@kodak.com