

2016



Making A Future
with Color Management

THE INTERNATIONAL CONFERENCE

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Color Management in the Post-Digital Age

Practical Philosophy for the Prudent Printer

By: William Li

Color Technology Manager, Kodak
ICC Co-Chair

COLOR MANAGEMENT IN THE POST-DIGITAL AGE

PRACTICAL PHILOSOPHY FOR THE PRUDENT PRINTER

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Who Am I

- Day Job:
 - Color Technology Manager
- Standards:
 - Co-Chair, ICC
 - Convenor, ISO TC130 JWG7 (Color)
 - Chair, Canadian TC130 SMC
 - Co-Chair, GWG Color WG

What is the ICC



**International
Color Consortium®**



**International
Cricket Council**

A woman in a black dress is standing and pouring champagne from a bottle into several glasses on a dining table. Two men are seated at the table, looking towards the camera. The table is set with white plates, green glass bottles, and glasses. A red lantern is visible in the background.





Color Facts

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**

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

Print as Manufacturing

A large stack of red Coca-Cola boxes, likely 1.5L or 2L bottles, arranged in a grid on a black pallet. The boxes feature the classic Coca-Cola logo and a bottle illustration. To the right, a portion of blue boxes is visible. The background shows a warehouse setting with other goods and a person in the distance.

[illegible]

Direct Mail (USA) – Retail



Direct Mail (France) – Fashion



Book Publishing (China)



First Digital Age: WYSIWYG

- What You See Is (sort of) What You Get
 - Desktop publishing = Democratization of Prep
 - Aldus PageMaker through to Adobe CS
- Production process improvements
 - CTP
 - CIP3, CIP4



~~First~~ Second Digital Age: WYSIWYG

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First Digital Age: Digital Scanning

- Crosfield, ICG, Howtek, Scanview, Hell
 - Input
 - Color separation to CMYK
 - Semi-managed color



Zeroth Age: WYGIWYG

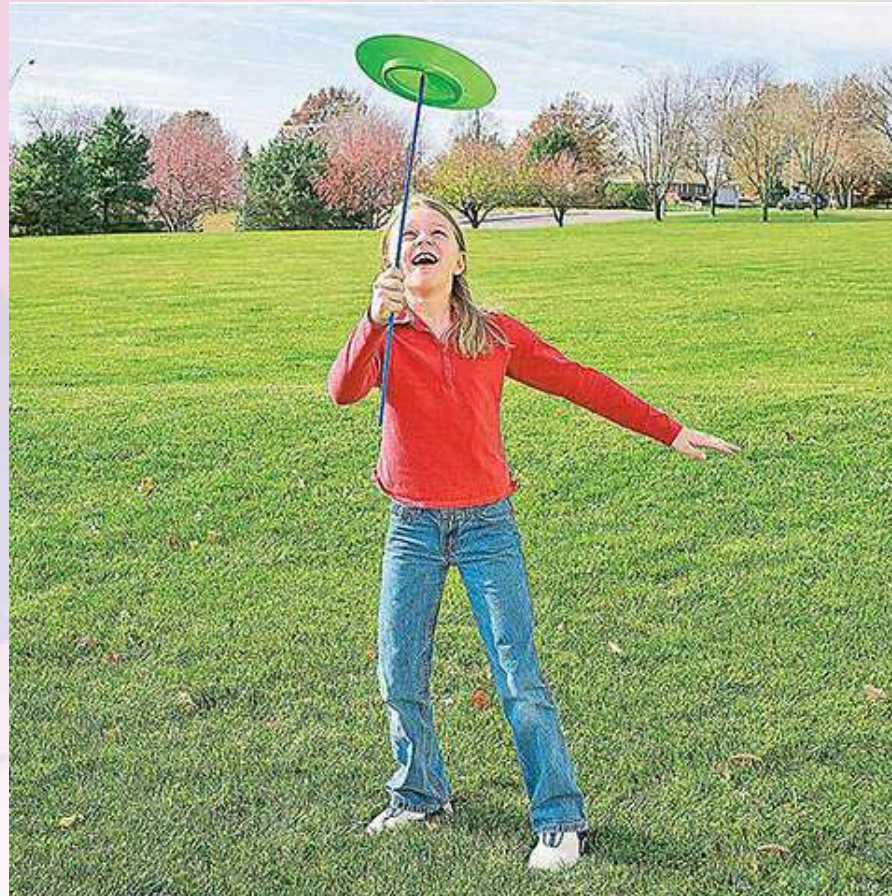
- What You Get is What You Get



Third Digital Age: Workflow Color Management

- Systems Evolution:
 - Scitex Trans/4
 - Apple ColorSync
 - International Color Consortium
 - Adobe Photoshop (CS...)
- Many to Many

Many Spinning Plates



Many Spinning Plates



Many Spinning Plates



One Spinning Plate



Manufacturing Strategies

- Target
- Measurement
- Consideration

Standards and Color Management



Color: What we want vs what we get

- **GET: Device Dependent** Color Space: describes color based on the input or output device
 - All RGB Devices (Monitors, Cameras, Scanners)
 - All CMYK Devices (Laser Printers, Inkjet Presses, Offset Presses)
 - WYGIWYG – What You Get Is What You Get

“Any customer can have a car painted any color that he wants so long as it is black” -- Henry Ford, Founder Ford Motor Company



- **WANT: Device Independent** Color Space: describes color as an absolute value regardless of the input or output device
 - L*a*b* Color Space – prime example
 - Key to matching and communicating colors
 - The Key to color management

The Rosetta stone is a multilingual (Greek, hieroglyphic and demotic Egyptian scripts) stele that allowed linguists to begin the process of hieroglyph decipherment -- WIKIPEDIA



Measuring Color

PROSPER DENSITY DATA

Paper Type	Black Density
Mill Coated Gloss	1.80
IOS Coated Gloss	1.83
Mill Coated Matte 45 lb	1.42
IOS Coated Matte 45lb	1.71

- Two color rulers

- Densitometers [Density]

- Reports optical density of given single color ink
 - C, M, Y, K
 - Example: 1.3D



- Spectrophotometers [$L^*a^*b^*$]

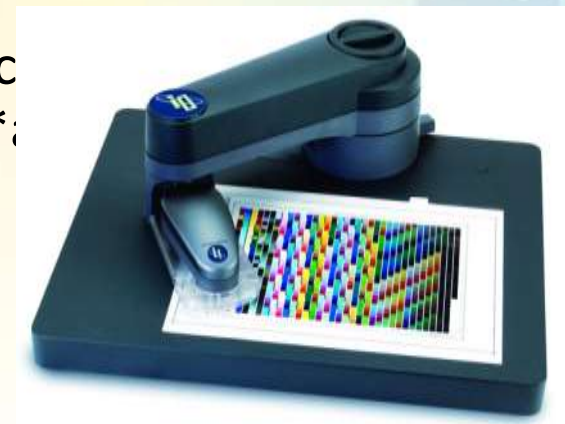
- Measures wavelengths of light reflected in L^*



and
Example: 9



in L^*



Production-Design: Earth and Sky



Production-Design: Earth and Sky



Press-Prepress Gap vs. Design

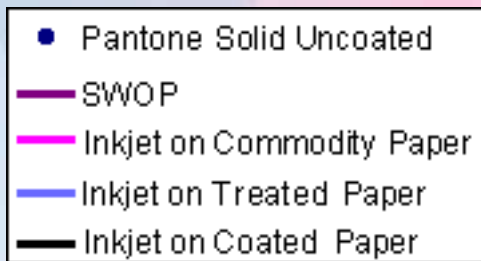


Earth and Sky

- Sky:
 - Imagination: What Could Be
- Earth:
 - Limitations: What Can Be

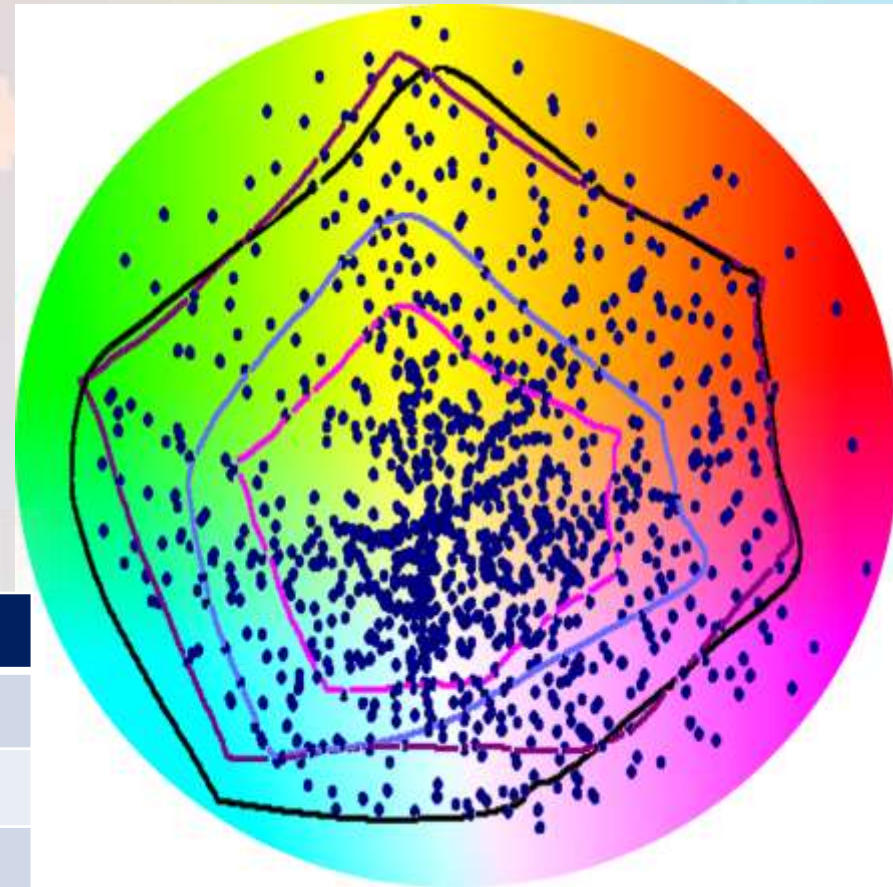


Example: Digital Spot Colors



PROSPER PANTONE DATA

Paper	% of PMS (<5 dE2000)
Enhanced Coated Glossy	88% (coated PMS)
IOS Coated Glossy	94% (coated PMS)
Enhanced Coated Matte	65% (matte PMS)
IOS Coated Matte	83% (matte PMS)



Perspective



Where Next?



What's Behind You?





A wide-angle photograph of a sunset over a beach. The sun is a bright yellow-orange orb on the horizon, with its reflection shimmering on the wet sand. The sky is a gradient of orange, yellow, and blue, with wispy white clouds. The beach is dark and textured, with some small rocks visible. The overall mood is peaceful and serene.

Thank You

Kodak