International Color Consortium®

ICC Color Symposium

22/10/2018 · Hong Kong

Standards in color specifications

ICC / ISO Standards

印刷色彩標準應用

Steve Smiley

SmileyColor & Associates

Convener WG2 ISO TC130

Prepress Data Exchange

Organizers

THE HONG KONG PRINTERS ASSOCIATION 香港印刷業商會

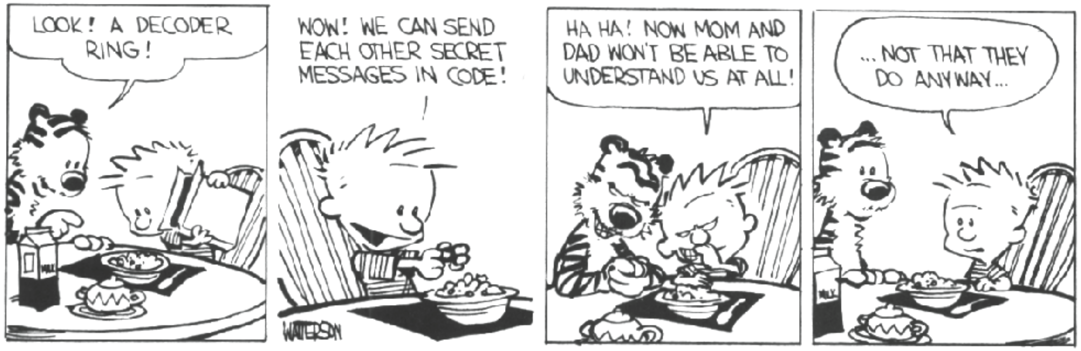
APTEC 印刷科技研究中心 Advanced Printing Technology Centre (A Subsidiary of The Hong Kong Printers Association)

ICC

ICC Relevant ISO Standards
ICC相關的ISO標準

- ISO 15930 Series PDF/X
- ISO 15076-1 - ICC V4
- ISO 20677-1 ICC Max
- BPC (Black Point Compensation)
  - ISO 18619 (CMYK) and **ISO**/TS 21830 (N-Channel)
- ISO 17972 - series CxF
- ISO 20654 - Spot colour tone value (SCTV)

ISO Decoder
ISO解碼



Stages of Standard Documents	
PWI - preliminary work item	**NP** - new work item proposal
WD - working draft	**CD** - committee draft
DIS - draft International Standard (ISO)	**FDIS** - final draft International Standard
PAS - Publicly Available Specification	**TS** - Technical Specification
TR - Technical Report	

PDF/X ISO 15390

- PDF Portable Document Format
- All PDF/X files require output intent ICC profiles providing a communication tool for aims from sender to receiver
  - PDF/X-1 - obsolete format
  - PDF/X-4 - file format for blind transfer
  - PPD/X-6 - Newest format to be published in 2019

(typically PDF standards take 5-10 years for implementation)

- PDF 便攜文件格式
- 所有 PDF/X 檔案都需要有輸出目標ICC 描述檔作為印刷溝通， 這是從發放文件者到接收者
  - PDF/X-1 - 已過時的格式
  - PDF/X-4 - 傳輸格式
  - PPD/X-6 - 將於2019年出版的最新格式

(一般PDF標準需要5年至10年的時間來實施)

ISO 12647 Series

- ISO CMYK printing standards define PDFX recommended file format
  - PDF/X shall have embedded ICC profile or characterization data
  - Data ”should” be used as customer aims
- We are hoping this will become a shall! By methods defined ISO 10128
  - Near Neutral Calibration
  - TVI Curves
  - ICC Workflows

- ISO CMYK 印刷標準定義了的PDFX建議的檔案格式
  - PDF/X 需要嵌入ICC描述檔或特徵數據
  - 數據 “應該”用作客戶目標
- 我們希望這將成為一個ISO 10128定義的方法
  - 近中性校正
  - 色調增值曲線
  - ICC 色彩流程

ISO ICC v4

- First ICC specification published in 1994
- Several version of the spec developed
- In 2010 ISO 15076 was published as a duplicate to the V4 ICC specification
- V4 Profiles contained a Profile reference medium gamut to provide better conversion with less compression. They also defined conversion to provide alignment across vendors.

- 第一份ICC規格於1994年出版
- 發展了規格的幾個版本
- 在2010年 出版了ISO 15076，內容主要是複製ICC 第四版本 (V4) 的規格
- 第四版本的描述檔包含了媒介參考色域描述檔，提供了以更少的壓縮及達到更佳的轉換。他們還定義了轉換方法使不同供應商達到一致性。

ICC Max

- ICC Max is currently under ballot for as ISO TS 20677-1
- ICC Max will provide better solutions for packaging utilizing spectral blending, having the ability to define conditions for multiple light sources, changes in inks sequence, or providing a good alignment to actual inks and overprints

- ICC Max目前正在進行ISO TS 20677-1的投票
- ICC Max 利用光譜，將為包裝提供更好的解決方案，能夠定義多種光源條件，改變油墨色序，或提供與實際油墨和套印的良好一致性

ISO - Black Point Compensation CMYK
ISO – CMYK的黑版補償

- Originally very few programs utilized Black point compensation - making conversions from a substrate with good ink holdout (high densities) substrate to a poor ink holdout (very low densities) substrate.
- By creating an international standard ICC was able to provide solutions to all vendors to have equally good results.

- 最初能使用黑版補償的軟件很少 - 由具有良好吸收油墨（高密度）的承印物轉換到比較差吸收油墨（非常低的密度）的承印物。
- 通過建立國際標準ICC，可以為所有供應商提供解決方案，以取得同樣好的結果。

ISO - Black Point Compensation N-channel
ISO – N-通道的黑版補償

- Packaging requirements to print non cmyk work requires N-channel profiles
  - More than 4 channel, defined as non-cmyk

- 包裝印刷在非cmyk的要求需要N-通道的描述檔
  - 超過4個通道，定義為非cmyk

ISO 17972

- Color Exchange format
  - Pt 1 Core Resources
  - Pt 2 Scanner Targets
  - Pt 3 characterization data exchange
  - Pt 4 spot color exchange
    - Requires spectral data
    - Full compliance 11 patches over substrate and black
    - Communicates ingredients, opacity

- 顏色交換格式
  - 第一部份：基本資料
  - 第二部份：掃描儀目標
  - 第三部份：特徵數據交換
  - 第四部份：專色交換
    - 需要光譜數據
    - 在承印物上的11個色塊和黑墨完全符合要求
    - 傳達成分及不透明度資料

ISO CxF colour exchange format

- Work started in 1997 for color exchange format to replace proprietary .txt files
- CxF was offered to ISO in 2002 by Xrite - GretagMcbeth at the time
- GWG (Ghent PDF Workgroup) was working on a project to use .xmp to describe color ingredients for proofing and PDFs.
- Combined work with GWG, ICC, ISO agreement to create an cxf format that could be used in ICC profile creation.
- In 2016 ISO 17972-4 providing spectral data for packaging was published

- 1997年開始制定顏色交換格式，用於替換專有的.txt文件
- CxF於2002年由Xrite-GretagMcbeth提交至ISO
- GWG (Ghent PDF Workgroup)正在開展一個項目，使用.xmp來描述打稿和PDF的顏色成份。
- GWG、ICC、ISO聯合制定，合作建立可用於建立ICC描述的cxf格式。
- 2016年ISO 17972-4出版，提供了包裝光譜數據。

ISO 17972-4 - CxF X4 Spot Colours

From Design through Print Consistency 從設計到打印一致性
Utilizing PDF X as the document to carry CXF X4 data 利用PDF X作為攜帶CXF X4數據的文檔

Objectives

設計師可以建立符合品牌
色彩要求的印刷產品
Designers can create a printable product that meets the brand requirements for colour

設計可以在顯示器上或
在紙打樣上準確檢查
Design can be proofed accurately on monitor or on hard copy proof

包裝（或其他產品）可以
按照設計師的預期印刷
Package (or other product) can be printed as the designer intended

PDFX – CxF/X-4 Workflow deliverables
PDFX– CxF/X-4 傳遞流程

PDF/X containing CxF/X metadata supplies improved solutions across the entire supply chain

- Brand owner
  - Brand Library standard open format
- Designer
  - Exact brand color used in Design, not a guide color
  - Correct Ink Lay down sequence
- Proofing
  - All data required for Matching Color, Tints and Overprints
    - Design Prints from Designer
    - Contract Proofs Supplier
- Printer
  - All the information needed to meet customers expectation
  - Aims, Tolerances, TVI expectations, Opacity, Ink Sequence
  - Reduction in Press setup with pre approved inks
- Ink Formulation
  - Ink formulation instructions
  - Process control
  - Aims and Tolerances
- Procurement
  - Tools for Quality Reporting Metrics included in file

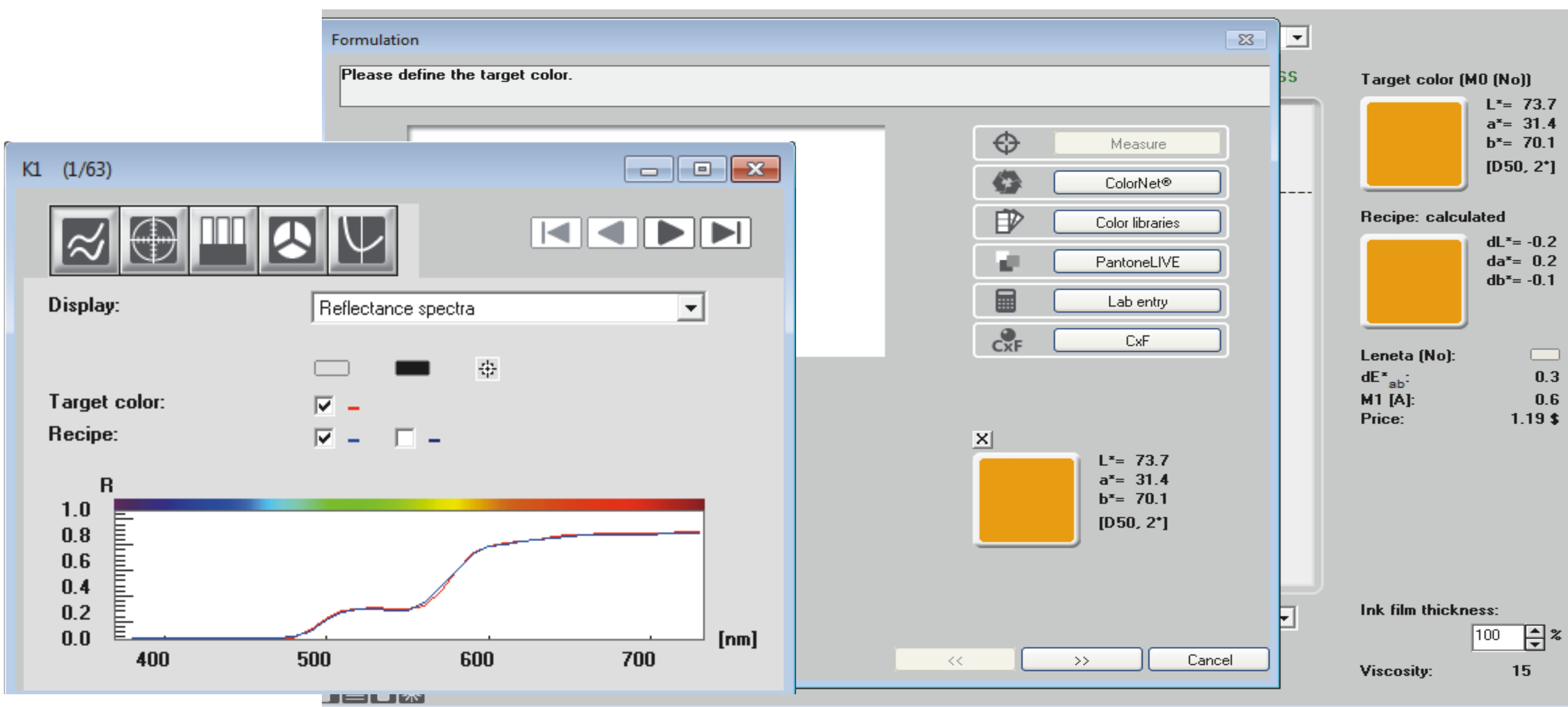
PDF/x包含的CxF/x元數據提供了橫跨整個供應鏈的改善方案

- 品牌商
  - 品牌庫標準開放格式
- 設計師
  - 準確的品牌顏色用於設計，而不是顏色指南
  - 正確油墨印刷色序
- 打樣
  - 所有數據需要匹配顏色，色調和疊印
    - 設計師的設計樣張
    - 合約打樣供應商
- 印刷商
  - 所有資料需要滿足客戶的期望
  - 目標、容差、TVI期望、不透明度、油墨色序
  - 使用預先批核的油墨減少印刷機設置
- 油墨配色
  - 油墨配方指引
  - 生產控制
  - 目標及容差
- 採購
  - 用於質量報告指標的工具包含在檔案中

CxF X-4 Ink Formulation
CxF X-4油墨配方

- CxF/X-4 for ink formulation – Lowest MI (metameric index)

  CxF / X-4的油墨配方- 最低MI (同色異譜指數)



International Color Consortium®

ISO spot colour tone value SCTV
ISO專色色調值SCTV

INTERNATIONAL STANDARD

ISO 20654

First edition
2017-08

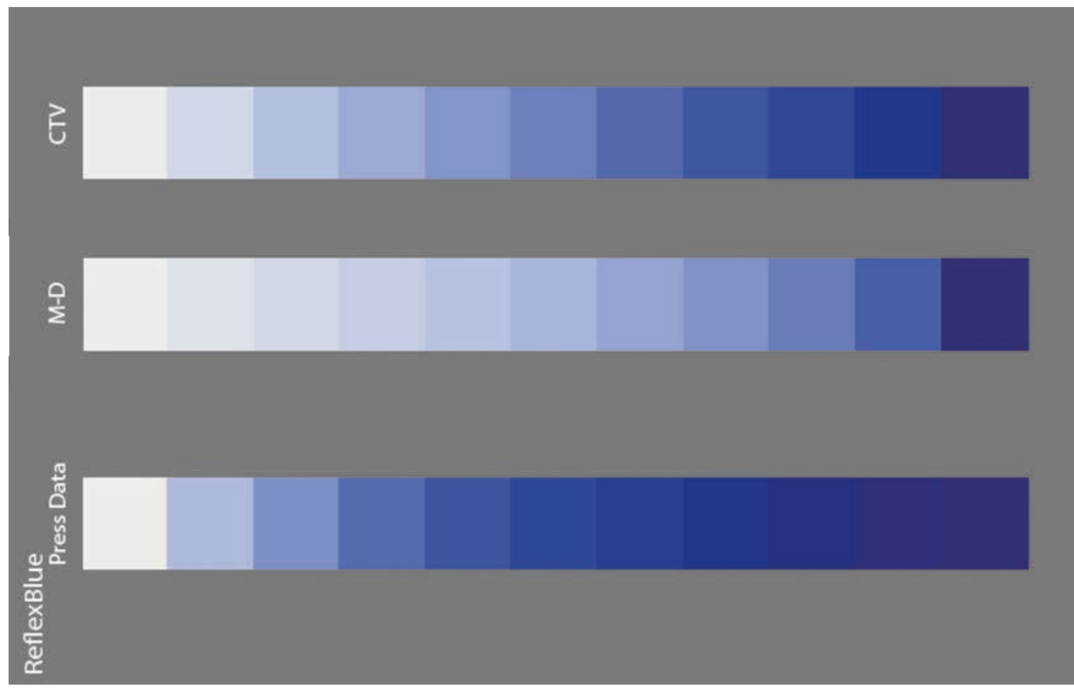
Graphic technology — Measurement and calculation of spot colour tone value

Technologie graphique — Mesurage et calcul de la valeur de tons des couleurs d'accompagnement

Example of SCTV
SCTV的例子

- Equidistant
- Open smooth shadows
- 50% Looks half way between paper and solid

- 等距
- 暗位順滑
- 50%看起來是紙與實色的一半



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Example of SCTV
SCTV的例子

- Aligns with Adobe applications
  與Adobe軟件配合

Defining Color aims in SCTV
以SCTV定義色彩目標

- Aim Curve is linear ….. 10=10%, 25=25%, 50=50%....100=1.0
- Opens shadow to smooth transitions in dark colours
- Aligns with Digital and Analog printing technology
- Provides data for Spectral Blending in ICCMax profiles

- 目標曲線是線性的 ….. 10=10%, 25=25%, 50=50%....100=1.0
- 暗調平滑變化至深色
- 數碼與傳統印刷技術達到一致
- 為ICCMax描述檔中的光譜混合提供數據

Thank You! 謝謝！

- Thank you for the opportunity to present
  謝謝您的出席
- Your support of industry standards helps us all support best practices with common tools across the planet
  您對行業標準的支持幫助我們支持全球通用工具的最佳實踐

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