Standards for the Printing and Publishing Industry

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Standards Philosophy

- In 1982, when I gave my first talk about the need for standards in the printing and publishing industry, the prevailing attitude was "Who needs standards, they represent the lowest common denominator, an no one prints that way!" Today standards are the number one or number two priority of every industry trade association or conference.
- In 1980 when the CEPS (color electronic prepress system) was born, Hell, Crossfield, DS, Eikonix, and Scitex all used proprietary file formats and interfaces to lock-in customers and to maintain captive shops. Today, we have a world of open exchange that is largely based on standard file formats.
Standards Philosophy

- These changes carry many messages. If we learn from these messages, and if we use standards to our advantage, they can represent significant opportunities. These opportunities include reduced development costs, increased marketing opportunities, more efficient customer support, etc. for manufacturers and increased productivity for printers.
- The most important benefit that support of standards brings, is to help maintain the viability of the printing & publishing industry. This in turn helps maintain our customer base as both manufacturers and printers.

Before we can use standards to advantage we need to understand how they are created and what’s available.

Let’s talk about standards
I am going to assume that as a group you a limited background in standards. So I am going to start with the basics.

What are standards?

Dictionary
- something established by authority, custom, or general consent as a model or example
- something, such as a practice or a product, that is widely recognized or employed, especially because of its excellence

ISO
- document, established by consensus and approved by a recognized body, that provides, for common and repeated use, rules, guidelines or characteristics for activities or their results, aimed at the achievement of the optimum degree of order in a given context.
**My Classifications**

1. "consensus standards" or "accredited standards"
   - open to "all affected parties"
2. "industry specifications"
   - usually have limitations on participation
3. "de facto standards"
   - traditionally proprietary,
   - without public evaluation or concurrence and often unavailable for use without fees and/or agreements.

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**All are important**

- Goal is to improve interoperability and/or facilitate communication
- Important to use what is available
- Don’t re-invent
- Use accredited standards to define/limit use of industry and/or de facto standards
- Make all work as part of an industry portfolio
Accredited Standards

1. The big picture
   - The organizations
   - The standards process

2. Imaging and image quality standards
   - Some of the key players
   - Some of the key standards

Some Definitions

- ISO – International Organization for Standardization
- IEC – International Electrotechnical Commission
- JTC1 – Joint Technical Committee 1
- CIE – International Commission on Illumination
- ANSI – American National Standards Institute
- USTAG – US Technical Advisory Group
How they fit together

ISO

IEC

TCs

JTC1

CIE

USNC

Accredited Committees
Directly Impacting Printing and Publishing Industry

• ISO TC 130, Graphic Technology
• ANSI Committee for Graphic Arts Technologies Standards - CGATS (including IT8)
• ANSI B65, Safety Standards
• ISO TC42, Photography
• CIE Division 8, Image Technology
Steps in the Standards process

• New Work Item Proposal (NWI)
  – Must be approved by majority of MB of TC
  – At least 4 MB must agree to participate
• Working Draft (WD)
  – Circulated within responsible group
• Committee Draft (CD)
  – Point at which most technical issues should be resolved
  – Balloted for at least 3 months
  – All MB that participate in TC

Steps in the Standards process

• Draft International Standard (DIS)
  – Final draft that committee believes is ready to go
  – Circulated to all MB of ISO
  – 5 Month ballot
• Final Draft International Standard (FDIS)
  – Essentially proof copy – 2 month vote
  – May be skipped if no negative responses on DIS
• Publication
That’s the organization and the process!

What are the standards?

Historical Note

• Prior to early 1980’s there were no US or International accredited graphic arts standards activities
• Some industry groups (e.g., SWOP)
• Borrowed standards from other industries
• DDES represented first major activity
  – File formats for CEPS data exchange
  – Magnetic tape file headers
• DDES became IT8 which became CGATS
• In 1989 -TC130 created (reactivated)
Data Exchange Standards

• First DDES
• Then TIFF/IT
• Then PDF/X

There is no sense in moving data unless you can define what the data means!

Data in file = ? Color on Printed page
Meaning of GA Data?

1. The relationship between the digital data and the image color that will be printed and viewed under a given set of conditions.

2. The relationship between the digital data and the desired color of the image to be printed.

Meaning of GA Data

- Image color
  - What Colorimetry?
  - How measured?
- Printed
  - Ink and paper?
  - Process and process control?
- Viewed
  - SPD and environment?
- Given set of conditions
  - More than one?
PDF/X

- First data exchange standard that fully defines content
  - Fonts embedded (must be used)
  - No ambiguity in formats and operators (PDF 1.X as modified by ISO 15930-X)
  - **Content data color definition** - pointer to (or inclusion of) characterization data and or ICC profile (ICC Characterization Data Registry and Profile Registry)

Characterization Data

- Data in computer
  - Targets and test images (ISO 12642-X, ISO 12640-X)
- Printing
  - Printing specification - ISO 12647-X or industry group like SWOP, SNAP, IFRA, etc.
- Measurement
  - Colorimetry and Density (ISO 13655, ISO 3664, ISO 5)
- Use
  - Viewing (ISO 3664)
  - Profile building (ISO 15076-1 or ICC.1)
  - Data exchange (CGATS.17)
Existing Characterization Data

ICC Registry
• CGATS: TR 001 (SWOP), DTR 004 (GRACoL)
• Japan Color: 2001 Uncoated, 2001 Coated, 2002 Newsprint, 2003 Gloss Coated
• IFRA 22, IFRA 26, IFRA 28, IFRA 30
• FOGRA 1 thru FOGRA 39

BUT
What is required to create characterization data?
Targets

• ANSI IT8.7/3-1996, Graphic technology — Input data for characterization of 4-colour process printing
• ANSI IT8.7/4-2005, Graphic technology — Input data for characterization of 4-colour process printing — Expanded data set

• ISO 12642-1:1996, Graphic technology — Input data for characterization of 4-colour process printing — Part 1: Initial data set
• ISO 12642-2, Graphic technology — Input data for characterization of 4-colour process printing — Part 2: Expanded data set
Test Images


Printing specifications

- ISO 12647, Graphic technology — Process control for the production of half-tone colour separations, proof and production prints
  - Part 4: Publication gravure printing (2005)
  - Part 5: Screen printing (2001)
  - Part 6: Flexographic printing (In Publication)
  - Part 7: Off-press proofing process working directly from digital data (CD)

Process control

- ISO 2834-1 Graphic technology — Laboratory preparation of test prints
  - Part 1: Paste inks (In publication)
  - Part 3: Screen inks (WD)
- ISO 2836:2004 Graphic technology — Prints and printing inks — Assessment of resistance of prints to various agents
- ISO/DIS 2846-1 Graphic technology — Colour and transparency of ink sets for four-colour-printing
  - Part 2: Coldset offset lithographic printing (2000)
  - Part 4: Screen printing (2000)
  - Part 5: Flexographic printing (2005)
- ISO 13656:2000 Graphic technology — Application of reflection densitometry and colorimetry to process control or evaluation of prints and proofs
**Viewing and Measurement**

- ISO 13655:1996 Graphic technology — Spectral measurement and colorimetric computation for graphic arts images
- ISO 3664:2000, Viewing conditions — Graphic technology and photography
- ISO 12646:2004, Graphic technology — Displays for colour proofing — Characteristics and viewing conditions
- ISO 5, Photography — Density measurements
  - Part 2: Geometric conditions for transmission density (2001)
  - Part 4: Geometric conditions for reflection density (1995)

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**A current dilemma!**

- At first blush, viewing, measurement, and process control all should use the same backing, illuminant SPD, and geometry.
- Most people want to get density and colorimetry from same measurement.
- Most measurement instruments do not have an illuminant that has correct (any) UV component.
- If we eliminate UV from measurement, we should also eliminate it from viewing.
- If we eliminate UV from viewing the effect of optical brightening agents used in paper is lost.
Exchange and Use

- Data exchange
  - CGATS.17, Graphic technology — Exchange format for color and process control data using XML or ASCII text
    (Also in ballot as ISO NWI)

- Profile building
  - ISO 15076-1:2005 Image technology colour management
    — Architecture, profile format and data structure — Part 1: Based on ICC.1:2004-10
  - ICC.1:2004-10, (Profile version 4.2.0.0), Image technology colour management — Architecture, profile format, and data structure

PDF/X Family

- ISO 15930, Graphic technology — Prepress digital data exchange — Use of PDF
  - Part 1: Complete exchange using CMYK data (PDF/X-1 and PDF/X-1a)-2001
  - Part 3: Complete exchange suitable for colour-managed workflows (PDF/X-3)-2002
  - Part 4: Complete exchange of CMYK and spot colour printing data using PDF 1.4 (PDF/X-1a) 2003
  - Part 5: Partial exchange of printing data using PDF 1.4 (PDF/X-2) 2003
  - Part 6: Complete exchange of printing data suitable for colour-managed workflows using PDF 1.4 (PDF/X-3) 2003
  - Part 7: Complete exchange of printing data using PDF 1.6 (PDF/X-4)
  - Part 8: Partial exchange of printing data using PDF 1.6 (PDF/X-5)
Who’s Involved

- TC130
- TC42
  - ISO 5, ISO 3664
- ICC
  - ICC.1, Characterization and Profile Registries
- CGATS
  - TR001, CGATS.17
- Paper
  - ISO TC 6, ??
- Industry Groups
  - SWOP, GRACoL SNAP, IFRA, FOGRA, etc.

A Practical Example

- TV Guide
  - Inside cover crossover
  - Cover stock & body stock
  - 150+ issues across US
  - Printing process used volume dependent
    - Sometimes gravure, sometimes offset
  - Both gravure and offset based on same aim color characterization data (TR 001)
  - All combinations of printing and stock MATCHED
What's New?

- GRACoL is developing a digital press calibration technique to complement the ISO 12647 standards
  - ISO Technical Report is in preparation for review at the upcoming TC130 meeting
- ICC and TC130 to hold a meeting on paper characteristics in June as part of ICC meeting
  - What paper characteristics can be measured that will predict applicability of characterization data between papers (equivalent color, TVI, SID support, gloss, etc.)
  - Paper manufacturers invited (urged) to participate

What's New?

- ISO 3664 being revised by TC42 JWG 24 (joint with TC130)
- ISO 13655 being revised by TC130 JWG8 (joint with TC42)
- JWG8 and JWG24 are meeting together to ensure compatibility between 3664 and 13655
- Reference color gamut defined in ISO 12640-3 (CIELAB/SCID) is defined as ICC perceptual PCS gamut
- ISO 19005-1 (PDF/A) has been completed by TC171 SC2 JWG5 composed of TC171/SC2, TC130, TC42 & TC46/SC11
Then (Early 80’s) vs Now

- Virtually no standards
- Halftone films normal exchange format
- Limited digital data
- Proofing all analogue
- Each proofing system had a “look” and users compensated
- No color management

- Industry fully embraces standards
- Digital data exchange the norm
- Proofing mainly digital
- Proofing to standards
- Color management used extensively

Not bad for an industry that only embraced standards a little over 20 years ago
Thank You

Questions?

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