

Standards and Specifications

The Standards Outlook for 2008

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The standards outlook for 2008 is very much a continuation of the work started in 2007. There are many ongoing activities, some new activities, but nothing earth-shattering or spectacular. In preparing this summary, I was struck by the fact that standards in the graphic arts industry are no longer something new or unusual. 2008 is the 40th anniversary of the initial creation of ISO TC130 and the 19th anniversary of its reactivation. In the United States, graphic arts standards became an issue in the 1982–1983 time frame—that's 25 years ago. So I guess it's OK that standards continue to be a "work in progress." [B65 was accredited by ANSI in 1983, and CGATS was accredited 1989. However, first B65 standard (B65.1) was published in 1954].

NPES continues to provide administrative support of the CGATS, B65, and US TAG to TC130 standards activities and is accredited the American National Standards Institute (ANSI) in these roles. More information is available at <http://www.npes.org/standards/workroom.html>, from Mary Abbott at mabbott@npes.org, or from the author.

Let's look at some of the more important achievements of 2007 and what we expect to see in 2008. We as an industry have become more diverse and therefore standards activities beyond ISO TC130, ANSI CGATS, and ANSI B65 impact us. I will note some of these other activities that may have significant impact on printing and publishing.

File Formats:

The ISO-defined PDF/X file formats are the dominant format for exchange of graphic arts content data, and their use and impact continues to increase. However, TIFF/IT continues to be viable in many parts of the world, and PPML/VDX is becoming significant for variable-data printing.

PDF/X

The family of PDF/X standards, published in late 2003, continues to be the workhorse of data exchange. The family include:

- ISO 15930-4:2003, *Graphic technology — Prepress digital data exchange using PDF — Part 4: Complete exchange of CMYK and spot colour printing data using PDF 1.4 (PDF/X-1a)*

- ISO 15930-5:2003, *Graphic technology — Prepress digital data exchange using PDF — Part 5: Partial exchange of printing data using PDF 1.4 (PDF/X-2)*
- ISO 15930-6:2003, *Graphic technology — Prepress digital data exchange using PDF — Part 6: Complete exchange of printing data suitable for colour-managed workflows using PDF 1.4 (PDF/X-3)*

Two new parts of the PDF/X family have been completed and will be published in early 2008. These are:

- ISO 15930-7, *Graphic technology — Prepress digital data exchange using PDF — Part 7: Complete exchange of printing data (PDF/X-4) and partial exchange of printing data with external profile reference (PDF/X-4p) using PDF 1.6*
- ISO 15930-8, *Graphic technology — Prepress digital data exchange using PDF — Part 8: Partial exchange of printing data using PDF 1.6 (PDF/X-5)*

PDF/X-5 has three conformance levels, which are: PDF/X-5g which allows external graphical content; PDF/X-5n which enables ICC profiles for n-colorant print characterizations to be referenced; and PDF/X-5pg which combines external graphical content and externally-referenced output-intent ICC profiles.

The International Color Consortium (ICC) characterization data registry, which is used as the primary pointer for the intended printing conditions for a PDF/X file, has been expanded to include a Profile Registry to facilitate the external referencing of profiles as allowed in PDF/X-4 and PDF/X-5. This is reachable through the ICC website, www.color.org. Although the standards do not require use of the ICC profile registry, it is believed use of a common profile registry will not only facilitate the use of PDF/X-4 and PDF/X-5 but will also help make profiles readily available for broader use.

TIFF/IT. TIFF/IT is still important for the exchange of data in some areas of the world. The most recent amendment to ISO 12639:2004, *Graphic technology — Prepress digital data exchange — Tag image file format for image technology (TIFF/IT)*, was published in 2006. Although no other work is currently planned for this standard it was re-confirmed by TC130 in 2007.

PPML/VDX. The PPML/VDX file format, ISO 16612-1, *Graphic technology — Variable printing data exchange — Part 1: Using PPML 2.1 and PDF 1.4 (PPML/VDX-2005)*, was published in 2005.

During 2007 work was started on Part 2 with a preliminary title of ISO 16612-2, *Graphic technology — Variable data exchange — Part 2: Using PDF/X-4 and PDF/X-5 (vPDF-1:200x)*. It is based on PDF 1.6 as restricted by PDF/X-4 and PDF/X-5, and is designed to enable vari-

able document printing in a variety of environments from desktop printers to digital production presses. This includes hybrid workflows involving both conventional and digital printing. It does not provide for the transmission of process control information but is constructed to enable its use with JDF or a similar job ticket format.

The present trend towards the separation of variable document content creation from the details of print production workflow and printing device dependencies is evolving rapidly. CIP4's JDF job ticket specification is the job ticket format of choice for specifying the definition of a print product and corresponding production process in a way that is independent of any particular graphical content format. In a production environment, vPDF requires the use of JDF—or a similar job ticket format—to define a print product and corresponding process. The focus is on the exchange of content between establishments as well as within an integrated environment that produces variable document printing.

Graphics design applications have continued to evolve with ever greater capability and sophistication in terms of graphical content effects and design complexity based on a graphics model that supports transparency. This is required to support such features as drop shadows and color blending effects associated with the interaction of translucent content objects. In recent years, the availability of such design capability has raised graphics complexity expectations. In the future, similar capabilities will be necessary for one-to-one customer communication print applications, including direct marketing, transactional, and transactional documents with integrated direct marketing messages. However, currently available VDP content specifications and standards do not support transparency.

Like PDF/X, this standard will enable the exchange of content where no additional technical information is required to be communicated between sender and receiver.

PDF/A. ISO 19005-1, *Document management — Electronic document file format for long-term preservation — Part 1: Use of PDF 1.4 (PDF/A)*, published in December 2005, is gaining wide acceptance for the archival storage of documents in electronic form. It was created by a Joint Working Group (JWG5-PDF/A) formed under ISO TC171/SC2 (Document management applications/Application issues) and includes representatives of ISO TC 171/SC 2, ISO TC 42 (Photography), ISO TC 46/SC 11 (Information and documentation/Archives records management), and ISO TC130 (Graphic technology).

This same JWG will circulate a CD of Part 2, which will provide expanded capabilities and will be based on PDF 1.7, in early 2008.

PDF. In January 2007 Adobe Systems announced it would work with AIIM (Association for Information and Image Management) and ISO TC 171 to make PDF 1.7 an ISO standard. In July the PDF 1.7 Reference, converted to follow ISO template and styling rules, was sent out for ballot as a Fast Track DIS as ISO 32000, *Document management — Portable document format — PDF 1.7*.

The ballot closed on December 2, 2007 and was approved by thirteen National Bodies with one negative. Following ISO rules, when all comments are resolved, the document will be circulated for an FDIS ballot and then will become an ISO Standard as ISO 32000-1. This is expected to occur by mid-to-late 2008.

A new JWG is being formed within ISO TC 171, and TC130 has requested to be part of this activity. It is this group that will be responsible for future definition of PDF and work has already been started to identify new features that are desirable to be included in the next version.

XPS. Ecma International has recently created a new technical committee, TC 46, to work on standardization of the XML Paper Specification (XPS). The goal of the Technical Committee is to produce a formal standard for an XML-based electronic paper format and XML-based page description language which is consistent with existing implementations of the format called the XML Paper Specification (XPS).

XPS is a document storage and viewing specification developed by Microsoft that is intended to describe electronic paper in a way it can be read by hardware, software, and the human eye. XPS is intended to provide a page view of the way the document will print. It will describe the appearance of fixed-format documents by using an XML-based format so the layout won't change. It is a key component of the Microsoft Vista Office Suite

A formal liaison has been established between Ecma TC46 and ISO TC130 to allow graphic arts interaction with, and input to, this activity.

Measurement and Process Control Data Formats

In addition to standards for content data, file formats for measurement and process control data are important. ISO 28178, *Graphic technology — Exchange format for colour and process control data using XML or ASCII text*, was approved and work is ongoing to resolve comments on the final ballot prior to publication. This International Standard is based on ANSI CGATS.17, which has the same title.

In addition, at the recent TC130 meeting, discussion was started concerning the possibility of an ISO standard based on the X-Rite CxF 2.0 file format. CxF 2.0 is a revision of the Gretag-MacBeth CxF file format. The CxF file format is XML-based and is intended to convey any color-related information, including target design, ink formulations, test data, etc. It is extensible and will provide compatibility with CGATS.17/ISO 28178.

It is not yet clear whether an ISO standard for graphic arts would just use a subset of CxF, or the entire schema. It was also questioned whether the development of an ISO standard based on CxF should be developed not just by TC130, or by a JWG made up of TCs that represent other industries that may have a need for such a data exchange standard.

File Content Definition/Printing Condition Definition

As we have said many times, meaningful data exchange is dependant on a clear definition of the intended color appearance of the content data being transmitted. The mechanisms used to convey the intend color appearance are pointers to characterization data and/or ICC profiles based on such characterization data. The use of the ICC Characterization Registry (<http://www.color.org/registry2.html>) has become the accepted reference for characterization data. Most of the characterization data posted on the ICC website and other references is based on the ISO 12647 series of standards. During 2007, this website has been expanded to also include an ICC Profile Registry which is required to support the new PDF/X-4 and PDF/X-5 standards.

Printing Aims and Characterization Data

CGATS, working with the various industry groups has completed and published the following Technical Reports documenting characterization data which can be posted to the ICC registry and forms the basis for ICC profiles.

- CGATS/SNAP TR 002-2007, *Graphic technology — Color characterization data for coldest printing on newsprint*
- CGATS/SWOP TR 003-2007, *Graphic technology — Color characterization data for SWOP® proofing and printing on U.S. Grade 3 coated publication paper*
- CGATS/SWOP TR 005-2007, *Graphic technology — Color characterization data for SWOP® proofing and printing on U.S. Grade 5 coated publication paper*
- CGATS/GRACoL TR 006-2007, *Graphic technology — Color characterization data for GRACoL® proofing and printing on U.S. Grade 1 coated paper*

In TC130, work has been started to develop a unified characterization data set for Type 1 paper as defined in ISO 12647-2. The first concrete step in this direction was the agreement to prepare an Addendum for ISO 12647-2 which adds an additional TVI curve which is generally representative of a direct-to-plate native exposure. This curve is similar to the TVI curves of both GRACoL and Japan Color.

ISO 12647-2:2004/Amd 1:2007, which slightly modifies the aim ink colors, primarily the two-color solid overprints, was published in 2007.

ISO 12647-7, *Graphic technology — Process control for the manufacture of half-tone colour separations, proof and productions prints — Part 7: Off-press proofing process working directly from digital data*, was approved at the DIS stage. However, there was one negative vote accompanied by a request to include provisions for design proofs in addition to contact proofs. This has resulted in extensive discussion in TC130 and the decision to proceed with the FDIS ballot of ISO 12647-7 without provision for design proofs. However, it was agreed to start an immediate revision to create a new document that will include this distinction.

Concerns were raised about the need to avoid misunderstanding between the two levels of “proofs” in contractual and/or quality terms. Alternate terms were discussed (e.g., print visualization, print simula-

tion, draft print, position proof, validation print. etc.). Discussions of the use cases led to an agreement that the key distinction was “prototype” color vs. a final quality color proof. The key use is probably customer communication, not printer guidelines or commitment.

Discussions of both “CMYK exchange color spaces” and “paper characterization” are ongoing in the ICC and in TC130. In TC130, work on the Technical Specification *Graphic technology - Method for calibration of a printing system with digital data*, continues and is related to the potential development of print-process-independent CMYK exchange color spaces. Discussions have been initiated between ISO TC 6 (Paper) and TC130 to begin reviewing issues of paper characterization. It is well recognized that paper is a critical component in all process color printing. It is not only the “fifth color” but its characteristics also determine both the appearance of and the amount of ink that can be printed. The sheer number of individual printing papers available from all suppliers is so vast that characterization data can never be provided for even a small number of them. Ideally, the color management community would like to be able to add metadata to printing characterization data, or CMYK color exchange space data, indicating the types of papers and printing processes for which that data is appropriate. Hopefully, both of these projects will progress significantly in 2008.

ICC Color Management

The ICC work on a coordinated revision of ICC.1 and ISO 15076:2005 (*Image technology colour management — Architecture, profile format, and data structure — Part 1: Based on ICC.1:2004-10*) is progressing. The major task of updating the current ISO document to better match the ISO editing criteria (we were given a waiver from ISO on many items in the current version) is almost complete. The approved changes will then be incorporated and the document will be circulated for simultaneous approval in the ICC and TC130.

The decision was made by the ICC Steering Committee that, because the current changes are classified as an ICC minor revision, the current version will be revised and the additions/changes identified in an informative annex. The alternative would have been to prepare the new version as a Part 2 of ISO 15076.

Color Data Space

Closely related to the issues of color content data is the issue of color data space definition. A new work item has been approved in TC 42/JWG 22 (Joint with TC130) to develop a Part 4 of ISO 22028. The proposed title is *Photography and graphic technology — Extended colour encodings for digital image storage, manipulation and interchange — Part 4: European Colour Initiative RGB colour image encoding (eciRGB (2008))*. Work will be started on this standard in 2008.

Test Images

ISO 12640-3:2007, *Graphic technology — Prepress digital data exchange — Part 3: CIELAB standard colour image data (CIELAB/SCID)* was published in 2007. This standard adds a third set of standard images to ISO 12640 which are encoded as CIELAB data

and provides a large gamut reference image set. This standard also documents a reference color gamut that encompasses the known range of real-world surface colors. This same gamut has been defined by the ICC as the gamut of the perceptual rendering intent reference medium.

TC130 has started work on two additional parts of ISO 12640. They are ISO 12640-4, *Graphic technology — Prepress digital data exchange — Part 4: Wide gamut display-referred standard colour image data (TBDencoded/SCID)* *Graphic technology — Prepress digital data exchange — Part 4: Wide gamut display-referred standard colour image data (AdobeRGB(1998)/SCID)*, and ISO 12640-5, *Graphic technology — Prepress digital data exchange — Part 5: Scene-referred standard colour image data (RIMM/SCID)*.

Part 4 is a set of display-referred images based on the Adobe RGB color gamut. They will complement the existing XYZ/SCID images of ISO 12640-2, which are based on the sRGB display gamut. Work is underway and a CD is expected to be distributed for ballot early in 2008.

Part 5 will include a set of scene-referred images, which will be encoded as RIMM-RGB (ISO 22028-3). These scene-referred images will complement the rest of the images of 12640, which are all rendered images. TC130/JWG9 has been created to allow TC42 (Photography) to be actively involved in the work on Part 5. Preliminary work is underway, but a draft document is not expected until mid-to-late 2008.

Metrology and Viewing Standards

Two key standards that play a pivotal role in the digital data exchange and color management arena are under revision. These are ISO 3664:2000, *Viewing conditions — Graphic technology and photography*, and ISO 13655:1996, *Graphic technology — Spectral measurement and colorimetric computation for graphic arts images*.

The revision of ISO 3664 is underway in TC42/JWG24 (a joint working group involving representatives of TC42 and TC130). The CD draft was approved, comments resolved, and a DIS draft is in preparation.

The revision of ISO 13655 is also progressing rapidly in TC130/JWG8 (also a joint working group involving both TC42 and TC130). The DIS is in ballot with a closure date of March 23, 2008.

ISO 12646:2004, *Graphic technology — Displays for colour proofing — Characteristics and viewing conditions*, although recently published, was revised to include and take into account the characteristics of flat panel displays. It has been approved and is at ISO Central Secretariat (ISOCS) for publication (hopefully early in 2008).

CIE Colorimetry Standards

CIE is in the process of developing a new CIE Standard, CIE S 014 *Colorimetry*. This is a multi-part standard. Individual parts are:

- *Part 1: CIE standard colorimetric observers*
- *Part 2: CIE standard illuminants*
- *Part 3: Part 3: CIE tristimulus values*
- *Part 4: CIE 1976 L*a*b* colour space*

- *Part 5: CIE 1976 L*U*V* colour space*

The intent is that these will have joint ISO/CIE designations. Parts 1, 2 and 4 are available from CIE. Parts 3 and 5 are being prepared by TC 2-57 based on existing ISO/CIE standards.

Safety Standards

Safety standards play a key role in helping determine the direction and form of regulations that impact our industry. Both ANSI B65 and ISO TC130 WG 5 have been active and made significant progress this year.

ANSI B65. The ANSI B65 Committee, administered by NPES, develops safety standards for equipment used in the graphic technology process. ANSI B65 has provided significant input into the development of ISO safety standards for printing equipment, and has now begun the process of nationally adopting the ISO work, when possible. The first national adoption was done during the revision of ANSI B65.2 for binding and finishing equipment, which was a national adoption of ISO 12649, with modifications. The intent is to continue to evaluate the ISO work and nationally adopt it whenever possible.

TC130 WG5 Safety and Ergonomics. TC130/WG5 has been working on a multi-part standard, ISO 12643, on safety of graphic technology machinery and systems. This work is essentially harmonizing the requirements set forth in the ANSI B65 standards with the European requirements of the EN 1010 series of standards.

The existing parts of ISO 12643, *Graphic technology - Safety requirements for graphic technology equipment and systems*, are:

- *Part 1: General requirements*
- *Part 2: Press equipment and systems*
- *Part 3: Binding and finishing equipment and systems*

Work has begun on two additional parts of the ISO 12643 series to address converting equipment and stand-alone platen presses.

ISO TC130 Standards Approved in 2007

The ISO TC130 standards published in 2007 are:

- ISO 12639:2004/Amd 1:2007, *Use of JBIG2-Amd2 compression in TIFF/IT*
- ISO 12640-3:2007, *Graphic technology — Prepress digital data exchange — Part 3: CIELAB standard colour image data (CIELAB/SCID)*
- ISO 12643-1:2007, *Graphic technology — Safety requirements for graphic technology equipment and systems — Part 1: General requirements*
- ISO 12643-2:2007, *Graphic technology — Safety requirements for graphic technology equipment and systems — Part 2: Press equipment and systems*
- ISO 12647-2:2004/Amd 1:2007 (Minor revision to) *Graphic technology — Process control for the production of half-tone colour separations, proof and production prints — Part 2: Offset lithographic processes*