INTERNATIONAL STANDARD

ISO 15929

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Graphic technology — Prepress digital data exchange — Guidelines and principles for the development of PDF/X standards

Technologie graphique — Échange de données numériques de préimpression — Lignes directrices et principes d'élaboration des normes PDF/X

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 15929 was prepared by Technical Committee ISO/TC 130, *Graphic technology*, in collaboration with the United States national body Committee for Graphic Arts Technologies Standards (CGATS).

Annex A of this International Standard is for information only.

Introduction

This International Standard specifies the guidelines and principles that serve as the basis for the development of both National and International Standards that define the use of the Portable Document Format (PDF) in various graphic technology applications. The family of International Standards contained in ISO 15930 defines methods for the exchange of digital data between establishments within the printing and publishing industry.

A variety of data formats and structures are used for the creation of material to be printed, but there are two prevalent kinds of underlying data structures. These are vector-based data for the encoding of line art and textual information; and raster-based data for the encoding of image information, including previously rasterized line art and textual information. Both kinds of data structures are required along with page description information in an open electronic workflow. The subject of the ISO 15930 family of International Standards is a format for the exchange of data objects where individual objects may be encoded in either vector or raster data structures.

The individual parts of ISO 15930 will address the needs of different workflows within the printing and publishing industry. That family of International Standards also addresses the behaviour of applications used to write and/or read the files prepared.

Annex A of this International Standard describes the intentions and goals of the members of Working Group 2 of ISO/TC 130 as they created this International Standard and the preliminary parts of ISO 15930.

Graphic technology — Prepress digital data exchange — Guidelines and principles for the development of PDF/X standards

1 Scope

This International Standard specifies the guidelines and principles that serve as the basis for the development of the parts of ISO 15930 that define the use of the Portable Document Format (PDF) in various graphic technology applications.

For the purposes of this International Standard, "PDF file format" refers to the file format described in the Portable Document Format Reference Manual published by Adobe Systems Incorporated and "PDF/X standard" refers to an International or National Body standard, prepared in accordance with this International Standard defining a specific use of the PDF file format for graphic technology applications.

2 Normative reference

The following normative document contains provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent edition of the normative document indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

Portable Document Format Reference Manual, Adobe Systems Incorporated, San Jose, CA, USA, 95110, www.adobe.com

3 Notations

PDF keywords, the names of keys in PDF dictionaries, and other predefined names are written in a bold sans serif type font; for example, the **Info** dictionary.

4 Requirements

4.1 PDF version

All PDF/X standards shall be based on the PDF file format and shall identify the particular version of PDF used as well as any modifying Technical Notes by Adobe Systems Inc. or other modifying documents.

NOTE Annex A describes the intentions and goals of the members of Working Group 2 of ISO/TC 130 as they created this International Standard.

4.2 Colour data definition

All colour data shall be explicitly defined or identified.

NOTE "Explicitly defined or identified" means that, for example, uncharacterized CMYK or RGB is not permitted. However, the definition or identification of the color data could be part of the particular standard rather than part of the data file, if that were appropriate for the needs of a particular PDF/X standard.

4.3 GTS_PDFXVersion key

Each PDF/X standard shall specify the use of the **GTS_PDFXVersion** key in the **Info** dictionary and shall define a unique value. The type of this value shall be string. This value shall be registered with ANSI CGATS.

NOTE This prefix is an extension of the GTS_ second class name prefix assigned by Adobe Systems Incorporated to the United States ANSI Committee CGATS. CGATS (and its secretariat, NPES The Association for Suppliers of Printing, Publishing and Converting Technologies, 1899 Preston White Drive, Reston, Virginia 20191-4367) has agreed to make the use of the GTS_ PDFX name prefix available without prejudice to accredited standards groups within the graphic technology industry and to maintain an open registry of all such uses.

4.4 GTS_PDFXConformance key

Where a PDF/X standard includes more than one conformance level the **GTS_PDFXConformance** key shall be used in the **Info** dictionary to distinguish between conformance levels. The type of this value shall be string.

4.5 GTS_PDFX prefix

Any additional graphic technology-specific keys described in a PDF/X standard shall use the **GTS_PDFX** prefix. All keys shall be registered with ANSI CGATS (see note in 4.3).

4.6 Common requirements

Unless technical reasons intervene, where different parts of ISO 15930 have common detail requirements, those parts with later publication dates shall use the same mechanism or data format that is used for the specification of those same details in parts with earlier publication dates. Using this same philosophy, the nomenclature established in parts of ISO 15930 with earlier publication dates shall be used in parts with later publication dates. Where technical reasons intervene to prevent either of these requirements from being fully met, special notice of such changes shall be provided.

NOTE The concern addressed by this requirement is the need to minimize the number of variant implementations.

4.7 Conformance

To minimize ambiguity in processing a file, each PDF/X standard shall limit the set of PDF objects which may be used and add restrictions to the use, or form of use, of those objects, and/or keys within those objects. Each part shall define one or more conformance levels for reading and writing tools. At any conformance level, writing tools may support part or all of the capabilities defined. To ensure predictable processing of any compliant file all complaint reading tools (including viewers and verifiers) shall read and appropriately process all capabilities defined for that tool's conformance level.

4.8 Conformance level identification

Each PDF/X conformance level shall be identified by a name that starts with the string "PDF/X-" followed by an appropriate identifier that is unique among PDF/X standards.

NOTE This name is generally derived from, and compatible with, the **GTS_PDFXVersion** key and the **GTS_PDFXConformance** key described in 4.3 and 4.4 above.

4.9 Guidelines for extending PDF functionality

The PDF file format, as defined in the *Portable Document Format Reference Manual*, shall not be violated.

PDF/X standards should be developed as far as is possible without adding extensions to the PDF file format upon which they are based. When it is found absolutely necessary to extend beyond the relevant version of PDF, the following guidelines shall be taken into account:

- Care should be taken to avoid the mechanisms and constructs used in a part of ISO 15930 coming into conflict with the mechanisms and constructs that might be expected to be added to a future version of PDF to provide the same functionality.

- Extensions to PDF shall be constructed in such a way that the resulting file may still be read without error by a PDF compliant reading application that is not also compliant with the part of ISO 15930 standard being developed, and by reading applications compliant with other parts of ISO 15930.
- Wherever possible the extensions should be specified in such a way as to maximise the probability that they may be implemented using plugins or other minor extensions to existing mainstream PDF applications.
- Extensions that will cause a significant difference in output when processed by a PDF/X complient application as opposed to a baseline PDF application should only be added after conclusive discussion and shall be clearly identified in the defining PDF/X standard.

Annex A
(informative)

Intentions and goals

A.1 Introduction

In building the PDF/X family of International Standards (the various parts of ISO 15930), the members of ISO/TC 130/WG 2 recognized that the needs of the printing and publishing industry varied both as a function of geographical region and application area (newspapers, publications, catalogues, commercial printing, etc.). To meet this diversity of need, and at the same time provide easily identified conformance levels, a multi-part International Standard (namely ISO 15930) was chosen as the approach to be used. It was also recognized that the Adobe PDF file format, upon which all parts of ISO 15930 are based, is still evolving. Individual PDF/X standards therefore, may refer to different versions of PDF, with or without extensions provided through modifying Technical Notes by Adobe Systems Inc. or other modifying documents.

This work was facilitated by the existence of an initial ANSI standard in this application area, CGATS.12/1-1999, Graphic technology — Prepress digital data exchange — Use of PDF for composite data — Part 1: Complete exchange (PDF/X-1). The ANSI standard specifies the methods for the use of the Portable Document Format (PDF) for the dissemination of composite CMYK digital data, in a single exchange, that is complete and ready for final print reproduction. It is based on *Portable Document Format Reference Manual*, Version 1.2, Adobe Systems Incorporated, November 27, 1996, as extended by Adobe Technical Note #5188, *PDF features to facilitate ANSI CGATS.12, PDF/X*, dated 11 January 1999.

A.2 PDF compatibility

It is the intent of ISO/TC 130 that all PDF/X standards, national or international, be based on defined PDF features and to only limit the set of PDF objects which may be used and/or add restrictions to the use, or form of use, of those objects, and/or keys within those objects. It is therefore expected that no PDF/X standard will extend the defined PDF file format features available at the time of its publication.

A.3 General requirements

This International Standard (ISO 15929) specifies the guidelines and principles for the use of the Portable Document Format (PDF) and forms the basis for the development of all international or national PDF/X standards. While all international PDF/X standards will be documented as parts of ISO 15930, national bodies are also encouraged to base any standards that define the use of the PDF file format for graphic technology applications on this International Standard.

Whereas some workflows require the exchange of complete material with all elements present, there are occasions where this is not appropriate. In certain workflows, some or all of the elements may be more logically present at the receiving site, or may be exchanged at a different time, and simply referenced in the final exchange. Examples of referenced elements include fonts, high resolution contone image files, or line art files. Further, evolving colour management capabilities may allow elements to be exchanged more expeditiously in colour spaces other than CMYK. Some workflows are intended to support blind exchange, where minimal technical communication is required between sender and receiver, while other workflows will be based on varying levels of prior technical agreement.

While the requirements for the various parts of ISO 15930 are still being studied, it is clear at this point in time that individual parts will represent some or all of the combinations of several general requirements. These include the following:

- "Blind" exchange vs. exchanges requiring prior technical agreement or agreement as to capabilities required to receive and process a file;
- the requirement to have all required elements available in a single exchange vs. the ability to have some elements simply referenced and available at the receiving site or transmitted in a separate exchange (sometimes called complete vs partial exchanges);
- exchange of CMYK data or exchange of data encoded in other colour spaces;

- the requirement that the sender define the expected printed appearance vs. the requirement that the sender include “full gamut” data and the receiver be responsible for appropriate adjustment to the actual printing condition used;
- the use of externally referenced (OPI) files for some objects vs. the requirement that all objects be encoded within the PDF file structure itself.

The choice, and priority for preparation, of the individual parts of ISO 15930 will be based on identified industry needs and the willingness of the proponents of those needs to work within ISO/TC 130 to develop the necessary documents for processing and approval.

A.4 Conformance philosophy

The various parts of ISO 15930 will define specific uses of the publically available Portable Document Format. To minimize ambiguity in processing of the file, each part of ISO 15930 limits the set of PDF objects which may be used and adds restrictions to the use, or form of use, of those objects, and/or keys within those objects. Each part of ISO 15930 will define one or more conformance levels for reading and writing tools.

It is anticipated that a variety of products (readers, writers, viewers, and products that offer combinations of these features) will be developed around each conformance level defined. Different products will incorporate various capabilities to prepare, interpret and process conforming files based on the application needs as perceived by the suppliers of the products. It is important to understand that at any conformance level, writing tools may support part or all of the capabilities defined, while reading tools (including viewers and verifiers) must read and appropriately process all capabilities defined for that conformance level.