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Graphic technology — Prepress digital data exchange using PDF

Part 8: Partial exchange of printing data using PDF 1.6 (PDF/X-5)

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National foreword

This British Standard is the UK implementation of ISO 15930-8:2010, incorporating corrigendum September 2011. It supersedes BS ISO 15930-8:2008 which is withdrawn.

The start and finish of text introduced or altered by corrigendum is indicated in the text by tags. Text altered by ISO corrigendum September 2011 is indicated in the text by ▌AC1⟩ ⟨AC1▐.

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A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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INTERNATIONAL STANDARD

ISO 15930-8

Second edition
2010-07-15

Graphic technology — Prepress digital data exchange using PDF —

Part 8: Partial exchange of printing data using PDF 1.6 (PDF/X-5)

Technologie graphique — Échange de données numériques de préimpression utilisant le PDF —

Partie 8: Échange partiel de données d'impression utilisant le PDF 1.6 (PDF/X-5)

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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 2.

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 document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 15930-8 was prepared by Technical Committee ISO/TC 130, *Graphic technology*.

This second edition cancels and replaces the first edition (ISO 15930-8:2008), of which it constitutes a minor revision to incorporate the following changes:

— correct issues with metadata and identification (8.3 and 8.4);

— fix some minor issues in Annex A.

ISO 15930 consists of the following parts, under the general title *Graphic technology — Prepress digital data exchange using PDF*:

— *Part 1: Complete exchange using CMYK data (PDF/X-1 and PDF/X-1a)*

— *Part 3: Complete exchange suitable for colour-managed workflows (PDF/X-3)*

— *Part 4: Complete exchange of CMYK and spot colour printing data using PDF 1.4 (PDF/X-1a)*

— *Part 5: Partial exchange of printing data using PDF 1.4 (PDF/X-2)*

— *Part 6: Complete exchange of printing data suitable for colour-managed workflows using PDF 1.4 (PDF/X-3)*

— *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*

— *Part 8: Partial exchange of printing data using PDF 1.6 (PDF/X-5)*

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Introduction

ISO 15930 (all parts) defines methods for the exchange of digital data within the graphic arts industry and for the exchange of files between graphic arts establishments. It is a multi-part document where each part is intended to respond to different workflow requirements. These workflows differ in the degree of flexibility required. However, increasing flexibility can lead to the possibility of uncertainty or error. The goal throughout the various parts of ISO 15930 has been to maintain the degree of flexibility required while minimizing the uncertainty.

Many printed documents are assemblies of partial pages and/or pages created at different locations and by different organizations. The merging of these individual elements into the final printing form and the subsequent printing can take place at different locations. Some of these elements might also be routed to multiple sites for incorporation into other documents. Each of these elements is referred to in ISO 15930 as a compound entity.

A variety of data formats and structures are used for the creation of this type of material, but with 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 exchange of raster-based data using the TIFF/IT file format is defined in ISO 12639. The subject of ISO 15930 is a format for the exchange of object-based data where individual objects can be in either vector or raster data structures.

The various parts of ISO 15930 define a number of conformance levels intended to address different requirements; all define data formats and their usage to permit the predictable dissemination of a compound entity to one or more locations. These goals are accomplished by defining a specific use of the publicly available Adobe Portable Document Format (PDF). In order to achieve a level of exchange that avoids any ambiguity in interpretation of the file, a limited set of PDF objects that are permitted to be used is identified and restrictions to the use, or form of use, of those objects, and/or keys within those objects are added.

In some environments, the data exchange needs to be in a form ready for final print reproduction, by transfer of a single file. This file contains all the content information necessary to process and render the document, as intended by the sender, coded inside a single PDF file. No other files, neither external files nor internally embedded files, are required or permitted. This exchange requires no prior knowledge of the sending and receiving environments and is sometimes referred to as “complete” or “blind” exchange. It is platform-independent and transport-independent. Whereas many production workflows benefit from the exchange of complete material, with all elements present, there are circumstances when this is not appropriate. In certain workflows, some or all of the referenced elements might be more logically present at the receiving site, or might be exchanged at a different time. These include high-resolution contone-image files, line-art files, ICC profiles, etc. These exchanges will generally require prior agreement between sender and receiver.

In some environments the exchange has to be restricted to CMYK (and spot colour) data, whilst in others it is more appropriate to convey it as colour-managed, CMYK, gray, RGB, and/or spot colour, or to use alternative process colour models.

Several new versions of the PDF specification have been issued since the publication of ISO 15930-1 in 2001. More recent parts of ISO 15930 expand on and extend earlier parts by reference to later versions of the PDF specification.

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Table 1 summarizes the conformance levels defined in the various parts of ISO 15930.

Table 1 — PDF/X conformance levels

Conformance level	Part of ISO 15930	Complete exchange	Colour-managed data permitted	Print characterization spaces supported	PDF version
PDF/X-1:2001	1	Yes	No	CMYK	1.3
PDF/X-1a:2001	1	Yes	No	CMYK	1.3
PDF/X-1a:2003	4	Yes	No	CMYK	1.4
PDF/X-2:2003	5	No	Yes	Gray, RGB, CMYK	1.4
PDF/X-3:2002	3	Yes	Yes	Gray, RGB, CMYK	1.3
PDF/X-3:2003	6	Yes	Yes	Gray, RGB, CMYK	1.4
PDF/X-4	7	Yes	Yes	Gray, RGB, CMYK	1.6
PDF/X-4p	7	No	Yes	Gray, RGB, CMYK	1.6
PDF/X-5g	8	No	Yes	Gray, RGB, CMYK	1.6
PDF/X-5n	8	No	Yes	n-colorant	1.6
PDF/X-5pg	8	No	Yes	Gray, RGB, CMYK	1.6

This part of ISO 15930 complements the other parts by defining a data format and its usage to permit the predictable dissemination of a compound entity to one or more locations, as colour-managed data, CMYK data, and/or spot colour data, by transfer of a file with some elements not included, but with provision for unique identification. An exchange identified by this part of ISO 15930 might require communication between sender and receiver to select the mechanism by which elements not included can be identified.

This part of ISO 15930 specifies PDF/X-5 conformance levels, which can be seen as expansions and extensions of the PDF/X-4 and PDF/X-4p conformance levels defined in ISO 15930-7, in that it allows the use of an n-colorant print characterization, and allows some data necessary for final printing to be supplied externally to the main file being exchanged, as follows.

— PDF/X-4 requires all raster and vector data to be imaged on the final print to be included within the single file being exchanged; PDF/X-5 allows such data to be held in external files.

  This allows the use of workflows similar to those using Open Prepress Interchange (OPI) comments in PostScript, or OPI objects in baseline PDF. These can have value in reducing the demands on design applications and the computers that they are used on, by allowing designers to work with low-resolution versions of images. They also enable parallel processing of work on an image or other graphic, and the page onto which it will be placed. In a publication or newsprint workflow, they allow advertising and editorial submissions to be composited together late in the workflow, without requiring that files submitted by third parties be amended in any way before the final prepress processes.

— PDF/X-4 is restricted to preparation for a gray, RGB or CMYK print characterization. PDF/X-5 enables the use of n-colorant print characterizations, using colorant sets that differ from or expand on gray, RGB or CMYK. The technical mechanism by which this is achieved requires that the ICC profile for the print characterization be external to the exchanged file.

In all cases, this part of ISO 15930 places restrictions on the external data, and requirements for metadata within the exchanged file that provide for an unambiguous determination as to whether the external data has been correctly associated with the PDF/X-5 file during processing after the exchange.

These differences from PDF/X-4 provide benefit in a variety of different sets of circumstances. Three conformance levels are therefore defined in this part of ISO 15930, as follows.

— PDF/X-5g External graphical content.

— PDF/X-5n External output intent ICC profiles for n-colorant print characterizations.

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— PDF/X-5pg External graphical content and external output intent ICC profiles describing a characterized printing condition using a gray, RGB or CMYK process colour model. This conformance level makes use of mechanisms defined in the PDF/X-4p conformance level specified in ISO 15930-7.

No conformance level defining the use of n-colorant printing conditions in combination with external graphical content is defined.

Thus, a file that requires external ICC profiles for use in the output intent, and external content data to be identified is a “PDF/X-5pg file”. A reader capable of processing a file that requires compositing with external content data, but that does not have the capability of processing a file with an external ICC profile, would be referred to as a “PDF/X-5g reader”.

It is anticipated that a variety of products will be developed based on PDF/X, such as readers (including viewers) and writers of PDF/X files, and products that offer combinations of these features. 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.

Due consideration needs to be given to the increased potential for issues requiring technical discussion between file submitters and receivers when determining whether to use any of the PDF/X-5 conformance levels in preference to PDF/X-4. In addition, it is likely that a larger proportion of receiving sites will be capable of accepting and correctly processing PDF/X-4 files. PDF/X-4 is preferred to any of the PDF/X-5 conformance levels where there is no significant benefit in the use of the latter.

This part of ISO 15930 does not define a reader that can read all PDF/X-5 files. Rather, each conforming reader is required to support at least one of the conformance levels listed above, and the documentation provided for each such reader needs to identify which conformance levels that reader is capable of supporting. A reader is required to read and appropriately process all files conforming to the conformance level(s) that it supports, when used within the parameters for the exchange agreed between the sender and receiver.

All parts of ISO 15930 define requirements and restrictions on the process of rendering PDF/X files for viewing and print, in addition to the requirements and restrictions of elements and structures within the files themselves. In some circumstances it might be appropriate to render files without rigid adherence to the provisions of this part of ISO 15930, but it is important to be aware that such renderings do not conform to PDF/X.

Although re-purposing of data is not a primary consideration or requirement of this part of ISO 15930, maximum flexibility will be maintained so that future requirements for re-purposing can be accommodated.

Users of this part of ISO 15930 are cautioned that they are expected to be familiar with the documents listed as normative references and the terms used within those documents. This part of ISO 15930, like all of the other parts, prescribes specific uses of, and limitations on the use of, the *PDF Reference* and its associated supporting documents.

An ongoing series of Application Notes (see Reference [3]) is maintained for the guidance of developers and users of the PDF/X family of standards. These application notes, and other documents relevant to PDF/X, are available from NPES, The Association for Suppliers of Printing, Publishing and Converting Technologies, in the NPES Standards Workroom at <http://www.npes.org/standards/toolspdfx.html>.

A number of other International Standards, defining focussed subsets of the portable document format in areas other than the graphic arts, are either published or under development, including PDF/A (see Reference [6]). Where possible, PDF/X has been designed to allow a single file to comply both with PDF/X and with these other conformance levels.

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