

**ANSI CGATS 15930-1:2004(2017)**  
(Identical to ISO 15930-1:2001)

AMERICAN NATIONAL STANDARD

# Graphic technology — Prepress digital data exchange — Use of PDF —

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

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## Foreword

ANSI CGATS/ISO 15930-1 is an identical adoption of ISO 15930-1:2001. ISO 15930-1 was prepared by ISO Technical Committee 130, *Graphic technology*, with the support of the ANSI Committee for Graphic Arts Technologies Standards (CGATS).

Minor edits have been made to this standard to prepare it as an ANSI CGATS standard. No technical changes have been made.

The CGATS consensus body approved the national adoption of ISO 15930-1 for issuance as CGATS/ISO 15930-1 in accordance with the *ANSI Procedures for the National Adoption of ISO and IEC Standards as American National Standards* and the CGATS Operating Procedures.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. Neither ISO, ANSI nor CGATS shall be held responsible for identifying any or all such patent rights.

CGATS/ISO 15930 consists of the following parts under the general title *Graphic technology — Prepress digital data exchange — Use of 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)*

NOTE: CGATS/ISO 15930-1 (PDF/X-1a) is maintained as a standard for legacy PDF workflows in which neither transparency nor color management are required. PDF/X-1a has been superseded by CGATS/ISO 15930-7 (PDF/X-4) for current, reliable PDF print publishing workflows.

## Introduction

CGATS/ISO 15930 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 CGATS/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 may take place at different locations. Some of these elements may also be routed to multiple sites for incorporation into other documents. Each of these elements is referred to in CGATS/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 CGATS 12639. The subject of CGATS/ISO 15930 is a format for the exchange of object-based data where individual objects may be in either vector or raster data structures.

This part of CGATS/ISO 15930 defines a data format and its usage to permit the predictable dissemination of a compound entity to one or more locations as CMYK data, in a form ready for final print reproduction, by transfer of a single file. This file must contain all the content information necessary to process and render the document, as intended by the sender. This exchange requires no prior knowledge of the sending and receiving environments and is sometimes referred to as "blind" exchange. It is platform and transport independent.

These goals are accomplished by defining a specific use of the publicly available *Adobe Portable Document Format* as specified in Version 1.3. In order to achieve a level of exchange that avoids any ambiguity in interpretation of the file, it identifies a limited set of PDF objects that may be used and adds restrictions to the use, or form of use, of those objects, and/or keys within those objects. It includes two compliance levels, PDF/X-1 and PDF/X-1a, that differ only in their allowed use of OPI references, and encryption which are allowed in PDF/X-1 but not in PDF/X-1a.

Whereas PDF/X-1 and PDF/X-1a specify the exchange of complete material, primarily as CMYK data, with all elements present, there are occasions when this is not appropriate. In certain workflows some or all of the referenced elements may be more logically present at the receiving site, or may be exchanged at a different time. These include fonts, high-resolution contone image files, or line art files. These exchanges will generally require prior agreement between sender and receiver. Further, colour management capabilities may allow elements to be exchanged more expeditiously in colour spaces other than CMYK. The requirements for such situations are addressed in later parts of CGATS/ISO 15930.

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

It is anticipated that a variety of products will be developed based on PDF/X-1, 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. However, it is important to note that a conforming reader must be able to read and appropriately process all files conforming to a specified conformance level.

The PDF/X-1 conformance level of this part of CGATS/ISO 15930 is generally similar to ANSI CGATS.12/1-1999, *Graphic technology — Prepress digital data exchange — Use of PDF for composite data — Part 1: Complete exchange (PDF/X-1)*.

ANSI CGATS 12/1 is based on *Portable Document Format Reference Manual* Version 1.2 as extended by Adobe Technical Note #5188. This part of CGATS/ISO 15930 is based on the *Adobe Portable Document Format* Version 1.3.

Users are cautioned that there are currently three different conformance levels that may be associated with PDF/X readers and writers. Two of these are generally referred to as PDF/X-1, and are those compatible with ANSI CGATS.12/1-1999 and the PDF/X-1 compatibility level of this part of CGATS/ISO 15930. It is recommended that these be referred to as PDF/X-1:1999 and PDF/X-1:2001, respectively. Further, this part of CGATS/ISO 15930 makes provision for a second conformance level that does not allow OPI references or encryption. This should be referred to as PDF/X-1a:2001. While a PDF/X-1:2001 reader should accept and properly read files conforming to both PDF/X-1:2001 and PDF/X-1a:2001 conformance levels, readers meeting the other two conformance levels should not be expected to properly read files outside of their own conformance level.

An ongoing series of Application Notes [1] is maintained for the guidance of developers and users of the CGATS PDF/X family of standards. They 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/tools.html>.

Attention is drawn to the fact that it is claimed that compliance with this part of CGATS/ISO 15930 may involve the use of a patent concerning data encryption (clause 6.17). Neither ISO, ANSI nor CGATS take a position concerning the evidence, validity and scope of this patent right. The holder of this patent right has assured CGATS that they are willing to negotiate licenses under reasonable and non-discriminatory terms and conditions with applicants throughout the world. Information may be obtained from: RSA Data Security, Inc., 100 Marine Parkway, Redwood City, CA 94065-1031, USA. Attention is also drawn to the possibility that some of the elements of this part of CGATS/ISO 15930 may be the subject of patent rights other than those identified above. Neither ANSI nor CGATS shall be held responsible for identifying any or all such patent rights.

# Graphic technology — Prepress digital data exchange — Use of PDF —

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

### 1 Scope

This part of CGATS/ISO 15930 specifies the methods for the use of the Portable Document Format (PDF) for the dissemination of compound CMYK digital data, in a single exchange, that is complete and ready for final print reproduction.

### 2 Normative references

The following normative documents contain provisions that, through reference in this text, constitute provisions of this part of CGATS/ISO 15930. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of CGATS 15930 are encouraged to investigate the possibility of applying the most recent editions of the normative documents 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.

CGATS/ISO 12639, *Graphic technology — Prepress digital data exchange — Tag image file format for image technology (TIFF/IT)*

ANSI/CGATS.12/1-1999, *Graphic technology — Prepress digital data exchange- Use of PDF for composite data — Part 1: Complete exchange (PDF/X-1)*

ICC.1:1998-09, *File Format for Color Profiles*, International Color Consortium

*Adobe Portable Document Format*, version 1.3, 2<sup>nd</sup> Ed., Adobe Systems Incorporated, Dated July 2000, ISBN 0-201-61588-6

Adobe Technical Note #5002 — *Encapsulated PostScript File Format Specification* — Version 3.0, 1 May 1992, Adobe Systems Incorporated

Adobe Technical Note #5044 — *Color Separation Conventions for PostScript Language Programs*, 12 February 1996, Adobe Systems Incorporated

Adobe Technical Note #5413 — *Recording Output Intentions for Color Critical Workflows*, 22 January 2001, Adobe Systems Incorporated

*Desktop Color Separation Specification 2.0*, June 1993, revised May 1995, Quark Inc.

*Draft TIFF Technical Note #2*, 17 March 95, Tom Lane, the Independent JPEG Group

*PostScript Language Reference Manual*, third edition, 1999, Adobe Systems Incorporated, ISBN 0-201-37922-8

*TIFF, Revision 6.0*, June 3, 1992, Adobe Systems Incorporated