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Graphic technology — Variable data exchange —

Part 3: Using PDF/X-6 (PDF/VT-3)

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 130, *Graphic technology*.

A list of all parts in the ISO 16612 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

This document defines the PDF/VT-3 document format which specifies methods for the use of the Portable Document Format (PDF) for the definition and exchange of all content elements and supporting metadata necessary for printing tasks involving variable or transactional document content. It allows the specification of document structure, document layout, content data, and interaction of graphical elements in a graphics model that supports transparency.

PDF/VT is designed to enable variable document printing (VDP) in a variety of environments from desktop printers to digital production presses, including hybrid workflows involving both conventional and digital printing. These capabilities are used in the creation of one-to-one customer communication print applications including direct marketing documents, transactional documents, and trans-promotional documents, as well as in labels, packaging and industrial print.

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, but there is an increasing need for predictable connectivity between the two.

The primary focus of PDF/VT is on the exchange of content between businesses or within an integrated environment that produces variable document printing. It is intended to be workflow-architecture-neutral. PDF/VT itself has no provision for encoding workflow or device-specific control information. The aspects of device control, resource, and production management are outside the scope of this document.

PDF/VT does, however, provide a print product metadata framework that may be used to embed workflow control data within the PDF/VT-3 file, as for example, product intent in a format specified in ISO 21812-1, or production requirements at a later stage in the workflow in the Job Definition Format (JDF) or the XML Job Definition Format (XJDF). The job ticket is expected to define the product or production requirements and draw upon PDF/VT for its content and metadata resources.

This document, which defines PDF/VT-3, includes support for the PDF 2.0 imaging model. It builds on the PDF/X-6 standard (defined in ISO 15930-9), which, in turn, references PDF 2.0 (see ISO 32000-2).

Like ISO 16612-2, this document supports the fundamental requirements of portability, device and workflow independence and guaranteed communication of the intended colour reproduction. The native constructs within PDF allow products to provide functionality equivalent to that of PPML workflows as used in ISO 16612-1, but using a single homogeneous format that adds support for a graphics model that supports transparency, as well as up-to-date structure tagging in support of repurposing of data where required.

PDF/VT supports the use of graphics object definitions as a method of specifying graphical content data only once in a PDF/VT-3 file independent of the number of times it is referenced in the file. This approach serves to reduce the file size of a PDF/VT-3 file and allows implementers of conforming processors to employ various processing optimization strategies. Within the context of PDF/X-6, these graphics objects are specified as image, form and transparency group XObjects.

While there is nothing in this document that enforces the creation of PDF/VT-3 files that make efficient use of XObjects, doing so is strongly recommended.

XObjects referenced multiple times from various content streams can be tagged with hint information that aids the conforming processor in its determination of XObject reuse. These hints can include an explicit lifetime scope to indicate the context within which the XObject is known to be referenced multiple times, such as within the current file, or that it is explicitly only referenced once.

An XObject can also be identified as an encapsulated XObject if its definition has a limited and well-defined interaction with the current graphics state when invoked. This explicit hint serves to assist a conforming processor in its optimization strategy.

A PDF/VT-3 file based on PDF/X-6 requires all resources necessary for proper interpretation of the PDF data to be included within the PDF file. This enables an exchange of content where no additional

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technical information is required to be communicated between sender and receiver to describe the appearance of page content.

A PDF/VT-3 file based on PDF/X-6p or PDF/X-6n does not necessarily include all ICC profiles required for correct rendering for visualization or print. It isn't necessarily suitable for an exchange without technical discussions between sender and receiver.

Application notes for print-related PDF subsets are available to provide assistance to developers and users and can be found at https://printtechnologies.org/programs/standards-workroom/tools-best-practices/.

A processor conforming to this document is not required to be capable of processing documents conforming to ISO 16612-1, which is based on the use of PPML. Neither is it required to be capable of processing documents conforming to ISO 16612-2, although it is anticipated that many creators of processors may choose to do so.

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Graphic technology — Variable data exchange —

Part 3: Using PDF/X-6 (PDF/VT-3)

1 Scope

This document defines the PDF/VT-3 document format and methods to enable reliable document exchange for variable data and transactional (VT) printing. It uses the Portable Document Format (PDF) Version 2.0, as restricted by PDF/X-6, for the representation of such documents. It allows the specification of document structure and layout, content data, and interaction of graphics objects in a graphics model that supports transparency and both device-dependent and device-independent colour spaces. All elements are either included or provision is made for unique identification of externally supplied ICC profiles.

PDF/VT-3 is designed to enable variable data and transactional printing in a variety of environments from desktop printers to digital production presses. This includes hybrid workflows involving both conventional and digital printing.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 15930-9, *Graphic technology — Prepress digital data exchange using PDF — Part 9: Complete exchange of printing data (PDF/X-6) and partial exchange of printing data with external profile reference (PDF/X-6p and PDF/X-6n) using PDF 2.0*

ISO 32000-2:—[1)], *Document management — Portable document format — Part 2: PDF 2.0*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
encapsulated XObject
XObject having a well-defined limited interaction with the current graphics state at the point of invocation

3.2
PDF/VT-3
document format and methods which enable reliable document exchange for variable data and transactional printing

1) Under revision. Stage at the date of publication: ISO/FDIS 32000-2:2020.

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3.3
PDF/VT-3 file
PDF 2.0 file conforming to the requirements of this document

3.4
record
collection of information relevant to pages that are to be processed together

Note 1 to entry: A common example of a record is the information about a single recipient for which a collection of pages was generated.

4 Notations

PDF operators, PDF keywords, the names of keys in PDF dictionaries, and other predefined names are written in a bold font; for example, the key **I**.

Operands of PDF operators or values of dictionary keys are written in an italic font; for example, the *true* value for the key **I**.

5 Conforming files and equipment

This document specifies the use of the PDF file format for the exchange of digital data representing a compound entity.

This document is based on ISO 15930-9, and defines one conformance level as follows.

— *PDF/VT-3* requires all compound entities, metadata and resources used in representing graphical content to adhere to the requirements of any of the conformance levels specified in ISO 15930-9.

PDF/VT conformance is identified in a PDF/VT-3 file by use of the **pdfvtid:GTS_PDFVTVersion** property as specified in 6.3. Neither the version number in the header of a PDF file nor the value of the **Version** key in the **Catalog** of a PDF file shall be used in determining whether a file is in accordance with this document.

A PDF/VT-3 file shall conform to all requirements set out in Clause 6.

A PDF/VT-3 conforming writer is an application that is able to write PDF/VT-3 files in accordance with the conformance requirements specified in Clause 6.

A PDF/VT-3 conforming processor is an application or system that is able to read and appropriately process all PDF/VT-3 files in accordance with the conformance requirements specified in Clause 6.

NOTE There is no requirement in this document that a PDF/VT-3 conforming processor be able to read and process files conforming to ISO 16612-2, although it is anticipated that many developers of PDF/VT-3 processors will choose to make them do so.

All conforming processors shall read and appropriately process the **DPartRoot** dictionary and its **DPart** sub-dictionaries defined in 6.4 and 6.5.

All conforming PDF/VT-3 processors that update a PDF/VT-3 file, shall write a new value for both the **pdfvtid:GTS_PDFVTModDate** and the **xmp:ModifyDate** properties when they do so.

To the extent that ISO 15930-9 and this document permit more than one rendering of a PDF/VT-3 file, a conforming processor may use a job ticket or metadata information to further restrict the rendering of the file.

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