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Document management — Portable document format — RichMedia annotations conforming to the ISO 10303-242 (STEP AP 242) specification

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National foreword

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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 171, *Document management applications*, Subcommittee SC 2, *Document file formats, EDMS systems and authenticity of information*.

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

0.1 PDF: ISO 32000

ISO 32000-2 is able to embed 3D CAD models as either 3D or RichMedia annotations. 3D node, stream and view dictionaries can only reference data saved in either the ECMA-363, Universal 3D (U3D) file format or ISO 14739-1, Product Representation Compact (PRC) file format. This often requires the authoritative CAD data to be translated to either U3D or PRC solely to embed the data in a PDF file.

0.2 STEP: ISO 10303

STEP is a set of specifications and methods that enable the exchange and sharing of enterprise engineering information. It is an international standard (ISO 10303) with many *application protocols* (APs) that have a common core data definition. For example, AP 203, AP 214, and AP 242 use the same definitions for three-dimensional geometry, assembly data and basic product information. ISO 10303-42 and ISO 10303-46 are the key standard parts for geometry representation and visual presentation. Most 3D design, engineering and manufacturing software can read and/or write data stored in the STEP format.

The latest AP of STEP, AP 242, was developed to converge the AP 203 and AP 214 standards. STEP AP 242 contains all the functionality covered by the AP 203 and AP 214. In addition, it adds new functionality including 3D tessellated geometry, composites and 3D product and manufacturing information (PMI). The major technical impact of the STEP AP 242 standard covers the areas of:

— model based definition (MBD);

— long term archiving (LTA);

— engineering data exchange including composites;

— manufacturing data exchange including PMI.

0.3 Extending PDF to support STEP

The purpose of this document is to extend the PDF specification to allow RichMedia annotations to include 3D assets saved in the STEP AP 242 (ISO 10303-242) format.

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Document management — Portable document format — RichMedia annotations conforming to the ISO 10303-242 (STEP AP 242) specification

1 Scope

This document specifies how to extend the ISO 32000-2 specification by adding the ISO 10303-242 (STEP AP 242) format as a valid format for 3D assets contained in a RichMedia annotation. It is intended for:

— developers of software that creates PDF files (PDF writers);

— software that reads existing PDF files and usually interprets their contents for display (PDF readers);

— software that reads and displays PDF content and interacts with the computer users to possibly modify and save the PDF file (PDF processors);

— PDF products that read and/or write PDF files for a variety of other purposes (PDF processors).

NOTE PDF writers and PDF readers are more specialised classifications of PDF processors.

This document does not specify the following:

— specific processes for converting paper or electronic documents to the PDF file format;

— specific technical design, user interface implementation, or operational details of rendering;

— specific physical methods of storing these documents such as media and storage conditions;

— methods for validating the conformance of PDF files or PDF processors;

— required computer hardware and/or operating system.

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 10303-242, *Industrial automation systems and integration — Product data representation and exchange — Part 242: Application protocol: Managed model-based 3D engineering*

ISO 32000-2:2020, *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 terminology databases for use in standardization at the following addresses:

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

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

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