
**Information technology — Coding of
audio-visual objects —**

**Part 27:
3D Graphics conformance**

*Technologies de l'information — Codage des objets audiovisuels —
Partie 27: Conformité aux graphiques 3D*

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Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
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Published in Switzerland

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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of the joint technical committee is to prepare International Standards. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national 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 and IEC shall not be held responsible for identifying any or all such patent rights.

ISO/IEC 14496-27 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 29, *Coding of audio, picture, multimedia and hypermedia information*.

ISO/IEC 14496 consists of the following parts, under the general title *Information technology — Coding of audio-visual objects*:

- *Part 1: Systems*
- *Part 2: Visual*
- *Part 3: Audio*
- *Part 4: Conformance testing*
- *Part 5: Reference software*
- *Part 6: Delivery Multimedia Integration Framework (DMIF)*
- *Part 7: Optimized reference software for coding of audio-visual objects*
- *Part 8: Carriage of ISO/IEC 14496 contents over IP networks*
- *Part 9: Reference hardware description*
- *Part 10: Advanced Video Coding*
- *Part 11: Scene description and application engine*
- *Part 12: ISO base media file format*
- *Part 13: Intellectual Property Management and Protection (IPMP) extensions*
- *Part 14: MP4 file format*

- *Part 15: Advanced Video Coding (AVC) file format*
- *Part 16: Animation Framework eXtension (AFX)*
- *Part 17: Streaming text format*
- *Part 18: Font compression and streaming*
- *Part 19: Synthesized texture stream*
- *Part 20: Lightweight Application Scene Representation (LAsSeR) and Simple Aggregation Format (SAF)*
- *Part 21: MPEG-4 Graphics Framework eXtensions (GFX)*
- *Part 22: Open Font Format*
- *Part 23: Symbolic Music Representation*
- *Part 24: Audio and systems interaction*
- *Part 25: 3D Graphics Compression Model*
- *Part 27: 3D Graphics conformance*

The following part is under preparation:

- *Part 26: Audio conformance*

Introduction

This part of ISO/IEC 14496 (MPEG-4) contains the description of all conformance bitstreams developed for the synthetic 3D graphics tools published in the following four other parts of MPEG-4: ISO/IEC 14496-11:2005, ISO/IEC 14496-16:2006, ISO/IEC 14496-21:2006 and ISO/IEC 14496-25:2009. This part of ISO/IEC 14496 also describes how tests can be designed to verify whether compressed data (i.e. bitstreams) and decoders meet the requirements specified for synthetic 3D graphics tools by those four International Standards.

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Information technology — Coding of audio-visual objects —

Part 27:

3D Graphics conformance

1 Scope

This part of ISO/IEC 14496 specifies how tests can be designed to verify whether compressed data (i.e. bitstreams) and decoders meet the requirements for the synthetic 3D graphics tools specified in ISO/IEC 14496-11:2005, ISO/IEC 14496-16:2006, ISO/IEC 14496-21:2006, and ISO/IEC 14496-25:2009.

This part of ISO/IEC 14496 does not specifically address encoders. As far as synthetic 3D graphics are concerned, an encoder can be said to be an ISO/IEC 14496 encoder if it generates compressed data compliant with the syntactic and semantic bitstream payload requirements specified in ISO/IEC 14496-11, ISO/IEC 14496-16, ISO/IEC 14496-21, and ISO/IEC 14496-25.

Characteristics of coded bitstreams and decoders are defined for ISO/IEC 14496-11, ISO/IEC 14496-16, ISO/IEC 14496-21, and ISO/IEC 14496-25. The characteristics of a bitstream define the subset of the standard that is exploited in the bitstream. Examples are the applied values or range of the bitrate. Decoder characteristics define the properties and capabilities of the applied decoding process. An example of a property is the applied arithmetic accuracy. The capabilities of a decoder specify which coded bitstreams the decoder can decode and reconstruct, by defining the subset of the standard that may be exploited in decodable bitstreams. A bitstream can be decoded by a decoder if the characteristics of the coded bitstream are within the subset of the normative references.

This part of ISO/IEC 14496 describes procedures for testing conformance of compressed data and decoders to the requirements defined in ISO/IEC 14496-11, ISO/IEC 14496-16, ISO/IEC 14496-21, and ISO/IEC 14496-25; given the set of characteristics claimed, the requirements that shall be met are fully determined by these parts.

This part of ISO/IEC 14496 summarizes the requirements, cross references them to characteristics, and defines how conformance with them can be tested. Guidelines are given on constructing tests to verify decoder conformance.

2 Normative references

The following referenced documents are indispensable for the application 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/IEC 14772-1:1997, *Information technology — Computer graphics and image processing — The Virtual Reality Modeling Language — Part 1: Functional specification and UTF-8 encoding*

ISO/IEC 14496-1:2004, *Information technology — Coding of audio-visual objects — Part 1: Systems*

ISO/IEC 14496-5:2001, *Information technology — Coding of audio-visual objects — Part 5: Reference software*

ISO/IEC 14496-11:2005, *Information technology — Coding of audio-visual objects — Part 11: Scene description and application engine*

ISO/IEC 14496-16:2006, *Information technology — Coding of audio-visual objects — Part 16: Animation Framework eXtension (AFX)*

ISO/IEC 14496-21:2006, *Information technology — Coding of audio-visual objects — Part 21: MPEG-J Graphics Framework eXtensions (GFX)*

ISO/IEC 14496-25:2009, *Information technology — Coding of audio-visual objects — Part 25: 3D Graphics Compression Model*

ISO/IEC 15444-1:2004, *Information technology — JPEG 2000 image coding system: Core coding system*

3 Terms definitions, abbreviations and symbols

For the purposes of this document, the terms, definitions, abbreviated terms and symbols given in ISO/IEC 14496-1, ISO/IEC 14496-5, ISO/IEC 14496-11, ISO/IEC 14496-16, ISO/IEC 14496-21, ISO/IEC 14496-25, ISO/IEC 14772-1 and ISO/IEC 15444-1 apply.

4 Tools from ISO/IEC 14496-11, Scene description and application engine, and ISO/IEC 14496-16, Animation Framework eXtension (AFX)

4.1 Scene graph nodes

4.1.1 Bitstream conformance

4.1.1.1 Conformance Requirements

BIFS streams shall comply with the specifications of Clause 8 of ISO/IEC 14496-11:2005 and Clause 4 of ISO/IEC 14496-16:2006.

4.1.1.2 Measurement procedure

The syntax of the BIFS stream shall meet the requirements of Clause 8 of ISO/IEC 14496-11:2005 and Clause 4 of ISO/IEC 14496-16:2006.

4.1.1.3 Tolerance

There is no tolerance for bitstream syntax checking. The diagnosis is pass or fail.

4.1.2 Terminal conformance

4.1.2.1 Conformance requirements

The terminal shall comply with the specifications of Clause 8 of ISO/IEC 14496-11:2005 and Clause 4 of ISO/IEC 14496-16:2006.

4.1.2.2 Measurement procedure

The terminal shall decode successfully all the test suites listed below. A test suite is a suite of material and measurement algorithms and associated reference algorithms.

4.1.2.2.1 Feature list

The test suite shall verify the features in Table 1. For nodes, the following shall be tested:

- Presence in the scene tree after decoding.
- Appropriate value of the fields after decoding.