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**Information technology — MPEG
systems technologies —**

**Part 17:
Carriage of uncompressed video
and images in ISO base media file
format**

*Technologies de l'information — Technologies des systèmes
MPEG —*

*Partie 17: Transport de vidéos et images non compressées dans le
format ISO de base pour les fichiers médias*



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Contents

Page

Foreword	iv
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Uncompressed video and image formats	2
4.1 Overview	2
4.2 Storage in media tracks	3
4.3 Storage in image items	3
5 Uncompressed frame description	4
5.1 Component Definition	4
5.1.1 Definition	4
5.1.2 Syntax	6
5.1.3 Semantics	6
5.2 Uncompressed Frame Configuration	6
5.2.1 Definition	6
5.2.2 Syntax	21
5.2.3 Semantics	21
5.2.4 Examples	22
5.3 Profiles for uncompressed frame configurations	28
5.3.1 Overview	28
5.3.2 Predefined configurations	29
5.4 MIME type sub-parameters	30
6 Component description extensions	31
6.1 Extensions for uncompressed video and uncompressed images	31
6.1.1 Overview	31
6.1.2 Component Palette configuration	31
6.1.3 Component Pattern Definition	32
6.1.4 Component Reference Level	33
6.1.5 Polarization Pattern Definition	34
6.1.6 Sensor Non-Uniformity Correction	36
6.1.7 Sensor Bad Pixels Map	37
6.1.8 Chroma Location	38
6.1.9 Frame Packing Information	39
6.1.10 Disparity Information	39
6.1.11 Depth Mapping Information	40
6.2 Sample group descriptions	40
6.2.1 Field Interlace Type	40
6.3 Image Item properties	41
6.3.1 Field Interlace Property	41
7 Multiple tracks and items storage	42
7.1 Overview	42
7.2 Component video track group	42
7.3 Image tiling using ISOBMFF tracks and items	42
Bibliography	44

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.

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A list of all parts in the ISO/IEC 23001 series can be found on the ISO and IEC websites.

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Information technology — MPEG systems technologies —

Part 17:

Carriage of uncompressed video and images in ISO base media file format

1 Scope

This document specifies how uncompressed 2D image and video data is carried in files in the family of standards based on the ISO base media file format (ISO/IEC 14496-12). This includes but is not limited to monochromatic data, colour data, transparency (alpha) information and depth information.

The primary goal of this document is to allow exchange of uncompressed video and image data while relying on the information set provided by the ISO base media file format, such as timing, colour space and sample aspect ratio to specify the interpretation and/or display of video and image data.

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/IEC 14496-12, *Information technology — Coding of audio-visual objects — Part 12: ISO base media file format*

ISO/IEC 23008-12, *Information technology — High efficiency coding and media delivery in heterogeneous environments — Part 12: Image File Format*

IEEE 754-2008, *IEEE Standard for Floating-Point Arithmetic*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 14496-12 and the following 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/>

3.1

block

consecutive bytes within the sample data containing one or more component values for one or more pixels and possible padding

3.2

component

part of the image data representing a single channel (or dimension) of the image

Note 1 to entry: In this document, a component may describe visual information such as luminance or chroma, or other information usually not intended for direct display such as depth or transparency.

3.3

frame

two-dimensional rectangular array of pixels contained in the sample data

3.4

interleaving

ordering of pixel or component within the sample data

3.5

pixel

smallest element of an image, comprised of one or more components

3.6

row

horizontal line of pixels within a frame or a tile

3.7

sample data

payload of the media sample when the uncompressed frame is described by a media track, or payload of the item when the uncompressed frame is described by an image item

Note 1 to entry: Media sample as defined in ISO/IEC 14496-12.

Note 2 to entry: Image item as defined in ISO/IEC 23008-12.

3.8

tile

two-dimensional rectangular array of pixels within a frame

3.9

uncompressed frame

frame for which each value of each component is coded independently from any other component value in the same frame or any other frame

Note 1 to entry: In this document, the uncompressed term is used with some video formats applying sub-sampling of some components for the purpose of data reduction; however, data access to each individual component for such formats is still independent from other components or frames.

3.10

uncompressed image

single uncompressed frame stored as an image item

3.11

uncompressed video

sequence of one or more uncompressed frames

4 Uncompressed video and image formats

4.1 Overview

Uncompressed frames may be stored in ISO base media files as media samples of media tracks or as image items using a generic uncompressed video description defined in this document.

Media tracks, media samples and image items may be further described using the various tools defined in ISO/IEC 14496-12, such as sample group descriptions, *MetaBox*, metadata tracks and sample auxiliary information. User-defined components may be used to carry per-pixel specific information, either in the same sample or item as the described pixels or in a separate track or item.

The tools defined in ISO/IEC 14496-12 and ISO/IEC 23008-12 should be used whenever applicable, namely to specify pixel aspect ratio, colour information, clean aperture, content light level, mirror and rotate properties or track header matrix, etc.

An uncompressed video media sample or item consists of one uncompressed frame. Each uncompressed frame is organized as a set of one or more rectangular, non-overlapping and contiguous (without holes) areas called tiles.

ISOBMF allows constructing files referring to external data. This enables building ISOBMF files describing existing uncompressed image or video files without having to copy the media data, simplifying integration into existing workflows.

4.2 Storage in media tracks

Uncompressed video tracks compliant to this document are tracks compliant to ISO/IEC 14496-12 that use a `VisualSampleEntry` with `codingname` equal to 'uncv', hereafter called uncompressed video sample entry.

The uncompressed video sample entry shall contain

- one `UncompressedFrameConfigBox`;
- one `ComponentDefinitionBox` if the `UncompressedFrameConfigBox` version is not 1.

When both `UncompressedFrameConfigBox` and `ComponentDefinitionBox` are present in the sample entry, the `ComponentDefinitionBox` shall precede the `UncompressedFrameConfigBox`.

The `compressorname` field of an uncompressed video sample entry should be set to all 0 (empty string). The `depth` field of an uncompressed video sample entry shall be ignored and should be set to 0, the bit depth per component being indicated by the `UncompressedFrameConfigBox`.

The handler type associated with the track is usually 'vide', 'auxv' or 'pict' but derived specifications may introduce new handler types. The `width` and `height` fields of the sample entry documents the exact frame dimension, in pixels of any non-subsampled component, of any sample of the video stream that is described by this sample entry. Consequently, if the frame dimension changes within a video track, multiple sample entries shall be used.

The payload of an uncompressed video media sample consists of one uncompressed frame.

The size in bytes of an uncompressed video media sample shall be at least the size in bytes required to store all the components values documented by the uncompressed video configuration as defined in [subclause 5.2](#).

NOTE The sample data can be larger than the size in bytes required to store all the components values, typically to store information in the trailing data. How such additional bytes are handled by a file reader is out of scope of this document.

Each uncompressed video media sample shall be marked as a sync sample. As a consequence, the `SyncSampleBox`, `ShadowSyncSampleBox`, `CompositionOffsetBox` and `CompositionToDecodeBox` shall not be present in the track.

Media tracks containing only non-visual components should be marked as not present in the presentation, i.e. `track_in_movie` flag should not be set.

Media tracks containing user-defined components providing per-pixel information for pixels in another track should use a track reference of type 'cdsc' to the track they describe.

4.3 Storage in image items

An uncompressed image compliant to this document is an image item compliant to ISO/IEC 23008-12 with the `item_type` 'unci'.

An uncompressed image shall be associated with:

- an `UncompressedFrameConfigBox` essential item property, i.e., `essential` shall be equal to 1 for an `UncompressedFrameConfigBox` item property associated with an image item of type 'unci';
- a `ComponentDefinitionBox` essential item property if the `UncompressedFrameConfigBox` version is not 1;