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**Information technology — MPEG video  
technologies —**

**Part 5:  
Reconfigurable media coding  
conformance and reference software**

*Technologies de l'information — Technologies vidéo MPEG —*

*Partie 5: Conformité du codage média reconfigurable et logiciels de  
référence*



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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](http://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](http://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 on 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 the following URL: [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

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

This second edition cancels and replaces the first edition (ISO/IEC 23002-5:2013), of which it constitutes a minor revision. It incorporates ISO/IEC 23002-5:2013/Amd 1 and ISO/IEC 23002-5:2013/Amd 2.

The changes compared to the previous edition are as follows:

- The Scope is updated and [Annex A](#) is added to clarify the purpose and usage of the reference software.
- Reference software implementations from the incorporated amendments are newly included in the electronic attachment, available at <http://standards.iso.org/iso-iec/23002/-5/ed-2/en>.

A list of all parts in the ISO/IEC 23002 series can be found on the ISO website.

## Introduction

Two International Standards define the Reconfigurable Media Coding (RMC) framework: ISO/IEC 23001-4 and ISO/IEC 23002-4.

ISO/IEC 23001-4 defines the overall framework as well as the standard languages that are used to specify a codec configuration of an RMC decoder. The Abstract Decoder Model (ADM) is an executable description that uses the modular data flow computation model and constitutes the only necessary specification for defining a codec configuration.

ISO/IEC 23002-4 specifies, in the form of a unified library of video coding algorithms, the modular components called Functional Units (FU) that in given configurations build the ADM of some profile and levels of the current existing decoding standards.

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# Information technology — MPEG video technologies —

## Part 5:

# Reconfigurable media coding conformance and reference software

## 1 Scope

This document describes:

- what is meant by conformance of what is specified in ISO/IEC 23002-4,
- the structure of the reference software related to what is specified in ISO/IEC 23002-4.

Currently the following profiles are included in ISO/IEC 23002-4 and in this document as reference software:

- ISO/IEC 14496-2 Simple Profile,
- ISO/IEC 14496-10 Constrained Baseline Profile,
- ISO/IEC 14496-10 Progressive High Profile,
- ISO/IEC 14496-16 SC3DMC, and
- ISO/IEC 23008-2 Main Profile.

**NOTE** The reference software supports the decoding of bitstreams that conform to the Main Profile of ISO/IEC 23008-2, but does not support display-related features indicated in supplemental enhancement information (the support for which is a display capability that is outside the scope of ISO/IEC 23008-2).

## 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 14496-2, *Information technology — Coding of audio-visual objects — Part 2: Visual*

ISO/IEC 14496-4, *Information technology — Coding of audio-visual objects — Part 4: Conformance testing*

ISO/IEC 14496-10, *Information technology — Coding of audio-visual objects — Part 10: Advanced Video Coding*

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

ISO/IEC 23001-4, *Information technology — MPEG systems technologies — Part 4: Codec configuration representation*

ISO/IEC 23002-4, *Information technology — MPEG video technologies — Part 4: Video tool library*

### 3 Terms and definitions

For the purposes of this document, terms and definitions given in ISO/IEC 23001-4 and the following terms and definitions apply.

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

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

#### 3.1

##### **CBP**

##### **Constrained Baseline Profile**

profile of the advanced video coding standard defined in ISO/IEC 14496-10

#### 3.2

##### **PHP**

##### **Progressive High Profile**

profile of the advanced video coding standard defined in ISO/IEC 14496-10

#### 3.3

##### **RMC**

##### **Reconfigurable Media Coding**

framework defined with support for media coding standards at the tool level

#### 3.4

##### **SP**

##### **Simple Profile**

profile of the MPEG-4 Part 2 standard defined in ISO/IEC 14496-2

### 4 Conformance testing of ISO/IEC 23002-4 Media tool library

A decoder in RMC is specified as a network (i.e. configuration) of FUs instantiated from the Media tool library. The conformance testing of an instantiated RMC decoder shall undergo the same procedure established for testing conformance to a given standard.

Therefore, the conformance tests for the Media tool library and the standard configurations specified in ISO/IEC 23002-4 consist of giving as input to the instantiated RMC decoder configurations the corresponding set of conformance bitstreams provided in ISO/IEC 14496-4 and of verifying that the generated outputs result identical to the set of uncompressed video sequences decoded as specified in ISO/IEC 14496-4.

[Figure 1](#) illustrates the conformance concept and procedure. Functional units instantiated from the Media tool library specified in ISO/IEC 23002-4 and configured with the network configurations specified in ISO/IEC 23002-4 builds an ADM that decodes a bitstream and generates a video sequence that is compared to the one decoded by a reference software.



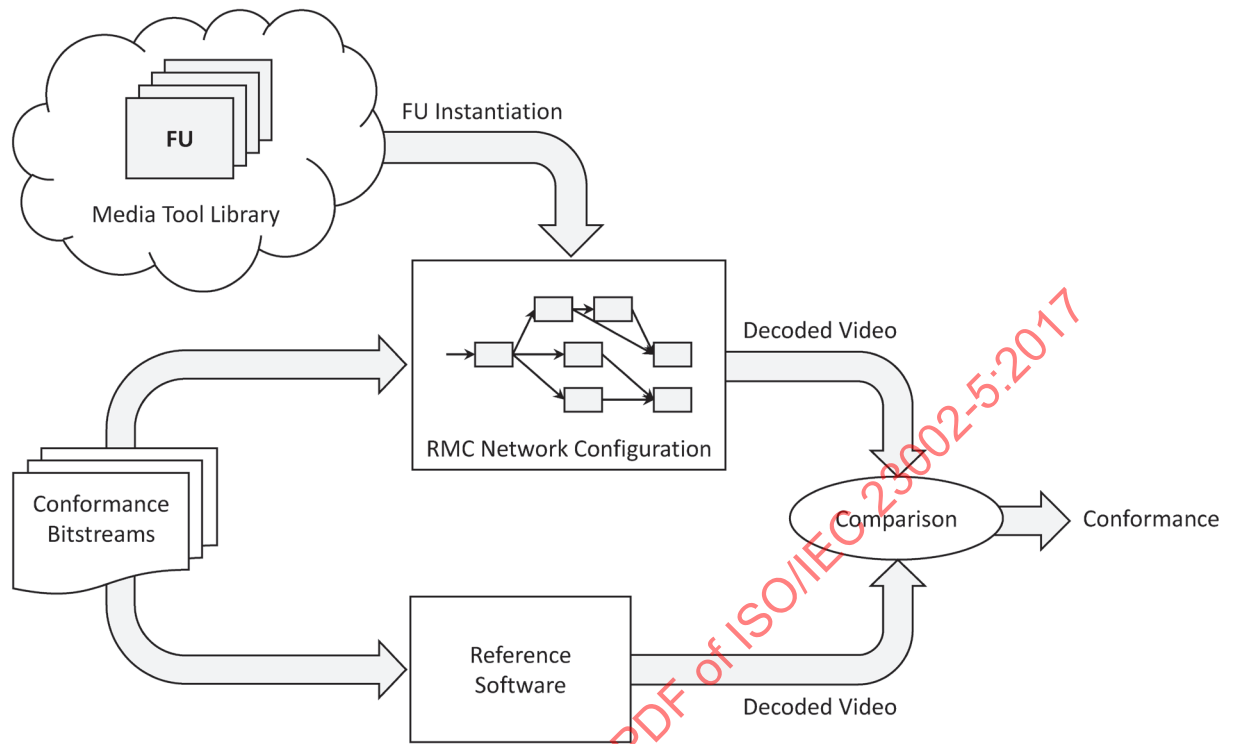


Figure 1 — Concept of RMC decoder level conformance testing

## 5 Conformance to ISO/IEC 14496-2 Simple Profile

The following conformance bitstreams, part of ISO/IEC 14496-4, have been used to verify the conformance of the RMC decoder configuration called:

— Top\_mpeg4\_part2\_SP\_decoder,

and specified in ISO/IEC 23002-4, to the standard ISO/IEC 14496-2 Simple Profile.

| MPEG-4 Part 2 Simple Profile bitstreams |
|-----------------------------------------|
| hit000.m4v                              |
| jvc000.m4v                              |
| san000.m4v                              |
| san001.m4v                              |
| hit001.m4v                              |
| hit002.m4v                              |
| hit003.m4v                              |
| hit004.m4v                              |
| hit005.m4v                              |
| hit006.m4v                              |
| hit007.m4v                              |

| <b>MPEG-4 Part 2 Simple Profile bitstreams</b> |
|------------------------------------------------|
| hit008.m4v                                     |
| hit009.m4v                                     |
| hit010.m4v                                     |
| hit011.m4v                                     |
| hit013.m4v                                     |
| hit014.m4v                                     |
| jvc001.m4v                                     |
| jvc002.m4v                                     |
| jvc003.m4v                                     |
| jvc004.m4v                                     |
| jvc005.m4v                                     |
| jvc007.m4v                                     |
| jvc008.m4v                                     |
| jvc009.m4v                                     |
| jvc010.m4v                                     |
| jvc011.m4v                                     |
| jvc012.m4v                                     |
| jvc013.m4v                                     |
| jvc014.m4v                                     |
| jvc015.m4v                                     |
| jvc016.m4v                                     |
| jvc017.m4v                                     |
| jvc018.m4v                                     |
| jvc019.m4v                                     |
| jvc020.m4v                                     |
| jvc021.m4v                                     |
| san002.m4v                                     |
| san003.m4v                                     |
| san004.m4v                                     |
| san005.m4v                                     |
| san006.m4v                                     |
| san007.m4v                                     |
| san009.m4v                                     |
| san010.m4v                                     |
| san011.m4v                                     |
| san012.m4v                                     |
| hit016.m4v                                     |
| hit017.m4v                                     |
| hit018.m4v                                     |
| hit019.m4v                                     |
| hit020.m4v                                     |
| hit021.m4v                                     |
| hit022.m4v                                     |
| hit023.m4v                                     |
| hit024.m4v                                     |

| <b>MPEG-4 Part 2 Simple Profile bitstreams</b> |
|------------------------------------------------|
| mat001.m4v                                     |
| mat004.m4v                                     |
| mat005.m4v                                     |
| mat006.m4v                                     |
| mat007.m4v                                     |
| mat008.m4v                                     |
| mat009.m4v                                     |
| mat010.m4v                                     |
| mat013.m4v                                     |
| mat014.m4v                                     |
| mat015.m4v                                     |
| mat016.m4v                                     |
| vcon-scs1.bits                                 |
| vcon-scs2.bits                                 |
| vcon-scs3.bits                                 |
| vcon-scs4.cmp                                  |
| vcon-scs5.cmp                                  |
| vcon-scs6.cmp                                  |
| vcon-scs7.cmp                                  |
| vcon-scs8.bits                                 |
| vcon-scs9.bits                                 |
| vcon-scs10.cmp                                 |
| vcon-scs11.cmp                                 |
| jvc013.m4v                                     |
| hit012.m4v                                     |
| san008.m4v                                     |
| san014.m4v                                     |
| jvc012.m4v                                     |
| san013.m4v                                     |
| san015.m4v                                     |
| san016.m4v                                     |
| san017.m4v                                     |
| san018.m4v                                     |
| san019.m4v                                     |
| san020.m4v                                     |

## 6 Conformance to ISO/IEC 14496-10 Constrained Baseline Profile

The following conformance bitstreams, part of ISO/IEC 14496-4 have been used to verify the conformance of the RMC decoder configurations called:

- Top\_mpeg4\_part10\_CBP\_decoder
- Top\_mpeg4\_part10\_PHP\_decoder

and specified in 23002-4, to ISO/IEC 14496-10 Constrained Baseline Profile (CBP).

NL sequences:

| AVC CBP conformance bitstreams |
|--------------------------------|
| NL1_Sony_D                     |
| SVA_NL1_B                      |
| NL2_Sony_H                     |
| SVA_NL2_E                      |

BA sequences:

| AVC CBP conformance bitstreams |
|--------------------------------|
| BA1_Sony_D                     |
| SVA_BA1_B                      |
| BA2_Sony_F                     |
| SVA_BA2_D                      |
| BA_MW_D                        |
| BANM_MW_D                      |
| BA1_FT_C                       |

MQ sequences:

| AVC CBP conformance bitstreams |
|--------------------------------|
| NLMQ1_JVC_C                    |
| NLMQ2_JVC_C                    |
| BAMQ1_JVC_C                    |
| BAMQ2_JVC_C                    |

SL sequences:

| AVC CBP conformance bitstreams |
|--------------------------------|
| SVA_Base_B                     |
| SVA_FM1_E                      |

SQ sequences:

| AVC CBP conformance bitstream |
|-------------------------------|
| BASQP1_Sony_C                 |

CI sequences:

| AVC CBP conformance bitstreams |
|--------------------------------|
| CI_MW_D                        |
| SVA_CL1_E                      |
| CI1_FT_B                       |

FC sequences:

| AVC CBP conformance bitstream |
|-------------------------------|
| CVFC1_Sony_C                  |

AUD sequences:

| AVC CBP conformance bitstream |
|-------------------------------|
| AUD_MW_E                      |

MIDR sequences:

| AVC CBP conformance bitstream |
|-------------------------------|
| MIDR_MW_D                     |

NRF sequences:

| AVC CBP conformance bitstream |
|-------------------------------|
| NRF_MW_E                      |

MPS sequences:

| AVC CBP conformance bitstream |
|-------------------------------|
| MPS_MW_A                      |

PCM sequences:

| AVC CBP conformance bitstream |
|-------------------------------|
| CVPCMNL1_SVA_C                |
| CVPCMNL2_SVA_C                |

MR sequences:

| AVC CBP conformance bitstreams |
|--------------------------------|
| MR1_BT_A                       |
| MR1_MW_A                       |
| MR2_MW_A                       |
| HCBP1_HHI_A                    |
| HCBP2_HHI_A                    |

LS sequences:

| AVC CBP conformance bitstream |
|-------------------------------|
| LS_SVA_D                      |

## 7 Conformance to ISO/IEC 14496-10 Progressive High Profile

The following conformance bitstreams, part of ISO/IEC 14496-4 have been used to verify the conformance of the RMC decoder configuration called:

— Top\_mpeg4\_part10\_PHP\_decoder

and specified in ISO/IEC 23002-4, to ISO/IEC 14496-10 Progressive High Profile.

BS sequences:

| AVC PHP conformance bitstreams |
|--------------------------------|
| CVBS3_Sony_C                   |
| BA3_SVA_C                      |
| SL1_SVA_B                      |
| NL3_SVA_E                      |
| cavlc_mot_frm0_full_B          |

WP sequences:

| AVC PHP conformance bitstreams |
|--------------------------------|
| CVWP5_TOSHIBA_E                |
| CVWP1_TOSHIBA_E                |
| CVWP2_TOSHIBA_E                |
| CVWP3_TOSHIBA_E                |

SE sequences:

| AVC PHP conformance bitstreams |
|--------------------------------|
| CVSE2_Sony_B                   |
| CVSE3_Sony_H                   |
| CVSEFDFT3_Sony_E               |

NL sequences:

| AVC PHP conformance bitstreams |
|--------------------------------|
| CANL1_TOSHIBA_G                |
| CANL1_Sony_E                   |
| CANL2_Sony_E                   |
| CANL3_Sony_C                   |
| CANL1_SVA_B                    |
| CANL2_SVA_B                    |
| CANL3_SVA_B                    |
| CANL4_SVA_B                    |

BA sequences:

| AVC PHP conformance bitstreams |
|--------------------------------|
| CABA1_Sony_D                   |
| CABA2_Sony_E                   |
| CABA3_TOSHIBA_E                |
| CABA1_SVA_B                    |
| CABA2_SVA_B                    |
| CABA3_SVA_B                    |
| cabac_mot_frm0_full            |

CAN sequences:

| AVC PHP conformance bitstreams |
|--------------------------------|
| CABACI3_Sony_B                 |

QP sequences:

| AVC PHP conformance bitstreams |
|--------------------------------|
| CAQP1_Sony_B                   |
| CACQP3_Sony_D                  |

SL sequences:

| AVC PHP conformance bitstreams |
|--------------------------------|
| CABAST3_Sony_E                 |
| CABASTBR3_Sony_B               |

CAPCM sequences:

| AVC PHP conformance bitstreams |
|--------------------------------|
| CAPCMNL1_Sand_E                |
| CAPCM1_Sand_E                  |
| CAPM3_Sony_D                   |

CAMR sequences:

| AVC PHP conformance bitstreams |
|--------------------------------|
| HCMP1_HHI_A                    |

CAWP sequences:

| AVC PHP conformance bitstreams |
|--------------------------------|
| CAWP1_TOSHIBA_E                |
| CAWP5_TOSHIBA_E                |

CAMV sequences:

| AVC PHP conformance bitstreams |
|--------------------------------|
| MV1_BRCM_D                     |

FREH sequences:

| AVC PHP conformance bitstreams |
|--------------------------------|
| FRExt1_Panasonic_C             |
| FRExt3_Panasonic_D             |
| HCAFR1_HHI_C                   |
| HPCANL_BRCM_C                  |
| HPCA_BRCM_C                    |
| HCAFR2_HHI_A                   |
| HCAFR3_HHI_A                   |
| HCAFR4_HHI_A                   |
| HPCADQ_BRCM_B                  |
| HPCALQ_BRCM_B                  |
| HPCV_BRCM_A                    |
| HPCVNL_BRCM_A                  |
| HPCVMOLQ_BRCM_B                |
| HPCAMOLQ_BRCM_B                |

| AVC PHP conformance bitstreams |
|--------------------------------|
| HPCAQ2LQ_BRCM_B                |
| brcm_freh1_B                   |
| brcm_freh2_B                   |
| brcm_freh3                     |
| brcm_freh8                     |
| brcm_freh9                     |
| brcm_freh12_B                  |
| HCHP1_HHI_B                    |
| HCHP2_HHI_A                    |
| FREXT_MMCO4_Sony_B             |

## 8 Conformance to ISO/IEC 14496-16, SC3DMC

The following bitstreams are in the conformance data set.

- a) Troll.s3d,
- b) Chicken.s3d,
- c) Dance.s3d.

All the bitstreams from the data set are encoded with the following configurations (each line in the table represents an encoding configuration):

| Encoding method | Entropy encoding type | Prediction type | Filename                        |
|-----------------|-----------------------|-----------------|---------------------------------|
| TFAN            | 4Bits coding          | Differential    | chicken_tfan_Diff_4C.s3d        |
| TFAN            | Arithmetic coding     | Differential    | dance_tfan_Diff_AC.s3d          |
| TFAN            | Exponential Golomb    | Differential    | troll_tfan_Diff_ACEG.s3d        |
| TFAN            | BitPrecision          | Differential    | chicken_tfan_Diff_BP.s3d        |
| TFAN            | NO                    | Differential    | chicken_tfan_Diff_NO.s3d        |
| TFAN            | BitPrecision          | Adaptive        | dance_tfan_Adap_BP.s3d          |
| TFAN            | BitPrecision          | Circular        | troll_tfan_Circular_BP.s3d      |
| TFAN            | BitPrecision          | XOR             | chicken_tfan_XOR_BP.s3d         |
| TFAN            | BitPrecision          | NO              | dance_tfan_NO_BP.s3d            |
| TFAN            | BitPrecision          | Parallelogram   | troll_tfan_Parallelogram_BP.s3d |
| SVA             | 4Bits coding          | Differential    | chicken_S_Di_4C.s3d             |
| SVA             | Arithmetic coding     | Differential    | dance_S_Di_AC.s3d               |
| SVA             | Exponential Golomb    | Differential    | troll_S_Di_EG.s3d               |
| SVA             | BitPrecision          | Differential    | chicken_S_Di_BP.s3d             |
| SVA             | BitPrecision          | Adaptive        | dance_S_Ad_BP.s3d               |
| SVA             | BitPrecision          | Circular        | troll_S_CD_BP.s3d               |
| SVA             | BitPrecision          | XOR             | chicken_S_Xo_BP.s3d             |

The conformance bitstreams are available at <http://standards.iso.org/iso-iec/23002/-5/ed-2/en>.