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AMENDMENT 1
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Information technology — MPEG video technologies —

Part 4: Video tool library

AMENDMENT 1: Video tool library conformance and reference software

Technologies de l'information — Technologies vidéo MPEG —

Partie 4: Bibliothèque d'outils vidéo

AMENDEMENT 1: Logiciel de référence et conformité à la bibliothèque d'outils vidéo

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Foreword

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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.

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Information technology — MPEG video technologies —

Part 4:
Video tool library

AMENDMENT 1: Video tool library conformance and reference software

After 7.3, add the following:

8 Conformance testing for MPEG-C Part 4 (ISO/IEC 23002-4)

8.1 Scope

In RVC conformance testing, two steps should be performed. The first step is for the FU verification before proceeding to the conformance testing at the CODEC Level.

- FU verification stage: this stage is to verify if the FU implementation is correct and the behavior corresponds to the one of the VTL. This is a necessary step before passing to the codec level conformance.

- The verification of FU consist of testing input/output patterns and compare them with the one of the standard VTL.

8.2 Testing environment, test input patterns and golden responses

FUs in RVC are specified as actors in the standard RVC-CAL language, where the behavior of the FUs depends on the input tokens and the internal state of the actors. Taking as reference the RVC-CAL reference SW implementation the verification processes of the FUs should be performed by feeding tokens to the FUs and checking the corresponding output tokens, since the functional units by definition and construction are independent entities that communicate with the external world only by exchanging I/O tokens.

The testbed is composed of the test input pattern database, the golden response database, and the automatic comparison and analysis unit. The test input pattern database contains the test patterns or tokens to feed the functional unit under verification or testing for different purposes.

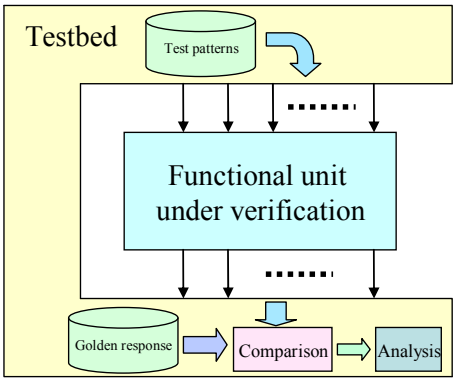

Figure AMD1.1 — Conformance testbed of functional units

Test input patterns and the corresponding golden responses or expected output tokens to and from the FUs are generated from the corresponding RVC reference software.

8.3 List of functional units and contributors for the verification tests of the FU included in the VTL

8.3.1 Syntax Parsing

FU Name	RVC simulation model	Contributor
Algo_ SynP_Generic	✓	EPFL/Xilinx/iNSA

8.3.2 Syntax Parsing FU for MPEG-4 Simple Profile

FU Name	RVC simulation model	Contributor
Algo_MVR_MedianOfThreeLeftAndTopAndTopRight	✓	EPFL/Xilinx/iNSA/HYU
Algo_MVSequence_LeftAndTopAndTopRight	✓	EPFL/Xilinx/iNSA/HYU
Mgnt_Splitter_420_TYPE	✓	EPFL/Xilinx
Algo_VLDtableB6_MPEG4Part2	✓	EPFL/Xilinx
Algo_VLDtableB7_MPEG4Part2	✓	EPFL/Xilinx
Algo_VLDtableB8_MPEG4Part2	✓	EPFL/Xilinx
Algo_VLDtableB12_MPEG4Part2	✓	EPFL/Xilinx
Algo_VLDtableB13_MPEG4Part2	✓	EPFL/Xilinx
Algo_VLDtableB14_MPEG4Part2	✓	EPFL/Xilinx
Algo_VLDtableB15_MPEG4Part2	✓	EPFL/Xilinx
Algo_VLDtableB16_MPEG4Part2	✓	EPFL/Xilinx
Algo_VLDtableB17_MPEG4Part2	✓	EPFL/Xilinx

8.3.3 Texture Decoding FU for MPEG-4 Simple Profile

FU Name	RVC simulation model	Contributor
Algo_IQ_QSAndQmatrixMp4vOrH263Scaler	✓	EPFL/Xilinx/iNSA/HYU
Algo_DCRAddr_ThreeLeftTop_8x8	✓	EPFL/Xilinx
Algo_DCRAddr_ThreeLeftTop_16x16	✓	EPFL/Xilinx
Algo_DCRInvPred_CHROMA_8x8	✓	EPFL/Xilinx/iNSA/HYU
Algo_DCRInvPred_LUMA_16x16	✓	EPFL/Xilinx/iNSA/HYU
Algo_IS_ZigzagOrAlternateHorizontalVertical_8x8	✓	EPFL/Xilinx/iNSA/HYU
Algo_IAP_AdaptiveHorizontalOrVerticalPred_8x8	✓	EPFL/Xilinx/iNSA/HYU
Algo_IAP_AdaptiveHorizontalOrVerticalPred_16x16	✓	EPFL/Xilinx/iNSA/HYU
Algo_IDCT2D_ISOIEC_23002_1	✓	EPFL/Xilinx/iNSA/HYU
Mgnt_DCSplit	✓	EPFL/Xilinx

8.3.4 Motion Compensation FU for MPEG-4 Simple Profile

FU Name	RVC simulation model	Contributor
Mgnt_FB	✓	EPFL/Xilinx
Mgnt_FBAddr	✓	EPFL/Xilinx
Algo_PictureReconstruction_Saturation	✓	EPFL/Xilinx/iNSA/HYU
Algo_Interp_HalfpelBilinearRoundingControl	✓	EPFL/Xilinx/iNSA/HYU

8.3.5 Syntax Parsing FU for MPEG-4 AVC Constrained Baseline Profile

FU Name	RVC simulation model	Contributor
Algo_NALU	✓	IETR/INSA
Algo_Synp_AVC	✓	IETR/INSA
Algo_BlockExpand_AVC	✓	IETR/INSA
Algo_BlockSplit_AVC	✓	IETR/INSA
Algo_IntraPred_Split	✓	IETR/INSA

8.3.6 Texture Decoding FU for MPEG-4 AVC Constrained Baseline Profile

FU Name	RVC simulation model	Contributor
Algo_IS_Zigzag_4x4	✓	Mitsubishi
Algo_DCR_Hadamard_LUMA_IHT1d	✓	Mitsubishi
Algo_Transpose4x4	✓	Mitsubishi
Algo_DCR_Hadamard_LUMA_Reordering	✓	Mitsubishi
Algo_DCR_Hadamard_LUMA_Scaling	✓	Mitsubishi
Algo_DCR_Hadamard_CHROMA	✓	Mitsubishi
Algo_IT4x4_1d	✓	Mitsubishi
Algo_IT4x4_Addshift	✓	Mitsubishi
Algo_IntraPred_LUMA_16x16	✓	Mitsubishi
Algo_IntraPred_LUMA_4x4	✓	Mitsubishi
Algo_Merge_4x4_to_16x16	✓	IETR/INSA
Algo_IQ_QSAndSLAndIDCTScaler_4x4	✓	Mitsubishi
Mgnt_IQ_INTRA16x16	✓	NCKU
Mgnt_DemuxIntraInter		IETR/INSA
Algo_IntraPred_4x4_to_8x8	✓	IETR/INSA
Algo_IntraPred_Add	✓	IETR/INSA
Algo_IntraPred_CHROMA	✓	Mitsubishi
Mgnt_Intra	✓	NCKU
Mgnt_Intra4x4	✓	NCKU
Mgnt_IQ_Chroma	✓	IETR/INSA

8.3.7 Motion Compensation FU for MPEG-4 AVC Constrained Baseline Profile

FU Name	RVC simulation model	Contributor
Mgnt_DBF	✓	NCKU
Algo_DBF_AdaptiveFilter_AVC	✓	NCKU
Algo_Interp_EighthPelBilinear	✓	NCKU
Algo_Interp_SeparableSixTapQuarterPelAVC	✓	NCKU
Algo_Interp_split_MB	✓	IETR/INSA
Algo_Interp_split_MB_C	✓	IETR/INSA
Algo_MVR_MultiFrameAdptive	✓	IETR/INSA
Mgnt_DPB_without_adaptiveFilter	✓	IETR/INSA
Mgnt_Buffer_Neighbor_FullMb	✓	IETR/INSA
Mgnt_Buffer_Neighbor_4x4	✓	IETR/INSA
Algo_MMCO	✓	IETR/INSA
Mgnt_FBAddr_Chroma_MxN	✓	NCKU
Mgnt_Interp_FBAddr_Luma_MxN	✓	NCKU

FU Name	RVC simulation model	Contributor
Mgnt_POC		IETR/INSA
Mgnt_MVR	✓	IETR/INSA
Algo_Add	✓	IETR/INSA

8.4 Conformance Testing at Decoder Level

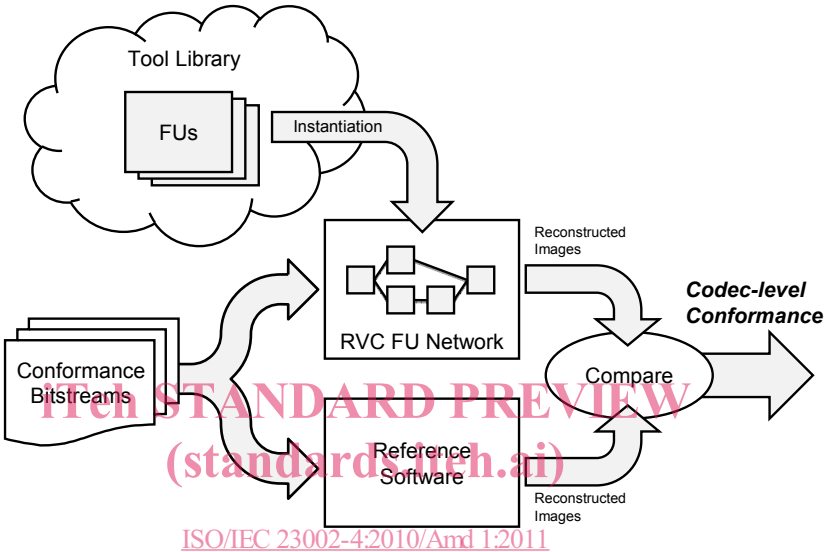

Figure AMD1.2 — Concept of CODEC level conformance testing

A decoder in RVC is specified as a network of FUs. Therefore, the conformance testing of a decoder can be conducted in the same manner as it is done for any other MPEG standard decoders. The input of the decoder network is the corresponding set of conformant bitstreams.