INTERNATIONAL STANDARD

ISO/IEC 29199-4

First edition
2010-08-01

Information technology — JPEG XR image coding system —

Part 4: Conformance testing

Technologies de l'information — Système de codage d'image JPEG XR —

Partie 4: Essai de conformité

Reference number
ISO/IEC 29199-4:2010(E)

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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 29199-4 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 29, *Coding of audio, picture, multimedia and hypermedia information*, in collaboration with ITU-T.

This part of ISO/IEC 29199 is technically aligned with ITU-T Rec. T.834 but is not published as identical text.

ISO/IEC 29199 consists of the following parts, under the general title *Information technology — JPEG XR image coding system*:

— *Part 2: Image coding specification*

— *Part 3: Motion JPEG XR*

— *Part 4: Conformance testing*

— *Part 5: Reference software*

The following part is under preparation:

— *Part 1: System architecture* [Technical Report]

Introduction

This part of ISO/IEC 29199 has been developed by ITU-T and ISO/IEC in a collaborative team that is referred to as the Joint Photographic Experts Group (JPEG). It is published as technically-aligned twin text by both organizations (ITU-T and ISO/IEC).

This part of ISO/IEC 29199 specifies a set of tests designed to verify whether codestreams, files, encoders, and decoders meet the normative requirements specified in ITU-T Rec. T.832 | ISO/IEC 29199-2 (*Information technology – JPEG XR image coding system – Image coding specification*).

- A codestream (or file) can be claimed to conform to ITU-T Rec. T.832 | ISO/IEC 29199-2 if it meets the normative requirements for such codestreams (or files) specified in ITU-T Rec. T.832 | ISO/IEC 29199-2.
- An encoder can be claimed to have codestream (or file format) conformance to ITU-T Rec. T.832 | ISO/IEC 29199-2 if the codestreams (or files) that it generates are conforming codestreams (or files).
- A decoder can be claimed to conform to a specified subset of ITU-T Rec. T.832 | ISO/IEC 29199-2 capabilities (such as a combination of "profile" and "level" capabilities) if it can properly decode all codestreams (or files) obeying the constraints specified in ITU-T Rec. T.832 | ISO/IEC 29199-2 for the specified subset of capabilities.

The tests specified in this part of ISO/IEC 29199 provide methods for (non-exhaustive) testing of whether encoders and decoders meet these requirements.

Characteristics of codestreams, files, and decoders are specified in ITU-T Rec. T.832 | ISO/IEC 29199-2. The characteristics of a codestream (or file) indicate the subset of that standard that is exploited within the codestream (or file). Examples are the selected values of the image size and number of associated color components. Decoder characteristics specify the properties and capabilities of the applied decoding process. The capabilities of a decoder specify which codestreams (or files) the decoder can decode by specifying the subset of ITU-T Rec. T.832 | ISO/IEC 29199-2 syntax features and values that may be exploited in the codestreams (or files) that it will decode. A codestream (or file) can be decoded by a conforming decoder if it is a conforming codestream (or file) and the characteristics of the codestream (or file) are within the subset of the standard that is specified by the decoder capabilities.

Procedures are specified in this part of ISO/IEC 29199 for testing the conformance of codestreams (or files) and decoders to the requirements specified in ITU-T Rec. T.832 | ISO/IEC 29199-2. Given the set of characteristics claimed, the requirements that shall be met are fully determined by ITU-T Rec. T.832 | ISO/IEC 29199-2. This part of ISO/IEC 29199 summarizes these requirements, cross references them to characteristics, and specifies how conformance to them can be tested. Particular tests to verify codestream and decoder conformance are specified.

A set of data for use in such tests is provided as an electronic attachment to this part of ISO/IEC 29199 and is considered an integral part thereof. When a decoder under test does not satisfy the requirements of the specified tests when operating on the provided data set, the decoder is indicated not to conform to ITU-T Rec. T.832 | ISO/IEC 29199-2.

The specified testing of codestreams (or files) produced by encoders employs the reference software decoder specified in ITU-T Rec. T.835 | ISO/IEC 29199-5 (with source code available in electronic format). When a codestream (or file) cannot be decoded by the reference software decoder without generating non-conformance warning messages, the codestream (or file) is indicated not to conform to ITU-T Rec. T.832 | ISO/IEC 29199-2. When an encoder produces any such codestreams (or files) that cannot be decoded without warnings by the reference software decoder, the encoder is indicated not to conform to ITU-T Rec. T.832 | ISO/IEC 29199-2.

Information technology — JPEG XR image coding system —

Part 4: Conformance testing

1 Scope

This part of ISO/IEC 29199 specifies a set of tests designed to verify whether codestreams, files, encoders, and decoders meet the normative requirements specified in ITU-T Rec. T.832 | ISO/IEC 29199-2 (*Information technology – JPEG XR image coding system – Image coding specification*).

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.

ITU-T Rec. T.832 | ISO/IEC 29199-2, *Information technology — JPEG XR image coding system — Image coding specification*

ITU-T Rec. T.835 | ISO/IEC 29199-5, *Information technology — JPEG XR image coding system — Reference software*

3 Terms and definitions

For the purposes of this document, the terms, definitions and symbols specified in ITU-T Rec. T.832 | ISO/IEC 29199-2 and the following apply.

3.1
codestream
sequence of bits contained in a sequence of bytes that conforms to the codestream requirements specified by ITU-T Rec. T.832 | ISO/IEC 29199-2 or is to be tested to determine whether it conforms to the codestream requirements specified by ITU-T Rec. T.832 | ISO/IEC 29199-2

3.2
decoder
embodiment of the decoding process specified by ITU-T Rec. T.832 | ISO/IEC 29199-2 or a process embodiment that is to be tested to determine whether it conforms to the decoding process specified by ITU-T Rec. T.832 | ISO/IEC 29199-2

NOTE The decoder does not include the display process, which is outside the scope of this part of ISO/IEC 29199.

3.3
encoder
process that produces **codestreams** or **files** that conform to ITU-T Rec. T.832 | ISO/IEC 29199-2 or are to be tested to determine whether these **codestreams** or **files** conform to ITU-T Rec. T.832 | ISO/IEC 29199-2

3.4
file
⟨ITU-T Rec. T.832 | ISO/IEC 29199-2:2009, Annex A⟩ finite-length sequence of bytes produced by an **encoder** that conforms to ITU-T Rec. T.832 | ISO/IEC 29199-2:2009, Annex A or is to be tested to determine whether it conforms to ITU-T Rec. T.832 | ISO/IEC 29199-2:2009, Annex A

3.5
reference output
output of the **reference software decoder**

3.6
reference software decoder
software decoder contained in ITU-T Rec. T.835 | ISO/IEC 29199-5

4 Abbreviations

For the purposes of this document, the abbreviations given in ITU-T Rec. T.832 | ISO/IEC 29199-2 apply.

5 Conventions

For the purposes of this document, the conventions given in ITU-T Rec. T.832 | ISO/IEC 29199-2 apply.

6 Conformance testing specification

6.1 General

The following subclauses specify normative tests designed to verify whether codestreams, files, encoders, and decoders meet the normative requirements specified in ITU-T Rec. T.832 | ISO/IEC 29199-2, as follows:

- A codestream (or file) can be claimed to conform to ITU-T Rec. T.832 | ISO/IEC 29199-2 if it meets the normative requirements for such codestreams (or file) specified in ITU-T Rec. T.832 | ISO/IEC 29199-2.
- An encoder can be claimed to have codestream (or file format) conformance to ITU-T Rec. T.832 | ISO/IEC 29199-2 if the codestreams (or files) that it generates are conforming codestreams (or files).
- A decoder can be claimed to conform to a specified subset of ITU-T Rec. T.832 | ISO/IEC 29199-2 capabilities (such as a combination of "profile" and "level" capabilities) if it can properly decode all codestreams (or files) obeying the constraints specified in ITU-T Rec. T.832 | ISO/IEC 29199-2 for the specified subset of capabilities.

The tests specified in this part of ISO/IEC 29199 provide methods for (non-exhaustive) testing of whether encoders and decoders meet these requirements.

Characteristics of codestreams, files, and decoders are specified in ITU-T Rec. T.832 | ISO/IEC 29199-2. The characteristics of a codestream (or file) indicate the subset of that standard that is exploited within the codestream (or file). Examples are the selected values of the image size and number of associated color components. Decoder characteristics specify the properties and capabilities of the applied decoding process. The capabilities of a decoder specify which codestreams (or files) the decoder can decode by specifying the subset of ITU-T Rec. T.832 | ISO/IEC 29199-2 syntax features and values that may be exploited in the codestreams (or files) that it will decode. A codestream (or file) can be decoded by a conforming decoder if it is a conforming codestream (or file) and the characteristics of the codestream (or file) are within the subset of the standard that is specified by the decoder capabilities.

Procedures are specified in this part of ISO/IEC 29199 for testing the conformance of codestreams (or files) and decoders to the requirements specified in ITU-T Rec. T.832 | ISO/IEC 29199-2. Given the set of characteristics claimed, the requirements that shall be met are fully determined by ITU-T Rec. T.832 | ISO/IEC 29199-2. This part of ISO/IEC 29199 summarizes these requirements, cross references them to codestream (or file) characteristics, and specifies how conformance to the requirements can be tested. Particular tests to verify codestream and decoder conformance are specified.

A set of data for use in such tests is provided as an electronic attachment to this part of ISO/IEC 29199 and is considered an integral part thereof. When a decoder under test does not satisfy the requirements of the specified tests when operating on the provided data set, the decoder is indicated not to conform to ITU-T Rec. T.832 | ISO/IEC 29199-2.

The specified testing of codestreams (or files) produced by encoders employs the reference software decoder specified in ITU-T Rec. T.835 | ISO/IEC 29199-5 (with source code available in electronic format). When a codestream (or file) cannot be decoded by the reference software decoder without generating non-conformance warning messages, the codestream (or file) is indicated not to conform to ITU-T Rec. T.832 | ISO/IEC 29199-2. When an encoder produces any

such codestreams (or files) that cannot be decoded without warnings by the reference software decoder, the encoder is indicated not to conform to ITU-T Rec. T.832 | ISO/IEC 29199-2.

6.2 Procedure to test codestreams (or files)

A codestream (or file) that claims conformance with ITU-T Rec. T.832 | ISO/IEC 29199-2 shall pass the following normative test.

The codestream (or file) shall be decoded by processing it with the reference software decoder. When processed by the reference software decoder, the codestream (or file) shall not cause any error or non-conformance messages to be reported by the reference software decoder. The output of the reference software decoder shall be considered the reference output.

NOTE 1 – This test should not be applied to codestreams (or files) that are known to contain errors introduced by transmission, as such errors are highly likely to result in codestreams (or files) that lack conformance to ITU-T Rec. T.832 | ISO/IEC 29199-2.

Successfully passing the reference software decoder test provides only a preliminary indication that the codestream (or file) under test is in conformance to ITU-T Rec. T.832 | ISO/IEC 29199-2, as not all conformance requirements of ITU-T Rec. T.832 | ISO/IEC 29199-2 may be tested by the reference software decoder.

Additional tests may be necessary to more thoroughly check that the codestream (or file) properly meets all the requirements specified in ITU-T Rec. T.832 | ISO/IEC 29199-2. These complementary tests may be performed using other codestream (or file) verifiers that perform more complete tests than those implemented by the reference software decoder.

NOTE 2 – Indications of codestream (or file) non-conformance obtained in such tests should be investigated to verify the exact characteristics of the codestream (or file) that resulted in the indication and the relationship of these characteristics to the requirements expressed in ITU-T Rec. T.832 | ISO/IEC 29199-2 for conformance to that Specification.

To check correctness of a codestream (or file), it is necessary to parse the entire codestream (or file) and to extract all the syntax elements and other values derived from those syntactic elements and used by the decoding process specified in ITU-T Rec. T.832 | ISO/IEC 29199-2.

Some verifiers may not necessarily need to perform all stages of the decoding process specified in ITU-T Rec. T.832 | ISO/IEC 29199-2 in order to verify aspects of codestream (or file) correctness. Many tests can be performed on syntax elements in a state prior to their use in some processing stages.

6.3 Procedure to test encoders

An encoder can be claimed to have codestream (or file format) conformance to ITU-T Rec. T.832 | ISO/IEC 29199-2 if the codestreams (or files) that it generates are conforming codestreams (or files). To test an encoder for conformance to ITU-T Rec. T.832 | ISO/IEC 29199-2, the encoder should be operated in such a manner as to maximally exercise its usage of the syntax features of ITU-T Rec. T.832 | ISO/IEC 29199-2, and sample codestreams (or files) produced from the encoder shall be checked for conformance to ITU-T Rec. T.832 | ISO/IEC 29199-2 as specified in subclause 6.2. If the encoder produces codestreams (or files) that do not conform to ITU-T Rec. T.832 | ISO/IEC 29199-2 under such sample testing operation, the encoder is indicated not to conform to ITU-T Rec. T.832 | ISO/IEC 29199-2.

6.4 Procedure to test decoders

A decoder can be claimed to conform to a specified subset of ITU-T Rec. T.832 | ISO/IEC 29199-2 capabilities (such as a combination of "profile" and "level" capabilities) if it can properly decode all codestreams (or files) obeying the constraints specified in ITU-T Rec. T.832 | ISO/IEC 29199-2 for the specified subset of capabilities. To test a decoder for conformance to a specified subset of ITU-T Rec. T.832 | ISO/IEC 29199-2 capabilities, the set of reference encoded files (or, in the case of codestream-level testing, the set of codestreams extracted from those files) specified below in clause 7 that are within the specified subset of ITU-T Rec. T.832 | ISO/IEC 29199-2 capabilities shall be processed by the decoder under test and by the reference software decoder. The decoder under test shall output decoded images, and the output decoded images produced by the decoder under test shall be checked for correspondence with the output of the reference software decoder. The output decoded images produced by the two decoding processes shall match exactly. When upsampling is invoked in the output formatting process specified in subclause 9.10 of ITU-T Rec. T.832 | ISO/IEC 29199-2, the upsampling process performed for purposes of conformance testing of the output of the decoder under test shall be the nominal upsampling process specified in subclause 9.10.3.1 or 9.10.3.2 of ITU-T Rec. T.832 | ISO/IEC 29199-2, as applicable. However, the actual manner of performing upsampling by a decoder for purposes other than conformance testing is outside the scope of conformance requirements to ITU-T Rec. T.832 | ISO/IEC 29199-2, as noted in subclauses 8.4.6 and 8.4.9 of ITU-T Rec. T.832 | ISO/IEC 29199-2.

7 Reference data set

7.1 General

A set of data for use in decoder conformance tests is provided as an electronic attachment to this part of ISO/IEC 29199 and is considered an integral part thereof. This set of data consists of a number of files encoded according to ITU-T Rec. T.832 | ISO/IEC 29199-2 Annex A. For purposes of codestream-only testing, the testing shall be performed by extracting the codestreams embedded within these files and performing the testing using these codestreams.

This set of files and the codestreams they contain are not intended to represent all combinations of syntax elements that are allowed in ITU-T Rec. T.832 | ISO/IEC 29199-2. Rather, the set of files (and the codestreams they contain) was developed with the intention of testing key selected aspects of the parsing and decoding processes that are required by the various syntax elements. Selected characteristics of the files in each category are described in corresponding subclauses of this part of ISO/IEC 29199.

7.2 Reference file set BasicAndOverlap_1x1Tile

This collection of 18 .jxr files has the following syntax element characteristics:

- The FREQUENCY_MODE_CODESTREAM_FLAG syntax element is set to FALSE (spatial mode) or TRUE (frequency mode)
- The OVERLAP_MODE is varied between the values 0, 1 and 2.
- The INTERNAL_CLR_FMT is set to YUV444 or YONLY.
- The QP (for all color channels and all bands) is set to 1 or 10.

For all files in the BasicAndOverlap_1x1Tile set, the syntax elements NUM_HOR_TILES_MINUS1 and NUM_VER_TILES_MINUS1 are both set to 0, resulting in each image being structured as a single tile.

The following files are included in the BasicAndOverlap_1x1Tile file set:

- Seattle_Spat_Ov0_1x1_YONLY_QP10.jxr
- Seattle_Spat_Ov0_1x1_YUV444_QP1.jxr
- Seattle_Spat_Ov0_1x1_YUV444_QP10.jxr
- Seattle_Spat_Ov1_1x1_YONLY_QP10.jxr
- Seattle_Spat_Ov1_1x1_YUV444_QP1.jxr
- Seattle_Spat_Ov1_1x1_YUV444_QP10.jxr
- Seattle_Spat_Ov2_1x1_YONLY_QP10.jxr
- Seattle_Spat_Ov2_1x1_YUV444_QP1.jxr
- Seattle_Spat_Ov2_1x1_YUV444_QP10.jxr
- Seattle_Freq_Ov0_1x1_YONLY_QP10.jxr
- Seattle_Freq_Ov0_1x1_YUV444_QP1.jxr
- Seattle_Freq_Ov0_1x1_YUV444_QP10.jxr
- Seattle_Freq_Ov1_1x1_YONLY_QP10.jxr
- Seattle_Freq_Ov1_1x1_YUV444_QP1.jxr
- Seattle_Freq_Ov1_1x1_YUV444_QP10.jxr
- Seattle_Freq_Ov2_1x1_YONLY_QP10.jxr
- Seattle_Freq_Ov2_1x1_YUV444_QP1.jxr
- Seattle_Freq_Ov2_1x1_YUV444_QP10.jxr

These files can be found in the directory BasicAndOverlap_1x1Tile.

7.3 Reference file set BasicAndOverlap_4x4Tile

This collection of 42 .jxr files has the same type of syntax element characteristics as in the BasicAndOverlap_1x1Tile file set (subclause 7.2), except that in the files in BasicAndOverlap_4x4Tile, the syntax elements NUM_HOR_TILES_MINUS1 and NUM_VER_TILES_MINUS1 are both set to 3, resulting in each image being structured as a 4×4 grid of tiles. The remaining note syntax characteristics are repeated here:

- The FREQUENCY_MODE_CODESTREAM_FLAG syntax element is set to FALSE (spatial mode) or TRUE (frequency mode).
- The OVERLAP_MODE is varied between the values 0, 1 and 2.
- The INTERNAL_CLR_FMT is set to YUV444, YUV422, YUV420, or YONLY.
- The QP (for all color channels and all bands) is set to 1 or 10.

The following files are included in the BasicAndOverlap_4x4Tile file set:

- Seattle_Spat_Ov0_4x4_YONLY_QP10.jxr
- Seattle_Spat_Ov0_4x4_YUV420_QP1.jxr
- Seattle_Spat_Ov0_4x4_YUV420_QP10.jxr
- Seattle_Spat_Ov0_4x4_YUV422_QP1.jxr
- Seattle_Spat_Ov0_4x4_YUV422_QP10.jxr
- Seattle_Spat_Ov0_4x4_YUV444_QP1.jxr
- Seattle_Spat_Ov0_4x4_YUV444_QP10.jxr
- Seattle_Spat_Ov1_4x4_YONLY_QP10.jxr
- Seattle_Spat_Ov1_4x4_YUV420_QP1.jxr
- Seattle_Spat_Ov1_4x4_YUV420_QP10.jxr
- Seattle_Spat_Ov1_4x4_YUV422_QP1.jxr
- Seattle_Spat_Ov1_4x4_YUV422_QP10.jxr
- Seattle_Spat_Ov1_4x4_YUV444_QP1.jxr
- Seattle_Spat_Ov1_4x4_YUV444_QP10.jxr
- Seattle_Spat_Ov2_4x4_YONLY_QP10.jxr
- Seattle_Spat_Ov2_4x4_YUV420_QP1.jxr
- Seattle_Spat_Ov2_4x4_YUV420_QP10.jxr
- Seattle_Spat_Ov2_4x4_YUV422_QP1.jxr
- Seattle_Spat_Ov2_4x4_YUV422_QP10.jxr
- Seattle_Spat_Ov2_4x4_YUV444_QP1.jxr
- Seattle_Spat_Ov2_4x4_YUV444_QP10.jxr
- Seattle_Freq_Ov0_4x4_YONLY_QP10.jxr
- Seattle_Freq_Ov0_4x4_YUV420_QP1.jxr
- Seattle_Freq_Ov0_4x4_YUV420_QP10.jxr
- Seattle_Freq_Ov0_4x4_YUV422_QP1.jxr
- Seattle_Freq_Ov0_4x4_YUV422_QP10.jxr
- Seattle_Freq_Ov0_4x4_YUV444_QP1.jxr
- Seattle_Freq_Ov0_4x4_YUV444_QP10.jxr
- Seattle_Freq_Ov1_4x4_YONLY_QP10.jxr
- Seattle_Freq_Ov1_4x4_YUV420_QP1.jxr
- Seattle_Freq_Ov1_4x4_YUV420_QP10.jxr
- Seattle_Freq_Ov1_4x4_YUV422_QP1.jxr
- Seattle_Freq_Ov1_4x4_YUV422_QP10.jxr

- Seattle_Freq_Ov1_4x4_YUV444_QP1.jxr
- Seattle_Freq_Ov1_4x4_YUV444_QP10.jxr
- Seattle_Freq_Ov2_4x4_YONLY_QP10.jxr
- Seattle_Freq_Ov2_4x4_YUV420_QP1.jxr
- Seattle_Freq_Ov2_4x4_YUV420_QP10.jxr
- Seattle_Freq_Ov2_4x4_YUV422_QP1.jxr
- Seattle_Freq_Ov2_4x4_YUV422_QP10.jxr
- Seattle_Freq_Ov2_4x4_YUV444_QP1.jxr
- Seattle_Freq_Ov2_4x4_YUV444_QP10.jxr

These files can be found in the directory BasicAndOverlap_4x4Tile.

7.4 Reference file set BasicAndOverlap_2x2Tile

This collection of 5 .jxr files has the same type of syntax element characteristics as in the BasicAndOverlap_1x1Tile file set (subclause 7.2) and BasicAndOverlap_4x4Tile file set (subclause 7.3), except that in the files in BasicAndOverlap_2x2Tile, the syntax elements NUM_HOR_TILES_MINUS1 and NUM_VER_TILES_MINUS1 are both set to 1, resulting in each image being structured as a 2×2 grid of tiles. The remaining note syntax characteristics are repeated here:

- The FREQUENCY_MODE_CODESTREAM_FLAG syntax element is set to TRUE (frequency mode).
- The OVERLAP_MODE is varied between the values 1 and 2.
- The INTERNAL_CLR_FMT is set to YUV422 or YUV420.
- The QP (for all color channels and all bands) is set to 10.

The following files are included in the BasicAndOverlap_2x2Tile file set:

- Seattle_Freq_Ov1_2x2_YUV422_QP10.jxr
- Seattle_Freq_Ov2_2x2_YUV422_QP10.jxr
- Small_Freq_Ov1_2x2_YUV422_QP10.jxr
- Small_Freq_Ov2_2x2_YUV420_QP10.jxr
- Small_Freq_Ov2_2x2_YUV422_QP10.jxr

These files can be found in the directory BasicAndOverlap_2x2Tile.

7.5 Reference file set BandsPresent_1x1Tile

This collection of 12 .jxr files has the following syntax element characteristics:

- The FREQUENCY_MODE_CODESTREAM_FLAG syntax element is set to FALSE (spatial mode) or TRUE (frequency mode).
- The INTERNAL_CLR_FMT syntax element is set to YUV444 or YONLY.
- The BANDS_PRESENT syntax element is set to the value DCONLY, NOHIGHPASS, or NOFLEXBITS.

For all files in the BandsPresent_1x1Tile set, the syntax elements NUM_HOR_TILES_MINUS1 and NUM_VER_TILES_MINUS1 are both set to 0, resulting in each image being structured as a single tile. The OVERLAP_MODE syntax element is set to 0 for all of these files.

The following files are included in the BandsPresent_1x1Tile file set:

- Seattle_Spat_Ov0_1x1_YONLY_SBDC.jxr
- Seattle_Spat_Ov0_1x1_YUV444_SBDC.jxr
- Seattle_Spat_Ov0_1x1_YONLY_SBNOHP.jxr
- Seattle_Spat_Ov0_1x1_YUV444_SBNOHP.jxr
- Seattle_Spat_Ov0_1x1_YONLY_SBNOFlex.jxr
- Seattle_Spat_Ov0_1x1_YUV444_SBNOFlex.jxr

- Seattle_Freq_Ov0_1x1_YONLY_SBDC.jxr
- Seattle_Freq_Ov0_1x1_YUV444_SBDC.jxr
- Seattle_Freq_Ov0_1x1_YONLY_SBNOHP.jxr
- Seattle_Freq_Ov0_1x1_YUV444_SBNOHP.jxr
- Seattle_Freq_Ov0_1x1_YONLY_SBNOFlex.jxr
- Seattle_Freq_Ov0_1x1_YUV444_SBNOFlex.jxr

These files can be found in the directory BandsPresent_1x1Tile.

7.6 Reference file set BandsPresent_4x4Tile

This collection of 12 .jxr files has the same syntax element characteristics as the BandsPresent_1x1Tile file set (subclause 7.5), except that in BandsPresent_4x4Tile, the syntax elements NUM_HOR_TILES_MINUS1 and NUM_VER_TILES_MINUS1 are both set to 3, resulting in each image being structured as a 4×4 grid of tiles. The remaining noted syntax characteristics are repeated here:

- The FREQUENCY_MODE_CODESTREAM_FLAG syntax element is set to FALSE (spatial mode) or TRUE (frequency mode).
- The INTERNAL_CLR_FMT syntax element is set to YUV444 or YONLY.
- The BANDS_PRESENT syntax element is set to the value DCONLY, to NOHIGHPASS, or to NOFLEXBITS.

As in subclause 7.5, the OVERLAP_MODE syntax element is set to 0.

The following codestreams are included in the BandsPresent_4x4Tile file set:

- Seattle_Spat_Ov0_4x4_YONLY_SBDC.jxr
- Seattle_Spat_Ov0_4x4_YUV444_SBDC.jxr
- Seattle_Spat_Ov0_4x4_YONLY_SBNOHP.jxr
- Seattle_Spat_Ov0_4x4_YUV444_SBNOHP.jxr
- Seattle_Spat_Ov0_4x4_YONLY_SBNOFlex.jxr
- Seattle_Spat_Ov0_4x4_YUV444_SBNOFlex.jxr
- Seattle_Freq_Ov0_4x4_YONLY_SBDC.jxr
- Seattle_Freq_Ov0_4x4_YUV444_SBDC.jxr
- Seattle_Freq_Ov0_4x4_YONLY_SBNOHP.jxr
- Seattle_Freq_Ov0_4x4_YUV444_SBNOHP.jxr
- Seattle_Freq_Ov0_4x4_YONLY_SBNOFlex.jxr
- Seattle_Freq_Ov0_4x4_YUV444_SBNOFlex.jxr

These files can be found in the directory BandsPresent_4x4Tile.

7.7 Reference file set Varied_QP

This collection of 12 .jxr files has the following syntax element characteristics:

- The value of CH_MODE (for DC, LP and HP) is set to 0, 1 or 2.
- The quantizers for low pass and high pass are set to be the same as DC or different from DC.
- The QP values are varied.

For all files in the Varied_QP set, the syntax elements NUM_HOR_TILES_MINUS1 and NUM_VER_TILES_MINUS1 are both set to 0, resulting in each image being structured as a single tile. The OVERLAP_MODE syntax element is set to 1 and the FREQUENCY_MODE_CODESTREAM_FLAG syntax element is set to FALSE (spatial mode) and the INTERNAL_CLR_FMT syntax element is set to YUV444.

The following files are included in the Varied_QP file set:

- Seattle_QP_1_BandInd_ChanInd.jxr
- Seattle_QP_1_BandInd_ChanSep.jxr

- Seattle_QP_1_BandInd_ChanUnif.jxr
- Seattle_QP_1_BandUnif_ChanInd.jxr
- Seattle_QP_1_BandUnif_ChanSep.jxr
- Seattle_QP_1_BandUnif_ChanUnif.jxr
- Seattle_QP_5_BandInd_ChanInd.jxr
- Seattle_QP_5_BandInd_ChanSep.jxr
- Seattle_QP_5_BandInd_ChanUnif.jxr
- Seattle_QP_5_BandUnif_ChanInd.jxr
- Seattle_QP_5_BandUnif_ChanSep.jxr
- Seattle_QP_5_BandUnif_ChanUnif.jxr

These files can be found in the directory Varied_QP.

7.8 Reference file set Varied_Internal_Color_Format

This collection of 8 .jxr files has the following syntax element characteristics:

- The OVERLAP_MODE syntax element is varied between the values 1 and 2.
- The INTERNAL_CLR_FMT syntax element is set to YUV420 or YUV422.
- The QP values are varied.

For all files in the Varied_Internal_Color_Format set, the syntax elements NUM_HOR_TILES_MINUS1 and NUM_VER_TILES_MINUS1 are both set to 0, resulting in each image being structured as a single tile. The FREQUENCY_MODE_CODESTREAM_FLAG syntax element is set to FALSE (spatial mode).

The following files are included in the Varied_Internal_Color_Format file set:

- Seattle_QP_1_YUV_420_Ov1.jxr
- Seattle_QP_1_YUV_420_Ov2.jxr
- Seattle_QP_1_YUV_422_Ov1.jxr
- Seattle_QP_1_YUV_422_Ov2.jxr
- Seattle_QP_5_YUV_420_Ov1.jxr
- Seattle_QP_5_YUV_420_Ov2.jxr
- Seattle_QP_5_YUV_422_Ov1.jxr
- Seattle_QP_5_YUV_422_Ov2.jxr

These files can be found in the directory Varied_Internal_Color_Format.

7.9 Reference file set Output_Bitdepth_16

This collection of 18 .jxr files has the following syntax element characteristics:

- The FREQUENCY_MODE_CODESTREAM_FLAG syntax element is varied between FALSE (spatial mode) and TRUE (frequency mode).
- The OVERLAP_MODE syntax element is varied between the values 0, 1 and 2.
- The Tile structure is varied between 1×1, 1×6, 6×1, and 6×6
- The INTERNAL_CLR_FMT syntax element is varied between YUV444 and YONLY
- The QPs are varied to exercise the corner cases of the QuantMap( ) function.
- The SCALED_FLAG syntax element is varied between 0 and 1.

The OUTPUT_BITDEPTH syntax element is set to BD16.

The following files are included in the Output_Bitdepth_16 file set:

- CarHandle_Spat_Ov0_1x1_YONLY.jxr
- CarHandle_Spat_Ov0_6x6_YUV444.jxr

- CarHandle_Spat_Ov0_1x6_YONLY.jxr
- CarHandle_Freq_Ov0_1x1_YUV444.jxr
- CarHandle_Freq_Ov0_6x1_YUV444.jxr
- CarHandle_Freq_Ov0_6x6_YONLY.jxr
- CarHandle_Spat_Ov1_1x1_YUV444.jxr
- CarHandle_Spat_Ov1_1x1_YONLY.jxr
- CarHandle_Spat_Ov1_1x6_YONLY.jxr
- CarHandle_Freq_Ov1_1x1_YUV444.jxr
- CarHandle_Freq_Ov1_6x6_YONLY.jxr
- CarHandle_Freq_Ov1_6x1_YUV444.jxr
- CarHandle_Spat_Ov2_1x1_YUV444.jxr
- CarHandle_Spat_Ov2_6x6_YUV444.jxr
- CarHandle_Spat_Ov2_1x6_YONLY.jxr
- CarHandle_Freq_Ov2_1x1_YUV444.jxr
- CarHandle_Freq_Ov2_1x1_YONLY.jxr
- CarHandle_Freq_Ov2_6x1_YONLY.jxr

These files can be found in the directory Output_Bitdepth_16.

7.10 Reference file set Special_QP

This collection of 7 .jxr files includes QP variations that test corner cases of the QuantMap( ) function:

- For syntax element SCALED_FLAG = = 0, there are streams that test QP < 32, 32 <= QP < 48, and QP >= 48
- For syntax element SCALED_FLAG = = 1, there are streams that test QP < 16 and QP >= 16.
- The special case of QP = = 0

The following files are included in the Special_QP file set:

- Seattle_QPIndex0.jxr
- Seattle_ScaleFlag0_QP31.jxr
- Seattle_ScaleFlag0_QP32.jxr
- Seattle_ScaleFlag0_QP47.jxr
- Seattle_ScaleFlag0_QP48.jxr
- Seattle_ScaleFlag1_QP15.jxr
- Seattle_ScaleFlag1_QP16.jxr

These files can be found in the directory Special_QP.

7.11 Reference file set Flags_And_Tiles

This collection of 7 .jxr files has the following syntax element characteristics:

- A syntax element INDEX_TABLE_PRESENT_FLAG is set to TRUE, despite having a 1×1 tile pattern and FREQUENCY_MODE_CODESTREAM_FLAG syntax element set to FALSE (spatial mode).
- A syntax element SHORT_HEADER_FLAG is set to FALSE.
- Various combinations of tile patterns: 1×2, 2×1, 1×4, 4×1, and 2×2 are used.

The following files are included in the Flags_And_Tiles file set:

- Seattle_1x1_IndexTable1.jxr
- Seattle_4x4_ShrtHdr0.jxr
- Seattle_QP1_1x2Tiles.jxr

- Seattle_QP1_1x4Tiles.jxr
- Seattle_QP1_2x1Tiles.jxr
- Seattle_QP1_2x2Tiles.jxr
- Seattle_QP1_4x1Tiles.jxr

These files can be found in the directory Flags_And_Tiles.

7.12 Reference file set Entropy_Table_Coverage

This collection of 8 .jxr files exercises table-switching for all of the 20 Adaptive VLC structures employed in the decoder. The files have been designed to test the use of the 20 different adaptive VLC decoding structures:

- **DecNumCBP**
- **DecNumBlkCBP**
- **AbsLevelIndDCLum**
- **AbsLevelIndDCChr**
- **DecFirstIndLPLum**
- **DecIndLPLum0**
- **DecIndLPLum1**
- **DecFirstIndLPChr**
- **DecIndLPChr0**
- **DecIndLPChr1**
- **AbsLevelIndLP0**
- **AbsLevelIndLP1**
- **DecFirstIndHPLum**
- **DecIndHPLum0**
- **DecIndHPLum1**
- **DecFirstIndHPChr**
- **DecIndHPChr0**
- **DecIndHPChr1**
- **AbsLevelIndHP0**
- **AbsLevelIndHP1**

Correct decoding of the images in these files thus requires appropriate initialization and updating of the various code tables for each of these different adaptive VLC structures. In addition, YONLY and YUV444 images are included, because the **DecNumBlkCBP** table sizes are different for these two color formats.

The following files are included in the Entropy_Table_Coverage file set:

- Boats.jxr
- Boats_YONLY.jxr
- Dog.jxr
- Dog_YONLY.jxr
- Seattle.jxr
- Seattle_YONLY.jxr
- Skyscraper.jxr
- Skyscraper_YONLY.jxr

These files can be found in the directory Entropy_Table_Coverage.

7.13 Reference file set Shift_Bits

This collection of 16 .jxr files includes variation of the value of the syntax element SHIFT_BITS, from 1 to 8, with OUTPUT_BITDEPTH set to BD16 or BD16S.

The following files are included in the Shift_Bits file set:

- CarHandle_Shift1.jxr
- CarHandle_Shift2.jxr
- CarHandle_Shift3.jxr
- CarHandle_Shift4.jxr
- CarHandle_Shift5.jxr
- CarHandle_Shift6.jxr
- CarHandle_Shift7.jxr
- CarHandle_Shift8.jxr
- Maui_Shift1.jxr
- Maui_Shift2.jxr
- Maui_Shift3.jxr
- Maui_Shift4.jxr
- Maui_Shift5.jxr
- Maui_Shift6.jxr
- Maui_Shift7.jxr
- Maui_Shift8.jxr

These files can be found in the directory Shift_Bits.

7.14 Reference file set MBLevel_QP_Coverage

This collection of 20 .jxr files exercises the feature of having DC, Lowpass and Highpass quantization parameters being sent at the tile level (as opposed to the image level). For DC tile-level QPs, there's only one possible QP for a particular tile; for Lowpass and Highpass QPs, there may be up to 16 QPs assigned per tile. The exact number is varied across the files.

Each of the images contain a tile (or multiple tiles) where the Lowpass and Highpass QPs are switched from macroblock to macroblock; the particular QP that is chosen for a given macroblock is selected from the table of available QPs for that band and tile by a QP index that is sent in the codestream.

Additionally, the following syntax elements are varied in these files:

- DC_IMAGE_PLANE_UNIFORM_FLAG
- LP_IMAGE_PLANE_UNIFORM_FLAG
- HP_IMAGE_PLANE_UNIFORM_FLAG
- USE_DC_QP_FLAG
- USE_LP_QP_FLAG

The following files are included in the MBLevel_QP_Coverage file set:

- Boat_MBQP1.jxr
- Boat_MBQP2.jxr
- Boat_MBQP3.jxr
- Boat_MBQP4.jxr
- Boat_MBQP5.jxr
- Boat_MBQP6.jxr
- Boat_MBQP7.jxr

- Bridge_MBQP1.jxr
- Bridge_MBQP2.jxr
- Dog_MBQP1.jxr
- Dog_MBQP2.jxr
- Skyscraper_MBQP1.jxr
- Skyscraper_MBQP2.jxr
- Skyscraper_MBQP3.jxr
- Skyscraper_MBQP4.jxr
- Skyscraper_MBQP5.jxr
- Skyscraper_MBQP6.jxr
- Skyscraper_MBQP7.jxr
- Skyscraper_MBQP8.jxr
- Skyscraper_MBQP9.jxr

These files can be found in the directory MBLevel_QP_Coverage.

7.15 Reference file set Output_Color_Format_Baseline

This collection of 11 .jxr files has the following syntax element characteristics:

- The syntax element OUTPUT_CLR_FMT is varied across supported formats.

NOTE – Each of these color formats is supported in the Baseline profile of JPEG XR, as defined in Annex B.

The following files are included in the Output_Color_Format_Baseline file set:

- Maui-8bppGray_64x64.jxr
- Maui-16bppBGR555_64x64.jxr
- Maui-16bppBGR565_64x64.jxr
- Maui-16bppGray.jxr
- Maui-16bppGrayFixedPoint_64x64.jxr
- Maui-24bppBGR_64x64.jxr
- Maui-24bppRGB_64x64.jxr
- Maui-32bppBGR.jxr
- Maui-32bppBGR101010_64x64.jxr
- Maui-48bppRGB_64x64.jxr
- Maui-64bppRGBFixedPoint.jxr
- Maui-48bppRGBFixedPoint_64x64.jxr
- Maui-BlackWhite_Black1_64x64.jxr
- Maui-BlackWhite_White1_64x64.jxr

These files can be found in the directory Output_Color_Format_Baseline.

7.16 Reference file set Output_Color_Format_Main

This collection of 75 .jxr files has the following syntax element characteristics:

- The syntax element OUTPUT_CLR_FMT is varied across supported formats.
- Formats with alpha channels are coded in planar format.

NOTE – Each of these color formats is supported in the Main profile of JPEG XR, as defined in Annex B.

The following files are included in the Output_Color_Format_Main file set:

- 3channel16_noprof_alpha.jxr

- 3channel16_noprof_noalpha.jxr
- 3channel16_prof_alpha.jxr
- 3channel16_prof_noalpha.jxr
- 3channel_noprof_alpha.jxr
- 3channel_noprof_noalpha.jxr
- 3channel_prof_alpha.jxr
- 3channel_prof_noalpha.jxr
- 4channel16_noprof_alpha.jxr
- 4channel16_noprof_noalpha.jxr
- 4channel16_prof_alpha.jxr
- 4channel16_prof_noalpha.jxr
- 4channel_noprof_alpha.jxr
- 4channel_noprof_noalpha.jxr
- 4channel_prof_alpha.jxr
- 4channel_prof_noalpha.jxr
- 5channel16_noprof_alpha.jxr
- 5channel16_noprof_noalpha.jxr
- 5channel16_prof_alpha.jxr
- 5channel16_prof_noalpha.jxr
- 5channel_noprof_alpha.jxr
- 5channel_noprof_noalpha.jxr
- 5channel_prof_alpha.jxr
- 5channel_prof_noalpha.jxr
- 6channel16_noprof_alpha.jxr
- 6channel16_noprof_noalpha.jxr
- 6channel16_prof_alpha.jxr
- 6channel16_prof_noalpha.jxr
- 6channel_noprof_alpha.jxr
- 6channel_noprof_noalpha.jxr
- 6channel_prof_alpha.jxr
- 6channel_prof_noalpha.jxr
- 7channel16_noprof_alpha.jxr
- 7channel16_noprof_noalpha.jxr
- 7channel16_prof_alpha.jxr
- 7channel16_prof_noalpha.jxr
- 7channel_noprof_alpha.jxr
- 7channel_noprof_noalpha.jxr
- 7channel_prof_alpha.jxr
- 7channel_prof_noalpha.jxr
- 8channel16_noprof_alpha.jxr
- 8channel16_noprof_noalpha.jxr
- 8channel16_prof_alpha.jxr
- 8channel16_prof_noalpha.jxr
- 8channel_noprof_alpha.jxr

- 8channel_noprof_noalpha.jxr
- 8channel_prof_alpha.jxr
- 8channel_prof_noalpha.jxr
- Maui-16bppGrayHalf_64x64.jxr
- Maui-32bppBGRA_64x64.jxr
- Maui-32bppCMYK_64x64.jxr
- Maui-32bppGrayFixedPoint_64x64.jxr
- Maui-32bppGrayFloat_2_64x64.jxr
- Maui-32bppGrayFloat_64x64.jxr
- Maui-32bppRGBE.jxr
- Maui-40bppCMYKA_64x64.jxr
- Maui-48bppRGBHalf_64x64.jxr
- Maui-64bppCMYK_64x64.jxr
- Maui-64bppRGBA_64x64.jxr
- Maui-64bppRGBAFixedPoint_64x64.jxr
- Maui-64bppRGBAHalf_64x64.jxr
- Maui-64bppRGBHalf.jxr
- Maui-80bppCMYKA_64x64.jxr
- Maui-96bppRGBFixedPoint_64x64.jxr
- Maui-128bppRGBAFixedPoint_64x64.jxr
- Maui-128bppRGBAFloat_64x64.jxr
- Maui-128bppRGBFixedPoint.jxr
- Maui-128bppRGBFloat_64x64.jxr
- P19d-32bppPBGRA.jxr
- P19d-64bppPRGBA.jxr
- P19d-64bppRGBAFixedPoint.jxr
- P19d-128bppPRGBAFloat.jxr

These files can be found in the directory Output_Color_Format_Main.

7.17 Reference file set Output_Color_Format_Advanced

This collection of 20 .jxr files has the following syntax element characteristics:

- The syntax element OUTPUT_CLR_FMT is varied across supported formats.

NOTE – Each of these color formats is supported in the Advanced profile of JPEG XR, as defined in Annex B.

The following files are included in the Output_Color_Format_Advanced file set:

- Maui-12bppYCC420.jxr
- Maui-16bppYCC422.jxr
- Maui-20bppYCC420Alpha.jxr
- Maui-20bppYCC422.jxr
- Maui-24bppYCC422Alpha.jxr
- Maui-24bppYCC444.jxr
- Maui-30bppYCC422Alpha.jxr
- Maui-30bppYCC444.jxr
- Maui-32bppCMYKDIRECT.jxr

- Maui-32bppYCC422.jxr
- Maui-32bppYCC444Alpha.jxr
- Maui-40bppCMYKDIRECTAlpha.jxr
- Maui-40bppYCC444Alpha.jxr
- Maui-48bppYCC422Alpha.jxr
- Maui-48bppYCC444.jxr
- Maui-48bppYCC444FixedPoint.jxr
- Maui-64bppCMYKDIRECT.jxr
- Maui-64bppYCC444Alpha.jxr
- Maui-64bppYCC444AlphaFixedPoint.jxr
- Maui-80bppCMYKDIRECTAlpha.jxr

These files can be found in the directory Output_Color_Format_Advanced.

7.18 Reference file set Alpha_Interleaved

This collection of 7 .jxr files is to operate in conjunction with Output_Color_Format_Main (subclause 7.16). ALPHA_IMAGE_PLANE_FLAG is set to TRUE, indicating that both the alpha image plane and primary image plane are stored within a single CODED_IMAGE( ) syntax structure.

The following files are included in the Alpha_Interleaved file set:

- Maui-32bppBGRA_64x64_Interleaved.jxr
- Maui-40bppCMYKA_64x64_Interleaved.jxr
- Maui-64bppRGBA_64x64_Interleaved.jxr
- Maui-64bppRGBAFixedPoint_64x64_Interleaved.jxr
- Maui-64bppRGBAHalf_64x64_Interleaved.jxr
- Maui-80bppCMYKA_64x64_Interleaved.jxr
- Maui-128bppRGBAFloat_64x64_Interleaved.jxr

These files can be found in the directory Alpha_Interleaved.

7.19 Reference file set Hard_Tile_Boundaries

This collection of 58 .jxr files has the same type of syntax element characteristics as in the BasicAndOverlap_4x4Tile file set (subclause 7.3), except that in the files in Hard_Tile_Boundaries, the syntax element RESERVED_C is set to 9, resulting in DisableTileOverlapFlag being set to TRUE. The remaining note syntax characteristics are repeated here:

- The FREQUENCY_MODE_CODESTREAM_FLAG syntax element is set to FALSE (spatial mode) or TRUE (frequency mode).
- The OVERLAP_MODE is varied between the values 0, 1 and 2.
- The INTERNAL_CLR_FMT is set to YUV444, YUV422, YUV420, or YONLY.
- The QP (for all color channels and all bands) is set to 1 or 10.
- NUM_HOR_TILES_MINUS1 and NUM_VER_TILES_MINUS1 are both set to 1 or 3.

The following files are included in the Hard_Tile_Boundaries file set:

- Seattle_Spat_Ov0_2x2_YUV420_HardTiles_QP1.jxr
- Seattle_Spat_Ov0_2x2_YUV420_HardTiles_QP10.jxr
- Seattle_Spat_Ov0_2x2_YUV422_HardTiles_QP1.jxr
- Seattle_Spat_Ov0_2x2_YUV422_HardTiles_QP10.jxr
- Seattle_Spat_Ov0_2x2_YUV444_HardTiles_QP1.jxr
- Seattle_Spat_Ov0_2x2_YUV444_HardTiles_QP10.jxr

- Seattle_Spat_Ov0_4x4_YONLY_HardTiles_QP10.jxr
- Seattle_Spat_Ov0_4x4_YUV444_HardTiles_QP1.jxr
- Seattle_Spat_Ov0_4x4_YUV444_HardTiles_QP10.jxr
- Seattle_Spat_Ov1_2x2_YUV420_HardTiles_QP1.jxr
- Seattle_Spat_Ov1_2x2_YUV420_HardTiles_QP10.jxr
- Seattle_Spat_Ov1_2x2_YUV422_HardTiles_QP1.jxr
- Seattle_Spat_Ov1_2x2_YUV422_HardTiles_QP10.jxr
- Seattle_Spat_Ov1_2x2_YUV444_HardTiles_QP1.jxr
- Seattle_Spat_Ov1_2x2_YUV444_HardTiles_QP10.jxr
- Seattle_Spat_Ov1_4x4_YONLY_HardTiles_QP10.jxr
- Seattle_Spat_Ov1_4x4_YUV420_HardTiles_QP1.jxr
- Seattle_Spat_Ov1_4x4_YUV420_HardTiles_QP10.jxr
- Seattle_Spat_Ov1_4x4_YUV444_HardTiles_QP1.jxr
- Seattle_Spat_Ov1_4x4_YUV444_HardTiles_QP10.jxr
- Seattle_Spat_Ov2_2x2_YUV420_HardTiles_QP1.jxr
- Seattle_Spat_Ov2_2x2_YUV420_HardTiles_QP10.jxr
- Seattle_Spat_Ov2_2x2_YUV422_HardTiles_QP1.jxr
- Seattle_Spat_Ov2_2x2_YUV422_HardTiles_QP10.jxr
- Seattle_Spat_Ov2_2x2_YUV444_HardTiles_QP1.jxr
- Seattle_Spat_Ov2_2x2_YUV444_HardTiles_QP10.jxr
- Seattle_Spat_Ov2_4x4_YONLY_HardTiles_QP10.jxr
- Seattle_Spat_Ov2_4x4_YUV444_HardTiles_QP1.jxr
- Seattle_Spat_Ov2_4x4_YUV444_HardTiles_QP10.jxr
- Seattle_Freq_Ov0_2x2_YUV420_HardTiles_QP1.jxr
- Seattle_Freq_Ov0_2x2_YUV420_HardTiles_QP10.jxr
- Seattle_Freq_Ov0_2x2_YUV422_HardTiles_QP1.jxr
- Seattle_Freq_Ov0_2x2_YUV422_HardTiles_QP10.jxr
- Seattle_Freq_Ov0_2x2_YUV444_HardTiles_QP1.jxr
- Seattle_Freq_Ov0_2x2_YUV444_HardTiles_QP10.jxr
- Seattle_Freq_Ov0_4x4_YONLY_HardTiles_QP10.jxr
- Seattle_Freq_Ov0_4x4_YUV444_HardTiles_QP1.jxr
- Seattle_Freq_Ov0_4x4_YUV444_HardTiles_QP10.jxr
- Seattle_Freq_Ov1_2x2_YUV420_HardTiles_QP1.jxr
- Seattle_Freq_Ov1_2x2_YUV420_HardTiles_QP10.jxr
- Seattle_Freq_Ov1_2x2_YUV422_HardTiles_QP1.jxr
- Seattle_Freq_Ov1_2x2_YUV422_HardTiles_QP10.jxr
- Seattle_Freq_Ov1_2x2_YUV444_HardTiles_QP1.jxr
- Seattle_Freq_Ov1_2x2_YUV444_HardTiles_QP10.jxr
- Seattle_Freq_Ov1_4x4_YONLY_HardTiles_QP10.jxr
- Seattle_Freq_Ov1_4x4_YUV420_HardTiles_QP1.jxr
- Seattle_Freq_Ov1_4x4_YUV420_HardTiles_QP10.jxr
- Seattle_Freq_Ov1_4x4_YUV444_HardTiles_QP1.jxr
- Seattle_Freq_Ov1_4x4_YUV444_HardTiles_QP10.jxr
- Seattle_Freq_Ov2_2x2_YUV420_HardTiles_QP1.jxr