International Standard

ISO/IEC 21122-4

Information technology — JPEG XS low-latency lightweight image coding system —

Part 4: Conformance testing

Technologies de l'information — Système de codage d'images léger à faible latence JPEG XS —

Partie 4: Essais de conformité

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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.

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 document 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 or www.iec.ch/members_experts/refdocs).

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

This third edition cancels and replaces the second edition (ISO 21122-4:2022), which has been technically revised.

The main changes are as follows:

— reference test streams have been revised;

— a test protocol for testing sequences of codestreams was added;

— additional test streams for the `TDC 444.12` and `TDC MLS 444.12` profiles were added;

— a test protocol for testing the frame buffer bandwidth model was added.

A list of all parts in the ISO/IEC 21122 series can be found on the ISO and IEC websites.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at https://www.iso.org/members.html and https://www.iec.ch/national-committees.

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Introduction

This document is part of a series of standards for a low-latency lightweight image coding system, denoted JPEG XS. It provides the conformance testing procedures for ISO/IEC 21122-1, ISO/IEC 21122-2 and ISO/IEC 21122-3.

This document specifies:

— conformance testing procedures for decoders implementing ISO/IEC 21122-1;

— tests to check which conformance point an ISO/IEC 21122-1 decoder conforms to, that is, whether a decoder satisfies the error bounds required for strict or relaxed conformance;

— conformance testing procedures for decoders implementing ISO/IEC 21122-3;

— tests to check codestreams for conformance to ISO/IEC 21122-1. As such, it provides means to test whether encoder implementations generate syntactically correct codestreams, and whether codestreams generated by such implementations follow the requirements of a particular profile, level, sublevel, frame buffer level and the buffer model implied by them;

— tests to check files for conformance to ISO/IEC 21122-3;

— conformance testing procedures that allow testing whether codestreams conform to any of the profiles specified in ISO/IEC 21122-2;

— conformance testing procedures that allow testing whether codestreams conform to the buffer model specified in ISO/IEC 21122-2 as part of a profile, level, sublevel and frame buffer level;

— codestreams, decoded images, and error metrics to be used within the decoder testing procedures;

— a buffer model test;

— abstract test suites.

This document does not specify:

— testing the reconstruction of a full resolution image from a subsampled image format. In particular, upsampling from 4:2:2 or 4:2:0 to 4:4:4 sampling is a non-normative extension and as such its testing is beyond the scope of this document;

— testing the conversion of the sample values reconstructed by an ISO/IEC 21122-3 decoder to the target colour space by means of the colour specification box of ISO/IEC 21122-3;

— testing of the composition of background and foreground for images reconstructed from ISO/IEC 21122-3 files or codestreams that contain auxiliary channels carrying opacity information;

— testing of the interpolation of a colour filter array image to a full scale colour image; this process is not normatively defined and beyond the scope of this document;

— acceptance testing: the process of determining whether an implementation satisfies acceptance criteria and enables the user to determine whether or not to accept the implementation. This includes the planning and execution of several kinds of tests (e.g. functionality, quality, and speed performance testing) that demonstrate that the implementation satisfies the user requirements;

— performance testing: measures the performance characteristics of an implementation under test (IUT) such as its throughput, responsiveness, etc. under various conditions;

— robustness testing: the process of determining how well an implementation is able to conceal problems from attempting to reconstruct an image from an ill-formed codestream.

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Information technology — JPEG XS low-latency lightweight image coding system —

Part 4: Conformance testing

1 Scope

This document specifies the framework, concepts, methodology for testing, and criteria to be achieved to claim conformance to multiple parts of the ISO/IEC 21122 series. It lists the conformance testing procedures.

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 21122-1, *Information technology — JPEG XS low-latency lightweight image coding system — Part 1: Core coding system*

ISO/IEC 21122-2, *Information technology — JPEG XS low-latency lightweight image coding system — Part 2: Profiles and buffer models*

ISO/IEC 21122-3, *Information technology — JPEG XS low-latency lightweight image coding system — Part 3: Transport and container formats*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 21122-1, ISO/IEC 21122-2, ISO/IEC 21122-3 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
codestream sequence
contiguously enumerated set of codestreams representing a temporally consistent video signal

3.2
executable test suite
set of executable test cases in the form of codestreams that are input into an implementation under test

3.3
interlace
scan method scanning each frame as two fields consisting of the even and odd lines of the frame

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