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Information technology — JPEG XL Image Coding System —

Part 1:
Core coding system

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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.

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).

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. 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).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of 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 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*.

A list of all parts in the ISO/IEC 18181 series can be found on the ISO website.

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 www.iso.org/members.html.

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Information technology — JPEG XL Image Coding System — Part 1: Core Coding System

1 Scope

This International Standard defines a set of compression methods for coding one or more images of continuous-tone greyscale, or continuous-tone colour, or multichannel digital samples.

This International Standard:

- specifies decoding processes for converting compressed image data to reconstructed image data;
- specifies a codestream syntax containing information for interpreting the compressed image data;
- provides guidance on encoding processes for converting source image data to compressed 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 10918-1:1993(E), *Information technology — Digital compression and coding of continuous-tone still images: Requirements and guidelines*

ISO 10526:1999/CIE S005/E-1998, *CIE Standard Illuminants for Colourimetry*

IEC 61966-2-1:1999, *Multimedia systems and equipment — Colour measurement and management — Part 2-1: Colour management — Default RGB colour space — sRGB*

ISO 15076-1:2010, *Image technology colour management — Architecture, profile format and data structure — Part 1: Based on ICC.1:2010*

ISO/IEC 14882:2011, *Information technology — Programming languages — C++*

ISO/IEC/IEEE 60559:2011, *Information technology — Microprocessor Systems — Floating-Point arithmetic*

Rec. ITU-T H.273 | ISO/IEC 23091-2:2019(E), *Information technology — Coding-independent code points — Part 2: Video*

Rec. ITU-R BT.709-6, *Parameter values for the HDTV standards for production and international programme exchange*

Rec. ITU-R BT.2100-1, *Image parameter values for high dynamic range television for use in production and international programme exchange*

SMPTE ST 428-1, *D-Cinema Distribution Master Image Characteristics*

INTERNET ENGINEERING TASK FORCE (IETF). RFC 7932: *Brotli Compressed Data Format* [online].

Edited by J. Alakuijala and Z. Szabadka. July 2016 [viewed 2019-08-05].

Available at https://tools.ietf.org/html/rfc7932

3   Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1   Data storage

3.1.1

bit

binary digit (0 or 1)

3.1.2

byte

8 consecutive bits encoding a value between 0 and 255

3.1.3

big endian

value representation with bytes in most to least-significant order

3.1.4

bitstream

sequence of bytes from which bits are read starting from the least-significant bit of the first byte

3.1.5

JPEG marker

two-byte code in which the first byte is 255 and the second byte is a value v with 1 <= v <= 254, as specified in ISO/IEC 10918-1

3.1.6

codestream

bitstream   plus   associated   JPEG   markers

2

3.1.7

bundle

structured data consisting of one or more fields

3.1.8

field

numerical value or bundle, or an array of either

3.1.9

histo

array of unsigned integers, used for entropy coding

3.1.10

set

unordered collection of elements

3.2 Inputs

3.2.1

pixel

vector of dimension corresponding to the number of channels, consisting of samples

3.2.2

sample

integer or real value, of which there is one per channel per pixel

3.2.3

greyscale

image representation in which each pixel is defined by a single sample representing intensity (either luminance or luma depending on the ICC profile)

3.2.4

continuous-tone image

image whose samples consist of more than one bit

3.2.5

opsin