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Information technology — JPEG 2000 image coding system —

Part 1: Core coding system

AMENDMENT 2: Inclusion of additional colourspace

*Technologies de l'information — Système de codage d'image
JPEG 2000 —*

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Partie 1: Système de codage de noyau

AMENDEMENT 2: Inclusion d'espace chromatique additionnel

Please see the administrative notes on page iii

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Reference number
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INTERNATIONAL STANDARD

ITU-T RECOMMENDATION

**INFORMATION TECHNOLOGY – JPEG 2000 IMAGE CODING SYSTEM –
CORE CODING SYSTEM**

**AMENDMENT 2
Inclusion of additional colourspace**

1) Clause 2

Add the following reference:

- IEC 61966-2-1:1998/Amd.1, Multimedia systems and equipment – Colour measurement and management –Part 2-1: Colour management – Default RGB colour space – sRGB – Amendment 1.

2) Subclause I.3.1

Rewrite the second sentence of the first paragraph as follows (with the changes underlined):

This method handles the specification of sRGB, greyscale, and sYCC images.

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3) Subclause I.5.3.3

Rewrite the last sentence of the EnumCS definition as follows (with the changes underlined):

Valid EnumCS values for the first colourspace specification box in conforming files are limited to 16, 17, and 18 as defined in Table I-10.

4) **Table I-10**

Add a new row defining colour space 18 (highlighted):

Table I-10 — Legal EnumCS values (Amended)

Value	Meaning
16	sRGB as defined by IEC 61966-2-1
17	greyscale: A greyscale space where image luminance is related to code values using the sRGB non-linearity given in Eqs. (2) through (4) of IEC 61966-2-1 (sRGB) specification: (The equations are the same as ones defined in IS) where Y_{lin} is the linear image luminance value in the range 0.0 to 1.0. The image luminance values should be interpreted relative to the reference conditions in Section 2 of IEC 61966-2-1.
18	sYCC as defined by IEC 61966-2-1 Amd.1: It is not recommended to use the ICT or RCT specified in Annex G of this Recommendation International Standard with sYCC image data. NOTE — See Annex J.16 for guidelines on handling YCC codestreams.
Other values	Reserved for ISO uses

5) **Table I-18**

Move the YCbCr row under Greyscale as follows (highlighted):

Table I-18 — Colours indicated by the Asoc¹ field (Amended)

Class of colour space	Colour indicated by the following value of the Asoc ¹ field			
	1	2	3	4
RGB	R	G	B	
Greyscale	Y			
YCbCr	Y	C _b	C _r	
The following colour space classes are listed for future reference, as well as to aid in understanding of the use of the Asoc ¹ field.				
XYZ	X	Y	Z	
Lab	L	a	b	
Luv	L	u	V	
Yxy	Y	x	y	
HSV	H	S	V	
HLS	H	L	S	
CMYK	C	M	Y	K
Jab	J	a	b	
n colour colour spaces	1	2	3	4

6) Annex J

Add the following immediately after J.14 as a new clause:

J.15 Guidelines on handling YCC codestream

J.15.1 Introduction

There are numerous applications and devices in both still and motion consumer imaging that cannot be considered without support for YCC and direct production of sub-sampled chrominance data. In such cases, the signaling of multiple component transformation within the codestream may not be necessary. This section provides guidelines on how to handle YCC data.

However, it is not intended to imply that YCC data shall be sub-sampled.

J.15.2 Use of multiple component transformation

It is not necessary to use the multiple component transformation in order to support YCC data as the components are already decorrelated. Therefore, the multiple component transformation signal of the SGcod parameter defined in Table A-17 shall always be "0000 0000".

J.15.3 Using the JP2 format

There are devices that will automatically output component transformed YCC data in sYCC colourspace. The JP2 format supports these cases by specifying the EnumCS value to "18" as defined in Table I-10.

J.15.4 Chrominance offset

Chrominance offset (a common term for the sub-sampling of chrominance components and their relative offsets) is specified in a JPEG 2000 codestream using the CRG marker (see Annex 9.1). Figure J-13 to Figure J-16 shows examples of well-known chrominance offset patterns. Table J-25 shows example SIZ (see Annex A.5.1) and CRG maker values for each pattern.

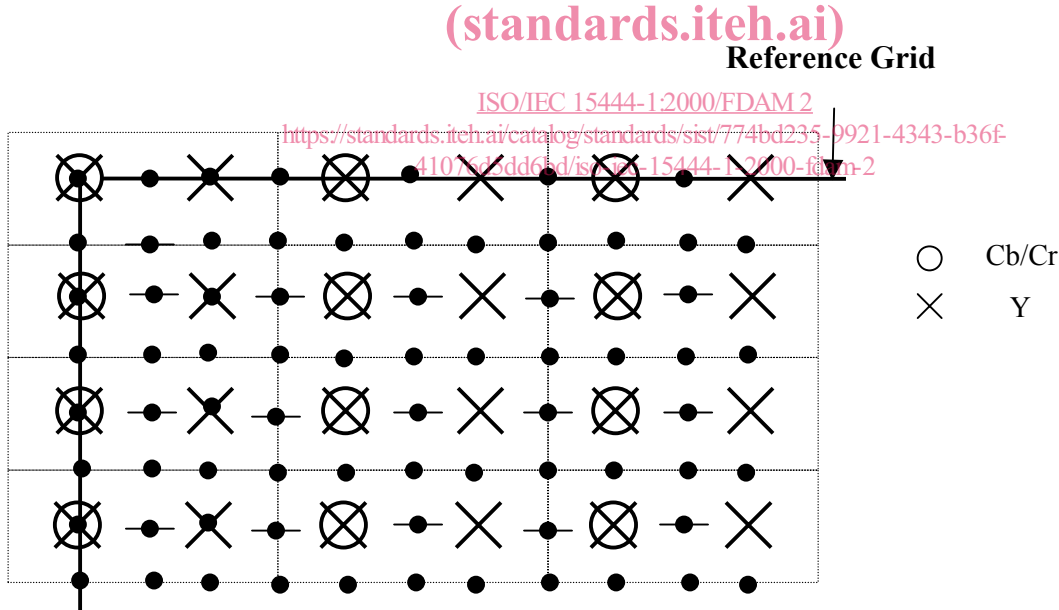


Figure J-13 — 4:2:2 format (co-sited)

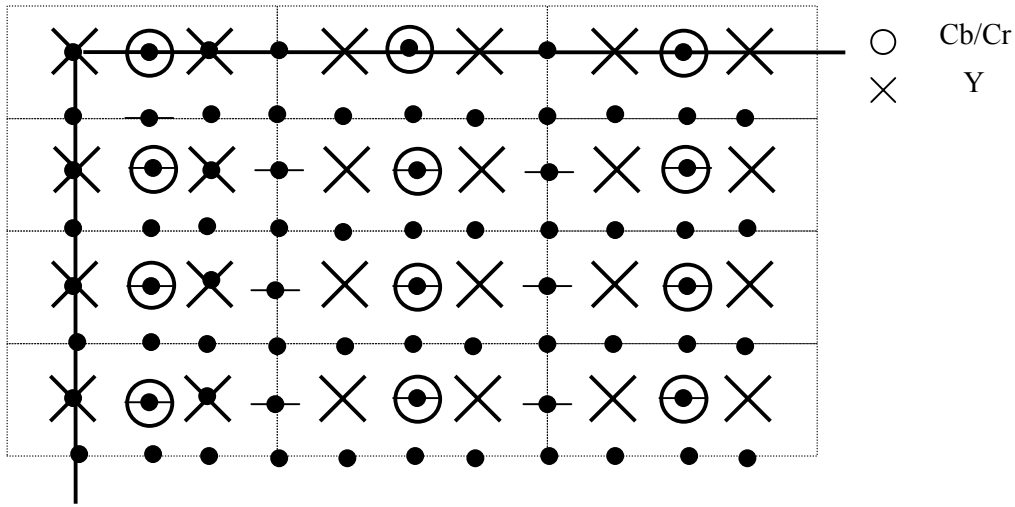


Figure J-14 — 4:2:2 format (centered)

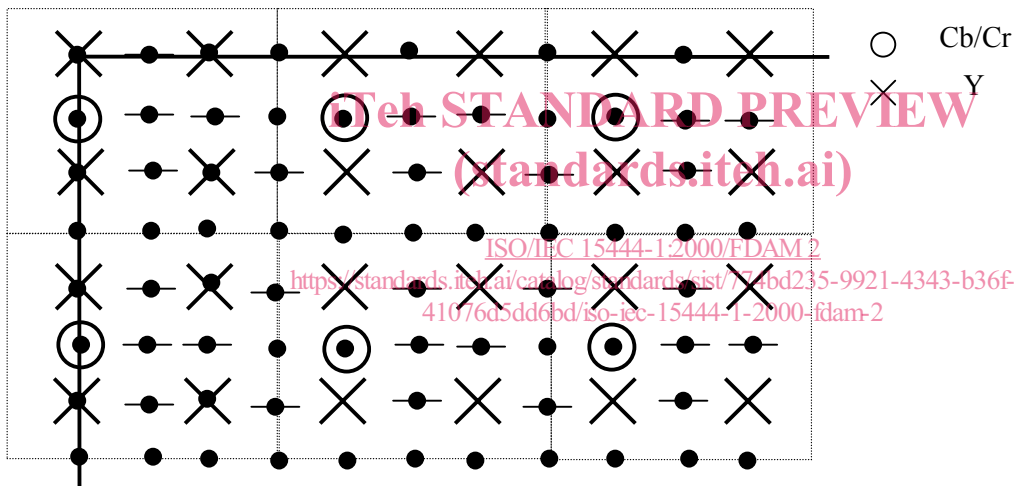


Figure J-15 — 4:2:0 format (co-sited)

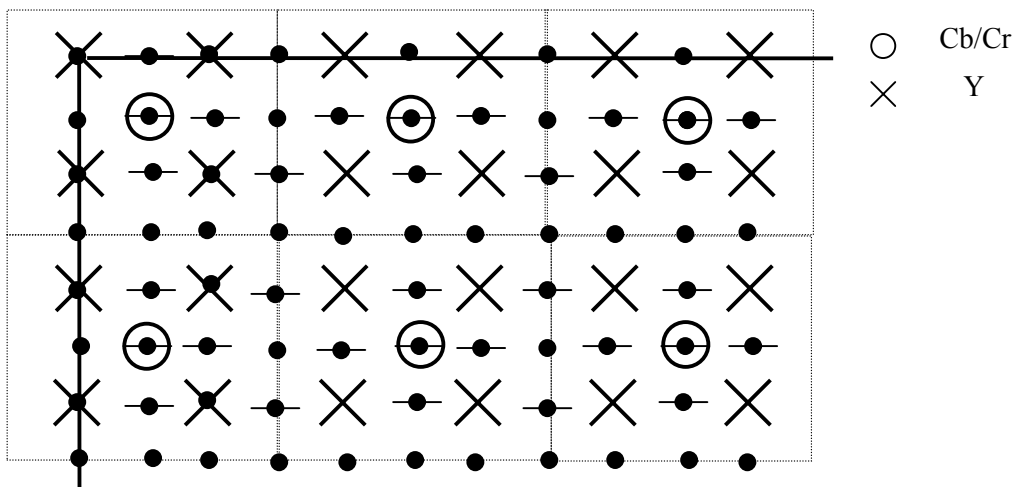


Figure J-16 — 4:2:0 format (centered)

Table J-25 — CRG (Component Registration) Value

		Figure J-13	Figure J-14	Figure J-15	Figure J-16
Y	(XR _{siz} , YR _{siz})	(2, 2)	(2, 2)	(2, 2)	(2, 2)
	(XO _{siz} , YO _{siz})	(0, 0)	(0, 0)	(0, 0)	(0, 0)
	(X _{cr} _g , Y _{cr} _g)	(0, 0)	(0, 0)	(0, 0)	(0, 0)
Cb	(XR _{siz} , YR _{siz})	(4, 2)	(4, 2)	(4, 4)	(4, 4)
	(XO _{siz} , YO _{siz})	(0, 0)	(0, 0)	(0, 0)	(0, 0)
	(X _{cr} _g , Y _{cr} _g)	(0, 0)	(16384, 0)	(0, 16384)	(16384, 16384)
Cr	(XR _{siz} , YR _{siz})	(4, 2)	(4, 2)	(4, 4)	(4, 4)
	(XO _{siz} , YO _{siz})	(0, 0)	(0, 0)	(0, 0)	(0, 0)
	(X _{cr} _g , Y _{cr} _g)	(0, 0)	(16384, 0)	(0, 16384)	(16384, 16384)

NOTE — The CRG value is defined so that all component samples shall be located in the reference grid points. Therefore, (XR_{siz}, YR_{siz})=(2,2) for Y does not mean samples of Y are also sub-sampled.

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