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Electronic still picture imaging — Removable memory — Part 3: XMP for digital photography

*Image électronique de photographie — Mémoire amovible —
Partie 3: Utilisation du XMP*

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Contents

Page

Foreword	v
Introduction.....	vi
1 Scope	1
2 Normative reference	1
3 Terms and definitions.....	1
4 Reference model and usage.....	2
4.1 General considerations	2
4.2 Native metadata properties and their usage	2
5 XMP namespace.....	3
5.1 General	3
5.2 Extensions.....	3
6 Metadata definitions	4
6.1 Metadata lists	4
6.2 Metadata definitions	9
6.2.1 ApertureValue	9
6.2.2 Artist	9
6.2.3 BodySerialNumber	9
6.2.4 CameraOwnerName	10
6.2.5 CaptureSet.....	10
6.2.6 CFAPattern	10
6.2.7 ColourEncoding	10
6.2.8 Copyright.....	11
6.2.9 DateTimeDigitized	11
6.2.10 DateTimeOriginal	11
6.2.11 DateTime.....	11
6.2.12 DigitalZoomRatio	11
6.2.13 Editor	12
6.2.14 ExposureBiasValue.....	12
6.2.15 ExposureIndex	12
6.2.16 ExposureProgram	12
6.2.17 Faces.....	13
6.2.18 Favorites	13
6.2.19 Flash	14
6.2.20 FocalLength.....	14
6.2.21 FocalLengthIn35mmFilm.....	14
6.2.22 GPS	14
6.2.23 ImageAspectRatio.....	16
6.2.24 ImageDescription	16
6.2.25 ImageLength.....	16
6.2.26 ImageTileSet.....	17
6.2.27 ImageWidth.....	17
6.2.28 LensMake	17
6.2.29 LensModel	17
6.2.30 LensSerialNumber	17
6.2.31 LensSpecification	18
6.2.32 LightSource	18
6.2.33 Make.....	19
6.2.34 MaxApertureValue	19
6.2.35 MeteringMode.....	19

6.2.36	Model	19
6.2.37	MultiSpectralCaptureSet.....	19
6.2.38	OECF.....	20
6.2.39	Orientation.....	20
6.2.40	SceneLuminance.....	20
6.2.41	Self-TimerMode	21
6.2.42	ShutterSpeedValue	21
6.2.43	Software.....	21
6.2.44	SubjectArea	21
6.2.45	SubjectDistance	22
6.2.46	UserComments	22
Annex A (normative) XMP metadata use with Exif image format		23
A.1	Overview	23
A.2	Uncompressed image data.....	23
A.3	Compressed image data.....	23
Annex B (normative) XMP metadata use with TIFF/EP image format		25
B.1	Requirements	25
Annex C (normative) XMP metadata use with JPEG 2000 image format		26
C.1	Requirements	26
Annex D (normative) Value forms and value types		27
D.1	Value forms	27
D.2	Value types	27
D.2.1	Overview	27
D.2.2	Basic value types	27
D.2.3	Derived value types	28
D.2.4	Exif namespace value types.....	29
Bibliography.....		33

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member 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 shall not be held responsible for identifying any or all such patent rights.

ISO 12234-3 was prepared by Technical Committee ISO/TC 42, *Photography*.

ISO 12234 consists of the following parts, under the general title *Photography — Metadata*:

- *Part 1: Basic removable-memory model*
- *Part 2: TIFF/EP image data format*
- *Part 3: XMP for digital photography (Photo XMP)*

Introduction

Metadata enables digital images to be more easily searched and located (e.g. by knowing more about the image), more appropriately processed and printed (e.g. by knowing the picture taking conditions), and more appropriately stored and shared (e.g. by knowing the GPS location of the image and the copyright owner).

Several different TIFF-based metadata formats are commonly used in digital cameras, while XML-encoded metadata is commonly used in on-line image databases.

The purposes of this standard are, first, to define unambiguously a mapping for metadata properties that are most relevant to digital photography into XMP and, second, to document the meaning of each metadata item.

This International Standard is independent of the format of the image file, could be used inside any image file, and could be used in databases of image-related metadata.

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Photography — Metadata — Part 3: XMP for digital photography

1 Scope

This International Standard defines an XMP namespace for the metadata used in digital photography applications that is formatted for exchange using the syntax of the XML and provides standard definitions of this metadata.

2 Normative reference

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies..

ISO/IEC 10646, *Information technology -- Universal Coded Character Set (UCS)*

ISO 12232, *Photography — Digital still cameras — Determination of exposure index, ISO speed ratings, standard output sensitivity, and recommended exposure index*

ISO 16684-1 *Graphic technology -- Extensible metadata platform (XMP) specification -- Part 1: Data model, serialization and core properties*

IETF RFC 3986, *Uniform Resource Identifier (URI): Generic Syntax*, January 2005

<http://www.ietf.org/rfc/rfc3986.txt>

Dublin Core Metadata Element Set, Version 1.1

<http://dublincore.org/documents/dces/>

Error! Hyperlink reference not valid.

3 Terms and definitions

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

3.1

Exif

an abbreviation of "Exchangeable image file format for digital still cameras"

3.2

namespace

a set of unique names that are used to unambiguously label the elements in related data sets

3.3

property

named container for a metadata value at the top level of an XMP packet

3.4

URI

a sequence of text characters that identifies an abstract or physical resource on the Internet as defined in IETF RFC 3986 for specifying the Internet location of a contributing namespace.

4 Reference model and usage

4.1 General considerations

Figure 1 summarizes the reference model for this part of ISO 12234.

This International Standard defines metadata for digital photography and identifies the XMP namespaces used to encode this metadata.

The metadata shall be encoded using the XMP data model and serialization defined in ISO 16684-1.

The metadata includes a number of items that are defined in either ISO 16684-1, in the Guidelines for Handling Image Metadata, version 2.0, or in CIPA DC-010-2012 Exif 2.3 Metadata for XMP, as indicated in the descriptions of the metadata items included in clause 6.

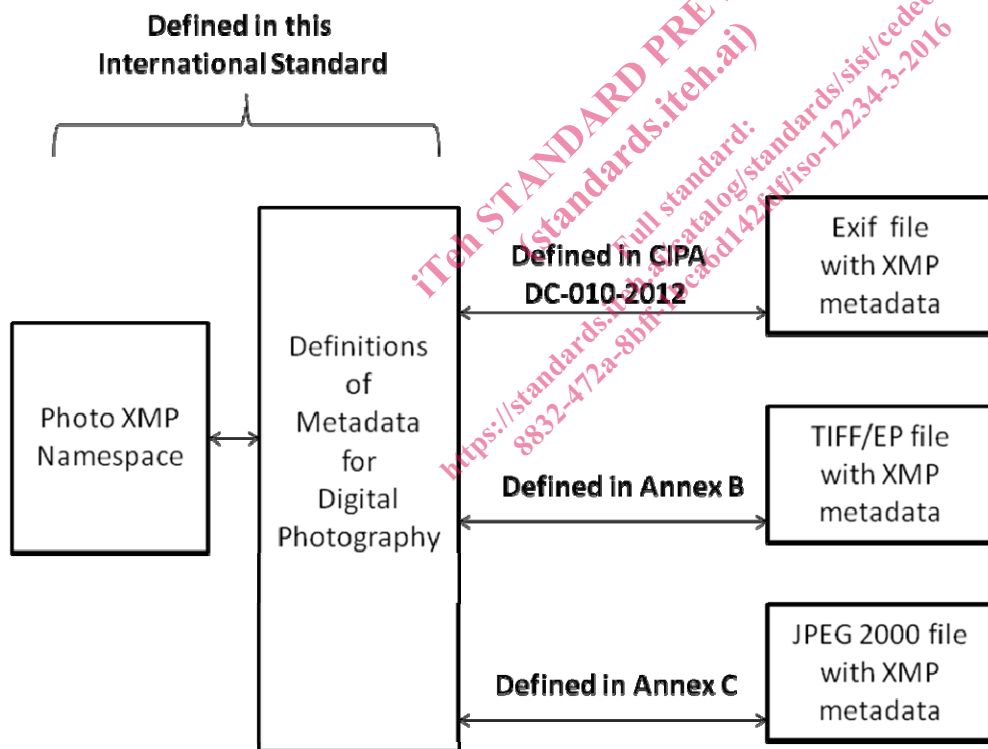


Figure 1 — Reference model

4.2 Native metadata properties and their usage

For Exif, TIFF and JPEG 2000 file formats supported technical metadata items, only TIFF tags, Exif tags and/or JPEG 2000 boxes should be stored respectively when any one of these file formats is used with the Photo XMP packet. These are Photo XMP properties in the dc:, tiff:, exif:, exifEX and xmp: namespaces which are defined in clause 5.

Refer to the section 4.2.2.1 and 4.2.3.1 of GUIDELINES FOR HANDLING IMAGE METADATA, Version 2.0, November 2010 [8] for details.

5 XMP namespace

5.1 General

The XMP namespaces are described in this section. Since definitions from current XMP namespaces are used when these definitions are appropriate, metadata properties in this International Standard are subset of the properties in these namespaces. Users shall note interpretation from Photo XMP namespaces to these XMP namespaces is not always possible. A new namespace is used only when this is required in order to address newly defined metadata items.

The namespaces in Table 1 shall be used, and the preferred namespace prefixes should be used.

Table 1 — Namespaces used in Photo XMP metadata

Name	URI	Recommended prefix
Dublin Core	http://purl.org/dc/elements/1.1/	dc
Exif 2.21 and Exif 2.3	http://cipa.jp/exif/1.0/	exifEX
Exif 2.2 or earlier	http://ns.adobe.com/exif/1.0/	exif
TIFF Rev. 6.0	http://ns.adobe.com/tiff/1.0/	tiff
XMP	http://ns.adobe.com/xap/1.0/	xmp
PhotoXMP	http://imaging.org/pxmp/1.0/	pxmp

NOTE For convenience in this document, XMP names are commonly written in a **prefix:local** style, for example, **dc:title**. The relevant URI for the prefix used in this document is either explicit or clear from local context.

5.2 Extensions

Properties and definitions for new metadata may be added to existing component and XMP namespaces if they do not cause problems for existing processors and applications of the metadata.

The names and definitions of properties in existing namespaces shall remain unchanged.

If it is necessary to change the definition of a property, a new property shall be created, and the old one may be deprecated.

A new version of a namespace and definitions with a new URI may be created so that there is no logical connection between the two versions and the same local name in two different namespaces refers to distinct properties and definitions.

6 Metadata definitions

6.1 Metadata lists

Photo XMP metadata items are defined in this section. A list of these items, along with a brief description and the XMP name, is given in Table 2.

Table 2 — Photo XMP metadata list

Metadata name	Description	XMP name	Type
ApertureValue	Aperture value, unit is APEX	exif:ApertureValue	Rational
Artist	Person who captured the image	dc:creator	Ordered array of ProperName
BodySerialNumber	Serial number of the digital camera used to capture the image.	exifEX:BodySerialNumber	Text
CameraOwnerName	This tag records the owner of a camera used in photography as an ASCII string.	exifEX:CameraOwnerName	ProperName
CaptureSet	Image position within a set of captured images.	pxmp:CaptureSet	Structure
CFAPattern	Colour filter array geometric pattern of the image sensor.	exif:CFAPattern	CFA-Pattern
ColourEncoding	Colour encoding information	pxmp:ColourEncoding	Closed choice of integers
Copyright	Image copyright holder and optional copyright statement.	dc:rights	LanguageAlternative
DateTimeDigitized	The date and time when the image was stored as digital data	xmp:CreateDate	Date
DateTimeOriginal	Date and time when the image was captured	exif:DateTimeOriginal	Date
DateTime	Date and time that the image was last modified	xmp:ModifyDate	Date
DigitalZoomRatio	Indicates the digital zoom ratio when the image was shot.	exif:DigitalZoomRatio	Rational
Editor	Person(s) who edited the image file	pxmp:Editor	Ordered array of ProperName
ExposureBiasValue	Exposure bias in exposure value, unit is APEX.	exif:ExposureBiasValue	Rational

Metadata name	Description	XMP name	Type
ExposureIndex	Exposure index used by the camera when the image was captured	exif:ExposureIndex	Rational
ExposureProgram	Class of camera exposure program used when the image was captured.	exif:ExposureProgram	Closed choice of integer
Faces	Locations of faces in the image, optionally includes the names of the faces	pxmp:Faces	Structure
Favorites	Identifies whether the image is a "favourite" image	pxmp:Favorites	Closed choice of integer
Flash	State of camera illumination source when the image was captured.	exif:Flash	Structure
FocalLength	Actual focal length of the lens when the image was captured	exif:FocalLength	Rational
FocalLengthIn35mm Film	Indicates the equivalent focal length assuming a 35mm film camera, in mm	exif:FocalLengthIn35mmFilm	Integer
GPS	Location of the camera when the image was captured	exif:GPS	Structure
ImageAspectRatio	Ratio of image width to image height.	pxmp:ImageAspect	Rational
ImageDescription	Title of the image	dc:description	LanguageAlternative
ImageLength	Number of rows of pixels in the image	tiff:ImageLength	Integer
ImageTileSet	The image position of a series of captured images of 1-D or 2-D panoramic series	pxmp:ImageTileSet	ImageTile
ImageWidth	Number of columns of pixels in the image	tiff:ImageWidth	Integer
LensMake	Records the lens manufacturer as an	exifEX:LensMake	ProperName

Metadata name	Description	XMP name	Type
	ASCII string.		
LensModel	Records the lens's model name and model number as an ASCII string.	exifEX:LensModel	Text
LensSerialNumber	Records the serial number of the interchangeable lens that was used in photography as an ASCII string.	exifEX:LensSerialNumber	Text
LensSpecification	notes minimum focal length, maximum focal length, minimum f/number in the minimum focal length, and minimum f/number in the maximum focal length, which are specification information for the lens that was used in photography.	exifEX:LensSpecification	Ordered array of Rational
LightSource	Light source which illuminated the scene that is depicted in the image file	exif:LightSource	Closed choice of integers
Make	Manufacturer of the digital camera used to capture the image.	tiff:Make	ProperName
MaxApertureValue	Smallest f/number of lens in aperture value, unit is APEX.	exif:MaxApertureValue	Rational
MeteringMode	Mode used for exposure metering when the image was captured.	exif:MeteringMode	Closed choice of integer
Model	Model name of the digital camera used to capture the image.	tiff:Model	ProperName
MultiSpectralCaptureSet	the spectral capture conditions of a multispectral image set	pxmp:MultiSpectralCaptureSet	MultiSpectral
OECF	Opto-Electronic Conversion Function as specified in ISO 14524.	exif:OECF	OECF/ SFR
Orientation	Orientation of the	tiff:Orientation	Closed choice of