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Photography — Archiving Systems — Vocabulary

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National foreword

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ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
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Foreword

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The committee responsible for this document is ISO/TC 42, *Photography*.

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Introduction

This International Standard provides a vocabulary which standardizes the use and meaning of terms associated with archiving systems for photography. These terms are drawn from traditional photography, digital photography, image permanence and information technology.

This International Standard is organized alphabetically and follows natural (English) word order wherever possible. The source documents for many of the definitions are International Standards developed by ISO/TC 42. Where possible, users are advised to verify if a more recent edition of the source document has been published, which contains an updated version of the term and definition. Future revisions of this International Standard will include updated terms and definitions consistent with the source documents at the time the revision is prepared.

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INTERNATIONAL STANDARD ISO 19262:2015(E)

Photography — Archiving Systems — Vocabulary

1 Scope

This International Standard defines terms used in the area of imaging system capability qualification for archival recording and approval.

Only terms related to this area are included. These terms are relevant to the current tasks or are of general interest in imaging system capability qualification for archival recording and approval.

2 Normative references

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.

There are no normative references cited in this document.

3 Terms and definitions

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

3.1
acutance
numerical value that correlates to some extent with subjective image sharpness

3.2
automatic document feeder
ADF
powered device to feed microforms, films or paper into a scanner for capture

[SOURCE: ISO 12651-1:2012, 4.10]

3.3
Adobe RGB 1998
three-component colour image encoding defined in Adobe RGB (1998) colour image encoding

[SOURCE: ISO 12640-4:2011, 3.1]

3.4
aliasing
output image artefacts that occur in a digital imaging system for input images having significant energy at frequencies higher than the Nyquist frequency of the system

Note 1 to entry: These artefacts usually manifest themselves as moiré patterns in repetitive image features or as jagged “stairstepping” at edge transitions.

[SOURCE: ISO 16067-1:2003, 3.2]

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3.5
ambient light
illumination that remains present in an area when some indicated light source (such as a specialized light, projector, or self-luminous display) is turned off

Note 1 to entry: Ambient light can be natural or artificial light. Ambient light is generally uncontrolled and can be highly variable, posing a possible risk to image quality. The level of ambient light should be minimized in relation to the level of light produced by the imaging system.

[SOURCE: ISO 4246:1994, 15]

3.6
array (imaging)
orderly arrangement of individual sensor elements in image capture devices

Note 1 to entry: In digital imaging, there are primarily three array types: two dimensional or area arrays, one dimensional or linear arrays, and tri-linear arrays consisting of three consecutive linear arrays of red, green, and blue sensitive sensor elements.

3.7
artifact
general term to describe a broad range of undesirable flaws or distortions in digital reproductions produced during capture or data processing

Note 1 to entry: Some common forms of image artifacts include noise, chromatic aberration, blooming, interpolation, and imperfections created by compression, among others.

3.8
aspect ratio
ratio of length to width of an object

[SOURCE: ISO 13794:1999, 2.10]

3.8.1
image aspect ratio
ratio of the image width to the image height

[SOURCE: ISO 15740:2008, 3.16]

3.8.2
pixel aspect ratio
ratio of the distance between sampling points in the two orthogonal sampling directions

Note 1 to entry: If the distances are equal, the pixel aspect ratio equals 1:1, and is said to be “square”.

Note 2 to entry: See also image aspect ratio (3.8.1).

[SOURCE: ISO 12231:2005, 2.6.2]

3.8.3
sampling aspect ratio
ratio of the sample spacing in the two orthogonal sampling directions

[SOURCE: ISO 12231:2012, 3.155]

3.9
banding (imaging)
unwanted stripes or bands that occur in a digital image

Note 1 to entry: Bands are usually caused by fixed pattern noise of linear sensors in scanners or interference problems between electronic parts of a camera.

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3.10
binary image
digitized image consisting of an array of pixels, each of which has a value of 0 or 1, whose values are normally represented by dark and bright regions on the display screen or by the use of two distinct colours

[SOURCE: ISO 13322-1:2004, 3.1.3]

3.11
bit depth
maximum number of discrete levels available for the digitized representation of the signal intensity, represented as a power of two

Note 1 to entry: The term can be confusing since it is sometimes used to represent bits per pixel and at other times, the total number of bits used multiplied by the number of total channels. For example, a typical colour image using 8 bits per channel is often referred to as a 24-bit colour image (8 bits × 3 channels). Colour scanners and digital cameras typically produce 24 bit (8 bits × 3 channels) or 36 bit (12 bits × 3 channels) images, and high-end devices can produce 48 bit (16 bit × 3 channels) images. A grayscale scanner would generally be 1 bit for monochrome or 8 bit for grayscale (producing 256 shades of gray). Bit depth is also referred to as colour depth.

[SOURCE: ISO 22493:2008, 5.2.2.2.1]

3.12
bit rate
number of bits transmitted per second

[SOURCE: ISO/IEC 18000-2:2009, 4.2]

3.13
bitonal (digital) image
see binary image

3.14
black point
neutral colour with the lowest luminance that can be produced by an imaging medium in normal use, measured using the specified measurement geometry

[SOURCE: ISO 12231:2012, 3.104]

3.15
blooming
phenomenon which occurs when a pixel of the solid-state imaging device is so illuminated that the number of generated electrons is greater than can be stored

Note 1 to entry: This excess of electrons can spread into neighbouring cells. As a result, the highlight areas of the scene appear increased in size on the television screen.

[SOURCE: IEC 808-04-03]

3.16
bits per pixel
see bit depth

3.17
brightness
attribute of a visual sensation according to which an area appears to emit more or less light

Note 1 to entry: Brightness is among the three attributes that specify colour. The other two attributes are hue and saturation.

[SOURCE: ISO/IEC 8613-2:1995]

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3.18
checkerboard
regular squared dark and bright structure on a surface like the one used on a chess board

3.19
chroma
C*
chromatic
chromaticiness, colourfulness, of an area judged as a proportion of the brightness of a similarly illuminated area that appears white or hrightly transmitting

[SOURCE: ISO/IEC 8613-2:1995]

3.20
chromatic aberration
image defect caused when different wavelengths of light are focused at different distances from a lens (longitudinal chromatic aberration) or when the scale of the image at different wavelengths is different (lateral chromatic aberration)

Note 1 to entry: This results in varying degrees of sharp focus at the image sensor or shifted objects in an image depending on the colour or wavelength of light. Chromatic aberration is seen as "colour fringing," and is most noticeable in an image at edges with high contrast.

3.21
chromaticity
attribute of a colour stimulus defined by its trichromatic coordinates or by its dominant or complementary wavelength and purity characteristics taken together

[SOURCE: IEC 723-08-33]

3.22
chromaticity coodinates
ratios of each of the members of a set of CIE tristimulus values to their sum

[SOURCE: ISO 105-A08:2001, 2.4]

3.23
CIELAB colour space
three-dimensional, approximately uniform colour space, produced by plotting, in rectangular coordinates the component values are L*, a*, b*

[SOURCE: ISO 5631-1:2009, 3.5]

[SOURCE: CIELAB colour space is specified in CIE Publication 15]

3.24
clipping
abrupt truncation of a signal when the signal exceeds a system's ability to differentiate signal values above or below a particular level

Note 1 to entry: In the case of images, the result is that there is no differentiation of light tones when the clipping is at the high end of signal amplitude and no differentiation of dark tones when clipping occurs at the low end of signal amplitude. For digital audio, clipping occurs when the signal is restricted by the selected bit depth (which represents amplitude). In a system using 16-bit signed integers, 32 767 is the largest positive value that can be represented. If input levels are set so that excursions above that are permitted, then clipping will result and some information will be lost.

Note 2 to entry: If clipping occurs in only one or two channels of an RGB image, the hue will change instantly. For example, Caucasian skin tones can go reddish yellow when highlight clipping occurs in the red channel only.

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3.24.1
clipping (black)
truncation of a signal when the signal represents a tone darker than the system's ability to differentiate

Note 1 to entry: Excessive black clipping tends to result in "blocked-up" or featureless shadows in an image.

3.24.2
clipping (highlights)
truncation of a signal when the signal represents a tone lighter than the system's ability to differentiate

Note 1 to entry: Excessive highlight clipping tends to result in "blown-out" or featureless highlights in an image.

3.25
codec
device or algorithm used to perform encoding/decoding and compression/decompression of the digital data

Note 1 to entry: This may be combined with converting analog signals into digital (and vice versa).

[SOURCE: ISO/TR 16056-1:2004, 3.16]

3.26
colorimeter
instrument for measuring colorimetric quantities, such as the tristimulus values of a colour stimulus

[SOURCE: IEC 845-05-18]

Note 1 to entry: Colorimeters are the primary device used to evaluate the colour qualities of display monitors. There are two basic types of colorimeters: tristimulus colorimeter and spectrocolorimeters.

3.27
colorimetry
measurement of colours based on a set of conventions

[SOURCE: IEC 845-05-10]

3.28
colour
sensation resulting from the visual perception of radiation of a given spectral composition

[SOURCE: ISO 4618:2006, 2.57]

3.29
colour accuracy
ability of an imaging system to reproduce the colours of some intended object, as specified using some colour difference metric

Note 1 to entry: The reference object against which the colour accuracy is measured can be, for example, an original scene, the colorimetry of an original scene chromatically adapted to some different adopted white, or an image file describing a reproduction on some reference medium.

3.30
colour cast
tint of a particular colour, usually unwanted, which affects the whole of a photographic image

3.31
colour channel
data channel that represents some specific aspect relating to colour in an image

Note 1 to entry: A colour channel stores the colour information for one colour component of a colour model. For example, the RGB colour model has three separate colour channels; one for red, one for green and one for blue.

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3.32
colour constancy
high level of invariance of the visual system relative to changes in the spectral qualities of the illumination to the perception of reflective colours

3.33
colour depth
here usually being the bit depth per colour channel but sometimes also used for the sum of the bit depth's for all colour channels

Note 1 to entry: See bit depth.

3.34
colour difference metric
metric based on some specified mathematical difference between the points representing a test specimen and its reference in an appropriate colour space

3.35
colour distance
see colour difference

3.36
colour encoding
quantized digital encoding of a colour space, encompassing both colour space encodings and colour image encodings

[SOURCE: ISO/TS 22028-3:2006, 3.5]

3.37
colour filter array
mosaic or stripe layer of coloured transmissive filters fabricated on top of an imager in order to obtain a colour image from a single image sensor

[SOURCE: ISO 12231:2005, 2.8]

3.38
colour fringing
existence of coloured fringes in the area of high contrast structures in images

Note 1 to entry: One of the sources for these is lateral and longitudinal chromatic aberration.

3.39
colour gamut
solid in a colour space, consisting of all those colours that are either: present in a specific scene, artwork, photograph, photomechanical, or other reproduction; or capable of being created using a particular output device and/or medium.

Note 1 to entry: See also luminance ratio (3.155).

[SOURCE: ISO/TS 22028-3:2006, 3.6]

3.40
colour image encoding
digital encoding of the colour values for a digital image, including the specification of a colour space encoding, together with any information necessary to properly interpret the colour values, such as the image state, the intended image viewing environment and the reference medium

Note 1 to entry: In some cases, the intended image viewing environment will be explicitly defined for the colour image encoding. In other cases, the intended image viewing environment may be specified on an image-by-image basis using metadata associated with the digital image.

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Note 2 to entry: Some colour image encodings will indicate particular reference medium characteristics, such as a reflection print with a specified density range. In other cases, the reference medium will not be applicable, such as with a scene-referred colour image encoding, or will be specified using image metadata.

Note 3 to entry: Colour image encodings are not limited to pictorial digital images that originate from an original scene, but are also applicable to digital images with content, such as text, line art, vector graphics and other forms of original artwork.

[SOURCE: ISO/TS 22028-3:2006, 3.7]

3.41
colour management
communication of the associated data required for unambiguous interpretation of colour content data and application of colour data conversions, as required, to produce the intended reproductions

[SOURCE: ISO 15076-1:2010, 3.1.11]

3.42
colour misregistration
colour-to-colour spatial dislocation of otherwise spatially coincident colour features of an imaged object

3.43
colour model
way of specifying or describing a colour numerically

EXAMPLE In the 24-bit-deep RGB colour model, the intensity of each of the red, green and blue components of the model (8 bits for each channel) are represented on a scale from 0 to 255.

Note 1 to entry: Common examples include RGB, HSV and CMYK.

Note 2 to entry: The lowest intensity of any colour is represented by 0 and the highest intensity by 255.

Note 3 to entry: There are two main categories of colour models: additive and subtractive. Additive colour models (such as RGB) are based on transmitted light while subtractive colour models (such as CMYK) are based on reflected light.

3.44
colour rendering
mapping of image data representing the colour-space coordinates of the elements of a scene to output-referred image data representing the colour-space coordinates of the elements of a reproduction

Note 1 to entry: Colour rendering generally consists of one or more of the following: compensating for differences in the input and output viewing conditions, tone scale and gamut mapping to map the scene colours onto the dynamic range and colour gamut of the reproduction, and applying preference adjustments.

[SOURCE: ISO/TS 22028-3:2006, 3.8]

3.45
colour re-rendering
mapping of picture-referred image data appropriate for one specified real or virtual imaging medium and viewing conditions to picture-referred image data appropriate for a different real or virtual imaging medium and/or viewing conditions

Note 1 to entry: Colour re-rendering generally consists of one or more of the following: compensating for differences in the viewing conditions, compensating for differences in the dynamic range and/or colour gamut of the imaging media, and applying preference adjustments.

[SOURCE: ISO 22028-1:2004, 3.12]

3.46
colour space
geometric representation of colours in space, usually of three dimensions

[SOURCE: CIE Publication 17.4 (845-03-25) and ISO 22028-1]

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3.47
colour space encoding
digital encoding of a colour space, including the specification of a digital encoding method, and a colour space value range

Note 1 to entry: Multiple colour space encodings can be defined based on a single colour space where the different colour space encodings have different digital encoding methods and/or colour space value ranges. (For example, 8-bit sRGB and 10 bit e-sRGB are different colour space encodings based on a particular RGB colour space.)

Note 2 to entry: This term is also defined in ISO 22028-1, ISO/TS 22028-2 and ISO/TS 22028-3.

3.48
colour space (colorimetric)
colour space having an exact and simple relationship to CIE colorimetric values

Note 1 to entry: Colorimetric colour spaces include those defined by CIE (e.g. CIE XYZ, CIELAB, CIELUV, etc.), as well as colour spaces that are simple transformations of those colour spaces (e.g. additive RGB colour spaces).

[SOURCE: ISO 22028-1]

3.49
colour space white point
colour stimulus to which colour space values are normalized

Note 1 to entry: It is not necessary that the colour space white point correspond to the assumed adapted white point and/or the reference medium white point for a colour image encoding.

[SOURCE: ISO 22028-1]

3.50
colour temperature
temperature of a Planckian radiator whose radiation has the same chromaticity as that of a given stimulus

[SOURCE: ISO 9241-302:2008, 3.2.13]

3.51
compression (lossless, visually lossless, lossy)

3.51.1
image compression
process that alters the way digital image data is encoded in order to reduce the size of an image file

[SOURCE: ISO 12233:2000, 3.11]

3.51.2
lossless compression
data file compression technique where the decompressed image is identical to the original uncompressed image

[SOURCE: ISO 12651:1999, 4.79]

3.51.3
lossy compression
data file compression technique where the decompressed image may not be identical to the original uncompressed image

[SOURCE: ISO 12651:1999, 4.80]

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3.51.4
visually lossless compression
form or manner of lossy compression where the data that is lost after the file is compressed and decompressed is not detectable to the eye; the compressed data appearing identical to the uncompressed data

Note 1 to entry: Visually lossless compression according to this definition is independent of the viewing condition meaning that even at highest magnification levels the difference to uncompressed data is visually imperceptible.

3.52
compression ratio
relationship of the file size before compression to the file size after compression

[SOURCE: ISO 12651-1:2012, 4.32]

3.53
continuous tone (image)
image represented using a large enough number of potential tonal levels per pixel so that the differences between adjacent tonal levels are visually imperceptible in the intended use condition

Note 1 to entry: It is an image that has not undergone a graphic arts halftone screening process.

Note 2 to entry: Generally referring to pictorial images, where there is a non-broken range of tones from white to black that may have every shade of gray represented. There are theoretically an infinite number of tones. Traditional photography (photochemical photography) produces continuous tone images. When reformatting pictorial items, it is important to distinguish continuous tone originals from printed halftones, since these two classes are likely to require different strategies and methods for making the digital images.

3.54
contrast
difference between the grey levels of two specified parts of the image

[SOURCE: ISO 21227-1:2003, 3.5.4]

3.55
contrast sensitivity function
CSF
functional description of the human visual systems sensitivity to peak-to-peak luminance differences (i.e. contrast) of a range of sine wave spatial frequencies

Note 1 to entry: The CSF varies with colour and viewing conditions.

Note 2 to entry: While the CSF is dependent on the average luminance viewing conditions, a single one is usually adopted for typical conditions.

3.56
correlated colour temperature
temperature of the Planckian radiator whose perceived colour most closely resembles that of a given stimulus at the same brightness and under specified viewing conditions

[SOURCE: ISO 3664:2009, 3.3]

3.57
D50
D65
standard illuminants specified by CIE publication 15

EXAMPLE A, D50, D65, F series.

[SOURCE: ISO 3664]

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