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Imaging materials — Permanence — Vocabulary

Matériaux pour l'image — Permanence — Vocabulaire

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Foreword

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This document was prepared by Technical Committee ISO/TC 42, *Photography*.

This third edition cancels and replaces the second edition (ISO 18913:2012), which has been technically revised.

Introduction

This document is one of a series dealing with the physical properties and stability of imaging materials.

Imaging materials — Permanence — Vocabulary

1 Scope

This document establishes a vocabulary of terms and definitions used in respect of the permanence of imaging materials, related storage materials and digital storage media.

In most cases these terms and definitions are generic and are applicable to the entire imaging industry. For terms and definitions specific to particular applications, refer to industry standards. However, in some cases the definition of a term is still evolving and/or is used by different user groups in different ways. In this case a definition fit for use in Imaging Materials – Permanence work is given and a note to this effect is included.

2 Normative references

There are no normative references in this document.

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 https://www.electropedia.org/

3.1
abrasion
loss of material from a surface or deformation of a surface, with changes in gloss, colour, or density, due to frictional forces as a result of rubbing

Note 1 to entry: Surface deformations can result in changes in gloss and colour.

Note 2 to entry: See also *mar resistance* (3.122), *rub resistance* (3.186), *scuff* (3.190), *smudge* (3.201), and *wet rub* (3.238).

3.2
absolute humidity
mass of water vapour per unit volume of wet gas

Note 1 to entry: It is a measure of the amount of water present as part of the chemical analysis of the space, i.e., how much water is available for chemical activity.

Note 2 to entry: See also *dew point* (3.56) and *relative humidity* (3.181).

3.3
accelerated ageing
procedure to simulate normal ageing process by subjecting a product to *stresses* (3.216) that are more severe or more frequent than normal environmental or operational stresses, thus shortening the test period relative to the normal ageing period

3.4
acid-free adhesive
adhesive material that does not release acidic species, such that the cold extraction pH is equal to or greater than the reference water minus 0,5 and less than 10,0

Note 1 to entry: ISO 18902 provides a cold extraction pH test method, which may be used to establish a specification for acid-free adhesive materials for intended photographic applications.

Note 2 to entry: An adhesive may contain acids, but the cold extraction pH test only measures acidic species released into water to determine pH.

3.5
acid-free paper or paperboard
paper or paperboard materials that do not release acidic species, such that the cold extraction pH is equal to or greater than the reference water minus 0,5 and less than 10,0

Note 1 to entry: ISO 18902 provides a cold extraction pH test method, which may be used to establish a specification for acid-free or alkaline paper and paperboard materials for intended photographic applications.

Note 2 to entry: A paper or paperboard may contain acids, but the cold extraction pH test only measures acidic species released into water to determine pH.

3.6
album
binder or book structure having front and back covers in which pages are bound along one edge either by plastic straps, gluing, sewing, metal posts or rings, and in which photographs are attached and related contents may be included

3.7
albumen plate
glass sheet bearing a silver halide/albumen layer which yields a visible image after exposure and processing

3.8
ambient conditions
conditions of the affecting environment

Note 1 to entry: For *preservation* (3.164) purposes these may or may not be the same as the *storage environment* (3.214).

3.9
ambrotype plate
glass plate collodion positive, i.e. glass sheet bearing a thin silver halide/cellulose nitrate layer which yields a visible image after exposure and processing

Note 1 to entry: The processed *negative* (3.134) silver image appears as a positive when backed by a dark field.

3.10
analogue print
print where the image is printed from the analogue domain

Note 1 to entry: In graphic printing, the marking information of an analogue print is generated by means of an off-line produced forme with which the ink is printed on the media. Examples of traditional forme-based ink printing as defined in ISO 12637-1 are flexographic, letterpress, letterset, (offset) lithographic, gravure, intaglio, pad-transfer printing, screen, and stencil printing.

Note 2 to entry: Ambiguous use also for chromogenic (silver-halide) print, where image information is exposed conventionally ("analogue") through a film *negative* (3.134) or positive, or actual scene images are exposed through camera lenses.

Note 3 to entry: See also *digital print* (3.58).

3.11
anti-blocking agent
additive or component which prevents *sticking* (3.211) or fusing of adjacent surfaces

EXAMPLE Talc, silicates or matte beads.

Note 1 to entry: See ISO 18902.

Note 2 to entry: See *blocking* (3.20)

3.12
aperture card
card of standard dimensions with one or more openings into which a microfilm frame or frames can be mounted or inserted

3.13
aperture window
opening in the *flange* (3.80) of a cassette that is used to facilitate threading of magnetic tape on the *hub* (3.46) and inspection of the *wind* (3.240)

3.14
archival
medium (3.124) that can be expected to preserve images at a stated level of quality or usefulness for a specified extended period of years

3.15
Arrhenius plot
plot of the logarithm of the time for a given change in a characteristic proportional to the reaction rate versus the reciprocal of the temperature expressed in K (Kelvin)

Note 1 to entry: The Arrhenius plot can be used to predict behaviour at a temperature lower than that at which a test is run, as described in ISO 18924.

Note 2 to entry: Changes in characteristics may include dye loss, tensile strength change, D_{min} (3.55) yellowing, etc.

3.16
artificial accelerated weathering
artificial weathering
laboratory weathering
exposure of a material in a laboratory weathering device to conditions which may be cyclic and may be intensified compared with conditions encountered in outdoor or in-service exposure

Note 1 to entry: The purpose of artificial accelerated weathering is to accelerate changes in the material that can correspond to changes observed after long-term, continuous, natural or end-use exposure.

3.17
base
support in a *recording material* (3.176) on which the image receiving/recording layers or magnetic layer (and, if necessary, the back layer) are coated

Note 1 to entry: *Substrate* (3.218) is the preferred term for the physical support of a receiving layer. The term 'base' should be used only in reference to pH.

3.18
blister
localized *delamination* (3.54) of a multilayer assembly that looks like a bubble

3.19
block error rate
BLER
ratio of erroneous blocks to total blocks on an *optical disc* (3.142) measured at the input of the first (C1) decoder (before any error correction is applied)

Note 1 to entry: The more commonly reported value for BLER is the number of erroneous blocks per second measured at the input of the C1-decoder during playback at the standard (1X) data rate.

3.20
blocking
undesired adherence between sheets of printed material

Note 1 to entry: Blocking can occur under a variety of pressures, temperatures, and humidity conditions, while in storage or in use.

Note 2 to entry: Blocking effects include *delamination* (3.54), paper splitting, tearing, gloss changes, physical image transfer, permanent bonding to adjacent materials and prints, and edge deformation.

Note 3 to entry: See also *anti-blocking agent* (3.11).

3.21
blue print
defect resulting from a drastic reduction in the light stability of the yellow dye in a *chromogenic print* (3.32)

Note 1 to entry: Be aware that "blue print" is not to be confused with "blueprint".

Note 2 to entry: A common cause in the case of a blue print is when a print has been lacquered in a very humid environment or was not thoroughly dried before lacquering.

3.22
book printing
printing of books and publishing of monographs (reference books, photo-books, comic, paperback, textbooks and directories)

Note 1 to entry: See also *commercial printing* (3.38), *newspaper and periodical printing* (3.135), *package printing* (3.146), *sign printing* (3.195), and *transactional and direct mail printing* (3.228).

3.23
brittleness
property of a material that causes it to crack or break when deformed by bending or flexing

3.24
buffered
<paper> characteristic of paper or paperboard materials containing a certain amount of alkali reserve to neutralize future attacks by acidic species, either from atmospheric pollutants or released from material degradations in the ageing process

Note 1 to entry: See ISO 10716 for a standard test method to determine the amount of alkaline reserve in paper materials.

Note 2 to entry: See ISO 18902 for specifications for alkaline reserve in paper and paper boards for albums, framing, and storage materials.

3.25
can
<recording media> metal or plastic *container* (3.44) for a roll of *recording material* (3.176), such as photographic film or magnetic tape

3.26
carrier
<recording media> *medium* (3.124) upon which information is recorded

3.27
cartridge
<recording media> housing for a roll of recording media, such as photographic film or magnetic tape, wound on a single *hub* (3.46) or *reel* (3.178)

Note 1 to entry: The term "cartridge" is also used in some cases to describe a colorant (e.g., ink, toner) container.

Note 2 to entry: See also *cassette* (3.28).

3.28
cassette
<recording media> housing for a roll of *recording material* (3.176), such as photographic film or magnetic tape, whose ends are attached to two hubs or reels

Note 1 to entry: See also *cartridge* (3.27).

3.29
cellulose-acetate base
base for *recording materials* (3.176) composed mainly of cellulose esters of acetic acid

3.30
cellulose-ester base
base for *recording materials* (3.176) composed mainly of cellulose esters of acetic, propionic, or butyric acid, or mixtures thereof

3.31
cellulose-nitrate base
base for *recording materials* (3.176) composed mainly of cellulose esters of nitric acid with a *plasticizer* (3.157) such as camphor

3.32
chromogenic print
gelatin print in which the colour image is composed of cyan, magenta, and yellow dye layers formed by a coupling reaction between the dye couplers (dye precursors) in the *emulsion layers* (3.69) as a result of silver development

Note 1 to entry: During development of exposed silver halide, the resulting oxidized colour developer molecules will react with the dye couplers (dye precursors, typically incorporated in the emulsion layers during manufacture but could be added during development), forming microdroplets of cyan, magenta, and yellow dyes. The silver image is then bleached and dissolved via a bleach-fix bath and then is washed away, and the colour image remains.

Note 2 to entry: To further distinguish chromogenic prints, note that in chromolytic prints, which use the silver dye bleach process typical for positive printing (as in Cibachrome and Ilfochrome), the dyes are already incorporated during the production process and present before exposure. During development the latent silver image is processed to develop silver. Next the silver dye bleach reaction destroys the dye into colourless products and dissolves the silver. Finally, the layer sequence in chromolytic prints is different from that of chromogenic prints, the chromolytic dye layers top to bottom are yellow, magenta, cyan.

Note 3 to entry: See also *blue print* (3.21), *cyan spots* (3.50), *red print* (3.177), and *yellow print* (3.244).

3.33
class 100 000 clean room
controlled environment in which the level of airborne contaminates meets standard requirements

Note 1 to entry: See ISO 14644-1 for the requirements to meet.

3.34
cockle
deformation of a sheet of paper due to unequal shrinkage giving it a planar distortion in the form of waves or ripples

Note 1 to entry: See also *edge fluting* (3.67) and *waviness* (3.236).

3.35
collodion plate
collodion wet or dry plate
glass sheet bearing a thin silver halide/cellulose nitrate layer which yields a visible image after exposure and processing

3.36
colorant
dye or pigment

Note 1 to entry: Colorant is typically a component of transfer ribbon, chromogenic material, toner or ink.

3.37
colour screen plate
glass sheet bearing a colour screen consisting of dyed elements in contact with a silver halide/gelatin layer which yields a visible image after exposure and processing

3.38
commercial printing
printing for graphic products for commercial application such as catalogue, advertisement (flyer, pamphlet, leaflet, direct marketing, free magazines), and others (manuals)

Note 1 to entry: See also *book printing* (3.22), *newspaper and periodical printing* (3.135), *package printing* (3.146), *sign printing* (3.195), and *transactional and direct mail printing* (3.228).

3.39
compact disc
CD
CD-ROM (3.40) *optical disc* (3.142) format in which the information layer is located at one surface of a *substrate* (3.218) and the data can be read by an optical beam

Note 1 to entry: Described in IEC 60908.

Note 2 to entry: See also *rewritable compact disc* (3.185), *compact disc-recordable* (3.41), and *read-only-medium compact disc* (3.173).

3.40
compact disc read-only memory
CD-ROM
optical disc (3.142) to which information is transferred during manufacture to certain areas in the compact disc format

Note 1 to entry: The information can be read many times.

Note 2 to entry: See also *rewritable compact disc* (3.185), *compact disc* (3.39), *compact disc-recordable* (3.41), and *read-only-medium compact disc* (3.173).

3.41
compact disc-recordable
CD-R
recordable *optical disc* (3.142) in which information can be recorded to certain areas in compact disc format

Note 1 to entry: Information can be recorded one time and read many times.

Note 2 to entry: The term "compact disc-write once" (CD-WO) has also been used to describe this type of disc.

Note 3 to entry: See also *compact disc read-only memory* (3.40), *rewritable compact disc* (3.185), *compact disc* (3.39), and *read-only-medium compact disc* (3.173).

3.42
conditioning
exposure of a specimen to air at a given *relative humidity* (3.181) and temperature until equilibrium is reached

3.43
conservation
all activities taken toward the long-term *preservation* (3.164) of cultural heritage, including examination, documentation, treatment, and preventive care, supported by research and education

3.44
container
<recording media> box, *can* (3.25), or carton used for storage and shipping of *recording materials* (3.176)

EXAMPLE The box into which a *reel* (3.178), *cassette* (3.28), *cartridge* (3.27), *optical disc* (3.142) or *shell* (3.192) is placed.

Note 1 to entry: *Reels* (3.178), *cassettes* (3.28), *cartridges* (3.27), and *shells* (3.192) are not containers.

3.45
copy
reproduction of the information from a master

Note 1 to entry: A copy is a reproduction that may be on a different media and in a different size or format than the master, whereas a *duplicate* (3.64) is an identical reproduction.

3.46
core
hub
<recording media> metal or plastic cylinder on which *recording material* (3.176) is wound

Note 1 to entry: See also *flange* (3.80), *reel* (3.178), *slot* (3.200), and *tape pack* (3.220).

3.47
crazing
network of fine cracks on the surface of a print or film that is the result of environmental stresses on the surface layer

3.48
cupping
departure of film or paper from physical flatness characterized by the condition where the four corners of a rectangular sheet turn up, but the edges do not

3.49
curl
departure of film, paper or magnetic tape from physical flatness with the tendency to curve into a cylindrical shape

Note 1 to entry: See ISO 11556.

3.50
cyan spots
defect that results when the ultraviolet absorber in an older technology *chromogenic print* (3.32) crystallises and permits the back-scattering of light

3.51
dark stability
ability of a print, *negative* (3.134), or *transparency* (3.230) to resist fading or staining due to ambient environmental factors in the absence of light

3.52
daylight filter
optical filter (or set of filters) used to modify the *spectral irradiance* (3.203) of a light source to simulate outdoor terrestrial daylight

3.53
daylight through window glass filter
window glass filter
optical filter (or set of filters) used to modify the *spectral irradiance* (3.203) of a light source to simulate outdoor terrestrial daylight transmitted through standard architectural window glass

3.54
delamination
separation of a laminated assembly into its constituent layers, either in whole or in part

3.55
density minimum
minimum density
D_{min}
density corresponding to the maximum transmittance, in the case of film, or reflectance, in the case of paper, that a photographic product can achieve

3.56
dew point
temperature at which moisture begins to condense on a surface, corresponding to saturation for a given *absolute humidity* (3.2)

EXAMPLE The higher the absolute humidity of air, the higher the dew-point temperature of the air. See also, *relative humidity* (3.181).

3.57
differential dimensional change
difference between the *dimensional change* (3.60) or *dimensional change after ageing* (3.61) of a material in the two principal directions of length and width

Note 1 to entry: Polyester-based films frequently have maximum and minimum dimensional changes in directions other than the length or width. These can be determined by rotating and viewing the uncoated base between a pair of crossed polarizers. When the direction corresponding to either the maximum or minimum dimensional change is coincident with the optical axis of one polarizer, there is minimum light transmission through the base.

3.58
digital print
print where the image is printed directly from the digital domain

Note 1 to entry: Digital print is a print made directly from digital data in a process such that the image forming mechanisms are refreshed for each impression, thus each impression can have different content.

Note 2 to entry: Offset printing in its various forms as defined in the ISO 12647 (all parts) is typically categorized as “analogue printing” even though data may stem from the digital domain as in the case of computer-to-plate systems. See *analogue print* (3.10)

Note 3 to entry: There is substantial confusion around the definition of this term by users, particularly in the consumer market where it may be taken to mean a print where the original image is produced or manipulated in the digital domain.

3.59
digital versatile disc
DVD
optical disc (3.142) format in which one or more information layers are located between two *substrates* (3.218) and the data can be read by an optical beam

Note 1 to entry: Formerly called digital video disc.

3.60
dimensional change
permanent change in dimension caused by photographic processing alone

Note 1 to entry: This can be the conventional wet chemical processing, vapour processing, or heat processing. The dimensional change is measured after *conditioning* (3.42) at the same *relative humidity* (3.181) and temperature as used for the original measurement and is expressed as a percentage.

Note 2 to entry: See also *differential dimensional change* (3.57), *dimensional change after ageing* (3.61), and *dimensional hysteresis* (3.62).

3.61
dimensional change after ageing
dimensional change due to processing plus ageing
permanent *dimensional change* (3.60) that occurs as a result of processing plus ageing of the processed material

Note 1 to entry: It is measured after *conditioning* (3.42) of the processed, aged film or paper at the same *relative humidity* (3.181) and temperature as used for the original measurement and is expressed as a percentage.

3.62
dimensional hysteresis
difference in the absolute dimensions of a specimen in equilibrium with air at a given *relative humidity* (3.181), when conditioned from a higher relative humidity and when conditioned from a lower relative humidity

Note 1 to entry: See also *differential dimensional change* (3.57) and *dimensional change* (3.60).

3.63
direct spectral irradiance
irradiation from a source without shading, scattering, or additional filtering at a specific wavelength over a narrow bandwidth, or as a function of wavelength; also, the derivative with respect to wavelength of irradiance, represented as $E\lambda$ or $E(\lambda)$[$W{\cdot}m^{-2}{\cdot}nm^{-1}$]

Note 1 to entry: In the context of solar irradiance, an alternative use of the term pertains to the radiation that is not scattered by the atmosphere (water vapor and other constituents). Its counterpart is “diffuse” radiation. The total of direct and diffuse equals what is called “global” radiation.

Note 2 to entry: See also *spectral irradiance* (3.203).

3.64
duplicate
identical (1:1) reproduction of a master, comprised of the same media and size

Note 1 to entry: A duplicate is an identical reproduction whereas a “copy”, as defined in this document, is a reproduction that may be on a different media and in a different size or format than the master.

3.65
durability
<image print> resistance of an image print to physical, mechanical, and environmental stresses

3.66
dye diffusion thermal transfer (D2T2) print
digital print (3.58) made using thermal print heads controlled by digital data and using donor ribbons coated with dye-based colorants that diffuse due to heating to reproduce images on an image receiving layer of a *substrate* (3.218)

Note 1 to entry: This process is sometimes known as “dye sub”, short for "dye sublimation". This is a misnomer as the dyes melt to form a liquid which is transferred to the substrate rather than subliming through the vapour phase. The misnomer arises from a similarity to an earlier textile printing process.

Note 2 to entry: See ISO 12637-1.

3.67
edge fluting
wave-shaped deformation along the edges of cut sheets, which may be caused by an expansion of the edge of the material, particularly when the edge is exposed to greater variations in temperature and humidity than the centre of the sheet

Note 1 to entry: See also *cockle* (3.34) and *waviness* (3.236).

3.68
electrophotographic print
print made from electrostatically charged toner particles or droplets that are transferred from a photoconductive *medium* (3.124)

3.69
emulsion layer(s)
image or image-forming layer(s) of silver halide *photographic films* (3.152), papers, and plates

3.70
encapsulation
process of placing a document between two sheets of plastic (usually polyester), which are sealed at the edges, in order to provide support and protect it from handling and the atmosphere

Note 1 to entry: Usually done using protective sheets that are larger in dimension than the specimen and then sealing at the overlaps.

Note 2 to entry: See also *irreversible encapsulation* (3.102) and *reversible encapsulation* (3.184).

3.71
enclosure
box, case, cartridge, folder, envelope, sleeve, or clam shell that is intended for physical protection against mechanical damage

Note 1 to entry: See also *envelope or bag* (3.74), *open enclosure* (3.140), *photographic enclosure* (3.151), *pocket-style page* (3.158), *protective enclosure* (3.168), *seam* (3.191), *sleeve* or *sheath* (3.197), and *storage enclosure* (3.213).

3.72
end-of-life
time at which a film, print or digital file stored is no longer suited for its intended purpose

3.73
endpoint
defined measurable densitometric, colorimetric, or physical change in a print parameter used to define the point at which a print is no longer usable or acceptable in a particular application

Note 1 to entry: The term "endpoint" is not to be confused with "end of test", which is the point at which a test is terminated after a pre-defined level of physical or chemical *stress* (3.216) has been applied, or after an accumulated exposure of the stresses which is determined based on the assumption of the exposure level of the use or the required level of longevity for the product.

3.74
envelope or bag
enclosure (3.71) that is sealed with adhesive, mechanically joined or heat-sealed on two-edges with a bottom fold and one side open

3.75
extended-term storage conditions
storage conditions suitable for the *preservation* (3.164) of recorded information having permanent value

3.76
ferrotyping
changes in surface gloss resulting from intimate contact with another surface, often associated with high humidity

Note 1 to entry: The term ferrotyping is derived from a historical term associated with silver halide photography. It is a process used to produce a very high gloss surface on a *silver halide print* (3.196) in which a damp print is placed in contact with a highly polished surface, such as chromium-plated steel, and dried under conditions of elevated temperature and pressure.

3.77
film substrate
film base
transparent support in a film *recording material* (3.176) on which the image recording layers are coated

Note 1 to entry: See *substrate* (3.218).

3.78
fire-protective storage
facility designed to protect records against excessive temperatures, water and other fire-fighting agents, and steam developed by insulation of safes or caused by the extinguishing of fires and collapsing structures

3.79
fire-resistant vault
fire-resistant vault as defined in appropriate national standards and regulations

3.80
flange
fixed or removable circular disc that is connected to the *hub* (3.46) to make a *reel* (3.178) for the purpose of protecting the roll of *recording materials* (3.176)

3.81
folder
single sheet that is folded, does not have adhesive seams, and can be made from either paper or plastic

3.82
folding endurance
measure of the ability of a material to withstand folding under specified conditions of test

Note 1 to entry: See ISO 5127.

3.83
frost point
temperature to which moisture-laden air must be cooled for frost or ice formation

3.84
full-reversal processing
reversal photographic processing that consists of development, bleach, clear, re-exposing and second development, followed by fixing and washing

3.85
gelatin plate, gelatin dry plate
glass sheet bearing a silver halide/gelatin layer which yields a visible image after exposure and processing

3.86
general indoor light filter
optical filter (or set of filters) use to modify the *spectral irradiance* (3.203) of a light source to simulate a typical spectral irradiance observed in a shaded part of a room in distance from windows, which is indirectly illuminated by *daylight through window glass filter* (3.53)

Note 1 to entry: See ISO 18937.

3.87
glass transition
reversible change in an amorphous polymer from, or to, a viscous or rubber condition to, or from, a hard and relatively brittle one

Note 1 to entry: See also *glass transition temperature* (3.88).

3.88
glass transition temperature
T_g
mid-point of the temperature range over which *glass transition* (3.87) takes place

Note 1 to entry: T_g can be determined readily only by observing the temperature at which a significant change takes place in a specific electrical, mechanical or other physical property.

Note 2 to entry: T_g can also be sensitive to the moisture content of the polymer.

3.89
graininess
appearance of unintended, microscopic, but visible, aperiodic fluctuations of lightness and colour, with higher frequency compared to *mottle* (3.131)

Note 1 to entry: ISO/IEC 24790 contains the following note applicable to measurement: "Microscopic means: variations with spatial frequencies greater than about 0,4 cy/mm."

3.90
heads out
configuration of roll film or magnetic tape stored on its *core* (3.46), *reel* (3.178), or in its *cassette* (3.28), such that the film or tape is positioned to play from the beginning of the recorded information

3.91
humidistat
device that senses the moisture content of the air for the purpose of controlling it

3.92
humidity coefficient of expansion
change in dimension per unit length per a 1 % change in the *relative humidity* (3.181) at constant temperature

3.93
humidity expansion/contraction
dimensional change (3.60) caused by the gain/loss of moisture as a result of changes in the *relative humidity* (3.181) of the ambient air at constant temperature

3.94
humidity fastness
ability of a *reflection print* (3.179) to resist changes in density or sharpness upon extended exposure to high or low *relative humidity* (3.181)

3.95
hygrometer
instrument that measures the moisture content of a sample of air

3.96
image permanence
ability of a printed image to remain stable over long periods of time

3.97
indirect spectral irradiance
irradiation from a source shaded, scattered, or through additional filtering (e.g. window glass) at a specific wavelength over a narrow bandwidth, or as a function of wavelength; also, the derivative with respect to wavelength of irradiance, represented as $E\lambda$ or $E(\lambda)$[$W \cdot m^{-2} \cdot nm^{-1}$]

EXAMPLE Indirect daylight – such as "daylight through window glass filter" and "daylight through general indoor filter" – is an important case.

Note 1 to entry: See also *spectral irradiance* (3.203).

3.98
ink jet print
digital print (3.58) made by the deposition of ink droplets

3.99
insulated record container
storage box designed to provide an environmental buffer against temperature and humidity fluctuations

3.100
insulated record containers (Class 150)
insulated record containers (Class 150) as defined in appropriate national standards and regulations

3.101
interval scale
<psychophysical> scale established by a psychophysical method, which, in addition to possessing the attributes of *rank order* (3.170), is distinguished by the fact that equal differences between numerical values correspond to equal differences between properties measured, or in sensory analysis, intensities perceived

Note 1 to entry: Larger values correspond to larger perceived intensities and the size of the difference between two values reflects the size of the difference in perceived intensity of the property being measured. However, a numerical value of zero may not indicate a total absence of the property and the ratio of two values cannot be assumed to reflect the ratio of the perceived intensities.

3.102
irreversible encapsulation
encapsulation (3.70) that cannot be removed without damaging the object

Note 1 to entry: Use of liquid coatings (liquid laminates) on two sides is not considered a form of encapsulation.

3.103
irreversible mounting
mounting (3.132) that employs pressure sensitive, thermoplastic or solvent-based adhesives that are not easily reversed without damage to the print, or may not be *photo-safe* (3.156)

3.104
isoperm lines
lines of constant life plotted as a function of temperature and *relative humidity* (3.181)

3.105
jacket
two transparent sheets separated by divider strips with single or multiple film channels (sleeves), also known as pocket pages or page protectors, made to hold single or multiple film images

3.106
just noticeable difference
stimulus difference that leads to a 75:25 proportion of responses in a paired comparison task

Note 1 to entry: See ISO 20462-1.

3.107
lacquer
coating composition that is based on synthetic thermoplastic film-forming material dissolved in organic or aqueous solvent that dries primarily by solvent evaporation

Note 1 to entry: Lacquers may include *matting agents* (3.123), *plasticizers* (3.157), cellulose derivative, acrylic polymer, and solvents. Lacquer, polyurethane, and shellac are all types of *varnish* (3.232).

3.108
laminate
layer of material that goes over the top or bottom of a specimen

Note 1 to entry: Usually water resistant to provide physical and/or ultraviolet (UV) light protection of the specimen.

3.109
laminate
<film> clear polyester or vinyl layer applied using thermosetting, pressure-sensitive or contact adhesive to one or both surfaces of a print to improve *durability* (3.65)

3.110
laminate
<liquid> water-based, solvent-based, or UV-curable liquid protective coating designed for use with prints, generally applied with a roller machine or spray system

3.111
laminated assembly
multilayer structure typically comprising a paper support, one or more barrier layers, an imaging layer, and a protective laminate top layer

3.112
lantern-slide plate
glass sheet bearing a silver halide/gelatin, silver halide/albumen, silver halide/collodion, or colour screen image that is usually protected with a cover glass bound on all sides with an adhesive tape and is intended for viewing by projection

Note 1 to entry: A lantern slide is generally a positive image. There are also later lantern slides for projection which were made by sandwiching a sheet of film (black and white or colour film) between two plates of glass and bound on all edges with adhesive tape.

3.113
leader
flexible plastic or paper strip which can be spliced to either end of a roll of *recording material* (3.176)

3.114
leafing
multiple *popped strand(s)* (3.162) in a magnetic-tape wind

Note 1 to entry: See also *stepped pack* (3.210).

3.115
length direction
machine direction
direction of the film or paper parallel to its forward movement in the film or paper-making machine

Note 1 to entry: This is also termed “grain” in the case of papers.

Note 2 to entry: See also *width direction* (3.239).

3.116
life expectancy
LE
rating for the life expectancy of *recording materials* (3.176) and associated retrieval systems

Note 1 to entry: The number following the LE symbol is a prediction of the minimum life expectancy in years for which information can be retrieved without significant loss when stored at the conditions as defined in the relevant standards.

EXAMPLE LE-100 indicates that information can be retrieved after at least 100 years storage.

3.117
lightfastness
ability of a *reflection print* (3.179) or *transparency* (3.230) to resist fading, staining, or physical degradation, upon extended exposure to light

3.118
lignin-free
characteristic of paper or paperboard with a Kappa number of 7,0 or less, corresponding to a lignin concentration of approximately 1,0 % or less by mass

3.119
loose pack
undesirable pack condition in a roll of *recording material* (3.176), such that the outer portion of the roll can be moved and tightened by pulling on the end

3.120
macroenvironment
atmospheric conditions, being temperature, *relative humidity* (3.181), and pollutants, in a large area in which records are kept

3.121
magnetic field intensity
magnitude of the magnetic field, in amperes per metre, at a point in space

3.122
mar resistance
ability of a coating to resist permanent deformation or fracture without removal of material, under the action of dynamic mechanical force; as such is directly related to the coating's ability to retain gloss in response to such force

Note 1 to entry: In general, the distinction between abrasion resistance and mar resistance is that abrasion implies removal of material from the surface, while mar implies smear or deformation of the surface without mass loss.

Note 2 to entry: See also *abrasion* (3.1) and *rub resistance* (3.186).

3.123
matting agent
substance applied to modify the optical characteristics of an assembly by reducing the gloss of a surface

Note 1 to entry: A matting agent may also alter the physical characteristics of a surface by increasing the surface roughness, reducing susceptibility of the surface to stick to other surfaces

3.124
medium (media, pl)
material on which information is recorded

Note 1 to entry: See also *carrier* (3.26).

3.125
medium-term storage conditions
storage conditions suitable for the *preservation* (3.164) of recorded information for a minimum of 10 years

3.126
microenvironment
atmospheric conditions, being temperature, *relative humidity* (3.181), and pollutants, inside a *storage enclosure* (3.213) in which records are kept

3.127
MO disc
optical disc (3.142) in which the information is recorded using magneto-optical technology in some specified format and which can be read many times and overwritten many times

3.128
moderately water resistant
print that exhibits some change or damage by water but is still considered usable for its intended application

Note 1 to entry: The damage can manifest itself as slight media *curl* (3.49), partial *delamination* (3.54) along an edge, ring-like watermarks due to gloss changes or a minor amount of colorant migration. This damage can be mitigated by the rapid removal of the water (careful blotting, shaking off the water, etc.).

3.129
monochrome image
image with recording in one colour or one shade of hue; in the case of images within the scope of this standard these images are often close to neutral in colour

3.130
morphological changes
changes in the physical structure of the association of the molecules

3.131
mottle
measure of the appearance of unintended, aperiodic macroscopic fluctuations of lightness and colour, with lower frequency compared to *graininess* (3.89), but higher frequency compared to shading

Note 1 to entry: ISO/IEC 24790 contains the following note applicable to measurement "Macroscopic means: variations with spatial frequencies less than about 0,4 cy/mm."

3.132
mounting
local attachment or overall adhesion of a photographic image/print to a rigid material (paperboard, metal and/or plastic) for purposes of framing, display, or physical support

EXAMPLE A local attachment can be at a corner using a mounting corner, hinge or adhesive.

Note 1 to entry: See also *reversible conservation mounting* (3.183) and *irreversible mounting* (3.103).

3.133
natural ageing
changes in the characteristics of imaging materials that occur under typical use or storage conditions

Note 1 to entry: See also *ambient conditions* (3.8).

3.134
negative
photographic image in which the light and dark regions and colours are reversed, which upon projection with transmitted light onto another negative silver halide sensitised print *medium* (3.124) will produce a positive image after processing

3.135
newspaper and periodical printing
printing for graphic products for newspaper (colour, B&W) and periodical magazines (monthly, weekly)

Note 1 to entry: See also *book printing* (3.22), *commercial printing* (3.38), *package printing* (3.146), *sign printing* (3.195), and *transactional and direct mail printing* (3.228).

3.136
Newton's rings
faint coloured rings or fringe patterns formed by the interference between a direct and a reflected beam of light generated by two transparent surfaces in close contact

3.137
non-curl backing layer
layer, usually made of gelatin, applied to the side of paper or *film substrate* (3.77) opposite that of the *emulsion layer* (3.69), for the purpose of preventing *curl* (3.49)

Note 1 to entry: It is comparable to the emulsion layer in thickness and is not removed in processing.

Note 2 to entry: Antihalation or other layers removed in processing are excluded from this definition.

3.138
not water resistant
characteristic of print that is easily damaged by contact with water, even when incidental (e.g. a water mist), and is considered unsuitable for applications involving contact with water

Note 1 to entry: Such damage can manifest itself as appreciable *curl* (3.49), *delamination* (3.54) of the image layer, colorant bleed into non-imaged areas or from colour to colour, or image degradation (hue and gloss changes, surface marks, etc.).

3.139
objective image quality
quantitative characterizations and measures of image attributes used to indicate the overall merit or excellence of an image

Note 1 to entry: See also *perceptual image quality* (3.148).

3.140
open enclosure
enclosure (3.71) that is intended for physical protection against mechanical damage, but is neither light-tight nor airtight

3.141
optical density
degree of light absorption, reflection or scattering characteristics of a photographic image, expressed as the logarithm to the base 10 of the ratio of incident radiant flux to the transmitted, reflected or scattered flux

Note 1 to entry: See ISO 5-3.

Note 2 to entry: See also *printing density* (3.165), *projection density* (3.167). and *visual density* (3.234).

3.142
optical disc
disc that will accept and retain information in the form of marks or density modulations in a recording layer that can be read with an optical beam

Note 1 to entry: See also *compact disc* (3.39), *compact disc read-only memory* (3.40), *compact disc-recordable* (3.41), *digital versatile disc* (3.59), *MO disc* (3.127), *read-only-medium compact disc* (3.173), *rewritable compact disc* (3.185), and *WORM disc* (3.243).

Note 2 to entry: See also *optical disc cartridge* (3.143).

3.143
optical disc cartridge
ODC
case containing an *optical disc* (3.142)

3.144
outdoor weathering
actual placement of specimens outdoors in specific locations, often those of climatic extremes

Note 1 to entry: This is differentiated from *artificial accelerated weathering* (3.16) where instruments (weathering devices) are used to obtain very controlled conditions that simulate, to some degree, and generally accelerate, the outdoor weathering results. Use of such instruments is described in ISO 18930.

Note 2 to entry: The purpose of outdoor weathering is to assess the effects of environmental factors on functional/aesthetic parameters of the specimen.

3.145
ozone fastness
ability of a film or print to resist fading, staining, or physical degradation, upon extended exposure to ozone

3.146
package printing
printing for graphic products for packages, including rigid and flexible packaging, such as beverage carton, cardboard container, corrugated box, label, sticker, snack and retort pouch

Note 1 to entry: See also *book printing* (3.22), *commercial printing* (3.38), *newspaper and periodical printing* (3.135), *sign printing* (3.195), and *transactional and direct mail printing* (3.228).

3.147
peel resistance
average force per unit test-specimen width, measured along the bond line, required to separate progressively the two members of a bonded test specimen under specified conditions of test

Note 1 to entry: Peel resistance is expressed in kilonewtons per metre of width.

3.148
perceptual image quality
impression of the overall merit or excellence of an image, as perceived by an observer neither associated with the act of photography nor closely involved with the subject matter depicted

Note 1 to entry: See ISO 20462-1 and ISO 17850.

Note 2 to entry: See also *objective image quality* (3.139).

3.149
photo book
bound book with printed pages comprised of integrated personal photos along with artwork and text designed by and usually dedicated to a limited group of people

3.150
photographic activity test
PAT
procedure to assess the reactivity risk of enclosure materials impacting the stability of photographic materials during long-term storage

Note 1 to entry: See ISO 18916.

3.151
photographic enclosure
enclosure (3.71) in close or direct contact with photographic plates, films or papers such as reels, cans, bags, folders, sleeves (sheaths), jackets, envelopes, window mounts or mats, slide mounts, cartons, boxes, and aperture cards

Note 1 to entry: Such materials should meet the requirements of ISO 18902 as well as passing a photographic activity test as defined in ISO 18916.

3.152
photographic film
material consisting of one or more radiation-sensitive layers coated on transparent or translucent plastic that yields a visible image

Note 1 to entry: The term is now sometimes used to describe plastic film that has an image printed onto it using newer printing technologies.

3.153
photographic layer
image forming layer
image receiving layer
radiation-sensitive coating that yields an image after exposure to radiant flux

Note 1 to entry: In the case of radiation sensitive coatings exposure is usually followed by processing to generate the image.

Note 2 to entry: The term "image receiving layer" may also be used in descriptions of non-photographic systems, such as dye diffusion thermal transfer printing. In such non-photographic systems the photographic layer definition does not apply.

3.154
photographic plate
material consisting of one or more radiation-sensitive layers coated on a rigid support, such as glass or metal, that yields a visible image

3.155
photographic print
all manner of printed photographic images, including materials consisting of one or more radiation-sensitive layers coated on paper, papers with a pigmented layer, papers with a resin layer, and other material supports that yield visible images

3.156
photo-safe
characteristic of material that meets requirements such that it will not accelerate the natural ageing of *photographic prints* (3.155) or films or digitally printed images

Note 1 to entry: Material that only meets the pH requirements or passes the photographic activity test described in ISO 18916 is not necessarily photo-safe due to other factors that may be harmful to images and substrates (3.218). These factors can include poor workmanship, poor design features, and harmful chemical reactions not predicted by pH or PAT alone. In addition, some materials are themselves physically and chemically unstable and thus will not last long, even though they may not initially be reactive.

Note 2 to entry: See ISO 18902 for the requirements to meet.

3.157
plasticizer
substance added to a material to either increase softness, flexibility, water resistance or extensibility

3.158
pocket-style page
enclosure (3.71) made from two pieces of plastic sheeting heat-sealed or ultrasonically welded along three or four edges and at various points across the sheets to create pouches (pockets) that have slit openings to allow the insertion of a photograph or a piece of film

3.159
poly(ethylene terephthalate) substrate
PET substrate
polyester substrate (3.160) for recording materials composed mainly of a polymer of ethylene glycol and terephthalic acid

3.160
polyester substrate
polyester base
substrate (3.218) for *recording materials* (3.176) composed mainly of a polymer of ethylene glycol and terephthalic acid (also referred to as polyethylene terephthalate), or a polymer of ethylene glycol and 2,6 naphthalene dicarboxylic acid (also referred to as polyethylene naphthalate)

3.161
polyurethane coating
coating composition that is based on film-forming material that has a urethane bond, which solidifies into flexible coating with good impact resistance

3.162
popped strand
lateral displacement of a single strand or wrap of magnetic tape extending beyond the plane of the *tape pack* (3.220)

Note 1 to entry: See also *leafing* (3.114) and *stepped pack* (3.210).

3.163
preconditioning
establishment of a moisture content history by *conditioning* (3.42) the specimen at a *relative humidity* (3.181) above or below the conditioning relative humidity used for measurement

Note 1 to entry: The purpose of preconditioning is to control the effects of hysteresis.

3.164
preservation
all measures taken, including financial and strategic decisions, to maintain the integrity and extend the life of documents or collections

EXAMPLE Activities associated with maintaining library, archival, or museum materials for use either in their original form or in some other format.

Note 1 to entry: Preservation is considered a broader term than conservation.

Note 2 to entry: See ISO 5127 for preservation measures.

3.165
printing density
optical density (3.141) of a processed silver halide photographic image in which the incident radiant flux has the same spectral energy distribution as the printer light source and the transmitted density is evaluated by a receiver having the same spectral response as the print material

Note 1 to entry: See ISO 5-3.

Note 2 to entry: Printing density compares the intensity of incident energy to the intensity of the energy transmitted by the photographic material, even though the qualities of the incident and transmitted light are made dissimilar by selective absorption of the photographic material. This is expressed as the log10 of the ratio of incident to transmitted photographic intensities: $D_p = \log_{10}(\Phi o/\Phi t)$, where Φo is the photographic intensity of energy incident on the sample, and Φt is the photographic intensity of energy transmitted by the sample.

3.166
print-through
unwanted transfer of a magnetic field and its signal from one tape lap to another within a roll of magnetic tape

3.167
projection density
optical density (3.141) of a processed photographic image in which the angular distributions of the incident and transmitted radiant flux are equal and specified

3.168
protective enclosure
enclosure (3.71) designed for protection from outside factors such as light, reactive gases, and moisture, including changes in *relative humidity* (3.181)

3.169
quasi-linear motion
<materials testing> curvilinear motion with a small component of total displacement orthogonal to its main direction of movement

Note 1 to entry: The Sutherland type *abrasion* (3.1) tester provides an arc motion, where the length of the arc is much shorter than the radius of the circle, resulting in a mainly linear motion with a small orthogonal component.

3.170
rank order
<psychophysical> result of a psychophysical method involving the arrangement by an observer of a series of stimuli in order of increasing or decreasing image quality or an attribute thereof, in accordance with the set of instructions provided

Note 1 to entry: See ISO 20462-1. See also *interval scale* (3.101) and *ratio scale* (3.171).

3.171
ratio scale
<psychophysical> scale established by a psychophysical method, which has the properties of an *interval scale* (3.101) but for which, in addition, the ratio between the values allocated to two stimuli is equal to the ratio between the perceived intensities of these stimuli

Note 1 to entry: With this scale, a numerical value of zero designates total absence of the property.

Note 2 to entry: The ratio scale is the only case for which it is meaningful to say that one result is, for instance, ten times as great as another.

3.172
raw photographic material
photographic material that has not been exposed to actinic radiation and has not been processed

3.173
read-only-medium compact disc
optical disc (3.142) to which information is transferred during manufacture to certain areas in the compact disc format and can be read many times

Note 1 to entry: Described in ISO/IEC 10149.

Note 2 to entry: See also *compact disc read-only memory* (3.40), *rewritable compact disc* (3.185), *compact disc* (3.39), and *compact disc-recordable* (3.41).

3.174
receptor
<materials testing> *substrate* (3.218) used to rub the test specimen and onto which ink or other material that is removed from the specimen is transferred

Note 1 to entry: An example of a receptor is the back side of the printed media (printed or D_{min} (3.55) area) being evaluated or a standard reference paper.

3.175
reciprocity law failure
non-equivalence in results between a long exposure/low-intensity experiment and its counterpart with an equivalent intensity-time product where exposure time is short and intensity is high

3.176
recording material
medium (3.124) that receives images, text or audio information which can subsequently be viewed or retrieved

3.177
red print
defect resulting from a thermal reaction between the cyan dye and other components of the cyan layer in a *chromogenic print* (3.32)

3.178
reel
spool
metal or plastic *hub* (3.46) or *core* (3.46) with *flange(s)* (3.80) (protective sides) onto which *recording material* (3.176) is wound

3.179
reflection print
positive photographic image intended to be viewed with reflected light

3.180
reflection print support
opaque support for the image forming and auxiliary layers of a *photographic print* (3.155) intended for viewing by reflected light

3.181
relative humidity
RH
ratio, defined as a percentage, of the existing partial vapour pressure of water to the vapour pressure at saturation at a given temperature

Note 1 to entry: It is usually, but not always, equal to the percentage of the amount of moisture in the air to that at saturation.

Note 2 to entry: See also *dew point* (3.56) and *absolute humidity* (3.2).

3.182
retrievability
ability to access information as recorded

3.183
reversible conservation mounting
mounting (3.132) that employs reversible *photo-safe* (3.156) materials such as locally applied non-adhesive attachment methods (e.g. “photocorners”, edge strips) or in some cases an adhesive applied locally (hinges) or overall, such that the mounting may be undone without harm to the mounted item using non-invasive procedures

3.184
reversible encapsulation
encapsulation (3.70) that can be removed without damaging the object

3.185
rewritable compact disc
CD-RW
recordable *optical disc* (3.142) in which information can be recorded to certain areas in the compact disc format, erased and rerecorded many times

Note 1 to entry: See also *compact disc read-only memory* (3.40), *compact disc* (3.39), *compact disc-recordable* (3.41), and *read-only-medium compact disc* (3.173).

3.186
rub resistance
ability and/or degree of a *substrate* (3.218) or a print to withstand rubbing, as evidenced by *abrasion* (3.1) effects

Note 1 to entry: See also *mar resistance* (3.122).

3.187
safety photographic film
photographic film (3.152) which passes the ignition-time test and the burning-time test

Note 1 to entry: Ignition-time test and burning-time test are defined in ISO 18906.

3.188
safety poly (ethylene terephthalate) base
safety poly (ethylene terephthalate) substrate
polyester *film substrate* (3.77) composed mainly of a polymer of ethylene glycol and terephthalic acid

3.189
scratch
form of damage, caused by a point or edge

3.190
scuff
form of *abrasion* (3.1), leading to a change in gloss

3.191
seam
area where an *enclosure* (3.71) has an adhesive bond or a heat-welded bond in its structure

3.192
shell
cassette or cartridge housing for magnetic tape

3.193
shellac
resinous secretion of the lac insect that has been purified and dissolved in alcohol

Note 1 to entry: Shellac has been used as a traditional coating on photographs. It is also applied as a liquid *varnish* (3.232) to restrict the migration of wood resins for sealing bare wood in framing.

3.194
show through
property of a *substrate* (3.218) that allows underlying markings or materials to affect the reflectance of the substrate

Note 1 to entry: Show through of a substrate results in the undesired appearance of information from the reverse of a document when viewed and/or scanned.

3.195
sign printing
printing for graphic products for indoor or outdoor displays (poster, banner, textile, billboard, and wrapping decoration)

Note 1 to entry: See also *book printing* (3.22), *commercial printing* (3.38), *newspaper and periodical printing* (3.135), *package printing* (3.146), and *transactional and direct mail printing* (3.228).

3.196
silver halide print
photographic print (3.155) made from material sensitised with silver halide emulsion and chemically processed to produce an image

3.197
sleeve
sheath
enclosure (3.71) with one or more *seams* (3.191) and both ends open

3.198
slide mount
structure to retain a film for slide projection

3.199
slip agent
component added to plastic material in order to reduce the coefficient of friction

3.200
slot
space or slit in the *hub* (3.46) or *flange* (3.80) surface

3.201
smudge
result of rubbing leading to the displacement and re-deposition of materials into adjacent areas

Note 1 to entry: See also *abrasion* (3.1).

Note 2 to entry: See ISO 18947-1 and ISO 18947-2.

3.202
solar radiation cut-on
wavelength of outdoor terrestrial daylight, typically 295 nm, at which point significant irradiance can be detected

Note 1 to entry: 295 nm is the wavelength at which, given unobstructed sunlight and standard atmospheric conditions (e.g. CIE-H8), the measure of terrestrial UV irradiance is above the threshold of 1,0E -03 $W/m^2/nm^{-1}$. CIE-H8 is defined in CIE 241 for given atmospheric conditions defined by air mass, water vapour, O_3 content, atmospheric optical density, and albedo.

3.203
spectral irradiance
absolute or relative radiant power emitted by a source, or incident upon a receiver, as a function of wavelength

Note 1 to entry: The term "spectral power distribution" is synonymous with spectral irradiance and has historically been used in many standards related to weathering and *lightfastness* (3.117) testing.

Note 2 to entry: See ASTM G113, which is the terminology standard in the G03 Weathering and Durability committee.

Note 3 to entry: See also *direct spectral irradiance* (3.63), *indirect spectral irradiance* (3.97), *daylight filter* (3.52), *daylight through window glass filter* (3.53), and *general indoor light filter* (3.86).