

A Resource List for Standards Related to Digital Imaging of Print, Graphic, and Pictorial Materials

The successful creation and maintenance of digital images depends on a complex network of formal standards and consensus-based best-practice guidelines. This resource list focuses on technical standards. The term “standards” is often used rather loosely, but in this guideline, it refers to voluntary standards developed by industry, such as [Adobe <http://www.adobe.com/>]; by standards bodies, such as the [Association for Information and Image Management (AIIM) <http://www.aiim.org/>]; or by Standards Developing Organizations, such as the [International Organization for Standardization (ISO) <http://www.iso.org>]. The [ISO/IEC Information Center <http://www.standardsinfo.net/info/livelink/fetch/2000/148478/6301438/index.html>] is one source of information about the standards process; another excellent reference on how standards are defined and categorized can be found on [Wikipedia <http://en.wikipedia.org/wiki/Standard>].

This document is intended to provide an overview of standards related to the creation and maintenance of digital images. (See [“Digital Conversion – Documents and Guidelines” {link to Sue’s document}] for a list of informal guidelines and best practices.) To help monitor new technology developments, it lists specialized Web sites for finding standards and describes the organizations most involved in developing and maintaining digital imaging standards. Two sections below, “Digitization Standards and Guidelines” and “Storage Standards and Guidelines,” cite specific standards related to digitizing documents and digital storage. These standards offer insight into the technical issues involved in the digitization process, with particular regard to imaging hardware and software. The digitization standards listed here include terminology definitions, specifications for opto-electronic conversion function, resolution, noise, dynamic range, speed, viewing conditions, and color management as well as project management and quality control. Digital storage standards encompass embedded metadata, storage media, file formats, and repositories. One can digitize bound materials, manuscripts, documents, maps, and pictures, and store the images without reading all of the standards, but it is important to ensure that the tools selected have incorporated the standards.

There are many forms of metadata (descriptive, administrative, structural), and many purposes for which it may be collected. The “Metadata Standards and Guidelines” section below focuses those forms of metadata commonly embedded in digital files, some of which include descriptive elements.

Disclaimer: This list was compiled as a service to those wanting information regarding digital imaging standards. Inclusion on this list does not represent recommendation or endorsement by the Federal Digitization Guidelines Working Group. While the following list was current and accurate at the time of compilation, versions are constantly updated. Users should consult the official sites for the latest version of documentation. Users should direct concerns about these links to their respective site administrators or webmasters. Suggestions for additions or modifications can be submitted here.

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Search Services for Standards

Specialized search services are available to help locate formally approved and developing digital standards as well as many other kinds of standards.

[National Resource for Global Standards (NSSN) <http://www.nssn.org/>]

The National Resource for Global Standards includes references to over 250,000 standards from more than 600 developers worldwide. Profiles of developers and technical committees are also available. Users can search for standards by subject keyword, document number, title word, responsible committee, and developer name.

[TechStreet <http://www.techstreet.com/>]

TechStreet, produced by Thomson Scientific, covers digital imaging as part of its “Information Technology” section. The site provides access to more than 300,000 industry codes and standards from over 350 leading standards developing organizations.

[World Standards Services Network (WSSN) <http://www.wssn.net/>]

The World Standards Services Network is a network of publicly accessible World Wide Web servers of standards organizations around the world. WSSN provides information on international, regional and national standardization and services through its members’ sites. The “structured index” links to the publication catalogs of many standards organizations.

Organizations that Develop and Maintain Digital Imaging Standards

Both general standards bodies, such as the International Organization for Standardization (ISO), and groups focused on imaging participate in the development of standards related to the digitization of pictures and print documents. This section lists the major organizations involved in national and international imaging standards. By visiting their Web sites you can read about existing standards, purchase or download documentation, and learn about new initiatives.

[American National Standards Institute (ANSI) <http://www.ansi.org/>]

Washington, DC. Headquarters

1819 L Street, NW, 6th floor
Washington, DC 20036
Tel: (202) 293-8020, Fax: (202) 293-9287

New York City Office, (Operations)

25 West 43rd Street, 4th floor
New York, NY 10036
Tel: (212) 642-4900, Fax: (212) 398-0023

The American National Standards Institute (ANSI) is a private nonprofit organization that administers and coordinates the United States voluntary standards and conformity assessment system. Founded in 1918, it is the official U.S. representative to the world's leading standards organizations, including the International Organization for Standardization (ISO), the International Electrotechnical Commission (IEC), and other regional standards bodies. ANSI accredits standards developers to create standards. The businesses, professional societies and trade associations, standards developers, and government agencies that make up its nearly 1000 members work together to develop voluntary national consensus standards.

[American Society for Quality (ASQ) <http://www.asq.org/>]

P.O. Box 3005
Milwaukee, WI 53201-3005
or
600 North Plankinton Avenue
Milwaukee, WI 53203
USA
Tel: 800-248-1946 (United States and Canada only); Fax: 414-272-1734
Tel: +1-414-272-8575 (International)

The American Society for Quality (ASQ), was formed in 1946 as the "American Society for Quality Control." With members in more than 120 countries, and its World Partner and Strategic Alliance international programs, it is the world's leading authority on quality. ASQ members use time-tested methods and processes to improve work in Education, Government, Healthcare, Manufacturing, and Service. ASQ's Standards Committee is involved in standards related to "quality management" through the ISO 9000 family of standards; "environmental management," through the ISO 14000 family of standards; the application of statistical methods through

ISO/TC 69; and social responsibility ISO/Technical Management Board/Working Group on Social Responsibility.

[Association for Information and Image Management (AIIM) <http://www.aiim.org/>]
1100 Wayne Avenue, Suite 1100
Silver Spring, MD 20910
Tel: (301) 587-8202, Toll-free: (800) 477-2446, Fax: (301) 587-2711

The Association for Information and Image Management (AIIM) was founded in 1943 as the National Microfilm Association and has evolved to serve the Enterprise Content Management Industry. AIIM's Standards Program began developing standards in the early 1960s as a subcommittee of the American Library Association; today it is comprised of more than twenty committees and working groups. More than eighty of AIIM's standards, recommended practices, and technical reports have been approved by ANSI. The imaging subcommittee is: **[C24, Electronic Imaging committee <http://www.aiim.org/standards/article.aspx?ID=24820>].**

[International Color Consortium (ICC) <http://www.color.org/>]
1899 Preston White Drive
Reston, VA 20191
Tel: (703) 264-7200

The International Color Consortium was established in 1993 to create, promote and encourage the standardization and evolution of an open, vendor-neutral, cross-platform color management system architecture. The resulting ICC specification (ISO 15076-1:2005) provides a cross-platform format to translate color data between devices in order to ensure color fidelity, and is specified in many international standards.

[International Electrotechnical Commission (IEC) <http://www.iec.ch/>]
IEC Central Office
3, rue de Varembe
P.O. Box 131
CH - 1211 GENEVA 20
Switzerland
Tel: +41 22 919 02 11, Fax: +41 22 919 03 00

Founded in 1906, the International Electrotechnical Commission prepares and publishes International Standards for all 'electrotechnology' fields (electrical, electronic and related technologies). IEC standards are created and maintained by 179 technical committees and about 700 working groups representing the sixty-nine national committees that make up the IEC membership.

[International Imaging Industry Association (I3A), <http://www.i3a.org/>]
I3A Headquarters
701 Westchester Avenue Suite 317W

White Plains, NY 10604
Tel: (914) 285-4933, Fax: (914) 285-4937

I3A Europe
"La Billardiere"
36190 Gargilesse
France
Tel: +33 (0) 254 47 80 39

The nonprofit International Imaging Industry Association (I3A) is the largest imaging industry group in the world, and serves as the central forum for the development and advancement of open standards within the imaging industry. It traces its beginnings to 1946 with the establishment of the National Association of Photographic Manufacturers (NAPM), later renamed the Photographic and Imaging Manufacturers Association (PIMA). I3A was formed by the merger of PIMA and the Digital Imaging Group (DIG). I3A's technical committees encompass all aspects of imaging, from traditional silver-halide photography to advanced digital still picture imaging to recycling of photographic materials and more. I3A's approach to standardization through its Initiative Groups allows for the rapid development of consortium standards to respond to market needs.

[I3A Working Group 18: Electronic Still Picture Imaging
<http://www.i3a.org/technologies/digital-imaging/wg18>] contributes to ISO TC42,

[International Organization for Standardization (ISO) <http://www.iso.org>]

ISO Central Secretariat
1, ch. de la Voie-Creuse; Case postale 56
CH-1211 Geneva 20
Switzerland
Tel: +41 22 749 02 22, Fax: +41 22 749 01 55

ISO is the world's largest standards organization. Its membership is composed of the national standards institutes of 157 countries. Since its formation in 1947, it has published more than 17,000 international standards in response to global needs. ISO standards are developed by 200 technical committees which include representatives from the industrial, technical and business sectors, with input from representatives of government agencies, consumer organizations, academia and testing laboratories. Thirty-eight member organizations serve as Technical secretariats providing administrative and technical services to the technical committees.

Of special interest for the imaging community:

[Technical Committee 42: Photography (ISO TC42)
<http://www.iso.org/iso/en/stdsdevelopment/tc/tclist/TechnicalCommitteeDetailPage.TechnicalCommitteeDetail?COMMID=1603>] (Includes list of more than 150 published standards. For draft standards, go to the committee's "Technical Programme" page.)

[Joint Technical Committee 1: Information Technology (JTC 1)

http://www.iso.org/iso/standards_development/technical_committees/list_of_iso_technical_committees/iso_technical_committee.htm?commid=45020

Secretariat: American National Standards Institute ([ANSI](#))

Secretariat direct:

Tel: (212) 642-4931 / (212) 642-4932, Fax: (212) 840-2298

[National Information Standards Organization (NISO) <http://www.niso.org>]

One North Charles Street

Suite 1905

Baltimore, MD 21201

Tel: (301) 654-2512, Toll-free: (866) 957-1593, Fax: (410) 685-5278

Founded in 1939, the National Information Standards Organization is a non-profit association accredited by ANSI with the mission to identify, develop, maintain, and publish technical standards to manage and provide access to trusted information. Its nearly eighty voting members represent a variety of groups involved in the organization and distribution of information, including libraries, the information technology and publishing industries, and the vendor community. NISO maintains the Z39 series of standards, and makes the standards it creates freely available on its website.

Digitization Standards and Guidelines

Many formal and de facto standards influence the digitization of documents.

The list below reflects the key factors that affect digital image capture and display. The sponsoring organizations can be identified through the document numbers. The organizations' acronyms are explained in the previous section. The url provided links to where the standard may be purchased or download from the originating standard organization's website, if available.

[Terminology]

[Resolution]

[Opto-Electronic Conversion Function]

[Modulation Transfer Function]

[Noise]

[Dynamic Range]

[Speed]

[Viewing Conditions]

[Color]

[Project Management]

[Quality Control]

Terminology

[ISO 12231:2005

<http://webstore.ansi.org/RecordDetail.aspx?sku=ISO+12231%3a2005>]

Photography - Electronic still picture imaging – Vocabulary

Description: ISO 12231:2005 defines terms used in electronic still picture imaging. Only terms related to electronic still picture imaging are included. These terms are relevant to the current tasks or are of general interest in electronic still picture imaging.

[ISO 12651:1999

<http://webstore.ansi.org/RecordDetail.aspx?sku=ISO+12651%3a1999>]

Electronic imaging – Vocabulary

Description: This International Standard is intended to facilitate communication in the field of electronic imaging. It presents, in two languages, terms and definitions of selected concepts relevant to this field of information technologies and identifies relationships among the entries. In order to facilitate their translation into other languages, the definitions are drafted so as to avoid, as far as possible, any peculiarity attached to a language.

[ANSI/NISO Z39.87-2006

http://www.niso.org/kst/reports/standards?step=2&gid=&project_key=b897b0cf3e2ee526252d9f830207b3cc9f3b6c2c]

Data Dictionary - Technical Metadata for Digital Still Images.

Description: This standard defines a set of metadata elements for raster digital images to enable users to develop, exchange, and interpret digital image files. The dictionary has been designed to facilitate interoperability between systems, services, and software as well as

to support the long-term management of and continuing access to digital image collections. ANSI Approval Date: 12/18/06 Metadata for Images in XML Schema (MIX).

Opto-Electronic Conversion Function

[ISO 14524:1999

<http://webstore.ansi.org/RecordDetail.aspx?sku=ISO+14524%3a1999>]

Photography -- Electronic still-picture cameras -- Methods for measuring opto-electronic conversion functions (OECFs)

Description: This International Standard specifies methods for the measurement of opto-electronic conversion functions (OECFs) of electronic still-picture cameras whose output is encoded as a digital image file. The OECF is defined as the relationship between the focal plane log exposures or scene log luminances, and the digital output levels of an opto-electronic digital image capture system. This International Standard applies to both monochrome and colour electronic still-picture cameras.

Resolution

[ISO 12233:2000

<http://webstore.ansi.org/RecordDetail.aspx?sku=ISO+12233%3a2000>]

Photography -- Electronic still-picture cameras -- Resolution measurements

Description: This International Standard specifies methods for measuring the resolution of electronic still-picture cameras. It is applicable to the measurement of both monochrome and colour cameras which output digital data or analog video signals.

[ISO 16067-1:2003

<http://webstore.ansi.org/RecordDetail.aspx?sku=ISO+16067-1%3a2003>]

Photography - Spatial resolution measurements of electronic scanners for photographic images - Part 1: Scanners for reflective media

Description: ISO 16067-1:2003 specifies methods for measuring and reporting the spatial resolution of electronic scanners for continuous tone photographic prints. It is applicable to both monochrome and colour print scanners.

[ISO 16067-2:2004

<http://webstore.ansi.org/RecordDetail.aspx?sku=ISO+16067-2%3a2004>]

Photography - Electronic scanners for photographic images - Spatial resolution measurements - Part 2: Film scanners

Description: ISO 16067-2:2004 specifies methods for measuring and reporting the spatial resolution of electronic scanners for continuous tone photographic negatives and reversal (e.g. slide) films. It applies to both monochrome and colour film scanners.

[ANSI/AIIM TR26-1993

<http://webstore.ansi.org/RecordDetail.aspx?sku=ANSI%2fAIIM+TR26-1993>]

Resolution as it Relates to Photographic and Electronic Imaging (NOT AN AMERICAN NATIONAL STANDARD)

Description: This technical report provides a tutorial on image resolution for micrographics and electronic images. The difference in the use of the term resolution in photographic and digital systems is clarified.

Modulation Transfer Function

[ISO 15529:2007

<http://webstore.ansi.org/RecordDetail.aspx?sku=ISO+15529%3a2007>]

Optics and optical instruments - Optical transfer function - Principles of measurement of modulation transfer function (MTF) of sampled imaging systems

Description: Specifies the principal MTFs associated with a sampled imaging system, together with related terms and outlines a number of suitable techniques for measuring these MTFs. It also defines a measure for the “aliasing” related to imaging with such systems.

Noise

[ISO 15739:2003

<http://webstore.ansi.org/RecordDetail.aspx?sku=ISO+15739%3a2003>]

Photography – Electronic still picture imaging – Noise measurements

Description: ISO 15739:2003 specifies methods for measuring and reporting the noise versus signal level and dynamic range of electronic still-picture cameras. It applies to both monochrome and colour electronic still-picture cameras.

Dynamic Range

[ISO 21550:2004

<http://webstore.ansi.org/RecordDetail.aspx?sku=ISO+21550%3a2004>]

Photography - Electronic scanners for photographic images - Dynamic range measurements

Description: ISO 21550:2004 specifies methods for measuring and reporting the dynamic range of electronic scanners for continuous tone photographic media. It applies to scanners for reflective and to scanners for transmissive media.

Speed

[ISO 12232:2006

<http://webstore.ansi.org/RecordDetail.aspx?sku=ISO+12232%3a2006>]

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

Description: ISO 12232:2006 specifies the method for assigning and reporting ISO speed ratings, ISO speed latitude ratings, standard output sensitivity values, and recommended exposure index values, for digital still cameras. ISO 12232:2006 is applicable to both monochrome and colour digital still cameras.

Viewing Conditions

[ISO 3664:2000

<http://webstore.ansi.org/RecordDetail.aspx?sku=ISO+3664%3a2000>]

Viewing conditions -- Graphic technology and photography

Description: This International Standard specifies viewing conditions for images on both reflective and transmissive media, such as prints (both photographic and

photomechanical) and transparencies, as well as images displayed in isolation on colour monitors. Specifically, it shall be used for: critical comparison between transparencies, reflection photographic or photomechanical prints and/or other objects or images, appraisal of the tone reproduction and colourfulness of prints and transparencies at illumination levels similar to those for practical use, including routine inspection, critical appraisal of transparencies which are viewed by projection, for comparison with prints, objects, or other reproductions, and appraisal of images on colour monitors which are not viewed in comparison to any form of hardcopy.

[ISO 12646:2008

<http://webstore.ansi.org/RecordDetail.aspx?sku=ISO+12646%3a2008>]

Graphic technology - Displays for colour proofing - Characteristics and viewing conditions

Description: ISO 12646:2008 specifies the minimum requirements for the properties of displays to be used for soft proofing of colour images. Included are requirements for uniformity, convergence, refresh rate, display diagonal size, spatial resolution and glare of the screen surface. The dependence of colorimetric properties on the electrical drive signals and viewing direction, especially for flat panel displays, is also specified.

Color

[ISO 12640-2:2004

<http://webstore.ansi.org/RecordDetail.aspx?sku=ISO+12640-2%3a2004>]

Graphic technology - Prepress digital data exchange - Part 2: XYZ/sRGB encoded standard colour image data (XYZ/SCID)

Description: ISO 12640-2:2004 specifies a set of 15 standard colour images (encoded as both 16-bit XYZ and 8-bit RGB digital data provided in electronic data files) that can be used for the evaluation of changes in image quality during coding, image processing (including transformation compression and decompression), displaying on a colour monitor or printing. They can be used for many graphic technology applications such as research, development, product evaluation, and process control.

[ISO/DIS 12640-3: 2007

<http://webstore.ansi.org/RecordDetail.aspx?sku=ISO+12640-3%3a2007>]

Graphic technology - Prepress digital data exchange - Part 3: CIELAB standard colour image data (CIELAB/SCID)

Description: ISO 12640-3:2007 specifies a set of standard large gamut colour images (encoded as 16-bit CIELAB digital data) that can be used for the evaluation of changes in image quality during coding, image processing (including transformation, compression and decompression), displaying on a colour monitor and printing. These images can be used for research, testing and assessing of output systems such as printers, colour management systems and colour profiles.

[ISO 12641:1997

<http://webstore.ansi.org/RecordDetail.aspx?sku=ISO+12641%3a1997>]

Graphic technology -- Prepress digital data exchange -- Colour targets for input scanner calibration

Description: ISO 12641 combines, into one International Standard, the more widely known ANSI IT8.7/1 and IT8.7/2 standards, which describe transmission and reflection targets for input scanner calibration.

[ISO 12647-1:2004

<http://webstore.ansi.org/RecordDetail.aspx?sku=ISO+12647-1%3a2004>]

Graphic technology - Process control for the production of half-tone colour separations, proof and production prints - Part 1: Parameters and measurement methods

Description: ISO 12647-1:2004 specify parameters that define printing conditions for the various processes used in the graphic arts industry. Practitioners wishing to work to common goals may use the values of the parameters specified in the exchange of data to characterize the intended printing condition and/or for the process control of printing.

[ISO 12647-7:2007

<http://webstore.ansi.org/RecordDetail.aspx?sku=ISO+12647-7%3a2007>]

Graphic technology - Process control for the production of half-tone colour separations, proof and production prints - Part 7: Proofing processes working directly from digital data

Description: ISO 12647-7:2007 specifies requirements for systems that are used to produce hard-copy digital proof prints intended to simulate a printing condition defined by a set of characterization data. Recommendations are provided with regard to appropriate test methods associated with these requirements. In addition, guidance with respect to the certification of proofing systems related to specific printing condition aims is also included.

[ISO 13656:2000

<http://webstore.ansi.org/RecordDetail.aspx?sku=ISO+13656%3a2000>]

Graphic technology - Application of reflection densitometry and colorimetry to process control or evaluation of prints and proofs

Description: This International Standard applies to process control and evaluation of single and multi-colour proofing and printing in the graphic arts using densitometry and colorimetry. This International Standard defines terms; specifies minimum requirements for control strips; specifies test methods; and specifies reporting procedures for the results.

[ISO 15076-1:2005

<http://webstore.ansi.org/RecordDetail.aspx?sku=ISO+15076-1%3a2005>]

Image technology colour management - Architecture, profile format and data structure - Part 1: Based on ICC.1:2004-10

Description: ISO 15076-1:2005 specifies a colour profile format and describes the architecture within which it can operate. This supports the exchange of information which specifies the intended colour image processing of digital data. Specification of the required reference colour spaces and the data structures (tags) are included.

[ISO/TR 16066:2003

<http://webstore.ansi.org/RecordDetail.aspx?sku=ISO%2fTR+16066%3a2003>]

Graphic technology - Standard object colour spectra database for colour reproduction evaluation (SOCS)

Description: ISO/TR 16066:2003 provides a database of typical and difference sets of existing object colour spectral data that are suitable for evaluating the colour reproduction of image input devices. It also includes the spectral reflectance and transmittance source data from which these data sets have been derived.

[ISO 17321-1:2006

<http://webstore.ansi.org/RecordDetail.aspx?sku=ISO+17321-1%3a2006>]

Graphic technology and photography - Colour characterisation of digital still cameras (DSCs) - Part 1: Stimuli, metrology and test procedures

Description: ISO 17321-1:2006 specifies colour stimuli, metrology, and test procedures for the colour characterization of a digital still camera (DSC) to be used for photography and graphic technology. Two methods are provided, one using narrow spectral band illumination and the other using a spectrally and colorimetrically calibrated target. Except for a specific set of permitted data operations, these DSC data are raw.

ISO/CD 17321-2 December 2003

Graphic technology and photography – Colour characterization of digital still cameras (DSCs) – Part 2: Methods for determining transforms from raw DSC to scene-referred image data\
Withdrawn

[ISO 22028-1:2004

<http://webstore.ansi.org/RecordDetail.aspx?sku=ISO+22028-1%3a2004>]

Photography and graphic technology - Extended colour encodings for digital image storage, manipulation and interchange - Part 1: Architecture and requirements

Description: ISO 22028-1:2004 specifies a set of requirements to be met by any extended-gamut colour encoding that is to be used for digital photography and/or graphic technology applications involving digital image storage, manipulation and/or interchange. ISO 22028-1:2004 is applicable to pictorial digital images that originate from an original scene, as well as digital images with content such as text, line art, vector graphics and other forms of original artwork. ISO 22028-1:2004 also describes a reference image-state-based digital imaging architecture, encompassing many common workflows, that can be used to classify extended colour encodings into a number of different image states. However, ISO 22028-1:2004 does not specify any particular workflow(s) that are to be used for digital photography and/or graphic technology applications.

[ISO/TS 22028-2:2006

<http://webstore.ansi.org/RecordDetail.aspx?sku=ISO%2fTS+22028-2%3a2006>]

Photography and graphic technology - Extended colour encodings for digital image storage, manipulation and interchange - Part 2: Reference output medium metric RGB colour image encoding (ROMM RGB)

Description: ISO/TS 22028-2:2006 defines a family of extended colour-gamut output-referred RGB colour image encodings designated as reference output medium metric RGB (ROMM RGB). Digital images encoded using ROMM RGB can be manipulated, stored,

transmitted, displayed, or printed by digital still picture imaging systems. Three precision levels are defined using 8-, 12- and 16-bits/channel.

[ISO/TS 22028-3:2006

<http://webstore.ansi.org/RecordDetail.aspx?sku=ISO%2fTS+22028-3%3a2006>]

Photography and graphic technology - Extended colour encodings for digital image storage, manipulation and interchange - Part 3: Reference input medium metric RGB colour image encoding (RIMM RGB)

Description: ISO/TS 22028-3:2006 specifies a family of extended-colour-gamut scene-referred RGB colour image encodings designated as reference input medium metric RGB (RIMM RGB). Digital images encoded using RIMM RGB can be manipulated, stored, transmitted, displayed, or printed by digital still picture imaging systems. Three precision levels are defined using 8-, 12- and 16-bits/channel. An extended luminance dynamic range version of RIMM RGB is also defined designated as extended reference input medium metric RGB (ERIMM RGB). Two precision levels of ERIMM RGB are defined using 12- and 16-bits/channel.

ISO/TS 22028-4:Draft

Photography And graphic technology -- extended colour encodings for digital image storage, manipulation and interchange -- part 4: Reference input medium metric L*RGB colour image encoding.

Description: The ISO technical committee 42 (Photography) working group 18 (digital still picture imaging) has accepted by a majority of the participating countries to standardize eciRGBv2 as a technical specification under the ISO 22028 series of color encodings. ECI will soon publish a document that serves as the basis for the standard and contains all necessary details to utilize eciRGBv2 for a perceptually linear gamma independent of the destination space with a D50 white point and L* gamma.

[IEC 61966-2-1 Ed. 1.0 b:1999

<http://webstore.ansi.org/RecordDetail.aspx?sku=IEC+61966-2-1+Ed.+1.0+b%3a1999>]

Multimedia systems and equipment - Colour measurement and management - Part 2-1: Colour management - Default RGB colour space - sRGB

Description: Applies to the encoding and communication of RGB colours used in computer systems and similar applications, by defining encoding transformations for use in defined reference conditions.

[IEC 61966-2-1 Amd.1 Ed. 1.0 en:2003

<http://webstore.ansi.org/RecordDetail.aspx?sku=IEC+61966-2-1+Amd.1+Ed.+1.0+en%3a2003>]

Amendment 1

[IEC 61966-2-2 Ed. 1.0 en:2003 <http://webstore.ansi.org/RecordDetail.aspx?sku=IEC+61966-2-2+Ed.+1.0+en%3a2003>]

Multimedia systems and equipment - Colour measurement and management - Part 2-2: Colour management - Extended RGB colour space - scRGB

[IEC 61966-2-4 Ed. 1.0 en:2006 <http://webstore.ansi.org/RecordDetail.aspx?sku=IEC+61966-2-4+Ed.+1.0+en%3a2006>]

Multimedia systems and equipment - Colour measurement and management - Part 2-4: Colour management - Extended-gamut YCC colour space for video applications - xvYCC

[IEC 61966-2-5 Ed. 1.0 en:2007 <http://webstore.ansi.org/RecordDetail.aspx?sku=IEC+61966-2-5+Ed.+1.0+en%3a2007>]

Multimedia systems and equipment - Colour measurement and management - Part 2-5: Colour management - Optional RGB colour space - opRGB

[ANSI IT8.7/1-1993 (R1999)

[http://webstore.ansi.org/RecordDetail.aspx?sku=ANSI+IT8.7%2f1-1993+\(R1999\)](http://webstore.ansi.org/RecordDetail.aspx?sku=ANSI+IT8.7%2f1-1993+(R1999))]

Graphic Technology – Color Transmission Target for Input Scanner Calibration

Description: Defines an input test target that will allow any color input scanner to be calibrated with any film dye set used to create the target. It is intended to address the color transparency products which are generally used for input to the preparatory process for printing and publishing.

[ANSI IT8.7/2-1993

<http://webstore.ansi.org/RecordDetail.aspx?sku=ANSI+IT8.7%2f2-1993>]

Graphic Technology – Color Reflection Target for Input Scanner Calibration

Description: This standard defines the layout and colorimetric values of a target which can be manufactured on any color photographic paper and which is intended for use in the calibration of a photographic paper/scanner combination (as used in the preparatory process for printing and publishing).

[Specification ICC.1: 2003-09

http://www.color.org/icc_specs2.xalter]

File format for color profiles, version 4.1 (Revision of ICC.1:1998:09)

See ISO 15076-1:2005 below.

Project Management

[ISO/TR 14105:2001

<http://webstore.ansi.org/RecordDetail.aspx?sku=ISO%2fTR+14105%3a2001>]

Electronic imaging - Human and organizational issues for successful Electronic Image Management (EIM) implementation

Description: This Technical Report systematically identifies and reviews the ergonomic and organizational issues and considerations associated with the selection criteria, implementation criteria, and work practice criteria for EIM systems. It focuses on cognitive, physical, organizational, and human factors as they apply to usability criteria for imaging technologies development, selection, and implementation. It a fundamental framework for understanding the basic issues and concepts of Organizational Factors, Human Factors, and Ergonomics for Electronic Image Management (EIM) systems. The principles of socio-technical systems theory are applied to the introduction of EIM into an organization.

[ANSI/AIIM TR27-1996

<http://webstore.ansi.org/RecordDetail.aspx?sku=AIIM+TR27-1996>]

Electronic Imaging Request for Proposal (RFP) Guidelines

Description: Do you need to develop an RFP for an image-based document storage and retrieval system? This technical report takes you step-by-step through the process of analyzing your situation and developing a "request for proposal" that systematically describes your firm's electronic imaging requirements and functional needs. The report focuses on imaging systems for office-type documents.

[ANSI/AIIM TR35-1995

<http://webstore.ansi.org/RecordDetail.aspx?sku=ANSI%2fAIIM+TR35-1995>]

Human and Organizational Issues for Successful Electronic Image Management (EIM) Implementation

Description: This document is a "must read" primer for organizations contemplating the acquisition of a document imaging system. It provides a framework for understanding the basic issues and concepts of organization, human and ergonomic factors for EIM systems. The focus is on cognitive, physical, organizational, and human factors as technologies.

[RLG Guidelines for Creating a Request for Proposal for Digital Imaging Services, 1998

<http://www.rlg.org/en/pdfs/RFPGuidelines.pdf>]

Description: Provides a framework for RLG member institutions in creating Requests for Proposal (RFP) for digital imaging services; prepared by Cornell University Library, Department of Preservation and Conservation.

Quality Control

[ISO 20462-1:2005

<http://webstore.ansi.org/RecordDetail.aspx?sku=ISO+20462-1%3a2005>]

Photography - Psychophysical experimental methods for estimating image quality - Part 1: Overview of psychophysical elements

Description: ISO 20462-1:2005 is part of a three-part standard pertaining to the subjective evaluation of pictorial still image quality. ISO 20462-1:2005 defines the units by which image quality is quantified (just noticeable differences, or JNDs); describes the influence of stimulus properties, observer characteristics, and task instructions on results obtained from rating experiments; and provides a flow chart for choosing the preferred psychophysical method for determining image quality from among those defined in subsequent parts of ISO 20462

[ISO 20462-2:2005

<http://webstore.ansi.org/RecordDetail.aspx?sku=ISO+20462-2%3a2005>]

Photography - Psychophysical experimental methods for estimating image quality - Part 2: Triplet comparison method

Description: ISO 20462-2:2005 defines a standard psychophysical experimental method for subjective image quality assessment of soft copy and hard copy still picture images.

[ISO 20462-3:2005

<http://webstore.ansi.org/RecordDetail.aspx?sku=ISO+20462-3%3a2005>]

Photography - Psychophysical experimental methods for estimating image quality - Part 3:
Quality ruler method

Description: ISO 20462-3:2005 specifies: the nature of a quality ruler; hardcopy and softcopy implementations of quality rulers; how quality rulers may be generated or obtained; and the standard quality scale (SQS), a fixed numerical scale that may be measured using quality rulers.

[ANSI/AIIM MS44-1988 (R1993)

<http://www.aiim.org/productcatalog/Product.aspx?id=220>]

Recommended Practice for Quality Control of Image Scanners

Description: Adopted as a Federal Information Processing Standard (FIPS), MS44 provides procedures for the ongoing control of quality within an electronic image management (EIM) system from input to output. Regular use of these procedures should ensure that the established level of quality is maintained. Targets are available separately as X441, and X443, or as a set X440. (FIPS withdrawn, 1997)

[ANSI/ASQC S2-1995

<http://webstore.ansi.org/RecordDetail.aspx?sku=ANSI%2fASQC+S2-1995>]

Introduction to Attribute Sampling

Description: The criteria provided in this document apply to the vibration of all non-reciprocating machinery on board ships, except for main propulsion machinery, which is covered in SNAME Code C-5 (Reference [3]). They apply to broadband vibration measurements taken on the bearing housings, or as close as possible to the bearings on the bearing supports, of machines under steady-state operating conditions within the nominal operating speed range. They apply to both acceptance testing (in the shop or installed on board), and operational monitoring in-situ. This standard covers marine machines, including those with gears or rolling element bearings. However, to evaluate the condition of gears or bearings, additional measurements and criteria may also be required.

[ANSI/AIIM TR34-1996

<http://webstore.ansi.org/RecordDetail.aspx?sku=ANSI%2fAIIM+TR34-1996>]

Sampling Procedures for Inspection by Attributes of Images in Electronic Image Management (EIM) and Micrographics Systems

Description: This Technical Report contains procedures that may be used to sample electronic or micrographic images to determine if a lot or batch of images meets specified quality requirements. Its purpose is to provide guidance in selecting a sampling procedure.

[ANSI/ASQ Z1.4-2003

<http://webstore.ansi.org/RecordDetail.aspx?sku=ANSI%2fASQ+Z1.4-2003>]

Sampling Procedures and Tables for Inspection by Attributes

Description: ANSI/ASQ Z1.4-2003 Sampling Procedures and Tables for Inspection by Attributes is an acceptance sampling system to be used with switching rules on a

continuing stream of lots for Acceptance Quality Limit (AQL) specified. It provides tightened, normal, and reduced plans to be applied for attributes inspection for percent nonconforming or nonconformities per 100 units.

[ANSI/ASQ Z1.9-2003

<http://webstore.ansi.org/RecordDetail.aspx?sku=ANSI%2fASQ+Z1.9-2003>]

Sampling Procedures and Tables for Inspection by Variables for Percent Nonconforming

Description: ANSI/ASQ Z1.9-2003 Sampling Procedures and Tables for Inspection by Variables for Percent Nonconforming is an acceptance sampling system to be used on a continuing stream of lots for Acceptance Quality Limit (AQL) specified. It provides tightened, normal, and reduced plans to be used on measurements which are normally distributed. Variation may be measured by sample standard deviation, sample range, or known standard deviation. It is applicable only when the normality of the measurements is assured.

Optical Character Recognition (OCR)

[ISO 1073-2:1976

<http://webstore.ansi.org/RecordDetail.aspx?sku=ISO+1073-2%3a1976>]

Alphanumeric character sets for optical recognition - Part 2: Character set OCR-B - Shapes and dimensions of the printed image

Description: Indicates the forms of printed images and the sizes of alphanumeric characters as well as the signs and graphical symbols (OCR-B-character set) intended for optical character reading according to ISO 646-1973.

Metadata Standards and Guidelines

Managing digital images effectively requires the use of metadata standards. There are many types of metadata (descriptive, administrative, structural), many purposes for which it may be collected, and many ways in which it may be used; this section focuses on those forms of metadata commonly embedded in digital files, some of which include descriptive elements. For information about other kinds of descriptive metadata, particularly metadata maintained in separate stores such as MARC, Dublin Core, and MODS, and other standards used at the Library of Congress, see ["Standards at the Library of Congress" <http://www.loc.gov/standards/>].

Metadata

[ISO 15836:2003; ANSI/NISO Z39.85: 2007

<http://webstore.ansi.org/RecordDetail.aspx?sku=ISO+15836%3a2003>] (also available from [NISO

http://www.niso.org/kst/reports/standards?step=2&gid=None&project_key=9b7bffd2daeca6198b4ee5a848f9beec2f600e5])

Information and documentation - The Dublin Core metadata element set

Description: The Dublin Core Metadata Element Set is a vocabulary of fifteen properties for use in resource description. The name "Dublin" is due to its origin at a 1995 invitational workshop in Dublin, Ohio; "core" because its elements are broad and generic, usable for describing a wide range of resources.

[IPTC-PhotoMetadata-2008.docx

http://www.iptc.org/std-dev/PhotoMetadata/2008/specification/IPTC-PhotoMetadata-2008_4.pdf]

Photo Metadata DRAFT 2008, The International Press Telecommunications Council IPTC Core Specification Version 1.1, ITPC Extension Specification Version 1.0, Document Revision 4.

Description: IPTC Photo Metadata provides data about photographs. The values can be processed by software. Each individual metadata entity is called a property and the are grouped into Administrative, Descriptive, and Rights Related properties. The specification does not include any technical metadata.

[ANSI/NISO Z39.87

http://www.niso.org/kst/reports/standards?step=2&gid=None&project_key=b897b0cf3e2ee526252d9f830207b3cc9f3b6c2c]

Data Dictionary - Technical Metadata for Digital Still Images

Description: This standard defines a set of metadata elements for raster digital images to enable users to develop, exchange, and interpret digital image files. The dictionary has been designed to facilitate interoperability between systems, services, and software as well as to support the long-term management of and continuing access to digital image collections.

[Adobe XMP Specification, 2005

http://www.adobe.com/devnet/xmp/pdfs/xmp_specification.pdf]

Adobe XMP (Extensible Metadata Platform) Specification

Description: XMP is designed to provide a common standard so that multiple applications can work effectively with metadata. XMP provides a Data Model, a Storage Model, and Schema of predefined metadata sets. XMP includes guidelines for the extension and addition of schemas.

[JEIDA-49-1998, Exif, Version 2.1

<http://it.jeita.or.jp/document/publica/standard/exif/english/jeida49e.htm>]

Digital Still Camera Image File Format Standard, (Exchangeable image file format for Digital Still Camera : Exif)

Description: EXIF stands for Exchangeable Image File Format, and is a standard for storing interchange information in image files, especially those using JPEG compression. Most digital cameras now use the EXIF format. The format is part of the DCF standard created by JEITA to encourage interoperability between imaging devices.

[PLUS Technical Specification, 2007

<http://ns.useplus.org/go.ashx>]

Picture Licensing Universal System (PLUS) Technical Specification, Glossary, License Data Format, and Media Matrix. (Requires free registration and login.)

The Picture Licensing Universal System (PLUS) is an integrated system of standards designed to simplify and facilitate image licensing. Contained on this site are technical specifications and examples relating to these standards.

[PREMIS (Preservation Metadata: Implementation Strategies)

<http://www.loc.gov/standards/premis/>]

Data dictionary for core elements of “implementable” preservation metadata and XML schema to support its implementation in a digital archiving system.

[TIFF Tag Reference

<http://www.awaresystems.be/imaging/tiff/tifftags.html>]

This is a reference on all known baseline, extended, and private TIFF tags. Every tag page offers a list of basic properties (such as code, name, LibTiff name and data type), as well as a short description. Web site maintained by Aware Systems, Inc.

Storage Standards and Guidelines: Metadata, Media, Formats, Repositories

Storing digital images effectively requires standards related to the storage media, such as CD-ROMs, and the file formats, such as TIFF. The table below also includes examples of guidelines that recommend functional requirements for digital image repositories.

[Storage Media]

[File Formats]

[Repository]

Storage Media

[ISO 18921:2002

<http://webstore.ansi.org/RecordDetail.aspx?sku=ISO+18921%3a2002>]

Imaging materials - Compact discs (CD-ROM) - Method for estimating the life expectancy based on the effects of temperature and relative humidity

Description: ISO 18921:2008 specifies a test method for estimating the life expectancy (LE) of information stored on compact disc (CD-ROM) media, including CD audio, but excluding recordable media. Only the effects of temperature and relative humidity on the media are considered.

[ISO 18923:2000

<http://webstore.ansi.org/RecordDetail.aspx?sku=ISO+18923%3a2000>]

Imaging materials -- Polyester-base magnetic tape -- Storage practices

Description: Relevant to medium-term and long-term storage of magnetic tape.

[ISO 18925:2002

<http://webstore.ansi.org/RecordDetail.aspx?sku=ISO+18925%3a2002>]

Imaging materials - Optical disc media - Storage practices

Description: This International Standard establishes extended-term storage conditions for optical discs and provides recommendations concerning the storage conditions, storage facilities, enclosures and inspection for optical discs. It is applicable to discs made for audio, video, instrumentation and computer use.

Recommendations are general in nature and the manufacturer's cautions for specific material should be considered. Relaxation from these recommendations, whether before or after recording, will generally result in shortened life expectancy.

[ANSI/PIMA IT9.26-1997

<http://webstore.ansi.org/RecordDetail.aspx?sku=ANSI%2fPIMA+IT9.26-1997>]

Imaging Materials - Life Expectancy of Magneto-Optic (MO) Disks - Method for Estimating, Based on Effects of Temperature and Relative Humidity

Description: Specifies test methods for estimating the storage life expectancy of information stored on rewritable and write once magneto-optic media.

[ANSI/AIIM TR39-1996

<http://webstore.ansi.org/RecordDetail.aspx?sku=ANSI%2fAIIM+TR39-1996>]

Guidelines for the Use of Media Error Monitoring and Reporting Techniques for the Verification of Stored Data on Optical Digital Data Disks

Description: These guidelines have been prepared primarily to support ANSI/AIIM MS59, Media Error Monitoring and Reporting Techniques for the Verification of Stored Data on Optical Digital Data Disks

File Formats

[ISO/IEC 10918-1:1994 <http://webstore.ansi.org/RecordDetail.aspx?sku=ISO%2fIEC+10918-1%3a1994>]

Information technology - Digital compression and coding of continuous-tone still images: Requirements and guidelines

[ISO/IEC 10918-1/Cor1:2005

<http://webstore.ansi.org/RecordDetail.aspx?sku=ISO%2fIEC+10918-1%2fCor1%3a2005>]

Information technology - Digital compression and coding of continuous-tone still images: Requirements and guidelines - Corrigendum

Description: Specifies processes for converting source image data to compressed image data, processes for converting compressed image data to reconstructed image data, coded representations for compressed image data, and gives guidance on how to implement these processes in practice. Is applicable to continuous-tone - grayscale or colour - digital still image data and to a wide range of applications which require use of compressed images. Is not applicable to bi-level image data.

[ISO/IEC 10918-2:1995

<http://webstore.ansi.org/RecordDetail.aspx?sku=ISO%2fIEC+10918-2%3a1995>]

Information technology - Digital compression and coding of continuous-tone still images: Compliance testing

Description: Specifies normative compliance tests for the ITU-T Rec.T.81 (ISO/IEC 10981-1) encoding and decoding processes. These compliances tests are applicable to "stand-alone" generic implementations of one or more of the encoding and decoding processes specified in ITU-T Rec.T.81 (ISO/IEC 10918-1). The purposes of these tests include that generic encoder (and decoder) implementations compute the discrete cosine transform (DCT) and quantization functions with sufficient accuracy.

[ISO/IEC 10918-3:1997

<http://webstore.ansi.org/RecordDetail.aspx?sku=ISO%2fIEC+10918-3%3a1997>]

Information technology -- Digital compression and coding of continuous-tone still images: Extensions

Description: Registration of new compression types and versions in the SPIFF header. Amd. 1, Provisions to allow registration of new compression types and versions in the SPIFF header

[ISO/IEC 10918-3/Amd1:1999

<http://webstore.ansi.org/RecordDetail.aspx?sku=ISO%2fIEC+10918-3%2fAmd1%3a1999>]

Revises ISO/IEC 10918-3:1997. Provisions to allow registration of new compression types and versions in the SPIFF header.

[ISO/IEC 10918-4:1999

<http://webstore.ansi.org/RecordDetail.aspx?sku=ISO%2fIEC+10918-4%3a1999>]

Information technology -- Digital compression and coding of continuous-tone still images:

Registration of JPEG profiles, SPIFF profiles, SPIFF tags, SPIFF colour spaces, APPn markers, SPIFF compression types and Registration Authorities (REGAUT)

[ISO/IEC 14495-1:1999

<http://webstore.ansi.org/RecordDetail.aspx?sku=ISO%2fIEC+14495-1%3a1999>]

Information technology - Lossless and near-lossless compression of continuous-tone still images:

Baseline (See Below)

[ISO/IEC 14495-2:2003

<http://webstore.ansi.org/RecordDetail.aspx?sku=ISO%2fIEC+14495-2%3a2003>]

Information technology - Lossless and near-lossless compression of continuous-tone still images:

Extensions

Description: ISO/IEC 14495-2:2003 defines a set of lossless (bit-preserving) and nearly lossless (where the error for each reconstructed sample is bounded by a predefined value) compression methods for coding continuous-tone (including bi-level), gray-scale, or colour digital still images. ISO/IEC 14495-2:2003: specifies extensions (including arithmetic coding, extension of near lossless coding, extension of prediction and extension of Golomb coding) to processes for converting source image data to compressed image data; specifies extensions to processes for converting compressed image data to reconstructed image data including an extension for sample transformation for inverse colour transforms; specifies coded representations for compressed image data; provides guidance on how to implement these processes in practice.

[ISO/IEC 11544:1993

<http://webstore.ansi.org/RecordDetail.aspx?sku=ISO%2fIEC+11544%3a1993>]

Information technology - Coded representation of picture and audio information - Progressive bi-level image compression

Description: Defines a bit-preserving (lossless) compression method for coding image bit-planes and is particularly suitable for bi-level (two-tone, including black-white) images.

Specifies requirements and test methods and gives datastream examples.

[ISO/IEC 11544:1993/Cor1:1995

<http://webstore.ansi.org/RecordDetail.aspx?sku=ISO%2fIEC+11544%2fCor1%3a1995>]

Corrigendum

[ISO/IEC 11544:1993/Cor2:2001

<http://webstore.ansi.org/RecordDetail.aspx?sku=ISO%2fIEC+11544%2fCor2%3a2001>]

Information technology - Coded representation of picture and audio information - Progressive bi-level image compression - Corrigendum

[ISO/TS 12033:2001

<http://webstore.ansi.org/RecordDetail.aspx?sku=ISO%2fTS+12033%3a2001>]

Electronic imaging - Guidance for selection of document image compression methods

[ISO 12234-2:2007

<http://webstore.ansi.org/RecordDetail.aspx?sku=ISO+12234-1%3a2007>]

Electronic still-picture imaging -- Removable memory -- Part 1: Basic removable-memory model

Description: ISO 12234-2:2007 specifies a basic removable-memory reference model for digital electronic still-picture cameras. The reference model includes image file formats for storing image data and metadata, filing system requirements for storing and retrieving the image files on the removable memory, and media profiles which are specific to a given storage technology. The reference model allows the image data and metadata to be interchanged among the various components of an electronic imaging system by using the removable storage media.

[ISO 12639:2004

<http://webstore.ansi.org/RecordDetail.aspx?sku=ISO+12639%3a2004>]

Graphic technology – Prepress Digital Data Exchange – Tag Image File Format for Image Technology (TIFF/IT)

Description: ISO 12639:2004 specifies a media-independent means for prepress electronic data exchange using a tag image file format (TIFF). ISO 12639:2004 defines image file formats for encoding colour continuous-tone picture images, colour line-art images, high-resolution continuous-tone images, monochrome continuous-tone picture images, binary picture images, binary line-art images, screened data, and images of composite final pages.

[ISO/IEC 15444-1:2004

<http://webstore.ansi.org/RecordDetail.aspx?sku=ISO%2fIEC+15444-1%3a2004>]

Information technology -- JPEG 2000 image coding system: Core coding system

Description: ISO/IEC 15444-1:2004 | ITU-T Rec. T.800 defines a set of lossless (bit-preserving) and lossy compression methods for coding bi-level, continuous-tone grey-scale, palletized colour, or continuous-tone colour digital still images.

ISO/IEC 15444-1:2004 | ITU-T Rec. T.800:

- specifies decoding processes for converting compressed image data to reconstructed image data;
- specifies a codestream syntax containing information for interpreting the compressed image data;
- specifies a file format;
- provides guidance on encoding processes for converting source image data to compressed image data;
- provides guidance on how to implement these processes in practice.

[ISO/IEC 15444-2/Amd2:2006

<http://webstore.ansi.org/RecordDetail.aspx?sku=ISO%2fIEC+15444-2%2fAmd2%3a2006>]

Enhancement to quantization method - Amendment 2: Extended capabilities marker segment

[ISO/IEC 15444-2/Cor3:2005

<http://webstore.ansi.org/RecordDetail.aspx?sku=ISO%2fIEC+15444-2%2fCor3%3a2005>]

Enhancement to quantization method - Corrigendum

[ISO/IEC 15444-2/Cor4:2007

<http://webstore.ansi.org/RecordDetail.aspx?sku=ISO%2fIEC+15444-2%2fCor4%3a2007>]

Enhancement to quantization method - Corrigendum

[ISO/IEC 15444-2:2004

<http://webstore.ansi.org/RecordDetail.aspx?sku=ISO%2fIEC+15444-2%3a2004>]

Information technology - JPEG 2000 image coding system: Extensions

[ISO/IEC 15444-6/Amd1:2007

<http://webstore.ansi.org/RecordDetail.aspx?sku=ISO%2fIEC+15444-6%2fAmd1%3a2007>]

Amendment 1: Hidden text metadata

[ISO/IEC 15444-6:2003

<http://webstore.ansi.org/RecordDetail.aspx?sku=ISO%2fIEC+15444-6%3a2003>]

Information technology - JPEG 2000 image coding system - Part 6: Compound image file format

[ISO 15929:2002 (withdrawn)]

Graphic technology - Prepress digital data exchange - Guidelines and principles for the development of PDF/X standards

Description: This International Standard specifies the guidelines and principles that serve as the basis for the development of the parts of ISO 15930 that define the use of the Portable Document Format (PDF) in various graphic technology applications.

[ISO 15930-4:2003

<http://webstore.ansi.org/RecordDetail.aspx?sku=ISO+15930-4%3a2003>]

Graphic technology -- Prepress digital data exchange using PDF -- Part 4: Complete exchange of CMYK and spot colour printing data using PDF 1.4 (PDF/X-1a)

Description: ISO 15930-4:2003 specifies the use of the Portable Document Format (PDF) Version 1.4 for the dissemination of complete digital data, in a single exchange that contains all elements ready for final print reproduction. CMYK and spot-colour data are supported in any combination.

[ISO 15930-5:2003

<http://webstore.ansi.org/RecordDetail.aspx?sku=ISO+15930-5%3a2003>]

Graphic technology -- Prepress digital data exchange using PDF -- Part 5: Partial exchange of printing data using PDF 1.4 (PDF/X-2)

Description: ISO 15930-5:2003 specifies the use of the Portable Document Format (PDF) Version 1.4 for the dissemination of digital data, where all elements necessary for final print reproduction are either included or provision is made for unique identification. Colour-managed, CMYK, and spot colour data are supported in any combination.

[ISO 15930-6:2003

<http://webstore.ansi.org/RecordDetail.aspx?sku=ISO+15930-6%3a2003>]

Graphic technology -- Prepress digital data exchange using PDF -- Part 6: Complete exchange of printing data suitable for colour-managed workflows using PDF 1.4 (PDF/X-3)

Description: ISO 15930-6:2003 specifies the use of the Portable Document Format (PDF) Version 1.4 for the dissemination of complete digital data, in a single exchange that contains all elements necessary for final print reproduction. Colour-managed, CMYK, Gray, RGB or spot colour data are supported.

[ISO 15930-7:2008

<http://webstore.ansi.org/RecordDetail.aspx?sku=ISO+15930-7%3a2008>]

Graphic technology -- Prepress digital data exchange using PDF -- Part 7: Complete exchange of printing data (PDF/X-4) and partial exchange of printing data with external profile reference (PDF/X-4p) using PDF 1.6

Description: ISO 15930-7:2008 specifies the use of the Portable Document Format (PDF) Version 1.6 for the dissemination of digital data intended for print reproduction. Where all elements necessary for final print reproduction are contained within the file it is designated as PDF/X-4. If a required ICC profile is externally supplied and unambiguously identified, it is designated as PDF/X-4p. Colour-managed, CMYK, gray, RGB or spot colour data are supported, as are PDF transparency and optional content. Files can be prepared for use with gray, RGB and CMYK printing characterizations.

[ISO 19005-1:2005

<http://webstore.ansi.org/RecordDetail.aspx?sku=ISO+19005-1%3a2005>]

Document management - Electronic document file format for long-term preservation - Part 1: Use of PDF 1.4 (PDF/A-1)

Description: This International Standard specifies how to use the Portable Document Format (PDF) 1.4 for long-term preservation of electronic documents. It is applicable to documents containing combinations of character, raster, and vector data. This International Standard does not apply to: -Specific processes for converting paper or electronic documents to the PDF/A format -Specific technical design, user interface, implementation, or operational details of rendering -Specific physical methods of storing these documents such as media and storage conditions -Required computer hardware and/or operating systems.

[ISO/IEC 29199 – JPEG DI

http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=45278]

JPEG XR - **HD Photo** (formerly **Windows Media Photo**) is a still-image compression algorithm and file format for continuous tone photographic images, developed by Microsoft.

Abstract (from press release): JPEG XR is a proposed new part (Part 2) of the recently established new work item in JPEG, known as JPEG Digital Imaging System Integration (). JPEG DI aims to provide harmonization and integration between a wide range of existing and new image coding schemes, in order to enable the design and delivery of the widest range of imaging applications, across many platforms and technologies. JPEG DI aims to leverage the rich array of tools developed in and around JPEG and JPEG 2000 to support new image compression methods such as JPEG XR. JPEG XR is designed explicitly for the next generation of digital cameras, based extensively on the technology

introduced by Microsoft in its Windows Media Format proposals, at present known as HD Photo. At the Kobe meeting, The JPEG XR specification (Working Draft) was reviewed and will be balloted for promotion to Committee Draft (CD) status before the 44th WG1 San Francisco meeting, March 31 to April 4, 2008.

[Adobe DNG Specification, V1.1.0.0, 2005

http://www.adobe.com/products/dng/pdfs/dng_spec.pdf

Digital Negative (DNG) Specification

The DNG Format Specification is an open, non-proprietary, standard developed and administered by Adobe Systems, Inc. DNG is an extension of TIFF 6.0 and is compatible with the TIFF-EP standard.

[Adobe TIFF Specification, V6, 1992

<http://partners.adobe.com/public/developer/en/tiff/TIFF6.pdf>

TIFF Format Specification

The TIFF Format Specification is a proprietary, but open standard held and administered by Adobe Systems, Inc., with support of The TIFF Advisory Committee, a working group of TIFF experts from a number of hardware and software manufacturers.

ITU-T Recommendation T.6 1988

Facsimile Coding Schemes and Coding Control Functions for Group 4 Facsimile Apparatus

Description: Recommendation T.6, Volume VII, Fascicle VII.3, Terminal Equipment and Protocols for Telematic Services, The International Telegraph and Telephone Consultative Committee (CCITT), Geneva, Switzerland, 1988. (Common name: Group 4 compression)

Repository

[ISO/IEC 12087-1:1995

<http://webstore.ansi.org/RecordDetail.aspx?sku=ISO%2fIEC+12087-1%3a1995>]

Information technology - Computer graphics and image processing - Image Processing and Interchange (IPI) - Functional specification - Part 1: Common architecture for imaging

Description: Concerns with the manipulation, processing, and interchange of all types of digital images. Defines a generic, unifying imaging architecture. Also defines those specializations or delineations of the generic imaging architecture that are required to support IPI-PIKS and IPI-IIF

[ISO 15740:2008

<http://webstore.ansi.org/RecordDetail.aspx?sku=ISO+15740%3a2008>]

Photography -- Electronic still picture imaging -- Picture transfer protocol (PTP) for digital still photography devices

Description: Provides a common communication protocol for exchanging images with and between digital still photography devices (DSPDs). This includes communication between DSPDs and host computers, printers, other digital still devices, telecommunications kiosks and image storage and display devices. This protocol is transport- and platform-independent.