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Graphic technology — Prepress digital data exchange —

Part 2: XYZ/sRGB encoded standard colour image data (XYZ/SCID)

Technologie graphique — Échange de données numériques de préimpression —

Partie 2: Données d'images en couleur normalisées codées XYZ/sRGB (XYZ/SCID)

Reference number
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Foreword

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

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The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 12640-2 was prepared by Technical Committee ISO/TC 130, *Graphic technology*.

ISO 12640 consists of the following parts, under the general title *Graphic technology — Prepress digital data exchange*:

— *Part 1: CMYK standard colour image data (CMYK/SCID)*

— *Part 2: XYZ/sRGB encoded standard colour image data (XYZ/SCID)*

Part 1 was published in 1997 with the number ISO 12640 and is in the process of being renumbered.

A Part 3, under the title of *CIELAB standard colour image data (CIELAB/SCID)*, is in preparation.

Introduction

The technical content of this International Standard was initiated by the Image Processing Technology Standard Committee in Japan as input to, and in coordination with, ISO/TC 130, WG 2.

0.1 The need for standard XYZ/sRGB digital test images

The existing Standard Colour Image Data (CMYK/SCID, ISO 12640) is defined in terms of CMYK dot percentages and as such is mainly applicable to printing applications. If attempts are made to apply it to other systems such as monitors, CMY printers, etc., the following problems arise.

— The image data, being expressed in terms of CMYK dot percentages, have no simple relationship to colorimetric values.

— The image data have a bit depth of only 8-bits, often causing inaccurate colour conversions.

— The image data are output-referred to a CMYK printing device; additional colour rendering may be required to create image data suitable for other devices.

In order to solve these problems a set of image data has been prepared that

— is expressed as sRGB encoded ITU-R BT.709-3 RGB primary based tristimulus values, and

— is output-referred to the standard sRGB display and viewing conditions defined in IEC 61966-2-1.

Furthermore, this part of ISO 12640 also provides 16-bit CIE XYZ image data that correspond to the display produced CIE XYZ tristimulus values for the sRGB image data, with a display white point chromaticity equivalent to that of CIE Illuminant D_{65}.

Because they exist as consistent and high quality image data sets, images of this part of ISO 12640 are expected to be widely used for the following:

— evaluating the colour reproduction capability of imaging systems and output devices;

— evaluating the coding technologies necessary for the storage and transmission of high-definition image data, etc.

0.2 Characteristics of test images

The performance of any colour reproduction system will normally be evaluated both subjectively (by viewing the final output image) and objectively (by measurement of control elements). This requirement dictates that the test images include both natural scenes (pictures) and synthetic images (computer graphics, a business graph, a colour chart and a colour vignette).

Because the results of subjective image evaluation are strongly affected by the image content, it was important to ensure that the natural images were of high quality and contained diverse subject matter.

0.3 Development of digital test images

A survey was conducted of all TC130 member countries to identify desirable image content and to solicit submission of suitable images for consideration. The image set that resulted consists of eight natural and seven synthetic images. The natural images include flesh tones, images with detail in the extreme highlights or shadows, neutral colours, brown and wood tone colours which are often difficult to reproduce, memory colours, complicated geometric shapes, fine detail, and highlight and shadow vignettes. The synthetic images selected were generated electronically and include computer graphics, a business graph, a colour chart and a series of colour vignettes.

All of the images consist of pixel interleaved data with the data origin at the upper left of the image, as viewed normally, and organized by rows. The file formats of the RGB images are compliant with TIFF 6.0 format. TIFF 6.0 does not define a method for storing XYZ colourspace. The XYZ images set the TIFF Photometric tag to 2 (RGB), which allows TIFF readers to open the TIFF file; however, the image will not be displayed correctly. The images can be imported and manipulated as necessary by a wide variety of commonly used imaging software packages, on platforms in general use in the industry. See Annex C for details of the TIFF header.