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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 18721.4-2024

**Graphic technology - Prepress digital data exchange - Part 4:
Wide gamut display-referred standard colour image data[Adobe
RGB (1998)/SCID]**

印刷技术 印前数据交换 第4部分：显示用宽色域标准彩色图像数据 [Adobe RGB
(1998) /SCID]

(English Translation)

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part 1: Structure and drafting rules for standardization documents" Drafting.

This document is part 4 of GB/T 18721 "Printing Technology Prepress Data Exchange". GB/T 18721 has been published as follows part.

- Part 1: CMYK standard color image data (CMYK/SCID);
- Part 2: XYZ/sRGB coded standard color image data (XYZ/SCID);
- Part 3: CIELAB standard color image data (CIELAB/SCID);

--- Part 4: Wide color gamut standard color image data for display [AdobeRGB (1998)/SCID];

--- Part 5: Scene-related standard colour image data (RIMM/SCID).

This document is equivalent to ISO 12640-4:2011 "Printing technology Prepress data exchange Part 4: Wide color gamut standard color for display Image Data [AdobeRGB (1998)/SCID]".

0.1 Standard digital test image requires

The standard test images provide a set of data that can be used for any of the following tasks.

- Evaluate the color reproduction of the imaging system;
- Evaluate color image output devices;
- Evaluate the effectiveness of image processing algorithms applied to images;
- Evaluate the coding technologies required for storing and transmitting high-definition image data, etc.

As a standard well-defined dataset containing high-definition images with typical common image content, standard test images can make users confident that If the mapping is done properly, the image will produce a high-quality replica and provide a reasonable test of the evaluation task.

Any system, but the image set provided in this document can be expected to obtain reasonable testing with a limited image set. In addition, the existence of a standard set makes it possible to Users in the same region can compare images without exchanging images before copying.

However, different applications require standard image data to use different image encodings in different image states (see ISO 22028-1).

The user needs to select the encoded image data that is suitable for the evaluation task. Although it is always possible to transform the image data into another image state, Generally speaking, there is no consensus among experts on how to best accomplish this task. Therefore, in the various parts of GB/T 18721, Consider providing data for different image states.

GB/T 18721 "Printing Technology Prepress Data Exchange" is divided into 5 parts.

- Part 1: CMYK standard color image data (CMYK/SCID);
- Part 2: XYZ/sRGB coded standard color image data (XYZ/SCID);
- Part 3: CIELAB standard color image data (CIELAB/SCID);

--- Part 4: Wide color gamut standard color image data for display [AdobeRGB (1998)/SCID];

--- Part 5: Scene-related standard colour image data (RIMM/SCID).

GB/T 18721.1 provides a set of 8-bit data per channel defined by CMYK dot percentage.

The colors are strictly defined only when printed, so these data are only suitable for evaluation of CMYK printing applications and cannot be transferred to other image states.

In fact, because in traditional printing applications, these image data are defined in the use of "Typical" ink systems and "typical" tone value mappings produce "satisfactory" images, while CMYK printing differs from this.

Printing systems that use inks of significantly different colors or produce very different tonal value mappings may not be useful without clear Without a defined color conversion, the data cannot be reproduced as a satisfactory image. Furthermore, with a bit depth of only 8 bits per channel, any any color changes may be affected by human intervention.

GB/T 18721.2 provides a set of test image data, which are encoded with XYZ values ranging from 0 to 65535 per channel, and Encoded in sRGB (defined in IEC 61966-2-1) with a bit depth of 8 bits per channel. (Due to the perceptual non-uniformity of linear color spaces the two sets of data are tested for the reference sRGB viewing environment and the reference sRGB CRT display.

The images are optimized and the XYZ tristimulus values are calculated relative to the CIE standard illuminant D65 before scaling.

It is based on a system that uses sRGB as a reference encoding and is therefore primarily suitable for the consumer market and for those whose color displays are used as "distributed" devices.

Although these systems have some applications in the printing industry, sRGB is definitely not the most common image encoding.

A significant disadvantage is that the gamut shape is very different from the typical offset gamut. This difference may require more vivid colors to be remapped to this will produce the best printing results for sRGB image data.

GB/T 18721.3 provides a set of test image data for a wide color gamut of reflective media, using D50 illumination.

The color depth is 16 bits per channel, while the color table and gradient map are 8 bits per channel.

In applications where the output color gamut plays a role, it is considered desirable to generate an image set that allows the entire color range close to the surface color gamut boundary to be in addition, from the perspective of color management, if the image uses

D50, the main reference illuminant in printing and photography, the image it is beneficial for both image observation and measurement. For this reason, this illuminant has become the main reference illuminant for most color management applications.

This document provides a set of wide color gamut test image data encoded in AdobeRGB with a bit depth of 16 bits per channel.

Optimized for viewing in the AdobeRGB reference viewing environment and on an AdobeRGB reference monitor [in AdobeRGB (1998) Color Image Coding Specification]. In addition to the reference AdobeRGB display in the reference AdobeRGB viewing environment Furthermore, the preferred mapping of these images on any medium depends on the medium used and the viewing environment. Therefore, no mapping is provided for any other medium.

The chromaticity values associated with the reproduction on.

These images are designed primarily for systems that use AdobeRGB as the reference encoding and are therefore primarily suitable for the professional market and for broadband A system where the color gamut of a color display is a "distributed" device. This workflow is popular among professional photographers and is increasingly used.

In printing technology. The AdobeRGB reference display color gamut is closer to the typical offset printing color gamut than the sRGB reference display color gamut.

The difference may require color remapping between AdobeRGB images and sRGB images. AdobeRGB -encoded images are often used in print.

Images encoded in sRGB require less vivid color remapping when rendered. Therefore, the purpose of this document is to provide a wider range of colors than sRGB.

The bit depth of natural and synthetic images is 16 bits per channel.

Possible wide gamut color encoding options include AdobeRGB, opRGB (IEC 61966-2-5), and ROMM RGB.

(ISO 22028-2). This document is intended to allow images to be perfectly mapped onto a carefully defined wide gamut reference display. Therefore, compared to other the two options are more inclined to AdobeRGB. Because the color mapping integrity of opRGB is somewhat fuzzy, that is, it is not enough in output ROMMRGB (ISO 22028-2) is clear in output, but the reference media and viewing conditions are slightly different.

The medium is a virtual reflective print (ICC-perceptual reference medium).

GB/T 18721.5 provides a set of scene-related test image data encoded as RIMMRGB with a bit depth of 16 bits per channel.

These data are obtained by capturing natural scenes with various digital cameras and converting the captured camera's original RGB signals to obtain scene chromaticity