

ANSI/I3A IT10.7466-2002

# American National Standard

*for Photography –  
Electronic Still Picture Imaging –  
Reference Input Medium Metric  
RGB Color Encoding: RIMM-RGB*

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for Photography –

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Reference Input Medium Metric  
RGB Color Encoding: RIMM-RGB**

Secretariat

**International Imaging Industry Association, Inc. (I3A)**

Approved July 17, 2002

**American National Standards Institute, Inc.**

## American National Standard

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**Foreword** (This foreword is not part of American National Standard ANSI/I3A IT10.7466-2002.)

This I3A standard has been developed in order to meet the industry need for a complete, fully documented, publicly available definition of a wide-primary scene-referred extended color-gamut RGB color encoding. This encoding provides a way to represent scene-referred images that does not limit the color gamut to those colors capable of being displayed on a CRT monitor, or require the use of negative RGB colorimetry co-ordinates.

An extended color-gamut scene-referred color encoding is particularly desirable for professional photography applications. For example, colors captured by digital cameras, as well as conventional capture devices such as photographic film, may be outside those that can be represented within the color gamut of a typical monitor or other types of output devices. Likewise, scene-referred images will generally have a larger luminance dynamic range than output-referred images since they have not been modified by a color rendering process to fit the images within the limitations of the output media and apply appropriate tone/color reproduction aims. Retaining the un-rendered scene-referred image data has the advantage that it preserves the option to make decisions about how a particular image should be rendered. For example, a scene-referred image of a back-lit scene can retain information about both the dark foreground region and the bright background region of the scene. This information can be used to make a properly exposed print of either the foreground region or the background region, or alternatively can be used to create an improved image by rendering the two regions differently. By using a standard scene-referred extended color-gamut color encoding, images can be stored, interchanged and manipulated without restricting the image to a particular rendering intent or output device. The Reference Input Medium Metric RGB (RIMM RGB) color encoding specified in this I3A standard meets the needs of these types of applications. An extended dynamic range version of this color encoding known as Extended Reference Input Medium Metric RGB (ERIMM RGB) is also specified for use with high-dynamic range input sources. (E)RIMM RGB is intended to be a companion to the output-referred ROMM RGB color encoding specified in ANSI/I3A IT10.7666-2002. Both color encodings are based on the same "wide RGB" color space to facilitate the development of image processing algorithms and simple color rendering transformations to convert scene-referred RIMM RGB images to rendered output-referred ROMM RGB images.

Within ISO/TC42, work has begun to develop ISO 22028, "Extended colour encoding for digital still image storage, manipulation and interchange". Work on this standard may progress as part of a new joint project team between ISO/TC42 and IEC/TC100 that is being set up in accordance with JTAB Decision 3/2000. After an international standard specifying RIMM-RGB is published, it is anticipated that this I3A standard will be withdrawn.

The International Imaging Industry Association (I3A) draws attention to the fact that it is claimed that compliance with this Standard may involve the use of patents owned by Eastman Kodak Company. I3A takes no position concerning the evidence, validity, and scope of these patents. Eastman Kodak Company has assured I3A that it is willing to negotiate licenses under reasonable and non-discriminatory terms and conditions with applicants throughout the world. In this respect, a statement from Eastman Kodak Company is registered with I3A. Information may be obtained from Eastman Kodak Company, 343 State Street, Rochester, NY 14650.

Attention is drawn to the possibility that some of the elements of this Standard may be the subject of patent rights other than those identified above. I3A shall not be held responsible for identifying any or all such patent rights.

Annexes A and B of this I3A standard are for information only.

Suggestions for the improvement of this standard will be welcome. They should be sent to the International Imaging Industry Association, Inc. (I3A), 550 Mamaroneck Avenue, Suite 307, Harrison, NY 10528-1615, e-mail: i3astds@i3a.org.

This standard was processed and approved for submittal to ANSI by I3A Technical Committee IT10 on Electronic Still Picture Imaging. Committee approval of the standard does not necessarily imply that all committee members voted for its approval. At the time it approved this edition of the standard, the IT10 Committee had the following members:

Ken Parulski, IT10 Chair  
 Jack Holm, IT10 Vice-Chair  
 Kevin Spaulding, Project Leader  
 James A. Peyton, IT10 Secretariat

<i>Organization Represented</i>	<i>Name of Representative</i>
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## 1 Scope

This I3A standard specifies a family of extended color-gamut scene-referred RGB color 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.

## 2 Normative References

The following standards contain provisions, which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid standards.

CIE Publication No. 15.2, *colorimetry*

ISO/CIE 10527:1991, *CIE Standard Colorimetric Observers*

ICC.1:2001, *File Format for Color Profiles*

ITU-R BT.709-3:1998, *Parameter values for the HDTV standards for production and international programme exchange*

ANSI/I3A IT10.7666-2002, *Photography – Electronic still picture imaging – Reference Output Medium Metric RGB Color encoding: ROMM-RGB*

## 3 Definitions

For the purpose of this standard, the following definitions apply:

### 3.1 Color rendering

Mapping of image data representing the colorimetric co-ordinates of the elements of a scene or original to image data representing the colorimetric co-ordinates of the elements of a reproduction.

### 3.2 Observer adaptive luminance factor

Ratio of the luminance of a stimulus to the luminance of a stimulus which an observer adapted to the viewing environment would interpret to be a perfect white diffuser.