

This is a preview of "PD ISO/TS 22028-4:20...". Click here to purchase the full version from the ANSI store.

PD ISO/TS 22028-4:2012



BSI Standards Publication

Photography and graphic technology — Extended colour encodings for digital image storage, manipulation and interchange

Part 4: European Colour Initiative RGB colour image encoding [eciRGB (2008)]

NO COPYING WITHOUT BSI PERMISSION EXCEPT AS PERMITTED BY COPYRIGHT LAW

raising standards worldwide™



This is a preview of "PD ISO/TS 22028-4:20...". [Click here to purchase the full version from the ANSI store.](#)

This Published Document is the UK implementation of ISO/TS 22028-4:2012.

The UK participation in its preparation was entrusted to Technical Committee CPW/42, Photography.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

© The British Standards Institution 2012

Published by BSI Standards Limited 2012

ISBN 978 0 580 63433 8

ICS 37.040.99; 37.100.01

Compliance with a British Standard cannot confer immunity from legal obligations.

This Published Document was published under the authority of the Standards Policy and Strategy Committee on 30 November 2012.

Amendments issued since publication

Amd. No.	Date	Text affected
-----------------	-------------	----------------------

This is a preview of "PD ISO/TS 22028-4:20...". [Click here to purchase the full version from the ANSI store.](#)

First edition
2012-11-01

Photography and graphic technology — Extended colour encodings for digital image storage, manipulation and interchange —

Part 4:

European Colour Initiative RGB colour image encoding [eciRGB (2008)]

*Photographie et technologie graphique — Codages par couleurs
étendues pour stockage, manipulation et échange d'image numérique —*

*Partie 4: Codage d'image en couleurs RGB par initiative de couleur
européenne [eciRGB(2008)]*



Reference number
ISO/TS 22028-4:2012(E)

© ISO 2012

This is a preview of "PD ISO/TS 22028-4:20...". Click here to purchase the full version from the ANSI store.



COPYRIGHT PROTECTED DOCUMENT

© ISO 2012

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

This is a preview of "PD ISO/TS 22028-4:20...". Click here to purchase the full version from the ANSI store.

Contents

	Page
Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Requirements	4
4.1 General.....	4
4.2 Reference viewing environment.....	5
4.3 Reference display.....	6
4.4 eciRGB (2008) colour image encoding.....	7
Annex A (informative) The eciRGB (2008) ICC profile considerations	11
Annex B (informative) Practical tolerances for viewing eciRGB (2008) encoded images	12
Annex C (informative) Comparison of primaries	15
Bibliography	17

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

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.

In other circumstances, particularly when there is an urgent market requirement for such documents, a technical committee may decide to publish other types of document:

- an ISO Publicly Available Specification (ISO/PAS) represents an agreement between technical experts in an ISO working group and is accepted for publication if it is approved by more than 50 % of the members of the parent committee casting a vote;
- an ISO Technical Specification (ISO/TS) represents an agreement between the members of a technical committee and is accepted for publication if it is approved by 2/3 of the members of the committee casting a vote.

An ISO/PAS or ISO/TS is reviewed after three years in order to decide whether it will be confirmed for a further three years, revised to become an International Standard, or withdrawn. If the ISO/PAS or ISO/TS is confirmed, it is reviewed again after a further three years, at which time it must either be transformed into an International Standard or be withdrawn.

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/TS 22028-4 was prepared by Technical Committee ISO/TC 42, *Photography*.

ISO/TS 22028 consists of the following parts, under the general title *Photography and graphic technology — Extended colour encodings for digital image storage, manipulation and interchange*:

- *Part 1: Architecture and requirements*
- *Part 2: Reference output medium metric RGB colour image encoding (ROMM RGB)*
- *Part 3: Reference input medium metric RGB colour image encoding (RIMM RGB)* [Technical Specification]
- *Part 4: European Colour Initiative RGB colour image encoding [eciRGB (2008)]* [Technical Specification]

This is a preview of "PD ISO/TS 22028-4:20...". [Click here to purchase the full version from the ANSI store.](#)

Introduction

This Technical Specification has been developed in order to meet the industry need for a complete, fully documented, publicly available definition of an output-referred extended gamut RGB colour image encoding which is optimized for an 8-bit encoding and the conversion of RGB images into offset print colour spaces. Since users have also asked for a 16-bit encoding it has been added to this Technical Specification as well. This colour image encoding provides a way to represent output-referred images that does not limit the colour gamut to those colours capable of being displayed on a CRT monitor, such as that represented by the sRGB colour encoding, or require the use of negative RGB colorimetry coordinates, such as with extended sRGB colour encodings like bg-sRGB.

An extended colour-gamut colour encoding is particularly desirable for professional photography applications. For example, colours used for company logos may be outside a monitor gamut and would therefore need to be clipped or compressed to a less saturated colour. Similarly, scanned photographic prints that are to be duplicated may contain colours outside a monitor RGB colour-gamut. By using a standard output-referred extended gamut colour image encoding, images containing such colours can be stored, interchanged, manipulated, and later printed, without limiting or distorting the colours of the final output.

The European Colour Initiative (ECI) RGB colour image encoding [eciRGB (2008)] specified in this international standard meets the needs of these types of applications.

The primaries of eciRGB (2008) are between Reference Output Medium Metric RGB (ROMM RGB) and sRGB, thereby providing a larger gamut than sRGB, together with lower quantization errors than ROMM RGB. The tone curve has an encoding linear to the L^* axis defined in the CIE 1976 (L^* , a^* , b^*) colour space (CIELAB 1976).

This Technical Specification has been prepared to provide sufficient documentation, consistent with the definitions of ISO 22028-1, to allow the imaging community adequate opportunity for implementation and evaluation of this colour image encoding. It is anticipated that, when there is sufficient implementation of, and practical experience in the use of, eciRGB (2008), this Technical Specification can be revised as an International Standard.

The European Colour Initiative owns the copyright on the name eciRGB (2008) and has granted ISO the irrevocable non-exclusive right to use the name for the purpose of this Technical Specification. A colour encoding named eciRGB was initiated by ECI in 2004. A second version of this encoding with a modified tonal curve was defined in 2008. Because of its importance to the European photographers and graphic arts industry, this Technical Specification was prepared in order to fully define eciRGB according to ISO 22028-1.

This is a preview of "PD ISO/TS 22028-4:20...". Click here to purchase the full version from the ANSI store.

Photography and graphic technology — Extended colour encodings for digital image storage, manipulation and interchange —

Part 4:

European Colour Initiative RGB colour image encoding [eciRGB (2008)]

1 Scope

This Technical Specification defines an extended colour-gamut output-referred RGB colour image encoding designated as European Colour Initiative RGB [eciRGB (2008)]. Digital images encoded using eciRGB (2008) can be manipulated, stored, transmitted, displayed, or printed by digital still picture imaging systems. Two precision levels are defined, using 8 bits/channel and 16 bits/channel.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 3664:2009, *Graphic technology and photography — Viewing conditions*

ISO 11664-1, *Colorimetry — Part 1: CIE standard colorimetric observers*

ISO 22028-1, *Photography and graphic technology — Extended colour encodings for digital image storage, manipulation and interchange — Part 1: Architecture and requirements*

CIE Publication 15, *Colorimetry*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

adapted white

colour stimulus that an observer who is adapted to the viewing environment would judge to be perfectly achromatic and to have a luminance factor of unity, i.e. absolute colorimetric coordinates that an observer would consider to be a perfect white diffuser

NOTE The adapted white can vary within a scene.

3.2

additive RGB colour space

a colorimetric colour space having three colour primaries (generally red, green and blue) such that CIE XYZ tristimulus values can be determined from the RGB colour space values by forming a weighted combination of the CIE XYZ tristimulus values for the individual colour primaries, where the weights are proportional to the radiometrically linear colour space values for the corresponding colour primaries

NOTE 1 A simple linear 3×3 matrix transformation can be used to transform between CIE XYZ tristimulus values and the radiometrically linear colour space values for an additive RGB colour space.