

INTERNATIONAL STANDARD

NORME INTERNATIONALE



iTeh STANDARD

Audio, video multimedia systems and equipment – Multimedia e-publishing and e-book technologies – Raster-graphics image-based e-books

Systèmes et équipements multimédias audio et vidéo – Technologies de l'édition électronique multimédia et des livres électroniques – Livres électroniques à images matricielles 63029:2017

<https://standards.iteh.ai/catalog/standards/sist/572a1911-1bee-4d2f-9b92-1d3c546c016e/iec-63029-2017>



THIS PUBLICATION IS COPYRIGHT PROTECTED

Copyright © 2017 IEC, Geneva, Switzerland

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 IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

Droits de reproduction réservés. Sauf indication contraire, aucune partie de cette publication ne peut être reproduite ni utilisée sous quelque forme que ce soit et par aucun procédé, électronique ou mécanique, y compris la photocopie et les microfilms, sans l'accord écrit de l'IEC ou du Comité national de l'IEC du pays du demandeur. Si vous avez des questions sur le copyright de l'IEC ou si vous désirez obtenir des droits supplémentaires sur cette publication, utilisez les coordonnées ci-après ou contactez le Comité national de l'IEC de votre pays de résidence.

IEC Secretariat
3, rue de Varembe
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
info@iec.ch
www.iec.ch

About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigendum or an amendment might have been published.

IEC publications search - webstore.iec.ch/advsearchform

The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee, ...). It also gives information on projects, replaced and withdrawn publications.

IEC Products & Services Portal - products.iec.ch

Discover our powerful search engine and read freely all the publications previews. With a subscription you will always have access to up to date content tailored to your needs.

IEC Just Published - webstore.iec.ch/justpublished

Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and once a month by email.

Electropedia - www.electropedia.org

The world's leading online dictionary on electrotechnology, containing more than 22 300 terminological entries in English and French, with equivalent terms in 19 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

IEC Customer Service Centre - webstore.iec.ch/csc

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: sales@iec.ch.

<https://standards.iec.ch/catalog/standards/sist/572a1911-1bee-4d2f-9b92-1d3c546c016e/iec-63029-2017>

A propos de l'IEC

La Commission Electrotechnique Internationale (IEC) est la première organisation mondiale qui élabore et publie des Normes internationales pour tout ce qui a trait à l'électricité, à l'électronique et aux technologies apparentées.

A propos des publications IEC

Le contenu technique des publications IEC est constamment revu. Veuillez vous assurer que vous possédez l'édition la plus récente, un corrigendum ou amendement peut avoir été publié.

Recherche de publications IEC -

webstore.iec.ch/advsearchform

La recherche avancée permet de trouver des publications IEC en utilisant différents critères (numéro de référence, texte, comité d'études, ...). Elle donne aussi des informations sur les projets et les publications remplacées ou retirées.

Découvrez notre puissant moteur de recherche et consultez gratuitement tous les aperçus des publications. Avec un abonnement, vous aurez toujours accès à un contenu à jour adapté à vos besoins.

IEC Just Published - webstore.iec.ch/justpublished

Restez informé sur les nouvelles publications IEC. Just Published détaille les nouvelles publications parues. Disponible en ligne et une fois par mois par email.

Electropedia - www.electropedia.org

Le premier dictionnaire d'électrotechnologie en ligne au monde, avec plus de 22 300 articles terminologiques en anglais et en français, ainsi que les termes équivalents dans 19 langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International (IEV) en ligne.

Service Clients - webstore.iec.ch/csc

Si vous désirez nous donner des commentaires sur cette publication ou si vous avez des questions contactez-nous: sales@iec.ch.

IEC Products & Services Portal - products.iec.ch

INTERNATIONAL STANDARD

NORME INTERNATIONALE



iTeh STANDARD

Audio, video multimedia systems and equipment – Multimedia e-publishing and e-book technologies – Raster graphics image-based e-books

Prévisualisation
(standards.iteh.ai)
Systèmes et équipements multimédias audio et vidéo – Technologies de l'édition électronique multimédia et des livres électroniques – Livres électroniques à images matricielles IEC 63029:2017

<https://standards.iteh.ai/catalog/standards/sist/572a1911-1bee-4d2f-9b92-1d3c546c016e/iec-63029-2017>

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 33.160.99; 35.140; 35.240.30

ISBN 978-2-8322-1087-5

**Warning! Make sure that you obtained this publication from an authorized distributor.
Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.**

CONTENTS

FOREWORD.....	4
INTRODUCTION.....	6
1 Scope.....	7
2 Normative references	7
3 Terms and definitions	7
4 Raster-graphic image-based e-book	7
4.1 General.....	7
4.2 Target sourcebook	8
5 Scanning scheme	8
5.1 Cutting the sourcebook	8
5.2 Scanning sourcebook.....	8
5.3 Setup/adjustment of image quality related parameters	9
5.3.1 Elimination of unintended density variation	9
5.3.2 Resolution	9
5.3.3 Highlight washout point.....	9
5.3.4 Tone curve adjustment / Black point setup.....	9
5.4 Post-processing / encoding.....	10
5.4.1 Post-processing.....	10
5.4.2 Encoding	10
Annex A (informative) Defect examples	11
A.1 Image loss	11
A.2 Image tilt.....	12
A.3 Show-through	13
A.4 Line image discontinuity.....	13
A.5 Moiré	14
A.6 Highlight washout	15
A.7 Highlight washout and unwanted shadow clipping	16
Bibliography.....	18
Figure 1 – Workflow for generating e-book from sourcebook.....	8
Figure 2 – Tone curve adjustment / Black point setup	10
Figure A.1 – An example of the double-page spread without image loss	11
Figure A.2 – An example of the double-page spread with image loss	12
Figure A.3 – An example of the text image without image tilt.....	12
Figure A.4 – An example of the text image with image tilt	12
Figure A.5 – An example of the text image without show through	13
Figure A.6 – An example of the text image with show through.....	13
Figure A.7 – An example of the text image without line image discontinuity	14
Figure A.8 – An example of the text image with line image discontinuity	14
Figure A.9 – An example of the photographic image without moiré.....	14
Figure A.10 – An example of the photographic image with moiré	15
Figure A.11 – An example of the business graphics image without highlight washout.....	15
Figure A.12 – An example of the business graphics image with highlight washout	16

ITEH STANDARD
PREVIEW
(standards.iteh.ai)

<https://standards.iteh.ai/catalog/standards/sist/572a1911-1bee-4d2f-9b92-1d3c546c016e/iec-63029-2017>

Figure A.13 – An example of the photographic image without highlight washout and unwanted shadow clipping 16

Figure A.14 – An example of the photographic image with highlight washout 17

Figure A.15 – An example of the photographic image with unwanted shadow clipping 17

**iTeh STANDARD
PREVIEW
(standards.iteh.ai)**

IEC 63029:2017
<https://standards.iteh.ai/catalog/standards/sist/572a1911-1bee-4d2f-9b92-1d3c546c016e/iec-63029-2017>

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**AUDIO, VIDEO MULTIMEDIA SYSTEMS AND EQUIPMENT –
MULTIMEDIA E-PUBLISHING AND E-BOOK TECHNOLOGIES –
RASTER-Graphics IMAGE-BASED E-BOOKS**

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 63029 has been prepared by IEC technical committee 100: Audio, video and multimedia systems and equipment.

The text of this International Standard is based on the following documents:

CDV	Report on voting
100/2817/CDV	100/2918/RVC

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

The contents of the corrigendum of January 2018 have been included in this copy.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

iTeh STANDARD PREVIEW (standards.iteh.ai)

[IEC 63029:2017](#)

<https://standards.iteh.ai/catalog/standards/sist/572a1911-1bee-4d2f-9b92-1d3c546c016e/iec-63029-2017>

INTRODUCTION

Scanning of existing printed books is presently carried out widely to store their content in an electronic format: raster-graphics image-based e-books. The scanning includes number of parameters and sometimes results in poor-quality scanned data due to inappropriate parameter settings.

The scanning devices with storage memory and automatic document feeders enable swift production of raster-graphics image-based e-books with a brief procedure that does not require advanced skills and knowledge.

Scanning schemes can have many attributes which affect the quality of raster-graphics image-based e-books, such as environmental conditions, sheet cutting/scanning operation, resolution, highlight washout point, tone curve adjustment/black point setup, post-processing and encoding. For example, inadequate selection of the scanning resolution can cause moiré in halftone images and discontinuation of lines in text images. The purpose of this document is to specify a scanning scheme for developing raster-graphics image-based e-books. When conforming to this document, a reasonable quality of raster-graphics image-based e-books is to be expected.

iTeh STANDARD PREVIEW (standards.iteh.ai)

[IEC 63029:2017](#)

<https://standards.iteh.ai/catalog/standards/sist/572a1911-1bee-4d2f-9b92-1d3c546c016e/iec-63029-2017>

AUDIO, VIDEO MULTIMEDIA SYSTEMS AND EQUIPMENT – MULTIMEDIA E-PUBLISHING AND E-BOOK TECHNOLOGIES – RASTER-GRAPHICS IMAGE-BASED E-BOOKS

1 Scope

This document specifies the scanning scheme to develop raster-graphics image-based e-books from existing printed books.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

IEC 61966-2-1, *Multimedia systems and equipment – Colour measurement and management – Part 2-1: Colour management – Default RGB colour space – sRGB*

ISO 12639, *Graphic technology – Prepress digital data exchange – Tag image file format for image technology (TIFF/IT)*

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1

bitmap image of sourcebook

two-dimensional raster data of each page of a sourcebook that can be aligned in exactly same page order as the sourcebook

3.2

raster-graphics image-based e-book

category of an e-book which consists of the bitmap image of sourcebook

3.3

sourcebook

printed book to be scanned

4 Raster-graphic image-based e-book

4.1 General

The creation sequence for raster-graphics image-based e-books is shown in Figure 1.

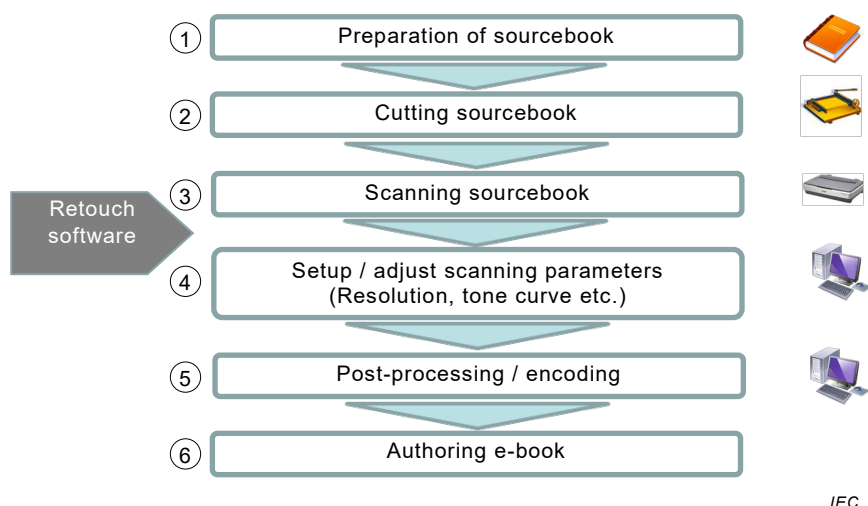


Figure 1 – Workflow for generating e-book from sourcebook

There are six steps to generating an e-book from the sourcebook, such as the preparation of the sourcebook, cutting the sourcebook, scanning the sourcebook, setup/adjustment of image quality related parameters, post-processing/encoding, authoring e-book. The first step is to clean up and to repair the sourcebook so that it becomes as close as possible to its original condition. A flatbed scanner is normally used for the third step, sourcebook scanning operation, so the second step is to cut the sourcebook to make the scanning operation easier. The fourth step is to setup/adjust scanning parameters such as resolution and tone curve. The fifth step is to adjust and to encode the scanned data for output media. The sixth step is authoring the e-book. This document specifies the second to fifth steps, which form the scanning scheme. Raster-graphics image-based e-books can be categorized as one of the fixed layout e-books.

4.2 Target sourcebook <https://standards.iteh.ai/catalog/standards/sist/572a1911-113c-516c0167-0000/iec-63029-2017>

The sourcebooks to which this document applies are mangas, paperbacks, hard covers, textbooks, magazines, music scores and newspapers.

5 Scanning scheme

5.1 Cutting the sourcebook

To avoid image loss, sheet cutting should be carried out exactly on the perimeter of the binding and the margin. If this is not possible, the cutting line shall be less than or equal to 2 mm from the perimeter of the binding and the margin. The cutting line should be parallel to the edge. To avoid variation of image area position between pages, the margin between pages should be less than or equal to 1 mm.

NOTE See Clause A.1 for a description of image loss.

5.2 Scanning sourcebook

Scanning shall be done in at least 8 bits per pixel, 256 grey levels unless otherwise instructed.

The sourcebook image area in the corresponding scanned image data should not have any tilt. Image tilt adjustment shall be done to achieve tilt angle of less than or equal to 0,5°.

NOTE See Clause A.2 for a description of image tilt.

The scanning of the monochrome original shall be carried out in monochrome scanning mode. Colour original shall be carried out in colour scanning mode.

NOTE When a black and white original is scanned using colour scanning mode, black text is likely to be greyed or coloured partially, and it can degrade text readability.

The tone curve of an original text image shall be adjusted for legibility.

5.3 Setup/adjustment of image quality related parameters

5.3.1 Elimination of unintended density variation

In general, there are four types of unintended original density variations as follows:

- foreign objects such as dripping coffee, soiling by handling, shading due to bump of correcting fluid on substrate and so on;
- degradation of substrate such as yellowing due to light fading or oxidization;
- show-through of image printed in opposite side of substrate;
- misplacement of original on scanning device leading to unpredictable unintended density variation at the border of the scanned data.

NOTE See Clause A.3 for a description of show-through.

The first three can be eliminated by adjusting the highlight washout point during the scanning operation or by erasing the defects, and the fourth one can be eliminated by trimming during post-processing.

5.3.2 Resolution

It is recommended to adopt a sufficiently high scanning resolution and bit depth in order to avoid line image discontinuity. Graphics and halftone image area may require moiré suppression. If moiré occurred due to too low a scanning resolution, use a higher scanning resolution.

NOTE See A.4 for a description of line image discontinuity and A.5 for a description of moiré.

For a text-based original document, 200 dpi or higher resolution is recommended. For text and low resolution halftone originals, 400 dpi or higher resolution is recommended. For high resolution halftone and graphics originals, 600 dpi or higher resolution is recommended for avoiding moiré. For on-demand printing and on-demand publishing usage, minimum resolution shall be 600 dpi.

The shape of the text is different between alphabets and it requires additional care to choose appropriate resolution and tone settings in order to avoid line image discontinuity. Clause A.4 shows an example of alphabet dependency.

5.3.3 Highlight washout point

The highlight washout point is effective for elimination of unintended density variation (see 5.3.3). But if the highlight washout point is set too high, it may cause discontinuity of line image in text and graphics. So, it is recommended to set the highlight washout point as low as possible. If line image discontinuity occurred after minimizing the highlight washout point, then it is recommended to adopt a higher scanning resolution and higher bit depth (see 5.3).

NOTE See Clause A.6 for a description of highlight washout.

5.3.4 Tone curve adjustment / Black point setup

In order to avoid tone-related issues, such as sleepy image, highlight washout and unwanted shadow clipping, it is recommended to adjust the density range by selecting a proper black point value and to adjust the tone curve shape appropriately for image appearance as shown in Figure 2.

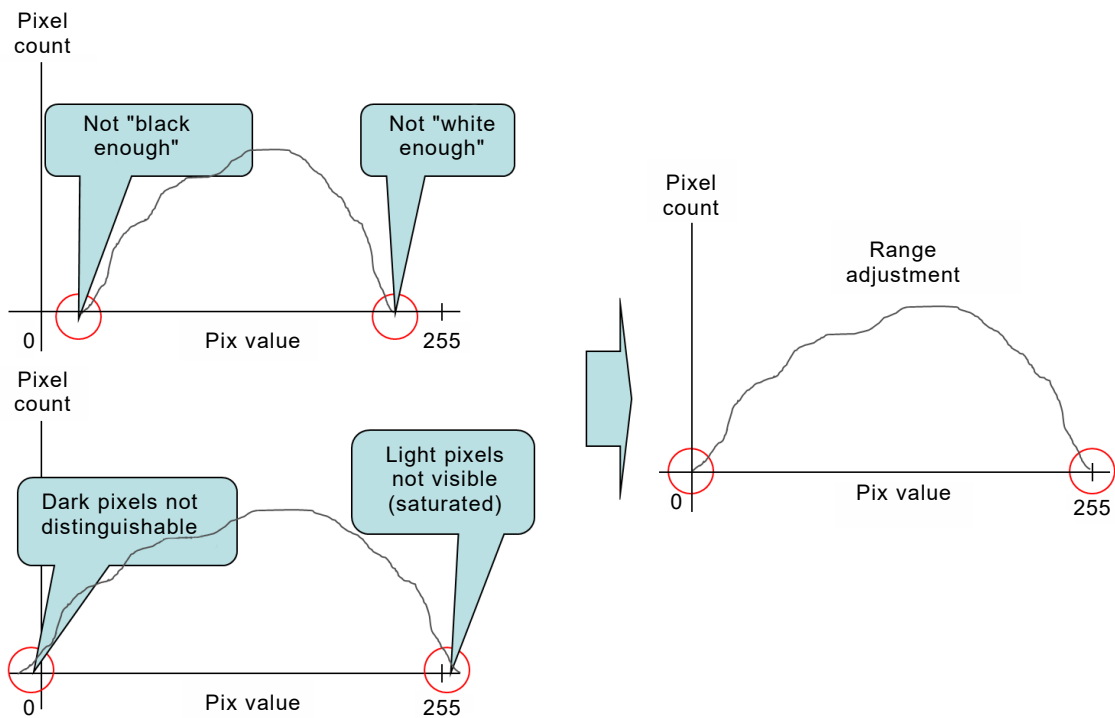


Figure 2 – Tone curve adjustment / Black point setup

NOTE See Clause A.7 for a description of highlight washout and unwanted shadow clipping.

5.4 Post-processing / encoding

5.4.1 Post-processing

If the resolution of the scanned data is higher than the output media resolution, the scanned data resolution shall be converted to match the output media resolution using a resolution conversion method such as the nearest neighbour method, the bilinear interpolation method or the bicubic convolution method.

5.4.2 Encoding

In order to avoid unwanted image noise due to lossy image encoding, such as mosquito noise or block noise, lossless compression shall be used.

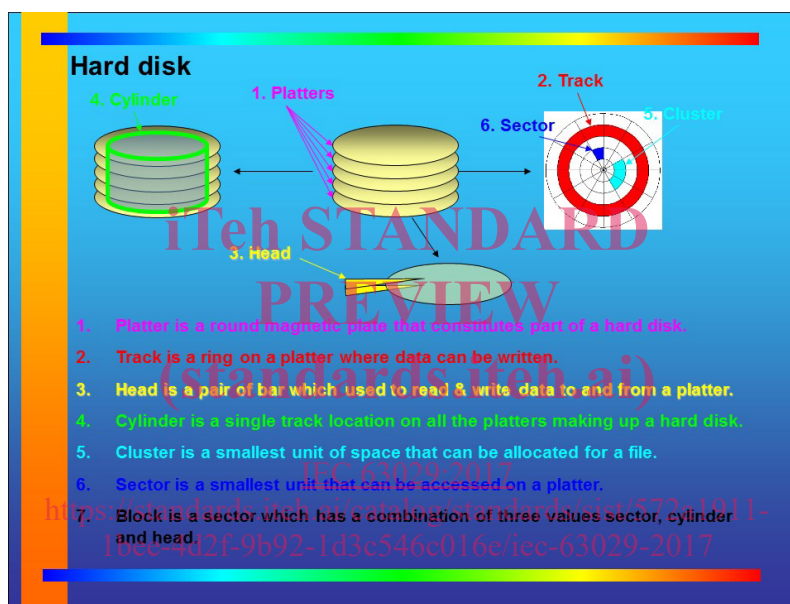
For black and white images, the recommended data file format is 8 bits per pixel TIFF/IT as specified in ISO 12639. For colour images, the recommended data file format is 8 bits per pixel sRGB as specified in IEC 61966-2-1 with TIFF/IT.

Annex A (informative)

Defect examples

A.1 Image loss

Printed books are normally bound by glue and string. So the horizontal length of the pages inside is shorter than the overall horizontal size of the book. In other words, the inside margin is shorter than the outside margin. As a result, image loss sometimes occurs at the inside margin. By comparison with the image without image loss in Figure A.1, it is clear that a part of the image disappeared vertically right at the centre of the image in Figure A.2. Therefore, special care is required during the sheet cutting process to avoid image loss and image position variation between pages at the inside margin.



IEC

Figure A.1 – An example of the double-page spread without image loss