

INTERNATIONAL STANDARD

**Multimedia systems and equipment – Multimedia e-publishing and e-books –
Reader's format for e-publishing**

<https://standards.iteh.ai>
Document Preview

[IEC 62524:2009](https://standards.iteh.ai/catalog/standards/iec/cf8d04dc-950f-4df7-8533-998d74af76af/iec-62524-2009)

<https://standards.iteh.ai/catalog/standards/iec/cf8d04dc-950f-4df7-8533-998d74af76af/iec-62524-2009>



THIS PUBLICATION IS COPYRIGHT PROTECTED

Copyright © 2009 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.

IEC Central Office
3, rue de Varembe
CH-1211 Geneva 20
Switzerland
Email: inmail@iec.ch
Web: 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 corrigenda or an amendment might have been published.

- Catalogue of IEC publications: www.iec.ch/searchpub

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 It also gives information on projects, withdrawn and replaced publications.

- IEC Just Published: www.iec.ch/online_news/justpub

Stay up to date on all new IEC publications. Just Published details twice a month all new publications released. Available on-line and also by email.

- Electropedia: www.electropedia.org

The world's leading online dictionary of electronic and electrical terms containing more than 20 000 terms and definitions in English and French, with equivalent terms in additional languages. Also known as the International Electrotechnical Vocabulary online.

- Customer Service Centre: www.iec.ch/webstore/custserv

If you wish to give us your feedback on this publication or need further assistance, please visit the Customer Service Centre FAQ or contact us:

Email: csc@iec.ch

Tel.: +41 22 919 02 11

Fax: +41 22 919 03 00

IEC 62524:2009

<http://www.iec.ch/catalog/standards/iec/cf8d04dc-950f-4df7-8533-998d74af76af/iec-62524-2009>



IEC 62524

Edition 1.0 2009-02

INTERNATIONAL STANDARD

**Multimedia systems and equipment – Multimedia e-publishing and e-books –
Reader's format for e-publishing**

iteh Standards
(<https://standards.iteh.ai>)
Document Preview

[IEC 62524:2009](#)

<https://standards.iteh.ai/catalog/standards/iec/cf8d04dc-950f-4df7-8533-998d74af76af/iec-62524-2009>

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

PRICE CODE



ICS 33.160.99

ISBN 978-2-88910-754-4

CONTENTS

FOREWORD.....	4
INTRODUCTION.....	6
1 Scope.....	7
2 Normative references	7
3 Terms and definitions	7
4 Position and requirements for reader's format	8
4.1 Reader's format in contents creation/distribution model.....	8
4.2 Requirements for reader's format	8
4.3 File format.....	9
4.4 Features of the reader's Format	9
4.4.1 General	9
4.4.2 Types of displayable elements.....	9
4.4.3 Layout and styling	9
4.4.4 Fonts.....	10
4.4.5 E-book specific features	10
5 Conformance level.....	10
Annex A (normative) C-XMLDF reader's format	11
Bibliography.....	48
Figure 1 – Contents creation/distribution model	8
Figure A.1 – Relation between generic and reader's formats.....	11
Figure A.2 – A visual example of a text flow.....	22
Figure A.3 – Relationship between cell flow, cell and scene.....	26
Figure A.4 – Paragraph tag and an image.....	31
Figure A.5 – Flowing text interrupted by line break tag.....	33
Figure A.6 – Horizontal line tag and an image.....	34
Figure A.7 – Effect of horizontal tag.....	36
Figure A.8 – Text and image tag	38
Figure A.9 – Effect of align parameter	39
Figure A.10 – Image splitting	42
Table A.1 – File types	11
Table A.2 – Cxmdf_string type	12
Table A.3 – File types	14
Table A.4 – File naming conventions	15
Table A.5 – Media types	16
Table A.6 – The data structure of root file	16
Table A.7 – Special characters	22
Table A.8 – Data structure of text flow control file	23
Table A.9 – Data structure of block control information	25
Table A.10 – Treatment of block boundary.....	26
Table A.11 – Data structure of cell flow control file	27

Table A.12 – Data structure of cell control information	28
Table A.13 – Parameters of a paragraph tag stored in block control information	32
Table A.14 – Parameter of a line break tag stored in the block control information.....	33
Table A.15 – Parameters of a font settings tag stored in the block control information	35
Table A.16 – Parameters of a ruby tag stored in the block control information	36
Table A.17 – Parameter stored in the block control information.....	36
Table A.18 – Parameters stored in the block control information	37
Table A.19 – Parameters of an image tag stored in the block control information	39
Table A.20 – Parameters of mask tag stored in the block control information	40
Table A.21 – Parameters of link jump tag stored in the block control information	41
Table A.22 – Parameters of a URL jump tag stored in the block control information	41
Table A.23 – Parameters of a mailer launch tag stored in the block control information	42
Table A.24 – Data structure of the MIG format	43
Table A.25 – Gif image support.....	44
Table A.26 – Possible tag nesting	45
Table A.27 – Conformance levels	46
Table A.28 – Tags eligible for each conformance level.....	46
Table A.29 – Files eligible for each conformance level.....	46

ITeH Standards
(<https://standards.iteh.ai>)
Document Preview

[IEC 62524:2009](#)

<https://standards.iteh.ai/catalog/standards/iec/cf8d04dc-950f-4df7-8533-998d74af76af/iec-62524-2009>

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**MULTIMEDIA SYSTEMS AND EQUIPMENT –
MULTIMEDIA E-PUBLISHING AND E-BOOKS –
READER'S FORMAT FOR E-PUBLISHING**

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 provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with an IEC Publication.
- 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 62524 has been prepared by technical area 10: Multimedia e-publishing and e-books, of IEC technical committee 100: Audio, video and multimedia systems and equipment.

The text of this standard is based on the following documents:

CDV	Report on voting
100/1376/CDV	100/1487/RVC

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

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

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

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

A bilingual edition of this document may be issued at a later date.

iTeh Standards
(<https://standards.iteh.ai>)
Document Preview

[IEC 62524:2009](#)

<https://standards.iteh.ai/catalog/standards/iec/cf8d04dc-950f-4df7-8533-998d74af76af/iec-62524-2009>

INTRODUCTION

Markets for multimedia e-book and e-publishing require standardization of formats for e-book data interchange among related parties; authors, data preparers, publishers and readers. The formats are classified into submission format, generic format and reader's format. The submission format has to support an interaction between authors and data preparers. The generic format has to provide an interchange format for data preparers and publishers and therefore should be reading-device-independent. The reader's format depends on e-publishing equipment.

iTeh Standards
(<https://standards.itih.ai>)
Document Preview

[IEC 62524:2009](#)

<https://standards.itih.ai/catalog/standards/iec/cf8d04dc-950f-4df7-8533-998d74af76af/iec-62524-2009>

MULTIMEDIA SYSTEMS AND EQUIPMENT – MULTIMEDIA E-PUBLISHING AND E-BOOKS – READER'S FORMAT FOR E-PUBLISHING

1 Scope

This International Standard specifies a reader's format for multimedia e-publishing employed for e-book data interchange among publishers and readers, satisfying a number of readers' requirements such as being non-revisable, equipment-adaptive and application-adaptive.

NOTE This International Standard does not address the following issues:

- elements necessary for final print reproduction only;
- rendering issues related to physical devices;
- metadata issues for document management;
- security issues such as DRM for document.

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.

IEC/TS 62229:2006, *Multimedia systems and equipment – Multimedia e-publishing and e-book – Conceptual model for multimedia e-publishing*

3 Terms and definitions

[IEC 62524:2009](https://standards.iteh.ai/catalog/standards/iec/cf8d04dc-950f-4df7-8533-998d74af76af/iec-62524-2009)

<https://standards.iteh.ai/catalog/standards/iec/cf8d04dc-950f-4df7-8533-998d74af76af/iec-62524-2009>

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

3.1

data preparer

organization or person that prepares an e-book

NOTE An editor is an example of preparer.

3.2

multimedia e-book

multimedia content consisting of text, graphics, sound and/or video data

3.3

publisher

organization or person that issues and distributes an e-book

3.4

reader

the final user who reads the e-book

3.5

reader's format

format for multimedia e-book contents rendered and presented by reading device

3.6

reading device

equipment or program used to render and display e-books

4 Position and requirements for reader's format

4.1 Reader's format in contents creation/distribution model

The conceptual model for multimedia e-publishing (IEC 62229) defines a contents creation/distribution model shown in Figure 1.

Author <--(1)--> Data preparer <--(2)--> Publisher --(3)--> Reader

IEC 190/09

Figure 1 – Contents creation/distribution model

In the third step of the distribution chain, the publisher creates the final version of the document in the reader's format, based on data obtained from the generic format in the previous step, and finally distributes it to the reader. There can be several distinct reader's formats, adapted to the various reading devices and distribution schemes. Because of reading devices' potential limitations, some reader's format may lack support for certain features of the corresponding generic format. It is the publisher's role to determine how to convert an e-book to a less capable format.

4.2 Requirements for reader's format

The reader's format can satisfy the following requirements of readers:

a) non-revisable

As the reader's format is the final form of the document, which will be used only for viewing, there is little point in it being revisable. What matters most is that the file should be easy to process, even if this makes editing the data more difficult. Being revisable can even be considered a problem, since it makes the format needlessly complex.

b) equipment-adaptive, application-adaptive

The reader's format is directly processed while the reader browses the book. For that reason, to maximize the reader's comfort, the format should be specifically designed to match the capabilities of the device, in terms of CPU power, memory foot-print, display size, etc. For example, a format targeted at a device with weak processing abilities should, in order to keep the memory and CPU requirements low: (1) Use a light special purpose binary structure, rather than processing-intensive formats like XML, (2) store the pre-calculated position of the elements, rather than compute the layout on the fly... On the other hand, if the target reading device is a high end processing system like a PC, a format allowing for rich multimedia effects would be preferred, since it can easily be handled.

c) legibility

To achieve a sufficient level of reading comfort, it is important that the reader's format pays attention to legibility on the reading device. In that regard, the following implementation methods can be considered.

- Fixed page layout

The format defines the document so that each page of the document may be rendered identically on any reading device. In this type of layout, it is common to record directly in the file the actual position of all displayable elements. Generally, as the publisher can specify precisely the final aspect, he will set the layout that is deemed to be the most comfortable for the reader. Consequently, complex designs can be achieved, as long as the display is as large as, or maybe larger, than the designer expected, making it possible to reach excellent levels of legibility. On the other hand, if the actual display is smaller than the one the document was designed for, it must be zoomed out,

possibly making some characters unreadable, or the reader has to scroll around the document, reducing the reading comfort.

- Flowing layout

In this type of layout, the reading device dynamically determines, according to the screen size, where line breaks should be inserted, and compute the resulting position of the various elements. The final layout therefore depends on the screen size, font type, font size, etc. The reading device usually has a set of rules to handle word wrapping or hyphenation (ends of lines). Even though this layout model cannot achieve designs as sophisticated as fixed page layouts, it can guarantee that the text will remain clearly readable, whatever the screen size. It also usually gives more customization options to the reader, letting him set parameters as the font size or colour, making it more easily adaptable to individual readers' preferences. On the other hand, the publisher somewhat loses control over the final appearance of the document.

- Others

Intermediate solutions also exist. For example, a format could specify what is essentially a fixed layout when the screen is large enough to display the defined layout at the current zoom level, but also allow, when zooming in, to change the layout (by collapsing the margins or changing the paragraphs size, for example), so that the characters can indeed be zoomed in, without making the page larger than the screen.

4.3 File format

A reader's format may have a specific data structure depending on the reading device. When rendering functionality is supported by reading devices, both logical structure and style specification are recommended for flexibility of presentation. When no rendering functionality is supported by reading devices, the reader's format should have a final form structure.

The format may also be adapted to the mode of distribution.

- Complete single download: A whole e-book is copied or downloaded at a time to the reading device. In that case, the e-book can usually be stored in a single file.
- Continuous download: Chunks are downloaded on demand, during the rendering. This is useful for device with readily available connectivity, but limited storage capacity. This may be achieved by splitting the document in several small files.

4.4 Features of the reader's Format

4.4.1 General

The features of the reader's format may vastly vary with the targeted reading devices, depending on their capabilities. For this reason, while creating contents for a particular reading device, the publisher may have to omit some features, or, on the contrary, add others to compensate.

4.4.2 Types of displayable elements

Actual rendering capacities of the rendering device may vary, but reader's formats should at least support text and static images. In addition, animations made of a sequence of static images, sound, movies and other multimedia data may be supported too.

4.4.3 Layout and styling

Reader's format, as the final document, shall contain all the styling information needed for proper screen rendering. As stated in 4.2 c), there are mainly two types of layout: the fixed page layout, and the flowing layout. In each case, the way to specify the style may be quite different. When opting for a fixed page layout, the most common solution is to store the final position and style of each displayable element. On the other hand, formats with a flowing

layout will have settings such as line spacing, character spacing, indentation and margins, which will be used for computing the layout on the fly by the reading device.

4.4.4 Fonts

In most formats, it is possible to set various text properties, such as font, size, colour, bold or italic, etc.

Moreover, in the case of fixed layout, to ensure that the page is rendered as intended, the font itself may be embedded in the document. On the other hand, in the case of flowing layout, while it is common to use the fonts bundled with the system, font data can sometimes be embedded in the document to ensure that all the needed glyphs will be available at read-time.

4.4.5 E-book specific features

- **Link jump**
Allows to jump to a predefined position within the document or to a web site, upon clicking on, or otherwise activating a certain part of the document.
- **Effects**
Specifies special visual effects for certain parts of the document, like fade-in or wipe.

5 Conformance level

Generally, reader's formats are designed to closely match the reproduction capabilities of the reading devices. As reading devices can be quite diverse in reproduction capabilities, it is to be expected that the capabilities of each reader's formats differ accordingly. To ease communication and understanding between the various actors of the e-book publishing market, this International Standard establishes a 3-level classification, namely, minimum, medium and rich conformance levels, to help categorize the different reader's formats.

This International Standard requires that each format define such 3-tier classification in itself.

While this standard stipulates a very rudimentary capability for minimum conformance level, other details of the 3 levels are left to the description of each format to allow for diversity among different formats.

a) Minimum conformance level

Targeted at devices with low reproduction capabilities.

This standard requires that at least a line of text data be displayed for a viewer to satisfy minimum conformance level.

b) Medium conformance level

Intermediate level between minimum and rich conformance levels.

c) Rich conformance level

Targeted at devices with high reproduction capabilities.

Annex A (normative)

C-XMDF reader's format

A.1 About compact XMDF

The present International Standard describes an e-book format targeted at mobile phones. Similarly to HTML, text is not divided into pages, but dynamically arranged according to the screen and font size. This type of layout will be called flowing layout.

Compact XMDF documents may be divided into several parts, for distribution or retail purposes.

A compact XMDF document is usually made of several flows. These data structures are meant to match a meaningful division of the document, such as chapters. Flows are displayed in the order specified in the content data. The viewer should do a page break when moving from a flow to the next one. The specific way a document is to be divided into flows is not specified, and is left to the document preparer's discretion. Chapters of a novel or articles of a newspaper are good examples of possible divisions. Note that it is perfectly acceptable not to organize the document in several flows, and store every thing in only one flow. There are two types of flows: formatted text flows, and image base cell flows. In this text, when the type of the flow is obvious from the context, or not relevant to the discussion at hand, they may be simply referred to as flows.

To meet both the requirements of ease of edition during the preparation phase, and ease of processing by the software viewer, there are two corresponding format, as described in Table A.1.

Table A.1 – File types

Type	Details
Generic format	Format used for creation and edition of the document. It is meant to be easy to modify with a text editor, and is based on XML and CSV files.
Reader's format	Format used for distribution purposes. It is designed to be easy to process by the viewer software, and is a binary format.

Both formats have equivalent semantics, and the generic format is to be translated to the reader's format prior to distribution, possibly using conversion software.

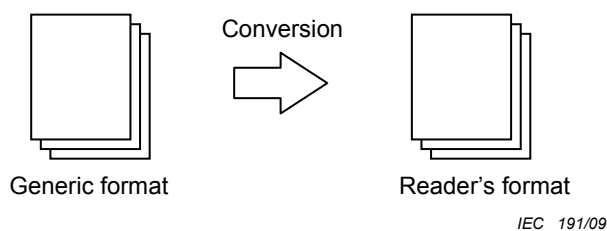


Figure A.1 – Relation between generic and reader's formats

This standard describes the binary reader's format.

A.2 Terms and definitions

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

A.2.1

checksum

sum one by one of all the bytes of the file (the checksum itself excluded) stored as a 4 byte field

A.2.2

cxmdf_char type

an integer ranging from 0 to 255, stored in one byte

A.2.3

cxmdf_int type

an integer ranging from 0 to 4 294 967 295, stored in four bytes in big-endian order

A.2.4

cxmdf_short type

an integer ranging from 0 to 65 535, stored in two bytes in big-endian order

A.2.5

cxmdf_Sshort type

an integer ranging from -32 768 to 32 767, stored in two bytes in big-endian order

A.2.6

cxmdf_string type

data type used to store character strings

See Table A.2 for details.

Table A.2 – Cxmdf_string type

Type/number of bytes	Content	Details
Cxmdf_char	Length of the string	Records the number of bytes used to store the string.
n	String	The number of bytes of this field is determined by the previous field. If 0, then this field does not exist. The string is to be interpreted according to the encoding specified in the character encoding flag of the root file (see A.4.1).

A.2.7

flow number

flows are numbered in order, starting at 0; the first flow is 0, the second is 1; the third is 2 and so on

A.2.8

half width and full width characters

characters called half width are the usual range of Latin characters, and similarly sized characters; full width characters, primarily used by CJK languages, are typically twice as large, even in mono space fonts

NOTE Most half width characters, including the space character, have a full width version, visually distinct, used for typographic purposes.